NASCAR RIDE ALONG CONTINUES IN APRIL

Enter by March 15 for your chance to race at RIR!

On a cool, clear day last November, Delta sponsored a client ride along in a genuine NEXTEL Cup race car provided by “The Racing School” of New Hampshire. We selected two people to ride with a professional driver in a multi-lap circuit of the Richmond International Raceway. With fire-retardant jump suits and safety helmets on, and insurance release forms signed, the riders gathered at the guard wall along pit row. Men, women, and some children were all there for a ride, along with camera-toting friends. As our participants were helped in through the window of the passenger seat they waved nervously and off they went. The car zipped past on the back straightaway and entered the bank on turn three. The laps progressed and finally, the car dropped into the pit road ready to change riders. Every rider emerged with a huge ear-to-ear grin and a thumbs-up sign. Some said the ride “Scared me to death.” Others exclaimed “I wanna go again!” If you’d love to join us for some NASCAR laps, Delta is sponsoring another two riders at RIR this April. Details for entering are below. Good luck!

JOIN THE RACE! Send us your name, company name and a way to contact to you. Our random drawing could land you in the passengers seat! Click on the email address to send your entry to racing@deltaautomation.com by March 15.

Click here to see a movie of the November ride along!

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TECH TIP: TESTING FOR CORRODED COAXIAL CABLES

During a past remote I/O cable system check-out at a refinery, the Delta Automation Engineers located a section of coaxial cable that had an incident along its length within an underground conduit run of about 800 feet. Although it was not causing any issues with the communications at the time, it was suggested that it be replaced and noted on the system report.

At a subsequent shutdown, a year or so later, the system was re-certified. Again this cable showed the incident at the same location and it had increased in size. Again the suggestion was made to replace it and noted in the report.

The following year the system began to experience errors in communications. The client called for support. He was asked if the suspect cable had ever been replaced. It had not. The client still wanted to have it rechecked.

Upon inspection with the TDR, the incident on the cable had increased in size tremendously. This section had to be replaced. The client put on the schedule to have the section replaced. After the replacement, the system worked flawlessly once again.

The client did a quick visual examination on the cable after it had been removed, but could not see any noticeable defects. He inquired if Delta would test the cable at our location and determine what the issue was with this section of coax. He shipped the entire removed section to Delta and it was tested and examined. The following is the report sent to the client afterwards:

As originally suspected, we located a slice in the outer jacket at the point where the TDR indicated the fault began. To properly locate the fault we had to actually cut in succession along the cable's length to visually examine the structure inside the jacket.

As we neared the slice in the jacket, the shielding began to take on a corroded look. At the point of origin (the opening in the jacket), the cable shielding consisting of both the two braids and the two foils were severely corroded.

Since a coaxial cable's typical impedance is derived from a formula using the physical distance and relationship between the two conductors (center to shield) with the dielectric material as a constant, the introduction of water plus the addition of the oxidation on the shield conductors changed the impedance along this section of the cable. The water and oxidation on the cable in effect did change the dielectric constant. The oxidation on the shield caused the conductors to actually become larger in diameter; thus the physical distance relationship was altered as well.

With both of these variables in the formula the impedance of the cable was destined to be dramatically different from the base line manufactured limits.

This change in impedance was first discovered with the use of the TDR several years ago. As time passed, more and more water was introduced into the cable and caused a continuation of the corrosion.

This section of mismatched impedance continued to increase in both amplitude and length until the impedance difference caused enough signal distortion to interrupt the proper flow of data.

The images below show the problem originally identified during a preventative maintenance system certification continued to degrade and eventually caused enough issues to interrupt the plant production. This is why all remote I/O systems should be certified at every annual shutdown interval. Please contact Delta Automation, Inc. for a quote on this invaluable service.

1. This is the slice in the jacket at the point where the incident was indicated on the TDR.
2. Here the shield is discolored and covered with a powdery corrosion.
3–4. In these photos you can see the difference between a good section of cable (left) and the corroded section. Notice both the discoloration and the size difference.

\[ Z = \left( \frac{138}{\sqrt{k}} \right) \log \left( \frac{D}{d} \right) \]

Where:
- \( Z \) = Impedance in Ohms.
- \( k \) = Dielectric constant.
- \( D \) = Inside diameter of the outer conductor in inches.
- \( d \) = Outside diameter of the inner conductor in inches.
Each November, Delta takes several clients on a Russian Wild Boar hunt to a Western North Carolina game reserve. This game reserve is owned and operated by Mr. Jerry Rushing, who is known as the inspiration for the character of Bo Duke on television's "The Dukes of Hazzard." To say that he is a colorful individual is an understatement. Mr. Rushing operates a first class hunting lodge in the mountains of North Carolina. On this reserve he has Russian Boar, Buffalo, Turkey, and several exotic species of Ram, Goat, and Deer. The hunts are all fair game hunts from either stands or individual stalks.

Located in Taylorsville, just west of Statesville, North Carolina, the Chestnut Hunting lodge is outstanding, with space for up to 14 hunters and guests. The guides are knowledgeable and professional.

Every person on this hunt harvested game. Everyone except Bob and Bobby Culley harvested Russian Wild Boar. Bob took a Corsican Ram and Bobby took a large Merino Ram. The largest boar was taken by Jim with a black powder rifle and weighed in at over 300 pounds. The average boar taken on this trip was easily over 200 pounds. Everyone thoroughly enjoyed the hunt and all left with several coolers full of meat for the family.

If you, or someone from your company is a hunter and would like to attend the next hunt with Delta, please contact Bob and let him know of the interest.

A very Delta Christmas Carol

‘Twas the night before Christmas when all through the shop, not a creature was stirring, you could hear a pin drop.
The repair shop supervisor was there, and ended up showing just how much Delta cares...

This past Christmas Eve Mike, the repair shop supervisor, just happened to be in the office closing out some last minute paperwork and enjoying the quite time with no one around.

Surprisingly, the UPS driver rang the shipping bell with four Next Day Air packages. Mike discovered upon opening the packing lists, that these units were needed immediately for a downed plant situation.

And although we had received no alert that these units were on their way, Mike went into action, calling in the technician that normally works on these units. Despite it being Christmas Eve, the technician came in right away and began troubleshooting and eventually repaired the four units in time for UPS’s afternoon pickup.

Then just a few days later on New Year’s Eve, a local plant called our emergency after hours number and reported that they had a defective Panelmate and were down as well.

Again, Mike sprung into action calling in the technician to repair it as well as retrieving the unit from the client’s site. When Mike got the unit back to the shop the technician was waiting and ready to go.

In short order, the unit was repaired and on its way back to the plant where it was immediately reinstalled, bringing their line back up.

Both of these emergencies are examples of how Delta responds to our clients’ needs.

Would another repair shop have gotten this done for you? Think about Delta for all of your repair needs.
TAKING THE HEAT OFF

The importance of motor turn-down ratios when using variable frequency drives

AC motors that are being controlled by variable frequency drives have the capability of being run at extremely slow speeds when required. This can, in the case of self-cooling motors such as open-frame drip proof (ODP), or totally enclosed fan cooled (TEFC), cause overheating issues. As the motor RPM decreases, so does it’s cooling fan efficiency. In applications where the load is classified as variable torque, such as fans or pumps, the load (and the current draw) decreases as the speed decreases.

At extremely slow speeds the loading from a fan or pump is minimal, therefore the cooling requirements are minimal as well. In constant torque applications, such as conveyors or cranes, the loads are constant, no matter what the speed. In these cases the current draw will remain at loaded levels even though the motor’s cooling fan efficiency is greatly reduced. This may cause motor overheating and eventually motor failure. Manufacturers specify the minimum speed at which their motors can safely be used.

This is commonly referred to as “Turn-down Ratio.” It is typically specified in a form such as 20:1 or 1000:1. Some manufacturers state a value for variable torque applications and another value for constant torque applications. If only one ratio is listed, it is usually meant to be for constant torque applications.

How this is defined, for example: a motor with a specified speed of 1760 RPM at 60 Hz, with a 20:1 turn down ratio, can safely be slowed to 88 RPM (1760/20=88). If the application uses Hertz as a value, it functions the same way. Using the same motor as above, at 60 Hz the 20:1 turn down ratio results in a minimum speed of 3 Hz (60/20=3). If you interpolate the two different methods of calculating these, you will see that at 1760 RPM it requires 29.3 Hz per revolution, so with the example above, a 3 Hz minimum would result in 87.9 or 88 Hz (3x29.3=87.9) just as calculated when using RPM. These basic rules are primarily to protect the motor from overheating. In extreme cases an external, independent cooling fan may be utilized, however in low horsepower applications, this may not be cost efficient.

COMMUNICATIONS GATEWAYS

Engineers looking for inexpensive ways to collect process data from the different types of control devices running within their plants should check out Red Lion’s communications gateway model CSMSTRs.

The master model provides RS232/422/485 communication ports and an Ethernet port for connecting to PCs, PLCs, and SCADA systems. The unit is configured and programmed using Crimson 2.0 software that runs on Windows 2000 or later platforms.

The software is easy to use and is a free download from Red Lion at www.redlion.net.

The web server feature provides worldwide access to data logs and the virtual HMI. The virtual HMI offers built-in PC-based SCADA functionality. The extensive built-in driver list allows easy mapping to PLCs, PC, and SCADA systems. The independent serial ports provide virtually unlimited integration methods.

Of course you could do the same with the CEV 300 module, but compared to the CEV300, the Red Lion module has more functionality at about half the price. The Ethernet connects at 10 base-T/100 base-TX. There is a compact flash slot that allows process data to be logged directly to CSV files. This device snaps on to standard top hat (T) profile DIN rail and requires a 24-VDC power supply.

The unit’s integrated serial and Ethernet ports provide the gateway, and with the communications drivers, it serves as a protocol converter. Any devices connected to the module can communicate with each other, have their data logged and are remotely accessible via Ethernet.
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Leave a message and someone will respond within fifteen minutes!

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