Rugged Surveillance and In-Vehicle Computing for Mining

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Introduction

The right controller solution is essential for effective monitoring on mine sites. Power over Ethernet-based camera set-ups represent an increasingly popular option, offering ruggedness, high performance, and flexibility benefits.

They are frequently in remote environments, host millions of dollars' worth of capital put to the job of extracting countless tonnes of valuable material from the earth.

They can also be a target for thieves or saboteurs, or be struck to random disasters or equipment failures. All of these can be hugely costly, and downtime costs – like anything in the mining sector – can pile up high and rapidly.

For these and other reasons, it's a good idea to keep an eye on your mine site.

Ruggedness is essential

Mine sites come with particular requirements for any engineered electrical equipment. The key word for the environment is extreme. Extreme weather conditions, extreme vibrations and extreme amounts of airborne dust are among the many challenges for anything electrical onsite.

Any vehicle or building's electrical equipment must be insulated against these elements, which can disrupt system reliability and be harmful to signal quality over time.

And like any other environment, the operations of mine sites are increasingly reliant on computers and data, as well as internet-enabled.

One area where internet connectivity is apparently on the rise is in IP-based system for security.

Though they're more expensive than traditional CCTV cameras, IP cameras come with many advantages, including power savings, far better resolution, and a high degree of toughness. Further than that, there are also benefits from simplicity in setting up. Many offer Power over Ethernet nowadays. PoE, or Power over Ethernet, is a technology to supply electrical power along with data on a standard CAT-5e/CAT-6 Ethernet cable.

Because an IP connection and power supply run through the one cable, this automatically cuts down on wiring and associated installation costs.

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The benefits of PoE surveillance systems

A PoE-based surveillance system has benefits around being cheaper in the longer-term, simpler, more flexible, higher-performing and highly scalable. As mentioned above, cabling costs are cut by combining power and data provision through a Cat 5 cable. Less time spent installing translates to lower labour costs. IP cameras can be turned up or down – or set to turn off at certain times of day – remotely, making for a highly scalable and less power-hungry solution.

An area where IP cameras are far, far ahead of CCTV cameras is in resolution.

Traditional CCTV images only provide up to 0.4 megapixel quality images. For IP cameras this is, on average, about five times higher, and as high as 10 megapixels.

A CCTV system is limited by the distance from the central location to endpoint. CCTV images can be converted to a digital high-definition image, but the quality starts to deteriorate at around 60 metres over video cables.

“An IP system can send true HD signals over a distance of 100 metres, and by simply adding a switch, the range can be extended almost indefinitely with no loss of image quality,” according to a recent article on the merits of IP cameras on mine sites.

“With the bandwidth achievable on a fibre-optic network that range can even extend to several kilometres.”

A controller solution for these environments

Designed for the buildings and vehicles operating in such demanding environments, the Neousys Nuvo-7100VTC is also the world’s first Intel Generation 9 i7 fanless embedded controller with integrated Gigabit PoE+ ports with optional M12 rugged captive connectors.

Nuvo-7100VTC integrates up to eight GigE PoE+ ports compliant with IEEE 802.3af standard, and each PoE port can deliver 25.5W of power to a PoE device, such as a PoE camera.

The PoE capability of Nuvo-7100VTC reduces the cost of deployment of Ethernet-based devices since power outlet is no longer needed. Its fanless design gives exceptional long-term durability, vibration resistance, and an operating temperature from -25°C to 70°C, another ideal characteristic for resources environments.

According to different application demands, such as stationary surveillance system, mobile NVR and video analytic, Neousys provides 2~14-CH PoE+ fanless computers, which can truly operate (100% CPU loading) under wide temperature range from -25°C to 70°C.

Two more Gigabit Ethernet ports by RJ-45 are available for data communication. You can also utilize four internal mini-PCIe sockets with corresponding modules for 3G/4G/WIFI/GPS communication. As well as two M.2 B key sockets supporting dual SIM mode.

In addition, Nuvo-7100VTC integrates CAN bus for in-vehicle communication, and isolated DIO for sensor/actuator control. Combing ignition power control and dual-drive RAID storage, Nuvo-7100VTC is simply the one to satisfy all your application demands.

Australian dealer Backplane Systems Technology offers technical support and advice to find the right solution for each controller application.

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