



## ENERGY

# IEC 61850 UNIGRID TEST TOOL

## IEC 61850 made easy and transparent

### Substation automation

Electric utilities are under increasing pressure to ensure their grids remain reliable over a wide range of operating conditions and to extend the operating life of key assets.

Substation automation (SA) has been successfully introduced for this goal over the past 30 years and is used for monitoring, controlling and protecting a power system through obtaining real-time information from the primary processes in the substation.

Substation automation equipment forms a significant and mature market now and in the future. The global substation automation market is expected to grow to \$ 4.3 billion by 2020 and at that moment nearly 150,000 electric utility substations will be automated or modernized.

The global IEC 61850 standard is rapidly gaining momentum in substation automation. The scope of the IEC 61850 standard is to support communication for all functions being performed in

substations. The goal of the standard is interoperability, i.e. the ability for equipment from different manufacturers to exchange information and use this information for their own functions.

### DNV GL and IEC 61850

Since the early 2000s, DNV GL (formerly known as KEMA) is heavily involved in the IEC 61850 standardization process. Our objective is to facilitate efficient implementation of IEC 61850 by manufacturers and to support a smooth introduction of the standard. This will help utilities and technology providers to gain confidence in the solutions available on the market.

DNV GL runs an independent (Level A) test center for IEC 61850 and carries out conformance tests either in the DNV GL laboratories in Arnhem or on-site globally. In addition to being world leader in IEC 61850 conformance testing, DNV GL offers training, consultancy and software solutions to help our customers in the area of IEC 61850-based substation automation activities.

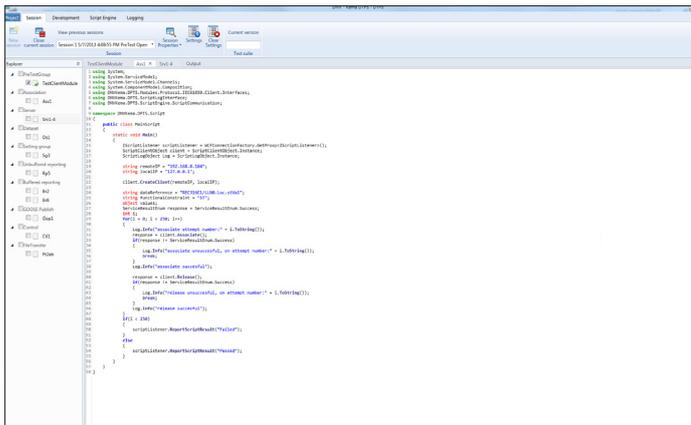
## The UniGrid test tool

Based on our many years of active participation and experience in the IEC 61850 domain, DNV GL has developed a suite of IEC 61850 test tools, which is sold under license to both utilities and technology providers.

Under the name UniGrid, DNV GL has released a new and improved test tool. UniGrid enables test and simulation of a complete IEC 61850 substation automation system and it can be used for various types of conformance and interoperability tests.

UniGrid contains a state of the art test script engine that allows the user to run test scripts written in C#. The UniGrid test tool suite comes with reference test suites, containing all necessary test scripts for the server and client test procedures as described in IEC 61850 part 10.

This allows technology providers to verify their IEC 61850 implementation during product development and be fully prepared for the official conformance test by DNV GL. It allows utilities to perform validation and verification tests during FAT or SAT test periods.



## Modular approach

The UniGrid test tool is a modular system allowing customers to purchase specific tool functionalities based on their project requirements. The following functional modules are available:

- **UniGrid 61850 Client & GOOSE simulator + Reference IEC 61850 part 10 test suite**  
This module allows for simulation of a complete IEC 61850 client system, including GOOSE messages (edition 1 and 2)
- **UniGrid 61850 Multi-IED simulator**  
This module allows for a complete simulation of all IEC 61850 server devices in a substation.
- **UniGrid 61850 Protocol Analyzer**  
This module allows for capture and analysis IEC 61850 communication traffic on an ethernet-based network.
- **UniGrid 61850 SCL Checker**  
This module allows for automatic verification of SCL files against the IEC 61850 standard



## Feature overview

The user-friendly UniGrid test tool is ideal for reducing the complex world of IEC 61850 testing and verification. It provides a simple and straightforward user interface.

It offers the following features:

- Supports fully compliant IEC 61850 Edition 1 and 2 client and server testing according to IEC 61850-10
- Test set automation, based on Omicron devices (ISIO 200), thus greatly reducing test lead times
- Ability to create new test cases and/or test suites based on customer specific test requirements
- Support of 'projects & sessions' in order to save partial results and improve the testing experience
- Datamodel view, allowing for easy readout and write of specific IEC 61850 parameter values
- Based on a NET C# script engine with added TTCN macro's, enabling understandable and well-designed scripts
- Detailed logging of test script results enabling easy debugging and error detection

## Business benefits

- Allows engineers without detailed protocol knowledge to thoroughly test the conformance of an IEC 61850 implementation for both client and server devices
- Lowers the cost of IEC 61850 conformance testing through the use of a fast and automatic reference test suite

## Services

The purchase of a license for the UniGrid tool comes with 6 months of free services, consisting of:

- Helpdesk service
  - Software updates
  - Expert advice
- After 6 months, service renewal can be purchased on a per year basis.