

# Training at ABB India

## Developing your full potential



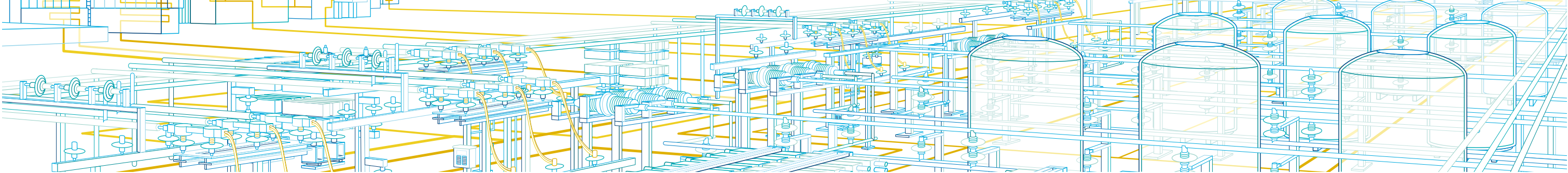
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# This is ABB

ABB is one of the world's leading power and automation engineering companies that enable utility and industry customers to improve their performance while lowering environmental impact.

Our portfolio ranges from light switches to robots, and from huge electrical transformers to control systems that manage entire power networks and factories. We provide solutions for secure, energy-efficient generation, transmission and distribution of electricity, and for increasing productivity in industrial, commercial and utility operations.



# ABB in India

Technology plays a key role for ABB. We have seven research centers, 6,000 scientists and 70 university collaborations across the world – all working to develop unique technologies that make our customers more competitive.

Sustainability is integral to all aspects of our business. We strive to balance economic, environmental and social objectives and integrate them into our daily business decisions. Sustainability considerations cover our entire value chain, from how we design and manufacture products, to how we behave in the communities where we operate and towards one another.

The sub-continent has witnessed an unprecedented level of economic expansion. To sustain this growth, ABB in India is actively reaching out and partnering with stakeholders to discover new ways of applying innovation, technology and global experience to find solutions to help build and sustain a low carbon economy.

Energy is a critical driver to accelerating economies. But what is more relevant in today's environment is making energy sustainable and a viable proposition. Nature makes energy available in various forms. And to harness this energy effectively and efficiently, ABB has developed technologies to utilize the latent energy that lies in the power of ocean water to natural resources like coal and to far more sustainable solutions like the sun and the wind.

Whether it is for power generation, transmission, distribution or applications in industrial automation, facilities or buildings; practically the entire ABB portfolio helps to reduce CO<sub>2</sub> emissions. Energy cost does not manifest itself in just producing and transmitting it. How well it is utilized and put to productive use is equally important. So when it comes to cement, steel, petrochemicals, pharmaceuticals or the likes of these industries, ABB India has been implementing global, leading-edge technology solutions to optimize energy utilization. So at the end of the day, increasing energy costs is not what one ends up paying for as we progress into the future.

Our strategy is to leverage our domain expertise in power and automation technologies to help utilities and industries improve productivity, efficiency and reliability of operations while reducing environmental footprint. Through various initiatives, we are continuously addressing customer needs, investing resources in indigenization, localization and manufacturing to develop products and solutions to cater to specific customer requirements through enhanced and customer delivery models.

To enhance our presence and sustain technology leadership, ABB is capitalizing on mega trends such as urbanization and emerging economies, resource efficiency and climate change, exploiting disruptive opportunities, such as direct current (DC) technologies, to enable a wide range of energy efficient automation and power solutions.

We are also focusing on improving our internal process efficiency, reducing material and energy consumption and improving productivity to deliver solutions to customers in an increasingly competitive environment.



# Our service portfolio

Service is an integral and important channel to improve customer intimacy and enhance value proposition. The service strategy is to unleash the full potential of the entire organization to take advantage of huge and growing installed base, which constitutes a large opportunity to increase the service offerings and to enhance customer value.

Our competent and experienced service teams develop, build and deliver holistic solutions to drive efficiency and productivity improvements by utilizing ABB's existing advanced knowledge and capabilities. Driven by customer needs, service teams across various product groups, functions and regions work together to offer comprehensive solutions for optimal improvements and value addition.

ABB Full Potential Service Strategy builds on strong foundations of the huge and continuously growing installed base, technologically superior products and solutions and long and proven engineering competences. The objective is to take advantage of these key imperatives to maximize the Return on Assets and improve productivity, availability, reliability and in turn the profitability for the customers.

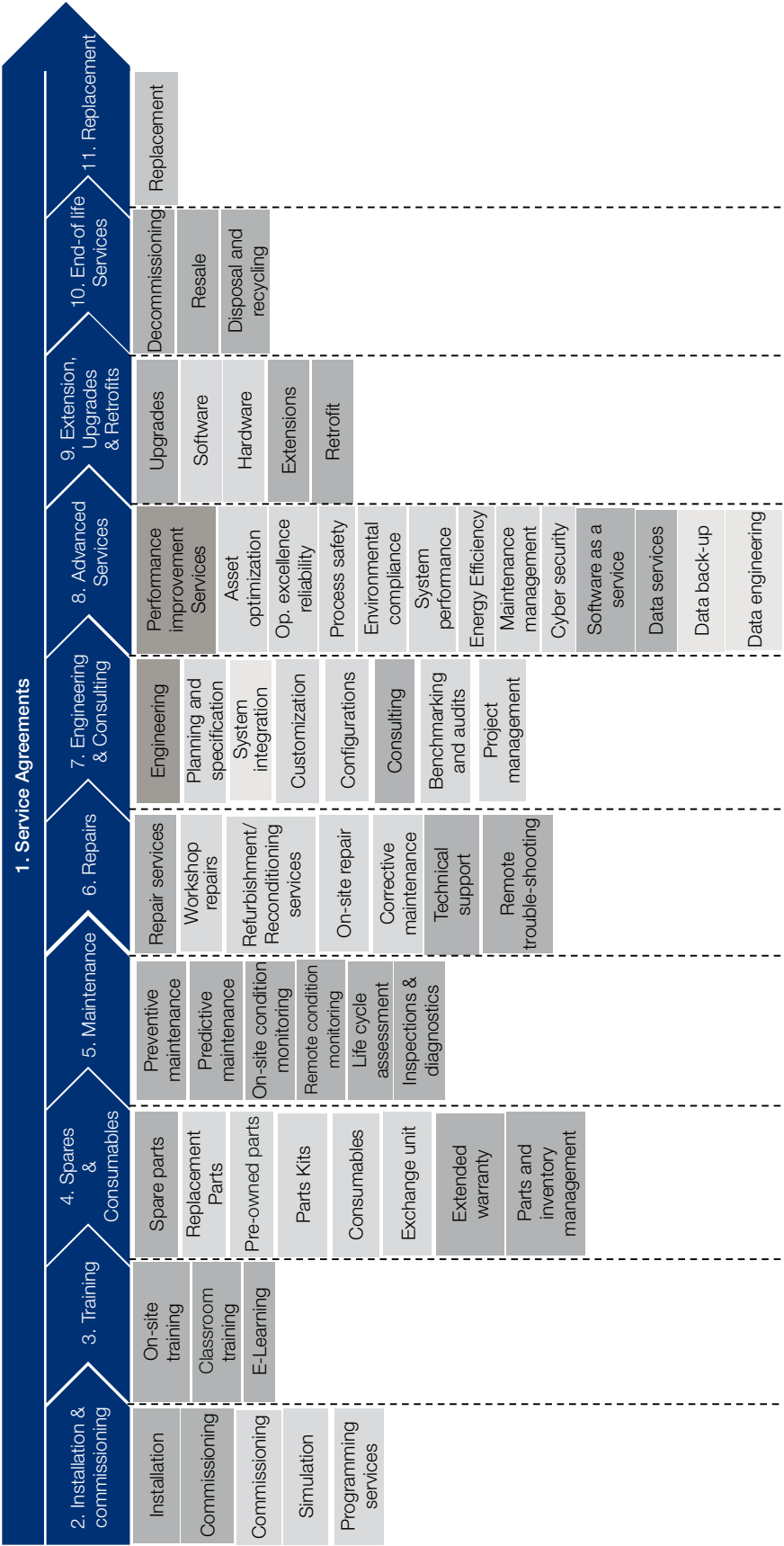
Through a holistic service portfolio from conventional life cycle support (like spare parts, training and field services) to more advanced solutions (like upgrades, evolution & retrofit solutions, optimization), ABB offers a complete range of solutions for all customer needs. Leveraging on the combined strength of strong electrical product portfolio and vast application knowledge, ABB is best prepared and equipped to cater to the needs of emerging trends and demands of energy efficiency and carbon footprint optimization.

People development and competence build up is a significant step in ensuring the best usage of various products and solutions delivered for control of various critical applications. ABB, through a comprehensive training portfolio, offers wide ranging standard and customized training modules for all customer needs at all levels.

State-of-the-art training facilities, with right and required number of training kits, managed by experienced and certified trainers, provide a unique opportunity to all customers for targeted and focused competence build-up of their entire workforce for improved availability and reliability of all equipment and systems. Generally, most of the training modules include both class room and hands-on sessions, for enhanced training effectiveness and better learning experience.

Fast growing demand for customized on-site (at customer locations / plants) training modules with mobile training kits, wherever possible, reflects ABB's flexibility and preparedness to meet the special challenges in terms of large pool of operators / engineers to be trained in short time and also on topics of special importance to a particular plant / unit.

ABB's training portfolio goes beyond the conventional product / equipment, by integrating special topics like system integration, technological solutions, process optimization, loop performance monitoring and tuning, IEC 61850 based power management solutions, industry safety solutions, functional safety systems, etc.



# Creating value through knowledge sharing

ABB's training programmes are designed and structured as an integral part of customer commitment. Our programmes focus on enhancing skills and developing the competence of our customers' personnel across functions and levels.

With decades of unparalleled domain knowledge and experience, ABB's expert team of internal and external trainers offer well-structured training programmes across a wide range of products and systems.

Through interactive workshops, hands-on training and product demonstrations, we create the ideal environment for our customers to familiarize themselves with various products and system platforms and enhance their skills.

## The ABB advantage:

Our training programmes offer the following benefits:

- Help customers stay ahead of the learning curve by sharpening their skills and integrating advances in technological innovation
- Better returns on training investment by maximizing productivity and performance
- Reduced life-cycle costs thereby increasing return-on-investments (ROI) and return-on-assets (ROA)
- Maintaining products and systems at a high level of readiness, so as to minimize downtime and mitigate the need for equipment repair

## ABB's training centre provides the ideal infrastructure with:

- Sophisticated learning aids such as, simulations, product cut-outs and multimedia presentations
- Demo-room with operating models
- Practice benches for hands-on training
- Well-equipped classrooms with instant access to ABB group e-learning sites
- Outdoor switchyard with high and medium voltage switchgear, power and distribution transformers and other power technology products



Training centre at Peenya



Training cum demo room at Nelamangala



Training centre at Vadodara



# Product training modules

## Transformers

**Product categories**

- Power Transformers (upto 765 KV)
- Distribution Transformers
- Dry-Type and Liquid-filled Type Transformers
- Reactors

**Topics covered**

- Basics of transformer and reactors - design aspects, insulation, principle, connections (vector groups)
- Transformer selection and application, accessories
- Manufacturing and testing of transformers / reactors
- Life extension and refurbishment of transformers
- Installation, commissioning, maintenance and troubleshooting
- Diagnostics - condition monitoring, oil processing, DGA
- Economic aspects of replacement of transformers
- Modern trends in design / manufacturing

**Target audience:** End users, system integrators, channel partners, Independent Service Franchise

**Duration of training:** 3 to 8 days



## High Voltage Switchgear (upto 765 KV)

**Product categories**

- Circuit Breakers
- Instrument Transformers (CT and CVT)
- Disconnectors
- Gas Insulated Switchgear (GIS) and Hybrid Switchgear (PASS)
- Surge Arrestors
- HV/LV Capacitors
- Generator Circuit Breaker (GCB)

**Subjects covered**

- Theory on working of product, applicable standards and selection parameters
- Operation, construction, components
- SF6 gas properties and gas filling, handling
- Control schemes, manufacturing and testing
- Hands-on practice
- Installation, commissioning, troubleshooting and site maintenance requirements
- Refurbishment, life extension
- Modern trends in design / manufacturing

**Target audience:** End users, system integrators, channel partners, Independent Service Franchise

**Duration of training:** 2 to 6 days



# Product training modules

## Medium Voltage Switchgear

**Product categories**

- Apparatus - Indoor and Outdoor Circuit Breaker, SF6 Vacuum Breaker, Railway Breaker, Vacuum Interrupters
- Air Insulated Switchgear (AIS)
- Gas Insulated Switchgear (GIS)
- Ring Main Unit (RMU)
- Compact Secondary Substation (CSS)

**Subjects covered**

- Design, operation and construction principles
- Inside the breaker - Hands-on practice, demo
- Hands on practice - operating mechanism, SF6 gas filling
- Control schematics and applicable standards
- Manufacturing and testing
- Setting examples and calculations
- Maintenance and troubleshooting
- New developments in MV Switchgear Technology - GIS

**Target audience:** End users, system integrators, channel partners, Independent Service Franchise

**Duration of training:** 3 to 5 days



## Utility Communication

**Product categories**

- Power Line Carrier Communication System (PLCC)

**Subjects covered**

- PLC Terminal Type ETL 4x -8x
- Protection Coupler Type NSD50
- VFT Equipment Type NSK5
- Modular Coupling Device Type MCD80
- Testing of equipments
- Fault tracing

**Target audience:** EPCs, all utility customers

**Duration of training:** 10 days



# Product training modules

## Distribution Automation Products

### Product categories

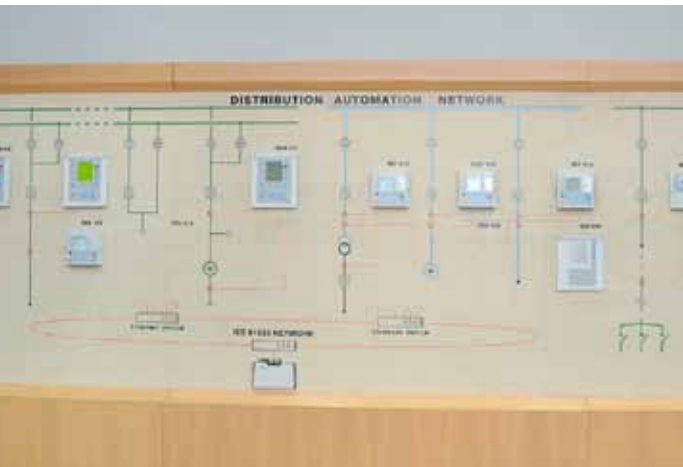
- Distribution Protection - SPACOM series and RED500 series
- Distribution Protection - 605 series and 630 series
- Distribution Protection - 611 and 615 series
- Station Automation - COM600
- Fast Bus Transfer device - SUE 3000
- Load Shedding Controller - PML630

### Subjects covered

- Overview of protection principles and application
- Relay functions and features
- Introduction to relay configuration tool along with communication with relay
- Relay engineering and configuration including logic building
- Relay operation - HMI navigation, relay parameterization and fault data upload and analysis, testing and trouble shooting
- Introduction to Fast Bus Transfer device, Load shedding controller PML630 and its Engineering
- Simulation of different modes of transfers
- Establishment of communication between substation IEDs, PML630
- Simulation of different scenarios of Fast and Slow load shedding
- Substation Automation Solutions - Structure and Architecture and introduction to COM600
- Control, protection and monitoring concepts and advantages of IEC61850
- Graphical User Interface, Single Line Diagram, Event List, Alarm List, Trends, Reports

**Target audience:** End users, system integrators, channel partners, Independent Service Franchise

**Duration of training:** 3 to 5 days



## Substation Automation System

### Product categories

- Line Distance Protection with REL670 and REL650
- Line Differential Protection with RED670
- Transformer Protection with RET670 and RET650
- Busbar Protection with REB670 and REB500
- Generator Protection with REG670
- Bay Controlling with REC670 and REC650
- Substation Automation with MicroSCADA
- RTU560 Gateway Engineering
- Power System Studies and Relay Coordination
- Power System Studies Software - NEPLAN

### Subjects covered

- Application
- Function and features
- Configuration and setting example
- Testing of product
- Hardware and software concept
- HMI Program and LDU
- Operation and maintenance
- Relay coordination and grading between overcurrent and short circuit devices
- RTU and MicroSCADA Pro

**Target audience:** End users, system integrators

**Duration of training:** 5 to 10 days



# Product training modules

## Power Generation (Control and Instrumentation)

### Product categories

- Power Plant Automation (Optimax)
- Power Plant Training Simulator
- Combustion Instruments - Flame Scanners
- Pro Control 13 with Progress 3 Engineering and Industrial IT HMI
- Symphony Harmony with Power Generation Portal (PGP) HMI and Composer Engineering
- Symphony Melody
- Turbine Protection and Control Solution - TSI, TSA, EHTC, ATRS etc
- Boiler Protection and Control Solution-FSSS, BMS
- Freelance 800F
- EGATROL System for Gas Turbine

### Subjects covered

- Performance monitoring of products
- Performance simulation
- Installation and configuration features
- Power generation information management (PGIM) for history and analysis
- HMI upgradation
- Operations and engineering including logic building
- Maintenance and troubleshooting

**Target audience:** End users, channel partners, OEMs, EPCs, System Integrators, Consultants, Energy Auditors

**Duration of training:** 3 to 5 days



## Low Voltage Switchgear

### Product categories

- Air Circuit Breaker
- Moulded Case Circuit Breaker
- Soft Starter
- Contactor
- Electronic Products and Relays
- Universal Motor Controller

### Subjects covered

- ModBus communication with RS485/Bluetooth
- Maintenance and troubleshooting techniques
- Components, accessories

**Target audience:** End users, system integrators, channel partners, Independent Service Franchise

**Duration of training:** 3 to 5 days





# Product training modules

## Low Voltage Systems

**Product categories**

- Convention Switchgear - MNS 3.0 and MNS R
- Intelligent Switchgear - MNS iS, MNS 3.0 with M10X, UMC Relay

**Subjects covered**

- MNS applications
- Functional description of MNS systems
- Erection and service instructions
- Parameterization and tool
- DCS and switchgear communication

**Target audience:** End users, consultants, OEM’S, EPC’S

**Duration of training:** 3 to 6 days



## Low Voltage Drives

**Product categories**

- ACS 55 and ACS 150 - Micro Drives
- ACS 355 and ACS 850-04 - Machinery Drives
- ACS 310 and ACS 550 - General Purpose Drives
- ACS 800, ACS 880, DCS 800 - Industrial Drives
- ACH 550 and ACQ 810 - Industry Specific Drives
- ACSM1 - Motion Control Products
- ACS 800 Multi Drives and Regenerative Drives

**Subjects covered**

- Product technical features and concepts
- Principle of operation
- Product hardware and software description
- Parameters and signal description
- Commissioning and maintenance tool exercises
- Standard operation and maintenance procedures
- Faults and alarms

**Target audience:** End users, system integrators, energy auditors,Independent Service Franchise

**Duration of training:** 2 to 5 days



# Product training modules

## Medium Voltage Drives

**Product categories**

- ACS 1000 and ACS2000 - General Purpose Drives
- ACS 5000 and ACS 6000 - Special Purpose Drives

**Subjects covered**

- Drive fundamentals and features
- Principle of operation
- Product hardware and software description
- Parameters and signal description
- Commissioning and maintenance tool exercises
- Standard operation and maintenance procedures
- Faults and alarms

**Target audience:** End users, system integrators, energy auditors, Independent Service Franchise

**Duration of training:** 3 to 5 days



## Power Electronics

**Product categories**

- High Current Rectifier - AC 800 PEC, DCR 600 and DCR 800
- Static Excitation System - UNITROL 1000, UNITROL F, UNITROL 5000, UNITROL 6000
- Traction Convertors - BORDLINE

**Subjects covered**

- Fundamental knowledge and product features
- Principle of operation
- Product hardware and software description
- Parameters and signal description
- Commissioning and maintenance tool exercises
- Standard operation and maintenance procedures
- Faults and alarms

**Target audience:** End users and system integrators

**Duration of training:** 3 to 5 days





# Product training modules

## Control Products (PLC)

**Product categories**

- DigiVis 500 SCADA
- AC 500 series PLC
- AC 500 (High Availability)
- AC 500 eCo PLC
- CP400 and CP600 HMI
- AC31 40/50 series PLC (on request only)

**Subjects covered**

- OPC configuration and AE configuration at DigiVis 500 SCADA
- Centralised and decentralised configuration of PLC
- HA PLC configuration steps
- Configuration with Profibus, CS31, Profinet, Modbus RTU, Modbus TCP/IP etc
- SNTP time synchronization
- HMI configuration steps, connectivity with PLC

**Target audience:** End users and system integrators

**Duration of training:** 3 to 5 days



## Motors and Generators

**Product categories**

- Low Voltage Motors
- High Voltage Induction Motor
- High Voltage Synchronous Motor
- DC Motor
- Traction Motor
- Wind Generators
- Energy Efficient Motors
- Motors for hazardous areas

**Subjects covered**

- Introduction of theory of electrical machines
- Mechanical and electrical designs/construction of electrical machines
- Operational aspects
- Thermal, electrical, ambient, mechanical stresses affecting a machine
- Installation and commissioning
- Methods to eliminate most frequently occurring faults
- Innovative ways of carrying out preventive and prediction maintenance

**Target audience:** End users, OEMs, channel partners, energy auditors, independent service franchise

**Duration of training:** 2 to 3 days



# Product training modules

## Robotics

**Product categories**

- Small size robot - IRB 120, IRB 1410, IRB 1600, IRB 2600
- Medium size robot - IRB 4400 and IRB 4600
- Large size robot - IRB 6600 series and IRB 7600
- Robot Studio - Simulation and Programming Software
- Paint robot
- Arc welding robot

**Subjects covered**

- ABB robot and their types
- Description of ABB robot components
- Basic operation and programming of robot
- Input/Output details and Interfacing with PLC
- Robot system applications and booting of system
- Troubleshooting and maintenance features

**Target audience:** End users, channel partners, system integrators

**Duration of training:** 3 to 5 days



## Control Technology Products

**Product categories**

- Freelance 800F
- 800xA with AC800 M controller
- Compact HMI 800

**Subjects covered**

- System overview, system architecture
- System functions
- Diagnostic features
- Basics of process control
- Configuration and commissioning
- Safety and redundancy concepts
- General troubleshooting tips

**Target audience:** End users, channel partners, EPC's, OEM's, system integrators, consultants

**Duration of training:** 3 to 5 days



# Product training modules

## Measurement Products

### Product categories

- Infra Red Analysers
- Para Magnetic Analysers
- Thermal Conductivity Analyser
- Continuous Gas Analyser (CGA)
- Gas Chromatograph
- Natural Gas Chromatograph (NGC)
- Fourier Transform Infra Red Analyser (FTIA)
- Liquid Analyser & SWAS (Steam & Water Analysis System)
- Flow Meter

### Subjects covered

- Working principle of product
- Construction and features of product
- Components of product
- Sample conditioning systems and various parameters of sample conditioning
- Erection and commissioning guidelines
- Maintenance and troubleshooting

**Target audience:** End users, channel partners, system integrators

**Duration of training:** 3 days



## Turbochargers

### Product categories

- Industry specific turbochargers ranging from 500KW to 80MW

### Subjects covered

- ABB turbocharging global and local service network
- Safe operation and maintenance of turbochargers
- Dynamic balancing
- Troubleshooting and failure analysis
- SIKO - safety design concept
- Latest development in turbocharger

**Target audience:** End users

**Duration of training:** Half day



# Industry specific training modules

## Process Industries

### Categories

- Primary Metals
- Hot Flat Rolling
- Cold Rolling Mills
- Processing Lines
- Profile Mills
- Tube Mills
- Cement Mills
- Paper Machines
- Paper Winders

### Subjects covered

- Drive Selections/Application Engineering
- Technology controls like AGC, RGC, AFC, Coil Eccentricity compensation, Tandem Mill controls, Rolling Mill Mathematical Models
- Level2 Systems

**Target audience:** End users

**Duration of training:** 2 to 3 days



## Process Automation Control

### Categories

- Configuration and operation of 800xA with AC800M Controller
- Configuration and operation of 800xA with AC450 Controller
- Engineering of a complete control project running in AC800M Controller
- ACM, CPM and KM

### Subjects covered

- System 800xA architecture
- Engineering workplace/plant explorer
- Controller hardware
- Controller communication and database management
- Applications with FBD and ST
- Graphics display
- Alarms, events and trends
- Back up and restore

**Target audience:** End users, OEMs and system integrators

**Duration of training:** 3 to 5 days





# Domain specific training modules

## Process Automation - Productivity and Optimization Suites

### Categories

- Energy Manager
- Scheduling Systems
- Knowledge Manager
- cpmPlus OEE

### Subjects covered

- Energy Monitoring, Load Planning and Optimization
- Melt Shop and Hot Strip Mill Schedule Optimization
- OEE Concepts and Tracking

**Target audience:** End users

**Duration of training:** 2 to 3 days





# Training modules at a glance

|  | Training Location  |   |   |   |  |  |   | Contact Person      | E-Mail Id                      | Office Landline Number | Mobile Number |
|--|--|---|---|---|--|--|---|---------------------|--------------------------------|------------------------|---------------|
| Product Category   | Bangalore (Peenya)   | Bangalore (Nelamangala)   | Bangalore (Rajaji Nagar)  | Vadodara (Maneja)   | Nashik (Satpur)  | Mumbai (Andheri)   | Faridabad (Mathura Road)                                    |                     |                                |                        |               |
| Transformer  |  |   |   | ●   |  |  |   | Dilip Shah          | dilip.shah@in.abb.com          | 0265 2604448           | 9724334124    |
| High Voltage Switchgear  |  |   |   | ●   |  |  |   | Dilip Shah          | dilip.shah@in.abb.com          | 0265 2604448           | 9724334124    |
| Medium Voltage Switchgear  |  |   |   | ●   | ●  |  |   | Guruprasad S Wagle  | guruprasad.s.wagle@in.abb.com  | 0253 2201266           | 9890700650    |
| Utility Communication  |  |   |   |   |  | ●  |   | Manali Rane         | manali.rane@in.abb.com         | 022 66717210           | 9820677004    |
| Distribution Automation  |  |   |   | ●   |  |  |   | Dilip Shah          | dilip.shah@in.abb.com          | 0265 2604448           | 9724334124    |
| Products   |  |   |   |   |  |  |   |                     |                                |                        |               |
| Substation Automation System   | ●  |   |   |   |  |  |   | Prakash Rao T       | prakashrao.t@in.abb.com        | 080 22949692           | 9972583890    |
| Power Generation (Control & Instrumentation)   | ●  |   |   |   |  |  |   | Anjali Desai        | anjali.desai@in.abb.com        | 080 22949648           | 9901493472    |
| Low Voltage Switchgear   |  | ●   |   |   |  |  |   | Prakash Gangoli     | prakash.gangoli@in.abb.com     | 080 22948927           | 9901490984    |
| Low Voltage Systems  |  | ●   |   |   |  |  |   | Manish Haswani      | manish.haswani@in.abb.com      | 080 22946878           | 9945120595    |
| Low Voltage Drives   | ●  |   |   |   |  |  |   | Srivatsa Ramamurthy | srivatsa.ramamurthy@in.abb.com | 080 22946508           | 9901491120    |
| Medium Voltage Drives  | ●  | ●   |   |   |  |  |   | Srivatsa Ramamurthy | srivatsa.ramamurthy@in.abb.com | 080 22946508           | 9901491120    |
| Power Electronics  |  | ●   |   |   |  |  |   | Srivatsa Ramamurthy | srivatsa.ramamurthy@in.abb.com | 080 22946508           | 9901491120    |
| PLC (Control & Automation)   | ●  |   |   |   |  |  |   | Srivatsa Ramamurthy | srivatsa.ramamurthy@in.abb.com | 080 22946508           | 9901491120    |
| Motors & Generators  | ●  |   |   | ●   |  | ●  | ●   | Srivatsa Ramamurthy | srivatsa.ramamurthy@in.abb.com | 080 22946508           | 9901491120    |
| Robotics   | ●  |   |   |   |  |  |   | Ravikumar Singadi   | ravikumar.singadi@in.abb.com   | 080 22948352           | 9901491151    |
| Distributed Control System   | ●  |   |   |   |  |  |   | Mohan Acharya       | mohan.acharya@in.abb.com       | 080 22948515           | 9964024200    |
| Measurement Products   | ●  |   | ●   |   |  |  | ●   | Balesh Kumar        | balesh.kumar@in.abb.com        | 080 22949662           | 9663577277    |
| Turbochargers  | ●  |   |   | ●   |  |  |   | Keyurkumar Patel    | keyurkumar.patel@in.abb.com    | 0265 2604413           | 7600053390    |
| Process Automation   |  |   | ●   |   |  |  |   | Rajeshwari Shenoy   | rajeshwari.shenoy@in.abb.com   | 080 22946302           | 9916985219    |
| Process Automation Control   | ●  |   |   |   |  |  |   | Rajeshwari Shenoy   | rajeshwari.shenoy@in.abb.com   | 080 22946302           | 9916985219    |
| Process Automation - Productivity and Optimization Suites                            |  |   | ●   |   |  |  |   | Rajeshwari Shenoy   | rajeshwari.shenoy@in.abb.com   | 080 22946302           | 9916985219    |
| Training location details  | ABB Limited<br>Plot No. 5 & 6,<br>2nd Phase,<br>Peenya Industrial Area<br>Bangalore-560058 | ABB Limited<br>Survey No 88/3,88/4,<br>Basavana Halli,<br>Kasaba Hobli,<br>Nelamangala,<br>Bangalore-562123 | ABB Limited<br>5th Floor,<br>KSIIDC IT/BT Park,<br>Rajaji Nagar<br>Industrial Estate,<br>Bangalore-560010 | ABB Limited<br>Power Technologies<br>Training Centre,<br>Maneja,<br>Vadodara-390013 | ABB Limited<br>Plot No 79,<br>Street 17,<br>MIDC Estate,<br>Satpur,<br>Nashik-422007 | ABB Limited<br>22-A, Shah<br>Industrial Estate,<br>Off. Veera<br>Desai Road,<br>Andheri (West),<br>Mumbai-400053 | ABB Limited<br>32 Industrial Area, NIT,<br>Faridabad-121001 |                     |                                |                        |               |
|  |  |   |   |   |  |  |   |                     |                                |                        |               |

For all training requirements, please contact us via:  
Email: [training@in.abb.com](mailto:training@in.abb.com)  
Toll free number: 1800 420 0707  
Website: [www.abb.com/service](http://www.abb.com/service)



# Contact us

**ABB Limited**

2nd Floor, East Wing  
Khanija Bhavan  
49, Race Course Road  
Bangalore - 560001  
Tel: +91 80 2294 9150  
Fax: +91 80 2294 9148  
Email: [training@in.abb.com](mailto:training@in.abb.com)

**[www.abb.com/service](http://www.abb.com/service)**