UNDERGROUND NETWORKING

Case Study

Background

Challenged with a dynamic mining environment and lack of qualified in-house fibre optic and network personnel, an underground coal mine in Queensland employed Ampcontrol's specialist network capability in conjunction with the H3RO (Harsh Environment Reticulated Optics) system to simplify their underground communication network. The customer's mining operation operates with five mining panels, each at various stages and each utilising fibre optic network communications. Equipment including the transformers, DCB's, section circuit breakers, belt starters, feeder breakers, gas monitoring and wireless communications required easy connection into the network by staff without a working knowledge of fibre optics.

The customer also required that the new system have the ability to be moved from one mining panel to another and be easily reconnected into the network without complex time-consuming configuration.

Achievements

- Cost savings by reducing hardware complexity
- Improved network availability and reliability while achieving the desired high level of redundancy for critical services
- System standardisation with spare capacity to support future expansion
- Improved network monitoring and management of critical services, able to be accessed remotely
- Reduced downtime for maintenance and system modification
- Ongoing system support to customer
- Customer satisfaction – the customer is looking to standardise (implement) the H3RO system as standard across other sites.

Problem

The site's network infrastructure had a number of limitations which were causing reliability and operational problems.

The customer's underground communication architecture consisted of a complex arrangement of segregated network components which made management of systems difficult. The architecture had grown organically, meaning there was no standard configuration or deployment of network devices, introducing redundancy and reliability issues. These issues were compounded by the installation of a mix of different vendor devices which created interoperability issues when managing the network including the failure of communication links and redundancy mechanisms not operating as expected.

A lack of up to date documentation made troubleshooting faults across the network difficult and time consuming, resulting in unacceptable downtime for communication network problems. In addition, the existing system at the mine had no capacity for future expansion increasing the risk of system instability and failure.

Network Solution

Working closely with the site's operational and IT personnel, Ampcontrol completed a comprehensive analysis of their system, defining the requirements of the network now and into the future. Based on this assessment, a custom architecture could be engineered to meet the demands of the network including:

- Implementation of a consistent arrangement for network hardware, including device consolidation and standardisation of vendor devices to eliminate interoperability and redundancy issues.

- Network device configuration standardised for easy equipment replacement.

- Increased security of network data provided through virtual separation of network traffic.

- Comprehensive network monitoring and management of critical infrastructure including logical segregation through the implementation of virtual networks, with the added benefit of increased bandwidth and performance.

- Software management system for remote access to all network devices and process control management.

Infrastructure Solution

As part of the site's network solution, Ampcontrol worked with the customer to install new fibre based communications hardware utilising the H3RO system. The H3RO system provided a new plug and play method of fibre versus traditional specialised labour install.

The customer was able to mount the small, robust IP68 rated H3RO fobots out of the way using the universal mounting system and avoided the need for specialist fibre labour for patching and mounting of traditional stainless steel fobot cabinets.

A standardised installation of H3RO allowed the customer to keep separate mining panels consistent by using the same H3RO fobot ports for similar applications across panels. This layout, in addition to the tool-less quick connect H3RO plugs, made it easy for unqualified staff to terminate the equipment and run cables into new mining sections to provide machine interconnectivity and data collection.
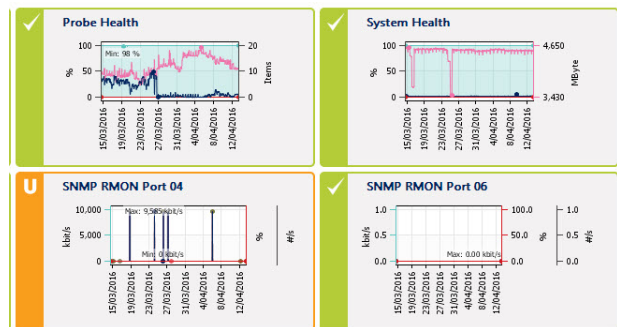
Software management system for remote access to all network devices and process control management.

WHAT IS H3RO?

H3RO is a reliable, scalable and cost effective reticulated optic fibre solution for industrial applications.

SIMPLE AND PORTABLE
Simple deployment with true plug and play functionality

ROBUST PRODUCT
A robust IP68 rated product, designed with the most difficult environments in mind

COST EFFECTIVE
A cost effective simple solution providing significant savings

HIGH PERFORMANCE
High performance single mode fibre optic hardware supporting Ethernet and PON architecture

REDUCED DOWNTIME
Reduced downtime with plug and play replacement that does not require specialist fibre optic splicing skills

Consistent network hardware

H3RO system components