

## Features and Benefits

- **Reduce Engineering Time and Cost:** Building control applications from a comprehensive set of pre-engineered process control devices will save many hours during project design and implementation. By selecting configurable options, device features can be tailored individually for each object, or globally for an entire project.
- **Shorten Project and Startup Schedules:** Leveraging 800xA's object-oriented technology, PCDeviceLib provides users with the ultimate balance between standardization and flexibility. Standard object types can be defined early in the project and used as the "masters" throughout the plant. Since each instance of a standard type can maintain its inheritance from the master, a change affecting many plant objects can be made within minutes – even if these changes are needed late in the project or during commissioning.
- **Maximize Security and Integrity:** PCDeviceLib library objects are developed under stringent Quality Assurance standards, factory tested and encapsulated to ensure functional integrity. This can greatly reduce project testing and documentation even for FDA validated projects.
- **Improve Operator Response to Trips and Interlocks:** PCDeviceLib searches the control code and automatically builds dynamic faceplate and graphic displays showing the active status of all interlocking logic for each device. For no additional engineering effort, operators can now have an easy way to see the root cause affecting a device - and be assured that what they see matches exactly with the logic executing in the controller.
- **Provide Inherent Asset Management:** PCDeviceLib extends normal device controls to include asset statistics such as motor running times, number of motor starts and stops, valve stroke times and object error alarms as standard features.



Process Control Device Library (PCDeviceLib) is a comprehensive and proven library for Industrial IT Extended Automation System 800xA. Part of a broad family of 800xA libraries, PCDeviceLib provides pre-configured, control modules for motors, control valves, enhanced PID controllers, on/off valves, measurements, flow compensation algorithms and other standard devices found in most process plants. Using PCDeviceLib automation engineers can create complex control applications simply and efficiently, while engineering to internationally recognized standards.

PCDeviceLib is a standard library that includes control modules, faceplates and graphic display elements for process control devices. It completely automates the customization of faceplates and graphic display elements to match the configured properties within the control logic. This ensures consistency of information displayed to operators while greatly reducing engineering and testing time. The system searches an application for the as-built priority commands and interlocks and then automatically builds the dynamic display elements to provide realtime root cause analysis of trip and interlock conditions. ABB's unique Aspect Objects technology makes the process easy.

This proven library of solutions for control devices significantly reduces the time and cost to engineer, configure, test and maintain an application. By using pre-tested control functions with their inherent operator interfaces, PCDeviceLib reduces project schedule risks for new installations. This is of particular relevance to those industries where safety, integrity and deterministic performance are paramount. In regulated industries like pharmaceuticals, PCDeviceLib reduces time to market for new chemical entities and products.

With its large portfolio of tested process control devices, PCDeviceLib minimizes the effort required to engineer control applications. Each device is represented in the library by an object enriched with “aspects” (intelligent information) that support device management over the entire life cycle. These aspects include the controller code, faceplate and graphic display element.

- The Block Valve Object
  - Digital Output to open/close
  - Optional 0, 1 or 2 feedbacks
- PCDeviceLib holds the master object with configurable options and all connections to pre-built aspects
  - Controller code for the DO DI and logic
  - Context sensitive faceplates
  - Alternative graphic display elements

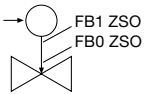








Figure 1. Multiple aspects for each device

Process Control Devices
■ Block valve
■ Manual valve
■ Pneumatic control valve
■ Electric control valve
■ Choke valve
■ On/off motor
■ On/off motor with motor control center
■ 2 speed/2 direction motor
■ Variable speed motor
■ Duty/standby motors
■ Analog input transmitter
■ Dual transmitter
■ Flow transmitter with compensation
■ Digital input
■ Digital output
■ PID controller(s)
■ Cascade controller
■ Ratio controller
■ Setpoint ramp
■ Totalized analog input
■ Totalized pulse and counter input
■ Process trips and interlocks

The object-oriented library has configurable general options, including alarm and state colors, user-definable functions and text with native language support (NLS). All device faceplates use a consistent, context sensitive design that shows information only if that feature is enabled in the controller. Faceplates have three views – simple, standard and extended - to promote ease of use and to provide information relevant for the task at hand. Individual devices can be configured so that each instance inherits the options of that device type, or they can be configured individually, so that each device is unique.

Each device has operational modes such as Auto, Manual, Local and a Test mode for simulation, testing and commissioning. Additional asset information such as running time, number of starts and current draw for motors; stroke times and timers for valves, is collected. These values can generate alerts or alarms, which are presented on the faceplate; they can also generate SMS messages to operators or maintenance personnel. Using the standard asset optimization facilities of 800xA, these alerts can be passed electronically to computerized maintenance management systems.



Figure 2. Extensive faceplate visibility

## Graphic Display Elements

PCDeviceLib provides a range of ISA style graphic symbols with configurable properties for valves, motors, analog values, digital indicators, etc.

Connections between the control logic and the display element are pre-configured; each device instance is simply placed onto a graphic and the appropriate properties are selected (element type, orientation, etc.). Each device display element can be rotated and resized. Fill colors and functionality to represent device states can be configured either globally or for each instance as needed.

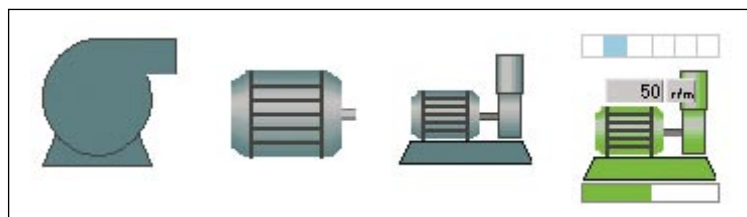


Figure 3. Alternative graphic symbols for motors and pumps

Each device has an optional status indicator frame with dynamic annunciator symbols to represent device states. To reduce graphic display “clutter” during normal operations, the frame is hidden if no annunciators are active. The status indicator frame can be positioned horizontally or vertically around the device. Optional colors, letters or both can be used to represent the device states.

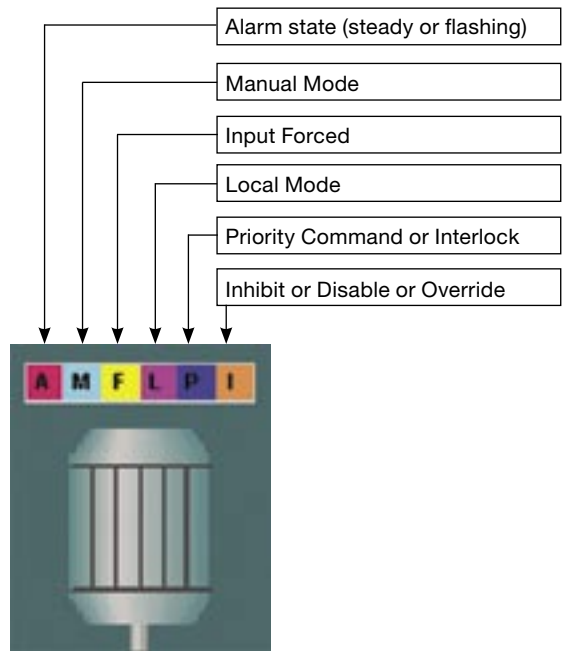


Figure 4. Device status indicators

**Priority commands and interlocks**

Priority commands force a device to a certain position. These are also known as safety commands or trips.

Interlocks prevent a device from being moved to a certain state. These are also known as permissives.

PCDeviceLib provides four types of priority commands:

- Stop motor or close valve (unlatched)
- Start motor or open valve (unlatched)
- Stop motor or close valve and put the device in manual mode when the cause is cleared (latched)
- Start motor or open valve and put the device in manual mode when the cause is cleared (latched)

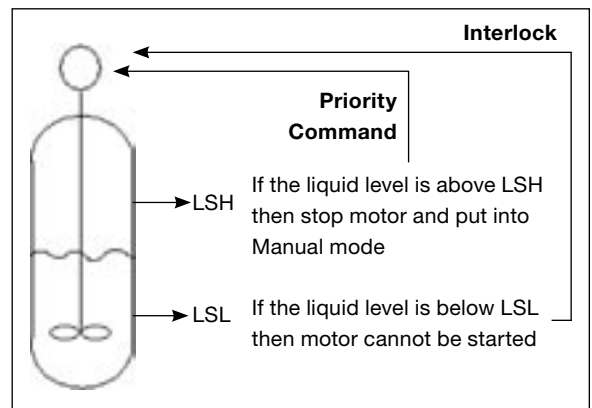


Figure 5. Priority commands and interlocks are easily managed

PCDeviceLib provides two types of interlocks:

- Prevent motor being started or valve opened
- Prevent motor being stopped or valve closed

Priority commands have priority over interlocks. There's one overriding inhibit for all priority commands and interlocks on a device.

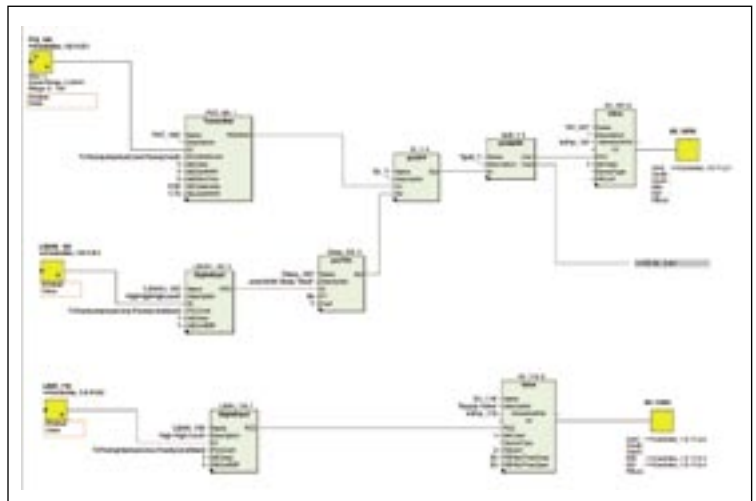
An immediate action button on the faceplate can be used to stop a motor or close a valve even if the device is locked in auto mode.

The creation of priority commands and interlocks is as easy as connecting input and output modules graphically. The use of nested structure data types means all necessary attributes of a device module are connected with one simple graphical connection. Standard Control Module blocks are used to create the required logic.

The system searches the application for the as-built priority commands and interlocks and automatically builds dynamic display elements in faceplates without any additional engineering effort and guaranteeing that the display is always correct and up to date with the controller logic. The display elements show active status of all interlocks and priority commands for each output device. Operators know immediately why they cannot start a motor or open a valve; or why a priority command or trip has occurred: simply by viewing its faceplate.



**Figure 6.** Immediate recognition of cause of a priority command or interlock



**Figure 7.** Simple graphical configuration of priority commands and interlocks

## The IndustrialIT Advantage

PCDeviceLib is part of the Industrial IT System 800xA suite of products, services and solutions from ABB. 800xA's Aspect Object technology and full integration with safety integrity systems, internal asset management, fieldbuses, intelligent motor control centers, drives and other automation and electrical devices provides many operational benefits while reducing cost and risk.

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