



## SUCCESS STORY

# Plexus PowerNet™

EASY TO POWER, INSTALL, ADVANCE & REPAIR



## Maestro Digital Mine's Plexus PowerNet™ Enhances Wireless Connectivity at NORCAT Underground Mine

**NORCAT**, short for Northern Centre for Advanced Technology Inc., is an innovative technology and training organization based in Canada known as a global leader in skilled training and development for the mining industry. It was established in 1995 and is headquartered in Sudbury, Ontario. NORCAT operates as a not-for-profit organization with a mission to drive economic growth and create job opportunities by fostering the development and adoption of advanced technologies.

As part of their initiatives, NORCAT owns and manages an underground operating mine built around the Fecunis mine, now called the NORCAT Underground Centre. This operation serves as both an innovation and training centre providing technology development, testing and demonstration, as well as experiential, hands-on training.

Located in The Greater City of Sudbury, the mine produced hard-rock metals such as copper and nickel. The mine is accessible from two surface level entrances that branch out to ten active drifts on one level with a combined length of approximately three kilometers. The mine is constructed at a 3% grade, allowing natural drainage. Since the mine still provides blasting, mine ventilation is a critical aspect of worker safety.

### The Challenge

NORCAT faced the challenge of providing reliable wireless connectivity throughout the underground mine drifts and required a reliable and quick solution to be ready before their Mining Transformed event, the first mining tech exhibition held in an underground mine.

The length of the drifts posed difficulties in running standard Cat5 cable for connectivity as these cables can not deliver connectivity over 100 metres. Seeking a cost-effective and efficient solution, NORCAT explored Maestro Digital Mine's Plexus PowerNet™, a gigabit underground communications network.



Recognizing the increasing need for real-time data in the mining industry, Maestro Digital Mine works with mining companies around the world, to address the challenges associated with communication backbone solutions.

## The Solution

After careful consideration, NORCAT determined that Maestro Digital Mine's Plexus PowerNet™ network was the ideal solution for their underground mine. Using a single conventional copper coaxial cable which provides power and data, Plexus PowerNet™ delivers a high speed, low latency digital communication network providing PoE+ power to IP Cameras, PoE+ lights, Wireless Access Points (WAPs) and any other IP based device. The system eliminates the need for costly fiber optic contractors and can be installed and maintained by any internal tradesperson or development miner.



*Plexus PowerNet™ delivers a high speed, low latency digital communication network.*

The Plexus PowerNet™ required power only at the first node, allowing for easy daisy-chaining to the other nodes within the mine. NORCAT leveraged this network infrastructure to establish reliable wireless access points connected to each Plexus node, ensuring consistent and dependable wireless connectivity throughout the mine.

*“Using Plexus PowerNet™ for our underground mine has been an absolute game-changer. Plexus PowerNet™ was the best solution because it only required power at the first node, while the same cable provided both data and power to all the wireless access points down the line.” – Greg Lajeunesse, Technology Manager, NORCAT Underground Centre.*

NORCAT evaluated several other solutions for wireless connectivity within the mine site. However, these alternatives required costly power allocation and additional cable runs through the drifts. By installing Maestro's Plexus PowerNet™, NORCAT eliminated the need for power distribution throughout the drifts, resulting in significant cost savings.

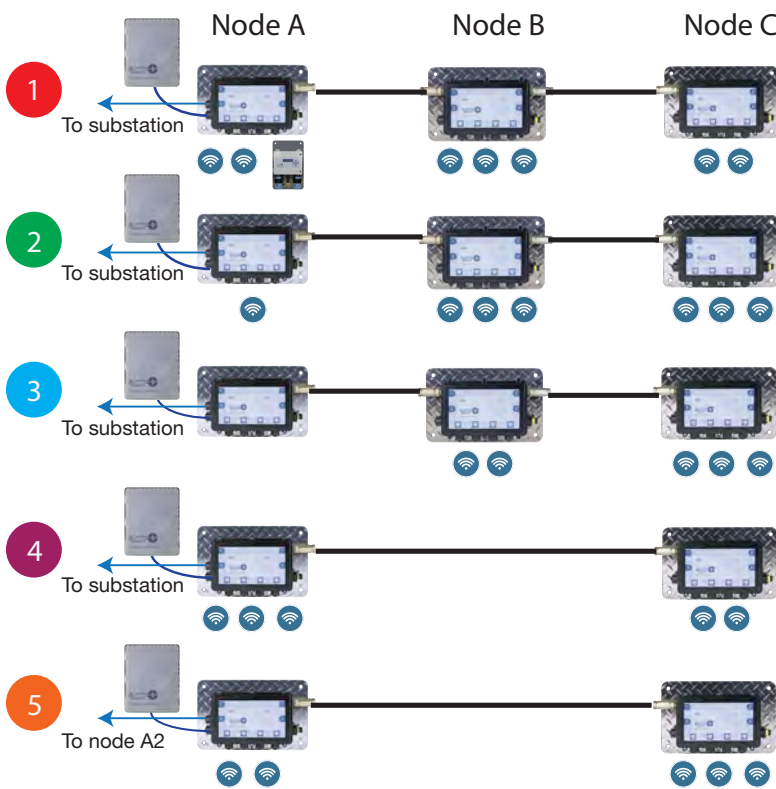
The Plexus PowerNet™ network supports VLANs, PoE+, and is enclosed in a ruggedized IP67 rated enclosure, making it resistant to dust and water common in mining environments. The installation of Maestro's equipment was seamless, with an easy plug & play setup, facilitating a quick and hassle-free deployment.



2 Hours of Maestro training  
 Installed by 2 people  
 Completed in 1 week's time  
 Deployed for the entire mine  
 Providing total wireless coverage underground

Remote connectivity for testing equipment:

- Autonomous aerial robots
- Tele-operated LHDs
- Live streams



Substation (warm room)



TP-Link Wireless Access Point (29)



6 Reels of coaxial cable (300m or 985ft. per reel)



Zephyr AQS™



Vigilante AQS™



SuperBrite™ Marquee Display

## Outcomes

The Plexus Nodes are providing power and data to wireless access points, as well as a Maestro Zephyr AQS™ air quality station measuring airflow, CO, and NO<sub>2</sub> gases.

The use of MaestroLink™ Server, Maestro's networked based software platform featuring a multi-instance web-based interface to monitor and record the health of Maestro devices, including a Vigilante AQS™ and SuperBrite™ Marquee Display, allows NORCAT to monitor network performance and environmental conditions in the entire mine. This comprehensive monitoring capability provides NORCAT with valuable insights for optimizing operations and ensuring a safe working environment.



The straightforward installation process allowed for efficient deployment. The reliable wireless connection positively impacted NORCAT's overall underground center, enhancing their Mining Transformed technology demonstration and extending network connectivity from the main building on surface to all throughout the mine drifts.

With easy installation and dependable performance, Plexus PowerNet™ proves to be a valuable solution for mine sites seeking efficient and reliable wireless connectivity.

*“The advantage of using Plexus PowerNet™ was that it supported VLANs, Power over Ethernet and it was IP67 rated, helping against dust and water throughout the mine. The installation of the Plexus PowerNet™ was super easy and plug and play right out of the box!” – Greg Lajeunesse, Technology Manager, NORCAT*



## About Maestro Digital Mine

Maestro Digital Mine manufactures Industrial Internet of Things (IIoT) measurement and control instrumentation for the optimization of underground mine ventilation and underground digital networks for last mile communication. Maestro products are made exclusively for the underground mine automation, IT, and ventilation sectors, delivering energy savings and productivity improvements while meeting the highest health and safety standards.