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# **ABB Ability™ System 800xA**

Evolve your plant into the future



# Evolve your plant. Secure your survival. Become more successful.

Order-to-delivery is a complicated process, especially if your customer base is global and you operate several production facilities in different countries.

Your survival in the marketplace depends on this process working flawlessly 24/7. Production execution is a core subprocess where effectiveness largely depends on the control systems you use – and on how well they meet your and your customers' demands on production quality, volume, time and cost..

## **Evolution solutions for your needs**

As DCS market-leader with the world's largest installed base of control systems, ABB truly understands your needs for step-wise improvement and modernization of production equipment. To achieve continuous improvement yet still retain productive assets, we have developed comprehensive evolution solutions for our own installed base as well as for thirdparty DCS systems. Such cost-efficient and low-risk evolution is ideal for manufacturers with a mix of systems (sometimes from different vendors) at each production site.

## **Make the most of what you have**

When you first acquired your automation system, it offered the best set of solutions to help your business be successful and stay competitive. That's no longer the case. Now the risk of unplanned downtime is always present. Lengthy production stops cannot be ruled out. What's more, production gains via mere process control improvements are no longer enough to ensure peace of mind. The real answer lies in evolution through stepwise enhancements.

Evolution helps you attain a state-of-the-art control system that seamlessly integrates all your business processes as well. Most importantly, a well-conceived evolution strategy protects the major hardware, software and intellectual property investments made when you purchased your current automation systems. Examples include control application software, user graphics, operator training, Standard Operating Procedures(SOP), verification and checkout, formal validation for regulated industries, and historical production information collected by and stored in the system.







01 Improving operator effectiveness through high-performance HMI is all about improving the operator's situation awareness and their effective situation handling.

## Future-proof with ABB Ability™ System 800xA

### **System 800xA – on top of the world's largest installed DCS base**

ABB helps you evolve your automation system via a well-conceived, step-by-step evolution strategy based on ABB Ability™ System 800xA, probably the world's foremost DCS. As the target system of choice, System 800xA meets all present and future business demands by providing:

- Robustness
- Unparalleled flexibility
- Outstanding performance and scalability
- State-of-the-art HMI
- Extensive plantwide integration capabilities

Evolving to System 800xA involves mapping out a pathway for expanded functionality that builds on the foundation of control products and applications already in place. The steps you can take include:

- Console replacement
- Controller replacement
- I/O replacement
- Cable solutions

Furthermore, you maintain production (often in perpetual mode) and benefit from incremental funding rather than large capital financing.

### **We're all living proof of stepwise evolution**

To survive and remain competitive, manufacturers need to change and improve their business processes. The changes made to the system must be limited to the specific areas where they will create most gain, and there must be a solid Return on Investment (ROI). ABB's evolution solution is a low-risk, incremental evolution strategy – adding value, meeting performance objectives, building strength on strength. It's proven – it has worked for thousands of end-users and it will work for you.

# ABB's evolution strategy is clear-cut 'only when it makes sound economic sense'.

With Brownfield expansion projects greatly outnumbering new Greenfield ones, squeezing the maximum productivity from current plants is paramount for most manufacturers. Extending the useful life of their systems and applications is the key challenge, while maximizing Return on Assets the key goal. Evolution strategies have never been more important than they are today.

With System 800xA, ABB has a huge pool of know-how for helping manufacturers upgrading ABB systems and thirdparty systems to it. Our overriding strategy is simple: We provide and follow a flexible, stepwise plan that lets end-users adapt new capabilities at their own pace and according to their needs – without any loss of production.

Protecting the security of long-term user investments is essential. Evolution with ABB is never a painful 'rip and replace' exercise. Our way lets users evolve in a manner that best meets their overall processing and automation goals – and 'only when it makes economic sense'.

## Product planning and development

ABB automation products provide unique flexibility and scalability. Mixing and matching different generations of hardware is a particular strength. End-users can thus protect their investments in field connectors, I/Os, controller hardware, etc., still retain their base control hardware, and utilize their full intellectual investment in software. All in a step-by-step, low-cost, low-risk manner.

## Protecting intellectual investment

The key ABB value proposition is evolution via enhancement. This includes operator graphics, historical data, batch recipes, operator training, etc. We invest huge resources to protect your investment, and the result can be seen in time and money-saving graphical and database conversions, as well as cable kits that eliminate the need for extensive rewiring. You'll find plenty more examples. What's more, they all follow an individually-tailored pathway.

ABB always takes a proactive approach. Our evolution programs give users great financial flexibility to evolve from their current equipment up to new high-performance Human Machine Interfaces, advanced engineering tools and seamless information management one function at a time. In addition, after-sales software services give immediate and automatic access to the latest productivity-enhancing programs as they become available.

## Engineering and project delivery

ABB's highly-skilled operations engineers are equipped with a well-stocked evolution toolbox. They have all the resources needed to deliver your evolution project on time while keeping risks as low as humanly possible. And with your evolution project safely home and dry, the continued commitment to your business ensures that future modernization is handled in the same safe and professional manner.

## Evolution

Lifecycle	Technology	Benefits
HMI replacement	Single unified HMI/control room consolidation	Increased operator efficiency
	Common plant object structure	Increased safety
	Vertical integration	Remove bottlenecks/increase capacity
Controller replacement	Architecture	Increased availability
	CPU power	Increased maintenance efficiency
	Footprint	Lower equipment cost
	Asset management/predictive maintenance	Lower energy cost
I/O /Field Termination Assemblies (FTA) replacement	I/O connectivity solutions	Retain I/O and/or cabling
	Cabling solutions	

Different levels of stepwise evolution that give users full flexibility to meet their own individual financial and performance goals is the essence of ABB's evolution strategy.

# Successful evolution on time and budget, from Honeywell TDC 3000 to System 800xA on-line.

A European manufacturer of speciality chemicals recently experienced ABB's evolution solution at first hand. Its plant now enjoys all the advantages of System 800xA. Furthermore, evolution caused minimal disruption and was completed on time and within budget.

Parts of the manufacturer's Honeywell TDC 3000 system were near the end of their life, plus the cost of spares and maintenance was high. New operator workstations were urgently needed, along with connections to new controllers and I/Os. The specific nature of the process required that implementation of the solution should be carried out with no interruption to production. ABB engineers utilized their full range of evolution tools to design a stepwise evolution that met the manufacturer's project schedule and budget.

## Connectivity made easy

The evolution solution was based on System 800xA architecture with connectivity (a so-called HSM Connect) for interfacing the existing TDC system, plus AC 800 Connect for the five AC 800M controllers that replaced the existing traditional control panels. New operator workstations with advanced HMIs were introduced as replacements for elderly units that no longer provided the level of efficiency and safety required for today's process control environment.

Installing the new controllers required no modification to the operator interface, as all communication between the ABB controllers and those of the old system had been simplified via AC 800 Connect and HSM Connect respectively.

## Step-by-step evolution program

ABB's evolution program ranged from evaluation through installation and commissioning to post-installation assistance. It included:

- Recovering input data (joint ABB/user functional analyses and evaluations)
- Establishing project rules and user validation of programming standards
- Creating the database (import)
- Building images from location data and creating the control environment
- Simulation and full testing
- Installation and on-site start-up
- Training system specialists, supervisors and operators
- Production start-up

A support contract for System 800xA and TDC with 24/7 technical assistance was included in the evolution service agreement. Note that a new remote maintenance connection now ensures speedier trouble-shooting and corrective measures.

## Future modernization includes alarm management

With the chemical plant now feeling the benefit of ABB's evolution strategy, future modernization is already being started. The owners plan to utilize System 800xA's outstanding integration and flexibility to the full. The future will see old Honeywell controllers replaced by AC 800Ms and new controllers or control stations added. As the plant has to meet the strict requirements of the EU Seveso II Directive, ABB's new alarm and safety system management will also be installed.

Product	Purpose
Conversion tools & Services	Retain and convert existing intellectual property
HMI connectivity	Implements a new, more capable HMI, to existing controllers, I/O and devices
Engineering libraries	Provides new type objects for the upgraded system
Gateways	Enables peer-to-peer communication
I/O interface	Uses existing I/O with new controllers
Field termination assemblies	Retains field devices and cabling

ABB engineers adapted their broad range of evolution tool products to meet the manufacturer's own production and budget needs. Planning began in September 2008 and the new system was operational on schedule on December 24.



# Comprehensive portfolio of evolution

## Products, tools and resources

With ABB, evolution belongs to the future, not the past. We are committed to help you upgrade your system while minimizing your ongoing risk. We work by your side on a continuous basis, helping you choose the right path and the right pace to proceed. At our disposal is a broad spectrum of evolution products, tools and resources.

### One common HMI highly desirable

In today's processing world, many plants have islands of systems with different HMIs and different vintages of control networks, controllers and I/Os. Every system brings with it an additional cost for operations, training, etc. Every interface between systems and/or from each system and a Manufacturing Execution System is costly.

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"It is not the strongest that survives – it is the most adaptable to change."  
Charles Darwin

A more coherent structure with a common ABB HMI is highly desirable, since it reduces maintenance and user-related costs. One HMI also promotes control room consolidation and means that existing personnel can be used more cost efficiently. But the really big upsides come when you fully automate the order-

to-delivery process and/or implement predictive maintenance by integrating a consolidated DCS layer with your maintenance system.

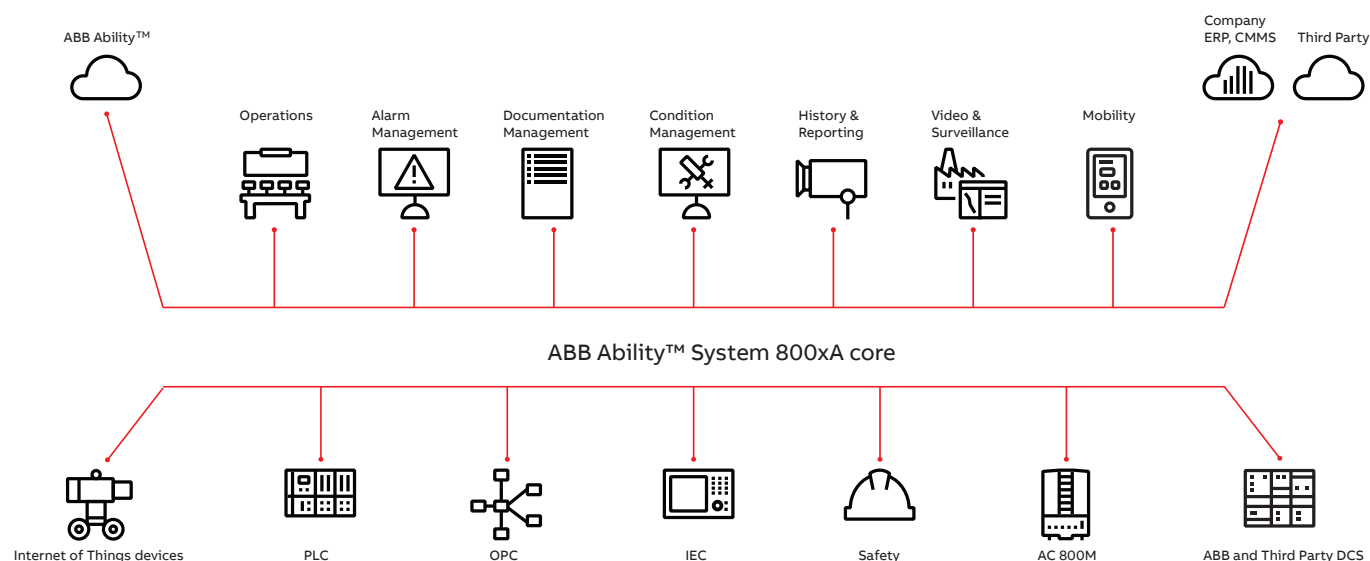
### "Use what you have to get what you need"

Evolving your ABB or third-party control systems in a cost-efficient way that meets your business requirements is never an easy task, but it doesn't have to be that difficult either. ABB offers a comprehensive portfolio of products, solutions, tools and skilled personnel, the combination of which facilitates a smooth, stepwise evolution of your control system where you retain what is still useful. Your reward is a production environment that is safer, more productive and more competitive. The ABB mantra "Use what you have to get what you need" is no idle slogan. With ABB as your control system partner, it's a timeless truth you'll appreciate over and over again.

Our comprehensive portfolio includes:

- HMI connectivity solutions
- Controller evolution kits and related services
- I/O connectivity solutions to System 800xA
- Field Termination Assemblies (FTAs) and different field cabling solutions for retaining existing field cabling
- Related Engineering libraries
- Evolution Solution Centers (ESC) with experts on different DCS evolution concepts, including services for controller code conversion





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List of installed own  
and third-party systems  
that ABB can integrate  
with System 800xA.

### Products and solutions for many systems

Today, ABB has a portfolio of evolution products and solutions for upgrading the following systems:

#### ABB:

- Advant Master
- Contronic
- Freelance
- Harmony
- Melody
- MOD 300
- SATT & Sattline series
- DCI System
- Safeguard 400 series

#### Third-party:

- Siemens Teleperm M
- Honeywell TDC 2000/3000
- Emerson Provox

System 800xA tool PLC-connect is used for ad-hoc PLC integration with PLCs like Siemens S7 and Allen Bradley.

### R&D resources for existing installations

ABB spends millions of dollars annually on research and development, providing new functions and features that improve the cost/performance curve of our products. We make our products more reliable and incorporate proven, new technology to enable step-change benefits.

Manufacturers with existing system installations are not forgotten. Their special concerns are all catered for – keeping processes operational and productive while installing new hardware and/or software, protecting investments throughout upgrades, and doing it all with incremental improvement budgets.

### Lifecycle planning

A successful evolution program must begin with a solid plan driven by end-user business goals. Good planning helps minimize any negative impact of the upgrade, and is critical for incremental stepwise evolution. It also simplifies yearly budgeting.

Individual planning is essential. ABB never adopts a 'one size fits all' approach. Different manufacturers always have unique strategies and business issues. Our account managers and technical experts work closely with them to address these individual needs. This collaborative relationship lets us map out the best strategy for each specific operation.

Following a comprehensive audit of the user's existing system, plus a thorough review of his business drivers, we submit a 3 to 5-year plan. This is reviewed and revised as necessary, which supports our incremental approach to evolution and allows all the flexibility that this implies.

Together, we identify and target which facilities are at greatest risk and thus candidates for near-term upgrading. As each phase is identified, we supply value and Return on Investment proposals that help you secure the required project appropriations. The long-term plan is reviewed and updated as required to reflect your changing business needs and new ABB solutions. We identify and initiate specific projects throughout.

### A world of new opportunities

In addition to the solutions outlined here, we can add further support to help you evolve your process control environment to System 800xA and a whole new world of increased operator and engineering efficiency. We'll always 'go the extra mile' to ensure the success of your evolution project.



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