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Contemporary Controls Completes Its Lead-Free Conversion Process

With the July 2006 deadline rapidly approaching, Contemporary Controls' Downers Grove, Illinois, plant has successfully completed a program to produce Restriction of Hazardous Substances (RoHS) compliant products as outlined in the European Union's RoHS directive. George Thomas, President of Contemporary Controls, thanks his entire manufacturing and engineering staff for their efforts in making the necessary conversion. "It took the thoroughness and the cooperation of everyone in operations to make compliance possible," says Thomas. "This process involved the purchase of new equipment, the specifying of alternate components, revised bill of materials, revised work instructions as well as in-depth training for the employees. It was a significant effort."

The Association Connecting Electronic Industries (IPC) aided us in our goal. IPC devotes its resources to protecting the environment and adhering to relevant government legislation. Manufacturing Engineer Neil Maloney said, "As members of IPC, we could rely on them for guidance through some of the darker areas along our path to RoHS compliance. The IPC did much investigating in lead-free solder alloys, manufacturing processes, and material declaration that were necessary for us to just keep up with the changing European marketplace."

The process began last year with the engineering department assessing the company's current products. It would determine if these products could be manufactured employing new parts and surface finishes that were compliant with the RoHS directive. Once the assessments were completed and the new components were effectively sourced, the company's factory floor had to be converted to a lead-free environment.

A new Vitronics® XPM820 reflow oven was purchased in order to solder at the required temperatures, necessary to meet RoHS compliance.

Maloney said the process involved the purchase of new capital equipment, specifically a new Vitronics® XPM820 reflow oven occupying 15 lineal ft. of processing space. The oven takes solder paste and reflows it so the solder can adhere to the metal portions of the components. The oven is designed with eight heating zones and two cooling zones in order to attain the required 217°C temperature and to acquire the proper ramp rate for lead-free soldering. "We had to purchase a larger reflow oven (8 heating zones instead of the previous 4) to heat up products to higher temperatures than before, when our leaded solder was melting at 183°C. This higher temperature makes it imperative that the components are rated to handle the additional thermal load. Not only that, but the increased number in thermal zones are necessary to ensure that the components are not heated too quickly. If you heat too quickly, any moisture trapped inside the components will expand and damage them even to the point of having components explode—right in the oven."

Maloney further explained, “That’s why we have different components that can handle the higher temperature with different surface finishes. When you remove the lead from solder, the higher percentage of tin acts more aggressively interacting with other metals. This forces us to employ a different finish on our circuit boards.”

The next step of the process was converting the Electrovert Astrapak wave solder machine. Solder wave conversion included refitting pumps and changing solder pots to titanium, and replacing the tin/lead solder with the new Tin Silver Copper (SAC) alloy solder.

Another important step of the process for RoHS compliance was converting the company’s solder wave machine by refitting pumps and changing solder pots to titanium.

There were other changes on the production floor as well. Maloney said lead-free solder has a different odor than our leaded alternative. “Personnel had to enclose the area behind our solder pots with a curtain and an exhaust system so the odor wouldn’t be prevalent in our manufacturing area during weekly solder pot maintenance,” he emphasized. Furthermore, he said, the rework section had to be modified because of the characteristics of lead-free solder. “Individuals repairing our products must use other soldering techniques that vary remarkably from working with leaded solder.”

Manufacturing Supervisor John Magagnini said production facility employees attended classes to learn no-lead soldering techniques. Classes taught employees what is a solder joint, heat transfer issues, types of flux, solder types, solder alloys, and more.

Magagnini said the instructor stressed that lead-free soldering is a very critical process, meaning every step of the process must be accurate. According to Magagnini, “You must be very, very patient with lead-free soldering because it doesn’t melt or flow as nicely as leaded solder.” “The operator must be trained properly to know what is an acceptable or an unacceptable solder joint. When the operator makes a correct lead-free solder joint; visually it may seem to be unacceptable. The operator learns to retrain his or her eyes to know what is right or wrong.”

The company’s manufacturing facility in China underwent a change to lead-free production less than a year ago. However, Maloney said, the Downers Grove facility is in the unique position that we need to support all our legacy products and our legacy products are leaded. Some of these products will not or cannot be converted. Therefore, after July 1, 2006, both leaded and unleaded products will be available. The customer must decide if a leaded product is acceptable for his application.

TECH UPDATE

Link LEDs and Cabling Distance

Not long ago, I received a call from a fellow seeking help in troubleshooting his new installation of Industrial Ethernet. He was trying to make sense of the Link LED behavior he was witnessing in the absence of data activity. The installation involved four Industrial Ethernet switches connected by unshielded twisted-pair (UTP) in a daisy-chain topology.

The installer observed a solid Link LED on his first unit as well as on the next one. However, the third switch in the chain exhibited a flashing Link LED and the LED on the last switch would not glow at all.

Some investigation revealed the following situation: The UTP segment between the first and second switches was somewhat less than 100 meters. The segment separating the second and third units was slightly more than 100 meters. And the installer admitted that the final segment distance was closer to 200 meters than it was to 100 meters.

The distance limit of 100 meters for Industrial Ethernet UTP cabling was being violated in the second and third segments. It is interesting to observe that the Link LED behavior was intermittent when the distance specification was violated only modestly. You might expect the LED to simply fail completely once the distance limit was exceeded, but such was not the case until the violation became extreme.

The foregoing anecdote illustrates the importance of keeping your segment lengths within spec. Furthermore, it serves as a warning that if you allow the segment distance specification to be violated “even a little bit,” you are risking erratic data transfer—even though your Link LED could be suggesting all is well.

By Bill Greer, Senior Product Specialist

Read more “great” topics by visiting Industrial Ethernet Blogging With Bill at www.ccontrols.com/blog.htm.

Contemporary Controls Participates in ODVA's Plug Fest #5

Contemporary Controls was among 21 vendors/organizations participating in the ODVA's Plug Fest #5 held in Elgin, Illinois, early in May 2006. Harpartap Parmar, the company's Software Engineer, said the Plug Fest provided an opportunity for Contemporary Controls to test its Ethernet EICP8M managed switch against a suite of interoperability tests with a number of other product and infrastructure vendors.

According to Parmar and other vendors, the goal of Plug Fest #5 was to provide feedback to the developer regarding any possible interoperability problems before they are discovered in the field. Devices were first pitted against a predefined test configuration and test procedure. This concluded with interoperability testing in a full multi-vendor system configuration. Kevin Knake of HMS Industrial Networks, Inc. in Michigan said starting with this Plug Fest, device performance testing was accomplished. Each product was provided with a performance analysis that included packet throughput and jitter.

Parmar said the company's EICP8M switch features including IGMP Snooping and VLANs passed the interoperability testing. However, vendors whose products didn't pass had the chance to consult with EtherNet/IP™ experts in the understanding and resolving of issues. "Vendors were encouraged to fix problems and re-test," explained Knake.

Knake believed that Plug Fest #5 extended the conformance testing process to help ensure that EtherNet/IP™ end-users can buy products that provide the functionality, and quality required to make deploying EtherNet/IP™ an easy experience.

The "ABCs of Ethernet Technology" is a Valued Resource Tool

The Campaign For Learning, an independent charity founded in 1997, conducted a survey which revealed that 93% of us believe that it's never too late to learn. For example, engineers will no longer be judged by their qualifications alone, but by their ability to adapt to changing technology and this can only be achieved through learning.

Keeping this in mind, Contemporary Controls has published the "ABCs of Ethernet Technology" to help you understand the key principles behind how your Ethernet network functions. These eleven documents may be found by visiting our www.ctrlink.com site and looking under Ethernet Articles. Topics range from troubleshooting your Ethernet network, using fiber optics, to Power Over Ethernet (PoE).

According to one Ethernet user, these documents prove to be a valued resource tool. Henry Fudge, the Technical Services Manager at Liebert Corp. in Columbus, OH, trains air conditioning contractors. While attending AHR 2006 and stopping at our exhibit, Fudge learned about these documents from our company.

"I must admit that these documents allow my students to make all the pieces fit into the puzzle," says Fudge. "The documents provide sufficient information so my students can ask intelligent questions in order to arrive at the right solution to their problem. I can't think of a better way for my students to learn the networking process, the types of switches deployed and much more."

As time goes on, more documents will be published to share new knowledge and broaden the company's presence as a resource for learning Ethernet technology.

Global Sales Meeting Plans its Course of Action

Nearly every company relies on meetings to support its mission and that's just what Contemporary Controls accomplished at its annual sales meeting held at its subsidiary in Suzhou, China. Strategic players from corporate and offices in the UK and Germany reviewed the company's research and development plans as well as its sales and marketing objectives. As a global company, communication is the key.

Basile Waite, Plant Manager, gave a tour of this world-class manufacturing facility. The Suzhou plant is now a lead-free operation, complying with the RoHS Directive.

First-time visitors to China were able to witness the explosive growth of China's economy. Building construction is everywhere.

And of course, there was leisure time. Everyone enjoyed the historical and cultural sights of China. In addition, they were able to attend the wedding of our accountant Jane Ye.

We give Jane and her new husband our best wishes, much prosperity and good health!

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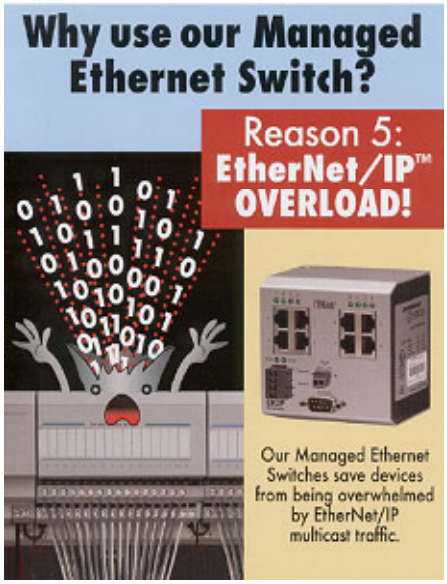

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- Contemporary Controls successfully converts to a lead-free operation for RoHS compliance.
- Company's EICP8M managed switch passed interoperability testing at ODVA's Plug Fest #5.
- Read this month's Tech Update to learn about link LEDs and cabling distance.