

Serial Connectivity Success Story Guidebook



Moxa's Smart Data Acquisition Solutions

- Factory automation
- Power automation
- Intelligent transportation systems
- Medical



Location / Country:
U.S.A

Smarter Shop Floor With Cloud-Based Monitoring

Project Introduction

Tech Manufacturing, a long-time manufacturer of machined metal parts for aerospace clients such as Boeing, Lockheed Martin, and Bombardier, needed to raise production capacity and reduce lead times for their clients' largest and most urgent orders. With their 5-axis CNC machines already running 24 hours a day up to 7 days a week, Jerry Halley, Chief Engineer at Tech Manufacturing, looked towards smarter operation and real-time performance data to increase the productivity and useful life of their existing machines. "We needed a better understanding of how our machines were actually performing for us in real-time," said Halley. "Live and historical machine performance data would also help us identify technical or process issues that were detrimental to productivity." With a combination of hardware and software, a CNC monitoring system would collect, analyze, and visualize the necessary performance metrics. However, Halley needed to weigh the productivity gains of such a system against the cost and effort of deployment, especially if it involved a new and unfamiliar server-based IT infrastructure. The ideal system would be easily deployed without specialized IT equipment, knowledge, or effort, and would not require repeated software installation, updates, or configuration.

System Requirements

- ◆ Live dashboard with alerts based on historical and target performance metrics
- ◆ Easy to use with existing CNC machines that may not have a built-in Ethernet interface
- ◆ Does not require investment or expertise in specialized IT infrastructure, servers, or software
- ◆ Knowledgeable and experienced integration and vendor support team

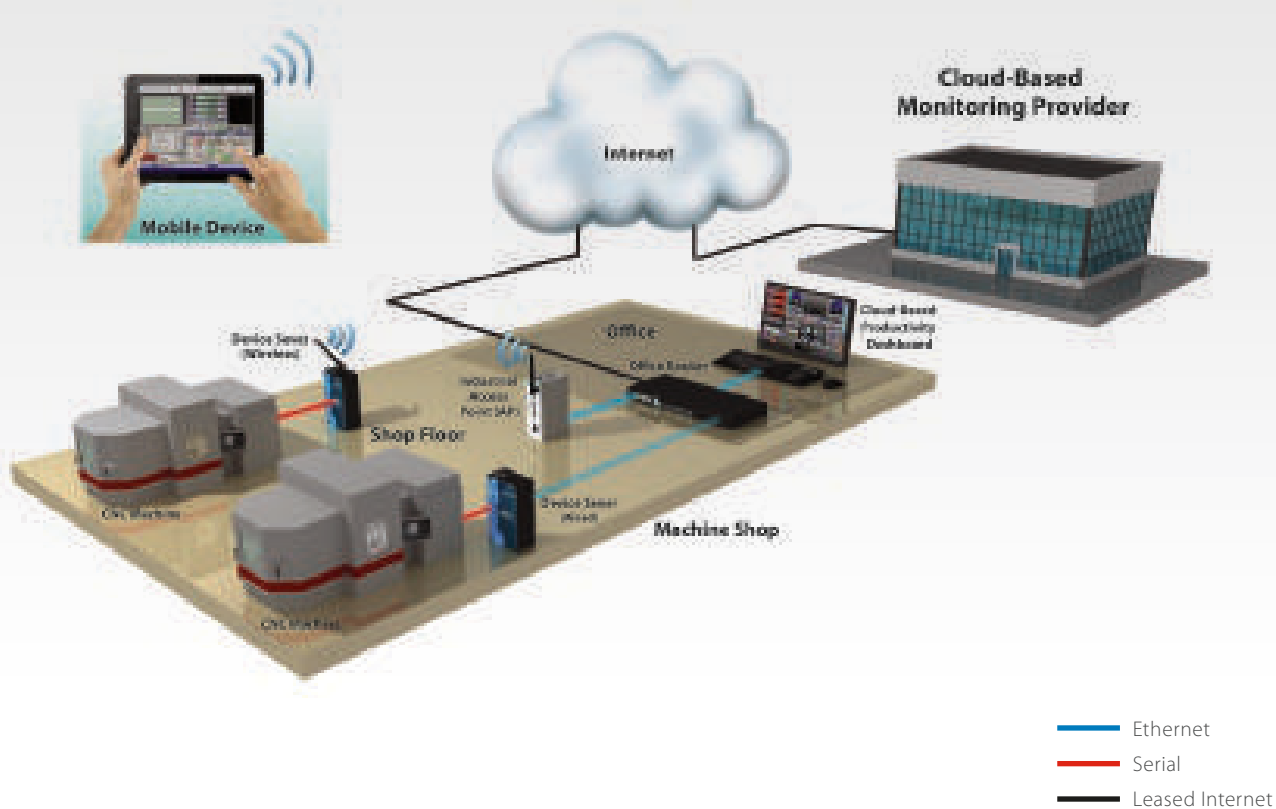
Moxa's Solution

Tech Manufacturing selected Shop Floor Automations, one of the most prominent systems integrators in North America specializing in CNC monitoring systems, to assist with cloud-based monitoring. Each CNC machine was connected to the existing local area network, so no additional IT infrastructure was required. For legacy machines that did not have a readily available Ethernet port, Shop Floor Automations provided an easy-to-deploy solution that was developed with Moxa. "The industrial networking units from Moxa make it easy for us to get our clients' legacy machines connected to the cloud," said Greg Mercurio, President of Shop Floor Automations. "For industrial users like Tech Manufacturing, these solutions are invaluable in extending the capabilities and useful life of their still-functional but older CNC machines." With the local network connected to the Internet, machine performance data was easily viewed and analyzed by cloud-based software such as Scytec DataXchange or Predator Machine Data Collection. Key performance metrics were organized on a visual dashboard so owners and machine operators were able to see exactly how productive each cell was, down to the machine level.

" Getting our CNC machines connected and monitored has made it much easier for us to deliver on our clients' build to print orders with maximum efficiency and minimum lead time. It is a lot easier to get connected than a lot of people may realize."

Jerry Halley, Chief Engineer at Tech Manufacturing

Application Topology



Why Moxa?

- ◆ Compact size for easy installation
- ◆ Standard TCP/IP interface and versatile operation modes
- ◆ Easy configuration by web console or Windows utility
- ◆ Multiple options for single/multiple ports and wired/wireless connectivity

Products Implemented



NPort W2150A

1-port RS-232/422/485 IEEE 802.11a/b/g wireless device server

NPort 5110/5130/5150 Series

1-port RS-232/422/485 serial device server





Location / Country:
Europe

Integrating Shuttles with an Automatic Storage/Retrieval System

Project Introduction

An Automatic Storage/Retrieval System (AS/RS) automatically stores and retrieves parts that are stocked in large warehouses. Not only can an AS/RS reduce the amount of labor required to move items into and out of storage, warehouses can also maintain less inventory, track their inventory more accurately, and save space, since with automation, merchandise can be packed more closely together.

A modern AS/RS often uses shuttles to achieve much higher performance than one would get from a conventional AS/RS. The system uses wireless data transmission to control the shuttle's movement, both when storing and retrieving products.

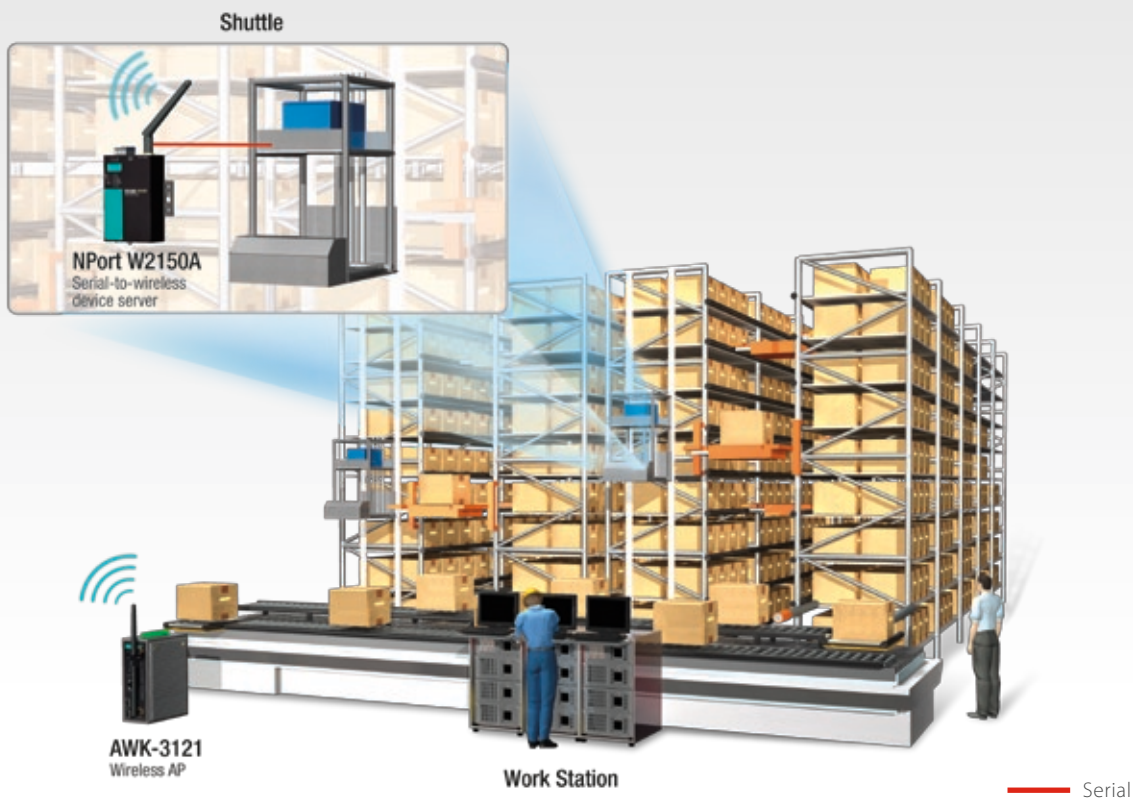
System Requirements

- ◆ Reliable data transmission when shuttles move at a high speed
- ◆ A wireless network that is highly immune to interference
- ◆ Anti-noise capability for data transmission

Moxa's Solution

The AWK-3121 AP/bridge/client is ideal for industrial hard-to-wire applications, since it helps keep wireless costs under control, and is easily integrated with existing mobile equipment. The NPort W2150A was chosen because it meets the 802.11a/b/g standards, giving customers the option of using 802.11a transmission, which is less likely to interfere with commercial products using 802.11 b/g. The NPort W2150A is more immune to shuttle noise that could interfere with wireless data transmissions, and supports 1 kV serial line surge protection to protect from surges on the data line.

Application Topology



Why Moxa?

- ◆ Support for 802.11a/b/g: 802.11a is less likely to interfere with commercial wireless transmissions
- ◆ Serial line surge protection: 1 kV (level2) to protect the shuttle from noise

Products Implemented



AWK-3121
Industrial IEEE 802.11a/b/g wireless AP/bridge/client

NPort W2150A
1-port RS-232/422/485 IEEE 802.11a/b/g wireless device server





Location / Country:
China

Integrating a Stacker Crane with an Automated Storage/Retrieval System

Project Introduction

The stacker cranes, which work much like a fork lift, move on tracks in the aisles of the warehouse. The fork can be raised or lowered to store and retrieve products from any of the storage shelves. Stacker cranes are often used in large freezer warehouses operated by companies that manufacture and store frozen food, which means that electronic devices installed on the stacker cranes must be able to operate reliably in sub-zero temperatures.

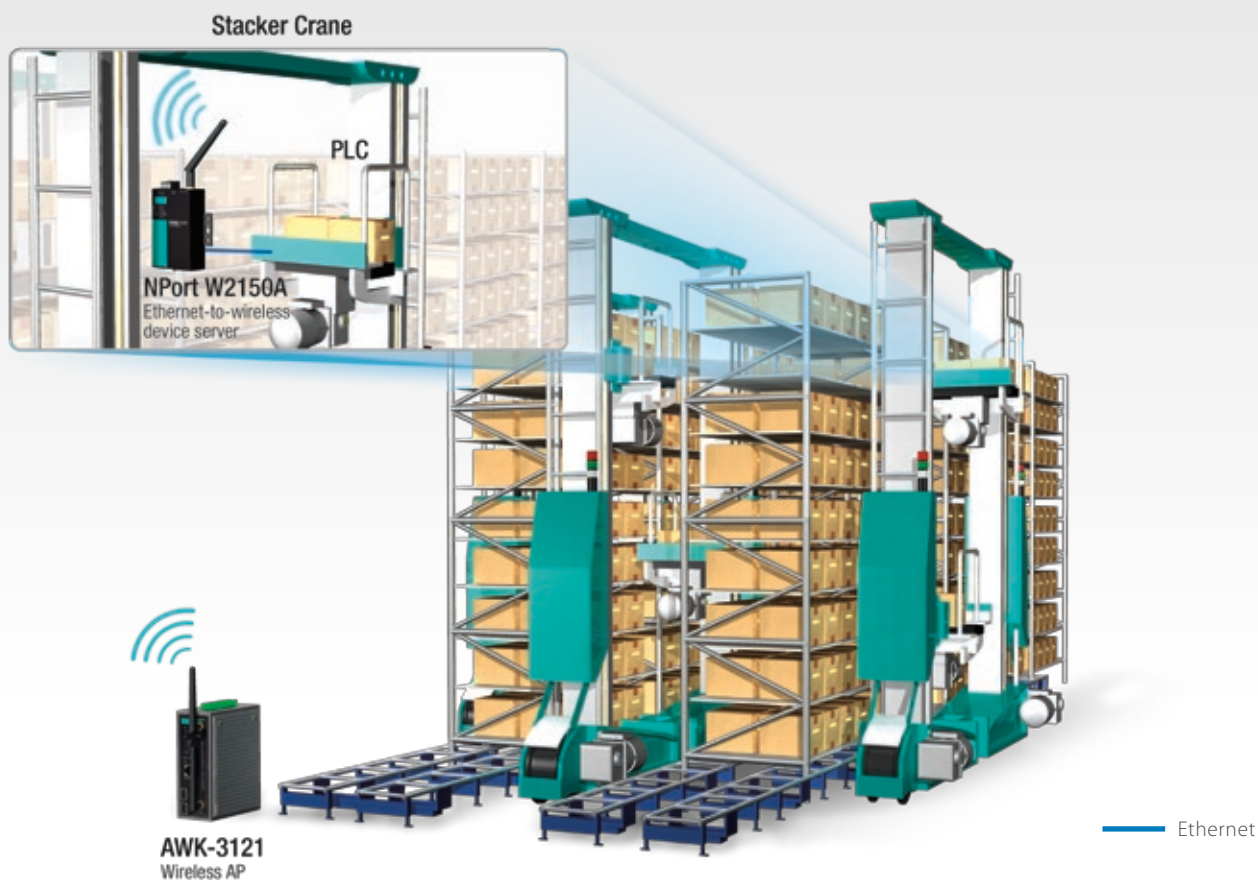
System Requirements

- ◆ Reliable data transmission when shuttles move at high speed
- ◆ Wireless network that is immune to high levels of interference
- ◆ Reliable operation when data is transmitted in a noisy network environment
- ◆ Reliable operation in sub-zero temperatures

Moxa's Solution

The NPort W2150A was chosen because it works reliably in temperatures ranging from -40 to 75°C making it an ideal choice for the constant sub-zero temperatures inside the freezers. Since the W2150A meets the 802.11a/b/g standards, it gives users the option of choosing 802.11a, which is less likely to interfere with commercial products using 802.11b/g. The AWK-3121 AP/bridge/client is ideal for industrial hard-to-wire applications. It keeps wireless costs under control and is easily integrated with existing mobile equipment.

Application Topology



Why Moxa?

- ◆ Support for 802.11a/b/g: 802.11a is less likely to interfere with wireless transmissions from commercial products
- ◆ Wide -40 to 75°C operating temperature

Products Implemented



AWK-3121
Industrial IEEE 802.11a/b/g wireless AP/bridge/client

NPort W2150A
1-port RS-232/422/485 IEEE 802.11a/b/g wireless device server





Location / Country:
Asia/Japan/USA

Achieving Ultra Low Serial-to-Ethernet Latency in Semiconductor Processing Equipment

Project Introduction

The fabrication of semiconductor wafers is a high precision process that requires over 300 individual steps categorized into various major process groups such as photo-resist, thinfilm, etch, and CMP. A typical thinfilm or etch device has many built-in serial devices such as vacuum turbo pumps, RF generators, and RF matches, all controlled by an internal PC. A Japanese company that produces thinfilm and etch process equipment was looking to develop a new-generation device communication solution. This solution would allow the serial devices to be controlled by a remote PC located in the control island of the semiconductor factory, enabling better control of the serial devices and finer precision. With this new solution, semiconductor makers can easily retrieve the baud rate parameters of the devices and remotely place process recipes to the process equipment. Currently, a majority of semiconductor fabrication factories use Ethernet communication as one part of their backbone network, and for this reason the company opted for a serial-to-Ethernet solution with the following requirements.

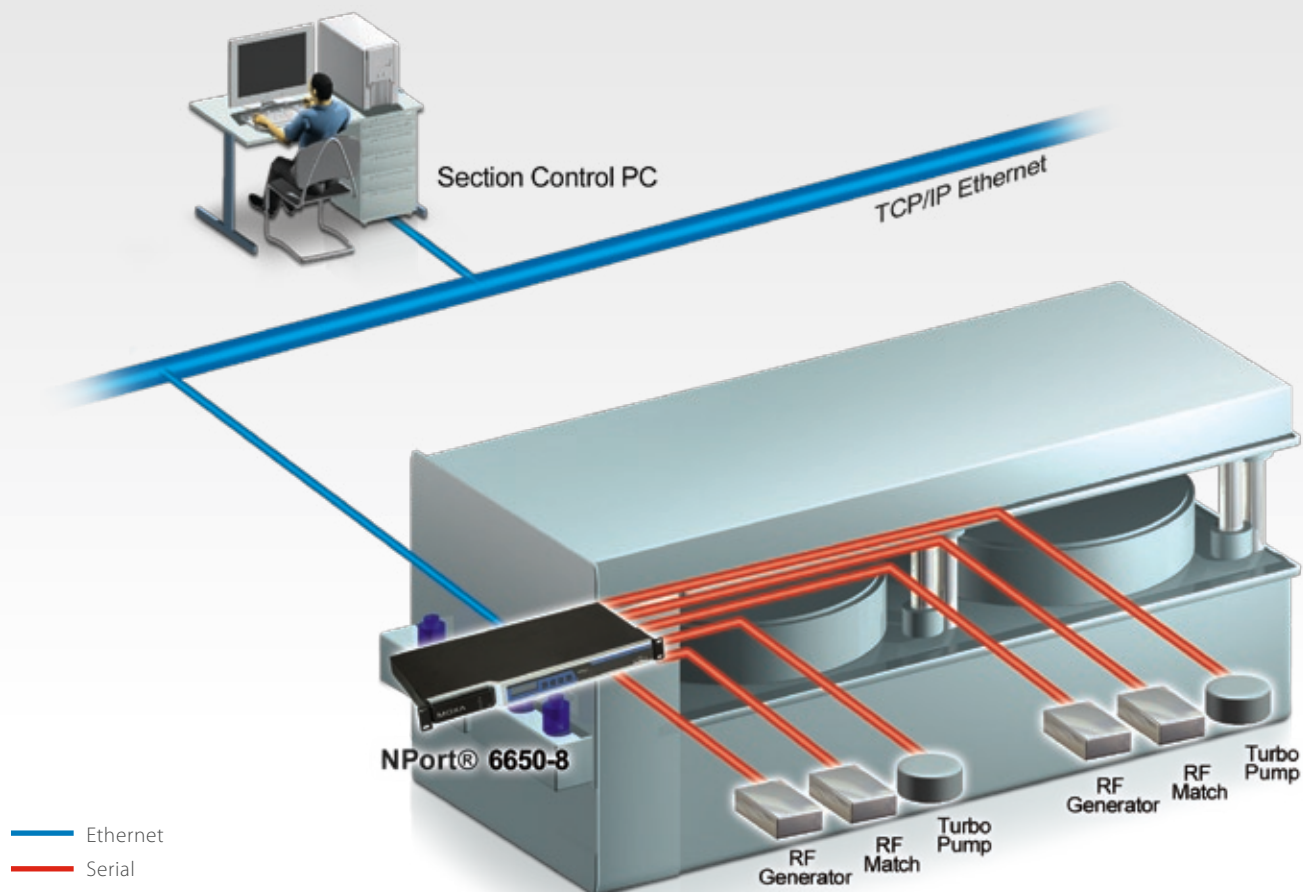
System Requirements

- ◆ WinCE driver for managing devices on a WinCE platform
- ◆ Ultra low latency for retrieving baud rate parameters and placing process recipes, which are extremely time critical, with the time calculated in milliseconds
- ◆ High MTBF since even a small pause in device connections can cause huge losses

Moxa's Solution

Moxa's NPort 6650-8 terminal servers were chosen since they meet all of the company's requirements. Each piece of thinfilm and etch process equipment is equipped with two chambers that run the process individually. Each chamber is equipped with a vacuum turbo pump, RF generator, and RF match, all of which use RS-232 communication. Inside the process equipment you will find a pair of NPort 6650-8 device servers that connect the serial devices to Ethernet, allowing the devices to be controlled and monitored by the remote PC. The company uses Moxa's WinCE Real COM driver on the NPort 6650-8 to connect the devices to the remote PC.

Application Topology



Why Moxa?

- ◆ With Moxa's ready-to-use Real COM mode for WinCE, the company spent just a fraction of the usual time to establish a robust connection between the serial devices and the remote PC.
- ◆ With the lowest latency on the market, the NPort 6650-8 ensures that parameters and process recipes are placed precisely on time to minimize process faults.
- ◆ With the highest MTBF on the market, the company used the NPort 6650-8 to minimize downtime, and as a result maximize the array yield rate.

Products Implemented



NPort 6650-8
 8-port RS-232/422/485 rackmount terminal server



Location / Country:
China

Using WLAN Device Servers to Streamline an AGV Application

Project Introduction

In the past, warehouses needed to hire a large number of workers to organize and retrieve the thousands of goods in stock. This leader in warehouse automation uses automated guided vehicles (AGVs) to categorize products, with an RFID tag that contains specific data used for categorization attached to each product in the warehouse. The use of AGVs and RFID tags allows the client to save valuable time and resources.

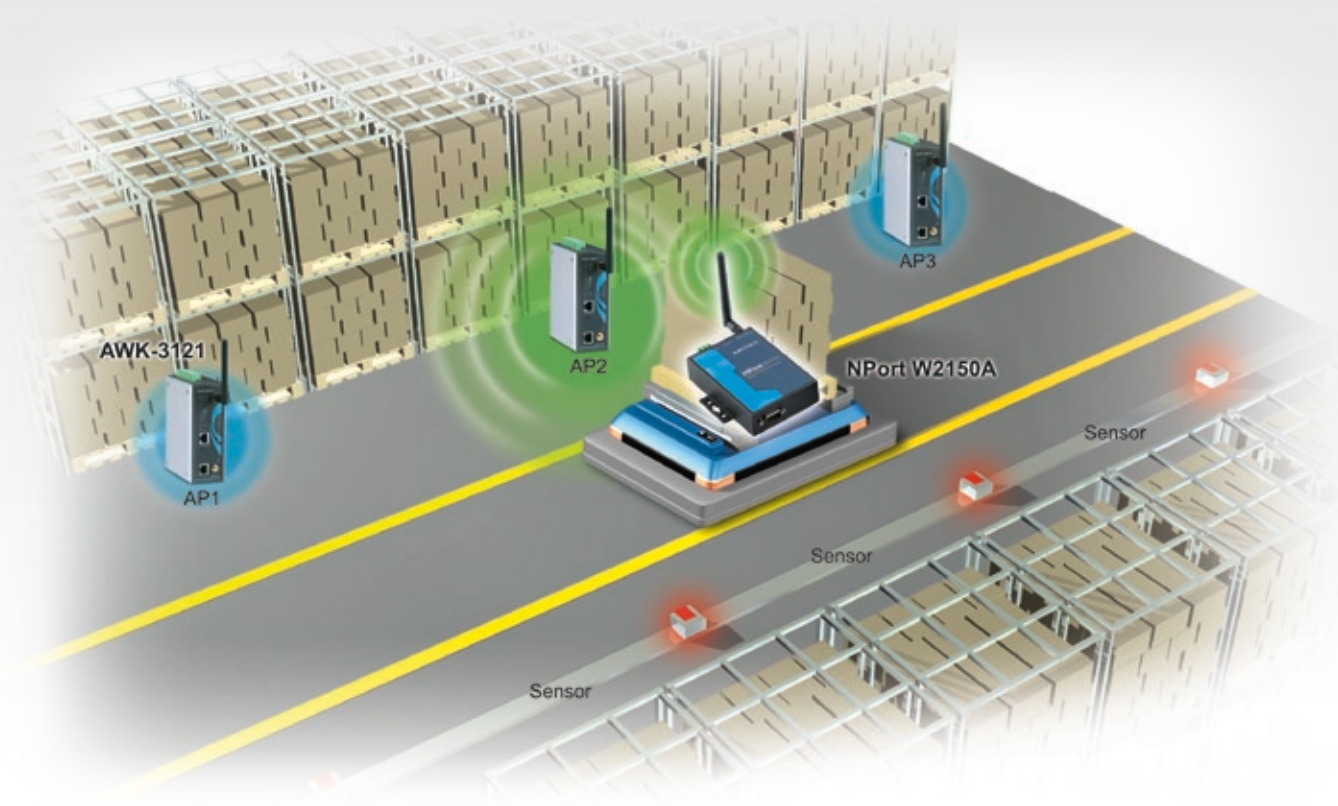
System Requirements

- ◆ Wireless communication with 802.11a/b/g
- ◆ Stable and reliable communication between access points and AGV controls
- ◆ Seamless roaming capability

Moxa's Solution

The Moxa NPort W2150A is an ideal choice for connecting serial devices. Since the NPort W2150A provides 802.11a/b/g wireless connectivity, it is compatible with our client's system specifications, which includes the ability to seamlessly reconnect as the device moves from place to place. The fact that the NPort W2150A satisfies this requirement makes it ideally suited for AGV applications.

Application Topology



Why Moxa?

- ◆ Support for 802.11a/b/g: the use of different wireless bands is necessary for this application.
- ◆ Seamless data roaming: the “Connect Rule” function allows wireless roaming with offline port buffering to prevent data loss between 802.11a and 802.11b/g environments during operation.

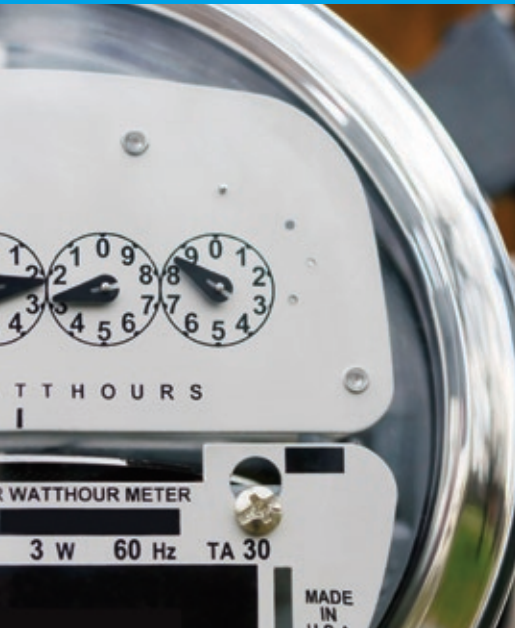
Products Implemented



AWK-3121
Industrial IEEE 802.11a/b/g wireless AP/bridge/client

NPort W2150A
1-port RS-232/422/485 IEEE 802.11a/b/g wireless device server





Location / Country:
Middle East

Automatic Meter Reading for Centralized Power Monitoring

Project Introduction

Automatic meter reading (AMR) technology automatically collects data from electricity, water, and gas meters, and transfers that data to a central database for billing or analysis.

One of our clients in the Middle East was constructing a skyscraper with a high density of devices and communication mediums on each floor. In addition, the control room needed to gather and monitor a great deal of information, including security alarm signals, air conditioner controls, signal controls, and power meters. However, they didn't have enough space to install serial communication wiring to connect the power meters to the control room.

System Requirements

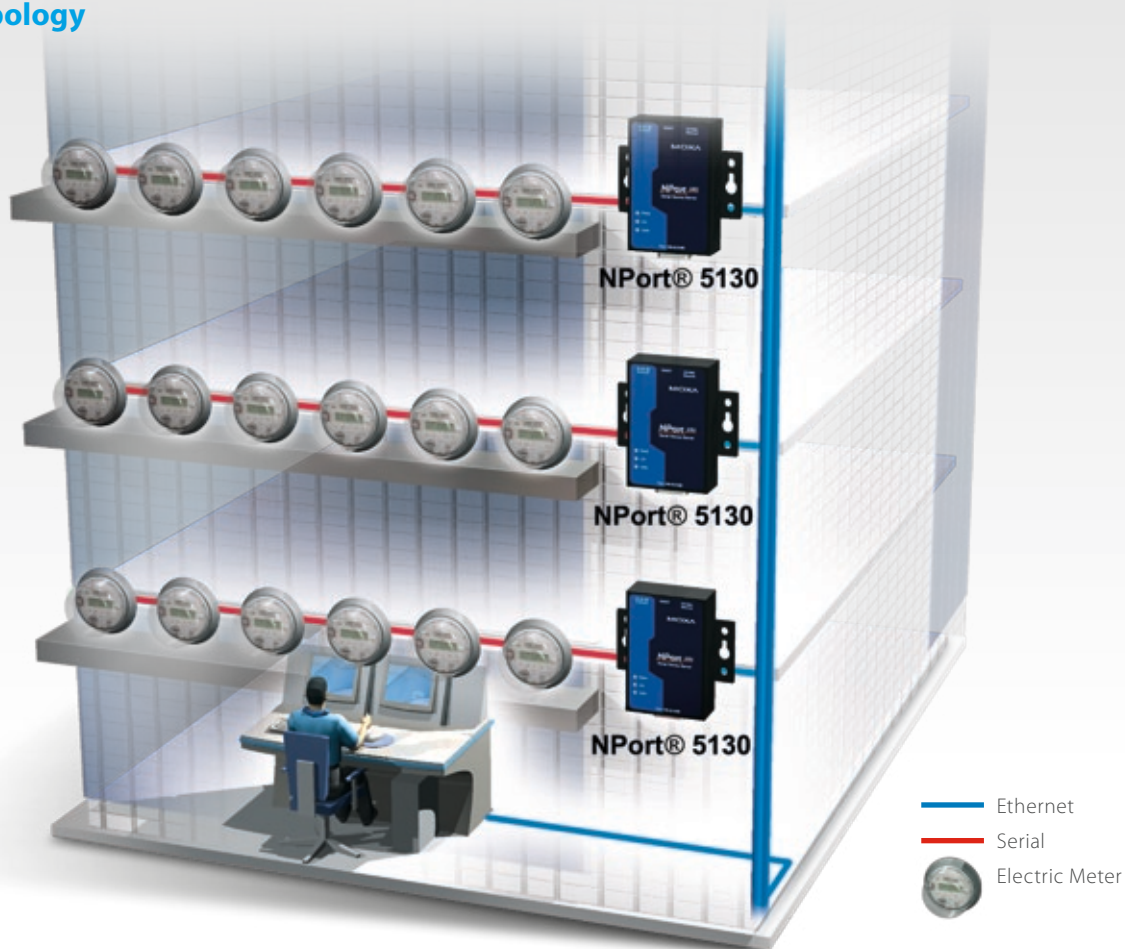
- ◆ Transmit data from each group of power meters to the control room
- ◆ Minimize the amount of additional wiring that needs to be done
- ◆ Minimize the number of additional IP addresses that will be required

Moxa's Solution

The power meters were connected to one of the NPort 5130's serial ports to exchanges signals with the control room over Ethernet. By utilizing the existing Ethernet network, serial signals from the power meter can be transferred without installing more wiring. In addition, the NPort 5130 supports a multi-drop network with up to 31 serial devices, making it possible for the control room to receive power meter data from all NPort 5130 units in the skyscraper over the Ethernet network, and still satisfy the following requirements:

- ◆ Use the existing Ethernet infrastructure to transmit power meter data.
- ◆ Easy to add more NPort 5130 devices when needed to serve all RS-485 serial interface power meters

Application Topology



Why Moxa?

- ◆ With COM port grouping, you can easily group serial field devices using virtual COM numbers.
- ◆ Each COM group can connect up to 32 serial devices.
- ◆ Compact size saves space.
- ◆ Additional wiring is not required, minimizing installation effort and cost.

Products Implemented



NPort 5130

1-port RS-422/485 serial device server



Location / Country:
China

Redundant Serial-to-Ethernet Communication in a Power Dispatch Control Center

Project Introduction

Power automation systems consist of 3 main segments: generation, transmission, and distribution. In most power distribution systems, control centers acquire data from the remote RTU via networks. Each network includes dial-up links from serial modems with the PSTN, and serial-to-Ethernet solutions are required in the power distribution systems of these applications to manage the numerous serial RTUs in the control centers.

System Requirements

- ◆ Redundant control servers: most power distribution systems are built with two or more control servers
- ◆ Redundant communication networks: two redundant networks are built to back each other up
- ◆ Redundant power: mission-critical devices in the system must have built-in dual power inputs

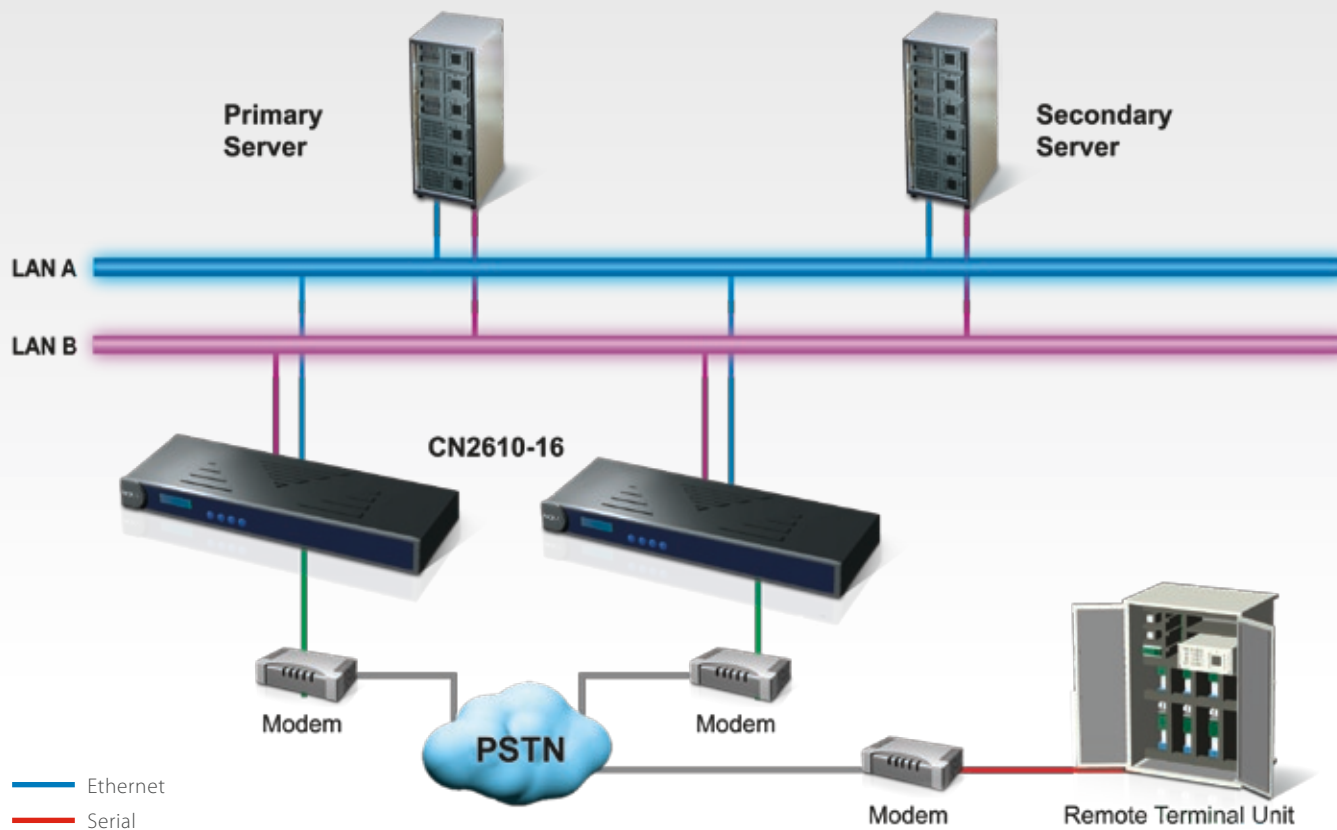
Moxa's Solution

Moxa's CN2610-16 was chosen for this application since it meets all of the above requirements for our client's power distribution system.

When the control server needs to acquire data from the remote RTU, the command is sent in TCP/IP packet format through the Local Area Network (LAN) and received by the CN2610-16, which converts the packet into serial messages for the modem to send to the remote modem via PSTN. Finally, the RTU receives the command from the modem and sends the data to the control server over the same communication route. Whenever the control server is down, another server is activated to back up the primary server. The LAN and power supply are also backed up in the same way.

Moxa's CN2610-16 offers high redundancy for the power distribution system. Today, thousands of Moxa CN2600 series terminal servers have been installed in power distribution systems all over China.

Application Topology



Why Moxa?

- ◆ DRDAS: Whenever the control server switch mechanism is activated, the CN2600 can automatically identify and cooperate with the backup server.
- ◆ Dual-LAN cards with two independent MAC and IP addresses allow the CN2600 to be connected to separate LAN networks. To use this feature, the PC host must also be installed with two LAN cards. If one of the networks fails, the PC host will still be able to communicate with your serial devices over the redundant LAN.
- ◆ Dual-power inputs minimize the risk of data loss in the event of a power failure.

Products Implemented



CN2610-16
16-port RS-232/422/485 terminal server with LAN redundancy



Location / Country:
Denmark/Europe

Using Moxa's NPort S8000 to Connect Solar Array Devices to a Network

Project Introduction

All solar power stations use the following three devices: a power inverter, a PLC, and meters. The power inverter converts the energy generated by the plant to power for end-users, and the PLC controls the base's sun tracking system. Although some inverters and meters are serial devices, these days PLCs are often Ethernet devices, and consequently the station needs to connect both serial and Ethernet devices to the Ethernet backbone network or the control center.

System Requirements

- ◆ Need to connect both serial and Ethernet devices to the Ethernet backbone network
- ◆ Power generation systems must be stable and reliable
- ◆ Devices should be able to endure wide variations in temperature

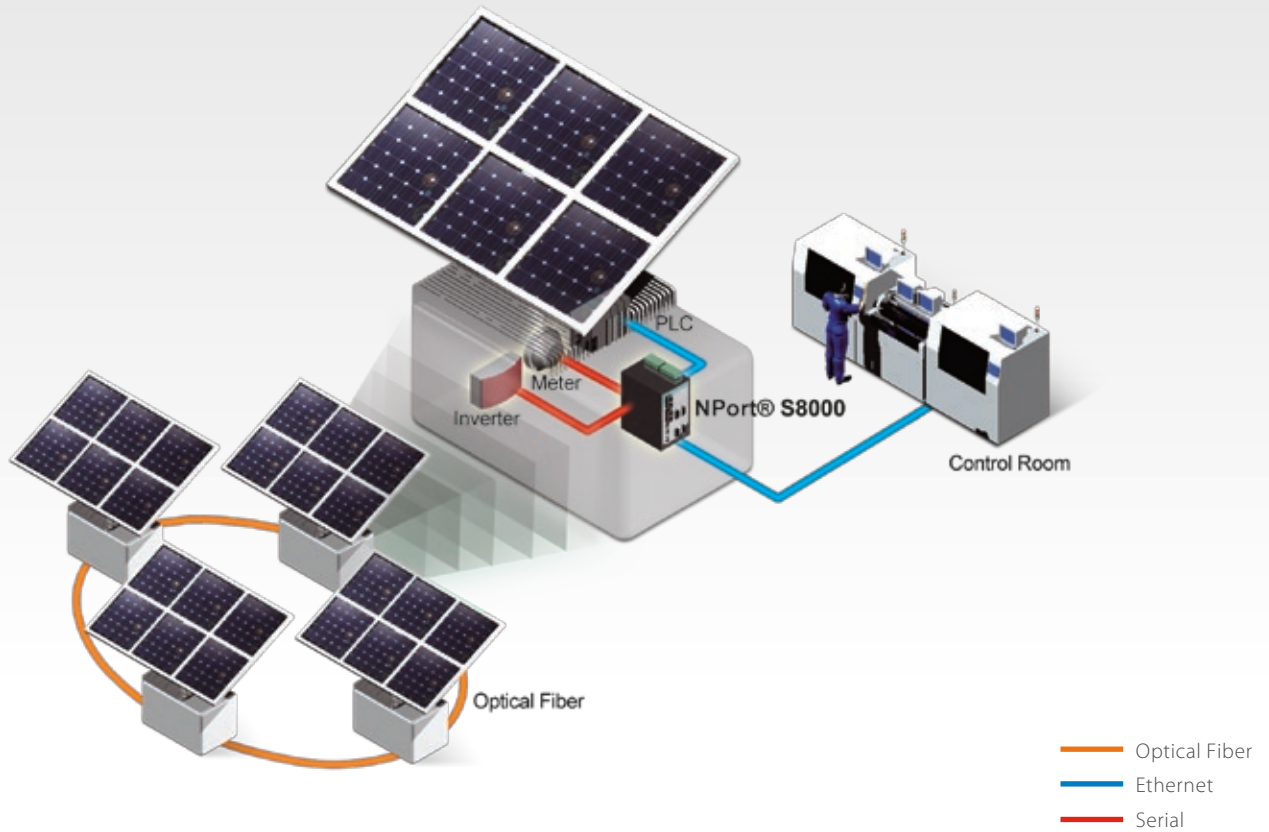
Moxa's Solution

With the NPort S8000, you can connect all of your Ethernet and serial devices to the control center easily and economically with a single device. The NPort S8000 is a compact and rugged all-in-one Ethernet switch and serial device server. The NPort S8000 supports Ethernet redundancy using a ring structure to increase the reliability and availability of your system. The NPort S8000 supports both the standard STP/RSTP protocol and Moxa's proprietary Turbo Ring protocol, which has the world's fastest recovery time of under 20 milliseconds.

With the NPort S8000's dual power inputs and complete hardware protection, your network's stability is ensured. Aside from being certified to meet the UL 508 international safety standards, the hardware is also fully equipped with surge protection for serial, Ethernet, and power to guard against voltage spikes. In addition, the NPort S8000 has level 4 ESD protection and 2 kV isolation protection on each serial port.

The NPort S8000 is perfectly suited for critical applications, and is the best solution for this type of solar power system.

Application Topology



Why Moxa?

- ◆ All-in-one design integrates an Ethernet switch with a serial device server for greater versatility and to simplify industrial network connections.
- ◆ Two fiber ports, three Ethernet ports, and four 3-in-1 serial ports for greater flexibility.
- ◆ Ring Redundancy at the device level for reliable connections.
- ◆ Wide operating temperature from -40 to 75°C.
- ◆ Rugged design with complete hardware protection (UL 508, full surge protection, Level 4 ESD, 2 kV isolation on each serial port).
- ◆ Compact size and cost effective solution.

Products Implemented



NPort S8455I/S8458 Series
Combo switch / serial device servers

Remote Monitoring and Control of a Windmill Generator

Project Introduction

As concerns over global warming continue to grow, green technologies are becoming increasingly popular. Wind turbine companies provide an excellent alternative to burning fossil fuels by harnessing kinetic energy from the wind and converting it into electricity. A typical wind farm may include over 80 wind turbines, making it imperative that the networks for managing and controlling these installations are reliable.

System Requirements

Each wind turbine includes a generator and a variety of serial components such as a water cooler, high voltage transformer, ultrasonic wind sensors, yaw gear, blade bearing, pitch cylinder, and hub controller. All of these components are controlled by a PLC and communicate with the ground host. Due to the total integration of these devices into an Ethernet network, one of our customers in the wind turbine industry needed a serial-to-Ethernet solution that can operate reliably for years without interruption.

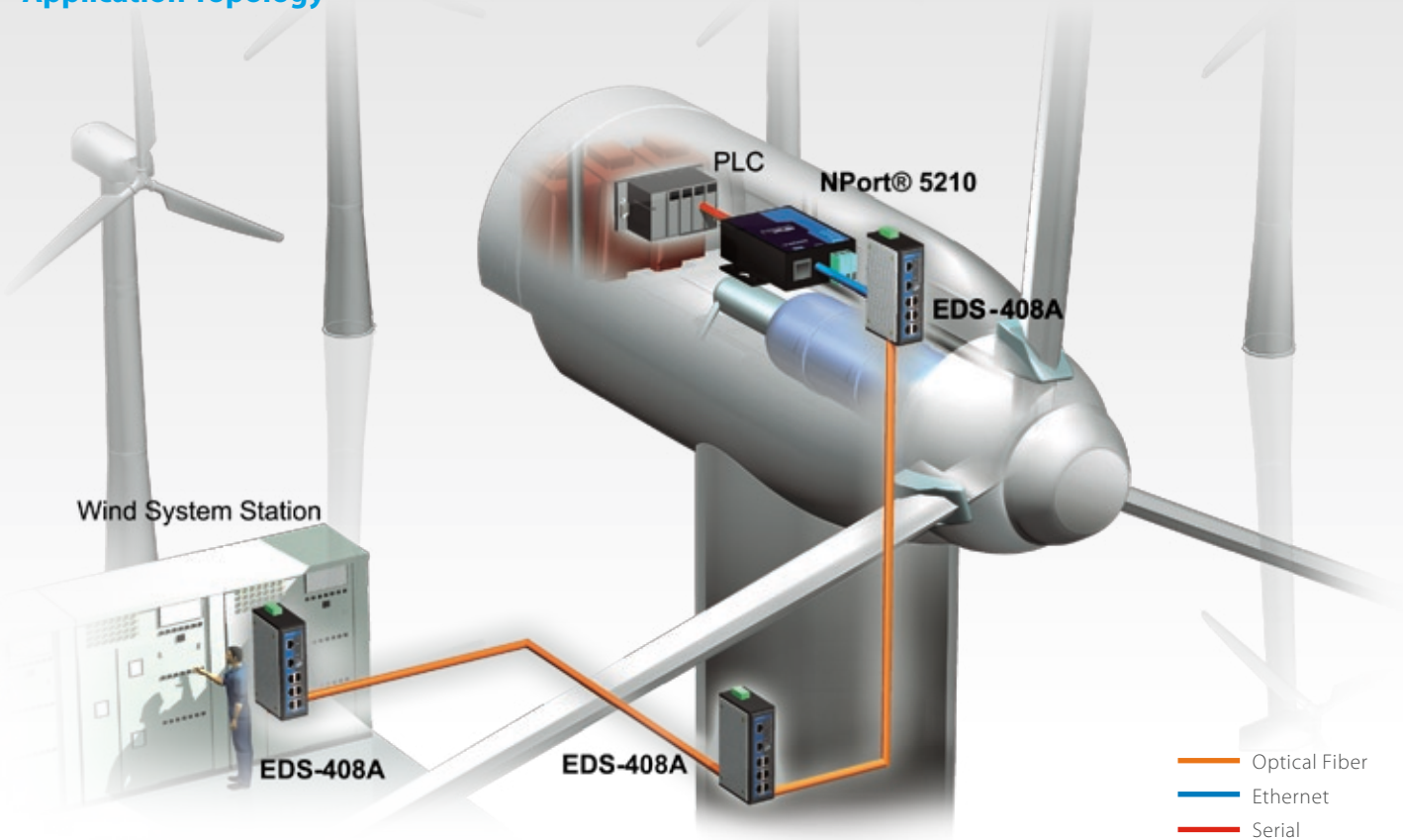
Moxa's Solution

Moxa's NPort 5210 device server can convert industrial serial devices inside the wind turbine into Ethernet devices. By using the NPort 5210, the host PC in the station running the SCADA system can communicate with the PLC to perform data analysis, system control, and maintenance from any network location, or even over the Internet. The NPort 5210's small size and easy configuration allow it to fit perfectly inside the wind turbine. Furthermore, the Ethernet network is connected to a remote control station via a Turbo Ring redundant network.



Location / Country:
Denmark/Europe

Application Topology



Why Moxa?

- ◆ Long MTBF with high reliability and effective system maintenance
- ◆ Small size for easy configuration
- ◆ High performance serial-to-Ethernet solution

Products Implemented



EDS-408A
8-port entry-level managed Ethernet switch



NPort 5210
2-port RS-232 serial device server



Location / Country:
USA

Moxa Wide Temperature Device Servers Used in Traffic Signal Control and Coordination System

Project Introduction

Intelligent traffic systems make traffic smoother and safer by managing Signal Light Control and Coordination Systems from Traffic Management Centers (TMC). Reliable and consistent remote device connectivity with these traffic signals and devices is the key to ensuring that the system operates smoothly. Traditionally, the traffic signal lights were controlled by an embedded controller, housed in a roadside cabinet mounted on a concrete pad, and connected to a detector interface panel. Modern intelligent traffic systems emphasize networked, centralized control. However, implementing these types of advanced intelligent traffic systems is only possible if any number of widely distributed devices can be connected to the same network. For existing serial traffic devices to be used as part of an intelligent traffic system, the serial devices must be connected to an Ethernet network.

System Requirements

- ◆ The reliability and service life of the traffic light controller
- ◆ The environmental challenges posed by outdoor, roadside cabinet operating environments
- ◆ The operating challenges posed by weather and temperature changes
- ◆ Preventing traffic light downtime and delays
- ◆ Achieving sufficient performance for real-time traffic monitoring
- ◆ Minimizing time spent on system and device maintenance and repair

Moxa's Solution

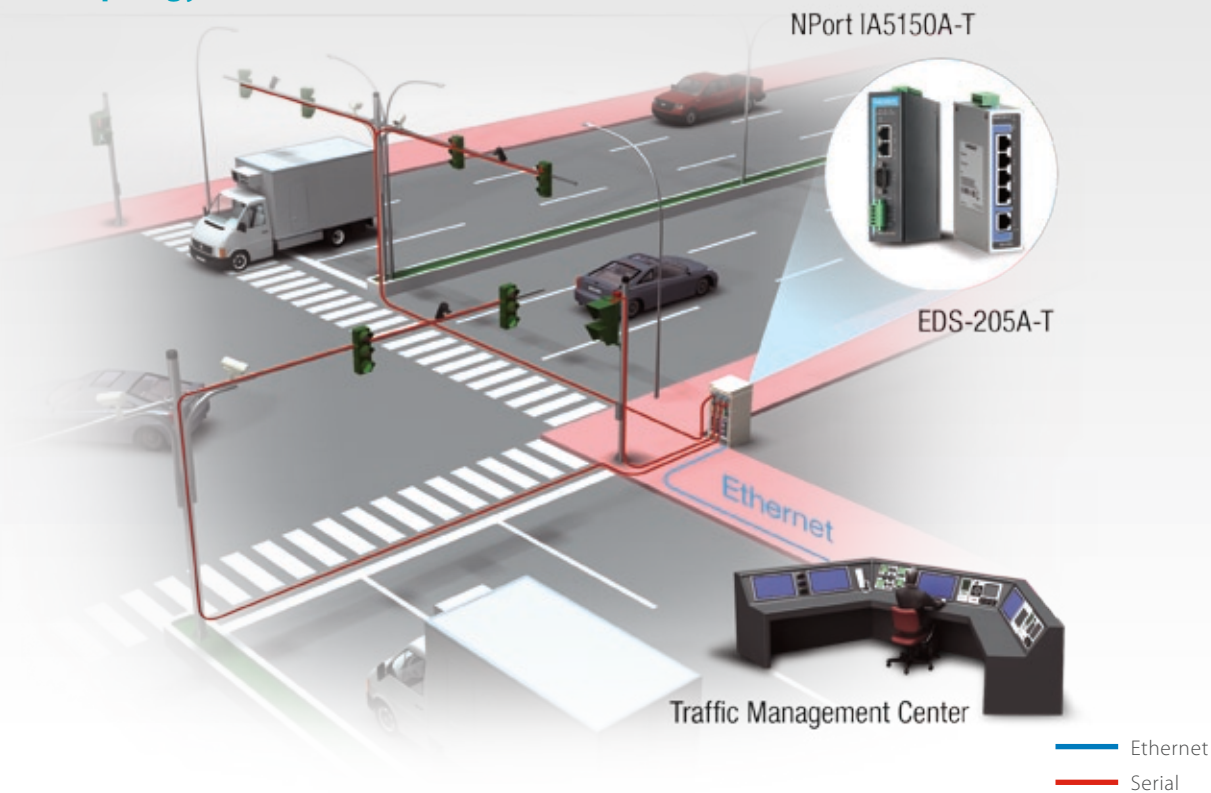
For device networking, Moxa provides industrial-grade, wide temperature device servers with 1 to 16 serial ports for connecting field devices to a network or the Internet so public agencies can monitor and access their traffic field devices remotely. Important features include:

- ◆ Real COM driver, which makes it possible to implement an intelligent traffic system without changing existing software.
- ◆ Moxa's device servers are designed with highly reliable, wide-temperature design for operating outdoors and in extreme temperature environments.

For networking, Moxa provides industrial-grade unmanaged or managed Ethernet switches for 24/7 non-stop remote networking with the traffic monitoring control network. Important features include:

- ◆ Low total cost of ownership
- ◆ High expandability

Application Topology



Why Moxa?

- ◆ Downtime caused by ambient temperature changes is prevented.
- ◆ Moxa's device servers can manage traffic signal sensors remotely over Ethernet or fiber networks.
- ◆ The efficiency of real-time traffic monitoring can be improved significantly.

Products Implemented



EDS-205A
5-port unmanaged Ethernet switch

NPort IA5150A/IA5250A/IA5450A Series
1, 2, and 4-port serial device servers for industrial automation





Location / Country:
USA

Moxa Wide Temperature Device Servers Are Used Effectively with a Ramp Management System

Project Introduction

Ramp management systems are an important tool to help traffic controllers gauge and manage traffic conditions. Deployed on freeway entrances and exit ramps, ramp management devices regulate and track how many vehicles use the freeway.

System Requirements

- ◆ How to implement the right strategies for ramp management
- ◆ Finding reliable equipment rugged enough to operate in extreme temperature environments
- ◆ Using networking, equipment, and systems in a way that optimizes the efficiency of remote monitoring and control performance
- ◆ Preventing downtime of ramp traffic lights and eliminating time delays between the lights and the control center
- ◆ Enabling immediate response to remotely initiate adjustments or closures of the ramp entrance in response to emergency events, such as bad weather or accidents
- ◆ Making the maintenance schedule more efficient and cost-effective

Moxa's Solution

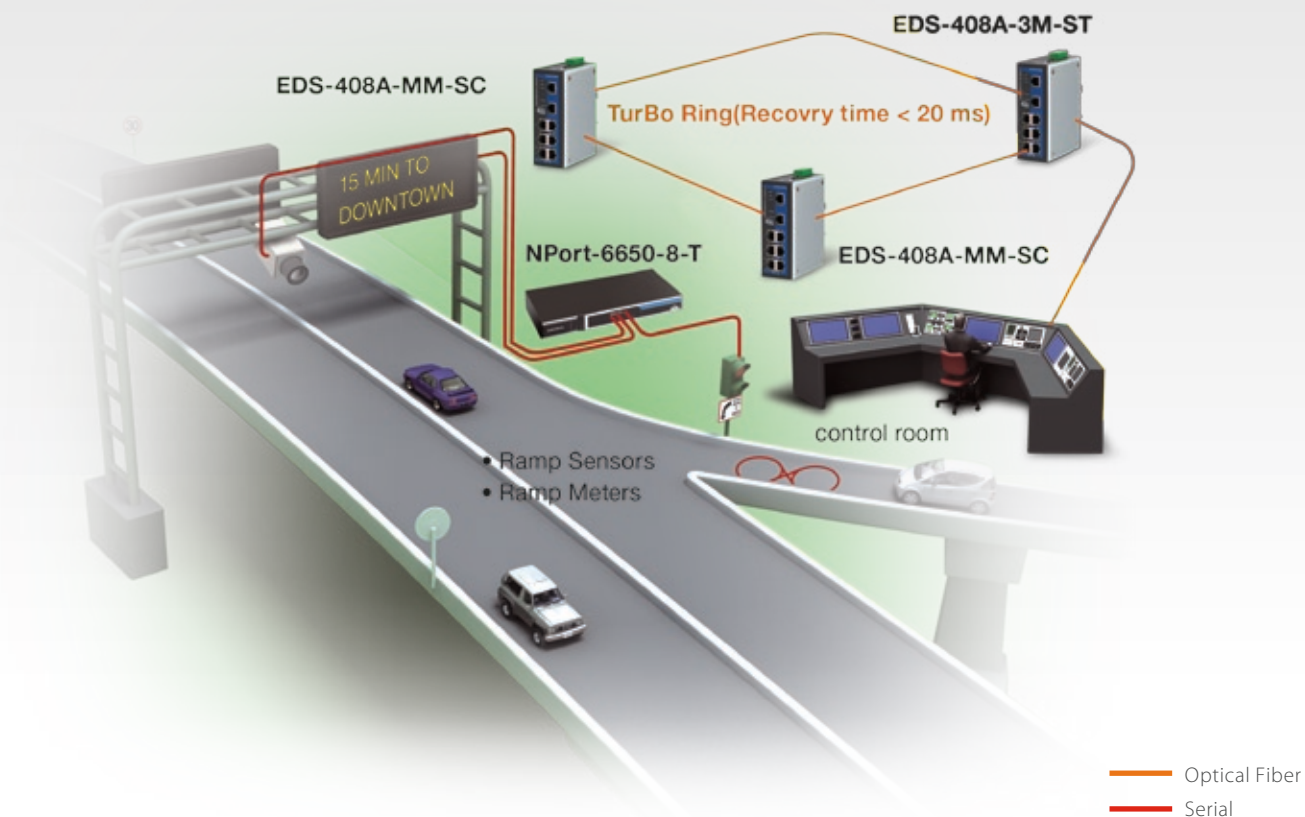
For device networking, Moxa provides industrial-grade device servers that operate reliably in a wide temperature range. Moxa's broad device server portfolio includes devices with between 1 and 16 serial ports. The device servers can transmit data over a private network or the Internet, so traffic controllers and the Traffic Management Center (TMC) can remotely monitor and access field devices.

- ◆ Real COM driver deploying intelligent traffic systems on existing serial systems without changing existing software or drivers.
- ◆ No distance limitations on the scale and reach of the traffic system, thanks to an Internet communications backbone.
- ◆ Highly reliable, wide-temperature design for operations outdoors and in extreme temperature environments.

For networking, Moxa provides industrial grade unmanaged or managed Ethernet switches for 24/7 non-stop remote networking over the TMC network.

- ◆ Low total cost of ownership
- ◆ High interoperability with many devices
- ◆ High expandability for adding network segments in the future
- ◆ Future-proof thanks to support for advanced protocols and features, such as 10/100BTx, Gigabit, 10GE Flexible Network Bandwidth
- ◆ Fast and reliable communications redundancy with Moxa Turbo Ring technology

Application Topology



Why Moxa?

- ◆ Highly flexible direct remote access and monitoring of field ITS devices, without installing PCs at remote sites.
- ◆ Longer MTBF for greater reliability and fewer maintenance requirements.
- ◆ High density of serial ports to support multiple ITS devices.

Products Implemented



EDS-408A
8-port entry-level managed Ethernet switch

NPort 6610/6650 Series
8, 16, and 32-port RS-232/422/485 rackmount terminal servers





Location / Country:
China

Using NPort Device Servers to Ensure Highway Safety

Project Introduction

The government would like to develop an intelligent highway system that can monitor vehicles, visibility, and other factors. The system will be designed to automatically broadcast an alarm to drivers when visibility is poor. The system will be installed outdoors, and consequently must be guaranteed to work reliably in very cold or very hot weather.

System Requirements

- ◆ Rugged design to protect from surge and isolation
- ◆ Wide temperature support
- ◆ High reliability

Moxa's Solution

The remote traffic microwave system, intercom, visibility monitor, and power generator can be integrated into an intelligent highway system using an NPort IA5450A-T serial device server. The NPort IA5450A-T has a rugged design, with surge protection and -40 to 75°C wide-temperature operation for reliable outdoor performance. It also has dual power inputs for power redundancy.

Application Topology



Why Moxa?

- ◆ Rugged design: Ethernet line has 1 kV surge protection
- ◆ Wide -40 to 75°C operating temperature
- ◆ Redundant power inputs

Products Implemented



NPort IA5150A/IA5250A/IA5450A Series

1, 2, and 4-port serial device servers for industrial automation



Location / Country:
USA

Using NPort Serial Device Servers to Enable an Electronic Toll Collection (ETC) System

Project Introduction

Traditional toll plazas are costly to construct and incur labor costs from collection booth personnel, but more importantly, they have become traffic bottlenecks for many highway systems. Because of this, many governments have chosen to construct intelligent ETC gantries to make toll collection more efficient, and keep highway congestion to a minimum for commuters and travelers.

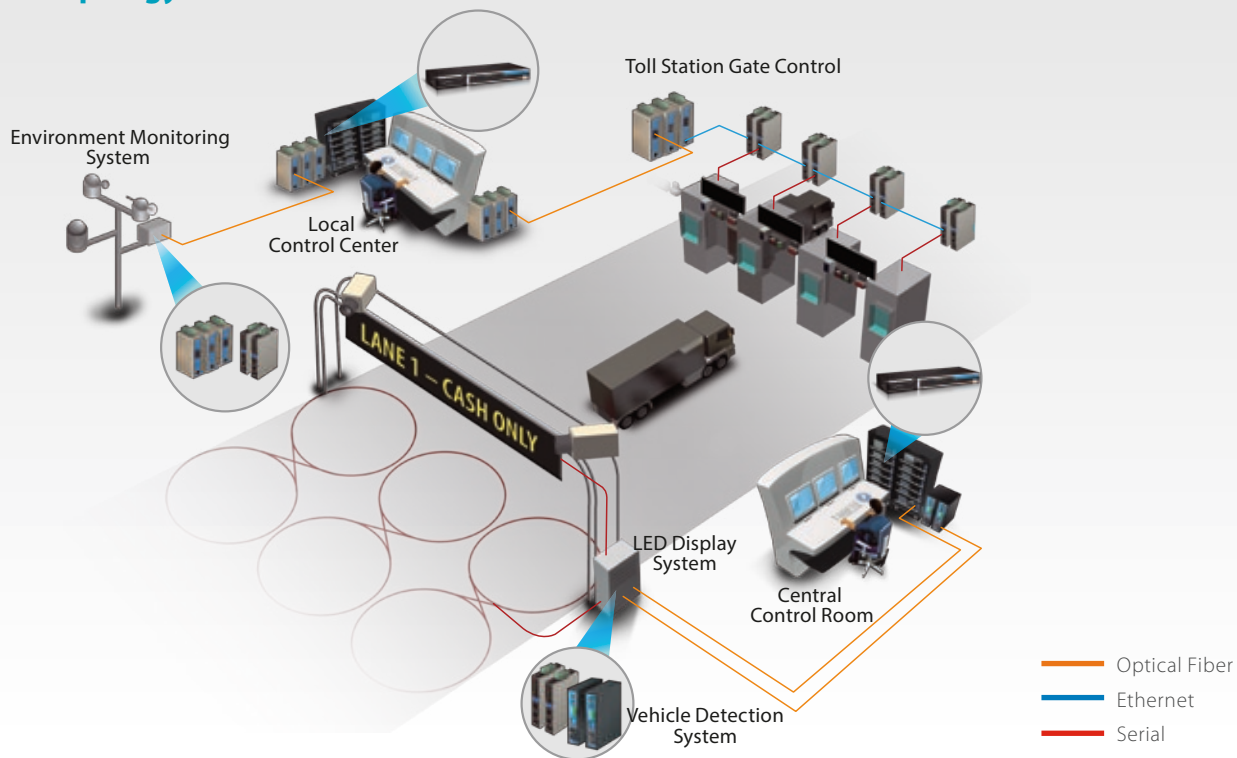
System Requirements

- ◆ Products must have a rugged design and be able to work reliably under extreme weather conditions
- ◆ Real-time data transmission to enhance traffic efficiency
- ◆ Remote monitoring to reduce labor costs

Moxa's Solution

The NPort IA5250 series and NPort 6650 series were used to construct an Ethernet-based ETC monitoring system, thereby alleviating congestion at the gate area. At each toll station, serial devices such as LED displays and gate bars can be connected to the NPort IA5250, with the device server's dual Ethernet ports used to create a daisy chain from one NPort to another, eliminating the need to invest in additional networking devices. To enable remote monitoring, the IMC-101 is used to extend communication distance over fiber cables to both local and central control centers. The ICF-1150 serial-to-fiber media converter can also be used to extend the serial communication distance with optical fiber cabling. Moxa's serial device servers and media converters are both designed to operate in wide-temperature conditions ranging from -40 to 85°C, and are suitable for outdoor environments.

Application Topology



Why Moxa?

- ◆ Reliable operation in extreme temperature environments.
- ◆ Advanced features for easy setup, integration, and maintenance of device servers.
- ◆ Able to extend transmission distance using fiber optic communication solutions.

Products Implemented



NPort IA5250-T

2-port serial device server for industrial automation

NPort 6610/ 6650 Series

8, 16, and 32-port RS-232/422/485 rackmount terminal servers



IMC-101 Series

Industrial 10/100BaseT(X) to 100BaseFX media converters

ICF-1150 Series

Industrial serial-to-fiber converters





Location / Country:
Taiwan

Centralized Control of a Passenger Information Display System on Railcars

Project Introduction

The biggest metro company in Taipei needed a Passenger Information Display System (PIDS) to enable central control of LED displays from the PIDS controller. The LED displays are serial-based and will be connected over an RS-485 network with linear multi-drop configuration. Conventional RJ45 connectors are not suitable for railcar applications where intense shock and vibration are frequent. EN 50155 rail certification is also required for rolling stock PIDS applications.

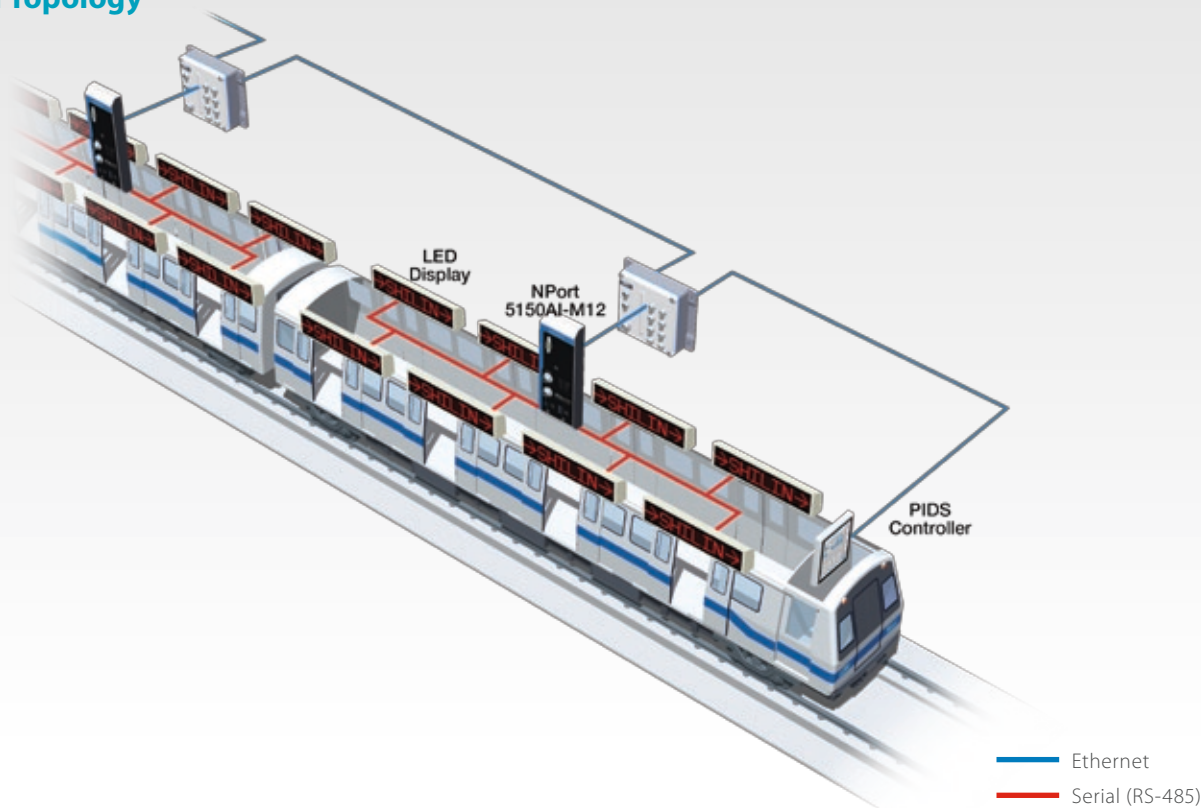
System Requirements

- ◆ EN 50155 certification for reliable operation in railcars
- ◆ Secure and robust installation to withstand shock and vibration
- ◆ RS-485 serial connections to save wiring and cabling costs

Moxa's Solution

Existing serial-based LED displays will be integrated into the PIDS through Moxa's NPort 5150AI-M12, which includes rugged M12 connectors for serial ports and the power input to prevent unintended disconnections caused by shock and vibration. The NPort 5150AI-M12 series offers dust and moisture protection, meets strict EN 50155 and EN 50121-4 standards for rolling-stock applications, and includes wide-temperature models that operate in temperatures ranging from -40 to 75°C for reliable outdoor performance.

Application Topology



Why Moxa?

- ◆ EN 50155 certified to operate in a wide, -40 to 75°C temperature range
- ◆ M12 connectors safely secure Ethernet ports and the power input
- ◆ Conformal coating protection to extend useful life
- ◆ Easy 3-step web-based configuration
- ◆ MXview enabled for remote management

Products Implemented



NPort 5150AI-M12/5250AI-M12/ 5450AI-M12 Series

1, 2, and 4-port RS-232/422/485 serial device servers for railway applications



Location / Country:
Taiwan/ Asia

Using NPort Serial Device Servers to Implement a Modern ICU Care System

Project Introduction

Intensive Care Units (ICUs) make use of a number of medical devices (pumps, monitors, ventilators, etc.) to collect patients' vital statistics. ICUs around the world are now using modern networking technology to transmit patients' data to a central computer so that physicians and nurses in the ICU can more easily monitor all of their patients, and respond to life threatening situations as quickly as possible. Hospitals are also using Electronic Medical Records (EMR) to replace traditional paper charts, and in this way increase the efficiency of the hospital's overall operation.

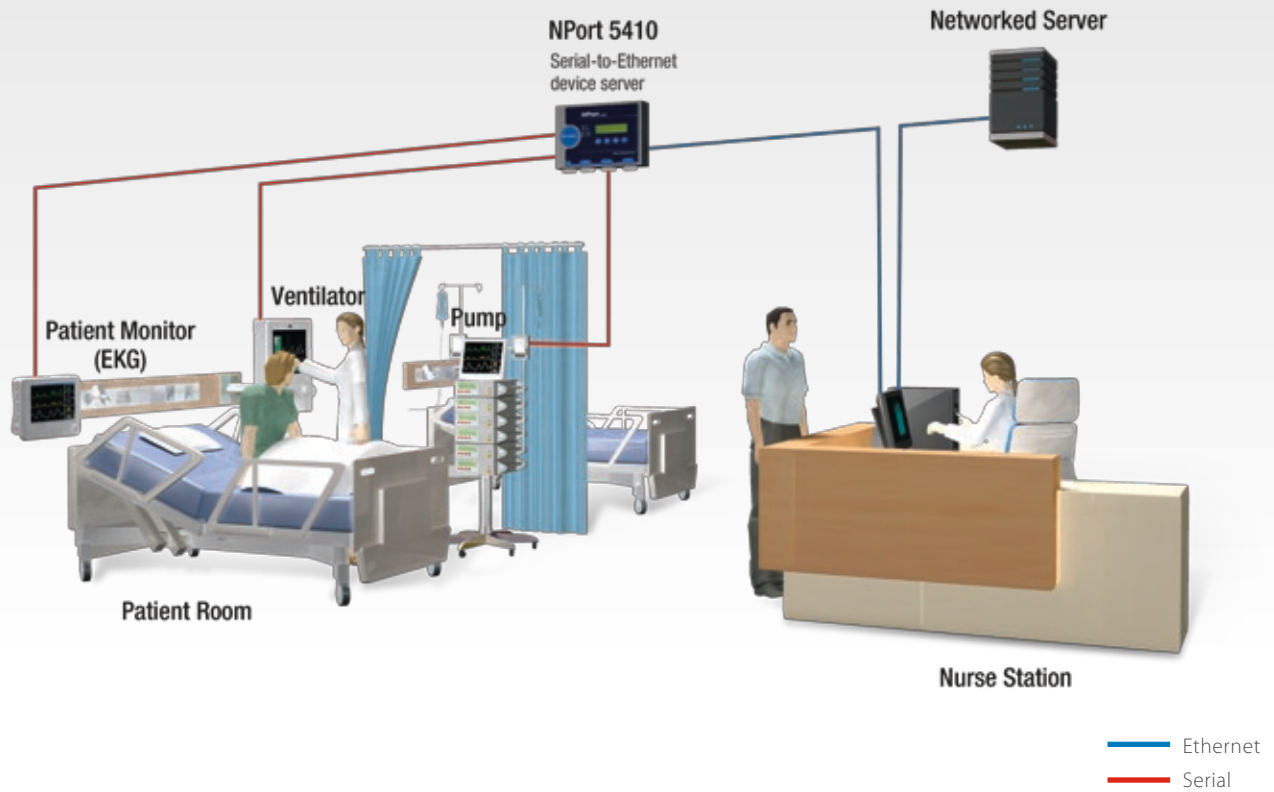
System Requirements

- ◆ Replace traditional paper charts with EMR (electronic medical records)
- ◆ Collectively connect multiple serial-based medical devices
- ◆ Transmit data in real time to the nurse's station and HIS (hospital information system)

Moxa's Solution

Moxa's NPort 5410 is equipped with 4 serial ports to connect up to 4 serial based medical devices. The connected devices send the patient's vital statistics to the nurse's station in real time over an Ethernet network to enable real-time monitoring, and transmit the data to the HIS for documentation purposes. This solution not only provides timely information for medical staff to take action when unexpected situations arise, but also allows better use of labor resources by eliminating traditional paper charts, and reducing errors that occur when data is typed into a PC by the doctor or nurse.

Application Topology



Why Moxa?

- ◆ Reliable real-time data transmission
- ◆ NPort 5410 with LCM human-machine interface allows on-site configuration
- ◆ Compact size for easy installation.
- ◆ Medical EN 60601-1-2 and EN 55011 certified.

Product Implemented



NPort 5410 Series
 4-port RS-232 serial device servers



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Moxa is a leading provider of industrial networking, computing, and automation solutions for enabling the Industrial Internet of Things. With over 25 years of industry experience, Moxa has connected more than 30 million devices worldwide and has a distribution and service network that reaches customers in more than 70 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for industrial communications infrastructures.

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