#55 SEPTEMBER–OCTOBER 2005

control NETWORK

Focusing on News & Information for Contemporary Controls' Valued Customers

Five Issues When Selecting Ethernet Switches

INSIDE

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CONTEMPORARY CONTROLS

Connecting Devices Worldwide

When you interconnect your Ethernet equipment within a control panel, you're tempted to select an office-grade or Small Office—Home Office (SOHO) Ethernet switch from a mass merchandiser such as Best Buy. The equipment is readily available and inexpensive!

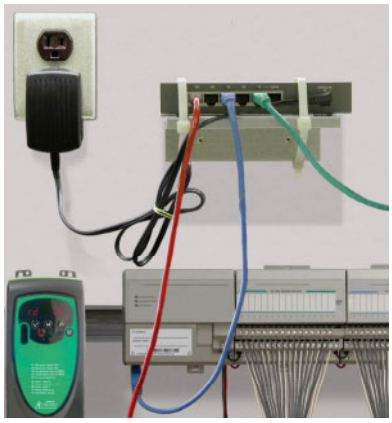
The alternative is to purchase Contemporary Controls' Industrial Ethernet equipment marketed under the CTRLink® trade name which costs more and perceived to be over qualified for the application. Since both approaches will work, why not save the money and take the SOHO route.

However, there are issues when making this decision as you see in the picture below. Cost savings may not always be realized and reliability could be compromised by taking this direction.

1. Mains Powered

SOHO equipment requires an external regulated 5 DC power supply which is frequently called a "wall wart" since it must be mains-powered and hangs from a duplex receptacle. Since a wall wart can be easily dislodged during shipment or use, some municipalities require a wall wart to be attached to the wall plate with a screw. Failure to do so can result in a "red tag" given by an electrical inspector.

CTRLink equipment is wide-range, low-voltage AC or DC powered, allowing the same equipment to operate worldwide. For safety purposes, most control panels function from either 24V AC or DC sources so it is simple to power the CTRLink switch from the same source as the other control equipment in the panel.



This installation is functionally correct, but it is a messy solution prone to mishap.

2. Mounting

SOHO equipment was made for the table top—with four rubber pads to prevent surface marring of a desk or shelf. Mounting the SOHO equipment in a control panel takes extra effort either by fabricating a bracket or a shelf to hold the unit. Attachment can be made using duct tape or tie wrap. LED indicators are on the opposite side of the RJ-45 connectors so either the LEDs can be viewed or the connectors can be viewed but not both.

CTRLink equipment was made for control panel installation. Flanges are provided for panel or DIN-rail mounting. Once attached, the CTRLink switch looks like it belongs with the other equipment. Both the LED indicators and RJ-45 connectors are easily viewable when the door of the control panel is opened.

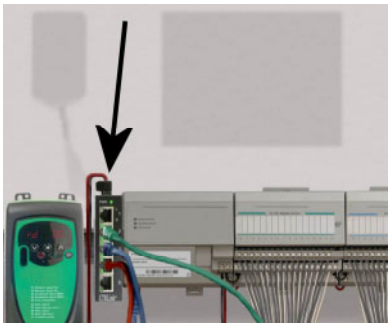
Continued on page 2

3. Redundant Power Source Provision

Because of Ethernet's star topology, the Ethernet switch is crucial to control system operation and, therefore, must perform continuously. A loss of primary power will disrupt system operation so CTRLink switches have redundant power connections, allowing the switch to continue to function without disruption from the loss of primary power.

4. Regulatory Approvals and Environmental Specifications

Most municipalities require a UL or CSA label applied to the control panels. A common standard is UL 508 Industrial Control equipment which CTRLink equipment meets this compliance. For more stringent applications, a UL 864 Control Units and Accessories for Fire Alarm Systems rating may be needed. SOHO equipment has neither of these approvals and installing a non-approved device in a UL control panel is an invitation for a red tag by an inspector.



The professional solution—neat and concise.

CTRLink equipment is definitely more rugged than SOHO equipment. Four-layer printed circuit boards and input filters meet the industrial limits of electromagnetic compatibility (EMC) standards EN 55022 and EN 55024.

There are two widely accepted temperature range specifications for CTRLink equipment. The industrial temperature range is 0° to 60°C. The second is the wide temperature range or outdoor range from –40° to +75°C. SOHO equipment is either rated from 5° to 40°C or not rated at all.

5. Product Support

Ethernet technology is complex and equipment selection from repeating hubs, plug-and-play switches and managed switches can be confusing. Troubleshooting problems in the field can be tedious and that is why CTRLink equipment is designed with ample LEDs to indicate crucial parameters such as data rate, activity, valid link and duplex. Some of the CTRLink products have a writing area on the switch itself to note connections to field equipment. This aids the technician to quickly find the source of a problem when drawings cannot be located.

Contemporary Controls understands control applications, the capabilities of Ethernet equipment, and the use of fiber or twisted-pair cabling. Our engineers can assist you with issues such as auto-negotiation and auto-MDIX as well as advanced features such as virtual LANs, trunking, and Simple Network Management Protocol (SNMP). This level of support is not provided by mass merchandisers.

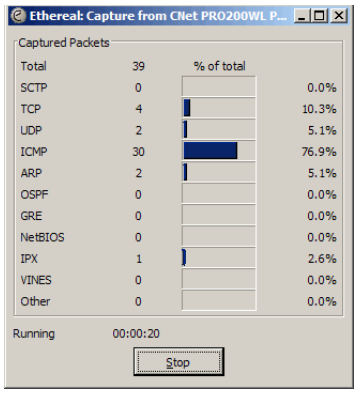
Depending upon the sophistication of the Ethernet switch being used, the cost differential between SOHO and CTRLink is not significant. You want 100% uptime and a switch failure results in an expensive service call so why not choose the best for the customer? A neat, clean, professional, and reliable installation will satisfy your customer and lead to repeat business for you, the installer, over time.

Ethereal to Fine-Tune Your Ethernet Network

How do you know if your traffic is normal? Are too many broadcast packets stealing your bandwidth? Is a misconfigured PC disturbing the network? Answering such questions is easy if your switch has port mirror and you use **Ethereal**.

Ethereal is a FREE packet analyzer that decodes all the protocols you will ever encounter. It has **all** the standard features as well as some unique ones. It runs on Unix, Linux, and Windows®.

As Ethereal captures packets, it reports capture percentage by protocol as shown below:



Once capture is complete, view a highly detailed time-stamped report (even TCP/UDP port usage). Each line includes helpful information and is color-coded for ease of use.

Time	Source	Destination	Protocol	Info
0.947346	10.0.0.144	Broadcast	ARP	Who has 10.0.0.42?
2.321276	10.0.0.2	Broadcast	ARP	Who has 10.0.0.47?
9.990989	10.0.0.138	10.0.0.2	DNS	Standard query A ww
10.036590	10.0.0.2	10.0.0.138	DNS	Standard query resp
10.037806	10.0.0.138	129.6.13.35	TCP	1637 > http [SYN] S
10.107906	129.6.13.35	10.0.0.138	TCP	http > 1637 [SYN, A
10.107993	10.0.0.138	129.6.13.35	TCP	1637 > http [ACK] S
10.108832	10.0.0.138	129.6.13.35	HTTP	GET /timezone.cgi?C
10.361974	129.6.13.35	10.0.0.138	TCP	http > 1637 [ACK] S
10.519095	129.6.13.35	10.0.0.138	HTTP	HTTP/1.1 200 OK
10.528216	129.6.13.35	10.0.0.138	HTTP	Continuation or non
10.528302	10.0.0.138	129.6.13.35	TCP	1637 > http [ACK] S
10.606477	129.6.13.35	10.0.0.138	HTTP	Continuation or non

Ethereal is loaded with remarkable features. Its reports are so powerful that it constitutes a handy learning tool to enrich your protocol knowledge.

Ethereal is one of the best packet analyzers available and it's FREE! For more information, access:

www.ethereal.com

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A Look Into the Past—From Senior Electronics Engineer to R&D Manager

A glimpse into Contemporary Controls' history brings us to an individual who has helped to push the limits of technology. Bennet Levine left his employment with AM Multigraphics in 1988 to find his niche at our company as a Senior Electronics Engineer. Back then, Levine and his associates shared their knowledge and expertise in custom engineering. They explored different aspects including industrial networking, industrial controls, the medical and printing fields.

Throughout the years, Levine has witnessed many changes. He says the most significant change occurred in manufacturing. "Our manufacturing department switched to surface mount technology to increase production and to improve the response time to our customers," explained Levine.

In his present position as R&D Manager and with the help of his staff, he has initiated new products and designs with emphasis on the company's Industrial Ethernet line, marketed under the CTRLink® trade name. Even work in the company's ARCNET® line remains strong as well with new products being introduced including the AI-USB hub, AI-SRVR and the USB22 adapter.

Levine concludes by saying, "We are always looking for new ideas from our customers that will bring solutions to their problems."

First in Class

While on leave, Keith visited with his associates at Contemporary Controls.

Our congratulations go out to L/Cpl. Keith Thomas, USMC for graduating first in his Data Network Specialist Course at the Marine Corps Communication —Electronics School located at 29 Palms, CA. He received a meritorious promotion to L/Cpl. for maintaining a 99% score on his tests. His previous employment as an engineering intern at Contemporary Controls, and studying Industrial Ethernet University course work really paid off. Keith has been assigned to network administrator duties with a Marine Wing Support Squadron (MWSS-374) at 29 Palms. We wish Keith the best of luck in his new assignment and thank him for serving our country.

The Passing of a Dear Friend and Mentor

Contemporary Controls has lost a dear friend and mentor with the death of Shirley Stein on September 3, 2005.

Shirley came to Contemporary Controls in July 1982. She applied for a part time clerical administrative position to fill her "retirement" years. We noted that with her B.S. from the University of Illinois, Champaign-Urbana as a Chemistry major and Math minor that she might be "overqualified" for the job. Prior to Contemporary Controls, she was employed at Argonne National Laboratory, where she met and married Lawrence Stein in 1952. A lifelong resident of Downers Grove, Shirley also taught at O'Neill Jr. High School.

Little did we know then that this regal woman would take all tasks to the highest professional level. Her dedication, organizational skills, research abilities, and penchant for accuracy set the bar for each of us. Her door was always open. No problem was too daunting or too complex. We called upon her time and again to take on new challenges and she always accepted. She became the company's personnel administrator and later the human resources manager.She mentored each of us and taught us by her examples of honesty, loyalty, and love.

Shirley decided to retire in May 2002. No one has ever been able to fill her shoes. Our sympathy goes out to her loving husband Larry, daughters Rachel and Susan, and grandchildren Joshua and Anna.

New Sales Manager on Staff at Contemporary Controls GmbH

Jan Thriene says his work experience at Heyfra Electronic GmbH in Eisleben, Germany was very positive as a salesman for wholesale and export. He says his past projects will fit in perfectly with what he'll be accomplishing in his position at Contemporary Controls GmbH as the new Sales Manager.

Since the start of his employment, Thriene has been involved in many international projects. His main responsibility will be the support of the distributors and the expansion of the distribution network in Eastern Europe. He will also help in providing technical support and training to the distributors.

Thriene is studying technical business administration at a local college and for the past 10 years has served as a volunteer firefighter.

When he finished high school in 1999, he enlisted in the armed service for 10 months. Thriene was a Loader and Gunner of the Main Battle Tank Leopard II.

Thriene is an avid reader of fantasy and science fiction books. Aside from that, he just likes to "kick back" with friends as often as possible.

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New ARCNET® Catalog—Coverage of Key Technology Concepts

If you must maintain an existing ARCNET system, you don't have to look far for the leading expert on ARCNET. The value of all of Contemporary Controls' knowledge on this technology is reflected in an updated ARCNET catalog entitled "ARC Control — ARCNET for Control." This 88-page technical resource is essential for any networking professional in the design, deployment, and support of such a system.

Written in a way that an engineer can relate to, the information is clearly stated and supported with numerous graphics and tables. The catalog is well indexed with these sections: ARCNET — The Hidden Real-Time Network, ARC Control, Transceiver and Connector Selection Guides, Product Descriptions, Technical Specifications, Regulatory Approvals, Accessories, Power Wiring Diagrams, Glossary, and much more!

Included in the catalog, the ARCNET Tutorial provides the reader with a good understanding of this Local Area Network (LAN). It emphasizes ARCNET's advantages, topologies, cable, segment lengths, transmission times, data link layer, software and standards.

Contemporary Controls' Sales Manager Joe Stasiek says "This catalog shows our continuing support for this time-proven, deterministic technology."