



**KINECTRICS**

# Substation Automation Systems(Sas) & Interoperability Testing Lab

Making The Most Of New Opportunities To Enhance Reliability



Kinectrics' expert electrical engineering and testing services promote safe, reliable and economic application of the new, advanced high-tech protection and automation equipment.



## THE MODERN POWER GRID = CHANGE!

The rapid evolution of communication, information and computer technologies presents both opportunities and challenges to the power industry. The need to satisfy increased customer reliability expectations, while operating in a difficult, cost-conscious competitive environment, has encouraged many utilities to automate their substations with integrated protection, control, monitoring, and metering systems.

With this drive, a new set of global standards, including IEC 61850, IEC 61970, and IEC 61968 has emerged. These new standards facilitate communications over a common, open information highway, with data being accessed at local and remote sites from many sophisticated devices for automation, protection, control, metering and monitoring.

Kinectrics can assist clients in this enterprise by offering state-of-the-art services that cover various interoperability tests, function and performance tests, and impact studies. By working with an established independent company like Kinectrics, vendors and utilities can discover implementation issues in advance, thereby enabling them to avoid costly issues and problems during the integration, operation and maintenance phases.

## ADVANCED FACILITIES

The Kinectrics Interoperability Lab offers full-scope testing and development services for Substation Automation Systems, EMS, and DMS systems to ensure seamless communications in power utilities. Our facilities are equipped with state-of-the-art test sets with full IEC 61850 capabilities Common Information Model (CIM) testing, background traffic simulation and protocol analysis, as well as a Real Time Digital Simulator™ (RTDS), with full GTNET option and software for GOOSE and message generation.

### Standard Open-loop Testing

Perform open loop tests by current and voltage injection and by digitally-generated GOOSE / GSSE messages with parallel copper and Ethernet wiring to verify if the Device Under Test (DUT) is compliant with your requirements or international standards.

## Powerful Closed-loop Testing

Kinectrics can also perform transient simulations on a simulated power system via models built using the advanced RTDS. The outputs of the RTDS are amplified to the level suitable for secondary injection tests, or digitized current and voltage signals are directly communicated to the DUT. This simulation replicates system operation—actual performance can be tested.

In addition, the digitally-generated GOOSE / GSSE signals are directly communicated to the DUT and the response from the DUT is fed back to the RTDS to influence the simulation. This type of closed loop testing not only evaluates the device under test, but also the impact on the power system, and whether the application best suits the power utility's needs.

## FULL SCOPE TESTING

With unrivalled expertise based on several decades of R&D and field experience in protection and control systems, Kinectrics is uniquely qualified to offer full scope, “one-stop” services to meet client needs in moving to IEC 61850 based substation automation systems.

### 1. Interoperability Testing

Perform single and multiple device interoperability testing and system integration testing:

- Single device IEC 61850 testing using both station and process bus
- IEC 61970 / IEC 61968 CIM testing
- Interoperability testing
- System integration and testing



### 2. Functionality Testing

Evaluate the functions of the DUT as specified and its response under the following conditions:

- Single device protection setting, timing, zone reach testing
- Multiple device scheme testing involving communication
- Single / multiple devices local / remote control schema, interlocking testing

### 3. Performance Evaluation

Co-ordination with utilities to define performance evaluation criteria, conduct performance evaluation in terms of latency delay, priority handling and fall-over handling etc. for communication systems, as well performance evaluation on:

- Substation communication architectures
- Substation automation and energy management systems
- Distribution management systems
- Protection and control schemes

### 4. Impact Studies

Using detailed transient-based power system component models in the RTDS for impact studies, current and voltage signals from the RTDS are amplified and injected into the DUT along with the digitally-generated current / voltage / binary signals. Actual device performance is tested according to system-specific concerns.

**IEC 61850 Training  
Courses now available.  
Visit our Web site at  
[www.kinectrics.com](http://www.kinectrics.com)  
for details.**



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**Head Office**

800 Kipling Ave., Unit 2  
Toronto, ON M8Z 5G5  
Canada  
416-207-6000

**Canada**

393 University Ave. 4th Floor  
Toronto, ON M5G 1E6

**USA**

2135 City Gate Lane, Suite 100  
Naperville, IL 60563

**United Kingdom**

17-18 Frederick Sanger Road  
Surrey Research Park  
Guildford, Surrey GU2 7YD

**Germany**

Hertha-Lindner-Strasse 10-12  
01067 Dresden

**Denmark**

c/o 360 Law Firm  
Gl.Kongevej 60  
DK- 1850  
Frederiksberg C

**Romania**

59 Grigore Alexandrescu Street.,  
2nd Floor Bucharest 010623

**India**

Sy No.125,  
Banda Mailaram Village,  
Mulugu Mandal, Siddipet District  
Telangana – 502 336

