



PMC800  
ABB's control solution for paper machine drives

# A drives control for the pulp and paper industry



**Paper Machine Drive PMC800 provides papermakers with a combination of software and hardware that helps them achieve the highest possible performance levels. By investing in PMC800, mills can increase their efficiency – and remain confident that their automation is functioning smoothly.**

## **Optimized configuration and control for paper machine drives**

PMC800 application software for ABB's System 800xA covers all of a paper mill's basic drive control functions, ensuring optimal web handling and streamlined drive operation:

- Machine level common controls and machine section controls
- Smooth operator interface
- Drive control logics with all run modes
- Fast speed and torque reference chain handling
- Web tension control loops
- Communication with current and legacy ABB drives

With its optimized, finely-tuned software capabilities, PMC800 gives drive systems the ability to operate smoothly even in complex – or unexpected – process variation combinations.

ABB's drives control includes unique and patented application features that help papermakers manufacture better products:

- Mechanically connected drives behave adaptively
- Acceleration and deceleration sequences use less power
- Drive safety and protection meets stringent international standards
- Web tension automatic recalculates, protecting against web breaks
- Advanced status indication and diagnostics include high frequency Fourier analysis of the drive train

ABB's control technology, combining the AC800M application and ACS800 DTC motor control, is proven in tachless and Direct Drive installations worldwide. In every implementation, ABB ensures that even the most demanding production processes can achieve static and dynamic control accuracy without the use of pulse encoders. ABB's encoderless operation for paper machines produces high quality products that include copy paper, newsprint, fluting, uncoated wood-free paper, machine-finished coated paper and coated boxboard.

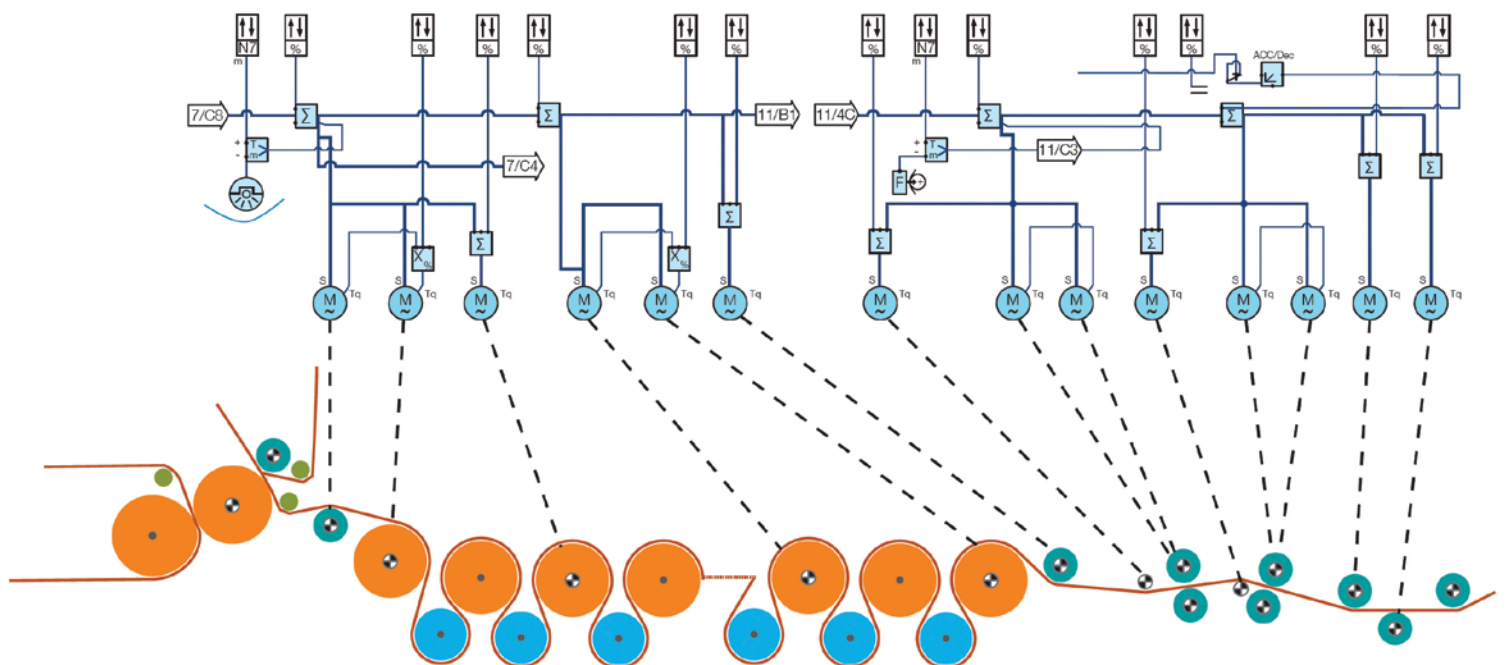


### Easy start-up, energy savings and reliability

On average, ABB starts-up a Paper Machine Drive system twice a week. With a track record of over 3,000 successful installations, ABB has achieved high quality engineering standards, a customized solution, and ease of implementation.

ABB's PMC800s offer mills solid benefits that include:

- Rigid, proven design and high reliability
- Energy savings with high efficiency products
- Easy communication with a mill's other control systems
- Ability to meet all process requirements



# Paper machine drives control

Specifically developed for paper machine drive control, PMC800 can handle the specialized needs of any paper mill's drive system. PMC800 features control application software for the drive section, machine section and machine type, as well as common control for the entire machine.

## Applications designed for the pulp and paper industry

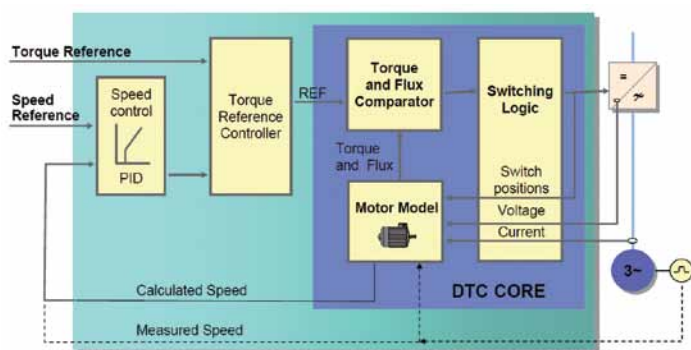
ABB designed PMC800 software applications that are precisely adapted for the different machine types operating in today's pulp and paper mills. PMC800 supports both integrated and stand alone systems, and uses AC800M controller family products, I/O, communication options and drive bus. The AC800M application, software developed for PM drives applications, covers all interlocks, control, diagnostics, history, event and alarm handling.

## Effective and scalable operator interface

PMC800 includes features that help operators perform their jobs more effectively. PMC800 has the advanced process graphics packages needed to handle large volumes of data and graphics. These capabilities also help operators access important information about motors and drives.

## High energy efficiency

As the largest inverters manufacturer in the world, ABB can offer the best products to build a mill's system to the scale that offers the greatest possible energy savings. Combined with various optimized control functions, customers achieve the best possible energy efficiency.



ABB's Direct Torque Control (DTC) concept.

## Complete diagnostics and maintenance tools

The PMC800 includes complete diagnostics and maintenance tools that were specifically developed for paper machine drive control. Applications cover the complete variety of machine types used in the paper industry.

## Efficient engineering

PMC800 enables engineering and system configuration through libraries, control modules, function blocks and standard engineering methods. Libraries are operated and controlled with common architecture and tools at the system engineering stations.

## Broad experience

Our drive systems represent a world-wide standard, featuring experience from a wide range of machine suppliers and different machine configurations. With a broad installed base and start-ups, covering a complete range of machinery for pulp, paper, tissue and board production, help us successfully implement solutions in even the most demanding operational environments.

## Global support

ABB's experienced and knowledgeable specialists are available globally to provide support. We offer service for many earlier generations of drives control systems as well as current systems.

## PMC800 encoderless drive control

Although motor speed feedback encoders are usually reliable, they need regular preventive maintenance for their permanently greased bearings. With encoderless drive control mills can reduce the need for maintenance, saving time and money.

Encoderless operation, an essential part of ABB's DTC control, lowers design complexity. Streamlined design makes the drive control easier to integrate into a system and, when positioned, easier to reach. With PMC800, mills can run their paper machine drives without the need for speed feedback. With fewer components in the drives systems, operation reliability is higher; there is less need for maintenance, which increases process availability.

# Winding and finishing drives control

PMC800 control application software, designed for winder drives, includes applications for the many finishing machines used in paper mills, including paper machines, winders, coaters and calendars. All of a mill's winding processes can be operated and controlled using a common architecture and control stations.

## Winder systems for creating better rolls, faster

The PMC800 Sectional Drive System rotates winder rolls, synchronizing them with the overall winding process. To optimize this process, PMC800 takes into account the available capacity of all drive components and the relevant process parameters in different running situations. By optimizing acceleration and deceleration, in most cases mills can increase their total production capacity.

## Operator interface for easy control

The PMC800's fast, powerful operator panels were designed to handle large volumes of data and graphics. Operators can easily expand and scale the system's memory for exceptionally demanding applications. The panels are designed to ensure file safety and data integrity while allowing rapid access to data.

## Wide off-machine drives installed base

ABB has started up thousands of winder drive systems, covering a complete range of machine configurations. This experience helps us provide solutions for every kind of operating environment.

## Customization with options

ABB offers an especially wide range of drive system options, from functional safety features to color graphic screens. This enables us to customize process control so it seamlessly fits each mill's operation.



## Functional safety features

Safety functions are an essential feature of today's variable speed drives. ABB's offering of low voltage AC drives and PMC800 winder drives provides proven safety functions for a wide range of finishing machines. ABB offers a detailed evaluation of the combination of safety related products and functions, such as prevention of unexpected start or emergency stop functions, to meet the necessary requirements at the system level.

ABB's functional safety solutions comply with the requirements of the European Union Machinery Directive 2006/42/EC. This directive is associated with standards such as IEC 62061 (Safety Integrity Level) and ISO 13849-1 (Performance Level), which require a well documented system and proven safety performance, as well as a lifecycle approach to safety.

# Process stations and systems configurations

The PMC800 drive control system is based on the System 800xA. This is the common platform from which all of ABB's automation systems are delivered.

## The System 800xA

The flexibility of the System 800xA enables ABB to cost effectively deliver PMC800 Drive Control for any size application while ensuring consistent standards. Regardless of the scale of the application, a common architecture allows deployment of a common software application for all system configurations.

## Integration to reduce lifecycle cost

The open architecture of AC800M Control and I/O reduces lifecycle costs by simplifying the task of integrating plant systems and devices. Additionally, the system's useful life is extended since the open architecture allows for easy integration of new commercial off-the-shelf applications and products.

If a mill uses other ABB automation solutions based on the Systems 800xA additional savings can be realized in spare parts, training and maintenance cost.

## AC800M Controllers

The System 800xA uses the AC800M controller family to deliver scaled solutions for the pulp and paper industry. With scalable options, unneeded redundancies can be avoided resulting in less hardware to meet the process requirements. Small machines can be programmed using a single controller; larger machines will utilize a control network of several controllers.

The power of the AC800M extends beyond configuration. After delivery, control modules, applications, and hardware settings may be changed online, in real time and under power, resulting in maximum control availability.

## S800 I/O Family

A wide range of I/O's covers a full range of signal types including AI, AO, DI, DO, Temp, Pulse, Freq, HART, IS interface and SOE.

## Communication

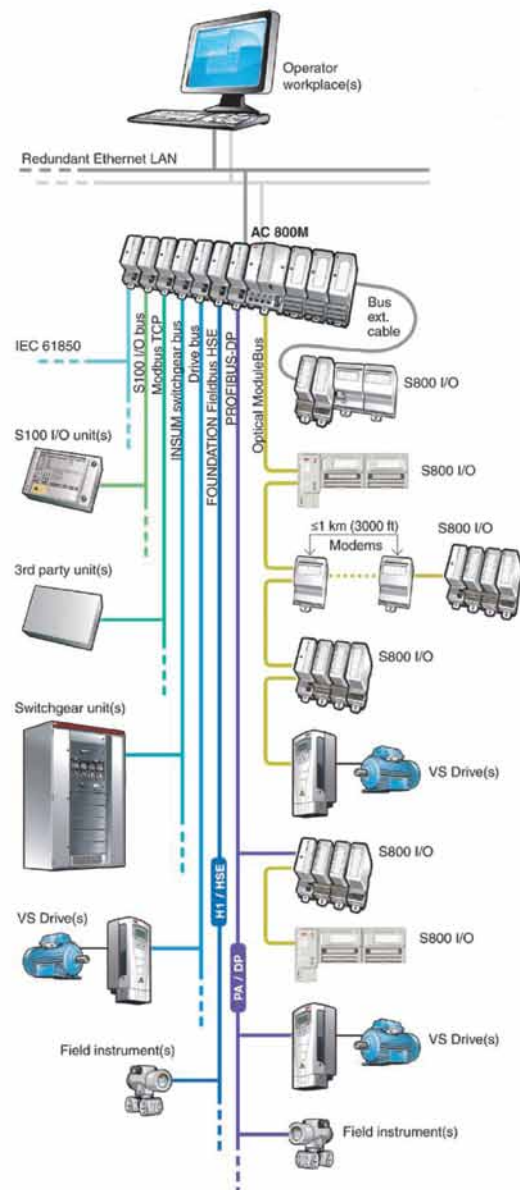
The AC800M options for communication includes:

- Networks: Control Network, MB300, SattBus on TCP/IP
- Field buses: PROFIBUS DP, FOUNDATION Fieldbus HSE
- Serial Protocols: COMLI, Modbus RTU/TCP, Siemens 3964R, user-defined solutions
- Optical DriveBus communication interface to drives, Control Network

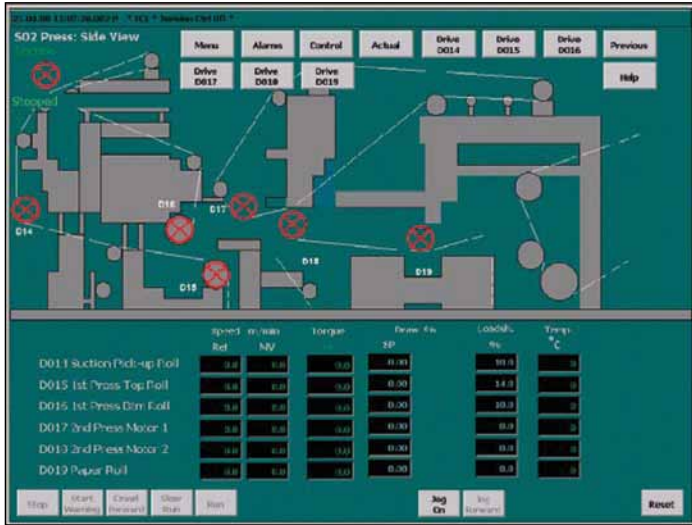
## Extending automation

AC800M Control and I/O seamlessly integrate traditionally isolated plant devices and systems into the 800xA system environment, extending the reach of the automation system to all mill areas. The system architecture of the 800xA makes all information available in a consistent, easy-to-use manner at the controller, engineering and process visualization levels.

AC800M Control and I/O can be fully integrated with the 800xA's Asset Optimization features to electronically submit fault reports to a computerized maintenance management system as a basis for work orders, which streamlines the maintenance processes.



# PMC800 process graphics



Industry-specific drives display elements and faceplates that make the system intuitive and easy-to-use.

An intuitive and easy-to-use system interface gives mill personnel direct access to relevant information, facilitating timely and accurate decision-making. PMC800's extensive user functionality helps operators and engineers make the most informed and prompt control decisions. This functionality includes basic information about motors and drives, including load, draw, operating status, control mode and alarms. Master display of a drive point provides information about interlockings, set points and actual values. Tension displays show the tension values, differences, limits and status.

Realistic process graphics feature standard faceplates with a uniform look and feel throughout. No matter which control system is being used, the operator always has a consistent presentation of the object and knows exactly how to proceed in all situations.

## Faceplates

The faceplates have three different appearances ranging from the most important information to full access to tuning and adjustable parameters. The standard set of faceplates can be used as is or modified, and customizing is very easy. With PMC800's standardized faceplate framework, configuration time is reduced to a minimum.



## Technology Based on .Net technology and WPF (Windows Presentation Foundation)

Mill personnel are able to perform their control functions easily and comfortably when working in a familiar Windows environment. This reduces training time considerably.

The Process Graphics Package for PMC800 is created with the 800xA Graphics Builder tool. The Graphics Builder offers an intuitive environment with many of the latest functions such as zoom, rotate, undo and mirror. Expressions can be copied and a find and replace tool offers a convenient way of replacing display references.

## Common pulp and paper style guide

A common pulp and paper style guide defines the look for different elements, such as colors, sizes, forms, symbols, status indicator light of the background, control buttons and trend windows. The same look applies to all OCS and QCS.

# Graphical operator panels

## G2000 Panel series for harsh conditions and rebuilds

The Graphical Operator Panels, used for the control of sectional drives on paper machines, coaters and winders, provides a user interface designed for harsh environments – and tested in them. Multiple panels can operate the same section, and multiple sections can be operated from the same panel.

### Easy to operate

With the graphical operator panel, a mix of alphanumeric and graphical user data with fast response can be easily displayed. Special, programmable graphical symbols enable information and commands to be displayed as symbols or in languages using graphic characters such as Chinese.

Operation is easy with keys placed around the programmable keypad. The operator can select functions, initiate actions or select displays showing the status, diagnostics, references and actual values of a specific machine part. Operators can start and stop the drives, set the reference values, select some drives to a separate mode and follow the values necessary for effective operation.

### Designed for demanding environments

Rugged design and an IP 65 level front panel, fulfills CE mark acceptance criteria for the requirements for heavy industry. The back cover is firmly protected against dust.

### Programming Tool

The Windows-based GOPTool configuration software offers graphical drawing tools for designing display layout, parameter settings for communication and logical operations as well as calculations to create panel functionality. Common graphics, such as bar charts and trend curves, are supported.



### G2000 technical specifications

- 5,7" TFT LCD display, (320x240pixels)
- Physical dimensions: width 200 mm, height 151 mm, depth 98 mm
- Weight: 2 kg
- Power supply: 48V DC 15W, optional: 24V DC
- Isolated Profibus interface: Profibus-DP (slave), RS-485, RS-323 (tool) selectable baud rate (9600bps - 1.5Mbps)

### G2010 technical specifications

- 10,4" TFT LCD display (640x480pixels)
- Physical dimensions: width 350 mm, height 255 mm, depth 83 mm
- Weight: 5 kg
- Power supply: 48V DC 15-25W, optional: 24V DC
- Isolated Profibus interface: Profibus-DP (slave), RS-485, RS-323 (tool) selectable baud rate (9600bps - 1.5Mbps)
- Modbus/TCP over Ethernet



## Panel 800 series for touch screen operation and 800xA integration

Panel 800 provides an intuitive, ergonomic and user friendly operator's interface. Panel 800 gives users the advantage of a common network for controllers, HMI and engineering. It also offers an extensive driver library, making it compatible with all ABB legacy control systems, all previous versions of Process Panel and most makes of PLC.

### Advanced graphic displays and seamless integration with AC800M

Panel 800 comes with specific displays for pulp and paper drives that show the status, diagnostics, references and actual values for parts of the machine. Operators can start and stop the drives, set the reference values, select some drives to a separate mode and follow values necessary for an effective operation.

Alarms and events from any AC800M controller show up in an alarm list with source name, condition name, severity and class. Alarms can be acknowledged from the Panel 800 just as if they would have been acknowledged from a System 800xA.

### Robust design

The waterproof front casing, made of lightweight aluminum, is designed to withstand wet, dusty and demanding environments. Its unique clamp-on construction eliminates the need for screws and for drilling holes in weaker surfaces where moisture and dirt can easily collect and penetrate. Less than 60 mm in depth, it is exceptionally space-efficient and can be mounted vertically or horizontally.

### Streamlined engineering

Based on a Windows interface, Panel Builder 800 contains features like Project Manager, Symbol Factory, and a new simulation tool, that enhance engineering efficiency and provide additional programming options.

All symbols, both predefined and user-created, are stored for easy and rapid access in the Symbol Library. The simulator opens the panel software in a separate window to enable operators to test-run settings.



### PP836/PP846 Technical Specifications

- 5,7"/6,5" TFT LCD display, (640x480 / 800x600 pixels)
- Physical dimensions: width 285/382 mm, height 177/252 mm, depth 60 mm
- Weight: 1,3/2,3 kg
- Power supply: 24V DC (0,4/0,5A)
- Ethernet RJ-45 (10/100Mbit/s), RS-422, RS-485, USB, Expansion slot for Profibus DP

### PP865 Technical Data

- 15" TFT LCD Touch Screen (resistive) display (1024x768pixels)
- Physical dimensions: width 398 mm, height 304 mm, depth 60 mm
- Weight: 3,7 kg
- Power supply: 24V DC (1,2A)
- Ethernet RJ-45 (10/100Mbit/s), RS-422, RS-485, USB, Expansion slot for Profibus DP

# Sustain drive system performance

PMC800 Data Logger is a data logging and visualization solution integrated to the drive control system. It is a tool for fault tracing, remote support and process improvement. It collects all useful data continuously and allows investigation of data afterwards on site or remotely. It can supervise system stability autonomously. The datalogger is standardized for all PMC800 and PMC200 systems.

## Part of the drive system

PMC800 Data Logger is easily included in the drive system with ready made configurations and can be used for processing big amounts of data from sectional drive systems and process control DCS systems. PMC data logger is based on ABB's unique real time database (RTDB) platform. It is used also for ABB Process historian reporting systems as well as plant and corporate wide energy management and optimizing systems, process data warehouse systems and for various other applications.

## All useful data collected, round the clock

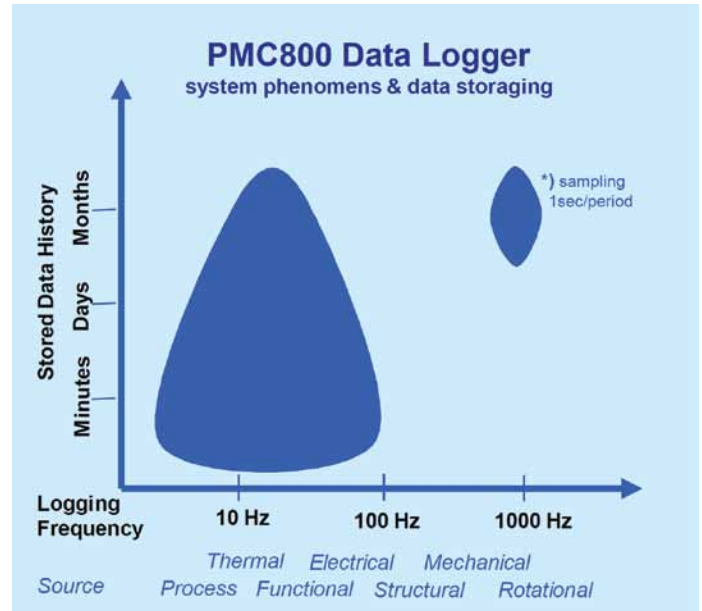
PMC800 Data Logger is delivered ready configured to collect all useful data from the PMC800 drive system. Normally 30 days long history is stored in the system, but the length of the history can easily be changed. The user can also add or change the collected variables easily.

Torsional disturbances originating from the process or equipment, and causing additional stress to shafts, couplings, gears etc. can be detected.

Values are collected as often as they are updated in the drive communication link between the drive and the application controller, typically 10-100 ms. Sample rate for an FFT analysis is set to 1000 per sec in short batches. This allows timely maintenance and process controls tuning before actual quality or production losses happen.

## Basis for remote support by ABB experts

PMC800 Datalogger supports remote usability directly, and acts as the basis for drive system remote support provided by ABB drives experts in different levels of the service content.



## On-going remote enabled Optimization Services

Remote Service with DriveScan and DriveTrack includes three components: remote connectivity, the PMC800 Data Logger monitoring and diagnostic solution and ABB's technical experts available 24/7.

DriveScan™ and DriveTrack™ ensures Drive System performance does not degrade over time and improves through periodic (Scan) and continuous (Track) monitoring and corrective actions. Allowing site engineers to collaborate with ABB experts on a continuous basis to achieve optimal machine availability and improved performance.

### PMC800 Data Logger installation:

#### Engineering PC software

- RTDB (PDM, Vtrin UI)

#### Control Network TCP/IP

- Interface to AC800M OPC server (basic)

#### Drive Tool Network

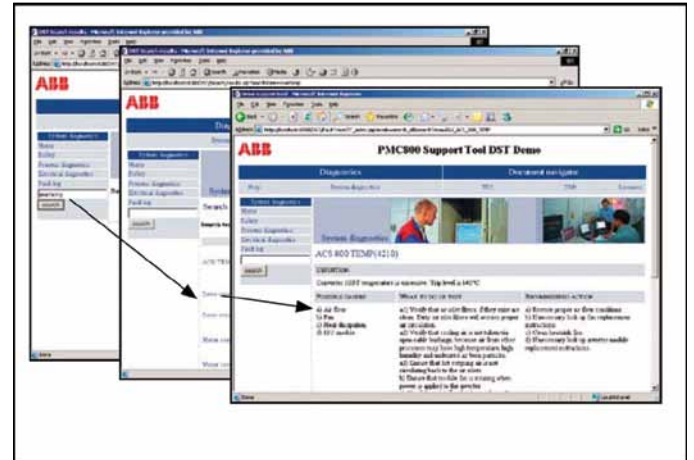
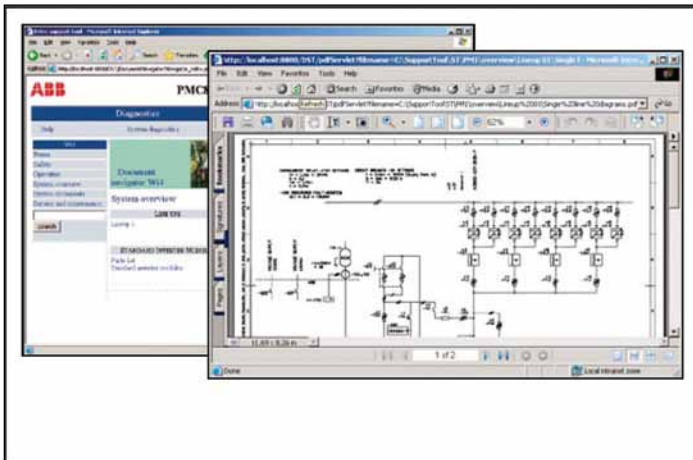
- Interface DriveOPC (FFT option)

#### Drive Control Network

- Interface Modbus/tcp driver in PDM (advanced)

# Fast access to design documents and maintenance instructions

PMC800 Support Tool combines project related system documentation, document search, root fault cause analysis and the maintenance log into a single convenient tool. Its “Google™”-style search function helps papermakers problem solve using clear recommendations drawn from a drive system knowledge base.



## Search function

A fast and efficient search-and-find function makes PMC800 documents easy to find. The search function extracts text from the files of any stored format.

## Root fault analysis

The PMC800 Support Tool enables root fault cause analyses instead of browsing instructions, helping papermakers obtain the in-depth information they need.

## Fault/Maintenance log

The maintenance log helps mills retrieve maintenance history, add new information and plan for future measures in a systematic way because data can be shared among large teams of specialists. Operators and maintenance personnel can add more information by using a fault log; the logged information can be viewed and sorted at a later convenient time.

## The PMC800 Support Tool provides operators with:

- a user friendly interface to all PMC800 System documentation
- an opportunity to make better decisions and, as a result, focus on improving product quality and process yield

## The PMC800 Support Tool provides maintenance personnel with:

- access to all needed data and information such as drawings, manuals and fault root causes
- a tool that helps reduce production stops and production downtime and improves production quality
- keeps track of service operations with a fault/maintenance log
- an opportunity to easily maintain project-related documentation by making it simple to add or remove documents

## Extended tool set for Maintenance Services

ABB's new ServicePRO™ application provides an additional “Knowledge Database” of service best practices specifically for ABB equipment. Additionally, PartsPRO™ module define Drives System spares and maintenance kits for aging equipment.

# Contact us

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