DNV·GL

ENERGY

DNV GL IEC 61850 TEST TOOL FAMILY

Can you create an intelligent substation?

SAFER, SMARTER, GREENER

IEC 61850 TEST TOOLS

The importance of a thoroughly tested IEC 61850 implementation

For substation automation, the international standard for data communication between metering, protection, control, transformer and switching devices within substations is IEC 61850. IEC 61850 is being extended towards communication between substations, decentralized energy resources and hydropower plants, thus becoming increasingly important. Another important feature of IEC 61850 is a language for engineering and configurating substation automation systems.

DNV GL has gained deep knowledge of the IEC 61850 standard. We offer training, consultancy and software solutions to help you to realize a reliable communication environment according to IEC 61850.

DNV GL developed several IEC 61850 Test Tools, which are of great use for the network operators and utilities. The IEC 61850 Test Tools are also used by technology providers to check conformity to the IEC 61850 standard during product development. DNV GL offers the following IEC 61850 Test Tools:

- IEC 61850 Protocol Analyzer
- IEC 61850 Client Simulator
- IEC 61850 GOOSE Simulator
- IEC 61850 SCL Checker
- IEC 61850 Multi IED Simulator

All together these tools create an advanced IEC 61580 conformance test system.

SIX MONTHS OF FREE SERVICES

- Expert opinion on test results - you can ask our expert opinion about your test results
  We can help you analyze your logs and guide you to resolve issues with your IEC 61850 substation automation system
- Helpdesk - the helpdesk is run by specialists of DNV GL and guarantees fast response times.
- The helpdesk is also the place to submit change requests
- Updates - all available software and test scripts updates via e-mail or internet

Compatible with edition 1 and edition 2 of the IEC 61850 standard.

PROTOCOL ANALYZER

Do you know what is going on in your IEC 61850 network?

Knowing how your IEC 61850 system is performing is of the utmost importance. Access and understanding of the currently communicated data is essential to assure the quality of your network setup and to prevent downtime. When communication errors occur, you really need to understand the exchanged network messages, in order to analyze and resolve undesired situations.

Our Protocol Analyzer enables you to capture and analyze IEC 61850 communication traffic on Ethernet-based networks. The Protocol Analyzer does not only display IEC 61850 communication packets in a comprehensible format, but also automatically analyzes the network traffic. Any errors will be automatically reported by our IEC 61850 Protocol Analyzer. The advantage is clear; you can analyze your communication without being a protocol expert. Imagine how this could help you; error-resolving has never been this quick and easy!

KEY BENEFITS

- Monitor your substation network
- Capture and analyze IEC 61850 messages
- Useful for acceptance testing, inter-operability testing, conformance testing, error logging and network performance monitoring
- Measuring GOOSE performance
- Perfect assistance for IEC 61850 product development

Compatible with edition 1 and edition 2 of the IEC 61850 standard.

SCL CHECKER

Gain time and quality by checking your substation configuration files

When engineering an IEC 61850 substation, it is a time-consuming, and error sensitive process to verify the SCL (Substation Configuration Language) files manually. Are there any other options?

DNV GL has found a way to speed up this process. We offer the IEC 61850 SCL Checker. This software solution helps you to:

- automatically verify complicated and large SCL files
- fast check if the SCL is valid according to the IEC 61850 standard for both edition 1 and 2
- automatic comparison and mismatch detection of the data model of the real device versus the SCL data model
- prevent a mismatch during all acceptance, interoperability and functional testing

The IEC 61850 SCL Checker allows an engineer to perform an automatic SCL verification in less than 5 minutes instead of multiple days when checking manually. This unique solution helps you to minimize errors, and considerably speed up the engineering processes.

TECHNICAL SPECIFICATIONS

- Automatic verification of SCL files
- System engineering verification
- System integration and acceptance testing
- Prevent configuration mismatches
- Proof of engineering quality and configuration management

Compatible with edition 1 and edition 2 of the IEC 61850 standard.

CLIENT & GOOSE SIMULATOR

How to simulate a full IEC 61850 client system?

When testing your IEC 61850 implementation, one of the essential facts to investigate, is if your full IEC 61850 system is implemented according the standard and interoperable with third party devices. The IEC 61850 Client Simulator can simulate a complete IEC 61850 client system. The IEC 61850 GOOSE Simulator allows you to construct and send correct and incorrect GOOSE messages to verify if your GOOSE system is working according to the standard.

Both simulators are controlled by standardized commands and user-adjustable scripts. The IEC 61850 Client Simulator and GOOSE Simulator both contain a reference test suite, which contains scripts for the test procedures as described in edition 1 and 2 of the IEC 61850 standard.

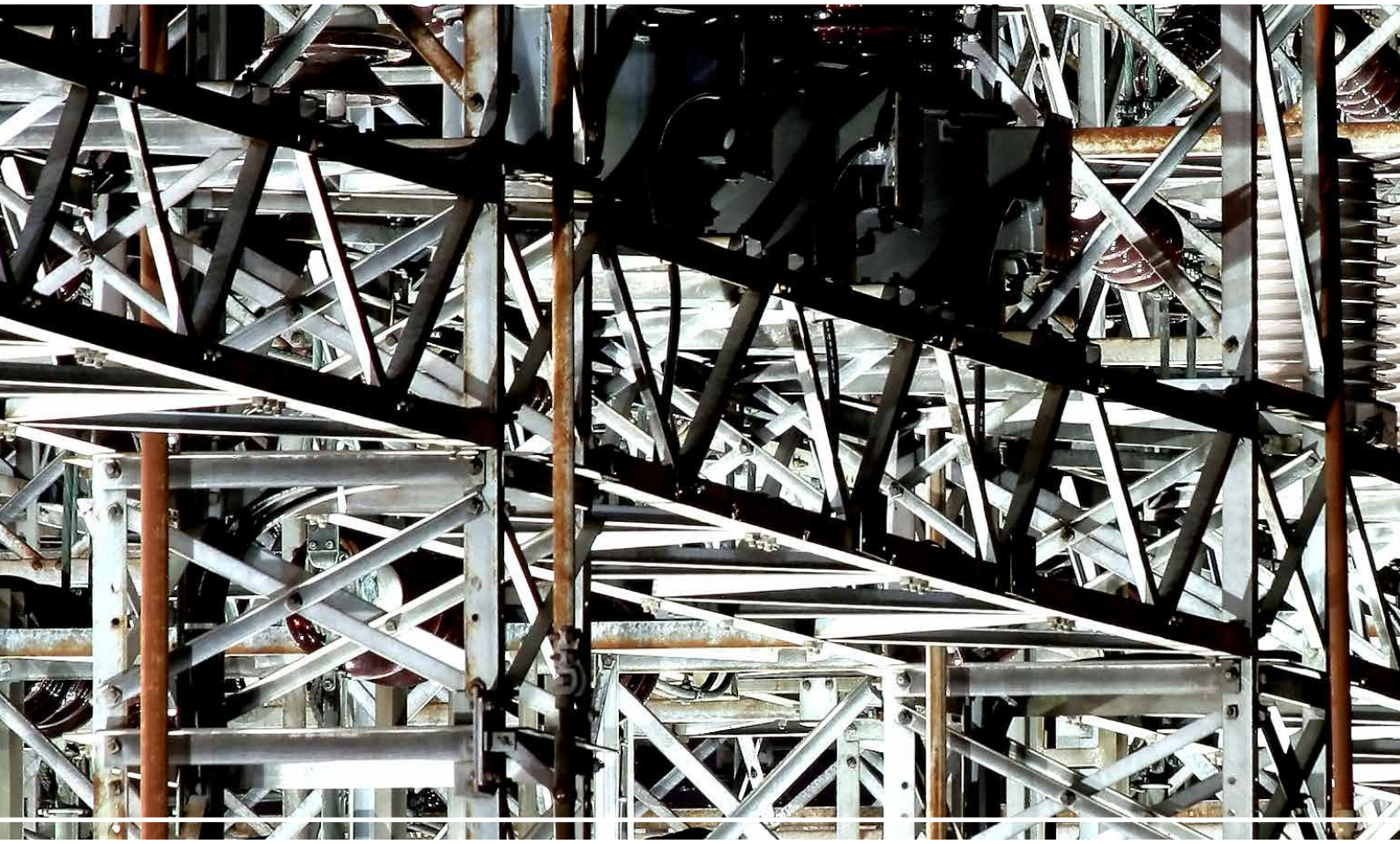
The IEC 61850 Client Simulator and GOOSE Simulator helps you to:

- Perform automatic conformance tests, by using the built-in test master and reference test suite according to IEC 61850 part 10:
- Conformance Testing
- Automatically check the server responses to the IEC 61850 Client Simulator requests
- Create new test cases or even complete test suites, to fullfil your internal testing requirements
- Automatically create network trace files for each executed test case
- Asses the test results automatically, so engineers can check the conformance of an IEC 61850 server implementation without being a protocol expert

TECHNICAL SPECIFICATIONS

- Simulate a complete IEC 61850 Client System
- Supports automatic conformance testing of IEC 61850 server implementations
- Automated checking of responses issued by a server device
- Easy to use built-in script editor to design your own specific test cases
- Cooperation with the IEC 61850 Analyzer to automatically create trace files of the network traffic

Compatible with edition 1 and edition 2 of the IEC 61850 standard.



MULTI IED SIMULATOR

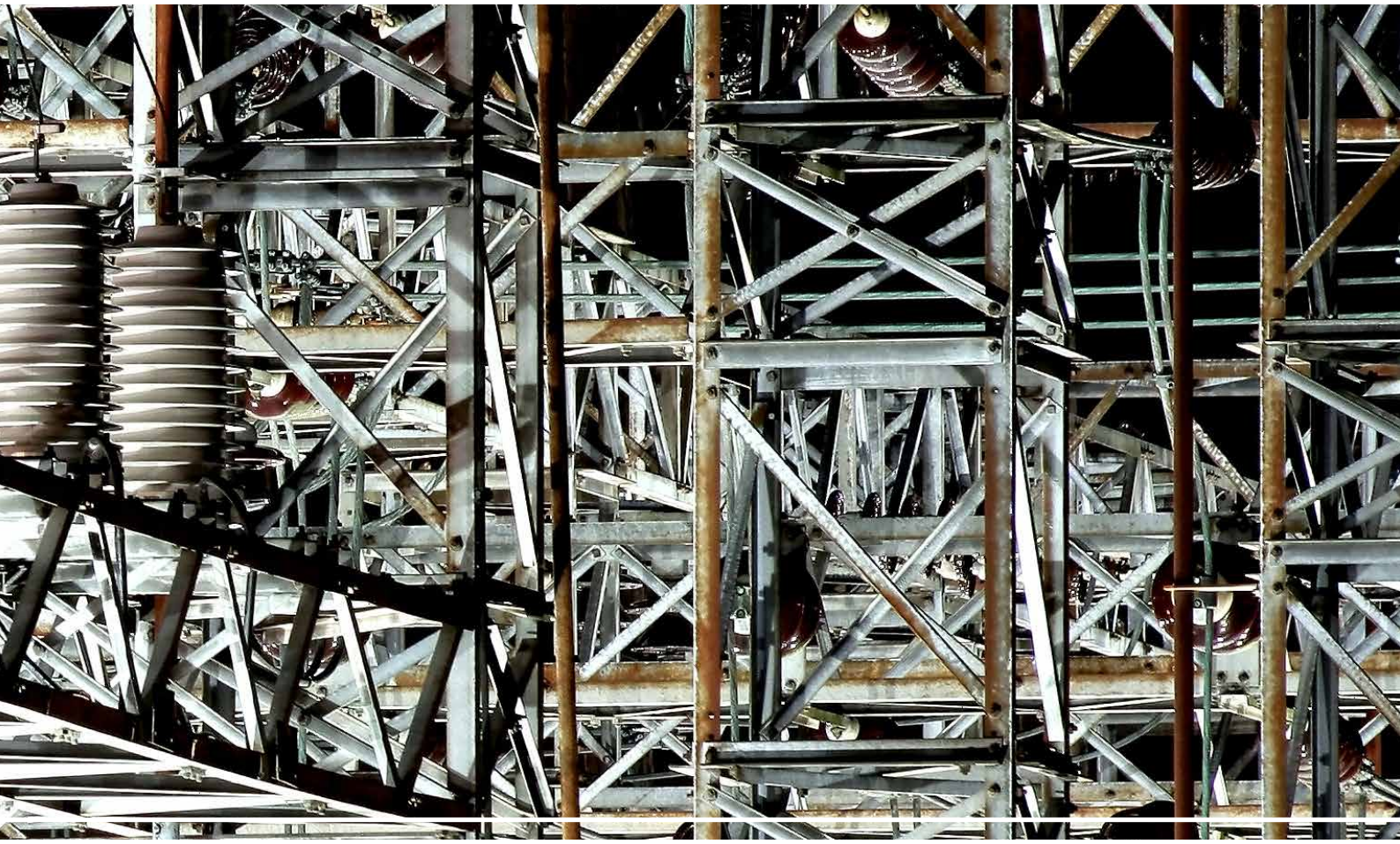
Can you simulate a large-scale roll-out of IEDs?

Imagine you have designed a complete IEC 61850 substation automation system and you would like to perform a full system test. This can be a real challenge.

DNV GL offers an appropriate solution for this. With the Multi IED Simulator, you are able to simulate many IEDs (Intelligent Electronic Device) on your own computer. Each simulated IED is uniquely configured by using your own SCL files, the process data simulation is configured by a configurable simulation file.

The IEC 61850 Multi IED Simulator is characterized by its user-friendly interface. It has been designed to help you to easily:

- Configure, start and stop IEDs
- Simulate up to 50 IEDs based on your own SCL file(s)
- Manage the simulated servers through a graphical interface
- Generate scripts to easily manage network interfaces and IP addresses
- Simulate periodic and random process parameters
- Explore and manipulate the data model of all simulated IEDs
- Provide additional functions for client testing purposes (optional)



TECHNICAL SPECIFICATIONS

- One screen overview showing graphical layout of all your simulated IED's
- The IEC 61850 Multi IED Simulator supports the following communication services:
  - Basic Exchange
  - Data Sets Definition
  - Setting Group
  - Control
  - Reporting
  - File Transfer
  - GOOSE
  - Process value simulation
  - Circuit breaker and disconnector control simulation

Compatible with edition 1 and edition 2 of the IEC 61850 standard.

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DNV GL
Driven by our purpose of safeguarding life, property and the environment, DNV GL enables organizations to advance the safety and sustainability of their business. We provide classification and technical assurance along with software and independent expert advisory services to the maritime, oil and gas, and energy industries. We also provide certification services to customers across a wide range of industries.

Combining leading technical and operational expertise, risk methodology and in-depth industry knowledge, we empower our customers' decisions and actions with trust and confidence. We continuously invest in research and collaborative innovation to provide customers and society with operational and technological foresight. With our origins stretching back to 1864, our reach today is global. Operating in more than 100 countries, our 16,000 professionals are dedicated to helping customers make the world safer, smarter and greener.

In the energy industry
DNV GL delivers world-renowned testing and advisory services to the energy value chain including renewables and energy efficiency. Our expertise spans onshore and offshore wind power, solar, conventional generation, transmission and distribution, smart grids, and sustainable energy use, as well as energy markets and regulations. Our 3,000 energy experts support clients around the globe in delivering a safe, reliable, efficient, and sustainable energy supply.