



*This is a real-life case study.
However the customer has chosen
not to feature their brand name.*

Effects:

- CAN system now communicates with PROFINET
- Seamless connection, ground & underground
- Easy configuration

"The Anybus Communicator CAN allows us to freely choose equipment in different parts of the system without worrying about different communication standards. Anybus Communicator CAN realizes seamless communication between different devices, and the product is easy to use, secure and reliable. Even in the complex and demanding environments of mines, the whole system works."

Industrial communication in mines Anybus Communicator helps electric mining vehicles connect to the main control

Intelligent mining is a strong trend today, and driverless systems such as electric mining trains are an important part. In an ore mine in China, a driverless system has been implemented using Anybus technology to bridge CAN and PROFINET network.

An unmanned driving system

Underground transportation is important to ensure smooth operation of a mining system. Mining locomotives are traditionally driven manually, where the human factor can cause accidents and safety issues. Compared to the traditional manned operation, an automated electric locomotive system not only meets the need for increased production and efficiency, but also reduces transport errors and injuries, improving the mine's production security and controllability, while saving costs. Driverless trains are an important part of realizing intelligent mining.

In an ore mine in China, an unmanned driving system handles the operation of the locomotive, automatic loading of ore, material levels at the unloading station and monitoring of ore. It also handles safety and emergency stops, material level detection and much more.

By applying automation control and a remotely controlled driving system, the total number of operators underground is minimized. The electric locomotive is operated from the surface, which not only improves the working environment and reduces safety risks, but also combines the two types of work (electric locomotive driving and ore mining) into one, optimizing the manual work, while greatly improving transportation efficiency and reducing production cost.

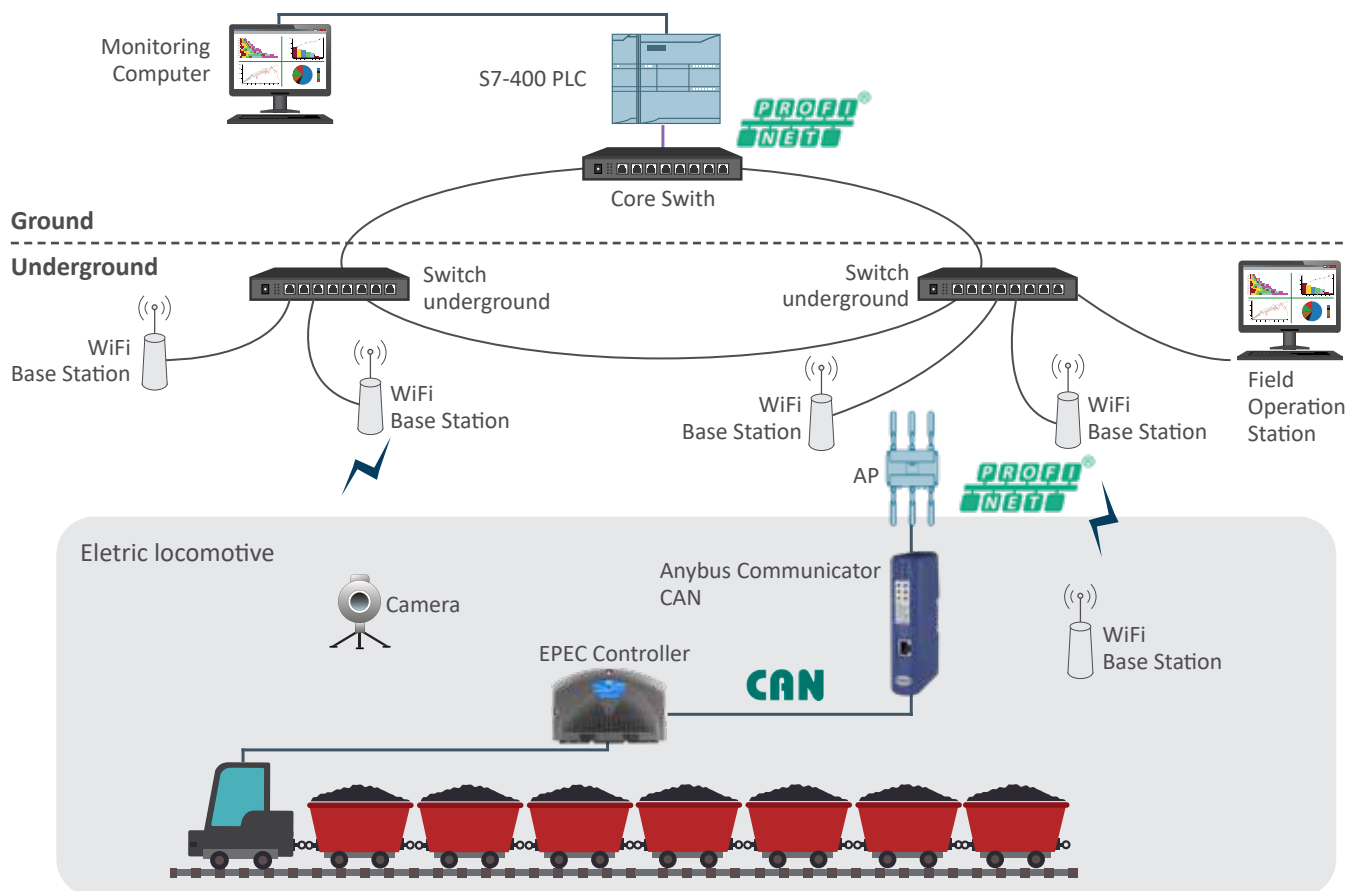
Real-time locomotive communicating with ground control station

Due to the harsh, special requirements of underground operation, the user has used a special motion controller called EPEC as the control unit. The motion control unit has a 16-bit processor and a CAN communication interface. It is used as a controller in a CAN control system to connect different sensors and actuators and other devices. However, to meet the requirements of complex logic control and data processing capability, the ground main control station has used a Siemens S7-400 as the controller and this Siemens PLC uses PROFINET for communication.

Therefore, the communication between the EPEC controller (CAN) and the Siemens controller (PROFINET) has become a key issue.

The Solution

After comparing and testing several different communication solutions, the choice finally fell on Anybus Communicator CAN from HMS Networks. The task for the gateway is to connect the CAN controller of the locomotive to the PROFINET controller of main control station. The Anybus Communicator CAN has proven to be very reliable, allowing the user to connect CAN equipment to almost any PLC system. The Anybus Communicator CAN gateway does not require any software or hardware changes to the host devices, as all protocol conversion is made inside the gateway.



As shown in the figure above, the underground unmanned locomotive uses EPEC controllers to control various sensors and actuators. The conversion between CAN and PROFINET is done by using an Anybus Communicator CAN gateway. The gateway is connected wirelessly using WiFi with the Siemens S7-400 PLC, thus enabling seamless communication on the ground and underground.

“Easy to use, secure and reliable”

The customer explains: “The Anybus Communicator CAN allows us to freely choose equipment in different parts of the system without worrying about different communication standards. Anybus Communicator CAN realizes seamless communication between different devices, and the product is easy to use, secure and reliable. Even in the complex and demanding environments of mines, the whole system works.”