

Turnkey Control & Protection Solutions for Grid Modernization and Electrification

Design of Grid Management Solutions for Distribution Systems and Microgrids

We offer high-speed Energy-Management-Systems (EMS) to transfer power-distribution systems into smart grids.

- Adjust electricity consumption in real-time based on demand fluctuations
- Inject power back to the utility grid based on Time-of-Use pricing, energy-arbitrage programs and Power-Purchase-Agreements (PPAs)
- Provide ancillary services, e.g., frequency support, voltage support, emergency power support, to the utility and enable new revenue streams for Inverter-Based-Resources (IBRs) and Distributed-Energy-Resources (DERs) asset owners

We offer deep technical expertise in designing and developing microgrid supervisory control systems.

- Enable optimal operation of grid-connected microgrid systems for behind-the-meter and Virtual-Power-Plant (VPP) applications
- Successful unplanned and pre-planned islanding of microgrid systems subsequent to grid outages and planned downtime
- Proper black start and energization of microgrid systems
- Seamless re-synchronization of microgrid systems back to the utility grid



Dynamical Control Systems for Inverter & Converter of DERs and IBRs

We develop high-speed control systems for robust operation of IBRs and DERs.

- Mitigate adverse impacts of interconnection of IBRs and DERs
- Meet power-quality criteria and comply with grid codes and standards, e.g., CSA 22.3 and IEEE 1547-2018
- Minimize Total-Harmonic-Distortion (THD) levels to comply with IEEE-519
- Enable ride-through operation capability during grid abnormal operation
- enable seamless mode transitions for DERs and IBRs:
 - seamless switching between MPPT and curtailment modes for solar-PV systems
 - seamless switching between grid-following and grid-forming modes for Battery-Energy-Storage-Systems (BESS)
 - Dynamic operation of Type-3 & Type-4 wind power plants



Get in touch with our team to schedule a real-time live demo!

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EdgeTunePower

Empowering Your Business At the **Edge**

Power System Protection Services:

Trust us as your one-stop shop for all your protection system needs.

- Comprehensive fault studies
- Relay protection system development
- Precision relay & re-closer setting, fuse selection, and protection system coordination
- Protection system simulations
- IBR and DER plant protection
- State-of-the-Art relay testing
- Craft and verify system integrity protection schemes
- Optimal control-protection coordination for DERs & IBRs
- Recommendations for upgrading protection systems
- Design protection, automation, and communication systems
- Tailor-made fault location scheme designs
- Design, test, and implement FLISR Schemes



Time-domain Electromagnetic and Phasor-domain Simulation:

We provide accurate and cost-effective time-domain and frequency-domain simulation services.

- Represent connection impact and operation of utility-scale IBRs and behind-the-meter DERs,
- Investigate operation of microgrid systems in different modes,
- Incorporate blackbox model of OEMs of IBRs and DERs into our customers' power system simulation models to ensure compliance with grid codes and standards,
- Enable protection coordination with control systems to ensure proper operations of IBRs and DERs

Real-time Hardware-In-the-Loop (HIL) Testing:

We offer state-of-the-art, real-time HIL testing to our customers.

- Comprehensively verify performance of embedded (physical) control systems of DERs and IBRs to ensure Model-Quality-Validation and to complete Model-Quality-Testings
- Accurately represent delays associated with standard communication mediums, e.g., IEC-61850, to investigate impact of such delays on performance of control and protection systems
- Comprehensively verify performance of protection schemes and generate proper group settings for protection relays,
- Minimize time, cost, and risk with control and protection systems during commissioning and troubleshooting stages



1021 Kennedy Avenue, North Vancouver BC, Canada, V7R 1L6 | +1 (800) 669-4797 | www.etpower.ca | info@etpower.ca

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