

English Training Courses 2009

ABB PSN

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What is new in 2009?

RTU560 Basic Course (7563E) for IEC-60870-5 and DNP3 protocols will be conducted in one class. For one day the student class is divided into two groups – one for IEC 608070-5 protocol and one for DNP3 protocol.

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 impart 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 2000 or XP. Just Microsoft DOS is sufficient for RTU200/232 courses.

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

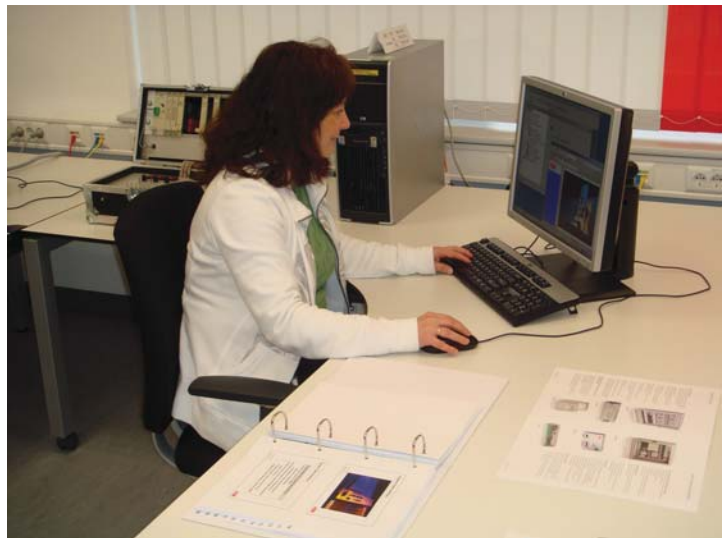


ABB PSN is the ABB competence center for RTU development. Specialists in Mannheim can find the answer to difficult customer questions also.

The learning rooms are equipped exemplarily for the benefit of the participants: Several RTU560 of several types, several RTU200/232, RTU211.

The full range of protocols can be trained: IEC6870-5, 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.

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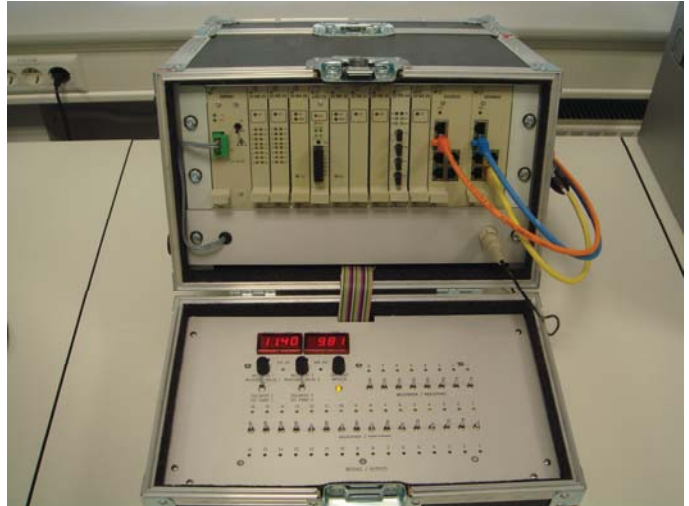
General

Dates

The dates of the courses are listed in the enclosed time schedule.

Training Location for courses in Germany

ABB Learning Center
Kallstadter Str. 1
D 68309 Mannheim



Demo Box for onsite training

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, the course program and a hotel list for your hotel reservation. We reserve the right to cancel a course if the number of applicants is too small.

Cancellation

No fee is payable if your cancellation is received 14 days prior to the start of the course. Thereafter 50% of the course fee are payable. For cancellations received less than 3 workdays before the start of a course the full fee becomes due.

Payment terms

Invoices for course fees are rendered immediately after the course starts. Payment is due within 10 days.

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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ABB Learning Center in Mannheim / Germany

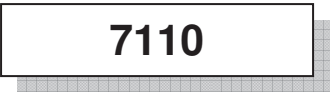


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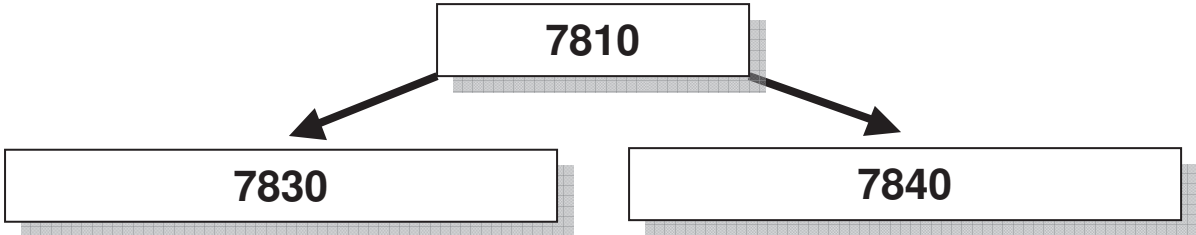
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Curriculum

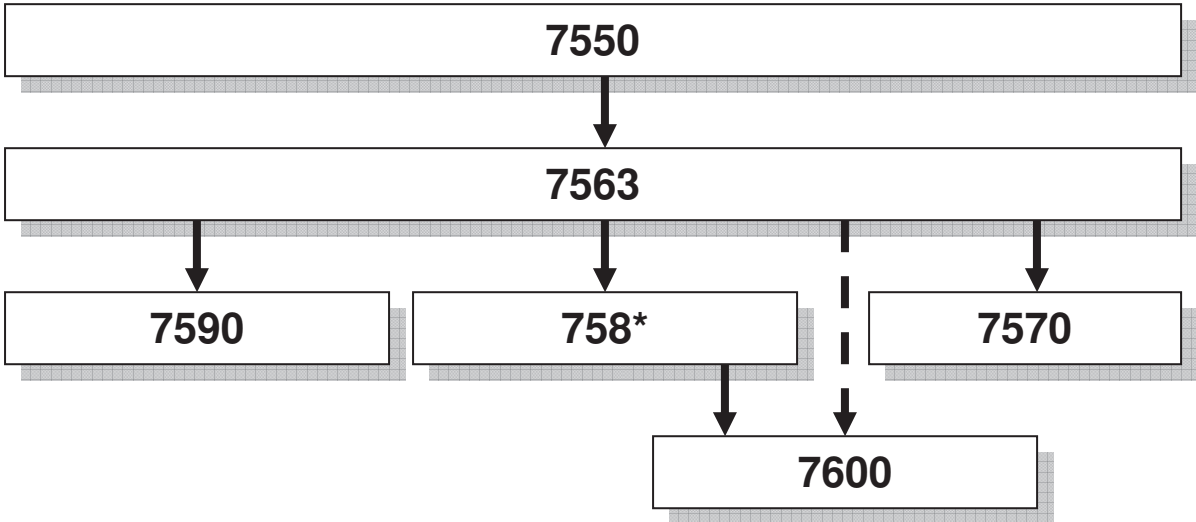
RTU211 :



RTU200/232 :



RTU560 :



Introduction Courses

7550E Introduction Data Acquisition and RTU560

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; RTU560 installation, PPP connection 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.

Basic Courses

4910E Basic Course MicroSCADA

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
- Operation of MicroSCADA
- Diagnosis
- Creation and modification of exercise displays
- Creation and modification of command procedures
- Picture Editor
- Creation of Function Keys
- Binding of the New Picture into an Existing Project
- Process Object Definition
- Application Library
- Creation and Definition of Display Windows
- Subwindow for Measurements
- Installation of Operator Keys
- Picture Generation by Program DRAW
- Bargraph generation
- Usage of a Variables
- Dynamic Picture Test with RTU560

Participants: Engineering-, commissioning- and maintenance-personnel

Prerequisites: Basic knowledge of a PC and of Microsoft Windows

Duration: 5 days

Course language: English

Start: Monday 9 a. m.

End: Friday 12 a. m.

7110E Remote Terminal Unit RTU211

Objectives of the course:

The participant is familiar with the system architecture, with the functionality and with the protocols of the Remote Terminal Unit RTU211. He is prepared to work with the PC-based tool for configuration, setting, test and protocol analysis (RP570/71).

Contents:

- Configuration options
- Hardware modules and housings
- Software structure
- Data acquisition and control functions (SCADA)
- Telecontrol functions based on RP570/RP571
- Tool installation and start at DOS or Windows XP
- Tool RTUtil with the menus Configure-Link-Transfer-Diagnosis-Protocol

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

Prerequisites: Knowledge of general telecontrol functions and of a personal computer with Microsoft operating system.

Duration: 3 days **Course language:** English

Start: 1st day 9 a. m. **End:** 3rd day 5 p. 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

Prerequisites: 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.

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7563E Remote Terminal Unit RTU560 Basic Course

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

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 install RTUutil 560, the Remote Access Service (RAS from Microsoft), a dial-up link 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. He can import data from Excel-sheets. For one day the student class is divided into two groups – one for IEC 60870-5 protocol and one for DNP3 protocol family.

Contents:

- System concept of the RTU Family RTU211 and RTU560
- Configuration options of RTU560A, RTU560C, RTU560D and RTU560E
- Cabinets, subracks and hardware modules
- Properties of the communication units (CMU)
- Process data acquisition and telecontrol functions (SCADA)
- Exercises with the Windows-based tool RTUutil560 for configuration, signal definition and parameterization
- Diagnosis by the Integrated Webserver
- Excel-Import/Export function of RTUutil560
- Process archives for indications, measurements and pulse counter
- Logic Function, and local print out
- **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: Course 7550E and knowledge of general telecontrol functions and of Microsoft Windows

Duration: 5 days **Course language:** English

Start: Monday 9 a. m. **End:** Friday 12 a. m.

Extension Courses

7840E Remote Terminal Unit RTU200/232 - Advanced Course

Objectives of the course:

The participant, who has already worked with RTU200/232 and RTUtil 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 RTUtil 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.

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7581E Remote Terminal Unit RTU560 Advanced Course, IEC60870

Objectives of the course:

The participant, who has already worked with RTU560, RTU560 and Webserver, refreshes his RTU knowledge. He extends his skills especially concerning configuration, extensions and trouble shooting.

The Redundancy Concept of the RTU560 concerning power supplies, communication lines and communication units will be discussed, and the participant will be informed about properties and limits.

The "System Data Interface" is explained. In chapter 'File Transfer' the participant will learn the possibilities to transfer (transparent) data and fault records from and to the RTU560.

He knows the features and possibilities of the 'Integrated Human Machine Interface', and will be trained in making his own station picture, to control a substation.

The participant will know about RTU nodes, subordinated devices (IED) and modems.

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 SPABus
- Exercises with leased line modems and subordinated devices
- Gateway Functions and Backplane Routing
- The training can be modified according to the requirements of the participants

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.

English Training Courses 2009

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7582E Remote Terminal Unit RTU560 Advanced Course, DNP3

Objectives of the course:

The participant, who has already worked with RTU560, RTU560 and Webserver, refreshes his RTU knowledge. He extends his skills especially concerning configuration, extensions and trouble shooting.

The Redundancy Concept of the RTU560 concerning power supplies, communication lines and communication units will be discussed, and the participant will be informed about properties and limits.

The "System Data Interface" is explained. In chapter 'File Transfer' the participant will learn the possibilities to transfer (transparent) data and fault records from and to the RTU560.

He knows the features and possibilities of the 'Integrated Human Machine Interface', and will be trained in making his own station picture, to control a substation.

The participant will know about RTU nodes, subordinated devices (IED) and modems.

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 DNP3 and MODBUS
- Exercises with leased line modems and subordinated devices
- Gateway Functions and Backplane Routing
- The training can be modified according to the requirements of the participants

Participants: Maintenance-, commissioning- and planning-personnel

Prerequisites: Attendance of the basic course 7563/2E

Duration: 5 days

Course language: English

Start: Monday 9 a. m.

End: Friday 12 a. m.

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7590E Remote Terminal Unit RTU560 IEC61850

Objectives of the course:

After the course the participant will be familiar to configure IEC61850 devices in the RTU560. In exercises the engineering is done for REC670. The participant will have a basic knowledge and practice of necessary tools for configuration (CCTLite) and protocol analysis.

Contents:

- Introduction in 61850 protocol structure - used protocol elements
- Data flow: EXCEL import of 61850 configuration into RTU560
- Usage of tools
- Integrated Human Machine Interface
- IEC 60870-5-101 configuration
- Protocol analysis tool

Participants: Engineering-, commissioning- and maintenance personnel

Prerequisites:

- Attendance of the basic course 7563E
- Basic knowledge of protocol IEC61850
- Basic knowledge of RE*670 devices is recommended

Method: Lecture, Exercises

Duration: 3 days

Course Language: English

Start: First day, 9 a. m.

End: Third day, 4:30 p. m.

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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

Courses Local Automation Functions (LAF / PLC)

Remark:

“Local Automation Function“ (LAF) is the former designation in the RTU community; “Programmable Logic Code“ (PLC) is a designation in the industrial controller world.

In both cases we mean programs, which can optionally run in a RTU additional to the standard telecontrol tasks.

Examples: Program for control of a local mimic including alarm horn, program for automatic busbar switchover, program for voltage control of a transformer tap changer, ...

7570E Remote Terminal Unit RTU560, Local Automation Functions LAF/PLC

Objectives of the course:

The participant will be able to program, test and integrate local automation functions (LAF/PLC) into a RTU560, either on the CPU used for telecontrol applications or on separate CPUs.

He can develop programs with the tool MULTIPROGwt using POUs (Program Organization Units) in compliance with IEC61131.

In RTUutil 560 he learns to expand signal tree and hardware tree for virtual data points, functions and tasks. In MULTIPROGwt he will be familiar with the different limbs of a project tree.

He will get the feeling for estimating computing power consumption for PLC programs.

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
- Installation and start of the software in a Personal Computer
- Relating input and output channels of the RTU to a PLC program
- Usage of virtual data points
- Loading and testing of programs
- Multitasking
- Playing with program cycle times
- Exercise program concerning voltage control
- Exercise with PID controller
- 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. 7563E

Duration: 3 days

Course language: English

Start: 1st day 9 a.m.

End: 3rd day 3 a.m.

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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.

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Course Schedule and Price List Release 15.06.2009

No. Booking Code	Course (English) Location: Mannheim Germany	D	Jan Feb	Mar Apr	May June	July August	Sept Oct	Nov Dec
4910E	MicroSCADA pro	5		02.- 06.03	04.- 08.05			02.- 06.11.

7550E	Introduction Data Acquisition and RTU560	3	04.- 06.02.	15.- 17.04		08.- 10.07	09.- 11.09.	04.- 06.11.
7563E /1 /2	RTU560 Basic Course IEC 60870-5 DNP3	5	09.- 13.02.	20.- 24.04.		13.- 17.07	14.- 18.09.	09.- 13.11.
7570E	RTU560 PLC - Local Automation Functions IEC61131-3	3	16.- 18.02.	27.- 29.04	23.- 25.06		21.- 23.09.	
7581E	RTU560 Advanced IEC 60870-5 Protocol	5	16.- 20.02.		11.- 15.05.	20.- 24.07.	21.- 25.09.	14.- 18.12
7582E	RTU560 Advanced DNP3 Protocol	5	16.- 20.02.		11.- 15.05..	20.- 24.07.	21.- 25.09.	14.- 18.12
7590E	RTU560 IEC61850 gateway	3	17.- 19.02.		18.- 20.05	21.- 23.07.	28.- 30.09.	
7600E	RTU560 Workshop	5	Date and price on request					

7110E	RTU 211 Basic Course	3	on request					
7810E	RTU 200/232 Basic Course	5						
7830E	RTU 200/232 Local Automation Functions	3						
7840E	RTU 200/232 Advanced Course	5						

Training on-site	on request
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At ABB Mannheim/Germany course no.	Duration	Price per participant VAT, Hotel excluded
491*,756*,758*, 781* 784*	5 days	€ 2,600.--
755*,757*,	3 days (a)	€ 1,700.--
711*,759*,783*	3 days (b)	€ 1,900.--
Requested Courses 49xxE or 75xxE for up to 6 participants	5 days	€ 14,200.--

Training on-site	Duration	Price VAT excluded travelling expenses have to be added
Up to 6 participants additional participants on request	1 day 3 days 5 days	€ 2,640.-- a: € 7,920.-- (b: € 8,120.--) € 13,200.--

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.

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We enrol for following course:

Course-No.: _____ Title: _____	
Date	from: _____ to: _____
Location	Mannheim/Germany or _____
Participant(s):	Company and address: (OEM Partner YES / NO)
male/female _____	_____
male/female _____	_____
male/female _____	_____
male/female _____	_____
Ordered by:	Confirmation to:
Name: _____	_____
Dept: _____	_____
Phone: _____	_____
E-Mail: _____	_____
	Invoice to:
	to: _____
Date: _____	_____
Signature: _____	_____