FUNDAMENTALS

SuperTAPP SG

VOLTAGE CONTROL FOR SMART GRID

PAST EXPERIENCE | PRESENT SOLUTIONS | FUTURE PROOF

SuperTAPP SG

Voltage Control for Smart Grid

SuperTAPP SG is the latest realisation of the market-leading AVC relay for transformer and tapchanger management. SuperTAPP SG provides practical options to deliver a Smart Grid approach for distributed generation, network interconnection and reconfiguration, flexible and highly variable loads, and many other scenarios which cause challenges for voltage control.

Key Features

- Complete voltage control package for Smart Grid
- Basic voltage control for standard applications
- Advanced solutions for distributed generation
- Accommodates reverse power flows, diverse feeder load profiles and variable power factors
- Integrated control panel with real control switches
- Comprehensive SCADA protocols including IEC 61850, DNP3 and IEC 60870
- PC software for management of entire SuperTAPP SG fleet, including settings, tapchanger operation, relay and tapchanger diagnostics and historical data

Key Benefits

For network operation

- Fewer customer complaints
- Reduce losses

For connection of generation

- Maximise voltage headroom and reduce generator curtailment
- Avoid complex ANM schemes for voltage management
- Reduce connection costs for DG

For asset management and replacement

- Deliver asset health indices at lower cost
- Reduce tapchanger maintenance costs
- Reduce effects of tapchanger failure and risk of damage

For reinforcement projects

- Deliver reinforcement plan at reduced cost
- Easy to install and commission
- Supports use with all types of transformer, tapchanger and schemes

Technical Overview

SuperTAPP SG designed with a single purpose in mind: excellent control of network voltages. The third generation of SuperTAPP, the SG designed to handle the many complex scenarios that a Smart Grid creates – multiple DG units, variable power factors, non-standard feeders, reverse power flows, capacitor banks and more. The substation operator is presented with an intuitive control panel which is easy to use, and makes engineering simple. SuperTAPP SG has communications capability with IEC 61850, DNP3 and IEC 60870 and more for complete ADMS integration.

SuperTAPP SG is available in three flavours which, with a withdrawable case, are easily upgradeable without disturbing existing wiring.

Basic

The SuperTAPP Basic SG is designed with all the hardware and functions required to control a standard transformer installation at a multi-transformer substation. It is designed as the direct inheritor of the original SuperTAPP and MicroTAPP technologies and SuperTAPP n+ Basic.

Advanced

Input of a numerical code is all that is required to enable additional functionality, suitable for advanced applications, including double secondary windings, difficult situations with differing feeder load profiles, and handling distributed generation including reverse power flows. This version includes all functions of the current SuperTAPP n+ Advanced.

Ultimate

The SuperTAPP Ultimate SG includes a number of smartgrid functions for voltage control and the ability to include additional measurements within the control loop. The SuperTAPP Ultimate SG therefore represents the ideal substation frontend to a Smart Grid control system.

One serial and two Ethernet rear ports for IEC 61850, DNP3 and IEC 60870

Withdrawable case, easily upgradeable without disturbing existing wiring

Digital and mA I/O modules for plant, SCADA and tap position indication

Front panel USB port for settings and data download

Easy to use control panel making engineering simple

Basic SG

Functions:

- Integrated manual controls
- Measurement of a three-phase VT and CT
- Automatic Voltage Control (AVC) for 2-winding transformers
- Compounding factors for:
  - Load/line Drop Compensation
  - Paralleling multiple transformers through:
    - Transformer Advanced Paralleling Principle
    - Negative Reactance
    - True Circulating Current
  - (Master-follower can also be handled)
- Tapchanger monitoring and runaway prevention
- Optional SCADA communications to IEC 61850, DNP3, IEC 60870-5-103, IEC 60870-5-104
- Additional I/O and mA loop options

Advanced SG

Functions:

All Basic functions plus:

- Measurement of 2 three-phase VTs and 3 CTs, with options for up to 10 CTs
- AVC for 3-winding transformers (double secondary)
- Use of additional current input for generation feeder, generation, load correction, load exclusion, load inclusion, interconnected substations

Ultimate SG

Functions:

All Basic and Advanced functions plus:

- Autonomous algorithms for frequency – and load-based voltage adjustments
- Tap stagger
- Smart Grid logic processing

Services

Fundamentals can assist with all aspects of voltage control applications and transformer and tapchanger management:

- Design and engineering
- Panel/cubicle build
- Site surveys, installation and commissioning
- Tapchanger health check, maintenance and reverse power assessments
- Transformer online dissolved gas analysis (DGA)
- Technical support and troubleshooting
- Power system analysis
- Generation connection assessment

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