Quality Control QCS800xA
The right mix of skills, experience, quality control products and service
ABB understands the papermaking business and the challenges you face today. We combine our extensive and expert knowledge of your markets, your business and your processes with our world-class products and services.
Scanners

ABB Network Platforms are the industry’s strongest and most advanced scanners, providing the process information necessary to optimize product quality. Scanning Platforms are self-contained; the on-board distributed architecture converts sensor inputs into engineering units that are spatial and temporally identified without external processing. The design facilitates rapid installation and expansion. A PC based engineering tool plugged into the end column, or connected via the mill network, makes troubleshooting easy. Working with ABB Sensors and Scanners gives you outstanding process visibility together with the most advanced control in the industry, enabling papermakers around the world to further optimize their paper machines.

ABB provides scanning solutions on more paper machines than any other company. We have earned this trust by providing the best QCS measurements and controls in the industry.
Network Platform NP1200
The Network Platform NP1200 provides scanning sensor support on processes of all sizes. Its rock solid 10 mm steel A-frame design is unparalleled in providing a sound foundation for measurement success. To ensure reliable performance in even the harshest mill environments, the system is pressurized by air and has a welded and well-sealed exterior with no service covers.

Network Platform NP700
The Network Platform NP700 provides a compact design, featuring an unparalleled strength-to-size ratio. It offers the opportunity for NP1200 quality and performance where space restrictions require a small footprint.

Network Platform RNP1200
The Network Platform RNP1200 supports ABB single-sided infrared measurements for process locations such as wet presses, coaters and size presses.
Measurements

As an industry leader, ABB prides itself in its ability to provide unique, leading-edge process measurements such as the new HPIR-FW Fiber Weight Sensor, HPIR Moisture Sensor and the revolutionary Optical Caliper Sensor.

In response to your needs, we also offer multiple basis weight, moisture, caliper and coat weight measurement solutions. This provides the freedom to choose process-optimized solutions.

HPIR-FW
Tissue production is an especially demanding process. Whether it’s energy, resources, capital or assets, tissue makers are constantly challenged to meet demanding requirements. Finding a supplier that thoroughly understands the elements involved in tissue production is critical to succeeding in today’s tough business environment.

ABB is ready to help with a tissue measurement solution without radiological isotopes and the regulations associated with them. Using a simple and proven design that delivers safe and reliable performance, HPIR-FW (High-Performance Infrared-Fiber Weight) directly measures fiber weight and moisture in a single sensor, enabling tissue makers to control two of the most expensive costs in the process – fiber and energy.

Basis Weight
ABB Basis Weight Measurement provides unparalleled accuracy and streak resolution. These sensors minimize, measure and control the mass of air between the measurement heads, resulting in the most accurate weight measurement available. The sensors use Krypton, Strontium or Promethium isotopic sources, depending on the application requirements.
“Optical Caliper is working with CD caliper control. We are very satisfied. It looks good! We have no problems on the paper edges. Measurement profiles agree with the laboratory. No marking or sheet damage, no holes picked.”
Peter Kluttig, Manager Process Automation Stora Enso Sachsen GmbH, Germany

**Optical Caliper**
Accurate caliper measurement and control are critical for defining paper quality and achieving customer satisfaction. Traditionally this has been achieved through the use of dual-sided contacting caliper sensors, but some paper applications pose severe challenges for contacting caliper measurement technology.

For this reason, ABB has developed a groundbreaking new non-laser-based Optical Caliper Sensor. ABB’s revolutionary optical technology is based on the confocal displacement method, to measure caliper online with unrivaled accuracy and stability.

**HPIR**
Excellent moisture measurement is critical to papermaking because almost every controllable parameter on the paper machine has an impact on moisture. HPIR (High-Performance Infrared) measurement provides the most precise tool available to measure moisture with the confidence needed to maximize control performance and to save both energy and fiber cost.

The compact optical and electro-mechanical design is robust and inherently stable, ensuring high performance even in severe environments. The innovative optical design doubles the signal to noise ratio of the instrument, removing bandwidth constraints imposed by chopping to provide an industry leading moisture measurement rate.
Measurements

Caliper
ABB Caliper Measurement incorporates sensing heads that combine low density, extreme durability and dirt-repelling qualities. These unique sensing planes glide smoothly over the sheet for superior measurement without damaging the sheet. Caliper options include a Light Touch solution for the most delicate processes and sensing heads optimized to reduce maintenance on grades with high recycle content.

Ash
ABB X-ray Measurement is optimized to measure the inorganic component of paper even in the face of a variety of furnish. Inorganic mixtures that include titanium dioxide, calcium carbonate, silicon dioxide, talc, aluminum oxide and highly refined clay derivatives are measured with ease. ABB offers several application-optimized sensor models to match your requirements for inorganic additives, coating composition and basis weight range.
**Fiber Orientation**

ABB continues its history of innovation with the first true online two-sided fiber orientation measurement, freeing operators from the constraints of laboratory gauges, and providing the information necessary to eliminate process problems such as curl and twist warp, while optimizing MD/CD sheet strength. Fiber orientation offers an insight into runnability on both the paper machine and converting equipment, and on your customers’ printing presses or copy machines.

**Color**

ABB Color Measurement provides the capability to measure and control colors, from high whites to deep shades. ABB color measurement provides online performance that rivals laboratory instruments. A unique high-intensity, UV-rich Xenon flash is employed. Advanced signal processing totally partitions the influence of whitening agents from shading dyes for improved color control and better agreement with laboratory instruments. The online instrument has sealed optics and is non-contacting. Patented opacity compensation provides tracking with laboratory instruments. Patented technology is employed to eliminate errors induced by process scanner deflection.
Measurements

Gloss
The Gloss Measurement simulates the human eye’s perception of gloss to provide continuous online gloss measurement in accordance with TAPPI standards.

OptiPak
ABB combines measurement of formation, opacity and brightness in one compact package. Simultaneous measurement of these optical sheet properties provides the information necessary to reduce wet end breaks, improve uniformity and optimize opacifier use.
Service Workstation

Commission, monitor, maintain and troubleshoot ABB Network Platforms, sensors and profiles with Service Workstation. This user-friendly application is accessible via millwide networks and to remote users via the Internet for system support. Service Workstation includes advanced health reporting for the scanner, sensors and electronics.

Network Platform engineering tools

Enhanced diagnostics tools and displays have dramatically increased the customer access to the measurement performance data and paper process data. These tools have increased the visibility into the scanning platform operation to help ABB service engineers be more efficient in their customer service, and to better enable customers who choose to perform their own service.

Moisture measurement

Moisture is a fundamental paper measurement. ABB offers two additional technologies to uniquely match your application requirements.

Transmission Moisture

Transmission Moisture Measurement analyzes multiple wavelengths of infrared energy transmitted through the sheet to directly calculate percent moisture and eliminate the need for basis weight compensation. Transmission Moisture Measurement provides high accuracy and precision with fine streak resolution and ultra-fast measurement rate.

Reflection Moisture

Reflection Moisture Measurement provides single-sided, non-contacting surface moisture measurement across a wide process range – from wet press to bone dry levels. ABB’s Reflection Moisture Measurement requires no basis weight sensor compensation on most grades – providing direct moisture measurement.

Microwave Moisture

Microwave Moisture Measurement provides dual-sided, non-contacting measurement of processes having high moisture, high basis weight or dark pigments. It is insensitive to moisture layering and carbon black content often found in recycled paper. Popular applications include multiply board and pulp dryers.

Coat weight measurement

Customer requirements and process conditions require a consultative approach to coat weight technology selection. ABB offers the expertise and technology to meet your coat weight requirements by using one of three methods.

X-ray Difference

X-ray Difference offers high measurement sensitivity to coating solids, combined with low sensitivity to cellulose and water. ABB’s patented X-ray filtering techniques eliminate calibration shifts due to coating composition changes. X-ray Difference measurement is optimized for grades up to 350 gsm (215 lbs/3,000 ft²).

Reflection Coat Weight

Reflection Coat Weight Measurement uses direct infrared absorption to measure the influence of clay, latex, calcium carbonate, cellulose and moisture to accurately calculate coat weight and percent moisture. Reflection Coat Weight is optimized for coated board grades or lightweight processes with simultaneous dual-side coating.

Dry weight difference

ABB’s high signal-to-noise ratio Basis Weight Measurement offers unparalleled coat weight accuracy at a lower capital investment.
Today’s profiling solutions require tighter zone spacing, higher precision, accurate mapping and creative control solutions. ABB's focus on quality using our new xP (eXtended Profiling) actuators provides the accuracy, precision and speed required by today’s challenging control applications. ABB’s knowledge and experience with all types of cross-direction actuator technologies and applications on all kinds of sheets means ABB knows how to effectively provide the best profiler solution.
Induction xP
This revolutionary actuator from ABB controls caliper and sheet finish gloss by applying induction heating to hard nips, soft nips and supercalenders. It uses 60 mm, 75 mm and/or 120 mm workcoil zones, compatible for any diameter roll, which can be installed in a variety of hybrid options to best match machine needs. The universal workcoils are powered by the world’s smallest, patent pending, 6,000 watt power modules, hydraulically cooled to increase life span, packaged into a single beam with the workcoils providing the most efficient AC induction actuator available.

- 50-90% reduction in profile variability
- Improved sheet finishing properties
- Reduced rejects
- Improved reel build
- Highest power density and efficiency available
- Simplified workcoil gap adjustment

SteamPlus xP
The SteamPlus xP wet end profiling steambox improves on previous steambox designs by controlling 100% of steam flow across the web. The SteamPlus xP is truly a total profiling actuator system because there are no unsegmented steam sections that reduce the amount of sheet temperature differential. The SteamPlus xP utilizes the proven, maintenance free, T880C pneumatic actuator, designed for highly corrosive environments (e.g., tissue, newsprint and pulp). The rigid “solid beam” design allows a smaller and lighter beam construction, yet maintains structural integrity for installation in the most challenging locations, while also providing for the highest steam usage efficiency in the industry. The “drip free” SteamPlus xP typically provides the following benefits:

- 5% to 10%+ increase in production or 5% to 10%+ reduction in energy costs
- Up to 80% reduction in moisture profile variability
- 10-year T880C pneumatic actuator guarantee
- Increases press felt life, sheet strength properties and sheet surface properties

“We consulted several other suppliers, however ABB was chosen for this project because of brand value, service and customer care. We have more confidence in ABB products than other suppliers.”
Ramkishan Rao, Electrical and Automation Manager for Esa Kertas Nusantara, Indonesia
CD Control

Slice xP
ABB pioneered stepper control of headbox slice spindles in 1985. Since then close to a thousand headboxes have utilized ABB actuators and controls to produce CD weight profiles with consistently low variability. Slice xP (extended profiling) is the very latest version of linear actuator technology. It is designed to meet exacting specifications that exceed process requirements. Slice xP is easy to install and maintain, and the rugged design is both robust and highly reliable.

- Reduced profile variability
- High-speed positioning and accuracy ensures the fastest possible recovery from grade changes and process upsets
- State of the art non-contacting positioning sensor maintains absolute positioning accuracy
- Measurement Fusion Techniques increases positioning measurement quality and reliability over actuator’s lifecycle
- Patented power supply solution with builtin backup, allows simultaneous movement of actuators at all times
- Simple installation and cabling
- Advanced diagnostics
- Built-in monitoring of each actuator
- Removable Service Module allows for rapid actuator replacement with no impact on slice lip alignment or profile disturbance

Dilution xP
Since 1994 over 150 dilution headboxes and radial distributors of all manufacturers have utilized ABB actuators or controls to produce CD weight profiles with consistently low variability. Dilution xP is the very latest version of rotary actuator technology. It is designed to meet exacting specifications that exceed process requirements. Dilution xP is easy to install and maintain, and the rugged design is both robust and highly reliable.

- Reduced profile variability
- High-speed positioning and accuracy ensures the fastest possible recovery from grade changes and process upsets
- State of the art non-contacting positioning sensor maintains absolute positioning accuracy
- Measurement Fusion Techniques increases positioning measurement quality and reliability over actuator’s lifecycle
- Patented power supply solution with builtin backup, allows simultaneous movement of actuators at all times
- Simple installation and cabling
- Advanced diagnostics
- Built-in monitoring of each actuator
The Air-Water xP Profiler offers the most robust design in the industry. There is very little maintenance, and reliability is significantly improved by eliminating the requirement for electronics in the hot and humid environment associated with remoisturizing actuators. Performance is ensured even if the water supply is less than optimum. The nozzle and actuator design eliminates small orifice requirements associated with needle valve or solenoid flow control arrangements and as a result is much less susceptible to plugging.

- 80% reduction in profile variability and improved reel building
- Precise, continuous flow control without electronics
- Pressure balanced flow control maintains predictable flow impervious to wear, buildup or water pressure variations
- Precise, homogeneous, droplet size delivers excellent sheet absorption
- Minimum zone-to-zone interaction eliminates air-induced streaks
- Common air and water headers eliminate tubing and piping in the actuator beam for simplified maintenance

Coat Weight xP
ABB’s Coat Weight xP is the fastest, most accurate and reliable coating profile bar or coating rod positioner available. Coat Weight xP ensures an optimum, smooth blade or rod coating application through precise positioning of the coater blade by using the same advanced interface hardware, cabling and mechatronic techniques as ABB’s Slice xP and Dilution xP actuator systems. Coat Weight xP is easy to install and maintain, and the rugged design is both robust and highly reliable.

- Reduced profile variability
- High-speed positioning and accuracy ensures the fastest possible recovery from grade changes and process upsets
- State of the art non-contacting positioning sensor maintains absolute positioning accuracy
- Measurement Fusion Techniques increases positioning measurement quality and reliability over actuator’s lifecycle
- Patented power supply solution with builtin backup, allows simultaneous movement of actuators at all times
- Simple installation and cabling
- Advanced diagnostics
- Built-in monitoring of each actuator
- Removable Service Module allows for rapid actuator replacement with no impact on slice lip alignment or profile disturbance

“Installation of the Air-Water xP actuators has seen the number of customer complaints about CD moisture profile fall to zero.”
Ivan Ratovcic, Head of Measuring and Control Engineering, Belišće Pulp and Paper Mills, Croatia
Process control

ABB’s Quality Control Solutions offer papermakers the most precise Machine-Direction (MD)/Cross-Direction (CD) time-based measurement separation, reliable multivariable Machine-Direction Controls, the latest Multivariable Cross-Direction (MCD) Controls and powerful color control applications.

Time-based Measurement

ABB Time-based Measurement updates MD and CD variations with both scan and single point data at every five seconds, reducing unnecessary scan delay. The approach provides the well separated MD and CD components for control continuously. Time-based Measurement enables highly responsive MD and CD controls which significantly reduce sheet variations, resulting in uniform sheet.

Machine-Direction Controls

ABB MD Controls apply accurate control actions based on multivariable models to predict long delay process responses. This results in fast response for all operations, achieving targets with the shortest transition and minimizing process variability.

Automatic Grade Change utilizes patented advanced multivariable models for predicting and eliminating rapid sheet weight and moisture dynamic variations during grade change transitions. The new innovative grade change allows faster, smoother grade changes with less broke and avoids sheet breaks.

ABB MD Controls include:

- Dry Stock Flow Control
- Model-based multivariable feedback control
- Multi-frame Inferential Control
- Coordinated Dryer Control
- Dryer Ratio Control
- Headbox Control
- Coordinated Speed Change Control
- Speed Optimization Control
- Multi-Stock/Ply Distribution Applications
- Coat Weight and Gloss Controls
- Auto Grade Change Control
Combined numeric and graphic display enables the operator to adjust targets and pump settings while monitoring the effect on historical trends.

**Dual-sided Multivariable Color Control**

Controlling to different shade targets for colored sheets is one of a papermaker’s most challenging tasks. ABB’s Color Control and Advanced Shade Change Control offer a comprehensive solution to assist papermakers in producing top-quality colored paper.

ABB’s Color Control pioneered the application of Kubellka-Munk theory to model dye additions. The control matrices dynamically adapt to dye characteristics, shade targets, color deviation weightings and machine running conditions. The amount of dye added is automatically normalized to throughput, and the shade is consistently maintained throughout any production change. The flexibility of the control allows the use of various types of dye pumps and a wide range of dye selection including OBAs (Optical Brightening Agents). ABB’s color control provides the ability to control Brightness/Whiteness using OBA dyes, which is vital to ensure consistency of shade in today’s hi-white paper grades.

**Advanced Shade Change**

ABB’s Advanced Shade Change models the complex coloring process from stock preparation to reel and provides the required boosting for desired fast response. The program coordinates the addition (or removal) of dyes and OBA, so that the combined responses reach the reel simultaneously. ABB’s Advanced Shade Change also records the historical dye usage as part of the shade recipe allowing this data to be reused to produce the same shade on a consistent basis. The combined effect of all these features is a significant reduction in shade change time.

ABB’s Color Control and Advanced Shade Change have been widely applied to all shades of the spectrum from deep shade specialty papers through light pastel shades to hi-white products. It has become an integral part of the QCS system for many mills.

This solution offers a complete set of features including:

- Multivariable Color Control
- Fluorescent Whiteness (OBA) Control
- Dual-Sided Color Control
- Advanced Shade Change
Cross-Direction Control

ABB CD Profile Control offers the most reliable and best performing solutions for the pulp and paper industry. This CD control suite provides a full range of options for various applications including weight, moisture, caliper, coat weight and gloss. The fully automated bump test tools allow process engineers to easily identify the process response and the mapping parameters.

ABB’s CD Control features include:

- Wavelet filtering
- Target profile shaping
- Auto mapping and response identification
- Grade dependent tuning
- Edge data and edge zone handling
- Fast startup and recovery

Enhanced CD displays allow for easy identification of the actuator to the process.

Multivariable Cross Direction Control (MCD)

A mill’s primary goal for any set of CD controls is to produce a paper sheet where all of the profiles (weight, moisture, caliper, fiber orientation) are uniform. To achieve this, mill personnel try to minimize profile variations – which can lead to competing control actions among multiple sets of actuators. ABB’s MCD application simultaneously optimizes and balances multiple paper quality CD profiles, while coordinating the contributions of multiple sets of CD actuators within their operational limits.

MCD coordinates multiple sets of CD actuators used for controlling multiple profiles of sheet properties. It delivers the most effective results by empowering operators to set the best balance among the objectives using a simple and intuitive operator interface.

State-of-the-art technique for separating controllable profile variation from noise, enabling responsive CD control and minimizing profile 2-sigma.
ABB’s unique LV Control monitors both profiles and actuator actions continuously and promptly performs corrections to localized profile variations. It automatically detects and corrects local mapping variations, without operator intervention or disruptive bump tests. This control can also be added to the existing ABB Nexus based CD Controls. ABB’s CD Solution with LV Control provides papermakers with consistently low 2-sigma profile values.

ABB’s LV Control includes:

- Identification of problem areas
- Local mapping optimization
- Stable CD profiles under different conditions

Wavelet Profile Filtering

ABB’s CD Control utilizes patented modern wavelet algorithms that are widely used in image processing, communication and many other applications. The wavelet filter implemented in ABB CD Control effectively separates the controllable profile from the raw measurement. The application of the wavelet filter significantly enhances profile signal to noise ratio, avoids aliasing effects and contributes to improving the performance of CD control applications.

State-of-the-art technique for separating controllable profile variation from noise enabling more aggressive CD control and lower 2-sigma.

“ABB CD solutions with LV Control perform very well. The resulting profile uniformity is consistent and stable.”

Dave Moore, Senior Process Engineer, SAPPI Somerset Mill, USA
ABB has developed a range of data collection and optimization tools compatible with all OPC systems. This enables the process engineer to easily access key information for analysis and optimization.

ABB ServicePort™: Channeling ABB experts

ABB ServicePort is a secure, remote-enabled service delivery platform that provides control systems with a secure connection to ABB services and expertise. Acting as an onsite channel guide, it enables delivery of local and remote services and provides access to the latest ABB equipment and process diagnostics.

Three categories of channels offer specific benefits:

- **Equipment Performance Channels** diagnose and facilitate services for ABB manufactured products, such as control systems, motors, drives, instruments and analyzers
- **Process Performance Channels** include services that diagnose and improve production processes
- **Industry Performance Channels** diagnose and improve equipment or processes specific to a certain industry

Through continuous monitoring of equipment and process variables, ServicePort creates a rich data pool to analyze and troubleshoot equipment and process issues. Customers can view related Key Performance Indicators (KPIs) to drive and implement improvements faster and more efficiently.
The ABB QCS generates extensive MD and CD data. Smart Client provides the means to access this data via user-friendly applications.

**QCS Smart Client**

All QCS data are just a mouse click away. The ABB QCS800xA system generates extensive data in both the Machine Direction and Cross Direction of the process. The Smart Client application uses a true Thin Client server to seamlessly retrieve this data to the desktop PC and provide the required analysis to generate useful information.

- **QCS Profile History**
  - Profiles are stored for months or longer
  - Several contour maps can be overlaid for a single view of several sensors
  - Trends and Profiles can be combined into a single display

- **QCS Reports**
  - All QCS report data can be stored for years
  - Instant online access of all data
  - User configurable reports
  - Graphics package – user-configurable displays
  - Trends and SPC – online analysis of process information

Also available as options are:

- Alarms and Events – analyze system, process and operator actions
- Lab system – record and store QC lab data
- Excel® Interface – drag and drop real time data and history into Excel
ABB Quality Control Solutions are implemented on the System 800xA control platform. This enables you to view operator displays, control status, process data, machine drawings and other useful information, including paper quality control, drives, pulp mill control and stock preparation controls.

Additional information is easily available via the right click context menu, which enables users to quickly analyze the situation and make a decision.

**Completely integrated solutions**

While others are only beginning the effort to tie fundamentally different systems together in a common user interface, ABB has been using a common platform for both control and user interface for all of its new products since 2001.

ABB’s pulp and paper customers can now realize the advantages of a system based on an architecture that ties together all major automation systems commonly found in a pulp and paper operation.

ABB breaks down the information barriers found in a mill’s systems to enable cost effective enterprise-wide use of information. Whether it’s putting automation system data in the front office, bringing legacy system interfaces into automation systems or building new production management applications, ABB can do it.
“With the changes ABB made throughout our mill, I am very happy to say we are getting the results we wanted. We are lucky to have all our information technology supplied by ABB.”

Anthony Tan, MNI Production Manager

Quality Control QCS800xA is a core product working as a totally integrated component with other ABB Solutions such as Paper Machine Drives, Open Control Systems, Field Instrumentation, CPM Systems and Web Inspection Systems, paper companies are reducing maintenance costs and increasing asset utilization in addition to making better paper.
Quality Control Objects and Aspects
QCS user interface displays are an integral part of the System 800xA Platform. Quality Control Objects and Aspects provides information associated with paper machine quality control. A user can control all of the papermaking process from one location.

Easy to use displays are provided for machine operators. You can instantly view high resolution measurements, machine-direction and cross-direction variations, profile contour maps, reel reports, grade reports, documentation and support tools.

All data are easy to export to standard spread sheets for convenient data capture and analysis. Having access to real-time quality control information enables better process decisions – reducing waste, saving raw material and ultimately increasing shareholder value.

ABB provides a full suite of displays, giving access to all Quality Control information.
ABB’s lifecycle management advantage
With the introduction of open standards for operating systems and standard PC hardware and software, process automation system owners were presented with a new challenge. While in the past there was a level of protection from frequent software updates and the need for constantly increased connectivity requirements, now these parameters are in a constant state of flux. The need for a focused and active lifecycle management program is clear.

StepUp
StepUp programs simplify the upgrade process, provide enhanced performance capabilities and maximize the value of installed systems and components. ABB StepUp programs also minimize maintenance costs and reduce downtime. As an added advantage, all StepUp services are designed to allow existing data to be used with upgraded systems. Key StepUp programs include:

- StepUp classic 1180M and 1190 systems to the latest Quality Control QCS800xA solution
- StepUp classic Measurement Platform and Smart Platform to the latest Scanning Platform
- StepUp classic Advant Operator Stations to the latest QC Aspect Workplaces

Automation Sentinel
ABB’s Automation Sentinel software management program extends the support and value of your existing ABB control software investment, while establishing an affordable path to the next generation of System 800xA functionality. It provides the best overall ROI for your past, present and future ABB software investments. This simple, safe and secure program puts you in control.

- Manage your lifecycle costs: Plan and budget your evolution path with predictable costs
- Get the most out of what you already have: Extended technical phone support and services
- Upgrade your software on your timetable
- Provides dependable support: Planned, long-term product support ensures your control system will be ready to move forward with your business
- The most affordable evolution path to the enriched System 800xA operating environment

Complementing our portfolio of evolution planning products and services, Automation Sentinel is another reason why ABB has the best track record in the business for control system investment protection.

StepUp provides a path you can use to cost-effectively upgrade your current QCS system, allowing you to take advantage of the most recent technological advances.

Automation Sentinel protects the value of your existing software investments by keeping them current with the latest industry standards and third-party OPC connectivity.
QCS services

ABB’s pulp and paper industry support organization is one of the world’s leading authorities in paper production and technology. ABB has invested substantially in business-driven research, and the development and delivery of world class service solutions to maximize paper machine return on investment.
Our complete portfolio of services and service products—from spare parts to consulting, optimization, and outsourcing services—can help to maximize your investment by:

- Improving equipment productivity
- Minimizing costs throughout the equipment life
- Extending the useful equipment life

**Maintenance Management**
ServicePro™ Service Management System is used by service engineers to collect, manage, and apply best practices for servicing ABB automation and ABB-automated processes. With ServicePro, service engineers in your facility benefit from knowledge accrued from years of ABB’s experience in delivering proven and consistent service for all types of automation equipment and industrial processes.

**Optimization Services**
Our Process and Asset Optimization Services use a proven, continuous improvement methodology, special tools and in-depth systems knowledge to find the valuable improvement opportunities currently hidden in your production assets.

**Spare parts and repair services**
A global logistics network is strategically positioned to provide fast parts and repair service throughout the world, 24 hours a day. Our organization uses standardized processes, tools and metrics to ensure that components are delivered quickly.

**Support and remote services**
From telephone and self-service web support to direct and secure system interaction, remote services provide real-time, 24 hour direct access to global technical specialists and service experts.

**Migration services**
Many ABB products provide useful service for 20 years or more, however when a product reaches the end of its lifecycle, ABB helps mills have a smooth transition to new software and equipment. Throughout the product lifecycle, we work to provide solutions that expand the functionality and extend the life of your equipment, while maintaining your core investment.

**Training**
ABB’s training programs for engineers, programmers, maintenance and operations personnel provide the comprehensive, up-to-date technical expertise that increases workers’ skills, knowledge and productivity. Training is available onsite at ABB training facilities, locally at your mill or online.
Maintaining speed, quality and consistency at Stora Enso Sachsen

PM1 at Stora Enso’s Sachsen Newsprint and Book paper mill in the state of Saxony in Germany is among the quickest in the world, and the fastest newsprint PM running without a shoe press, producing some 340,000 tons/yr from 100% recovered paper.

To achieve the ultimate production figures in terms of speed, quality and consistency, the mill has looked beyond the norm in terms of finding the right fit for its own unique requirements. The Sachsen mill has historically worked with ABB since the initial startup in 1994 and has ABB provided mill wide automation in the shape of DCS and QCS systems.

The two, mill and supplier, have worked closely together on various projects over the years with some major highlights in the last two years. In 2007, the mill upgraded the complete DCS to ABB’s System 800xA technology.

The latest pioneering work carried out has been in the area of the measurements and especially the caliper sensor, an essential tool if quality newsprint production is going to be consistently maintained. The first step was to upgrade the 16 year-old Smart Platform measurement scanner to ABB’s newest Network Platform, providing the mill with a stable foundation of up-to-date technology for the new sensors.

PM 1 at Sachsen was originally equipped with a contacting sensor supplied by ABB. However, as the speed of the machine increased, so did the problems associated with having a sensor that actually came into contact with the paper. Paul Goss, ABB’s paper system’s sales manager for central Europe explains, “In the first 10 years of production, there was no issue with the original caliper sensor simply because the speeds were lower. On very high speed machines like PM 1 it is a very fine balancing act to achieve an accurate measurement, at the same time as applying the least amount of pressure.”

Running without an accurate caliper measurement is not an option in newsprint production. “We need to have an accuracy of one micron to maintain consistent thickness, we cannot have any variation,” explains Peter Kluttig, the mill’s manager of process automation

Solution: ABB’s Optical Caliper Sensor

Today’s newsprint market is a tight one, and there is no room for poor quality or late deliveries, so Stora Enso Sachsen has had to lead from the front when it comes to everything related to customer satisfaction.

After a number of discussions between the mill and ABB, it was decided that Sachsen would become the first mill to install a revolutionary new product, the Optical Caliper Sensor, a sensor that uses a “confocal displacement” technique that measures caliper based on reflected light.

The very first permanent installation of the Optical Caliper Sensor began in early 2009 and it was measuring effectively “half an hour” after installation.

“ ”The new caliper sensor has had a very positive impact, eliminating caliper measurement related holes and breaks and reducing wastage dramatically. It has also improved the quality of measurement which is now sound and dependable. These improvements have allowed us to tackle one of our biggest challenges, the one of improving quality for our heatset web customers, which will hold us in good stead for the future,” concluded Mr. Kluttig.
Immediate CD moisture results at Belišće with Air-Water xP Actuators

Founded in 1884 by Hungarian businessman, S.H. Gutmann, the Belišće mill in Slavonia, eastern Croatia, produces 210,000 tons/yr of containerboard on two units, plus 35,000 tons/yr of packaging products.

An integrated mill, Belišće has its own woodyard, two semi-chemical (sulphite) pulp mills for internal use, as well as chemicals, power and water treatment plants.

Since 1991, the Belišće Group has expanded its operations beyond Croatia’s borders and today, in addition to the Belišće mill, it has one converting company in Slovenia, one in the Macedonian capital, Skopje, as well as Bilokalnik in the Croatian town of Koprivnica.

Steps to better paper
Since 1998, upgrades have been “step-by-step”, notes Belišće’s head of measuring and control engineering, Ivan Ratkovcic. “We tried to do various projects around the same time to increase quality and output,” he explains.

ABB was contracted to supply a package of improvements, comprising a new DCS for PM 3, an upgrade of the scanning platform on PM 2 from Measurement Platform to Smart Platform, as well as Air-Water xP Actuators on both machines to improve the moisture profile.

A team from the mill paid a reference visit to a mill in France and saw the technology in action. “They had a good experience and we saw it working, we saw the 2-sigma reduction. The reference visit really made up our minds,” recalls Ratkovcic.

The Air-Water xP Actuators were installed by a team from ABB Dundalk in Ireland and commissioned by a team from ABB Sesto San Giovanni in Italy. There are 60 actuators on PM 3 and 69 on PM 2.

The Air-Water xP Actuator is designed to be more robust and much less susceptible to plugging than needle valve or solenoid flow control arrangements. There is very little maintenance, and reliability is significantly improved by eliminating the requirement for electronics in the hot and humid environment associated with remoisturizing actuators. Performance is ensured even if the water supply is less than optimum.

ABB met its guaranteed performance values. Installation of the Air-Water xP Actuators has seen the number of customer complaints about CD moisture profile fall to zero.

“Everything fell into place very quickly,” says Ratkovcic. “The performance improvement was almost immediately visible. It was very easy, very quick, I was surprised by that,” he adds.
ABB QCS R&D has a very long and proud heritage, tracing its roots back to the Industrial Nucleonics company in Ohio over fifty years ago. Over the years ABB has built up a very solid and widely-respected portfolio of QCS products, and even today ABB maintains its technology lead.

ABB has developed the newest suite of innovative paper machine actuators available in the industry. A particularly important milestone is the introduction of Induction xP. It offers papermakers an unparalleled opportunity to further improve paper caliper and gloss, while providing the industry’s highest power density in a revolutionary compact actuator package. The latter is a perfect fit in processes where space is a premium, e.g. supercalender stacks.

In the area of QCS measurements, ABB proudly presents the new HPIR transmission moisture and HPIR-FW fiber weight sensors. Their innovative design provides breakthrough measurement rate for the highest precision, and fine streak resolution of moisture, coat weight and fiber weight. The new design is consistent with ABB’s technical strategy for simplicity that leads to robust performance in the papermaking environment.

Both these sensors and the Optical Caliper are perfect complements to ABB’s Network Platform. In addition to its ease-of-use, the Network Platform also accommodates the significant processing demands of the new generation high-speed sensors like Optical Caliper and HPIR, and future high-speed sensors. Network Platform also offers an attractive and cost-effective upgrade path for existing ABB scanners, which is further proof of ABB’s strong commitment to the paper industry by extending the product lifecycle of ABB’s installed base of QCS.

QCS controls are another important aspect of the QCS product portfolio that allows papermakers to further improve product quality and throughput. Recently ABB introduced its revolutionary Multivariable CD (MCD) control package. It enables both energy and chemical savings as well as product improvements. This unique control application allows the operator to coordinate multiple actuators, while at the same time prioritizing multiple, and sometimes conflicting, process control objectives.

ABB’s award-winning System 800xA OCS platform also continues to evolve. It is an integral part of ABB’s QCS offering, which allows end user to take advantage of ABB’s integrated product offering across the whole mill operation, from individual instruments and drives, via OCS and QCS, all the way to ABB’s Collaborative Production Management (CPM) solutions for the total enterprise.
Pioneers in the QCS paper industry

1951  Basis Weight Gauge
1956  Mechanical Scanner
1961  Moisture Gauge
1970  Optimizing Controls
1974  X-ray Ash
1977  CD Control
1981  Slice Motor
1986  Color Control
1986  X-ray Coat Weight
1987  Motorized CD Coat Weight Actuator
1991  Integrated System
1991  Smart Scanner Processor
1999  Fiber Orientation Sensor
2001  IndustrialIT
2002  Direct Torque Control
2002  LV Control
2004  Direct Drive
2006  Fiber Orientation Control
2006  xP Profilers
2007  Network Platform
2008  Multivariable Cross Direction (MCD) Control
2009  Optical Caliper Sensor
2010  HPIR (High-Performance Infrared) Sensor
2011  Weight xP Family
2012  HPIR-FW (High-Performance Infrared-Fiber Weight) Sensor

...the innovation continues.