

Measuring Fast Phenomena on the Grid

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Who we are

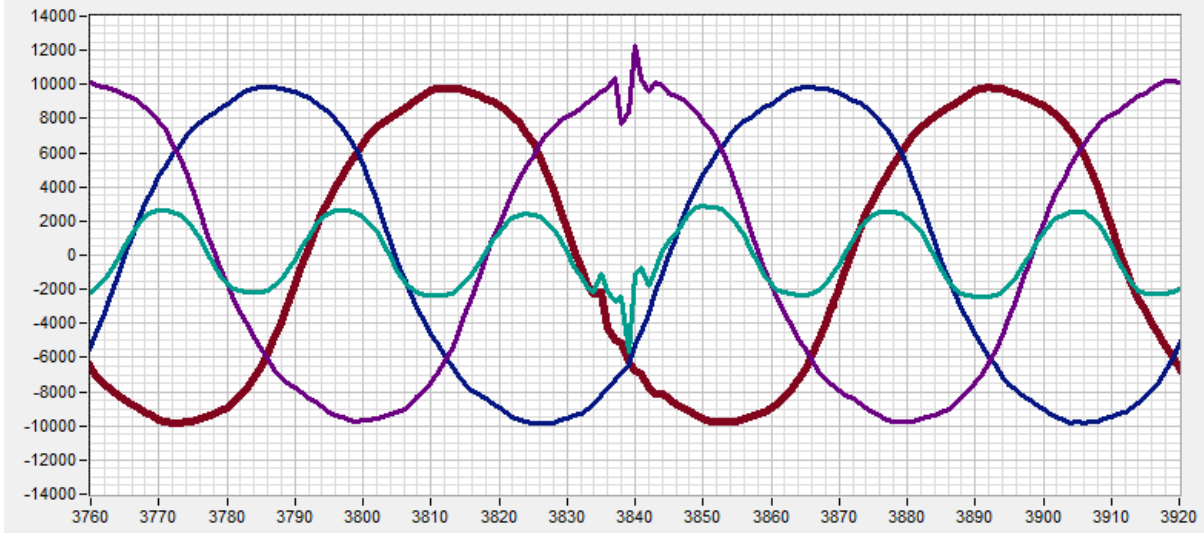
- NuGrid provides advanced sensors and consulting services to improve grid reliability and resiliency.
- NuGrid focusses on leveraging optical sensing technology for measuring and monitoring faster phenomena across the grid safely and confidently.
- NuGrid sensors sample at 1M samples / sec providing bandwidth in excess of 100 kHz to see fast events including higher harmonics, switching and lightning transients, and travelling waves.
- The sensors also provide standard PMU and IEC 61850-9-2 sampled-value outputs to support mainstream applications.

Focus on Faster Phenomena

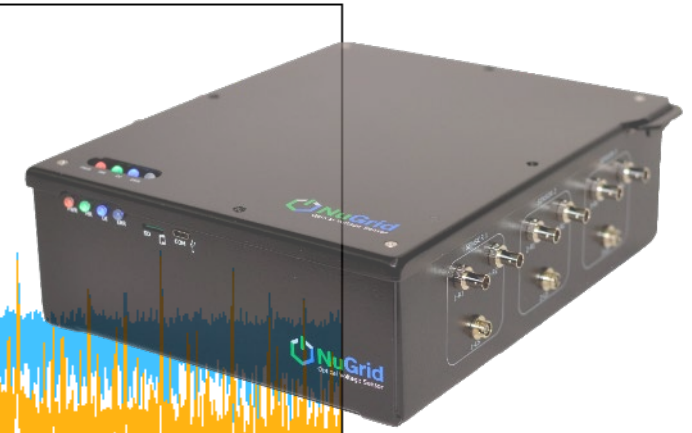
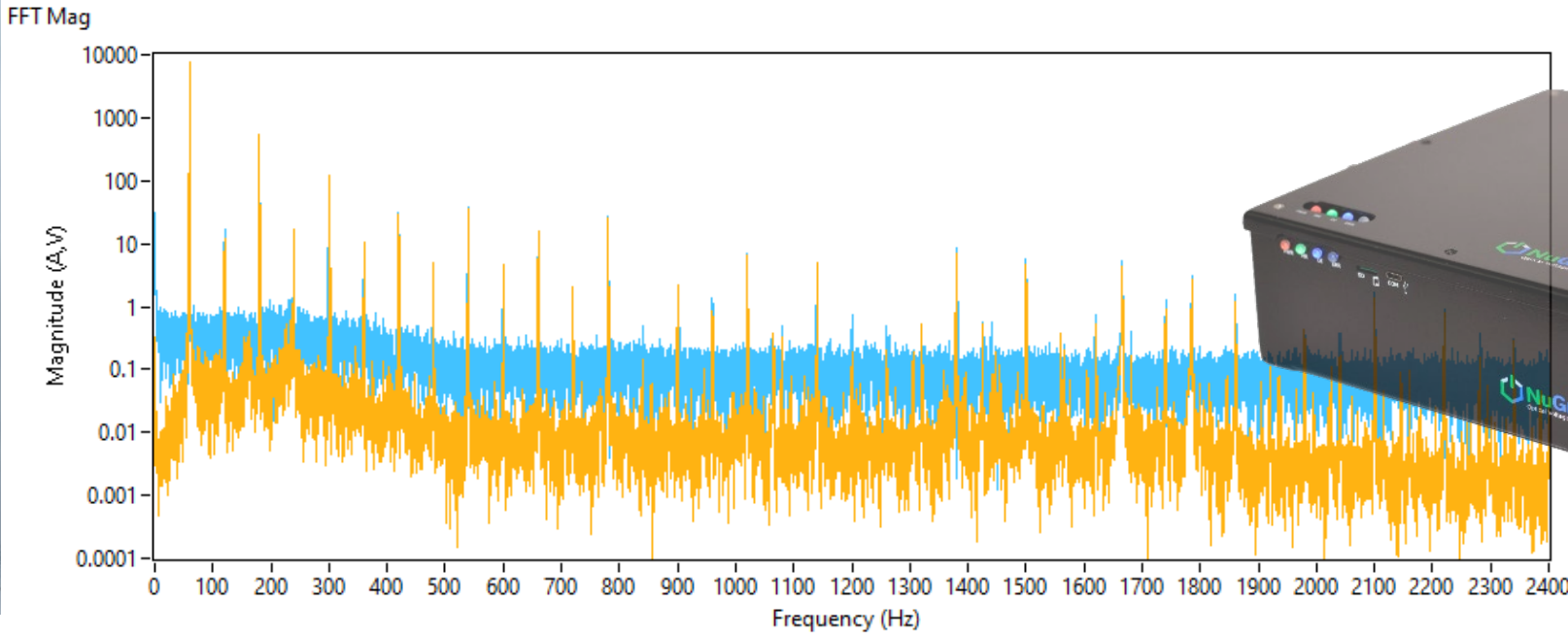
- Traditional grid switching events such as TRV (Transient Recovery Voltage) measurements* (up to a few 10's of kHz)
- Fast switching and lightning phenomena detection (up to a few MHz)
 - Including travelling-wave protection function support
- Basic harmonics up to 3 kHz (up to 50th harmonic, IEC 61000-4-7)
- Inverter and power electronics measurements up to 10 kHz
- Advanced inverter and EV charging systems, signals up to 100 kHz
- Supra-harmonic measurement 2-150 kHz (IEC 61000-4-30)
- Grid event signature analysis

* For example see IEEE PES Tutorial on TRV and its measurement https://resourcecenter.ieee-pes.org/education/tutorials/PES_Ed_TUT_TRV4_100620.html

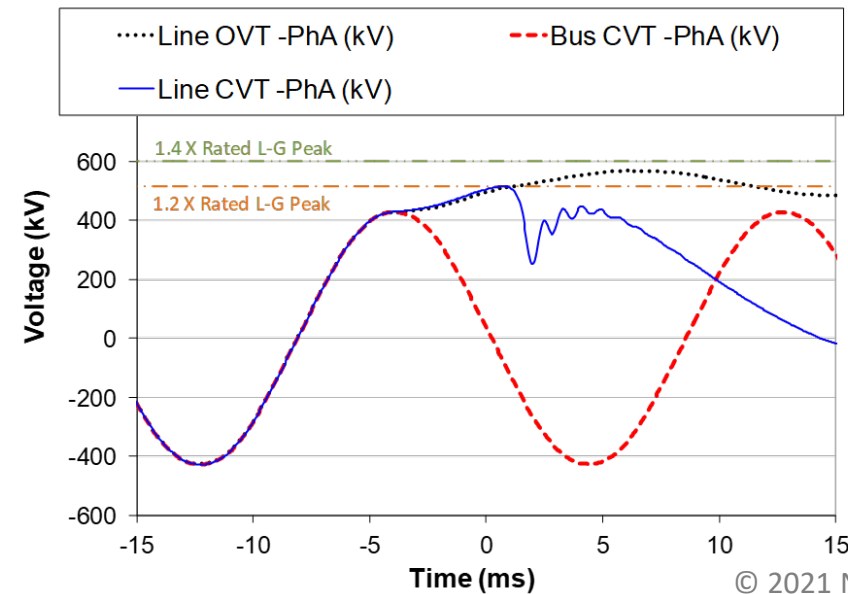
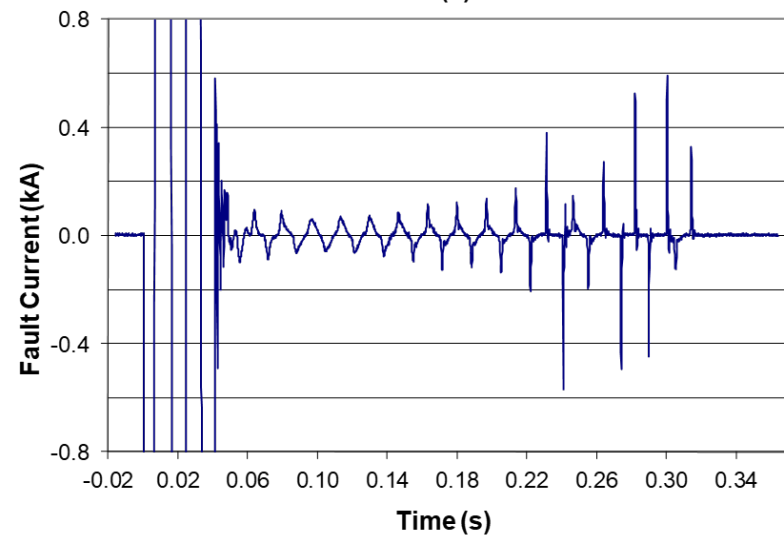
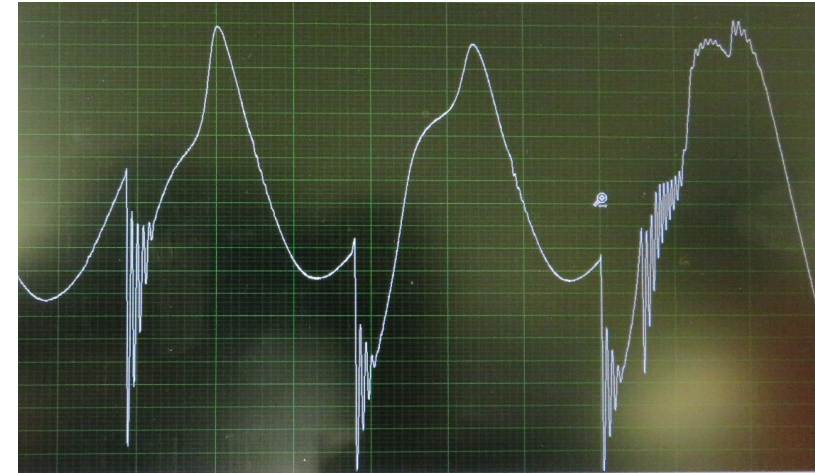
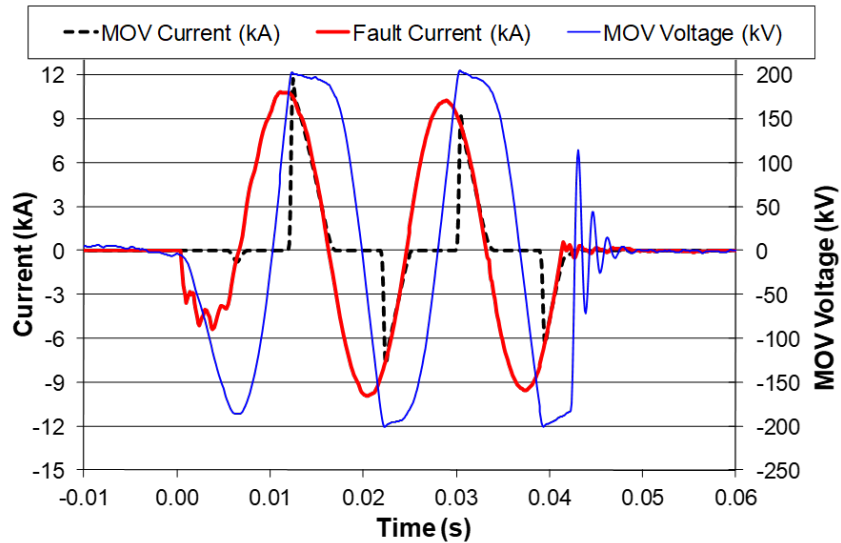
Example: Distribution Capacitor Switching and Disturbance Monitoring



3 phase voltages and summation (zero-sequence) waveforms sampled at IEC 61869-9 preferred rate of 4800 samples/s {& 14,400 samples/s}



Example: Voltages Transients Monitoring



Sensor Interface

- Sampling rate ~ 1 MHz
- 3 dB bandwidth >100 kHz
- LEA output (± 10 V)
- Ethernet ports, up to 4 (2 RJ45, 2 SFP)
- Time sync with PTP (IRIG-B optional)
- Optional PMU output
- Optional IEC 61850-9-2 SV output

