

Analyze^{IT} for Integrated Solutions

ABB: your partner in process analytics



Analytical and advanced solutions for your industry.

ABB

ABB Industrial^{IT} is more valuable than the sum of our Products...

ABB Industrial^{IT} bridges the gap between business assets and Information Technology (IT). It enables all your business assets to work together seamlessly, in real time. ABB's philosophy is to add value from the ground up and with every individual product.

Based on our extensive experience in laboratory and process analysis, ABB Analytical and Advanced Solutions offers a comprehensive Analyze^{IT} Suite to meet the most diverse and stringent requirements for applications and measurement technology as part of the Industrial^{IT} suite of solutions.

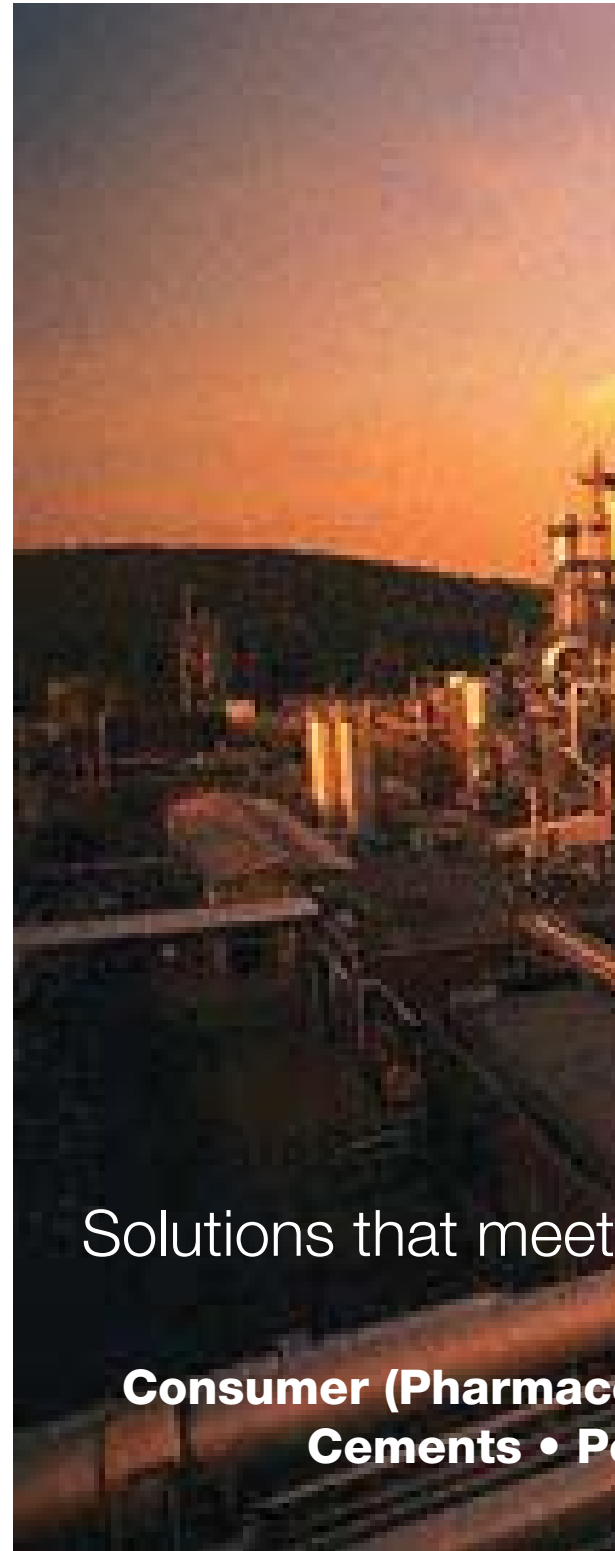
The Analyze^{IT} suite of process analyzers are a critical component of Industrial^{IT}. ABB's analytical team provides:

- Unique applications expertise
- Industrial network architectures providing robust communications over existing infrastructure, allowing administration and maintenance throughout the plant complex and beyond
- OPC communications technology, allowing seamless connectivity to Industrial^{IT} applications (such as Inform^{IT} or Control^{IT}) or third-party OPC-enabled platforms
- Backward compatibility with legacy DCS systems using MODBUS or ASCII communications technology

The Analyze^{IT} products include: continuous gas analyzers, FTIR and FT-NIR spectrometers, gas chromatographs, mass spectrometers, photometers, physical property analyzers and network components.

The Analyze^{IT} family is supplemented by software applications residing anywhere on the analyzer, control, or plant networks. These applications provide access and control to the analyzers for maintenance, diagnostic, and configuration activities. OPC technology facilitates incorporation of software, devices and sampling accessories, providing a broad range of solutions from ABB or third party suppliers.

ABB Analytical and Advanced Solutions can custom-build your Industrial^{IT} solution to maximize profitability and minimize costs. We are your partner in finding Solutions. We work with you from installing and commissioning, through startup and training and continuing to service and maintenance.



Solutions that meet

Consumer (Pharmaceuticals)
Cements • P

“Analyze^{IT} provides solutions that combine analyzers, advanced process control, process and application knowledge to create greater value to our customers.”

Frank DeThomas
Head of Analytical and Advanced Solutions Business
ABB

In industries like yours – across the world
ABB is delivering Industrial^{IT} solutions

industry needs

**Academia • Aerospace & Military • Automotive • Chemicals •
(Pharmaceutical, Food & Beverage) • Environmental • Metals, Minerals,
Petroleum • Power Generation • Pulp & Paper • Semiconductor**

Analyze^{IT} for Process Industries

Petroleum (Refining, Natural Gas & Gas Processing)

- **Process:** Crude oil, transport, storage and blending, refining, hydro processing, blending fuels, finished product blending, alkylation process
- **Solutions:** Gasoline and diesel blending measurements, middle of the barrel processing, sulfur recovery, continuous emissions monitoring (CEMS), analysis for the alkylation process, analysis of the reformate, analysis of the heavy residues. ABB Centers of Excellence include: Enhanced Oil Production, Oil & Gas SCADA, Pipelines, Terminal Automation, Crude Assay, Blending Optimization, Dynamic Solutions, Advanced Process Control, Training Simulators, Energy & Environment Optimization, Safety Consulting, Electrical, Telecommunications, HVDC Light.

Chemicals and Petrochemicals

- **Process:** Petrochemical process technologies from olefins to polymers, polymer flat sheets production, and chemicals including fertilizers, ammonia, and methanol, specialty chemicals
- **Solutions:** Olefins, propylene, styrene, polystyrene, polypropylene, polyolefins, cumene, phenol, bisphenol-A, light hydrocarbons, chlorine, bulk chemicals, specialty chemicals, CEMS, oleochemicals, polyols, isocyanates. ABB Centers of Excellence include: Chemical Flat Sheet, Sustainable Chlorine Envelope, Aspects Exchange Services, Advanced Process Control, Dynamic Solutions, Training Simulators, Energy & Environment Optimization, Safety Consulting, Electrical.

Consumer Industries (Pharmaceutical, Food and Beverage)

- **Process:** Primary and secondary pharmaceuticals, food and beverages, laboratory, on-line and at-line analysis
- **Solutions:** Pharmaceutical industry validation and automation, butter, milk, fat and oil analysis and blending, quality control, environmental, health and safety mandates, packaging, building automation, process analytics technology, raw material identification, on-line drug analysis, solid dosage form content uniformity, solvent recovery.

Metals, Minerals and Cement

- **Process:** Iron, steel and cement
- **Solutions:** Iron and steel: coal mill, top gas, blast furnace, CEMS inclusion and hydrogen measurement. Cement: optimization of kiln control, coal mill, coal bin, CEMS

Power Generation

- **Process:** Utility and process power stations, CEMS, safety monitoring
- **Solutions:** Power stations: combustion control, DENOX and desulphurization, turbo generators. CEMS: Legislation and environmental mandates. Safety monitoring: coal mill, coal bin, electrostatic precipitator

Semiconductor

- **Process:** Wet station control
- **Solutions:** Real-time characterization and control of wet chemicals, wet processes, CEMS

Environmental

- **Process:** Waste disposal, sewage plants, CEMS
- **Solutions:** Waste disposal: waste incinerating plants, landfill Sewage plants: sewage plant gas, sewage sludge incineration CEMS: European legislation, Clean Air Act

Other industries include pulp & paper, aerospace & military, academia, research & development, automotive & fuel cells.

The Analyze^{IT} Suite

Composition measurement for laboratory, on-line and at-line control solutions

ABB's measurement devices calculate chemical or physical composition in real-time. Our analytical products communicate with Industrial^{IT} control systems.

Based on our extensive experience in process analysis and environmental analysis, our Analyze^{IT} Suite is tailored to the interests of the different fields of industry.

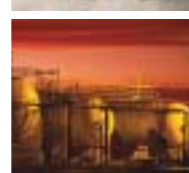
ABB Analytical and Advanced Solutions offers a comprehensive product range to meet the most diverse requirements. According to the task specified, the appropriate measurement method is available as part of the appropriate Analyze^{IT} "package."

ABB analyzers are used in virtually every field of industry including refining, petrochemicals, chemicals, industrial gases, natural gas processing, plastics, pharmaceuticals, metals and minerals, food and beverage, paper and chemical pulp and power generation.

Programs in communications and network engineering make the operation and servicing of analyzer systems simpler, while standards are applied for linking to PCs or distributed control systems.

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Solutions that meet your
present and future needs



FT-IR Analyzer
FTLA2000

FT-IR/NIR Analyzers

With permanent factory alignment of the optics, ABB Fourier Transform Infrared (FT-IR) instruments provide exceptional repeatability and stability over time. They have high sensitivity and photometric linearity. Each spectrometer is manufactured with such close tolerance that all ABB FT-IRs have identical absorbance response providing for easy calibration transfer. The high degree of reproducibility is easily maintained and is verified by means of a simple validation protocol.



Process FT-IR/NIR
System

The FT-IR analyzers allow rapid troubleshooting in the mid-IR range, trouble-free sampling (near IR), and maximum productivity for research and development in analytical chemistry laboratories. They eliminate wet chemistry testing in the QA laboratory and optimize your processes with multi-point on-line monitoring of chemical composition or physical properties. The solutions are available in bench (laboratory), at-line and in-process configurations. The FT-IR analyzers are used in:

- Raw material identification
- Moisture in solids and lyophilized products
- Solid dosage form content uniformity
- Proteins analysis
- On-line dryer monitoring
- Gasoline and diesel blending
- HF alkylation
- Catalytic reforming
- At-line analysis of bitumen and residues
- Sulfur recovery
- In-line butter analysis
- On-line milk analysis
- Oleochemicals
- Edible oils
- Polyols
- Wet process analysis in semiconductor manufacturing



FTPA 2000



AO2000 Series

Process FT-IR/NIR

ABB offers a wide range of process FT-IR/NIR analyzers designed for the real-time monitoring of continuous and batch processes. Real-time monitoring of chemical composition and physical properties is key to providing tight control of industrial processes. Higher yields, higher throughput and improved quality are typical results from the implementation of real-time monitoring systems.

ABB field proven FTPA 2000-400 Series (AFT) offers using single or multi-point sample extractive technology that allow the precise control of sample parameters to achieve the highest accuracy and precision possible for the measurements. The FTPA 2000-200 Series (Network^{IR}) provides convenience using fiber optic and in-situ sampling probe for single-point, multi-point, multi-stream analysis. Fiber optic and probe technology allow for applications flexibility for the analysis of liquids, solids and gases.

As part of ABB Industrial^{IT} solutions suite, FTSW100 process software controls the process FT-IR/NIR analyzers and for seamless integration of data through an open analyzer network architecture. ABB guarantees transferable methods between its analyzers, allowing analytical methods to be transferred seamlessly from one instrument to another with no loss of precision.

- Easy to operate and compact analyzer systems
- Long maintenance intervals
- Complete remote control and monitoring

AO2000 Series

The AO2000 series of process gas analyzers has a modular design that increases flexibility and saves money. Modules can be combined into tailor-made solutions and upgraded to new features at any time. Remote modules are easily attached and centrally operated. Because the emphasis is on functionality and flexibility, legacy system components, third-party instruments and networks can be easily integrated in the AO2000 series.

With the AO2000 series, one system gives you infinite solutions. The AO2000 series is CSA approved for Class 1 Division 2 and ATEX approved for installation in Zone 1/Zone 2. For measuring flammable gases, the AO2000 series incorporates safety tools such as purge control and alarm monitoring. All the analyzers use high-performance measurement technology and simplified calibration that doesn't require test gas bottles. The AO2000 analyzers work with Ethernet and the TCP/IP protocol, with RS 232/RS 485 and the Modbus protocol, and with RS 485 and the Profibus protocol.

Distinguished by our
engineering and manufacturing innovation



Infrared Analyzer Module
Uras14

AO2000 Series (continued)

Infrared Analyzer Module

AO2000-Uras14 is an NDIR (non-dispersive infrared) process photometer that measures up to four components simultaneously and continuously. The NDIR method is based on the absorption of radiation in the medium infrared between 2 μm and 12 μm . The Uras14 is TÜV approved.

The Uras14 measures components such as CO, CO₂, NO, SO₂, N₂O, CH₄, C₃H₈, C₂H₄ and Refrigerant 12. The Uras14 is used in:

- Emission monitoring
- Firing management
- Landfill gas monitoring
- Gas production and purity monitoring
- Burner optimization
- Process monitoring in chemical engineering, steel and iron, power
- Fermentation processes
- Blast furnace gas analysis



UV/IR Analyzer
Module Limas11

UV/IR Photometer

The AO2000-Limas11 UV/IR-photometer selectively measures the concentration of up to five components. The four-beam method provides excellent stability. Selectivity is achieved using the measuring wavelength and reference wavelength, gas filters and electronic balancing of cross-sensitivity. The Limas11 measures components such as NO, NO₂, SO₂, H₂S, CS₂, COS, Cl₂, CO, CO₂, COCl₄, HCl, and hydrocarbons (including chlorinated components). The Limas11 is used in:

- Burner optimization
- Managing DeNO_x systems
- Emissions monitoring of fossil fired furnaces
- Nitric acid production
- Cement production
- Exhaust gases or purity measurements in the chemicals industry
- Production and processing of cellulose and viscose rayon
- Natural gas conditioning
- Production and processing of Chlorine
- Plastics production
- Phosgene processes



TC Analyzer Module
Caldos15/17

Thermal Conductivity Analyzer Module

The thermal conductivity analyzer module Caldos 15/Caldos 17 exploits the varying thermal conductivities of different gases. Because of its glass coated cell, the Caldos 15 can be used in highly-corrosive applications. A silicon sensor inside Caldos 17 allows especially rapid measurement and extremely small measuring ranges. The Caldos 15 measures components such as H₂ in Cl₂, SO₂ in N₂/air and H₂ in N₂/air. The Caldos 17 measures components such as Ar in O₂, H₂ in Ar, H₂ in N₂/air, CH₄ in N₂/air, Ar in N₂ and He in N₂.

The Caldos 15 is used in:

- Chlorine production
- Sulfur dioxide in smelter off-gas
- Ammonia dissociation

The Caldos 17 is used in:

- Hydrogen purity measurement
- Turbo generator monitoring
- Inert gas monitoring
- LEL monitoring

Oxygen Analyzer Modules

The measuring principle used in oxygen analyzers is based on the specific paramagnetic behavior of oxygen. The Magnos106 exploits the magneto-mechanical measuring principle, measuring the force that oxygen molecules must exert so as to turn a body suspended in a magnetic field. The Magnos17 exploits the thermomagnetic measuring principle, which is based on the temperature dependence of paramagnetism (creation of a "magnetic wind"). Both analyzers are TÜV approved. These analyzers measure O₂.

The Magnos106 is used in:

- Air fractionation plants
- Biochemical plants
- Process gas measurement
- Oxygen purity measurement
- Emission monitoring

The Magnos17 is used in:

- Flue gas analysis
- Roasting gas analysis
- Cement flue gas analysis

No matter how difficult your application
ABB is committed to the solution



FID Analyzer Module
MultiFID14

AO2000 Series (continued)

FID Analyzer Modules

The MultiFID14 flame ionization detector measures the total content of organic carbon in the sample gas. During the combustion of organic substances in a hydrogen flame, electrically charged particles are produced. The resulting current of these ions is proportional to the organic carbon content. The MultiFID14 NMHC (nonmethane hydrocarbon) detects the total amount of organic carbon with or without methane carbon. The MultiFID14 measures the total content of hydrocarbons. The MultiFID14 is used in:

- Emission monitoring
- Process control/LEL monitoring
- Monitoring of volatile hydrocarbons in water in combination with a stripper

meets the requirements for installation in Zone 1, Category 2G (according European ATEX Legislation).

The safe touch screen allows easy control inside a hazardous location without opening the housing. Independent analyzers in their own flameproof cylinders can be mounted apart from the controller. Three types of ATEX-approved instruments are available:

- IR photometer Uras14 for measuring components such as CO, CO₂, SO₂, NO
- Paramagnetic Oxygen Analyzer Magnos106
- Thermal conductivity analyzer Caldos17 for measuring components such as H₂, Ar, CO₂

Industrial Mass Spectrometers

The ABB industrial mass spectrometers IMSQ4-1, IMSQ4-2 and IMSQ4-GP (formerly the Questor IV and Questor GP Mass Spectrometers) are designed for real-time monitoring and control of many petrochemical and industrial processes.

These low maintenance mass spectrometers provide fast and accurate gas analysis from percent levels to parts per billion. The rugged and reliable IMSQ4-1 and IMSQ4-2 is designed for use in virtually any environment. The IMSQ4-GP (General Purpose) is designed for use in non-hazardous environments.

These quadrupole mass spectrometers measure up to 128 streams quickly, accurately and almost continuously (300 msec/1sec per component). Mechanical wear is eliminated through seal-less technology. The industrial mass spectrometers are used in:

- Chemicals and petrochemical applications such as ammonia plants and in the production of ethylene oxide (EO/EG), ethylene, methanol and polyethylene
- Monitoring of room air
- Steel production
- Fermentation
- Environmental monitoring for benzene, acrylonitrile, toluene, xylene and chlorine



EL1020 Series
Gas Analyzers

EL1020 Series Gas Analyzers

The EL1020 family is ABB's entry line of products for continuous gas analysis. EL1020 analyzers offer a robust but nevertheless low priced option for measuring gas concentrations in numerous applications inclusive flammable gases in non-hazardous locations.

The EL1020 series incorporates ABB's proven measuring technology like infrared photometer, thermal conductivity analyzer and paramagnetic oxygen analyzer, extensive self-diagnosis functions and simplified calibration without test gases for many applications. The analyzers are easy to link to PCs or PLCs. The EL1020 series is used in:

- Bio-fermentors
- Landfill
- Combustion processes
- Ambient air monitoring
- Warehouses and fruit storage
- Oxygen purity measurement



EL6010 Series

EL6010 Series Gas Analyzers

The EL6010 series of analyzers are specially designed for hazardous areas. Their robust flame-proof design

ABB – the number one choice for compliance and performance

The Analyze^{IT} Suite



Process Gas Chromatographs

Process Gas Chromatographs

With the ABB Analyze^{IT} PGC2000 Series of process gas chromatographs (formerly Vista II 2000 Series), ABB Analytical has set a new standard for ease of operation, quality and reliability. The PGC2000 Series also raises process gas chromatography technical standards, with more compact design, improved serviceability, superior connectivity and digital analytical control. No other process gas chromatograph offers the versatility and broad capability of the PGC2000 series:

- PGC2000 Standard GC with TC (thermal conductivity) FID (flame ionization detector) FPD (flame photometric detector)
- PGC2002 Simulated Distillation
- PGC2005 Temperature Programmed GC
- PGC2007 Fuel Sulfur Analyzer

The PGC2000 series is used in chemical, petrochemical and petroleum applications, such as:

- Chemical process measurements for hydrogen, air separation, synthesis gas
- Olefins (e.g. furnace, acetylene converters and fractionation), bulk intermediates (e.g. phenol, LAB, maleic anhydride, styrene, EO/EG) and polymers (e.g. polyolefins and polystyrene)
- Natural gas, LPG and fuel-gas applications
- Gasoline blending components
- Gas oil conversion units and diesel blendstock properties including low-level sulfur content
- Low-sulfur and reformulated fuel properties

Process Photometers

The ABB process photometers PUV3402, PIR3502 and PFO3372 (formerly Vista II Multiwave Photometers Models 3402 and 3502) provide continuous on-line measurement of gas or liquid components, in simple or complex process streams, for process control, product quality assurance, safety, catalyst protection and area monitoring. They operate in the infrared (IR), near infrared (NIR), ultraviolet (UV) and visible (VIS) regions.

The filter photometer accepts up to eight wave lengths, increasing the number of measurement

solutions. Because it uses multiple wavelengths, the photometer can compensate for many types of interference and handle multiple component applications. The process photometers connect to VN2300 analyzer network and the PFO3372 incorporates the use of fiber optic sampling accessories for added measurement capability. The series includes: PIR3502 process infrared photometer, PUV3402 process ultraviolet photometer and PFO3372 process fiber optic photometer. These process photometers are used in measuring and monitoring:

- Isocyanate in chloroaromatic solvent
- Ambient air
- Multicomponent monomers in polymer process
- Water in organics, such as ethylene dichloride (EDC)
- Caustic in acid gas scrubbers
- Color (ASTM, APHA, Saybolt Color Units)
- Chlorine in phosgene
- %T @ multiple wavelengths in glycol processes



Process Photometers



PPA4100 RVP Analyzer

Physical Property Analyzers

The PPA4100, PPA4101 and PPA4102 accurately measure Reid Vapor Pressure throughout the gasoline range of 0 to 20 psia. The PPA4100 offers a simple, reliable, compact, single cell design that requires minimal operator interface, minimal maintenance and no calibration. It validates every analysis with self-diagnostics. The PPA4100, PPA4101 and PPA4102 Series analyzers are used for gasoline blending.

The ABB PPA4230 (formerly the Model 4230) measures hydrogen sulfide in gas streams (such as reformer recycle gas, natural gas pipelines and ethylene/propylene plants) by using lead acetate paper tape method coupled to a photocell. The rapid response of the PPA4230 enables fast corrective action when high levels of H₂S are detected, for better catalyst and corrosion protection in gas plants. The PPA4230 analyzer is used in measuring and monitoring:

- Hydrogen recycle gas
- Natural gas pipelines
- Fuel gas
- Propane/butane mixtures
- Storage tanks



PPA4230 Analyzer

Unique and innovative
solutions from ABB

Integrated Analyzer Systems



Analyzers, Networks and Components

The Analyze^{IT} family is supplemented by software applications residing anywhere on the analyzer, controller or plant networks. These applications provide access and control to the analyzer for maintenance, diagnostics, and configuration activities. OPC technology facilitates incorporation of software, devices and sampling accessories, providing a broad range of solutions from ABB or third party suppliers.

Our analyzers, networks and components provide:

- Unique applications expertise and methods specifically for your solution.
- Industrial network architecture provides robust communications over existing infrastructure, allowing administration and maintenance throughout the plant complex and beyond communicating with our analyzers seamlessly.
- Our OPC communications technology allows seamless connectivity to ABB Industrial^{IT} applications (such as Inform^{IT} or Control^{IT}) or third-party OPC-enabled platforms.
- Backward compatibility with legacy DCS systems using MODBUS or ASCII communication technology.

ABB Analytical and Advanced Solutions can custom-build your Industrial^{IT} solution maximize profitability and minimize costs. We are your partner in finding solutions.

There is an ABB Analytical solution that can help ensure process integrity, process quality and manufacturing productivity.

Emissions Monitoring Systems

The ACF-NT and ACN gas analysis systems are the most advanced analytical packages available for Continuous Emission Monitoring Systems (CEMS). The systems combine multi gas analysis, I/O for system control and alarms, diagnostics, and a simple user interface in a single unit.

The modular system design means analyzer or sample system modules can be replaced in minutes or added in the future to provide additional gas measurements.

- Reliable, accurate measurement with accepted methods including FTIR, NDIR, UV-RAS, Paramagnetic, ZrO₂ and FID
- Menu-driven displays guide the operator through setup, configuration, calibration, operation, and maintenance functions
- Accepts analog or digital inputs and controls external devices such as opacity monitors, flow monitors, and other instruments to provide common control and reporting
- Low maintenance/high reliability
- Hot wet or cold dry measurements
- Complete remote control and monitoring through standard Ethernet interface
- Daily validations can be performed without test gases
- OPC enabled

Integrated Systems and Services

ABB provides all the services required for complete, integrated analyzer systems, from initial engineering through manufacturing, testing, field startup and support. Our quality-built systems are delivered on time and supported by experienced professionals from systems manufacturing facilities in Houston, USA; Telford, UK; and Shanghai, China.

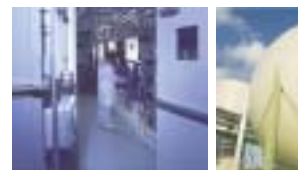


Emissions Monitoring System



Integrated Systems

Proven, reliable technology
to meet your needs precisely



Analyze^{IT} value proposition

ABB - Your Partner in Analytical and Advanced Solutions

ABB Customer Support Services

Our portfolio of customer support services keep your solutions and products current and increase your return on investment while enhancing availability and performance.

At ABB, we understand the pressures of your business and are dedicated to providing fast, timely solutions where and when you need them. We know that you need the highest levels of service and support to attain your goals in the highly competitive world in which we do business. We set the same high standards of quality, precision and reliability for our after-sales service that we set for our products.

ABB will work closely with you to develop solutions to meet your specific needs. We offer a wide range of customer support services, including method development and both in-house and on-site personnel training, as well as startup, commissioning, system validation, calibration, preventative maintenance plans and after-sales service.

ABB's Customer Support Service Center is staffed with trained professionals and qualified technical personnel who keep up-to-date on new technology, products and service tools through regular workshops. These characteristics are key factors in the high level of customer satisfaction. The Customer Support Service Center handles:

- Commissioning (Field Start-up)
- Contracts (Preventative Maintenance, Total Maintenance, Full Service)
- Maintenance
- Technical Support
- Training (Operator Training, Maintenance Training)
- Upgrades
- Parts and Repairs (Warranty Exchange, Refurbishment)

Contact the ABB Service Center to schedule on-site service, order parts, receive technical support or register for training.

Some of our satisfied customers

- Advanced Micro Devices
- Agropur
- Alcan
- Alstom Power
- AMPI
- Ansaldo
- AstraZeneca
- Aventis
- BASF
- Bayer
- BP
- Bristol-MyersSquibb
- British Energy
- China Steel
- Citgo
- ConocoPhillips
- Dow Chemical
- DuPont
- ExxonMobil
- FLS
- Foster Wheeler
- General Electric
- General Mills
- GlaxoSmithKline
- Holcim
- Huntsman
- Infineon Technologies
- LaFarge
- Lurgi
- Merck
- Micron Technology
- Petronor
- PPG
- Pfizer
- PowerGEN
- Sanofi Synthelabo
- Saputo
- Shell
- Solutia
- Solvay
- Thyssen Krupp
- Total
- United Milk
- Wacker Siltronic



ABB's Analytical and Advanced Solutions



Analyze^{IT} for Process Industries

- Petroleum
(Refining, Natural Gas & Gas Processing)
- Chemicals and Petrochemicals
- Consumer Industries
(Pharmaceutical, Food & Beverage)
- Metals, Minerals and Cement
- Power Generation
- Semiconductor
- Environmental

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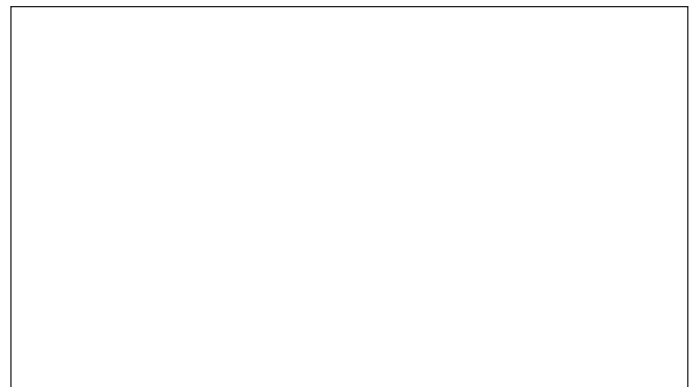
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