

Autorecloser-based Control System for Distribution Feeders

Introduction

In any 11kV distribution network, there are critical feeders servicing industrial units or high-revenue areas. Multiple units/areas are serviced by a single feeder from a nearby substation.

In the current scenario, it has been observed that ~80-90% of the feeder tripping incidents are of transient nature, i.e., the faults are temporary. However, this results in outage of all the units/areas serviced by that feeder, which is often restored after manual patrolling. The time taken for this exercise is usually few hours and sometimes days also. This results in not only affecting the consumers, but also to significant revenue losses to the distribution utility.

Auto-reclosers

Auto-reclosers are pole-mounted interrupters, with in-built protection capability to interrupt the power flow on a fault, and also attempt automatic restoration of the power flow. The installation of auto-reclosers serves two main purposes –

1. Automatic restoration of power supply in case of temporary faults.
2. Sectionalizing of main feeder, on the basis of different branches. This protects the main outgoing substation feeder from tripping, thus, restricting the outage to the specific branch of the feeder on which the fault occurred.

Remote Monitoring & Control

A centralized control system to monitor and control the auto-reclosers can be deployed. Under this implementation, typically FRTU/DCU device is installed along with the auto-recloser to enable data acquisition and control functions.

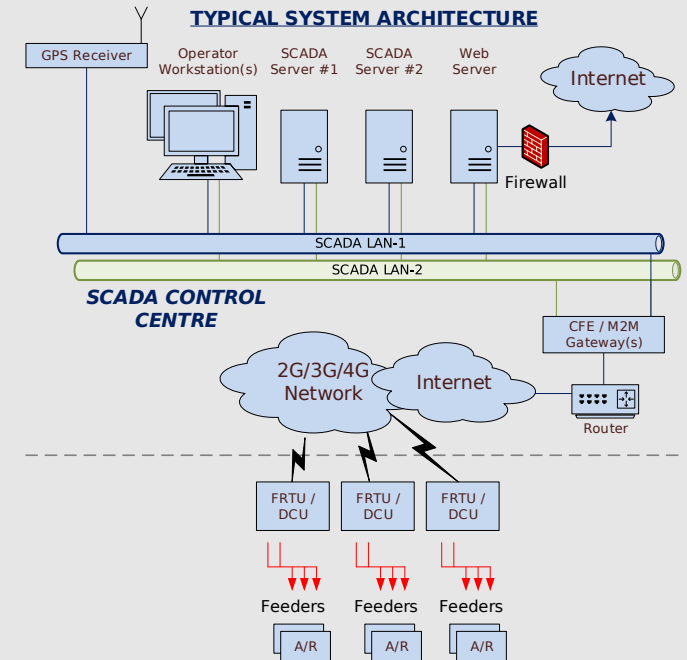
The FRTU/DCU device consists of a wireless modem (e.g., for LTE network), via which it can communicate with a central SCADA system. Notification to utility personnel on permanent faults via mail or text-messages (SMS) can also be implemented using the SCADA system.

The system operator from the SCADA control centre, can monitor the status of all the auto-reclosers, and if required, also perform control to trip / restore a feeder-branch.

Additionally, MIS functions like system availability, trip reports, can be obtained providing a better overview of the distribution network. In certain cases, fault record acquisition can also be done at SCADA level for centralized analysis.

Further, integration with customer database can also be possible, to enable sending out outage information to affected consumers, and generate SAIFI/SAIDI reports.

The same SCADA can also be extended to monitor the substations from which the feeders emanate, thus providing even more network visibility at the 11kV level.



Portfolio of Synergy Systems & Solutions

SSS can execute the complete solution described in this application note. Industry-standard interfaces are followed to interface with any make of auto-recloser either via standard protocols or via hardwired interfaces.

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