

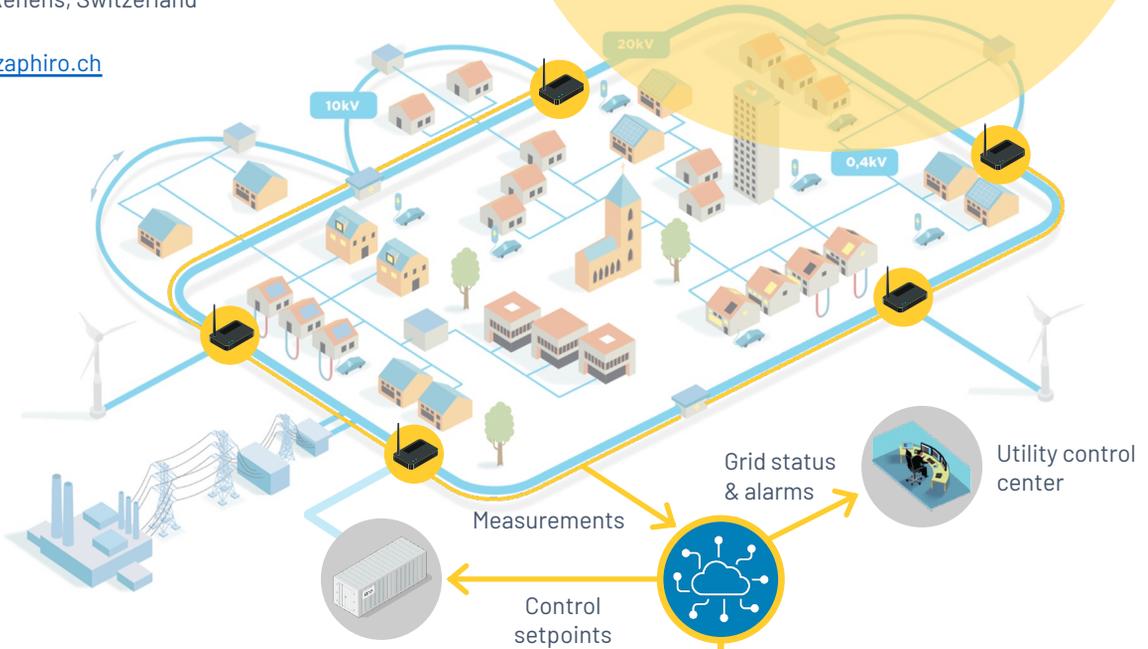
Zaphiro Technologies SA

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SynchroGuard

Unlock your grid potential



The first grid monitoring & automation system based on D-PMU technology

Lowest Total Cost of Ownership

- Easy to install, simple to run and maintain
- Full grid visibility with little measurement coverage
- Ideal for distribution grid retrofitting
- Tailored to minimize operational costs with efficient & effective use of public and private LTE or fiber

Best in Class PMU

- Ranked among the top-2 PMUs in the world by NIST, exceeding IEEE Std. limits by up to 2 orders of magnitude

Linear Distribution System State Estimation

- 3-phase state estimation for unbalanced power grids
- Real time topology estimation and island identification
- High accuracy and high availability solution
- Automatic handling of data losses and bad-data

Unprecedented Fault Detection & Location

- Automatic fault detection and location of permanent and incipient faults as well as single/multi-phase faults
- Works irrespectively of network topology, neutral treatment or presence of DERs
- Real-time notification and alarming. Easy integration in protection or FLISR schemes



Modular & scalable software platform

- Full interoperability
- Patented algorithms



High-fidelity real-time grid monitoring

- Full grid visibility with as little as 10% of measurement coverage



Accurate fault location

- Automated fault location to reduce duration or prevent blackouts



DER integration and control

- "Grid aware" control of DERs for voltage control and congestion mgmt



Offline grid analytics

- Advanced analytics for optimal grid planning and predictive maintenance



Patented D-PMU device

- Time-synchronized high-speed measurements of voltage/current
- IEEE C37.118 compliant

Zaphiro

Dynamic. Smart. Grid.

LEVERAGING PHASOR MEASUREMENT UNIT TECHNOLOGY FOR ACHIEVING CARBON-NEUTRAL GRIDS

Zaphiro developed **SynchroGuard**, the first high-fidelity distribution grid monitoring & automation system based on IEEE C37.118 compliant **D-PMU** technology, tailored to be utilized over public and private LTE infrastructure or fiber where available. With satisfied customers across the globe, SynchroGuard achieved:

- Over **180** SynchroSense PMU devices installed in the field
- More than **1,600** grid assets and more than **200** km of MV lines monitored **24/7**
- Over **120** Gb of data collected and processed daily



High-fidelity Distribution Grid Monitoring

- Voltage profiles monitoring
- Line congestion/power flow monitoring
- Critical customer monitoring
- Distribution system linear state estimation
- Topology identification



Offline Grid Analytics

- Power quality analysis
- Optimal grid planning/reinforcement
- Condition-based, predictive maintenance
- Post-event analysis
- Power losses estimation



Advanced Distribution Automation

- Accurate fault identification and location
- Adaptive protections and new load shedding schemes
- Unintentional islanding detection
- Wildfire prevention



New Microgrid Applications

- Optimal DER orchestration
- "Grid-aware" DER control
- Microgrid islanding operations
- Optimal grid reconfiguration
- Advanced VPP support

ComEd

CLP 中電

**ROMANDE
ENERGIE**

BKW

unareti

Terna

Netze BW

KAHRA **MAA**