Advant news

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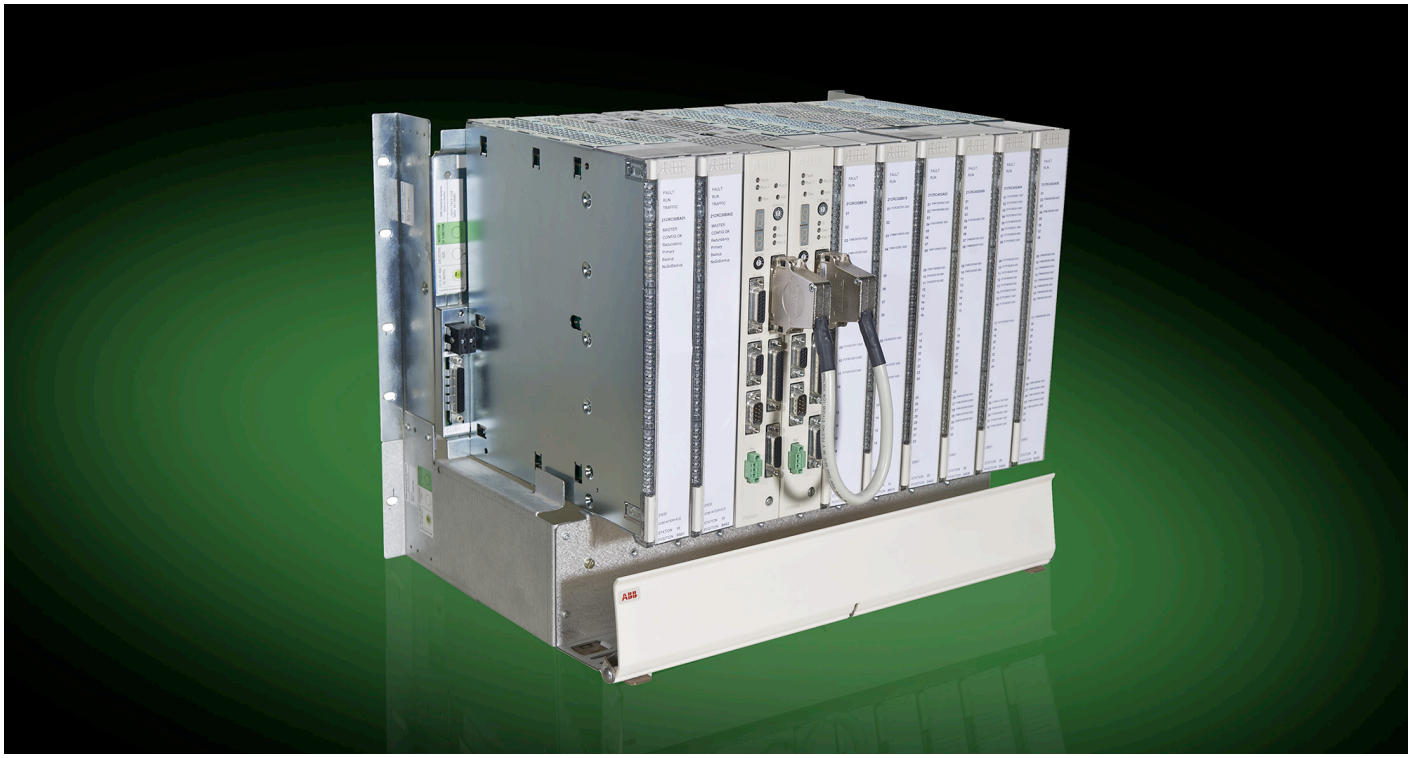
The ABB Advant Power news bulletin



Welcome to the new Advant Power bulletin

Dear readers,

I'm pleased to bring you our latest Advant newsletter, intended for users of the ABB Advant Power control system.

This issue includes a feature article about an Advant control system upgrade as well as news about software releases, an updated life cycle plan and FAQ for the Advant controller 160, and information about Advant platform solutions for Windows XP systems.

Aging operator stations and information management systems at a combined cycle power plant were replaced with up-to-date control technology that flexibly integrated existing controllers, and replaced obsolete HMI and historian systems.

Elsewhere, we highlight ABB's risk-mitigating solutions for Windows XP users, including Advant platform solutions for XP obsolescence. The new release of 800xA Version 6.0 (which fully supports connectivity to Advant Master and AC160 system) is featured, as is the new version of the Advant Master engineering tool, Control Builder A1.4.

We also examine the updated life cycle plan for the Advant controller 160 product line with a FAQ section that answers important questions.

Finally, you will find details about the annual Advant Power Control User Conference (APCUC) held in US and Australia, where engineers share experiences and get information and advice from ABB experts.

I hope this issue of Advant Power news is interesting, informative, and can provide added value to your operations. We encourage feedback and invite you to share your interests and comments with us. And we are happy to provide any additional information or advice you may need.

I wish you happy reading.

Kind regards
Matthias Bolliger
VP, Head of Global Execution
ABB Power Systems

Power and productivity
for a better world™

Project news

Smooth upgrade and DCS capacity improvements

ABB upgraded a typical CCPP control system to the latest technology and significantly improved the DCS capacity and load at the same time.

The upgraded power plant has three combined cycle generating units, each with a gas and a steam turbine, generators, condenser and heat recovery systems, all operated by ABB's Advant Distributed Control System. Its combined cycle technology utilizes waste heat from the combustion turbines to generate steam, which is supplied to the steam turbine to generate additional electricity, and increases the overall efficiency of the unit.

An upgrade of the plant's control system was approved in 2013, and old equipment was finally decommissioned in 2014. This was necessary because the plant's front end HMI (Advant OS500) had become obsolete, making repair and replacement of the Unix-based equipment expensive. Furthermore, the sources of refurbished equipment were too unreliable, compared to readily available "off-the-shelf" replacement parts.

Plant managers opted for up-to-date technology that would provide flexible integration with existing Advant AC450 and AC160 controllers. The existing front end HMI consisted of the following subsystems, all with limited repair or replacement capability:

- seven operator stations (OS500)
- six X terminals for "virtual" operator stations (additional screens)
- three engineering stations
- three information management systems (IMS)

Because of the difficulty of maintaining the OS500 and IMS systems, the customer decided to replace the existing HMI and historian systems with ABB's System 800xA together with the Power Generation Information Manager (PGIM) as historian.

ABB responded to the request by proposing not only to upgrade the HMI system and keeping everything as is, but also improving the controller load and capacity at the same time, increa-sing the diagnostic capabilities of the control system, and reduce the hardware necessary for engineering and maintenance.

These improvements were achieved by:

- Making use of the latest PU410 Ethernet-based RTA board to enable easy client-server configuration for the engineering stations.
- Using serial device servers with multiuser support to allow full AC160 remote support without local interaction on all AC160 CPUs.
- Implementing 800xA for AC100 Connectivity to reduce the load on the AC450 controllers, reduce the no. of binary data points (DI) in the AC450 DB and simplify the signal tracing from HMI to AC160 controllers for these kind of signals. This implementation is also the basis to be prepared for the next evolution step of AC450, e.g. replace it with AC800M. The technical details of the last item can be found in the article on the next page.

The customer supplied ABB with the existing OS500 display data once the work commenced. Since there are differences in the form and function of new displays compared to the OS500s, the closer they match the old screens, the easier it is for operational staff to transition to System 800xA. ABB implemented an enhanced version of the old displays with the latest 800xA graphics technology while still retaining the familiar look and feel for the operators.

ABB supplied eight workplaces, including four for the main control room with four monitors. Three engineering work stations with two monitors were supplied, including one engineering station in each unit's electronics room, which can be accessed from any authorized computer in the system.

A new version of Control Builder A enables more than one Online Builder to be open at one time, but only one per node. As part of the project, the customer also opted for the central single point connection to each AC160 controller as ABB proposed (see above).

ABB also supplied a variety of redundant servers for the 800xA system, including two redundant PGIM servers functioning as the plant-wide historians and a PGIM application server, providing access to the PGIM data from the office network.

In addition, a terminal server was installed acting as a gateway to access the system network from the outside and directly attached to a firewall. The degree of system access depends on user level and password.

System 800xA supports faster network speeds for all components, so the plant network and all servers, workstations and engineering stations have been upgraded to Gigabit Ethernet.

Project scheduling required working through an "A" inspection for the first phase of the turnover to System 800xA. The second and third unit swap over was done on consecutive one-day shutdowns after the inspection of Unit 1. AC100 connect commissioning needed about 24 hours. The customer choose to schedule this work during winter and early spring outages.

A number of bugs were worked out during the process of upgrade, including display sizes, flash card programming, graphic card issues, and incorrect cable lengths.

The customer set up the project with a manager overseeing the budget and an I&C technician acting as the technical lead, working with the manager. This allowed the ABB installation and commissioning team to have a single point contact. It also helped refine different requests from operation and maintenance staff to ABB, to help avoid confusion over project expectations. To save time and money, plant personnel pre-positioned switches, server racks and computers.

In the end, the systems worked perfectly. "We see System 800xA as a good product," said the responsible plant engineer. "Overall it was a good purchase, and a good upgrade to replace the aging OS500's and IMS's."

Optimizing AC450 capacity and load in an Egatrol System

The challenge

The AC450 node in GT24/26 Egatrol 8 systems is typically quite critical regarding resources like CPU load and database capacity. The latter is mostly observed for binary signals (DI, required for generating alarms and events) and hence does not allow the end-user to add more binary signals (from I/Os or calculated) to the respective AC450 node.

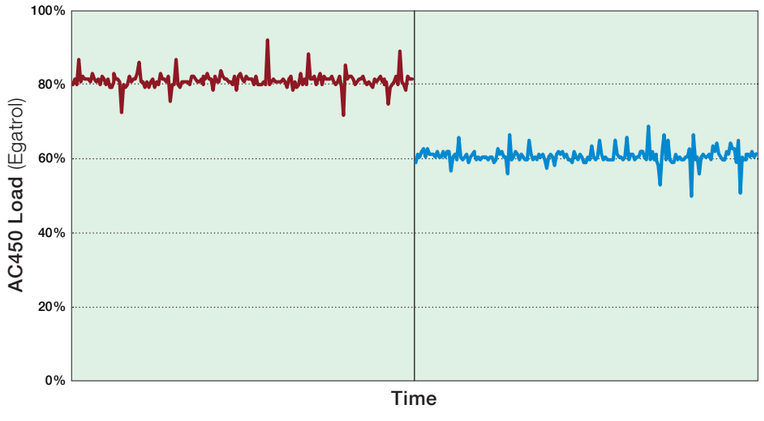
This situation persists despite of workarounds being implemented to overcome the DI signal limit, e.g. Binary signals like BDQ (XQ63) from the AC160 part of the Egatrol are not time-stamped and alarmed in the actual receiving AC450 node. Instead the signals are directly sent to another node via MB300 and time-stamped in this node (see figure 1, blue line).

In addition, that this workaround is sometimes not enough to release the required DB capacity, it also has quite some disadvantages with respect to diagnostic capabilities and maintenance:

- Low accuracy of time-stamps as communication delays and increased tolerance bands need to be incorporated.
- Increased effort to analyze incidents as multiple values are communicated at the same time, thus receiving the same time-stamp in the target AC450 node. This has a high probability for wrong conclusions.
- Engineering of additional signals/alarms is time consuming as three nodes need to be modified.

AC450 load reduction in Egatrol node

Optimizing the communication architecture with System 800xA can reduce load on the main Egatrol AC450 node by at least 20%.



AC450 DB capacity (DI signals) in Egatrol node

	With Advant OS500 only	With System 800xA and AC100 Connect
Spares	0%	52% ⬆
Required	116%	48% ⬇
Routed to other node	16%	0% ⬊

(100% = 2430 signals)

The solution

ABB's System 800xA allows to incorporate all of ABB's control system families into one common HMI system. By implementing a direct connectivity to the AF100 bus with 800xA for AC100 in addition to 800xA for Advant Master for the MB300 bus, not only the capacity and load issues are resolved but also the diagnostic capabilities and engineering efficiency are enhanced significantly.

Increasing DI spare capacity on AC450

With implementing direct HMI routing for all applicable signals, the DI database on the main Egatrol node can be freed of typically over 40% of the previously used DI signals. This is mostly possible by reducing the number of required DIEV blocks by typically more than 75%. Also, the 2nd AC450 node, previously "misused" just for routing DI signals – is freed of most of its calculated DI signals.

AC450 load reduction

At the same time as the capacity is improved, the main Egatrol node is also relieved of the need to handle all these signals and events and therefore the AC450 CPU load is significantly reduced. While this depends on the actual application, an improvement (decrease) of at least 15% should be viable anywhere. The AC450 load reduction is achieved with a negligible change of the AC160 CPU load.

Engineering efficiency improvement

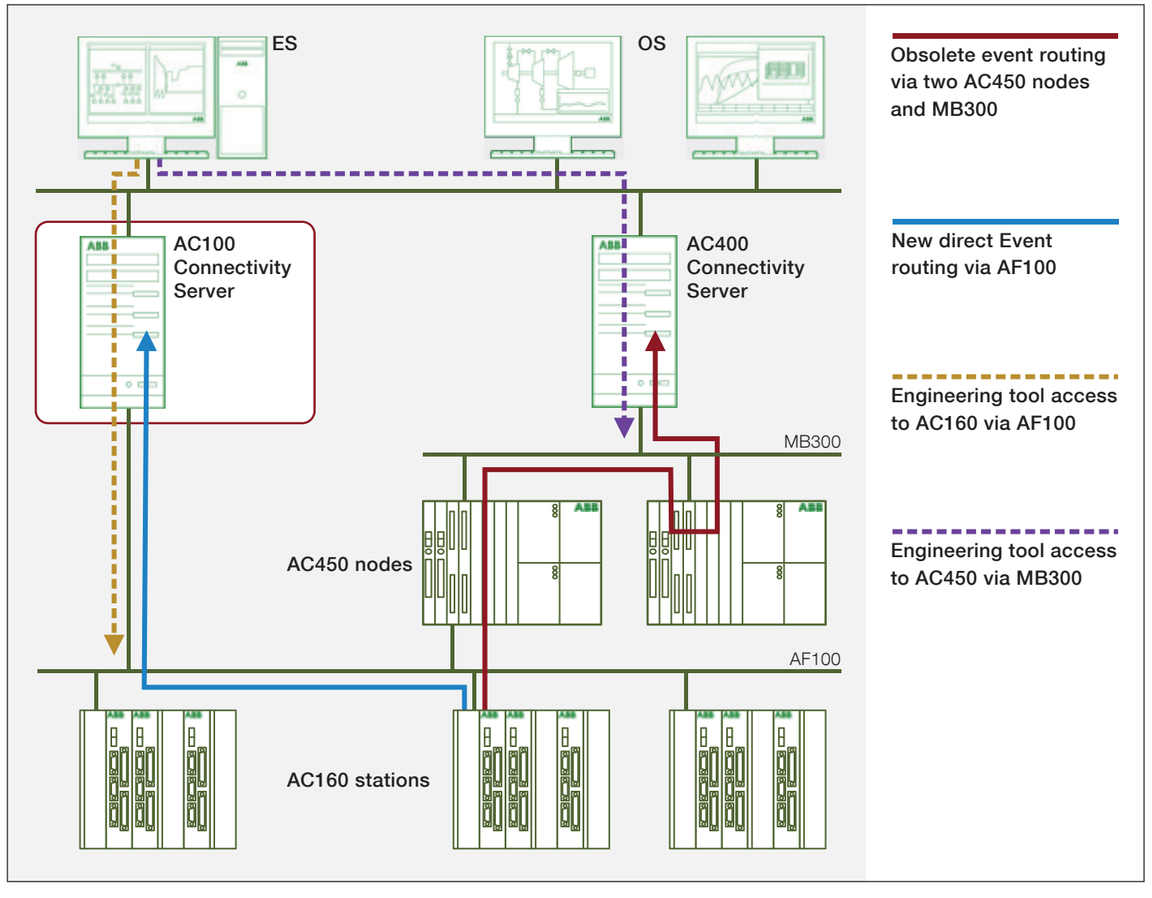
The 800xA for AC100 connectivity includes a direct connection to the AF100 bus via a CI527A card. This can be used at the same time by integrating an engineering station on the server to communicate with all devices on the AF100. Compared with the typical serial connection to the AC160 controllers, a download via AF100 is much faster and allows for more efficient maintenance.

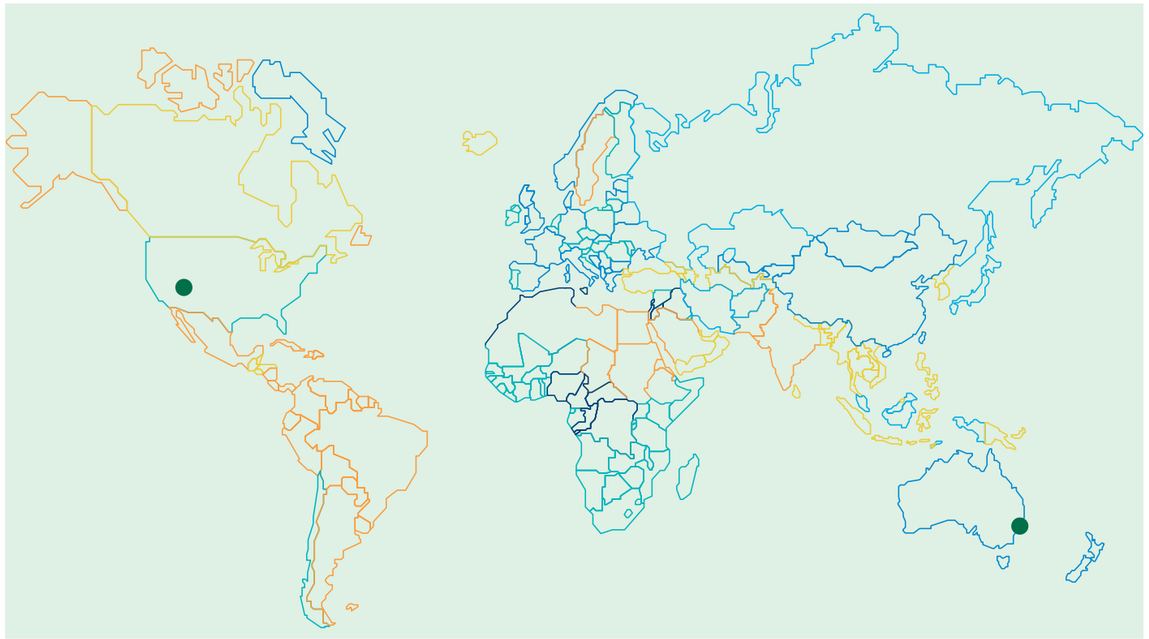
Diagnostic capabilities improvements

By acquiring all signals relevant for the HMI at their actual source, fault tracing and system status supervision is made a lot easier. The newly available object displays for the AC100 objects show directly the network, station and position of the CPU where the signal originates. No need to fire-up the ONB or FCB to trace a faulty signal. Of course, the time stamps of any event and alarm are also originating directly from the source CPU. In addition, the system status of any AF100 station is directly visible in the HMI and any system message or alarm from the AF100 is also available without any further engineering required. Besides these major improvements on Advant controller, engineering and diagnostic level, an upgrade to System 800xA offers even more. Together with System 800xA ABB will implement PGIM, the Power Generation Information Manager, as plant-wide historian, a tightly-integrated and perfect-matching upgrade for any IMS/AEH system (see Advant News 1/2014). Naturally, all of System 800xA's advanced features for improving awareness and operator effectiveness are included as well.

Direct connectivity to AF00 and MB300 with System 800xA significantly improves AC450 CPU load, capacity and diagnostic capabilities of an Egatrol system.

Egatrol communication architecture with MB300 and AF100





Welcome to the ABB events

Here you can find all events and conferences from the power generation industry that may be of interest for you.

Last year's North America user conference was the eleventh one to be held. Uncasville in Connecticut was the venue for this anniversary meeting in August. The participants liked the visit to the Lake Road combined cycle power plant, where a smooth upgrade replaced the aging controls (see article on pages 2 – 4).

APCUC, the Advant Power Control User Conferences are warmly recommended to attend. These are hosted by the Advant users themselves and the focus is really on meeting, sharing experiences and exchanging best practices. In addition, they are the perfect platform to experience the latest Advant Power product updates and system news by ABB. If you would like to participate in one of the two Advant User Conferences, please do not hesitate to contact us:

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Event	Start date	End date	City	Country
APC User Conference Australia	November 26	November 27	Sydney	Australia
POWER-GEN International	December 8	December 10	Las Vegas	USA

800xA Version 6.0 is now released

800xA 6.0 is the culmination of 10 years of software and hardware development providing the best and most full featured control system in the world. This new 800xA release provides users with improved protection against cyber threats, lower total cost of ownership and possibility to improve productivity and profitability. 800xA 6.0 adopts the latest operating system technologies to ensure long term support for years to come.

System 800xA is a comprehensive process automation system. It extends the scope of traditional control systems to include all automation functions in a single operations and engineering environment; enabling process plants to perform smarter and better at substantial cost savings. The System 800xA products have been developed by incorporating information technology with the experience and know-how collected over decades of successful deliveries and customer installations.

ABB recognizes that security is a continuously changing landscape. System 800xA continues to evolve and has improved in a number of security related areas, like digital code signing, Windows User Account Control, improved firewall configuration and improved IPSEC support for secure isolation of 800xA node communications from other network communication.

800xA version 6.0 fully supports connectivity to Advant Master (AC450) and AC160 systems. There are various improvements available for these systems, including a new security enhanced firmware for the PU410 RTA unit and support for central backup and alarm refresh of AC450 controller nodes. System 800xA 6.0 is available for new installations as well as for all 800xA customers with valid Automation Sentinel Maintain Plus agreements. Please refer to your local sales contacts for further information of contact the Global Execution Center for Advant Power in Switzerland (see contacts page in this newsletter).

New Control Builder A Release

A new version of the Advant Master engineering tool, Control Builder A 1.4, has been released. This version adds support for Windows 8.1 and Windows Server 2012 R2 in addition to Windows 7 and Windows Server 2008 R2.

Control Builder A consists of the components Application Builder, Bus Configuration Builder, Function Chart Builder, On-line Builder and AMPL PC and DB Element Libraries. The new release contains updated versions of all these components. Details about corrected errors can be found in the product release notes available from ABB Solutionsbank for Automation Sentinel subscribers.

CBA 1.4 is available for new installations as well as for all existing 800xA or Advant Power customers. It has been especially verified together with System 800xA Version 6.0 but can be used for any existing Advant Power installation. Automation Sentinel subscribers with valid Maintain Plus agreement are eligible for a free upgrade, customers without a valid subscription will need a new license.

Please note, that the new CBA version does only support the PU410 (Ethernet-based) RTA Communication Kit and the PU516A (PCI-based) Engineering Board is not supported anymore. Together with a new PU410 firmware release, cyber security will be substantially increased.

The required Advant Power engineering extensions for this release are also released and available.

For any question, don't hesitate to contact your local Advant Power sales contact or the Global Execution Center for Advant Power in Switzerland (see contacts page).

Advant Controller 160 and S600 I/O Updated lifecycle status

ABB has released an updated life cycle plan for the Advant Controller 160 product line where the product has been transferred to Classic from January 1st, 2015.

AC160 controllers are extensively used in power generation solutions like EGATROL and TURBOTROL and the FAQ section below will answer the most important questions you as our power generation customers will have.

The products will continue to be supported according to System 800xA lifecycle policy. Related products as the integration to System 800xA (800xA for AC 100), AC 100 OPC Server and the Control Builder A engineering tool remain in Active lifecycle phase.

For Automation Sentinel subscribers, Advant Controller 160 will be maintained and supported according to the lifecycle policy. For subscribers, the latest available and functionally equivalent Advant Controller 160 software will be delivered at no additional license cost.

For any question, don't hesitate to contact your local ABB Power Generation sales representative for further details. If no specific Advant sales support is available in your area, please contact the GEC Advant Power in Switzerland directly (see contacts page).

Frequently Asked Questions

General

What is the general support status of AC160 for power generation customers?
For power generation customers, the product line is continued to be supported for all types of projects. This extended life cycle support will be provided by the Global Execution Center (GEC) for Advant Power within BU Power Generation in Switzerland.

What is the support status of my EGATROL and TURBOTROL turbine control solutions?
The EGATROL and TURBOTROL turbine control solutions are fully supported by ABB Power Generation. Evolution and migration solutions will be made available to allow for seamless and continued operation of your plant even beyond the lifetime of the Advant Controller 160.

What is the lifecycle commitment for Advant Controller 160 and S600 I/Os?
The lifecycle policy for AC160 and S600 I/O is defined by the System 800xA Life Cycle Policy. Minimum lifecycle commitment is according to Advant Master 100 Series lifecycle Plan currently until 2017. An updated version of the plan is released on a regular basis.

What is the impact of this change on the Advant Controller 450 and related products?
The AC450 controller and its related products are not affected by this change and remain in Active lifecycle phase until further notice. Any change of the lifecycle will be communicated according System 800xA Life Cycle Policy in due time. Details can be found in the Advant Master 400 series lifecycle plan (3BSE070734). An updated version of the plan is released on a regular basis.

Hardware

Can I still get spare parts and AC160 hardware for extensions?
Yes, the AC160 platform is continued to be maintained and Advant Controller 160 parts are in production and available.

How can I order spare parts?
Spare part orders can be placed at your local ABB Power Generation sales office or at the GEC Advant Power in Switzerland (see contacts page).

Can I still get updates for my AC160 system software?
For Automation Sentinel subscribers, the latest available and functionally equivalent Advant Controller 160 software will be delivered at no additional license cost. For those customers who are not current subscribers, we recommend subscribing to Automation Sentinel in order to receive the available support, maintenance and upgrades to their system in the future.

Software

What is the support status of related software products to the Advant Controller 160?
Related basic platform products as the integration to System 800xA (800xA for AC 100), AC 100 OPC Server and the Control Builder A engineering tool remain in Active lifecycle phase. Any change will be communicated in time according to System 800xA lifecycle policy.

What is the support status of the Advant Power Control (APC) products?
The following Advant Power Control (APC) products supplied by ABB Power Generation are fully supported and maintained:
APC for AC450 Controller Library (UDPC Version)
– Option 10 for AC160 Controller
– APC Engineering Extensions for Control Builder A
– APC AC450 for 800xA
– APC AC160 for 800xA

Upgrade paths for older products and versions exist. Please contact your local ABB sales office or the GEC Advant Power in Switzerland for any question about ordering and upgrading of these products.

How can I order software upgrades for basic platform products or APC products?
Upgrade orders can be placed at your local ABB Power Generation sales office or at the GEC Advant Power in Switzerland (see contacts page).

How to handle obsolete and exposed Windows XP and Server 2003 systems

Background

As announced previously, Microsoft stopped supporting the ageing Windows XP operating system on April 8, 2014 and Windows Server 2003 on July 14, 2015. Users of those systems are no longer receiving software updates or technical support from Microsoft.

Risks to consider

Microsoft is recommending XP users to upgrade to Windows 8 or 10 and Server 2003 users to Server 2008 R2 or 2012, but this involves costs for new operating system software, and could also require investment in new hardware since the PCs and servers (or other hardware devices) that have been used to run XP and Server 2003 for some years may be incompatible with the latest Windows operating systems.

Computers using XP and Server 2003 after support ends could become more vulnerable to security risks and viruses, and users will find new software and hardware is optimized for more current Windows operating systems, so that greater numbers of apps and devices will not work with XP and Server 2003.

Windows XP and Server 2003 end-of-life presents some critical risks to the safe management of assets and plants operating on XP- or Server 2003-based solutions, a situation that also affects ABB automation and control systems.

ABB can help you

The ABB Evolution pathway updates and upgrades an existing system to the actual versions of operating systems as well as product and application software. In addition, for customers not yet subscribed to ABB Evolution programs such as Sentinel, ABB offers special maintenance contracts for a specific time period as a means of upgrading and avoiding end-of-life operating system issues.

Advant platform solutions for XP and Server 2003 obsolescence

The Advant platform and the applicable Power Generation add-ons are fully supported by ABB on the latest Microsoft operating system platforms. For all products required to operate and maintain an Advant Power system ABB is offering upgrades and seamless evolution paths to the latest versions:

- Control Builder A supports Windows 7 (32-bit and 64-bit), Server 2008 R2 SP1, Windows 8.1 (64-bit only) and Server 2012 R2 since version 1.4/0 including all Advant Power add-ons.
- The PU410 external RTA board solution is totally independent of server HW and also supports virtualized systems.
- The new System 800xA Version 6.0 (including Advant Master and AC100 connectivities) fully supports Windows 8.1 and Server 2012 R2. The predecessor version 5.1 supports Windows 7 and Server 2008 (R2) (32 and 64-bit).
- The Advant Power Connect (APC) add-on packages for AC450 and AC160 based on System 800xA fully support the latest Microsoft operating systems, same as the supported target version of System 800xA.

For details about the available upgrade paths specific to your configuration and type of application, please contact your local ABB Power Generation contact.

Core Advant Power and related products

Latest Revisions

Product	Version	Released	Remarks
Connectivities and Operator Stations			
AdvaCommand	1.8/6	2004	
AdvaCommand Extensions 1	1	2006	Station backup on file
AdvaCommand Extensions 2	2	2007	Print to file
APC for OS500	2.3/4	2004	
APC AC160 for 800xA EDB	5.1.0	2012	PG2 graphic elements
APC AC160 for 800xA DAT	5.0.0	2008	
APC AC450 for 800xA	**5.1.1**	**2014**	**64bit compatible; PG2 graphics (faceplates and symbols)**
AEH Enterprise Historian	2.2/0	2000	
IMS Reports	2.1/0	2002	
800xA for Advant Master	**6.0.0/0**	**2015**	**New support for Advant Master central backup**
AC100 OPC Server	**6.0.0/0**	**2015**	**Support for Windows 8.1 and Server 2012 R2**
APC AC450 for 800xA	**6.0.0**	**2015**	**Support for 800xA 6.0 on Windows 8.1 and Server 2012 R2**
System Software and Libraries			
APC AC450 UDPC version	2.1/2	1999	Released for Advant Controller 450 2.3/10
APC AC450 PC version	2.3/0	1999	FlashPROM version; Released for Advant Controller 450 2.3/10
Advant Controller 450	2.3/10	2012	
AC160 SSW	2.2/6	2012	
Engineering Tools			
Control Builder A	**1.4/0**	**2015**	**Support for Windows 8.1 and Server 2012 R2**
CBA for Advant Power		**2015**	**Advant Power Engineering Extensions for Control Builder A**
FCB	**6.4/0**	**2015**	**Support for Windows 8.1 and Windows Server 2012 R2**
ONB	**3.2/0**	**2015**	**Support for Windows 8.1 and Windows Server 2012 R2; PU516A not supported anymore**
Hardware			
PM665	PR: N	2002	Successor of PM645x with higher performance and capacity
CI630	PR: L FW w	2012	Improved redundancy switchover reduced AF100 errors (compared to FW <u)
CI631	PR: K FW w		
CI820V1	2.2/5	2013	Fixes issue described in APN2072, see page 7
CI869	PR: D	2011	AF100 interface for AC800M controller for 800xA SV5.1 and later
CI527A		2006	3.3V PCI Support
CI527A for PCI Express			**External solution for current server HW**
DI651	PR: G FW e	2005	Support of DI651x DB element to avoid nuisance time-jitter alarms
DP640	PR: L FW e	2009	Fast Trip from low speed
CSM01	A	2008	Support module for SIL3 certified protection
PU410	**1.0.4.0**	**2015**	**Cyber security enhanced version supporting 800xA SV6.0**

Coming soon

Product	Version	New Feature
Connectivities and Operator Stations		
APC AC160 for 800xA		Unified version with PG2 and 64-bit support

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Advant Power presence worldwide
We are here to support you

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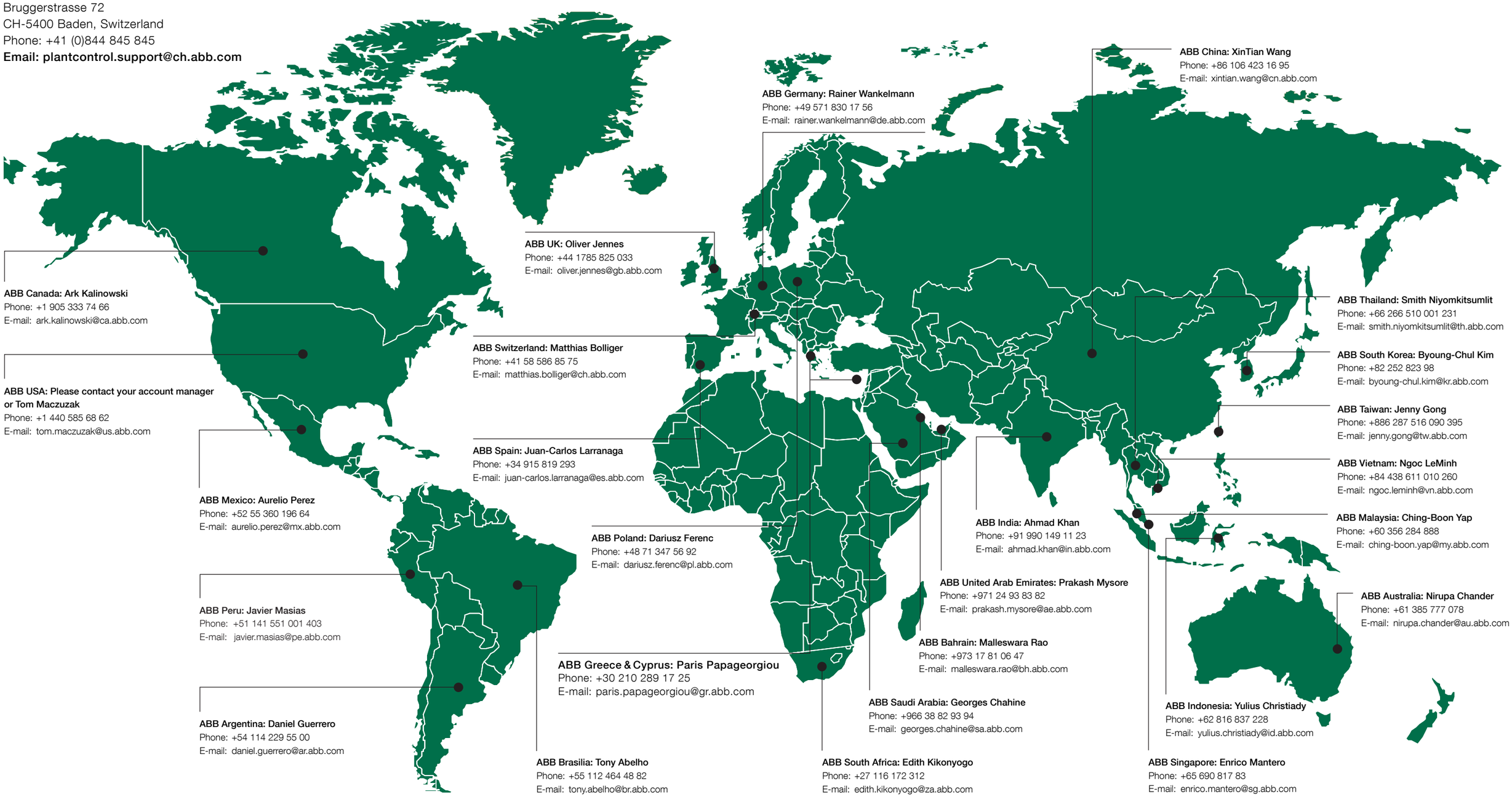

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