

CASE STUDY

Plexus PowerNet™

Your last mile solution
To the face.



Plexus PowerNet™ Case Study at Fruta del Norte Mine

LUNDIN GOLD

The Fruta del Norte gold deposit was discovered in 2006. Lundin Gold purchased the asset in late 2014 for US\$240 million. Since acquiring the asset, Lundin Gold completed a feasibility study, signed all major agreements with the Ecuadorian Government providing for the fiscal and regulatory regime and economic stability, and subsequently financed and constructed the mine and infrastructure on time and on schedule in five short years. First gold production was reached in November 2019 and commercial production was achieved in February 2020.

The Fruta del Norte deposit is an intermediate sulphidation epithermal gold–silver deposit measuring approximately 1,670 m along strike, 700 m down dip, and between 150 m and 300 m wide. Fruta del Norte, located in the high Amazon jungle of Ecuador, is the first Grand Scale mine in the country and plans to produce 3,500 tpd at 8.74 g/t.

Mining Method: Transverse Stopes; Drift and Fill.

Identifying the mining industry’s rising demand for real-time data, Maestro Digital Mine works with mining companies around the world, such as Lundin Gold, to address the challenges associated with traditional communication backbone solutions (broadband and fiber).

Lundin Gold’s Fruta del Norte Mine integrates Maestro Digital Mine’s Plexus PowerNet™, which addresses the challenges associated with extending fiber optic-based communication backbone solutions for “last mile” data applications.

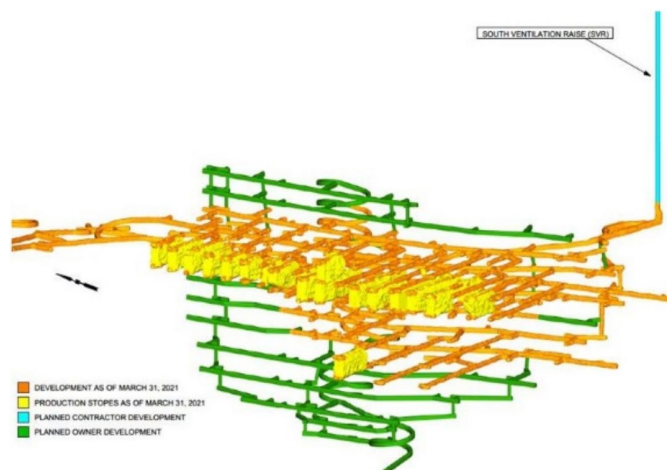




The Challenge

Lundin Gold, environmentally and socially responsible, developed a 105 m³/hour paste fill plant to help reduce surface mine tailings by reclaiming it for ground support underground.

Paste fill generation and delivery is a tricky business and if not properly designed and monitored can result in plugged distribution lines causing production delays and significant operating expenses.



To mitigate the plugging, it is critical to monitor the paste fill underground at each pour location using a high definition camera and powerful light so that operators can view the delivery from the surface control room and confirm the paste mix in real-time.

This type of monitoring requires both high data rates and power normally achieved by running both fiber optic cable and line power cable.

The major challenge is the requirement of a highly skilled specialist to run and terminate the fiber optic cable as well as running a separate power line. Often this infrastructure either is too complicated or is too slow to keep up with the pour cycle.

The Solution

Lundin Gold decided to use the Plexus PowerNet™ because it uses a single conventional copper coaxial cable which provides power and data. Plexus PowerNet™ delivers a high speed, low latency digital communication network that provides PoE+ power to IP Cameras, PoE+ lights, Wireless Access Points (WAPs) and any other IP based device. The system eliminates the need for costly outside fiber optic contractors and can be installed and maintained by any internal tradesperson or development miner.

Brad Howe, senior mine engineer, Lundin Gold stated, *“It is easy to install and train the miners on-site to use the Plexus and does not require an Electrician which reduces the cost and time to integrate into the mine. I can just have the miners advance the Plexus to the heading and terminate.”*



“Now we have a single coaxial cable going 500m from the substation where we have installed the power supply, Plexus A node (starter node). Now that it is all set up, the miners can run the Plexus cable themselves. It is paramount that enabling technologies must be simple, robust and straightforward for the workers. The Plexus is super robust, unlike fiber which is fragile and time consuming to terminate, you don't have to be super delicate with it. It is built for the underground environment.”

“There are two locations for where we needed to put the pour point cameras for monitoring paste backfill – at the first point of the stope and directly below at the barricade. The cameras remove the worker from the active area, keeping them safe and free to work on the rest of the system or in other areas that require the manpower.”

Monitoring the paste backfill process can now be done by the control room operator. If there is a back up in the paste flow, that is a sign that something is wrong. It makes sense for the control room operator to receive this vital information with clear images from the computer, in real-time, to determine the status of the paste backfill pour and resolve the situation quickly and safely.

Secondly, monitoring the barricade is very important to be able to see cracks or leakage, especially during the pour. It has become best practice to not have any person downstream of the barricade during the pour in case of a catastrophic failure.”

Lundin currently has four portable monitoring stands including a PTZ (pan-tilt-zoom) IP Camera, PoE+ light and Plexus C node. Howes states, *“I love it. Miners can pull their own coaxial cable and do terminations!”*

Lundin’s IT department says, *“they are the best cameras on site... even better than security’s!”*



Paterson & Cooke (P&C) designed the paste fill plant and distribution system. Rob Brown, Director & Principal Engineer, after providing on-site commissioning and training services states, *“The Maestro monitoring system enables the surface operator to see the quality of the paste at the stope in real-time and if the paste is flowing in steady state or surging so the plant performance can be verified. The difference between paste and flush water can also be detected visually. The software allows the operator to select from multiple cameras and can take either a video or pictures of the pour at any point in time.”*



Outcomes

As a result of the Plexus, instead of having a miner dedicated to watching the pour, that person can now be installing pipe or the barricade reducing manpower to focus on other tasks at hand.

Howe states, *“The Plexus helps us take people away from a risky area as well as having eyes on the pour during our three shift changes. Having Maestro equipment gives us the confidence that we will have a successful pour!”*

Maestro is honoured to be collaborating with Lundin Gold. Our clients come first; we believe in leaving no one stranded as we assist with integrating our digital solutions into operating mines in this digital age of mining, Industry 4.0!

Our current clients have compared other gigabit network solutions and concluded that CAPEX can be decreased in the area of 40-60% without any compromise of network speed or capability. The Plexus PowerNet™ can be used in mines with or without a fiber optic network. The Plexus has been designed for the quickest “last mile” of communications.

