P14 news

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The ABB Procontrol® P14 news bulletin

Welcome to the first issue of the Procontrol P14 news bulletin

Dear Readers,

Since the beginning of the eighties until now the ABB control system Procontrol P14 has been installed in nearly 500 power stations in 46 countries all over the world.

Almost all of these installations are still in service and the positive customer feedback shows us that our obligation to support the installed system over the total life cycle of the power plant is the right strategy.

To obtain the high availability and reliability the Procontrol P14 control system is constantly being improved. Our aim is to keep it up-to-date and to fulfill customer requirements for first installations in new power plants as well as a solution for the installed base.

Our development department is committed to delivering improvements and if necessary compatible upgrade solutions in case of obsolescence or unavailability of components, systems and support.

This newsletter is intended for users and interested parties of ABB control systems and to keep you informed about P14 technology.

In this first bulletin, you will find information about:

- The newest module types developed and released within the last year and a view in the future
- Managing Windows XP end of life. No new announcement but very important to inform and to remind
- Project example: Migration of three turbine control systems of first generation P14 modules to the newest state-of-the-art at Gandhar power station in India
- The map of our Procontrol P14 presence worldwide

Our intention is to issue at least one annual newsletter for you, containing valuable information. We hope you will find this newsletter helpful and we are looking forward to your feedback and requests. Your local representative and I welcome any questions or comments you may have reading our newsletter.

With kind regards,
Günter Herz
Procontrol P14 Evolution Manager
ABB Power Generation

Power and productivity
for a better world™

Projects

ABB P14 upgrade breathes new life into old control system

An ABB control upgrade at the 648-megawatt (MW) Jhanor-Gandhar combined cycle gas turbine (CCGT) power plant in India extends the life of the existing Procontrol P14 plant automation system, and replaces multiple systems and interface problems with a common, problem-free control system. The upgrade saves the customer time, money and delivers efficient, reliable control that can be easily upgraded in the future.

The base-load Jhanor CCGT power plant is owned by the state-run National Thermal Power Corporation (NTPC), and operates in the state of Gujarat near the city of Baruch, on India's northeastern coast. It is supplied with natural gas from the Gandhar gas field, and water from the Narmada River. Commissioned in 1994/95, ABB's turbine control system upgrade started in 2013; the last unit was finalized in April 2015.

Upgrade delivers numerous customer benefits

A major benefit of ABB's solution is NTPC's own team could perform the mechanical and installation work, since there are well-trained technicians on site, which meant only one supervisor was required. In addition, replaced cards were reusable as spare parts for the main DCS. The schedule provided by ABB meant upgrade expenses could be stretched over a longer time period and tuned to the customer's budget. The customer also benefits from ABB's obligation to provide suitable solutions for upgrading Procontrol P14 installations step by step, either with P14 successor modules, or suitable alternative ABB solutions, beyond 2030.

The Jhanor plant transmits power at 220-kilovolts (kV) and 400 kV to India's western regional grid using three gas turbines (GT13 units originally supplied by ABB) that are controlled with a first generation Procontrol P14 plant automation system, installed in 1994.

All three P14 turbine control system modules were replaced with new modules unit by unit during an outage period using the KISS engineering tool, which ABB has specially developed to upgrade Procontrol P14 systems.

Engineering simplified with a KISS

KISS is an acronym for "configuration, information and service system," which reads the logic from old modules and recovers it in a new form suitable for new modules. The KISS tool improves and simplifies engineering, commissioning and maintenance efficiency.

Part of the scope of delivery included replacing three old PDDSs (Programming, Diagnosis and Display Systems) with the newest version based on Windows 7. All of the new cabinets are compatible with FDDI (Fiber Distributed Data Interface) bus technology, in preparation for future improvements.

ABB's upgrade ensured there is still one common engineering tool and operator system, and enables easy upgrading and transfer of control logic to new modules.

All three upgrades were performed without delays, to the satisfaction of NTPC, and maintain the high reliability of the existing P14 control system. The work was completed without requiring modifications to the main distributed control system (DCS), and finalized in a short time frame, solidifying the long and trustworthy relationship NTPC and ABB have developed over 25 years. The order is including five training days for the new modules in use at the ABB training center in Mannheim.

NTPC is the largest power generating company in India with a total installed capacity of 39,174 MW from 29 power generating stations spread across the country. With over 16,000 MW capacity under construction, NTPC plans to become a 128 GW company with a well-diversified fuel mix by the year 2032.

Project name
Jhanor-Gandhar combined cycle gas turbine (CCGT)

Location
Baruch, state of Gujarat, India

Customer
National Thermal Power Corporation (NTPC)

Completion
April 2015

ABB solution
- Extends the life of the existing Procontrol P14 plant automation system.
- Replaces multiple systems and interfaces with a common, problem-free control system.

System benefits
- The KISS tool improves and simplifies engineering, commissioning and maintenance efficiency (see left column for detailed explanation).
- Saves the customer time, money and delivers efficient, reliable control that can be easily upgraded in the future.

New modules available in the Procontrol P14 product family

According to the lifecycle policy “Evolution without obsolescence”, ABB is committed to our customers for continued support on maintenance for all equipment supplied. ABB is a trendsetter in the field of control system technology and is always in tune with the market strategy.

Procontrol systems and its components have been continuously improved and developed to meet the needs of the market from the very beginning of the systems life cycle.

The goal of ABB is to protect our customer investments as long as possible and economically reasonable. Thus we will not remove from sale any product or family of products until an equivalent replacement to those products has been made available.

The ABB Procontrol control system is designed for continuous evolution, although individual products within the system go through a life-cycle process.

In 2014/2015 three new modules were launched in the P14 product family.

Furthermore, another module has been released by a new firmware version with additional functionalities.

The technical details you will find on the following pages. Please note: Also these modules are compatible to all P14 installations, however. The replacement is not always like plug and play. Some points are to be considered and some minor modifications in hard- and software could be neccessary. In case of questions please contact our local representative or direct to our contact address you will find on the last page.

HSI Communication Module 87TS51R1210

Module characteristics

- New HSI communication module 87TS51R1210
  - Communication with the HSI systems POS30 and the S+ Operations
  - Successor module for 87TS50R12xx/14xx
- Comparison with predecessor modules
  - 100 % pin & function compatible
  - 50 % smaller footprint (1 Horizontal Pitch)
  - 4 times better performance
  - IT Security approved (DSAC test successfully passed)
  - Standard embedded Freescale ColdFire CPU module
  - OSS Real-time Linux Operating System
- IT Security approved

Communication Modules 87TS01R16x5 with Ethernet Interface

Module characteristics

- New communication modules to interface the P14 engineering systems PDDS, EDS and KISS
  - 87TS01R1645 (for Master Bus systems)
  - 87TS01R1665 (for FDDI systems)
- 10/100BaseT Ethernet interface on board
  - Standard embedded Com-Server module (COTS)
- Reduced cabling and power supply components
  - No external Com-Server required
  - Reduced engineering and installation cost
  - No 230V AC required in P14 cabinets
- IT Security approved

Universal Control Module 83SR50R1210 – New Firmware P0022

Module characteristics

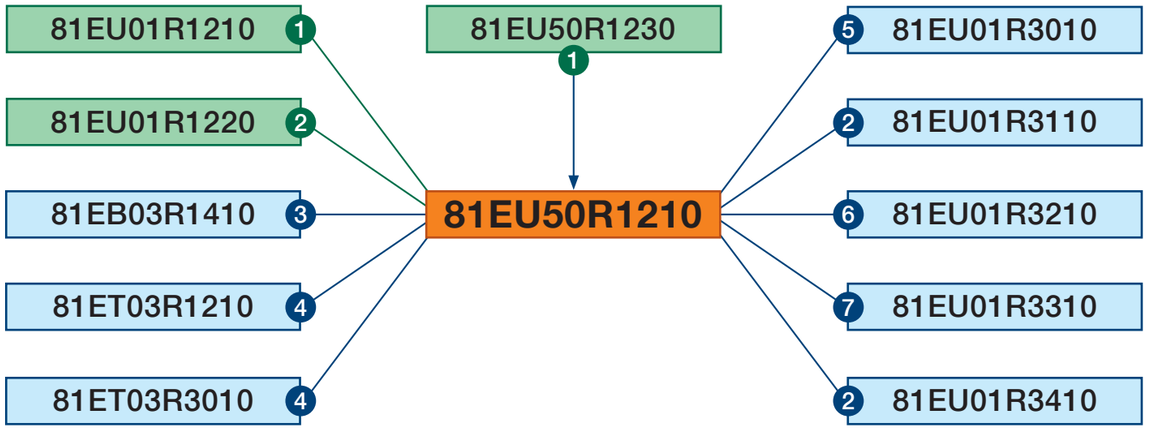
- Universal control module suitable for the applications
  - Drive control of reversible & unidirectional drives, actuators and solenoid valves
  - Function group control, 3-step control and signal conditioning
- 32 bit processor executing application programs based on predefined function blocks
  - 4 process interfaces with 2 DO and 4 DI including signal processing
- Configurable cycle times 20-700 ms
- Module hardware & software self diagnosis
- Replacement (with new firmware P0022)
  - Direct replacement of the control modules 83SR04R1210/1211
  - Replacement of 83SR04R2220: Solution by combination of: 83SR50R1210 + 81EU01R1210

New Universal Input Module 81EU50R1210

Module characteristics

- 16 channel universal input module for binary, analog and temperature signals
  - Each channel configurable as analog or binary input or alternatively 16 binary input channels with time stamp
- 32 bit processor executing application programs based on predefined function blocks
- Wire break supervision, On-board field supply voltage incl. supervision
- Disturbance display/annunciation, Module hardware & software self diagnosis
- Signal filtering & pre-processing (linearization and correction functions)
- 4 limit values per analog signal
- Only one module for all analog and binary inputs
- Better module performance than predecessors due to powerful 32-bit CPU
- Better engineering flexibility by increased number of function blocks

New Universal Input Module 81EU50R1210
Streamlining I/O Modules – Replacement Strategy



Life cycle today

“Active” **“Classic”**

1. Direct replacement of predecessor module
2. Direct replacement with migration of some function block types
3. Additional electrical isolation with measuring transducer and modification of process cabling required
4. Reduced support of thermocouples
5. No support of non-coincidence monitoring and modification of process cabling required
6. Max. 2 inputs for 4-wire transducers supported and modification of process cabling required
7. Input of voltage signals within 0...10 V not supported

Managing Windows XP end of life

Windows XP background

As announced several times, Microsoft stopped supporting the ageing Windows XP operating system on April 8, 2014. XP users will no longer receive software updates or technical support from Microsoft, although the company announced earlier this year that it will continue to provide virus warnings for Windows XP for some time. The Windows Server 2003 server operating system also reached its end of life in July 2015.

Risks to consider

Microsoft is recommending XP users upgrade to Windows 7 or 8, but this involves costs for new operating system software, and could also require investment in new hardware since the PCs (or other hardware devices) that have used to been run XP for some years may be incompatible with the latest Windows operating systems.

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

XP end of life presents some critical risks to the safe management of assets and plants operating on XP-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.

Procontrol P14 solution for XP obsolescence

All Computer systems based on Windows belonging to the Procontrol P14 system are fully supported by ABB and overcame the XP obsoleses quite some time ago. For all products required to operate and maintain a P14 System, ABB is offering upgrades and seamless evolution paths to the latest versions. Current system versions compatible with the Windows 7 platform are listed below:

- PDDS Version 6.4.2
- CDS Version 6.1
- EDS Clients for EDS Server Version 7.1
- Operator Stations for POS30 Version 8.0
- Kiss Version 10.1.4

Life cycle management for power plants

ABB offers a comprehensive portfolio of life cycle management and service products for the power generation – a portfolio based on extensive process and application know-how and one of the largest installed bases in the world.

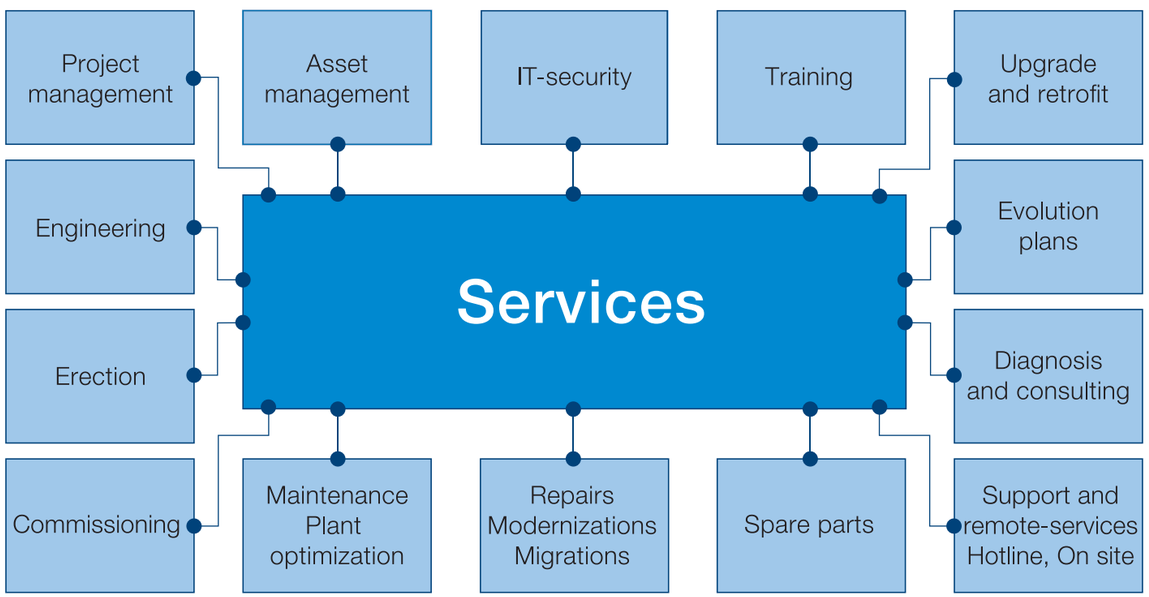
As a leading supplier of instrumentation, control and electrical equipment, ABB possesses both, the system technology and the process expertise required, as well as the qualified and skilled staff needed for successful implementation of solutions.

Our philosophy is simple: we protect your investment through the stepwise evolution and upgrading of your electrical, control and instrumentation systems to minimize the consumption of energy, prolong asset operating life, and minimize the cost of ownership.

Why ABB?

– ABB has been in the power generation industry for more than 125 years
– ABB is a leading supplier of power and automation products and systems for utility and industry customers
– ABB covers the complete scope of power and automation systems
– and offers a full portfolio of life cycle management services

ABB offers professional life cycle services for your products and systems, including component reliability analysis. Through our assessments you will gain the information required for cost effective long-term decisions concerning overall system operation and maintenance.



Plant optimization and energy efficiency

ABB plant optimization and energy efficiency solutions enable power producers to maximize plant performance and achieve significant benefits and savings in all types of market – dynamic response, base load and renewables integration.

In mature markets the days of thermal power plants operating constantly at base load are over. Often these plants now have to operate as back-up to wind farms and solar power plants, running below their designed capacity and ramping up or shutting down several times over a 24-hour cycle. For power generators in these markets, the ability to respond quickly and cost-effectively to rapidly changing load requirements is crucial.

In developing parts of the world, where there is often a shortage of electric power, thermal power plants continue to operate around the clock at base load. Here there is scope for huge savings to be made by optimizing plant performance or improving the plant's energy efficiency. The objective is to increase plant electrical output with a given and limited amount of resources.

In many countries – developed and developing – there is a need to participate in intra-day and day-ahead energy trading efficiently in order to maximize returns. This can be achieved by optimizing unit production in a multiunit conventional power plant, or by integrating small renewable energy installations into one large virtual power plant in distributed generation.

ABB has a proven and comprehensive range of plant optimization and energy efficiency solutions that enable power generators to thrive in these diverse market requirements.

Throttle-free frequency control

MODAN and MODAKOND is a unit control solution that delivers the fast load ramps and frequency control required to meet the dynamic response schedules of load dispatchers in mature markets. It does this by coordinating the boiler, turbine and energy reserves by means of model-based set-point control and model-based feed forward control. This eliminates the need to throttle the turbine control valves. Whereas throttling usually achieves the desired results but lowers plant efficiency, MODAN and MODAKOND improve plant efficiency by 0.3 to 0.4 percent.

The two products can be installed as an integrated control solution in units running on ABB control systems or as an optimization solution to upgrade power plants running on non-ABB control systems. Installations at more than 80 power plants show that a typical 700 MW unit operating at an average load of 88% can reduce energy consumption on throttling by around 10,150 MWh a year. "The annual cost savings for such a reduction are significant."

Optimizing start-ups and shutdowns

Because of the increasing number of start-ups and shutdowns that thermal power plants have to perform – often several times a day – power generators need to know how long it will take from firing up to synchronization in order to meet the required load scheduling. They also need to keep the cost of these potentially budget-busting boiler start-ups as low as possible.

In one of many project examples in a German 840 MW power plant OPTIMAX® BoilerMax has reduced fuel consumption and greenhouse gas emissions by 20 percent. The power station is one of several plants that now benefits from lower fuel costs and a reduced carbon footprint thanks to BoilerMax.

By applying the above solutions a power plant can reach a higher ranking in the enterprises scheduling list, resulting increasing operation. This can be achieved by using the existing Melody control system and the proven, standardized ABB solutions. Get in contact with ABB to get more information and to learn how this could be implemented in your plant.

Contact

Procontrol P14 presence worldwide
We are here to support you

Procontrol P14 Global Execution Center
ABB AG Germany – Power Systems
Günter Herz, Peter Beer
Kallstadter Strasse 1
DE-68309 Mannheim, Germany
Phone: +49 621 381 33 33
E-mail contact centers 24/7: contact.center@de.abb.com

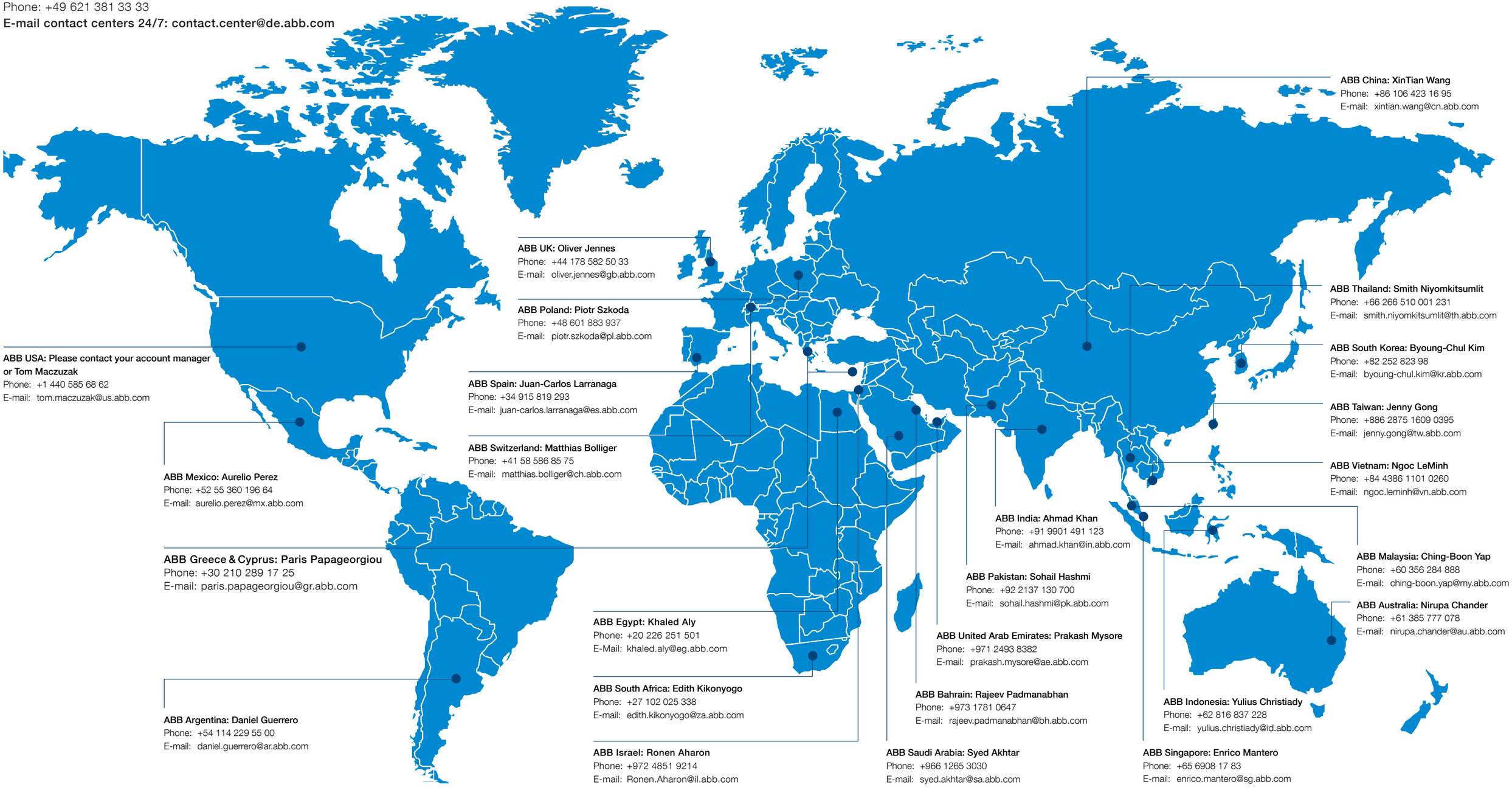


ABB USA: Please contact your account manager or Tom Maczuzak
Phone: +1 440 585 68 62
E-mail: tom.maczuzak@us.abb.com

ABB Mexico: Aurelio Perez
Phone: +52 55 360 196 64
E-mail: aurelio.perez@mx.abb.com

ABB Greece & Cyprus: Paris Papageorgiou
Phone: +30 210 289 17 25
E-mail: paris.papageorgiou@gr.abb.com

ABB Argentina: Daniel Guerrero
Phone: +54 114 229 55 00
E-mail: daniel.guerrero@ar.abb.com

ABB UK: Oliver Jennes
Phone: +44 178 582 50 33
E-mail: oliver.jennes@gb.abb.com

ABB Poland: Piotr Szkoda
Phone: +48 601 883 937
E-mail: piotr.szkoda@pl.abb.com

ABB Spain: Juan-Carlos Larranaga
Phone: +34 915 819 293
E-mail: juan-carlos.larranaga@es.abb.com

ABB Switzerland: Matthias Bolliger
Phone: +41 58 586 85 75
E-mail: matthias.bolliger@ch.abb.com

ABB Egypt: Khaled Aly
Phone: +20 226 251 501
E-Mail: khaled.aly@eg.abb.com

ABB South Africa: Edith Kikonyogo
Phone: +27 102 025 338
E-mail: edith.kikonyogo@za.abb.com

ABB Israel: Ronen Aharon
Phone: +972 4851 9214
E-mail: Ronen.Aharon@il.abb.com

ABB Saudi Arabia: Syed Akhtar
Phone: +966 1265 3030
E-mail: syed.akhtar@sa.abb.com

ABB Bahrain: Rajeev Padmanabhan
Phone: +973 1781 0647
E-mail: rajeev.padmanabhan@bh.abb.com

ABB United Arab Emirates: Prakash Mysore
Phone: +971 2493 8382
E-mail: prakash.mysore@ae.abb.com

ABB Pakistan: Sohail Hashmi
Phone: +92 2137 130 700
E-mail: sohail.hashmi@pk.abb.com

ABB India: Ahmad Khan
Phone: +91 9901 491 123
E-mail: ahmad.khan@in.abb.com

ABB China: XinTian Wang
Phone: +86 106 423 16 95
E-mail: xintian.wang@cn.abb.com

ABB Thailand: Smith Niyomkitsumlit
Phone: +66 266 510 001 231
E-mail: smith.niyomkitsumlit@th.abb.com

ABB South Korea: Byoung-Chul Kim
Phone: +82 252 823 98
E-mail: byoung-chul.kim@kr.abb.com

ABB Taiwan: Jenny Gong
Phone: +886 2875 1609 0395
E-mail: jenny.gong@tw.abb.com

ABB Vietnam: Ngoc LeMinh
Phone: +84 4386 1101 0260
E-mail: ngoc.leminh@vn.abb.com

ABB Malaysia: Ching-Boon Yap
Phone: +60 356 284 888
E-mail: ching-boon.yap@my.abb.com

ABB Australia: Nirupa Chander
Phone: +61 385 777 078
E-mail: nirupa.chander@au.abb.com

ABB Indonesia: Yulius Christiady
Phone: +62 816 837 228
E-mail: yulius.christiady@id.abb.com

ABB Singapore: Enrico Mantero
Phone: +65 6908 17 83
E-mail: enrico.mantero@sg.abb.com

Contact us
P14 Global Execution Center

Procontrol P14 Global Execution Center
ABB AG Germany – Power Systems
Günter Herz, Peter Beer
Kallstadter Strasse 1
DE-68309 Mannheim, Germany
Phone: +49 621 381 33 33
E-mail contact centers 24/7: contact.center@de.abb.com

www.abb.com/powergeneration

Procontrol P14 Product portal:
new.abb.com/power-generation/power-plant-automation/p14

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