TRAINING CENTER

Seminar Description

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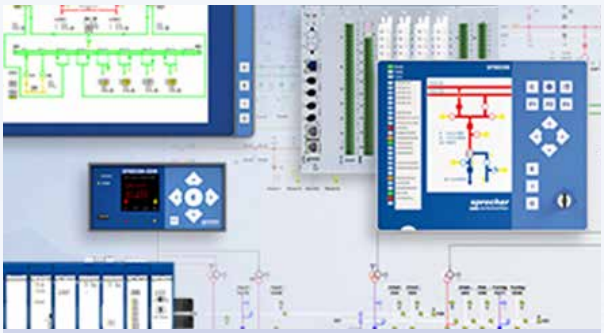
sprecher automation

TABLE OF CONTENTS

PRODUCT-SPECIFIC TRAINING



SPRECON-E BASIC TRAINING

Requirements:

Knowledge of the most important terms of automation technology.

Seminar aim:

Participants develop an understanding of the performance of the scalable control, protection and automation system SPRECON:

- You have an overview of the structure of SPRECON
- You understand the most important functions
- You know the basic methods of operation of SPRECON

Topics:

- Overview of the SPRECON product families
- SPRECON scalable concept
- The characteristics of the system components
- Architecture, hardware, performance features
- Functionality of SPRECON
- Processing of messages, measured values, commands and setpoints
- Diagnosis and test options
- Configuration options
- Documentation

Duration: 1 day

SPRECON-E SERVICE PROGRAM

Requirements:

SPRECON-E basic training or basic SPRECON system knowledge recommended.

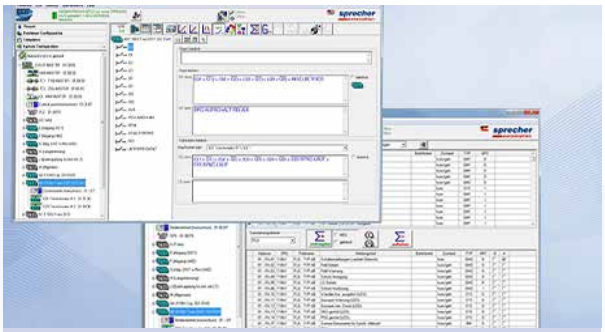
Seminar aim:

The participants are able to carry out the maintenance of the scalable automation system SPRECON with the tools provided by the system.

Topics:

- System architecture and hardware overview
- Connection technology, mechanics
- Functions of the SPRECON-E Service Program
- Diagnostic options
- Exchange of modules
- Loading parameters, loading firmware
- Remote maintenance
- Practical exercises with the SPRECON-E
- Service Program
- Use of the operating unit
- Exercises with SPRECON-E-C or SPRECON-E-P units

Duration: 2 days



SPRECON-E DESIGNER

The SPRECON-E Designer is used for a quick, clear and convenient parameterisation of control technology components and systems of different architecture.

Requirements:

Basic knowledge of the SPRECON automation system (e.g. from the SPRECON-E basic training).

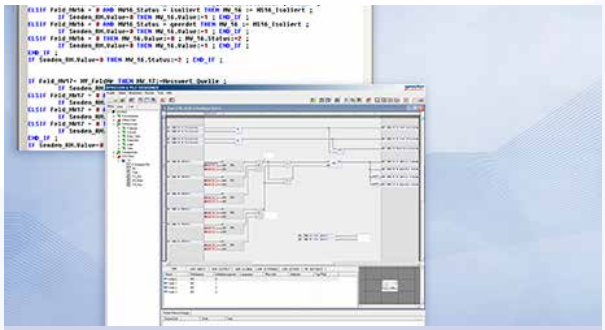
Seminar aim:

The participants master the correct project planning of the SPRECON automation system with the parameterisation programme SPRECON-E Designer.

Topics:

- Installation and basic parameterisation
- Hardware configuration
- Overview of system functions
- Editing process variables
- Create
  - Switchgear interlocks
  - Cyclic equations
  - Automatic switching
  - Summary messages
  - Message groups
  - Service functions
  - Documentation

Duration: 2 days



SPRECON-E PLC-DESIGNER

Requirements:

Knowledge of the most important terms of automation technology or SPRECON basic training.

Seminar aim:

The participants master the handling and creation of a control task in the SPRECON automation system using the SPRECON-E PLC Designer tool. They know the IEC 61131 compliant programming language with focus on FBD (function block language) and how to use it.

Topics:

- Overview of the IEC 61131 standard
- Creating the data model for the SPRECON-E PLC Designer
- Creating and structuring a control task
- Overview of the most important functions and function blocks
- Application of variable classes
- Loading into the target system SPRECON-E
- Application of the test options (offline, online and oscilloscope)
- Documentation
- User-defined function modules and data types

Duration: 2 days

SPRECON-E-P ENGINEERING

Requirements:

Protection know-how, SPRECON-E basic training and SPRECON-E Designer knowledge.

With the SPRECON-E-P combined protection and control devices, protection and control functions are separated from each other, as protection runs in its own independent task.

Seminar aim:

The participants can programme the protection function independently. (Attention: The configuration of the control function is taught in the seminar SPRECON-E-C Parameterisation).

Topics:

- System architecture and overview of the hardware
- Parameterising the protection functionality
- Image design for the local display
- Diagnostic options
- Design and mechanics
- Practical exercises with SPRECON-E Designer and SPRECON-E-P devices

Duration: 2 days

SPRECON-V460 OPERATION & CONFIGURATION

Requirements:

SPRECON-E basic training or basic SPRECON system knowledge recommended.

Seminar aim:

Participants will be able to use the designer (editor) of the SPRECON visualisation and independently make changes and extensions in a SPRECON-V project. (In this seminar, a new SPRECON-V project is started. In the course of this, the most important functions of the SPRECON-V product will be explained).

Topics:

- Overview of SPRECON-V460
- The Designer (Editor)
- Project creation
- Data point parameterisation
- Image construction
- Static picture elements
- Dynamic picture elements
- Interface with IEC 60870-5-104
- Interface with IEC 61850
- Command function
- Alarm function
- Practical exercises
- Data backup
- Handling user documentation

Duration: 5 days

GENERAL TECHNICAL TRAINING

INTRODUCTION TO AUTOMATION TECHNOLOGY FOR ENERGY SYSTEMS

Requirements:
Basic electrical engineering knowledge

Seminar aim:
The participants are familiar with telecontrol-specific terms and problems of automation technology or telecontrol technology and know terms such as double message, type identification or blocking.

Topics:

- Aims of automation technology
- Basic structure of automation systems
- Information and its handling
- Messages, measured values, counter values, commands, setpoints
- Data communication
- Physical interfaces and transmission media
- Protocols
- Information on important standards
- IEC 60870-5-101/104, IEC 61850 and IEC 61131-3
- Cross-system concepts
- Data addressing

Duration: 2 days

INTRODUCTION TO PROTECTION TECHNOLOGY

Requirements:
Basic knowledge of electrical engineering as well as knowledge of power generation and distribution.

Seminar aim:
The participants know the basic terms and tasks of protection technology. They will also receive an overview of the SPRECON-E-P protection range.

Topics:

- Tasks of protection technology
- Terms and abbreviations
- Types of faults
- Instrument transformers
- Line protection
- Transformer protection
- Busbar protection
- Sprecher Automation protection devices

Duration: 2 days

INTRODUCTION TO SWITCHGEAR TECHNOLOGY

Requirements:
Basic electrical engineering knowledge.

Seminar aim:
The participants gain basic knowledge of the primary technology of switchgear (structure, different configurations) and process technology know-how for switchgear technicians.

Topics:

- Basic structure of switchgear
- Components of switchgear
- Voltage levels
- Busbar systems
- Construction types of switchgear
- Functions in switchgear
- Practical demonstration of switchgear devices

Duration: 2 days

NETWORKS IN AUTOMATION TECHNOLOGY

Requirements:
Basic IT and communication skills.The seminar is mainly hardware-oriented with a focus on LAN networks (Ethernet) in automation.

Seminar aim:
The participants know the types, structures, basic operation and possible applications of computer networks.

Topics:

- What is a network (local area network, wide area network, client-server)?
- Transmission technology & media
- Copper cable in structured twisted pair technology
- Glass fibre cables
- Shared Ethernet with 10 or 100 MBps
- Gigabit Ethernet
- CSMA/CD access protocol, frame format
- Switched Ethernet – differences to the „old“ Ethernet
- Redundant Ethernet structures with switches
- Ethernet real-time capability, prioritisation and VLAN
- Layer 2 and 3 switching
- Network protocol architectures
- Overview of architectures: OSI model,
- IEEE 802.x, TCP/IP etc.
- Client-server application in automation

Duration: 2 days

IEC 60870-101/103/104 THEORY & PRACTICE

Requirements:

Basic IT and communication skills or basic SPRECON system knowledge.

Seminar aim:

Today, standardisation in telecontrol communication does not only include communication between the control center and the substation. There are standards for meter reading transmission as well as for communication between protection devices and substation control devices. The participants can apply this overview-like theoretical knowledge in practical examples.

Topics:

- Overview of standards
- Address concepts
- Structure of an IEC 60870-5-101 connection
- The most important data formats
- Important application functions
- Parameterisation of commands
- Structure of an IEC 60870-5-104 connection
- Analysis tools and protocol test systems
- Timing
- General interrogation
- Practical examples

Duration: 2 days

IEC 61850 THEORY & PRACTICE

Requirements:

Basic knowledge of digital communication technology and network technology as well as basic knowledge of switchgear.

Seminar aim:

In this seminar, we use practical examples to teach the new IEC 61850 standard for communication in switchgear. The standard represents the basis for a consistent communication architecture in the power supply. The aim is to achieve consistent communication from the process to the network control center.

Topics:

- Introduction and overview
- System and project management
- Communication requirements for function and device models
- Principles and models
- Establishing an IEC 61850 connection
- Browsing an IEC 61850 server
- New communication functions
- Analysis tools and protocol test systems
- Converting to IEC 60870-5
- Practical examples

Duration: 2 days

TRAIN THE SPRECHER TRAINER

Requirements:

Experience with project planning and commissioning of automation systems based on SPRECON-E.

Seminar aim:

The participants are familiar with the didactic concept and the methods used in the Sprecher Automation trainings.

The practical exercises are carried out with the help of the Sprecher Automation training system. In addition to the theoretical lecture, test trainings with video feedback are also conducted. This seminar strengthens the presentation and methodological skills of the future Sprecher trainer and also serves as a prerequisite for the Sprecher Certified Trainer.

Topics:

- Structure of the Sprecher training system
- Functions of the training system
- Contents and application of MS Powerpoint-based training materials
- Didactic concept
- Variety of methods in Sprecher trainings
- Use of video tutorials
- Video analysis

Duration: 2 days

IT SECURITY

IT SECURITY BASIC

Requirements:
Basic IT and communication skills

Seminar aim:
Participants will get an overview of the technologies and solutions in the security sector. Topics of the energy automation process are dealt with in particular.

Topics:

- Basic concepts and strategies of data security
- Social engineering
- Malware and anti-virus software
- Networks and access control
- Network protocols and ports (IPSec, SSH, HTTP, HTTPS, SNMP etc.)
- Cryptography / PKI
- Operating system and application security
- Monitoring and intrusion detection systems (IDS)

Duration: 1 day

HARDENING OF SPRECON-E

Requirements:
Trainings on IT security basics and network technology

Seminar aim:
The participants are able to configure a safe system from a conventional “unsafe“ system.

All exercises are carried out with practical examples for SPRECON-E products. The training shows all safety risks of a typical I&C system. Afterwards, the installation is hardened step by step.

Topics:

- Configuring secure service access for SPRECON-E
- LDAP and RADIUS settings
- Set SPRECON web server with https
- SNMPv3 in SPRECON-E
- Encryption with IPsec in SPRECON-E-C or SPRECON-E-T3
- Syslog configuration in SPRECON-E
- Firewall configuration in SPRECON-E
- Virus protection
- Securing Windows-based station operation

Duration: 1 day

HARDENING OF SPRECON-V460

Requirements:

Trainings on IT security basics and network technology

Seminar aim:

The participants are able to configure a secure system even from a conventional “insecure“ Microsoft-based visualisation system. All exercises are carried out with practical examples for SPRECON-V products. The security risks of a typical Windows-based SPRECON-V460 visualisation are demonstrated. The system is then hardened step by step.

Topics:

- Windows and SPRECON-V460
- patch management
- Hardening of the Windows operating system
- Firewall configuration with SPRECON-V
- Virus protection
- Encrypting internal SPRECON-V460
- communication
- User/role model in SPRECON-V460
- RBAC in the SPRECON-V460
- Information about IT security and event
- management with Syslog
- SNMPv3 in SPRECON-V460
- Windows 10 AppLocker
- Securing the SPRECON-V460 runtime system

Duration: 2 days

IT STANDARDS & NORMS

Requirements:

Basic knowledge of energy automation systems in the field of critical infrastructure as well as knowledge of communication standards such as Ethernet, IEC 60870-5 and/or IEC 61850.

Topics:

- Overview of standards & protocols
- (ISO 27001, IEC 62443, IEC 62351)
- Overview of EU-wide and national directives (EU/AT/DE)
- Impact on companies
- Implementing ISMS
- Risk Analysis
- MMS and TCP/IP profiles
- Security for IEC 60870-5 and IEC 61850
- Network and system management
- RBAC
- Key management
- Secure system architecture
- Security for XML files
- Event logging and system events

Duration: 1 day

SECURED NETWORK & SYSTEM DESIGN

Requirements:

Trainings on IT security basics and network technology

Seminar aim:

Using Ethernet-based automation solutions in the area of critical infrastructure and the IEC 62443 (industry) and IEC 62351 (energy) standards, the participants receive a solid foundation for their system design activities in the area of planning and implementing energy systems in the area of critical infrastructures.

Topics:

- Secure installations through secure system and network design
- Recommendations from the IEC 62443
- (industry) or IEC 62351 (energy) standards
- Network redundancy
- Virtual LAN
- Station bus security (IEC 61850 or IEC 60870)
- Process bus security (IEC 61850)
- WAN security
- Decentralised energy resources (Smart Grid)

Duration: 1 day

IT SECURITY TEST & PENETRATION

Requirements:

Trainings on IT security basics and SPRECON-E or SPRECON-V hardening.

Ablauf:

A comparison between an insecure and a secure system consisting of SPRECON-E and SPRECON-V460 products is presented using the common test tools. After a theoretical overview of the most common test tools, the tools are then used in practice.

Seminar aim:

This seminar offers the perfect conclusion for all persons who have completed a SPRECON-E or a SPRECON-V460 system hardening course.

Topics:

- Realising a test configuration at
- IEC 60870-5-101/104
- Realisation of a test configuration for
- IEC 61850
- Testing of Windows systems
- Testing of protection and control systems or telecontrol devices
- Test tools for penetration
- Practical exercises

Duration: 1.5 days

IT SECURITY WORKSHOP

Requirements:

Profound IT security knowledge

Seminar aim:

In addition to the standard IT security trainings, we also offer an IT security workshop. You yourself compile the topics individually before the workshop. Our IT security experts will explain them to you in the workshop and – depending on the topic – also implement the contents together with you.

Topics:

- Developing an IT security concept for the company‘s own automation systems in the area of critical infrastructure.

Duration: 1 day

INDIVIDUAL TRAININGS

PROJECT-SPECIFIC WORKSHOPS

Requirements:

Depending on the training goal

Seminar aim:

All trainings are structured as interactive, moderated trainings. This means that you have enough time during the training to put the knowledge you have acquired into practice.

Topics:

- You determine the exact content in consultation with us based on our training and your projects.

Duration: 1 Tag

CERTIFICATION

SCME – SPRECHER CERTIFIED MAINTENANCE ENGINEER

Requirements:

SPRECON-E Basic and Service Training, as well as knowledge about network and communication technologies.

Seminar aim:

SCMEs carry out maintenance and repair tasks of SPRECON automation systems independently as well as engineering tasks under instruction.

Topics:

- Repetition of SPRECON-E Basic and Service Training
- Examination:
  - Multiple Choice Test
  - Practical exam

Duration: 1 day

SCSE – SPRECHER CERTIFIED SYSTEM ENGINEER

Requirements:

SPRECON-E basic and service training or SCME certification, SPRECON-E Designer, PLC, COMM3 and SPRECON-V460 training, IEC 60870-5 and IEC 61850 seminars, network and communication technology, analysis in automation systems, 2 years of professional experience in the field of energy automation, proof of independent working methods in SPRECON automation systems (FAT, SAT protocols)

Seminar aim:

SCSEs are able to independently solve tasks in the field of engineering of SPRECON automation systems.

Topics:

- Examination
  - Multiple Choice Test
  - Independent parameterisation of a system
- Decision of the Certification Committee

Duration: 1 day

SCSP – SPRECHER CERTIFIED SYSTEM PROFESSIONAL

Requirements:

SCSE certification, 5 years of professional experience in the field of energy automation, proof of holding product training courses with lists of participants, completed feedback forms for at least 5 courses, 3 different topics (e.g. SPRECON-E Basis, Service, PLC, SPRECON-V460 standards).

Seminar aim:

SCSPs perform complex automation tasks independently. In addition, they have enough knowledge to evaluate any SPRECON automation system and act as a project coach for it.

Testing:

- Multiple Choice Test
- Independent creation of an automation concept
- Decision of the Certification Committee

Duration: 1 day

SCTR – SPRECHER CERTIFIED TRAINER

Requirements:

3 years of professional experience in the field of energy automation, „Train the trainer“ training at Sprecher Automation, proof of holding product training courses with lists of participants, completed feedback forms for at least 5 courses, 3 different topics (e.g. SPRECON-E Basis, Service, PLC, SPRECON-V460, standards).

Seminar aim:

SCTRs can pass on expertise to third parties using the methods and the didactic concept of the Sprecher Training Center.

Topics:

- Train the Trainer
- Decision of the Certification Committee

Duration: 1 day

DATES & PRICES

https://www.sprecher-automation.com/en/training/

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OR VIA WEBSITE

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