



## With Eaton solutions at DSU, knowledge is power—and power is knowledge

**Location:**

Madison, S.D.

**Segment:**

Higher education

**Solution:**

Eaton® 9PX UPSs, Eaton RS Networking Rack Enclosures, Environmental Monitoring Probes, Metered and Monitored G3 ePDUs, Network Card-MS

**Problem:**

The university sought a comprehensive power protection solution capable of providing students with hands-on learning opportunities, while also safeguarding an extensive lineup of IT equipment

**Results:**

The Eaton solution made the grade on every level, facilitating an end-to-end learning environment while simultaneously protecting equipment

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*Dr. Kyle Cronin, assistant professor of cyber operations*

**Background**

Founded in 1881 as a college for teacher education, Dakota State University (DSU) is now among the most technologically advanced campuses in the Midwest. The public university specializes in computer management, computer information systems and many other technology-centric programs, offering 32 undergraduate and nine graduate majors to its 3,300-plus students.

At DSU, professors don't simply rely on textbooks and lectures as primary teaching methods. Rather, the university is committed to taking hands-on learning to a whole new level—an approach that even the National Security Agency (NSA) has endorsed! Following a rigorous application and screening process, in 2012 the NSA named DSU a National Center of Academic Excellence in Cyber Operations. Because the university provides students the opportunity to focus on cyber operations as a major, it met the NSA's stringent requirements for a program offering deeply technical, interdisciplinary curriculum in the field and, therefore, was one of the first four schools nationwide to receive this distinction. DSU also has Center of Academic Excellence designations in cyber defense education, cyber defense research, and as a cyber defense consultative regional resource center; it is one of only two institutions in the nation with four or more of these distinctions.

**Challenge**

Leveraging its technical expertise to train students to defend against the latest hacking tactics, DSU is currently one of only 19 universities in the country to have achieved the NSA's designation in cyber operations, and among a very select few that offer it as an undergraduate major. "We are taking 18-year-olds and getting them prepared in a very deep technical approach to cybersecurity," explains Dr. Kyle Cronin, assistant professor of cyber operations at DSU.



Powering Business Worldwide



That commitment is underscored within the university's new \$11.4 million Beacom Institute of Technology, which was unveiled in August 2017. Designed to advance innovative approaches in education, the building includes state-of-the-art classrooms, teaching laboratories and collaborative spaces where faculty in all disciplines may develop and refine new teaching methods. "One of the really cool features is an academic server room inside the building," notes Cronin. "We are running real servers and other network equipment as part of a classroom experience."

When building out the 13x26 square foot room, DSU went to great lengths to ensure that the environment was packed with all of the devices students will encounter in the real world—including those that are power-related. "When you're trying to teach students how data centers work, you are really constrained by not having the ability to accurately discuss power requirements and all of the components that go along with it," Cronin points out. "We wanted to do more than just talk about it."

### Solution

While most higher education institutions would emphasize that knowledge is power, at DSU, power has become knowledge. Thanks to a unique partnership with Eaton® distributor HM Cragg and IT solutions provider High Point Networks, the university was able to deploy a comprehensive Eaton power solution within the server room. First installing eight Eaton rack enclosures, the university outfitted each with an Eaton 9PX uninterruptible power system (UPS), both a metered and a managed ePDU, an environmental monitoring probe, and a Network Card-RS communications card. The solution safeguards dozens of servers, switches, routers, firewalls and other network gear within the server room, which has become a focal point of the building behind impressive glass walls.

"You can see eight racks of equipment all running with UPSs and ePDUs," explains Cronin. "It is entirely a classroom for learning. We wanted equipment we could tinker with, and something that would allow us to really teach students behind the scenes."

Adding a little "cool factor" to the equation doesn't hurt either: the setup boasts power cables and LEDs that glow in the school's colors of yellow and blue. "Because of the glass walls, the thought was to have something that was aesthetically pleasing, as well as functional," Cronin notes. "You can see the LEDs glowing all down the hallway."

While the venture was driven in large part by academic desires, Cronin acknowledges there was also a practical side to the investment. "Even though this is a non-production environment, we still wanted to protect all of the equipment," he explains, adding that the sensitive electronic devices require a high level of shielding against South Dakota thunderstorms and other hazardous weather conditions.



Mother Nature's power hazards are no match for the Eaton 9PX UPS, which maximizes availability with extended battery runtime options, hot-swappable batteries, an internal bypass and an optional maintenance bypass. In addition to exceptional reliability, the UPS also provides more real power (watts) to protect equipment, while leaving room for expanding IT systems.

"Even though it's for learning exercises, we wanted it to simulate a real server room, so we decided to go with an online double-conversion UPS," explains HM Cragg Sales Representative Scott Missling, who was brought in to the project by High Point Networks. "We also recommended the managed and metered ePDUs so DSU could use them remotely if they desired, and they could monitor and control critical factors at the outlet level. We wanted to provide them with a well-rounded solution that would work very well in a learning environment."

"Our big claim to fame is that we offer a super hands-on academic experience; our students are immersed in it," Cronin confirms. "The Eaton equipment allowed us to go this next step."

Indeed, thanks to the Eaton gear, students are gaining invaluable experience, completing a wide range of tasks such as deploying and provisioning equipment, running cable, monitoring power conditions, and viewing live power metrics with the ePDUs.

"Students plug things in and out, they are educated about the different cords, and they can see everything that is going on with the equipment, such as whether a rack is over-powered," Cronin says. "Having all of the Eaton equipment in there, we are able to look and feel and touch what's really going on. They can assess power requirements and learn what to expect in a real data center, based on this lab scenario."

"Students aren't just talking about a concept, they are interfacing with PDUs and UPSs," Cronin emphasizes, "and that's where we're really happy with the equipment we ended up with, as opposed to some black box that just sits there with some outlets on it."

In the near future, DSU also plans to install Eaton's power management software, which will enable students to engage with a variety of UPS monitoring and management tools. "The idea is that students will leave DSU, hit the work force, and will be able to truly walk into a position with a managed service provider or networking business thanks to the knowledge they have acquired here," says Cronin.

The professor also offers high praise for the Eaton ePDUs. "One thing that's often unappreciated is the fact that the cord doesn't fall out," he notes. "In a real server room, people probably aren't crawling around inside the racks on a daily basis like we do here in the classroom environment, but it's great not having to worry about that when we have kids in and out of these full racks every day."

The ability to link the two ePDUs in a single network drop is another advantage Cronin appreciates. "It's very helpful when we are pulling cables and configuring," he explains.

In addition to the functionality and features of the power protection equipment, DSU was equally impressed with the level of service it received from Account Manager Ryan Fonder of High Point Networks and HM Cragg's Missling.

"Most vendors are just focused on the tech specs," Cronin acknowledges, "but we told Ryan the story of what our facility was envisioned to be and he brought Scott in to hear the requirements. Everyone sat down with us to really understand what we were trying to do and why this wasn't just another data center," he continues. "Wheels started spinning about how we could make this installation set itself apart. Aside from the functionality of a regular server room, it had to look cool—and provide the protection we needed."

The personalization and level of support didn't end after the order was placed. "When the racks arrived, Scott was here to help with the entire install," Cronin recalls, "and everything was all tricked out with LEDs glowing in our school colors. This team certainly went above and beyond. It's amazing how much time they put into this project with us."



## Results

The future certainly looks bright for the next generation of cyber warriors, thanks to DSU's unwavering commitment to real-world education.

"The biggest takeaway is that we have equipment in the room that we can use in an academic setting, which gives us tremendous value," Cronin emphasizes. "And we can also depend on the solution to protect our equipment from the good 'ole South Dakota power challenges."

Indeed, with the Eaton solution in place, DSU is now able to:

- Provide a comprehensive IT lab environment where students gain proficiency in power-related aspects of the IT world;
- Safeguard its server room against downtime and equipment damage from power anomalies;
- Give students a leg up in preparing for a future profession in IT networking and security.

For more information, visit  
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