

The first gigabit network providing both data and power using coaxial cable.



Hecla Mining's Casa Berardi mine is an underground gold mine located in western Quebec, a politically stable and mining friendly region, with good geology and infrastructure. The Casa Berardi mine is situated 95 kilometres north of La Sarre, Quebec and straddles a 37-kilometre section of the Casa Berardi fault. In 2018, the mine produced 130,647 ounces of gold at a cash cost, after by-product credits, per gold ounce of \$800. The mill throughput rate averaged 3,769 tons per day. The mine is expected to produce 150,000 ounces of gold in 2019 at a cash cost, after by-product credits, of \$850 per ounce. Hecla Mining Company is the largest primary silver producer in the U.S. – and the oldest NYSE-listed precious metals mining company in North America.

Maestro worked diligently with Hecla Mining's Casa Berardi Mine team to understand their challenges associated with traditional communication backbone solutions. Recognizing potential for substantial improvements to bring both power and data, Maestro took immediate action and installed the Plexus PowerNet™ network. The Plexus PowerNet™ network extended communications using existing infrastructure to where it is needed the most, i.e., the last mile to the face. As a leader in innovation, Hecla Mining was one of the first companies to embrace and integrate this technology into their operations in North America. This innovative extension increases production, reduces cost, and enhances worker safety.



The Challenge

With over 30 years of mine development at Casa Berardi Mine, Hecla is continuously developing and advancing their mine, therefore utilizing various innovative digital technologies. It is important for the mine to track the production and performance of their underground fleet of trucks and scoops because unscheduled downtime has a significant impact on operations, not only for repair costs but for production rates. Obtaining this data allows the mobile team to be proactive and properly schedule maintenance. To do this effectively, Hecla needed a robust, reliable and easy to advance “last mile network” to collect the data.

Jeremie Frenette the Senior Electrical Foreman at Casa Berardi Mine stated, “We began to install fibre optics underground first and we had a number of problems with the fibre that made it difficult to work with and took time to install with a lot of specialized manpower, which is costly. We did not want to use fibre optics where the highest level of activity takes place because fibre is fragile and difficult to install underground. We were looking for something reliable, rugged, with high performance and that can be maintained easily. The opportunity to demonstrate the value of the Plexus PowerNet™ to enhance production, safety and enable real-time data was the solution needed to resolve this challenge.”

The Solution

The *Maestro* team worked in partnership with the Hecla team to help enable a solution in the West Mine section. *Maestro* designed a communication system that simplified the installation, extension, and maintenance of the network, while enabling high bandwidth, low latency, low jitter data and endpoint power using tried-and-true coaxial copper cable. The termination process now becomes easy and cost effective, utilizing basic tools. A termination can be completed by any tradesperson in less than 3 minutes.

Frenette remarked, "With the *Plexus PowerNet*™ nodes, we can start from where the fibre optics are already embedded in the mine. We have fibre optics in the main infrastructure, but we want to go further, to the last mile. Therefore, enabling the Plexus with the coaxial cable, was easy to install, fast and gave us the high performance we were looking for. When we were looking at difference networks to install, I don't know any other network that can do it as well as *Maestro's Plexus*."

The west mine also has a leaky feeder communication network, but it lacked high performance data and latency rates that would enable modern technologies to be deployed.



"With the Plexus, we can have both high data rates and distribute power over a single durable coaxial cable! That is a big difference. So as soon as you want to get more data, you need a system that can handle the speed and power such as the Plexus."

"The *Plexus* was delivered on time and with client support from *Maestro* and we were able to install it ourselves. We even created our own training guidelines to support advancing and termination of the coaxial cable. Our previous fiber optic installations took 3 times the length of time to install, then the *Plexus* solution," say Frenette.

Outcomes

Ten *Plexus PowerNet*™ nodes were installed in the west mine to deploy Wi-Fi AP's and ethernet connectivity. The access points are installed where we have important infrastructure like garage, fuel bay, chutes, rock breaker and main stations. The first application Hecla used the *Plexus PowerNet*™ was for the telemetry of the mobile equipment like truck and scoop.

"The network infrastructure is simple as we had already installed a fiber optic backbone with Cisco switches in the principle zones and then we just extended the network by deploying the *Plexus* to both power and provide data to the Cisco AP'S. The *Plexus* installation went very well and was easy and fast to install and commission. The network performance is impressive as we are able to do data collection, voice calls, messaging, video and many other applications. The first *Plexus* test with the telemetry is going very well."

In the future, Hecla will expand the use cases for the *Plexus PowerNet*™ to other areas of the mine and applications such as ventilation monitoring with *Maestro's Vigilante AQS*™ air quality stations and use with Sandvik's AutoMine® with their two TH540 autonomous trucks.