

Suzuki Automobile Plant Uses Ethernet Solution to Integrate Assembly and Painting Operations

2008-09-05

Location / Country :Magyar Suzuki Rt./Hungary

Product Solutions:

[EDS-408A 3 Fiber Series](#)

8-port Entry-level Managed Ethernet Switch with 3 Fiber Ports

Introduction

Project Introduction

The Suzuki branch located in Esztergom Hungary, called Magyar Suzuki Rt., has manufactured more than 500,000 cars since 1992, and has been the market leader in Hungary's new car market for six years. The firm produces a quarter of all Suzuki's sold in Western Europe, and exports more than 50,000 cars each year. Magyar Suzuki Rt. produces 1200 cars a day (approximately one every 90 seconds), and for this reason, assembly line interruptions lasting only a few minutes can be extremely expensive.

The company manufactured a total of 170,000 cars in 2006, but has plans to boost output to 300,000 units by 2008. Instead of just adding new floor space to their factory, Suzuki has also sought ways to improve the manufacturing process or upgrade the facilities at the plant to increase production. Recently, Magyar Suzuki Rt. upgraded the system in its assembly shop and paint shop. Since automobile plants must maintain a very precise manufacturing process, the factory needs to use a management system that is both reliable and redundant to increase productivity, but without sacrificing safety. To do this, the Hungarian (Magyar) Suzuki Company sought the help of KVL COMP Ltd. to develop an electronic management system. The system tracks each car as it moves along the assembly line, and is tied in with the plant's Andon system, Pokayoke limits, torque wrenches, and the collection system for event messages sent from equipment in the assembly area to the painting area.

Moxa Solution

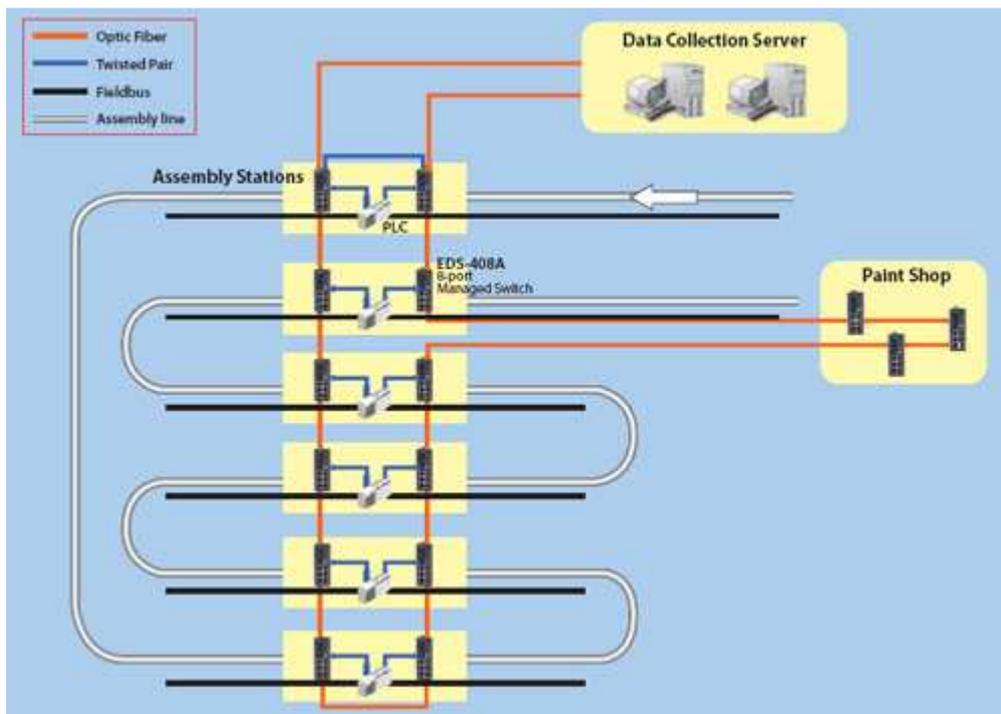
Currently, the Magyar Suzuki Rt.'s assembly shop has 9 sub-assembly stations. Each assembly station uses a master PLC to control equipment used in the assembly process at the station. The master PLCs use fiber optic Ethernet to communicate with each other and with the data server. Communications with the Pokayoke, Andon systems, and other devices are through a Fieldbus network, such as DeviceNET, CLK, or twisted pair copper Ethernet network.

As each car enters the assembly line, the car's VIN (Vehicle Identification Number) is read from an RFID tag. The Master PLC exchanges data with the data server, and in reply gets all of the information it needs about the car through the Ethernet LAN. The data for the car is then delivered to line equipment for operation references, such as torque and pick up systems, through the Fieldbus network. During the operation, the devices at the station send event messages back to the master PLC, which forwards the message to the data server for storage and further analysis.

The assembly shop uses a dual-redundant concept for the network of assembly lines that are part of mission-critical applications. The main communication network connecting the assembly stations and paint stations uses a redundant ring topology formed by Moxa's EDS-408A-MM-SC managed switches. If any of the cable connections gets disconnected, the network will automatically return to normal in less than 0.3 seconds, and the Moxa EDS-408A-MM-SC switch sends an error message to notify the administrator. In addition, each master PLC is connected to two separate EDS-408A-MM-SC switches to provide device redundancy.

The Ethernet network formed by the EDS-408A-MM-SC switches turns the assembly lines into an integrated, complete system that synchronizes the operating process among the assembly shop, paint shop, and data servers. Magyar Suzuki Rt. is even considering the possibility of making the entire system more mobile by using Moxa wireless solutions. "With Moxa's products we can increase the speed of the Ethernet communication. Over the last year, Moxa's devices have made the communication better and easier," said Zsolt Tüske, who is one of the engineers at Magyar Suzuki Rt. "This is extremely important for us, since we can make the equipment mobile, allowing us to move equipment around as frequently as we like."

Network System Diagram



Why Moxa

- Moxa's Turbo Ring provides perfect redundancy with a fast recovery time under 300 ms, making the network for the car assembly lines more reliable. NOTE: Recent Turbo Ring upgrades provide EDS-500A & EDS-400A series a 20 ms recovery time at 250-switch load.
- The multi mode fiber supported by the EDS-408A-MM-SC provides the automobile plant with long-haul transmission and immunity to electronic interference.

- The EDS-408A's user-friendly, web-based configurator makes it easy for users to configure network settings.
- Sending event warnings by email provides a great way to monitor the network in real-time.
- Moxa's managed Ethernet switches support a fast booting time to enhance the manufacturing efficiency of the assembly lines.