

Improving Reliability of Monitoring Systems in the Iron and Steel Industry

Application: Facility Management

Industry: Steel Manufacturing

Location: China

Project Introduction:

Most iron and steel processors have already implemented monitoring systems that use traditional PCs or controllers for data samplings. But traditional PCs have often had problems with the rough operating environment of steel and iron mills. A customer in China wanted to create a more reliable, but also efficient monitoring system to replace their old system. UNO-2176 proved to be the right solution after matching all the critical requirements.



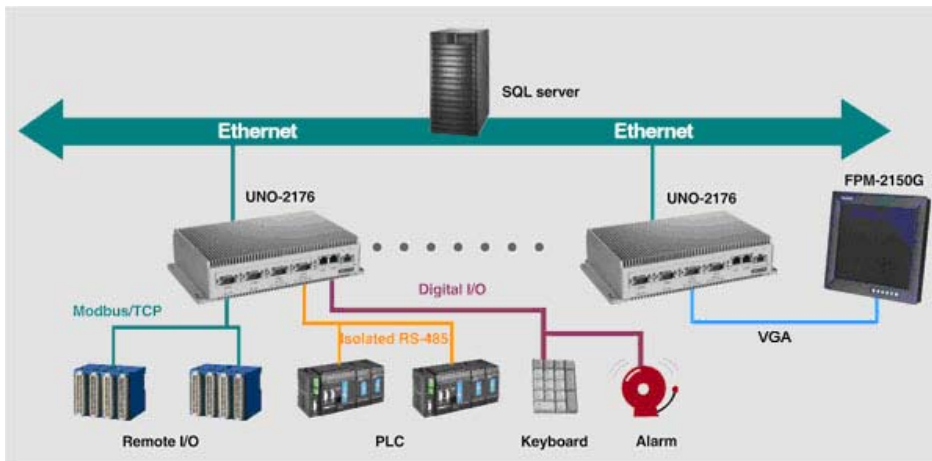
System Requirements:

The main challenge with monitoring systems in iron and steel mills is the large volume of sample data, and the extreme environment. Traditional PCs often become unstable in these conditions, and these older systems can rarely be trusted to provide reliable monitoring data. The customer therefore wanted to create a new system based on an industrial PC that could withstand tougher environments, and at the same time provide good computing performance.

Project Implementation:

- UNO-2176: Pentium M UNO with 2xLAN, 2xRS-232, 4xIsolated RS-232/422/485, 16x DI/O

System Diagram:



System Description:

With the implementation of UNO-2176 in an iron and steel manufacturing system, all the pump station data can be sampled through an Ethernet network using Modbus/TCP communication. The PLC monitoring control for manufacturing processes can also be connected to UNO-2176 through an isolated RS-485 network. Local storage is done through a vibration-resistant Compact Flash card, while the monitoring data is simply collected and transferred to a secured SQL server for storage. Through the factory intranet, management can monitor, control and search for specific data. A set of control buttons is connected to the 16-channel of isolated DI/O interface of UNO-2176, so if the system detects an alert, operators can quickly deal with the situation via the control keypad.

Conclusion:

UNO-2176 is utilized in this project primarily as a highly stable and functional embedded platform. UNO-2176 not only has the same capabilities and flexibilities of a traditional PC, but it also overcame the three biggest issues our customer had with its previous computer system. First, an unreliable fan system can fry the internal circuit, causing downtime that hurts productivity. Second, the spindle of a HDD can not work properly in vibrating environments. Lastly, the flow of power will create an enormous amount of heat. UNO-2176's fanless, anti-shock and anti-vibration design is the perfect solution for such a hostile environment.

Equipped with two LAN ports, UNO-2176 not only collects sampling data using Modbus/TCP, but also transfers this data to the server through the Intranet. So it works like an intelligent device between two networks. Installed on the Compact Flash card is the embedded version of Windows CE 5.0, which has built in SQL components so that management can search through the database remotely. To simplify the operator's usage, a set of simple control keys are connected to UNO-2176's 16-channel digital I/O for simple control commands.