



Choose certainty.
Add value.

IEC 61850 Edition 1 and 2

Test and certify the compliance of your data communications to interact in the Smart Grid.

Your challenges

Due to the growing focus on renewable energy sources from diverse electricity producers such as wind farms and photovoltaic facilities, Smart Grids are becoming increasingly important. These intelligent networks are necessary to adjust and optimise energy generation and consumption. To ensure correct Smart Grid implementation, new devices must integrate and communicate with existing equipment. IEC 61850 is the new global standard for power utility communication. Many energy stakeholders such as energy producers, utilities and device manufacturers, especially small and medium-sized companies, are not sufficiently aware of this comprehensive standard. IEC 61850 implementation can be challenging, with features such as GOOSE, reporting, sample values, redundancy and security aspects. To facilitate a smooth implementation, companies need to ensure that all of a device's features operate correctly. They also have to make sure that all the devices they use can exchange data. This is because while a particular device may conform to IEC 61850,

conformance does not guarantee its interoperability with devices from different manufacturers.

What IEC 61850 testing services does TÜV SÜD provide?

TÜV SÜD's IEC 61850 testing services include testing for conformance and interoperability. Conformance testing ensures that a tested device communicates as the standard specifies. Our test exchanges messages between a test system and a device under test (DUT) to determine if it conforms to the specifications of the standard. The messages are designed to test compliance of all the features of the DUT that have to be verified. Our interoperability testing is performed on multiple devices, relays or intelligent electronic devices (IEDs) from different manufacturers to determine if they can exchange data in a correct and effective manner. As the standard is very extensive, we also perform pre-testing to find mistakes in implementation and configuration at an early stage. Our experts can help you determine the root cause of problems once they are identified.



Why is IEC 61850 testing important for your business?

IEDs that communicate via interfaces and protocols as defined in IEC 60870-5-101 or -104 have been used extensively for the control and management of power generation and distribution systems. However, the IEC 61850 communication standard has become increasingly accepted in recent years as it also includes the definition and use of data models. New and modernised power or transformer stations increasingly use this new communication standard.

Almost all owners and operators of power stations and power distribution systems now require IEC 61850 as a communication standard for all IEDs. Manufacturers of IEDs need to implement this communication mechanism in accordance with IEC 61850. Electricity grid operators and legislators (the German Renewable Energies Act, EEG) will continue to increase the demands for interoperability, which makes proof of conformity an essential precondition for systems connected to the grid or for the possibility of funding under the EEG. System integrators who are required to use IEDs from different manufacturers also need to be assured of the interoperability of these devices.



How can you prepare for IEC 61850 testing?

Documentation of implementation and pre-testing services must be prepared before testing and certification.

How can we help you?

TÜV SÜD checks and certifies devices and systems for conformance and interoperability with IEC61850. We are accredited by the Utility Communications Architecture International Users' Group (UCAIug) as a Level A Independent Test Lab. This means our experts are authorised to perform IEC 61850 Conformance Testing in accordance with the Users Group Quality Assurance Testing Program Procedures.

To qualify as an accredited UCAIug committee, TÜV SÜD is equipped with the three core requirements listed by UCAIug: the IEC 61850 accreditation programme; quality assurance procedures for following up on interoperability issues; and, step-by-step test procedures for conformance tests under both normal operating conditions and error conditions.



Our IEC 61850 testing services

■ Conformance testing and certification

We perform testing and certification of IEDs and their configuration in conformity with the IEC 61850 standard, as well as testing and certification of IEC 61850 clients.

■ Interoperability testing

TÜV SÜD tests IEDs for their interoperability and ensures that they can exchange data with systems of different manufacturers.

■ IEC 61850 pre-testing

TÜV SÜD tests IED implementations with an IEC 61850 client simulator, which includes a GOOSE simulator for testing IED implementations. We also provide an SCL checker tool to ensure that your SCL files are compliant.

■ Training

Our basic, advanced and customised training on IEC 61850 is suitable for a wide range of stakeholders including vendors, integrators, developers, engineers, utilities and decision makers.

■ Assessment

We evaluate your requirements and prepare a roadmap for implementation. Our experts can also assess your implementation and prepare a GAP analysis.

Your business benefits

- **Save time and money** – by achieving faster integration at every stage with TÜV SÜD's one-stop IEC 61850 testing solution.
- **Build up your in-house expertise** – by leveraging on the industry-leading knowledge of our training experts.
- **Minimise risk of test failure** – with our comprehensive pre-testing of your equipment, which identifies faults ahead of testing to reduce or eliminate damage.
- **Gain a competitive edge** – by demonstrating the credibility of your components with testing by TÜV SÜD, an accredited Level A Independent Test Lab.
- **Expand your market** – with devices that are fit for integration into the Smart Grid, opening the door to new export markets based on IEC 61850 conformity and interoperability.
- **Demonstrate compliance** – to the new global standard for power utility communication with an instantly recognisable TÜV SÜD certificate.



Why choose TÜV SÜD?

TÜV SÜD is a worldwide leader in Smart Grid integration, with experts who actively participate in international committees and exchange knowledge with their peers. This gives our experts a broad understanding of all the issues involved.

With our embedded systems expertise, we serve energy stakeholders as a one-stop provider of comprehensive Smart Grid services. Our highly trained experts guide clients through the entire process, from pre-testing and assessment through to testing and certification.

As part of our industry-leading approach, we use the most current and versatile testing software. Our modern test bench design allows us to perform a high level of nearly automated tests to obtain correct and reproducible results as opposed to the non-automated (and therefore error-prone) test methods used by the rest of the industry. In addition, we add value with our up-to-date network analyser and well-trained personnel.

Choose certainty. Add value.

TÜV SÜD is a premium quality, safety and sustainability solutions provider that specialises in testing, inspection, auditing, certification, training and knowledge services. Represented in over 800 locations worldwide, we hold accreditations in Europe, the Americas, the Middle East, Asia and Africa. By delivering objective solutions to our customers, we add tangible value to businesses, consumers and the environment.

Related services

TÜV SÜD provides the following related services:

- Testing of IEC 61400-25 (wind power application of IEC 61850) protocol
- Performance of selected tests according to IEC 61850-3 and IEEE 1613
- Smart Grid compatibility testing of e-power producers
- Training and workshops regarding IEC 61850 and Smart Grid integration
- Industrial IT security testing