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Standard Training

The Training Center of ABB AG / PSN offers product- and project-related courses for different target groups within the scope of a modular training program.

This brochure contains the English course program for remote terminal units (RTUs).

Our aim is to impact the basic know-how and a general overview of our system to the participants of the training courses on the one hand, and to familiarize them with those details, which ensure safe handling and practical application of the equipment on the other hand. Therefore our instructors are people of practice, experienced both as technical specialists and as teachers.

For your best success the persons per training place are limited to 1-2 participants per place. If you prefer to work on your company’s laptop, feel free to take it along. You may also work with your laptop and you may parameterize the RTU in the training room with it if you like. You should have administrator rights at your laptop. If you attend an RTU560 course, please plug the CD-ROM-drive into your laptop. For RTU560 courses you need Windows XP. Just Microsoft DOS is sufficient for RTU200/232 courses.

Picture 1
Training place in Mannheim/Germany with RTU, simulator desk, personal computer, training file, CDs

ABB PSN is the ABB competence center for RTU development. Specialists in Mannheim can find the answer to difficult customer questions also.

The learning rooms are equipped exemplary for the benefit of the participants: Several RTU560 of several types, several RTU200/232, RTU211 and DIN rail mountable devices.

The full range of protocols can be trained: IEC60870-5, DNP3, RP570/71, MODBUS, SPABus, IEC61850.... A process simulator for single and double point informations, for single and double point commands, for counter values and for analogue inputs and outputs belongs to each RTU. There are 16 PCs including LAN connection to RTUs.

The training courses are subdivided into theoretical and practical sections. Extensive and continually updated instruction documents are available for all training courses and will be issued to the students at the beginning of the course. Their cost is included in the course fees.
General

Dates
The dates of the courses are listed in the enclosed course schedule.

Training Location for courses in Germany

ABB Learning Center
Kallstadter Str. 1
D 68309 Mannheim

Time
The training schedule is part of the course program. On the first day lesson starts at 9:00 am.

Registration
To guarantee maximum benefit of the courses for the attendees, the number of participants per course is restricted. You are therefore advised to apply early. Immediately after ordering the course a registration confirmation will be sent to you together with a description of how to get there.

Customized training courses
If you are interested in special customized courses to be conducted in our learning center or on your site, please contact us.

Hotel reservations
Together with the confirmation of your order for one of our training courses we will send you a list of hotels. Please make reservation by yourself as soon as possible.

Inquiries
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Cancellation
Please look at chapter Commercial Conditions

Payment terms
Please look at chapter Commercial Conditions
ABB Learning Center Mannheim / Germany

Picture 4  Training room Substation Automation (left) – RTU training (right)

Picture 5  ABB Power Systems Mannheim training facility: red building, fourth floor
Curriculum RTU

RTU200/232 :

- 7810 Basics
  - 7830 Local Automation
  - 7840 Advanced Course

RTU211/560 :

- 7575 DIN rail mountable RTU
- 7550 Introduction Network Control Technology
  - 7563 Basic Course
    - 758* Advanced Course
    - 7570 PLC
  - 7600 Workshop
  - 7591 IEC61850 Server & Client Configuration

Necessary prerequisites

Recommended prerequisites
Introduction Courses

7550E  Introduction Network Control Technology

Objectives of the course:
The training course provides a basic introduction into data acquisition and RTU560. The course is proper to be prepared for the RTU560 basic course. 
After the course participant will be informed about the basics of data acquisition process and the utilities' secondary process. He knows all actually used means of communication, networks, and usual communication protocols. 
He is informed about the actual ABB RTU products, RTU211 and RTU560 family. He knows how to configure PC for using RTU560 and is familiar with RTU demonstration box which is used in the RTU560 courses.

Contents:
- Basics of data acquisition and utilities' secondary process (SCADA),
- Communication protocol basics,
- Communication interfaces, networks,
- Introduction into ABB RTU products, RTU211 and RTU560 family,
- PC applications for RTU560; RTUtil560 installation and COMPROTware
- The integrated Webserver of the RTU560
- RTU Demonstration box.

Participants:  Engineering-, commissioning- and maintenance-personnel

Prerequisites: Knowledge of utility process, PC handling (Microsoft Windows) and Internet Explorer experiences.

Method: Lessons and Exercises

Duration: 3 Days

Course Language: English

Start: 1st Day 9 a.m.
End: 3rd Day 12 a.m.
7575E  Introduction to DIN Rail Mountable RTU

Objectives of the course:
After the course the participant will be familiar with DIN Rail mountable modules of the RTU211 and RTU560 family.
The available DIN Rail mountable modules are introduced, and the system concept for DIN Rail mounting is described (Connections to the bus system, system limitations, license model, ...). Using RTU WIZARD and the configuration tool RTUtil560 DIN Rail mountable systems are configured in practical exercises.
The technical details of the available Multi Meter (CT / VT interface modules) are discussed, the configuration and conversion parameter are described. In a practical exercise the participant is able to configure and test his own Multi Meter (560CVD03).
The features and configuration of the available GSM/GPRS modems is presented in the training.

Contents:
- Hardware modules for DIN Rail mounting (basic modules, I/O modules, additional)
- System concept of the DIN Rail mountable RTU Family RTU211 and RTU560
- Configuration of DIN Rail mountable Systems by using RTU WIZARD and RTUtil560
- Configuration of additional DIN Rail mountable I/O modules by using RTUtil560
- Technical Details and Properties of the Multi Meter (CT / VT Interface modules)
- Wiring principles for Voltage Transformer (VT) / Current Transformer (CT)
- Configuration of Multi Meters
- GSM / GPRS modem connection (client / server) and PPP connection
- Practice with basic modules, I/O modules, Multi Meter und GSM/GPRS modems

Participants: Proposal- and Engineering-personnel

Prerequisites: Knowledge of general telecontrol functions, IEC protocols, and of Microsoft Windows

Duration: 2 days  Course language: English

Start: Monday 9 a. m.  End: Tuesday 4 p. m.
Basic Courses

4911E MicroSCADA Rel. 9 System Operation

Objectives of the course:
After the course the participant will be familiar with control options of substations or network control function. He will be able to operate a substation using MicroSCADA.

Contents:
- Basics of MicroSCADA / System Functions
- Operation (dialogs and menus in MicroSCADA)
- Diagnosis of lines and stations
- Handling with curves and reports

Participants: Operators

Prerequisites: Basic knowledge of a PC and of Microsoft Windows

Duration: 2 days Course language: English

Start: First day 9 a.m. End: Second day 4:30 p.m.
Objectives of the course:
After the course the participant will be familiar with architecture, functionality and control options of the substation or network control system MicroSCADA. He will be able to operate his substation from the MicroSCADA console. He can make system modifications.

Contents:
- Basics of MicroSCADA
- Creation and modification of exercise displays
- Creation and modification of command procedures
- Process Object Definition
- Measurands
- Time channels
- Event channels
- Data Objects
- Menu adaption
- Tool launcher function
- How to configure an IEC 101 / 104 communication line
- Creation of trend displays
- Creation of overview displays

Participants: Engineering-, commissioning- and maintenance-personnel

Prerequisites: Participation in 4911E or Basic knowledge of a PC

Duration: 5 days

Course language: English

Start: Monday 9 a. m.  
End: Friday 12 a. m.
7563E  Remote Terminal Unit RTU560 Basic Course

- IEC 60870-5 Protocol (booking code: 7563/1E)
- DNP3 Protocol (booking code: 7563/2E)

SCADA Engineering Platform (remote control and process interface) based on RTU560 product line.

Objectives of the course:
After the course the participant will be familiar with the system architecture, with the functionality and with the telecontrol protocol options of the Remote Terminal Unit RTU560. He will be able to use RTUtil 560 and the Internet Explorer. The participant can communicate with the RTU560 by the Internet Explorer, he can download and upload files, he can diagnose the RTU560. He can listen to telecontrol communication and record it. He can work with telegram filters. He is able to simulate the network control center and use Excel export and import. For one day the student class is divided into two groups – one for IEC 608070-5 protocol and one for DNP3 protocol family.

Contents:
- System concept of the RTU Family RTU211 and RTU560
- Configuration options of Rack / DIN Rail
- Cabinets, subracks and hardware modules
- Properties of the communication units (CMU)
- Process data acquisition and telecontrol functions (SCADA)
- Exercises with the Windows based tool RTUtil560 for configuration, signal definition and parameterization
- Diagnosis by the Integrated Webserver
- Excel-Import/Export function of RTUtil560
- Process archives for indications, measurements, pulse counter, security events
- Logic Function
- **Trainee group 1**: Basics of IEC 60870-5-101 and IEC 60870-5-104
- **Trainee group 2**: Basics DNP3 and DNP3 via LAN/WAN

Participants:  Engineering-, commissioning- and maintenance-personnel

Prerequisites:  Knowledge of general telecontrol functions and of Microsoft Windows and office. Participation in course 7550E is recommended.

Duration:  5 days  Course language:  English

Start:  Monday 9 a. m.  End:  Friday 12 a. m.
7810E Remote Terminal Unit RTU200/232

Objectives of the course:
The participant gets familiar with the system architecture, with the functionality and with the
telecontrol protocols of the Remote Terminal Unit RTU200/232. He can install the tool RTUtil
on a PC. He can use the tool for configuration, setting, test and protocol analysis (RP570/71).

Contents:
- System integration
- Configuration options
- Hardware and software modules
- Control functions
- Data acquisition functions
- Tool RTUtil with the menus selection-configuration-filter-transfer-diagnosis-list-
  protocol-configuration monitor
- Tool installation and start from DOS or WindowsNT
- Introduction to LAF (local automation functions)

Participants: Engineering-, commissioning- and maintenance-personnel

Prerequisities: Knowledge of general telecontrol functions and operating of PC

Duration: 5 days Course language: English

Start: Monday 9 a. m. End: Friday 12 a. m.
8420E  REF542\textit{plus} – Operation, Maintenance, Engineering

\textbf{Objectives of the course:}\n
The attendee becomes acquainted with architecture, functionality and control options of the switchbay protection and control unit REF542plus. The course participant can operate the device by the display menus and the front keys. He is prepared to work with the PC-based tools for configuration, setting, test and protocol analysis. He knows how to modify functions and how to implement additional features.

\textbf{Contents:}\n
- Hardware REF542(SCU) and REF542\textit{plus}\n- Tool SCUconf - installation and menus\n- Preparing a single line display with circuit breaker, and disconnectors\n- Programming of event and alarm text strings and of LEDs\n- Configuring of measurement displays\n- REF542 logic programming, interlockings, collective alarm etc.\n- Programming of overcurrent protection module\n- Programming of fault recorder function\n- Program download and test by simulator\n- Transfer of a fault record from REF542 to laptop, evaluation by program Reval\n- Configuring and test of ABB SPAbus and of the IEC870-5-103-interface\n- Principle connection to remote terminal units ABB RTU\n- Further protection functions in REF542\n- Operating REF542plus, menus, key chip switch

\textbf{Participants:}  Engineering-, commissioning- and maintenance-personnel

\textbf{Prerequisites:}  General knowledge of medium or high voltage plants and of PCs (Microsoft Windows)

\textbf{Duration:}  3 days \hspace{1cm} \textbf{Course language:} English

\textbf{Start:}  First day 9 a. m. \hspace{1cm} \textbf{End:}  Third day 4 p. m.
8670E RE*650/670 – Operation, Maintenance, Engineering

Objectives of the course:
The attendee becomes acquainted with architecture, functionality and control options of a switchbay protection or control units RE*650/670 of the family RELION. He is prepared to work with the PC-based tools for configuration, setting, test and diagnosis. The attendee can test protection functions and will be able to modify them. He will be familiar with event lists and will be able to evaluate fault recordings.

Contents:
- Operating RE*6xx, display menus, LEDs
- Hardware Hardware
- Tool PCM600
  - Connectivity packages
  - Graphical Subtool „Application Configuration“
    - Standard modules
    - Logic
    - Interlocking
    - Fault recording module
    - Four step phase overcurrent protection (PTOC, 51_67)
  - Display Editor
    - Engineering of the bay single line
    - Measurement
    - Indication text
  - Signal Matrix
  - Parameter Setting
  - Upload and Download
  - Signal Monitoring
  - Event list
  - Reading and evaluation of fault recording
  - Creation and use of Templates
- Logical nodes
- Principal configuration of interfaces (ABB SPAbus, IEC870-5-103, 61850-8)
- Principal connection of remote terminal unit ABB RTU560
- Presentation of selected protection functions
- Commissioning and test by Omicron or similar equipment

Participants: Engineering-, commissioning- and maintenance-personnel

Prerequisites: General knowledge of medium or high voltage plants and of PCs (Microsoft Windows)

Duration: 3 days

Course language: English

Start: First day 9 a. m.

End: Third day 4 p. m.
8700E   Busbar Protection REB500 – Operation, Maintenance, Engineering

Objectives of the course:
The attendee becomes acquainted with architecture, functionality and control options of the busbar protection system REB500. He is prepared to work with the PC-based tools for configuration, setting, test and protocol analysis. He knows how to modify functions and how to implement additional features.

Contents:
- Principle of busbar protection
- Centralized and decentralized applications
- Hardware of the REB500 family
- Display menus and their structure
- Tool: Installation of REBWIN
- Training example
- Programming of event and alarm text strings
- Measurement displays
- Logic programming, collective alarm etc.
- Parameterizing of protection modules
- Programming of fault recorder function
- Program download and test by simulator
- Transfer of a fault record from REB500 to notebook and evaluation by program
- Configuring and test of bus interface
- Principle connection to remote terminal units RTU or to gateway COM581
- Further protection functions in REB500

Participants:  Engineering-, commissioning- and maintenance-personnel

Prerequisites:  General knowledge of medium or high voltage plants and of PCs (Microsoft Windows)

Duration:  3 days  Course language: English

Start:  First day 9 a. m.  End:  Third day 4 p. m.
Advanced Courses

7581E  Remote Terminal Unit RTU560 Advanced Course, IEC60870-5 protocol

Objectives of the course:
The participant, who has already experience with RTU560, RTUtil560 and Webserver, refreshes his RTU knowledge. He extends his skills especially concerning configuration, extensions and trouble shooting.

1. The Redundancy Concept of the RTU560 concerning power supplies, communication lines and communication units are discussed and the participant is informed about properties and limits.
2. The "System Data Interface" is explained.
3. In chapter ‘File Transfer’ the participant learns the possibilities to transfer (transparent) data and fault records from and to the RTU560.
4. He knows the features and possibilities of the ‘Integrated Human Machine Interface’, and is trained in creating his own station diagram, to control a substation.
5. The participant learns about RTU nodes and subordinated devices (IED).
6. Cyber security features are treated during the course.

Workshop 7600E provides the possibility for a more detailed training of issues. It is possible to discuss individual requirements, which can be tested on the RTU560 training system.

Contents:
- System integration of subordinated RTUs, Master- and Slave function
- Transfer of files from and to the RTU560
- RTU560 Redundancy Concept for power supplies, communication lines and -units
- RTU560 System Data Interface (System Events)
- Properties of the ‘Integrated Human Machine Interface’ (HMI)
- Creation of a single line diagram for switchgear by using the ‘Integrated HMI’
- Fault tracing and eliminating in an operating RTU560 by the Webserver
- Analyzing telecontrol protocols based upon protocol family IEC60870-5-101, IEC60870-5-103, IEC60870-5-104 and other protocols
- Exercises with subordinated devices
- Gateway Functions and network-tree-routing
- The training can be modified according to the requirements of the participants
- Cyber security features of the RTU

Participants:  Maintenance-, commissioning- and planning-personnel

Prerequisites:  Attendance of the basic course 7563/1E

Duration:  5 days  Course language:  English

Start:  Monday 9 a. m.  End:  Friday 12 a. m.
7591E Remote Terminal Unit RTU560 IEC61850 Client and Server

Objectives of the course:
After the course the participant will be familiar to configure RTU560 IEC61850 as client (gateway) and server (IED Proxy). In exercises the engineering is done for common configuration together with REx670 or 615, 630, REF542plus… The participant will have a basic knowledge and practice of necessary tools for configuration and protocol analysis. He is able to commission RTU560 in IEC61850 client, server and GOOSE configuration.

Contents:
- Introduction in IEC61850 standard structure - used protocol elements
- RTU560 as IEC61850 server
- RTU560 as IEC61850 client
- RTU Server (IED) configuration
- RTU client (gateway) configuration
- GOOSE configuration
- Data flow: EXCEL import of IEC61850 configuration into RTU560
- Usage of tools (RTUtil560, RTUtil61850, ITT600)
- Create SCD files
- Integrated Human Machine Interface
- Configuration of NCC protocols (e.g. IEC60870-5-101)
- Protocol analysis tool
- Commissioning of a IEC61850 configuration

Participants: Engineering-, commissioning- and maintenance personnel

Prerequisites: 
- Attendance of the basic course 7563E
- Basic knowledge of standard IEC61850
- Basic knowledge of IEC61850 devices is recommended

Method: Lectures, Exercises

Duration: 5 days Course Language: English

Start: Monday, 9 a.m. End: Friday, 1 p.m.

For trainees, who already have participated in the course “7590 RTU560 IEC61850 gateway” course, server and GOOSE amendment workshops are conducted on request.
7600E  Remote Terminal Unit RTU560 Workshop

**Objectives of the course:**
The Workshop gives the possibility to address certain topics, which are not the subject of the other courses, or which would like to be studied more in detail. In particular it is possible to treat individual topics from 756*E and 758*E. In addition it is possible to discuss special actual problems and try to reproduce it on a training system.

**Contents:**
Contents are specified according to agreement.

**Participants:**  Engineering-, commissioning- and maintenance personnel

**Prerequisites:**  Attendance of the RTU560 basic course 7563E

**Method:**  Workshop

**Duration:**  by agreement  
**Language:**  English

**Start:**  by agreement  
**End:**  by agreement
Objectives of the course:
The participant, who has already worked with RTU200/232 and RTUutil at Microsoft DOS, refreshes his RTU knowledge. He extends his skills especially concerning trouble shooting, router RTUs and planning and extending RTU systems.

Contents:
- System integration
- Functionality
- Planning
- Changing of boards, extension of racks and cabinets, configuration and parameters
- Fault tracing and eliminating
- Proper engineering and diagnostic with the tool RTUutil at operating system DOS or WindowsNT
- Parameterising and working with Line Couplers
- Exercises with modems, RTUs and Sub-RTUs, protocol listening and simulation (RP570/71)

Participants: Maintenance-, commissioning- and planning-personnel
Prerequisites: Attendance of the basic course RTU200/232 7810E
Duration: 5 days Course language: English
Start: Monday 9 a. m. End: Friday 12 a. m.
Objectives of the course:
After successful participation in the course you are familiar with the configuration options and with the functions of the remote terminal unit RTU560 and of the bay control and protection unit REF542plus, both by compressed lessons.
The participant works with tools for configuring, parameterizing, test and diagnosis. He configures and checks the RTU560 by the Internet Explorer. He once uses all operator menus of REF542. The participant gets familiar with the basics of SPAbus- and IEC870-5-103-communication. He can send test commands via the RTU to REF542 and can release interrogations for the opposite direction.

Contents:
- REF542 hardware
- Tool SCUconf: installation, modification of bay mimic and of text and of measurement displays
- REF542 logic programming
- RTU560-REF542-system incorporation
- RTU560 configuration options
- RTU560 hardware
- RTU560 functions and process data parameter
- Tool RTUtil560: installation, project evaluation by network tree, signal tree and hardware tree
- RTU560 diagnosis via browser
- Telecontrol: basics of IEC 60870-5-101 and of IEC 60870-5-103, interoperability, basics of SPAbus, telegram tools for line listening and for simulation

Participants: Maintenance-, commissioning- and planning-personnel

Prerequisites: Knowledge of general telecontrol functions and of Microsoft Windows

Start: Monday 9 a. m. End: Friday 12 a. m.
8470E     REF542plus – IEC61850 – RTU

Objectives of the course:
After successful participation in the course you are familiar with the configuration options and with the functions of the remote terminal unit RTU560 and of the bay control and protection unit REF542plus, both by compressed lessons.
The participant works with tools for configuring, parameterizing, test and diagnosis.
He configures and checks the RTU560 by the Internet Explorer.
He once uses all operator menus of REF542.
The participant gets familiar with the basics of IEC61850-communication.

Contents:
- REF542 hardware
- Tool SCUconf: installation, modification of bay mimic and of text and of measurement displays
- SCL-Tool
- REF542 logic programming
- RTU560-REF542-system incorporation
- RTU560 configuration options
- RTU560 hardware
- RTU560 functions and process data parameter
- Tool RTUtil560: installation, project evaluation by network tree, signal tree and hardware tree, Excel import
- CCT-tool, 61850 file types *.SCD, *.ICD, *CID
- RTU560 diagnosis via browser
- Telecontrol: basics of IEC 60870 and IEC61850

Participants: Maintenance-, commissioning- and planning-personnel

Prerequisites: Knowledge of general telecontrol functions and of Microsoft Windows

Start: Monday 9 a. m.  End: Friday 12 a. m.
8473E RE630 – IEC61850 – RTU

Objectives of the course:
The attendee becomes acquainted with the configuration options and with the functions of the remote terminal unit RTU560 and of a bay control or protection unit of the ABB Relion family RE630, both by compressed lessons.
The participant works with tools for configuring, parameterizing, test and diagnosis.
He configures and checks the RTU560 by the Internet Explorer.
He once uses all operator menus of REF630.
The participant gets familiar with the basics of IEC61850-communication.

Contents:
- RE630-Hardware
- Tool PCM600, Installation, Connectivity Packages
- Creation of a project structure according to IEC61850
- Add IED type REF630 either in on-line or in off-line mode
- Read configuration in on-line mode
- Application Configuration, Parameter Setting, Signal Matrix
- Modify the configuration
- Tool Rtutil560, Installation
- Creation of a project with network tree, signal tree and hardware tree
- RTUtil Excel-export and import
- RTU-RE630 system integration
- Tool CCT (Communication Configuration IEC61850)
- Creation of a project tree in CCT
- Import/Export of SCD-files
- IEC61850 Data Engineering
- Report Control Engineering
- RTU-Diagnosis by WEB-browser
- Basics of IEC60870 und IEC61850

Participants: Maintenance-, commissioning- and planning-personnel

Prerequisites:
Knowledge of general telecontrol functions and of Microsoft Windows and Excel.
In case the participant wants to use his own PC instead of ABB training room PCs, this is required: WindowsXP SP3, administrator right, license ABB PCM600 Engineering Pro, LAN-RJ45-plug

Start: Monday 9 a. m.       End: Friday 12 a. m.
Objectives of the course:
The attendee becomes acquainted with the configuration options and with the functions of the remote terminal unit RTU560 and of a bay control or protection unit of the ABB Relion family RE650, both by compressed lessons.
The participant works with tools for configuring, parameterizing, test and diagnosis.
He configures and checks the RTU560 by the Internet Explorer.
He once uses all operator menus of RE650 relay.
The participant gets familiar with the basics of IEC61850-communication.

Contents:
- RE650-Hardware
- Tool PCM600, Installation, Connectivity Packages
- Creation of a project structure according to IEC61850
- Add IED type RE650
- Read configuration
- Application Configuration, Parameter Setting, Signal Matrix
- Modify the configuration
- Tool Rtutil560, Installation
- Creation of a project with network tree, signal tree and hardware tree
- RTUtil Excel-export and import
- RTU-RE650 system integration
- Tool CCT (Communication Configuration IEC61850)
- Creation of a project tree in CCT
- Import/Export of SCD-files
- IEC61850 Data Engineering
- Report Control Engineering
- RTU-Diagnosis by WEB-browser
- Basics of IEC60870 und IEC61850

Participants: Maintenance-, commissioning- and planning-personnel

Prerequisites: Knowledge of general telecontrol functions and of Microsoft Windows and Excel.
In case the participant wants to use his own PC instead of ABB training room PCs, this is required: WindowsXP SP3, administrator right, license ABB PCM600 Engineering Pro, LAN-RJ45-plug

Start: Monday 9 a. m.       End: Friday 12 a. m.
8477E RE670 – IEC61850 – RTU

Objectives of the course:
The attendee becomes acquainted with the configuration options and with the functions of the remote terminal unit RTU560 and of a bay control or protection unit of the ABB Relion family RE670, both by compressed lessons.
The participant works with tools for configuring, parameterizing, test and diagnosis.
He configures and checks the RTU560 by the Internet Explorer.
He once uses all operator menus of a RE670 relay.
The participant gets familiar with the basics of IEC61850-communication.

Contents:
- RE670-Hardware
- Tool PCM600, Installation, Connectivity Packages
- Creation of a project structure according to IEC61850
- Add IED type RE670
- Read configuration
- Application Configuration, Parameter Setting, Signal Matrix
- Modify the configuration
- Tool Rtutil560, Installation
- Creation of a project with network tree, signal tree and hardware tree
- RTUtil Excel-export and import
- RTU-RE670 system integration
- Tool CCT (Communication Configuration IEC61850)
- Creation of a project tree in CCT
- Import/Export of SCD-files
- IEC61850 Data Engineering
- Report Control Engineering
- RTU-Diagnosis by WEB-browser
- Basics of IEC60870 und IEC61850

Participants: Maintenance-, commissioning- and planning-personnel

Prerequisites: Knowledge of general telecontrol functions and of Microsoft Windows and Excel.
In case the participant wants to use his own PC instead of ABB training room PCs, this is required: WindowsXP SP3, administrator right, license ABB PCM600 Engineering Pro, LAN-RJ45-plug

Start: Monday 9 a. m. End: Friday 12 a. m.
Courses Local Automation Functions (LAF/PLC)

Remark:
“Local Automation Function” (LAF) is the term formerly used by the RTU community, “Programmable Logic Controller“ (PLC) is the present term in the world of industrial controlling systems, defined by IEC61131, used for programs which may run optionally on an RTU, besides of the standard remote control application.

7570E Remote Terminal Unit RTU560, Integration PLC
Local Automation Functions

Objectives of the course:
The participant is able to extend the configuration of an RTU560 by a PLC program. Programs which were created by using the tool MULTIPROGwt can be loaded into the RTU560 and be tested by the participant.

He is able to navigate within the project tree in MULTIPROGwt. He is able to expand signal tree and hardware tree for virtual data points and PLC programs in RTUtil 560.

Contents:
- Basics of function block diagram programming according IEC61131-3: project tree, library types, program organization units, global and local variables, tasks, functions, instances, busIOs
- Libraries and their modules
- Cyclic tasks and system tasks
- Extension of a project in RTUtil560 by a PLC-program
- MULTIPROGwt – handling of the tool
- Exercise program concerning binary and analog processing and command handling

Participants: Engineering-, commissioning- and maintenance-personnel

Prerequisites: Course No. 7563E, basic knowledge in PLC programming and standard function blocks

Duration: 3 days

Course language: English

Start: 1st day 9 a.m.

End: 3rd day 3 a.m.
7830E  Remote Terminal Unit RTU200/232, Local Automation Functions LAF/PLC

Objectives of the course:
The participant will be able to program, test and integrate local automation functions (LAF/PLC) by the tool PTS (Program and Test System) using function block diagrams (FBD).

Contents:
- Basics of function plan programming
- Typical applications
- Benefits and limits of LAF programs
- Cycle times
- Real and virtual data points
- Data types bit - word - double word
- Library of function elements
- Installation and start of the tool PTS
- Working with PTS and the data base editor DBL
- Usage of subplans
- Creation of small example programs (adding indications to a collective alarm – usage of timers – analogue value calculations)
- Loading and testing of programs
- At the last day the participant may write a program of his special interest, load it into the training equipment and test it

Participants:  Engineering, commissioning and maintenance personnel

Prerequisites:  Course No. 7810E

Duration:  3 days

Course language:  English

Start:  1st day 9 a. m.

End:  3rd day 4 p. m.
Commercial Conditions

General
“Client” is the contractor, in the name of which the registration for a training course is applied for.
"Participant” is the natural person, who is registered to the training course or participates in it, respectively.
As far as delegations for the participants are assigned within these conditions provide for obligations of the participant,
the client, which the participant is attending, or is to attend, the course for, guarantees their complete fulfillment.
The client is aware, that without the requirements specified in the training program it will be difficult or impossible to
reach the course objectives. The client will take care of it, that the nominated participant fulfills these conditions.

Registration for Training Courses
Due to organizational reasons the registration has to be done by use of our registration form. With registration
(enrolment) these General Commercial Conditions are accepted as a part of the contract.

Confirmation
We will confirm the receipt of your course registration (confirmation of receipt) but reserve for the decision on final
acceptance (confirmation of registration).
It is agreed by you, that we send all our correspondence directly to the registered participants.

Training Prices
For prices please refer to our actual price list. The prices are net prices, are valid per participant and taxes as VAT,
customs duties and other duties are not included (training price).
Included in the training price are the training documentation for the participants, the costs for the use of the technical
equipment, refreshments and lunch for the participant during the training days.
Other costs in connection with the training course and the course participation (especially travel and hotel charges)
will be borne by the participant. A part time participation of a training course does not justify a price reduction. In case
of delay of payment we are authorized without prejudice to other or further rights and claims to charge annual
interest rates of 8 % higher than the basic rate of interest (§ 247 of the German Civil Code “BGB”).

Terms of Payment
Germany:
If the client is domiciled in Germany, the training price is due, without deduction, after 30 days
after the performance of the training course and receipt of an invoice.

Abroad:
If the client is not domiciled in Germany, the training price is due without deduction before the performance of the
training course within 30 days after receipt of a request for payment. A confirmation of registration will be issued by us
under the reservation of an on-time and complete payment (without deduction) of the training price.

When doing the payment, the purpose of it has to be indicated: Training course title, date, client and the name of the
participant.

Withdrawal
The withdrawal of a training course has to be done in writing. In case of a withdrawal up to three weeks before the
date of the training course (the date of receipt by us will be decisive) the client will incur no obligations towards us.
If the withdrawal is done in a time less than three weeks up to four days before the date of the training course, 50 % of
the training price is due. If a withdrawal is done later, the total training price will be invoiced. The payable amount will be
due as the genuine training price.
The client may nominate a substitute participant; we may reject the substitute participant, if the substitution is not
acceptable for us (e.g. because certain qualifications/requirements have to be satisfied by the participant). If the
substitute participant is acceptable for us, no additional costs will be generated for the client.
In case of a withdrawal/nomination of a substitute participant the client will be liable for obligations to third parties, e.g.
for hotel reservations (no-show costs, etc.).
Cancellation and Postponement by us
ABB reserves the right - also after confirmation of registration - to postpone or to cancel offered training courses due to low demand, low numbers of participants, non-availability of the lecturer, force majeure or important reasons, which ABB is not responsible for. The concerned participants will be informed without undue delay and, if possible, alternatives will be offered. An additional information to the client is not required.
If the minimum number of participants is not reached the participants will be informed two weeks before the training date and we will offer, if possible, an alternative training date. In case of any cancellation or postponement of the training course due to the afore cited reasons ABB shall not be liable.

Exclusion of Liability

1. The information given in the training courses and in the training documentation - including data carriers - are prepared by ABB didactically and professionally using its best efforts. For eventual mistakes ABB cannot be kept liable. We shall not be liable for damages resulting from such mistakes, in particular for any consequential damages or losses.

2. Independent of clause 1. claims for damages and reimbursement of expenses (together: claims for damages) of the client, based on whatever legal reason, including infringement of duties arising in connection with the contract or tort, shall be excluded.

The above shall not apply in the case of mandatory liability, e. g., under the German Product Liability Act (“Produkthaftungsgesetz”), in the case of intent, gross negligence, injury of life, body or health, or breach of a condition which goes to the root of the contract (“wesentliche Vertragspflichten”). However, claims for damages arising from a breach of a condition which goes to the root of the contract shall be limited to the foreseeable damage which is intrinsic to the contract, unless caused by intent or gross negligence or based on liability for injury of life, body or health. The above provision does not imply a change in the burden of proof to the detriment of the client.

3. Furthermore we shall not be liable for unprofessional handling of the training facilities and equipment at the training location and/or systems owned by the client. The liability for consequential damages caused by faulty or negligent handling by the trainer and/or participant shall be excluded in any case.

The client shall hold harmless and indemnify us from and against any third party claims which are put forward in connection with the afore cited damages, and shall fully reimburse ABB costs and expenses so incurred.

Training Documentation
The training documents represent the state at the time of training. We do not assume any guarantee or liability that the data/instructions stay valid without modification.
We reserve all our rights in the training documentation and training equipment which must not be used - even partly - in Germany or abroad without our written approval.

Other
If the client is a businessperson, sole venue for all disputes arising directly or indirectly out of the contract shall be ABB’s place of business. However, ABB may also bring an action at the client’s place of business.
Legal relations existing in connection with this contract shall be governed by German substantive law, to the exclusion of the United Nations Convention on Contracts for the International Sale of Goods (CISC).
The legal invalidity of one or more provisions of this contract shall in no way affect the validity of the remaining provisions. This shall not apply if it would be unreasonable for one of the parties to continue the contract.
# Course Schedule and Price List

**Release 22.01.2014**

<table>
<thead>
<tr>
<th>No. Booking Code</th>
<th>Course (English)</th>
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<tr>
<th>No. Booking Code</th>
<th>Course (English)</th>
<th>Location:</th>
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**Training on-site** | on request |
## Training Courses 2014 – English
### RTU / Substation Automation / MicroSCADA
#### ABB DEPSNM-T (13.03.2014)

### At ABB Mannheim/Germany course no.

<table>
<thead>
<tr>
<th>Course Numbers</th>
<th>Price Class</th>
<th>Duration (Days)</th>
<th>Price per Participant VAT, Hotel excluded</th>
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<tbody>
<tr>
<td>4912, 756*, 758*, 846*, 847*</td>
<td>a</td>
<td>5</td>
<td>2.750 €</td>
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<tr>
<td>758*, 7591</td>
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<td>5</td>
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<td>755*, 7570, 8420, 8670, 8700</td>
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<td>4911, 7575</td>
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### Requested Courses (At ABB Mannheim)

<table>
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<th>Course Details</th>
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<tbody>
<tr>
<td>Requested courses up to 8 participants</td>
<td>2.990 € / day</td>
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<tr>
<td>Requested courses up to 8 participants</td>
<td>3.300 € / day</td>
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### Requested Courses on customersite

<table>
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<th>Price Per Day VAT, Hotel excluded travelling expenses have to be added</th>
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<tbody>
<tr>
<td>Up to 6 participants</td>
<td>a</td>
<td>2.780 € / day</td>
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<td></td>
<td>b</td>
<td>2.940 € / day</td>
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<tr>
<td>Additional participants</td>
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<td>50 € / day / participants</td>
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Our prices do not include any profit taxes and custom duties, which may be imposed in Purchaser’s country on ABB’s supplies and services. Should ABB nevertheless be charged with such levies, these shall be borne by the Purchaser and directly be paid by him to the respective Authorities.
We enrol for following course:

<table>
<thead>
<tr>
<th>Course-No.:</th>
<th>Title:</th>
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<table>
<thead>
<tr>
<th>Location</th>
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<th>or</th>
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<table>
<thead>
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<th>Participant(s):</th>
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<th>Company and address: (OEM Partner YES / NO)</th>
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<tr>
<td>Male / female</td>
<td>Male / female</td>
<td>Male / female</td>
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<td>Phone:</td>
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<td>Phone:</td>
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<th>Signature:</th>
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(Mark with a cross) We accept the General Commercial Conditions and are aware of the withdrawal rule.