OMNIVERTER VECTO 3

Grid Oscillation Plus

Phasor Measurement Unit+ | Power Quality Analyzer+ | Automation+ | Billing+ | Grid Oscillation+

The case for Oscillation Phasor Monitoring

Sub-synchronous Resonance (SSR) occurs when an electrical network exchanges energy with a source at a frequency lower than the system's synchronous frequency. This can induces torsional stress on generator shafts, posing a risk of damage or fracture. Although traditional power grids are designed to handle disturbances, the increased integration of renewables and electronic equipment has made these oscillations more complex and frequent.

To address this, a small signal stability algorithm has been developed for the VECTO System. This algorithm detects and calculates the frequency, amplitude and phase angle of a dominant oscillation phasor within a specified frequency range. The VECTO's small signal stability algorithm concurrently identifies three ranges of dominant oscillation phasors between 0.1Hz to 55Hz., representing low, medium and high frequency ranges.

VECTO concurrently identifies up to three dominant oscillation phasors within the range of 0.1Hz to 55Hz.

Low Frequency Range

The algorithm's low-frequency range, spanning from 0.1Hz to 1Hz, specifically identify inter-area oscillations. These oscillations often results from the interaction of large energy sources that are geographically distant. Such oscillations are commonly observed in the frequency range of 0.2Hz to 0.8Hz.

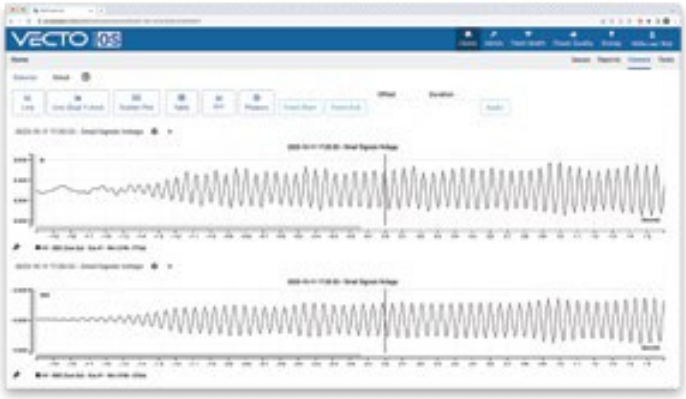
Medium Frequency Range

The algorithm's mid-frequency range, from 1Hz to 10Hz, detects local-area oscillations. These oscillations typically emerge from the interaction among energy sources situated in closer to each other. A common cause is the phenomenon known as "hunting" among a group of generators.

High Frequency Range

The algorithm's high-frequency range, from 10Hz to 55Hz, pinpoints oscillations caused from control loop instability among different Inverter-Based Resources (IBR) energy sources.

Oscillation Phasor Measurement Unit (oPMU)



VECTO includes unique phasor measurement capabilities that delivers the experience of an Oscillation Phasor Measurement Unit (oPMU). The system captures GPS time synchronized data through a fleet of wave synchronized edge computers installed throughout the grid, continuously recording and streaming oscillation phasor data using the established IEEE C37-118 protocol. Oscillation phasors captured at different locations is similar to synchrophasor data, allowing for interaction with all existing Phasor Measurement Units currently on the market.

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The Dominant Oscillation Phasor Monitoring algorithm is a licensed software module that can be loaded onto any existing VECTO Measurement Platform. It offers the following main functionality:

Continuous trending of a dominant oscillation phasor for the low, mid & high frequency bands

- Frequency & ROCOF
- Voltage & current amplitude & phase angles
- Powers
- 20ms update interval (mid & higher band)
- 200ms update rate for (lower band)

3 x Event Monitors with pre- and post- event data

- 1-sec Interval Oscillation Phasor Profiles
- Waveform, RMS & Fundamental Phasor data
- Alarm & Notification on Threshold Exceedance
- Oscillation Phasor Streaming using IEEE C37-118 Protocol

Features of Grid Oscillation Plus

- High precision oscillation phasor estimation
- Simultaneous detection & estimation of up to 3 xindividual oscillation phasors
- 20ms update interval on mid & higher bands
- IEEE C37-118 oscillation phasor streaming
- 3 x event monitors with pre- and post- event data
- 1-sec interval oscillation phasor profiles
- Waveform, RMS & fundamental phasor data
- Alarm & notification on threshold exceedance
- Oscillation phasor streaming using IEEE C37-118 protocol
- Functional elements for S5.2.5.10, proposed in AEMO's review of technical requirements for connection in the NEM
- Output relay control
- Independent threshold levels for alarms and relay control

INNOVATIVE MONITORING

Add impetus to your grid oscillation analysis

Discover the power of VECTO, set up a call with one of our team now for a free demonstration.

Synchro Wave Edge Analyzer

VECTO OS GRID

Data visualization at the edge

omniverter

tame your power—keep your profits

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