

# Automation Service News

**The Newsletter of Delta Automation Inc.**

**Tech Tip!**

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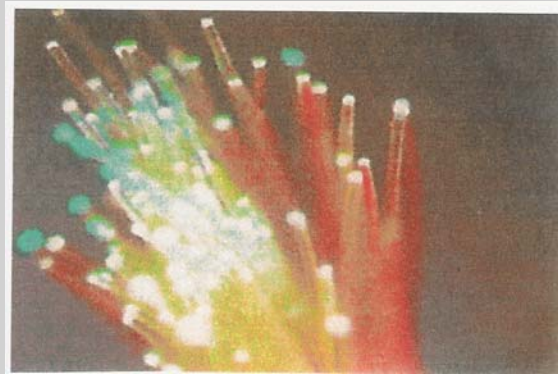
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# Tech Tip!



## Fiber for the Industrial Environment

In most process plants and factories electronic components must withstand harsh environmental conditions from extreme temperature ranges, lightning strikes, electromagnetic interference, radio interference, and hazardous locations. The data carrying capacity of an optic fiber is far greater than that of copper wire or coaxial cable. Optical fibers are extremely small, lightweight, resistant to corrosion, and are immune to electrical noise (EMI/RFI) and lightning. Since fiber cables do not carry electrical energy they are approved for hazardous locations. Ground loops are not a problem when cabling from building to building as with coaxial cable. The cost of fiber cable and the connectors has decreased over the years making it a preferred choice for automation and control networks. Fiber Optic manufacturers recognize that many protocols, both open and proprietary, are used for factory automation applications. Their products come in many form factors from DIN rail mounting to shelf installations. Space requirements are always an issue since the network components must be housed in the same cabinet as the industrial control equipment. Ethernet technology is quickly being embraced by the industrial automation and control industry for data acquisition of what's going on at the factory floor. By installing fiber as your backbone for each layer of network communications, you will be well ahead of the curve as the hardware continues to improve capacity of information and speed of throughput. The modular design makes for an easy choice to use off the shelf products when designing your networks and lend themselves to future expansions with minimal redesign. Fiber modems can be employed in a self-healing ring application to improve communications reliability with a single point of failure. The same application would be more cost prohibited using copper. Your decisions will be what kind of fiber to specify, single or multimode. What type of connectors, SMA, ST, or SC? The newest form factor for miniature connectors is the LC type.

# Ethernet Cable Testing

In the Ethernet domain, the need for speed is constantly improving with each new generation of hardware. Network cards have gone from the 10Base-T to the 100Base-T and now the newer hardware is boosting 1000Base-T capability. The question is: Can the cable you have installed and are now using handle the increase in speed?

Category 5e uses 4 pairs of conductors to meet the TIA cable performance specifications which include: attenuation, near end cross talk, return loss, and far end cross talk. Category 5 uses 2 pairs of conductors to handle the 100Base-T transmissions.

Delta Automation, Inc. has the test equipment and expertise to certify your existing cable system and determine if it will support a 1000Base-T network according to the TIA or ISO link specifications. If you are in a troubleshooting environment, and need to prove unequivocally that the link under test is failing the category 5e or 6 performance requirements according to the standards, then you should have Delta Automation, Inc. certify your installation. If you have a mixture of both copper and fiber cabling you will need to test both mediums.



## PLC Battery Replacement

Almost every PLC has a battery installed to backup the memory in the event of a power loss/failure. There has always been some confusion as to the function of this battery backup arrangement. The battery does NOT allow the PLC to continue performing it's job. It simply prevents the program and data from being loss or corrupted during an interruption of incoming power.

The batteries most often are installed in systems which, under normal circumstances, never are without power. In these cases, the battery is not really in use. A voltage level sensing circuit monitors the battery to determine its' relative health. The battery essentially is doing nothing, therefore the shelf-life, determined by the manufacturer, is typically the replacement cycle. In most installations temperature fluctuations and vibration are not taken into consideration when the manufacturer sets the limits on shelf-life.

Delta Automation, Inc. strongly recommends that PLC batteries be replaced **every year** during a routine scheduled maintenance period.

Be sure before replacing the battery, that there exists a recent backup of the program in the PLC. Also, be certain to perform the change out while the incoming power is still ON, otherwise the removal of the battery with no incoming power will cause the very problem that you are attempting to prevent!

## Motor and Resolver Cable Assemblies

The cables which are typically utilized in an industrial environment that interconnect the drive/servo system to the motor and/or resolver, are usually very specialized units. Specifically, the cable and jacket are usually oil resistant or UV protected and typically have a heavy jacket to resist physical abrasion and friction wear.

Additionally, the connectors are very specific. Most often they are MIL spec. That factor alone usually means that the cost is higher than regular commercially available connectors. Sometimes these connectors are so specific that they are only manufactured to meet an order. This dictates long lead times for these connectors as well.

Some of the cables used in Modicon, as well as other brands, servo and drive systems have been obsoleted by the manufacturer. This leaves few options for the end user should a replacement be required.

Delta Automation, Inc. has and keeps a stock of these motor/resolver cables as well as the components to build and produce them to order.

Contact Delta Automation, Inc. for ALL of your cable needs: motor/resolver, RS-232, Remote I/O, Modbus Plus, programming, and more. All assemblies are tested on live systems before shipment.

# Important Info

## Advantages of fiber optics for large networks !

We all know the basic problems encountered with installing a Modicon remote I/O network. They range from unbalanced systems to weak signals at the remote drops. Factors adding to the communications problems such as noise from other electrical equipment, improper grounding, and RFI/EMF. Approximately 1 dB of signal is lost passing through the input to output connection on a tap and 3 dB is lost per 1000 feet of RG-11 coaxial cable. Modicon specifications state the signal should not be attenuated more than 35 dB. Since a Quantum system can have up to a maximum of 31 remote drops, you see the drops located near the end will have weak signal strength. To overcome this problem, a set of fiber optic repeaters can be installed back to back somewhere halfway down the coaxial cable system. This starts a new 35 dB signal budget for the second half of the system. It will also insure noise picked up on the shield of the coaxial system from the second half is not carried over to the first half and vice versa. Another advantage is that fiber modems can be used in place of a splitter to disperse the network in different directions without the need to balance the network.

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### For after hours

### Emergency Service or Parts

Call our main number 888-723-3582

Extension 55

Leave a message and someone will respond within fifteen minutes to answer your call.

[www.deltaautomation.com](http://www.deltaautomation.com)

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