Industry: Telecommunications/Lighting/Surveillance

Customer case study

PHOENIX CONTACT
INSPIRING INNOVATIONS



All tower photos are property of Tower Solutions. Used with permission.

From three days to three hours

Tower Solutions slashes wiring time with heavy-duty connectors

Highlights

- After winning a contract to build a large number of mobile towers, Tower Solutions needed a faster way to wire the connections.
- Originally, it took one worker up to three days to wire the multiple systems on a single tower.
- Tower Solutions switched to HEAVYCON connectors from Phoenix Contact and reduced the wiring time to just a few hours per tower.

> "The wiring time has gone from three days to maybe three or four hours."
>
> **David Hall,**
> **Hallfield Controls**

Customer profile

Tower Solutions (https://www.towersolutionsinc.com/), located in Pine City, Minnesota, manufactures mobile tower platforms. Tower Solutions strives to meet the need for quality tower construction for any market, application, or industry. The company has a strong focus on customization to provide satisfactory results in terms of height, strengths, operation, portability, and many other factors.

Challenge: Wiring multiple systems took days

One of Tower Solutions' flagship products is the PTX-100 tower, a robust and stable mobile tower. Its unique design brings a compact transportable model that deploys quickly and stands up to hurricane-level wind speeds without the need for ground-penetrating guy wires.



Figure 1: The PTX-100 tower is a robust and stable mobile tower. It can stand up to hurricane-level wind speeds without the need for ground-penetrating guy wires.

The PTX-100 is based on a trailer. It can lift a one-ton load up to 80 feet into the air in five minutes. Each trailer includes several subsystems, such as the control cabinet, generators, cable reel, and power distribution. All of these systems need to be interconnected.

"There's a hybrid energy system, which is battery storage," explained David Hall of Hallfield Controls, the engineering firm that assisted with the electrical side of the system. "The system is designed to run as a stand-alone, so they have two diesel generators for redundancy. Whenever the batteries run low, it kicks one of the generators on to charge the batteries.

"Then the hybrid system goes to the tower control system to distribute the power, so we have to connect the two generators to one hybrid system. We also have to

© 2021 PHOENIX CONTACT
003384A:02.21

PHOENIX CONTACT • P.O. BOX 4100 • HARRISBURG, PA 17111-0100
Phone: 800-888-7388 • 717-944-1300 • Technical Service: 800-322-3225 • Fax: 717-944-1625
E-mail: info@phoenixcontact.com • Website: www.phoenixcontact.com

connect that hybrid system to the tower control system, and then the tower control system provides power up to the customer.

"Today, they run liquid-tight conduit between all the components and the trailer," said Hall. There are seven liquid-tight conduits per tower. "They pull wires and then terminate all of those wires."

In the past, Tower Solutions focused on smaller projects, but they recently won a contract that requires a higher output. When building the initial trial run of 14 towers, each tower took about three days to wire.



Figure 2: Due to the mobile nature and extreme operating environments, Tower Solutions also needed to ensure vibration-tight connections that would not come loose.

The next run required building an additional 50 towers, and Tower Solutions wanted to increase its output to three towers per week. Power/mation, the local distributor, had presented a quick-connect system more than three years ago. With the production volume increasing, Tower Solutions decided it was time to upgrade to this faster connection technology.

Solution: Heavy-duty connectors that withstand the elements

Hall stated, "We were looking for a product that was compatible with the liquid-tights. Power/mation came back with HEAVYCON. We've used Phoenix Contact products a lot over the years, and we were already familiar with HEAVYCON."

Phoenix Contact's HEAVYCON Advance (ADV) is a series of heavy-duty connectors that protects interfaces from dirt, water, oil, and other contaminants. The connectors can withstand high vibrations and mechanical strain and remain sealed up to IP69K degree of protection. Although this job did not require an IP67 or IP69 rating, Hall said it's a best practice to select products that will keep the water out. Additionally, Hall is using the Outdoor version with black powder coating and Viton seal that are excellent for prolonged exposure to the elements, including UV exposure.

The HEAVYCON ADV tool disconnect feature was also an asset. A more permanent connection was desired, but adding a connector meant it would be easier to disconnect components when it needed to remain connected. HEAVYCON ADV with its screw-locking mechanism was the perfect middle-ground between ease of assembly while making disassembly a more thoughtful process if needed at all.

Due to the height and potential wind speeds, Tower Solutions also needed to ensure vibration-tight connections that would not come loose. The assemblers are very mechanically oriented. While they have a basic understanding of the electrical side, it's not their specialty. Hall said that having the ability "to just connect and screw down is a huge gain for them. They can get just about anybody in their shop to do that. They don't have to worry about relying on the one or two guys in their shop who have enough knowledge to pull it off."

The application also used Phoenix Contact power supplies and terminal blocks. "The QUINT Power supply was the go-to because of the extended temperature range. We needed something that could get down to -40 degrees Fahrenheit, which is hard to find," he explained. "It also has the ability to mount on a Panama bracket, as opposed to just DIN rail… While we tend to use the TRIO power supplies in many of our applications, we also do a lot of standard industrial applications. We went with the QUINT in this case because it's a little more rugged. It's a higher grade, so it could withstand the environment better. I could also mount it to the back panel instead of the DIN rail, so I don't have to worry about it bouncing off on the road."

Hall is familiar with Phoenix Contact's Limited Lifetime Warranty, but he said that was not a significant factor in this project. "I have used Phoenix Contact products so long and the product works so well, that it's kind of hard to worry about."



Figure 3: Phoenix Contact's HEAVYCON Advance (ADV) protect interfaces from dirt, water, oil, and other contaminants. The connectors can withstand high vibrations and mechanical strain and remain sealed up to IP69K degree of protection.

Results: Upgrade pays off

So far, Tower Solutions has sent out 94 of the new towers and has the potential to build many more. The customer assembles the systems on-site, and Hall said they've been happy with the ease of the new connection solution.

"The wiring time has gone from three days to maybe three or four hours," he said.

"With the addition of HEAVYCON, all of the connectors match up, so it only takes a couple of hours. When they're trying to crank out three a week, they can't have one guy spending three days terminating wires at the final customer." He concluded, "In the end it's about saving time."

© 2021 PHOENIX CONTACT

PHOENIX CONTACT • P.O. BOX 4100 • HARRISBURG, PA 17111-0100
Phone: 800-888-7388 • 717-944-1300 • Technical Service: 800-322-3225 • Fax: 717-944-1625
E-mail: info@phoenixcontact.com • Website: www.phoenixcontact.com