



800xA Simulator
Improve safety and productivity
through simulation

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While control systems automate large sections of most plants, human error remains a critical aspect in most accidents. 800xA Simulator provides a safe and realistic environment where operators can learn to master the process, thereby reducing risks and the number of un-planned shutdowns.

Additionally, 800xA Simulator is a powerful tool for optimization and engineering studies to improve productivity and energy savings.

Automation system used in simulator

ABB can offer a realistic simulator solution for the extended automation system 800xA that makes it possible to create a simulator system of the running plant with identical operator layout, view and control logic. Optionally, operator panels' physical I/O can be integrated with the simulator for identical control room interactions.

The simulator system is a standalone automation system, disconnected from the real process to provide a safe environment, and instead connected with a dynamic process model that simulates the process and the control feedback. This provides the most realistic simulator solution.

Lifecycle simulator

800xA Simulator can be an integral part for all phases of the plant lifecycle. By combining engineering verification, operator training and optimization studies into one system, you can maximize the value of your simulator system.

Use the simulator for verification and optimization in engineering and modification phases of the automation system:

- Verification of control applications and operator interfaces
- Verification of operator and maintenance instructions
- Tuning of automation parameters
- Test updates of control applications and libraries
- Test updates of automation system software
- "What if" engineering

Use the simulator for operator and technician training prior to production start and before modifications are implemented on plant system, and train new and existing personnel during the operation phase:

- Plant familiarization
- Safety and Automation system operation
- Plant start-up and shutdown
- Response on malfunction and emergency situations
- Safety procedures
- Operator certification
- Recruitment

800xA Simulator environment

800xA Simulator extends the automation system software with simulator functionality that makes training and testing efficient: for instance save and load of the process state in control applications and operator interfaces, or freeze and resume of a simulation session. The operator interfaces and control applications are identical as in the plant system, and standard engineering tools and methods are used for transferring the configuration data between the two systems.

The simulator solution runs the controllers in a more cost and space efficient hardware, and the physical I/O is replaced with software signals. This requires some changes of the controllers' configuration from the plant system, and 800xA Simulator is provided with efficient tools to automatically perform this after once defining the configuration. This reduces maintenance costs.

Operation, control and engineering functionalities are identical as in the plant system, and this assures realistic and correct behavior of the simulator. Skills are 100% transferable between plant and simulator system.

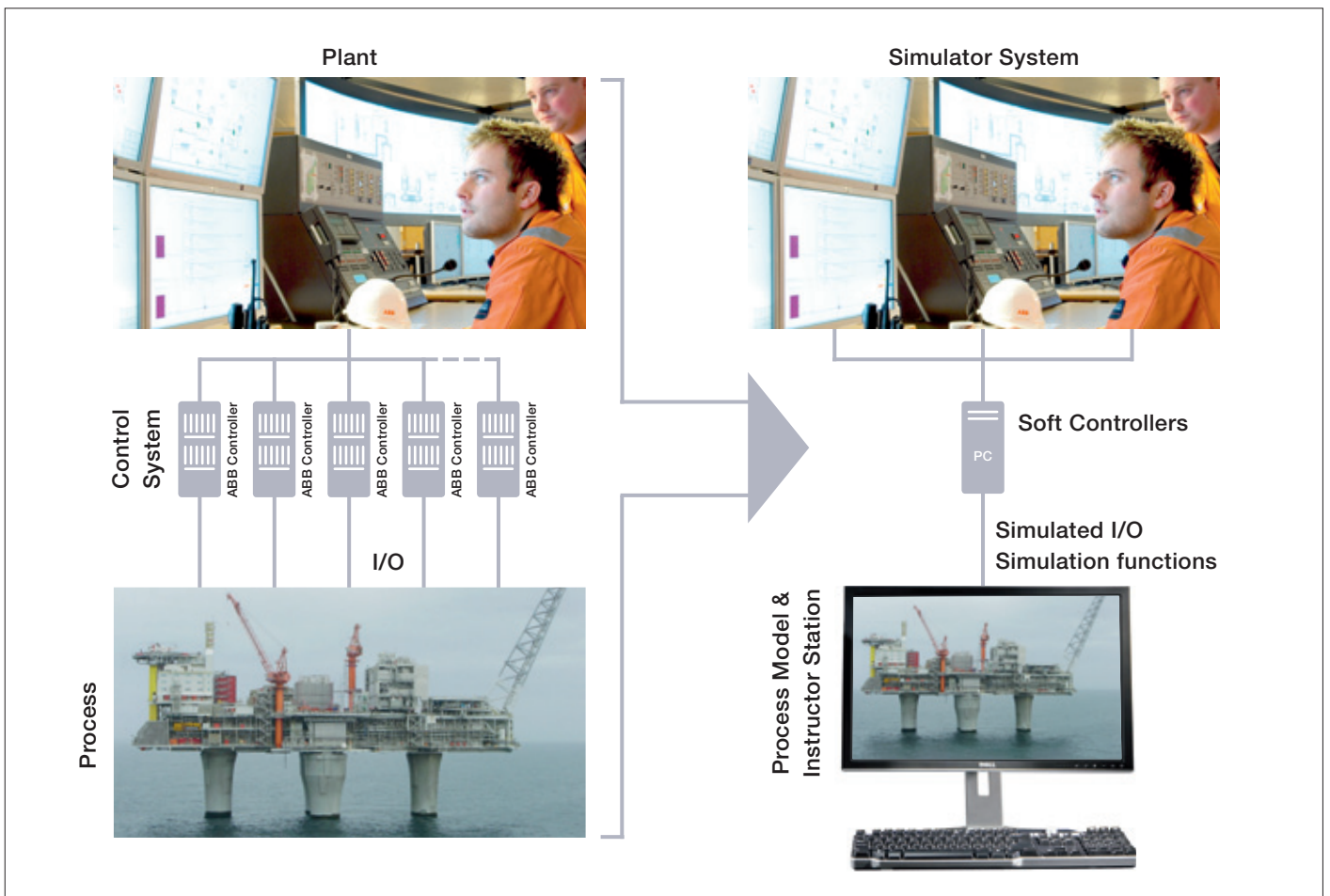
Process model environment

800xA Simulator, simulating the automation system, is connected to a dynamic process model that simulates the process and control feedback, the process model also has an instructor station that administrates training and test sessions. A dynamic process model simulates plant equipment, instrumentation and the process itself. The process model exchanges simulated I/O signals with the control system: reads outputs, calculates new process state, and writes back input signals to simulate control feedback. A process model can be implemented as simple feedback simulation in control logic, but typically the process model environment is from a model vendor, including a high fidelity dynamic process model and an instructor station.

Process model and instructor station from a model vendor runs in an environment outside 800xA, and 800xA Simulator provides OPC DA interface for I/O exchange and COM interfaces for activation of simulation functions. Process models from a large number of vendors have interfaced 800xA Simulator.

Benefits

- 100% realistic and correct behavior as the real system
- Cost and space efficient simulator platform
- Exact copy of engineering data from plant system
- Automated reconfiguration reduces maintenance costs
- Identical engineering environment
- Assures reuse through plant system's lifecycle



With 800xA Simulator, it is possible to create a simulator system of the running plant with identical layout, view and control logic. The control system runs on more cost and space efficient hardware, disconnected from the real process. A dynamic process model simulates the process and I/O signals. An external process model environment can connect to 800xA Simulator.

Control systems

800xA Simulator supports simulation of several control system in ABB's portfolio:

- AC 800M including High Integrity
- Advant OCS with Master software
- Symphony Melody (AC 870P and CMC50/60/70)
- Symphony Harmony
- PLC Connect for third party integration

AC 800M is ABB's latest control system family. The simulator topology is very similar to the plant system by running one Soft Controller pr. AC 800M. 800xA Simulator manages several Soft Controllers individually in one computer, and controllers can automatically load control applications after restart. An easy configuration tool quickly adapts the controllers to run in soft controllers. The adaptations are minimal, so engineering changes can be transferred back to the plant system.

Simulation functionality

- I/O exchange with process model
- Interface for activation of simulation functions
- Run and freeze the control system
- Run faster or slower than real time
- Run the control system in steps
- Save and load of different initial process conditions (100% production, cold start, etc.)
- Automated or manual snapshot of current process condition
- Recreate alarm/event lists and trends when restoring process conditions

- Simulated I/O and protocol inputs
- Simulated fieldbus communication between control systems
- Record and Replay of operator actions
- Hardware malfunction simulation
- Physical I/O support
- Configuration tools for System 800xA and the different control systems
- Supervision tool for the system status

Offering

800xA Simulator is a scalable solution in system size, functionality and control system connectivity. The product offering is available in three editions: 800xA Basic, Premium and Professional Simulator.

800xA Simulator can follow a System 800xA offering, and is not process specific for Oil & Gas, Nuclear, Power Generation, Pulp & Paper, Mining, etc. Process model vendors are often specialized on specific process, and are more related to business area.

ABB can offer complete project execution of 800xA Simulator deliveries, including sub-contracted process models. ABB also provides training, support, service and software upgrade agreements.

Contact us

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