

Remote Monitoring and Control of RMU Stations

Client/Project Background

Client:

Reliance Energy Limited

Industry:

Distribution



Context

Reliance Energy Limited, a Major Private Utility based out of West/North India having a deep and intricate distribution network, was contracted to wheel electrical power to homes and industrial consumers in Mumbai city.

Reliance Energy set a very ambitious SAIDI (System Average Interruption Duration Index) index to meet the high service quality expectations from consumers. SAIDI is the average outage duration for each customer served.

Meeting SAIDI targets could only be achieved by investing heavily in Ring Man Units and their automation. The utility proceeded to invest heavily on RMUs and on parallel lines to set up a world class SCADA centre with a main centre and a corresponding redundant backup centre.

A key component to complete the automation infrastructure was Remote Terminal Units. The Remote Terminal Units needed to be intelligent so that the grid would be ready for the eventual roll out of a self-healing grid network.

The Challenge

The network was densely packed within the Mumbai and Greater Mumbai regions, and was not connected via a high-speed optical network.

However, Mumbai was served with excellent mobile network connectivity – one of the best in the country.

The utility specifications for RTUs reflected their desire to leverage mobile network technology, and have a rugged platform for RMU Monitoring and Control.

The information exchange requirements comprised of analogue measurements from Modbus MFMs, hardwired digital signals (LBS status, Earth Isolator status, Transformer CB status, Phase and Earth Fault alarms, auxiliary power failure, etc.) and commands.

The Solution

The RTU device – SYNC 2111 – based on standard protocols and integrated communication platform with real time IO monitoring and control, and embedded IEC61131 logic engine was the choice.

The compactness of SYNC 2111 gave it a natural advantage for retrofitting into RMU panels having a high space concern.

SYNC RTU's have IEC60870-5104 slave implementation with a broad spectrum of available Application Service Data Units (ADSU), ensuring full compatibility with the Reliance Dispatch Centre's SCADA system.

In addition to a serial RS232 port with full Modem signals, the SYNC 2111 RTU's have an additional RS232/485 port and two RS485 ports, which were used to get data from MFMs and protection devices, FPIs over modbus or IEC 60870-103 relays.

Benefits

Today Reliance Energy is a critical and dependable utility in India providing its services in Mumbai and Delhi. It has been able to meet its QoS obligations and by remote monitoring of the distribution stations, improve its On Roll Staff per Wattage Index.

The entire automation system helped Reliance be quick on its feet to address fault conditions in the grid and also place its maintenance units at strategic points in the city so as to mobilize to the fault location in no time.

Moreover as part of its best practices, thefts and energy accounting were monitored, collected at SCADA, analyzed and point of unauthorized power-tappings were traced.

Features

The integrated HMI allowed for enhanced local viewing and real-time decision making for the on-ground maintenance team.

Modular design gave Reliance Energy the flexibility to add or reduce inputs and outputs as per the local configuration requirements. The utility found this useful to fit the same RTU for its two-way, three-way and four-way RMUs by increasing or decreasing add-on cards as necessary.

The PLC logic engine compliant to IEC 61131 created software interlocks for the RMU to provide an additional layer of failsafe security. In addition, interlocks were created to ensure energy feed through the Load Break switches were allowed only after certain conditions were met.

End Result

Reliance over a period of time was able to recover their investments and at the same time ensure customer centric delivery, for which SYNC 2111 RTU was a key component.