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SIEMENS OPEN LIBRARY

9 – Device Simulation

JUNE 11, 2019

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1. Purpose

The purpose of this document is to assist with configuration of the PID Open Library Object. In order to use the features of the built in Technology Object for the PID Compact Block, the library object requires special setup. The PID Comact Block only exists on the S7-1200 and S7-1500. The Open Library Object was written to be compatible with PID_Compact V2.2, and capabilities cannot be guaranteed for other versions of the PID Compact block.

2. Intended Use

This document is to be used by anyone utilizing the Siemens Open Library fbPID_CompactInterface. This document is used to configure the PLC and HMI objects for the library, as the configuration of these objects is not standard with the rest of the library.

3. Revision History

Version	Date	Author	Comments
1.0	2019-06-11	DMC	Initial Release of simulation library

4. Open Library License

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5. Open Library Simulation

The release of version 4.0 of the library now includes blocks with built-in simulation capabilities. The following steps describe the features of the new additions and how to use the properly. Simulation is only available on device blocks that control physical hardware.

NOTE: This is a brand new feature to the library. Although it has been tested prior to release, it is possible that software bugs exist that can cause unexpected behavior. Please ensure the appropriate safety systems are in place prior to simulating a system.

5.1. Architecture and Approach

The simulation features is a PLC-only concept. Devices cannot be simulated from the library HMI structure but can display indication that they are being simulated. Each simulatable block includes a boolean input to the block called 'bInSimulate' which initiates simulation.

While a device is being simulated, several important things are guaranteed:

- The signaling inputs from physical devices will be ignored and substituted with ideal (no error) running conditions for the device
- The commanded physical outputs will remain in safe operation for the device (e.g. valves will not output either command, VFDs will remain in stop mode)
- No error conditions will be achievable

5.2. Use Cases

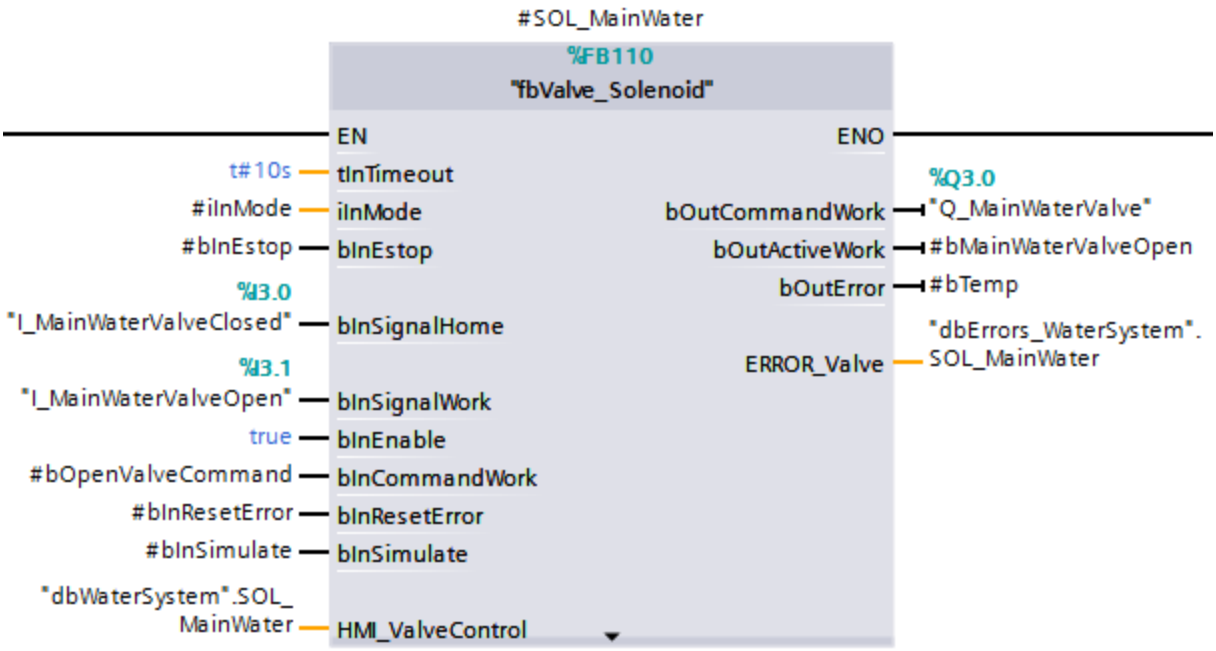
Simulation is intended to be used in a limited subset of scenarios.

- System-level testing prior to obtaining access to the physical system
- Hardware inaccessibility (i.e. not installed, delayed, etc.)

Other use cases may exist, but simulation is *not* intended to be used as a "maintenance" feature to bypass improperly functioning equipment. This, and other improper use, may lead to failure of or damage to physical equipment or persons.

5.3. Implementing Simulation

Enabling and running simulation is as simple as adding a boolean input to each device that will be simulated.



The 'bInSimulate' input defaults to false and is hidden. Unless an input is wired in, simulation will remain inactive.

To simulate an entire sytem, the input should be passed in from a high level function block such that all devices within that system simulate simultaneously.

5.4. HMI Indication

Simulated devices have separate HMI indication from normal running modes. To enable this, devices write unique values to the 'iStatus' variable of the HMI structures. A list of the simulated values are provided in the table below.

Status	Value
Forward / Work Position Active	7
Forward / Work Position Commanded	8
Reverse / Home Position Active	9
Reverse / Home Position Commanded	10