

Substation Retrofit for Total IEC 61850 MMS Solutions

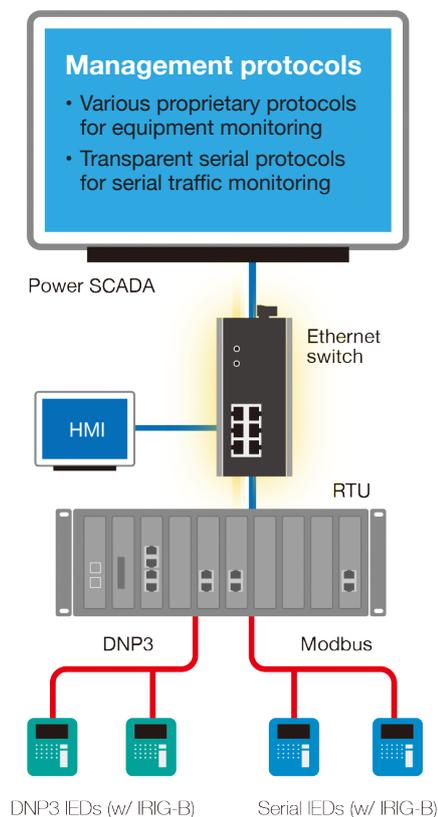
Overview

A regional substation was tasked with improving the substation's performance and reducing maintenance problems, on the condition that several key serial intelligent electronic devices (IEDs) could not be replaced. Because many of the RTUs, HMIs, switches, and IEDs installed in the substation were from different vendors, of which some used proprietary protocols, several different drivers had to be installed to allow the power SCADA system to manage the entire substation. A key part of the solution was to upgrade or replace the existing SCADA system, RTUs, HMIs, and switches to support the IEC 61850 MMS protocol to achieve unified MMS monitoring and vendor-independent maintenance. In order to keep the existing serial IEDs connected to the system, RTUs were considered for connecting the legacy Modbus and DNP3 IEDs to the substation's network.

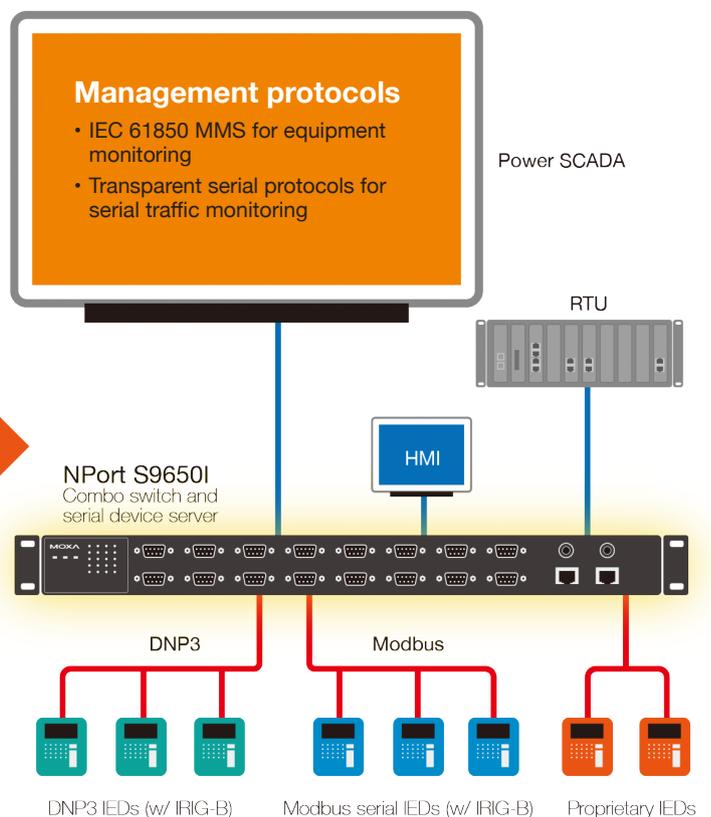
System Requirements

- Use IEC 61850 communication for power SCADA supervision
- High-port density of serial connections to network the existing Modbus, DNP3, and proprietary legacy IEDs to the substation network
- Robust reliability to withstand harsh EMI conditions

Using RTUs to connect legacy IEDs



Using the NPort S9650I to connect legacy IEDs



— Ethernet for IEC 61850 MMS — Serial Modbus / DNP3

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Moxa's Solution

Instead of using RTUs, the system integrator found that Moxa's NPort S9650I was a perfect solution for connecting the aging legacy IEDs to the substation's IEC 61850 network. Since the NPort S9650I serial device servers support the IEC 61850 MMS protocol, they can be monitored by the power SCADA system. The NPort S9650I provides up to 16 serial ports to connect existing Modbus and DNP3 IEDs, and uses the MMS protocol to communicate with both the power SCADA system and RTUs to report the status of legacy IEDs, such as checking modem signal status, keeping track of TX/RX counts, etc.

After the substation's Ethernet equipment was upgraded to a total MMS solution, the power SCADA system could use the unified MMS interface to monitor all of the substation's various Ethernet devices, regardless of the brand. In fact, the NPort S9650I's serial-to-Ethernet capability and support of the MMS protocol allowed the substation's power SCADA system to monitor the status of all the substation's legacy serial IEDs in addition to the Ethernet-based devices.

Why Moxa

- The NPort S9650I supports unified IEC 61850 MMS communication to bridge a legacy infrastructure to an IEC 61850 network
- Modbus/DNP3 protocol gateway with up to 16-port serial ports for a cost-effective network retrofit
- Dual power inputs and IEC 61850-3 compliance for robust performance



NPort S9450I/S9650I Series

IEC 61850 Combo Switch and Serial Device Server

- 4, 8, or 16 serial port serial connections
- 2 or 4 managed Ethernet switch ports
- Supports Ethernet, DNP3, and Modbus protocols
- Supports the IEC 61850 MMS protocol
- IEC 61850-3 and IEEE 1613C1D2* compliant
- Supports IEEE 1588v2 and IRIG-B for time synchronization**
- IEC-62443 standards supported for better cybersecurity
- -40 to 85°C wide operating temperature

* C1D2 is available with NPort S9450I only

** Time synchronization is available with NPort S9650I only

[↓ Datasheet](#)

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