

IEC 61850 Comprehensive & Independent Hands-on Training

The Future of Power Systems Requires Comprehensive Know-how

IEC 61850 is the global standard for Power System Automation (generation, transport, distribution ... high, medium and low voltage levels). It allows for an open and "future proof" design, different architectures and possibilities to combine products from multiple vendors. In order for users and system integrators to utilize the benefits of IEC 61850 it is necessary for power utilities, integrators and vendors to education their most crucial asset – people, and start the migration to IEC 61850.



Training is performed in small groups mixing theory and practice

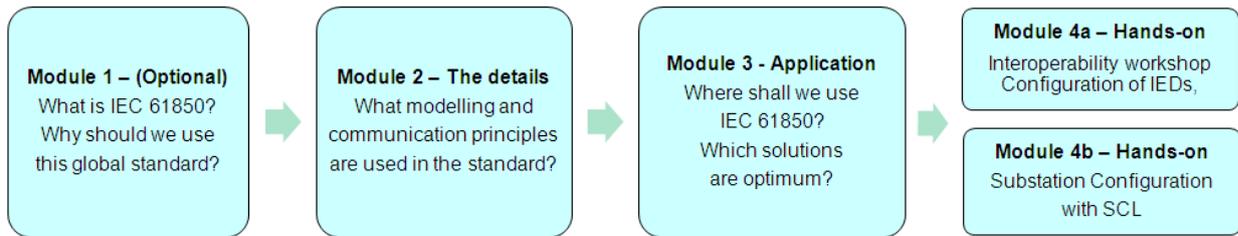
The popular STRI and NettedAutomation hands-on training provides both theory and practice on the application of IEC 61850 in a substation. During the training we follow the planning, design and engineering process for real applications all the way to configuration and testing on a real multivendor test installation. We believe real understanding is the result of both knowledge and hands-on experience. Therefore the training offers a unique combination of presentations, demonstrations and practical workshops in smaller groups.

NettedAutomation (Germany) provide training, consultancy and product support services for the application of distributed automation systems and open communications.

STRI (Sweden) is an accredited high voltage laboratory and independent technical consulting company. We offer IEC 61850 consulting services and independent multivendor interoperability testing. STRI's IEC 61850 lab comprises IEDs and tools from ABB, Areva, Siemens and SEL together with test sets from Omicron, Doble and Megger.

Training Content

The four day training consists of individual modules. Experienced IEC 61850 users may start directly with module 2. Module 4a and 4b are run in parallel and only one can be attended. During the last hour of the training the workshops 4a and 4b join and compare the IEC 61850 systems created with vendor and third-party tools.



- ❖ **Module 1** gives a basic introduction to the IEC 61850 standard together with a summary with real applications and the demonstration of an IEC 61850 software, devices and test procedures with STRI's Independent IEC 61850 laboratory
- ❖ **Module 2** gives an independent and more detailed presentation of the IEC 61850 standard for substation and device modeling as well as communication principles (GOOSE, Sample Values, Client/Server applications). This module tells you what you need to know for specification, evaluation, verification and maintenance of IEC 61850 systems (whole substations and IEDs), with real examples and demonstration of IEC 61850 specification using independent tools.
- ❖ **Module 3** will present possible functional allocation and architecture of a typical substation for substation automation. Optimized application of IEC 61850 in power utilities with examples based on the STRI multivendor application with ABB, Areva and Siemens IEDs for a typical substation. The afternoon contains group workshop to design and specify typical substation functions.
- ❖ **Module 4A: IED interoperability workshop (limited to 14 people)**
IEC 61850 hands-on workshop demonstrating interoperability of protection and control devices from ABB, Areva and Siemens. In subgroups the participants browse the IED model of each device (using self-description, validation of model and SCL file) and create outgoing GOOSE messages. After lunch the network traffic is jointly analyzed and the reception of GOOSE messages will be configured in subgroups and tested using IEC 61850 compatible test devices. Configuration is also demonstrated using vendor independent tools. Experience in system debugging and network traffic analysis using third party and open source tools is gained.
- ❖ **Module 4B: Substation Configuration Language (SCL) workshop (limited to 12 people)**
The workshop focuses on the design of typical substation functions and the engineering of the substation and IEDs according to the engineering process described in edition 2 of IEC 61850-6 (SCL). The participants will use third-party tool to for specification, design and engineering of IEC 61850 systems. The SCD file is also used in IED configuration tools to configure real IEDs. This workshop requires participants to bring their own notebooks. Demo tools (from third parties) will be provided prior to day 4.



Training Program

Day 1 – Tuesday 20th of October 2009

10 ⁰⁰ –10 ¹⁵	Welcome and course introduction	Nicholas Etherden, STRI
10 ¹⁰ –16 ⁰⁰	IEC 61850 Module 1	Karlheinz Schwarz, NettedAutomation
16 ⁰⁰ –17 ⁰⁰	Demonstration of an IEC 61850 system	Jörg Reuter, Helinks LLC
20 ⁰⁰	Welcome drink for all participants*	

* People arriving for day 2 are welcome to take part in demonstrations and evening activity

Day 2 – Wednesday 21st of October 2009

09 ⁰⁰ –16 ⁰⁰	IEC 61850 Module 2	Karlheinz Schwarz, NettedAutomation
16 ⁰⁰ –17 ⁰⁰	Specification of IEC 61850 systems using vendor independent tools	Nicholas Etherden, STRI

Day 3 – Thursday 22nd of October 2009

08 ⁰⁰ –15 ⁰⁰	Application of IEC 61850 in protection and control (Theory and group sessions)*	Carl Öhlen, STRI
15 ⁰⁰ –16 ⁰⁰	Questions, answers and discussions	All

* Karlheinz Schwarz, NettedAutomation and engineers from the STRI IEC 61850 Independent Interoperability Laboratory, will be available during day 3 for answering questions and providing more details on the standard series and the use in IEDs, tools and substations.

Day 3 – Thursday 22nd of October 2009

16 ⁰⁰ –17 ³⁰	Introduction for participants of workshop	Nicholas Etherden/Karlheinz Schwarz
------------------------------------	---	-------------------------------------

Day 4 – Friday 22nd of October 2009

08 ⁰⁰ –15 ⁰⁰	IEC 61850 interoperability workshop	Nicholas Etherden, STRI Andrea Bonetti, Megger
08 ⁰⁰ –15 ⁰⁰	Substation Configuration Language workshop	Karlheinz Schwarz, NettedAutomation Jörg Reuter, Helinks LLC
15 ⁰⁰ –16 ⁰⁰	Final Q&A with comparison of workshops result	All



Participants of previous trainings in Ludvika and Frankfurt

Registration Options and Prices

Module 1 covers the general introduction, Modules 2 and 3 are intended for engineers working with the planning, specification, design, operation and maintenance of substation automation who need a deeper understanding for migration to, and application of, IEC 61850. Module 4 is intended for engineers specializing in the application, engineering, configuration and testing of IEDs for protection and control in an IEC 61850 based system.

Module 1	IEC 61850 Introduction (when booked alone)	600 EUR
Module 1	IEC 61850 Introduction (when booked with other modules)	400 EUR
Modules 2–3	IEC 61850 Details and applications	1.100 EUR
Modules 2–4a	IEC 61850 Details, applications + interop. workshop (max 14)	1.950 EUR
Modules 2–4b	IEC 61850 Details, applications + SCL workshop (max 12)	1.750 EUR

Please read more on www.stri.se/iec61850 and www.nettedautomation.com/seminars. Since the number of participants is limited please email a non-binding "Interest to participate" with an indication for which module you want to participate in to seminars@nettedautomation.com before September 15th, 2009. A formal registration form is attached. Formal registration depending on availability is required latest October 1st. We reserve the right to cancel the training course if the number of registered participants is less than 15 at that date. For additional dates and in-house hands-on training courses please contact us (contact see below).

Curriculum vitae of Lecturers

Karlheinz Schwarz received his diploma (masters degree) in Information Technology at the University of Segen (Germany) 1982. He has held a management position within Siemens and has an immense experience in the migration from proprietary or other solutions to standard compliant solutions. He is involved in many standardization activities within IEC, CENELEC, IEEE and DIN since 1985. He received in 2007 the IEC 1906 Award "for his strong involvement in the edition of the IEC 61850 series, its promotion inside and outside IEC, and specifically its adaptation for wind turbine plant control". He has since many years as an independent consultant provided training courses and consulting services for IEC 61850 all over the world. (http://nettedautomation.com/download/Netted-Schwarz-Profile-en_2009-01-21.pdf).

Carl Öhlen from STRI has a MSc in Electrical Engineering at The Royal Institute of Technology in Stockholm, 1973. He has more than 30 years of experience in protection, control and substation automation working for Vattenfall, Programma and ABB in Sweden, Switzerland, Brazil and USA. He is author of several CIGRE & IEEE papers as well as books within this field and has held a management position within ABB during the introduction of IEC 61850 IED product family.

Nicholas Etherden from STRI has a MSc in Engineering Physics from Uppsala University, 2001. He has several years experience from the development of a new IED family for IEC 61850 as application engineer, project manager and product marketing manager at ABB. He is responsible for the STRI IEC 61850 Independent Interoperability Laboratory and a member of IEC TC 57 working group 10 and UCA Iug testing subcommittee.

Andrea Bonetti from Megger, graduated as electrical engineer at Università La Sapienza in Rome, Italy in 1993. Between 1998 and 2008 Andrea worked as relay engineer for after sales customer support and training at ABB Substation Automation Products in Västerås, Sweden. He has participated in several IEC 61850 projects with protection/control applications.

Jörg Reuter is director of HELINKS LLC, Switzerland and has 20 years experience in industrial and power system automation (from amongst others Alpha Laval). Jörg has experience as IT-Consultant, Software Architect, as well as global R&D Manager for substation engineering tools at ABB. Today Jörg is consultant and trainer on IEC 61850 tools.

Karlheinz Schwarz, NettedAutomation GmbH
Im Eichbaeumle 108
DE-76139 Karlsruhe
Germany
Phone +49-721-684844
Fax +49-721-679387
karlheinz.schwarz@nettedautomation.com

Nicholas Etherden, STRI AB
Box 707
SE-771 80 Ludvika, Sweden
Direct phone +46 (0)240 795 02
Mobile +46 (0)70-6179562
Fax +46 (0)240 807 66
nicholas.etherden@stri.se



Registration Form

IEC 61850 Comprehensive & Independent Hands-on Training with Multivendor IEDs
20 – 23 October 2009 in Frankfurt, Germany

Personal data

Name		Company
E-mail		Department
Telephone	Fax	Address for invoicing
Occupation (E.g. planning engineer)		Signature

I will participate in the following modules (Please mark with X)

Module 1 Introduction to IEC 61850 <input type="checkbox"/>	Module 2-3 Update on IEC 61850 and demos of real IEDs ... <input type="checkbox"/>
Module 2-4 IED interoperability workshop (includes module 2-3) <input type="checkbox"/>	Module 2-4 SCL workshop (includes module 2-3) <input type="checkbox"/>
Prices: Module 1 (when booked alone) = 600 EUR Module 1 (when booked together with other modules) = 400 EUR Module 2-4 Interoperability workshop = 1 950 EUR	Module 2-3 = 1 100 EUR Module 2-4 SCL workshop = 1 750 EUR

Meeting location and accommodation

The course will be held at the NH Hotel Frankfurt-Moerfelden; very close to the Frankfurt Rhein-Main International Airport with convenient transportation by hotel shuttle bus or public transportation.

Please return the filled out and signed form by e-mail or fax, no later than **October 01, 2009** to seminars@nettedautomation.com

fax +49 721 679387

For further information please visit: <http://www.nettedautomation.com/seminars/> or www.stri.se

NettedAutomation GmbH will send you a confirmation and invoice as soon as we have your registration received.

For more information please contact:

Karlheinz Schwarz, NettedAutomation GmbH
 Im Eichbaeumle 108, D-76139 Karlsruhe, Germany
 Phone +49-721-684844
 Fax +49-721-679387
karlheinz.schwarz@nettedautomation.com

Carl Öhlén, STRI AB
 Box 707, SE-771 80 LUDVIKA, Sweden
 Direct phone +46 (0)240 795 02
 Mobile +46 (0)70-6179562
 Fax +46 (0)240 807 66
carl.ohlen@stri.se

Privacy Policy

STRI and Nettedautomation GmbH take precautions (including administrative, technical, and physical measures) to safe-guard your personal information against loss, theft, and misuse, as well as unauthorized access, disclosure, alteration, and destruction.

Cancellation Policy

Cancellations received up to 10 business days prior to the start of the event will be fully refunded. Cancellations within 9 business days to the start of the workshop are subject to the entire event fee. If you don't cancel and don't attend, you are still responsible for payment. Substitutions can be made at any time.