POWER UTILITY REMOTE RECLOSER MANAGEMENT

APPLICATION BACKGROUND

Power utilities use circuit breakers and fuses to interrupt power in the event of a fault on a transmission line.

The problem with fuses and circuit breakers is that once activated, a person is needed to visit to replace the fuse or reset the circuit breaker. The problem could be long term failure of equipment or just a short term, like a tree falling onto a transmission line or wires touching in high winds momentarily.

To solve the short term problem reclosers and sectionalisers are used to allow for a reconnection of the power which saves the need for field staff to visit the site. Management of reclosers and sectionalisers from a distance, using a telemetry system, assists electricity network operators manage the electricity transmission network.

APPLICATION DETAIL

Reclosers and sectionalisers are distributed throughout the electricity network.

Simple reclosers are generally used to break and attempt to reclose the system based on voltage levels and a preset number of tries, perhaps 3 times, in the event of an overload condition. As reclosers are spread throughout the electricity network, only smaller sections of the network are affected for one recloser event, making it easier to manage the electricity transmission network.

More complex reclosers have additional features, perhaps a system of current transformers so the voltages on the 3 phase lines, the status of the recloser and a record of the number of trips are reported.

There are also recloser systems with inbuilt RTU modules which allow a high level of measurement capability as well as some control capability. There could be data logging and remote control functionality, full directional protection for overcurrent, earth fault and sensitive earth fault, over and under voltage, over and under frequency and auto reclosing functionality.

Unidata can provide voltage measurement instruments with Neon Remote Logger systems. These would be appropriate manual, semi or fully automated recloser systems.

For more sophisticated recloser and sectionaliser equipment Unidata can provide a Neon Remote System utilising Modbus. The System can be set up so that the Neon Remote System (Neon Remote Logger and Neon Application Software):

- Acts as Modbus Master that collects and presents Modbus Slaves' (reclosers and sectionalisers) data or

- Act as Modbus Slave that collects and presents reclosers and sectionalisers data as Modbus TCP for SCADA Modbus Master ingestion.
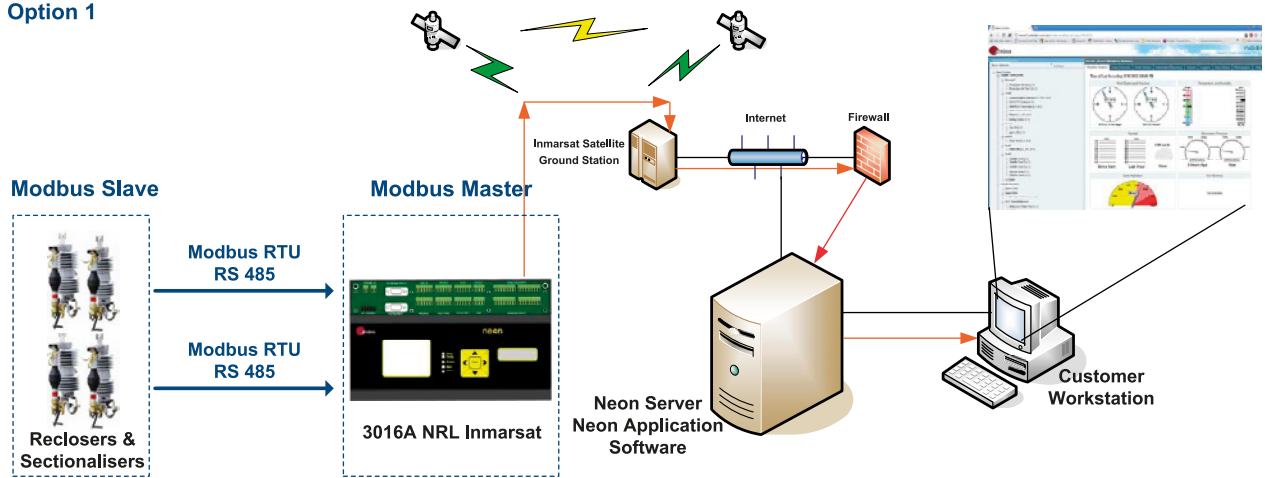
For management of reclosers a telemetry system is vital. In areas of cell phone coverage a Cellular 4G Neon Remote Logger can be used. Remote transmission system require satellite based telemetry systems such as the Neon Remote Logger Satellite - Inmarsat Satellite System which is "always on system" rather then a "satellite pass low earth orbit" system.

Unidata's Neon Applications Software manages the telemetry coming in from remote reclosers and presents that information directly on the Neon Web system.
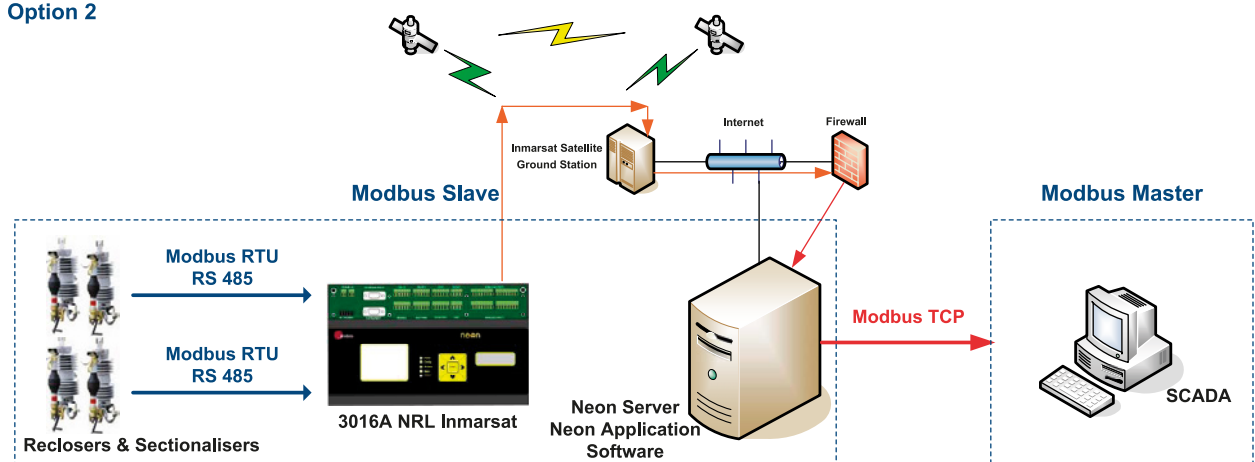
As power utilities often have a central SCADA system the information could also be presented in real time using a direct SQL database interface or a Modbus TCP interface.

Option 1

Modbus Slave

Modbus Master

Inmarsat Satellite Ground Station

Internet

Firewall

Modbus RTU RS 485

Modbus RTU RS 485

Reclosers & Sectionalisers

3016A NRL Inmarsat

Neon Server Neon Application Software

Customer Workstation

Option 2

Inmarsat Satellite Ground Station

Internet

Firewall

Modbus Slave

Modbus Master

Modbus RTU RS 485

Modbus RTU RS 485

Reclosers & Sectionalisers

3016A NRL Inmarsat

Neon Server Neon Application Software

Modbus TCP

SCADA

TYPICAL CONFIGURATION

APPLICATION SPECIFIC INSTRUMENTS / INPUTS

Options	Unidata Part Number	Description
Customised Current Transformers	Current Trans	Custom Current Transformers, Custom Outputs V, 4-20mA
Recloser RTU / Modbus RTU	Modbus RTU	Recloser RTU
Sectionaliser RTU / Modbus RTU	Modbus RTU	Sectionaliser RTU

NEON TELEMETRY - NRL / RTU / FIELD UNITS

Options	Unidata Part Number	Description
Ethernet	3016A-000 / 3008A-000	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Ethernet & 3G / 4G	3016A-C00 / 3008A-C00	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Ethernet & 3G / 4G and LoRa	3016A-CL0 / 3008A-CL0	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Equatorial Orbit Satellite - Inmarsat	3016A-00I / 3008A-00I	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Equatorial Orbit Satellite - Inmarsat & 3G / 4G	3016A-C0I / 3008A-C0I	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Low Earth Orbit Satellite - Globalstar	3016A-00G / 3008A-00G	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Satellite - Iridium Short Burst Data	3016A-00R / 3008A-00R	Neon Remote Logger-16 or 8 Analog Ch / Touch Screen Display
Standalone RTU / NRL - Industrial	3004A-00 / 3004A-0L	Neon Remote Logger-4 Analog Ch with or without Touch Screen Display
Cellular RTU / NRL 3G / 4G - Industrial	3004AC0 / 3004A-CL	Neon Remote Logger-4 Analog Ch with or without Touch Screen Display
M – Series Standalone RTU / NRL	3004B-M000 / 3004B-M0B0	Neon Remote Logger-4 Analog Ch with or without Li Battery
M – Series Cellular RTU / NRL 3G / 4G	3004B-MC00 / 3004B-MCB0	Neon Remote Logger-4 Analog Ch with or without Li Battery
M – Series LoRa RTU / NRL	3004B-ML00 / 3004B-MLB0	Neon Remote Logger-4 Analog Ch with or without Li Battery
M – Series Ethernet RTU / NRL	3004B-MEBL	Neon Remote Logger-4 Analog Ch, Li Battery & LCD are optional
M – Series Microsatellite RTU / NRL	3004B-MHBL	Neon Remote Logger-4 Analog Ch, Li Battery & LCD are optional
M – Series Iridium Short Burst Data RTU / NRL	3004B-MIBL	Neon Remote Logger-4 Analog Ch, Li Battery & LCD are optional

NEON APPLICATION SOFTWARE - CUSTOMER SERVER

Options	Unidata Part Number	Description
Neon Applications Software	2302A	Neon Server Software Licence Incl 5 NAL
Neon Applications Software	2302A-10	Additional 10 NRT Access Licence
Neon Applications Software	2302A-20	Additional 20 NRT Access Licence
Neon Applications Software	2302A-50	Additional 50 NRT Access Licence

NEON HOSTING SERVICE - UNIDATA SERVER

Options	Unidata Part Number	Description
Neon Hosting Service	2301A	Neon Data Initial Subscription Setup Fee
Neon Hosting Service	2301A-01	Neon Data Service Fee for 1-50 NRT
Neon Hosting Service	2301A-02	Neon Data Service Fee for 51-100 NRT
Neon Hosting Service	2301A-10	Neon Data Service Fee Metering

DATALOGGER MANAGEMENT SOFTWARE

Options	Unidata Part Number	Description
Starlog V4 Management Software	6308A-AUE	STARLOG V4 Full Licence Key

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