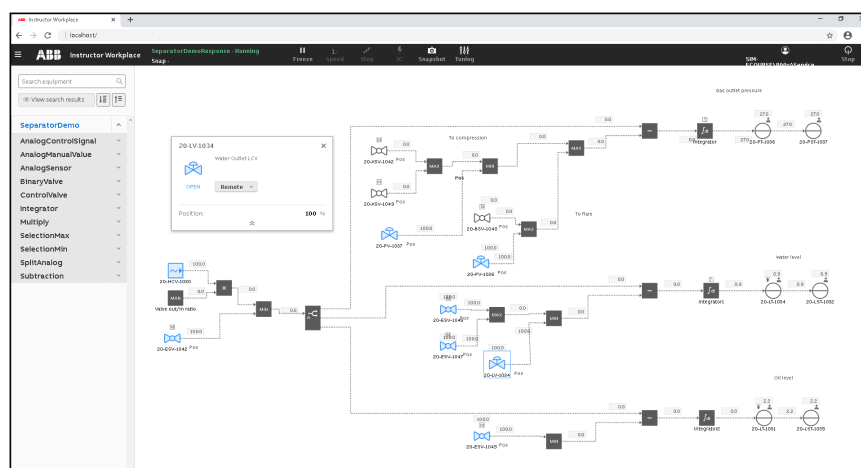# Loop Feedback
Simple dynamic simulation models
- A product within ABB Ability™ Simulation models

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Loop Feedback extends the features from I/O and Device Feedback, providing automated dynamics for process sensors and operator training early in the project.

The main focus of ABB Process Model Engine is to offer a cost-efficient simulation product for automation systems. In an engineering phase where systems or control areas are integrated, it is beneficial to add more dynamic response to the simulation, so that manual response interactions towards the control system are reduced. Adding Loop Feedback to I/O and Device Feedback will provide a very efficient and realistic test environment for control system tests and early operator training.

This will increase testing possibilities so that improvements and corrections in control logic are completed before commissioning, as well as enabling early training and knowledge sharing of the operators.

Loop Feedback extends the features from I/O and Device Feedback with dynamic simulation models for analog and digital sensors, typically for sensors related to control loops and sequences that need dynamic simulation. Loop Feedback models are engineered in Model Editor, and when loaded, these models run integrated with the control system.

Control equipment from 800xA (valves, motors, sensors etc.) are efficiently imported to minimize engineering and configuration. The model consists of the connection between control equipment and the created response to simulate sensor in a loop.

Communication with control system is automatically set up, so no manual integration with the control system is required. Loop Feedback models are smartly pre-tuned from I/O ranges in the control system at runtime, and boundary limits keep the model stable while tuning to perfection.

To make initial conditions automatically consistent on both process model and control system side, 800xA Simulator is required. An 800xA Simulator system may also combine different models; ABB Process Model Engine, with simulation of I/O and Loop Feedback, ABB Process Power Simulator for simulation of electrical networks, and 3'rd party process models. Loop Feedback models can extend the system's simulation usability to operator training and operator familiarization.
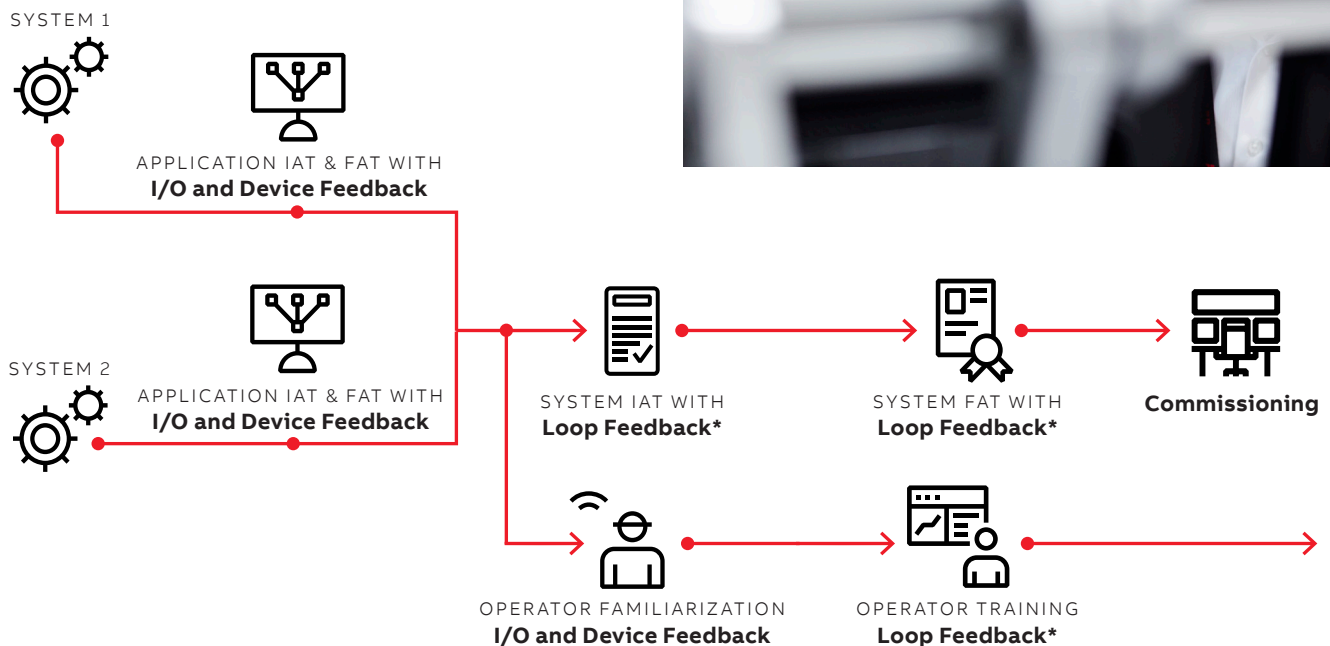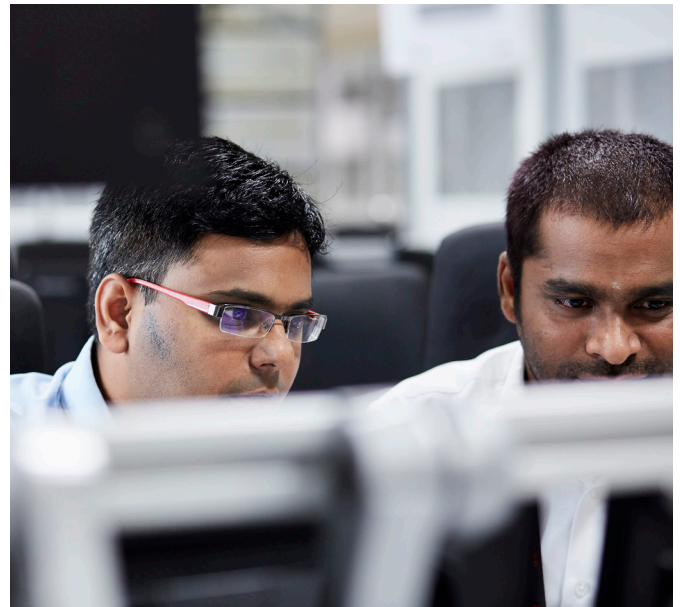
Loop feedback can be purchased as an extension to an 800xA Simulator system.

What does Loop Feedback do?

- Easy import of simulation objects, reflecting control devices and sensors in the control system into the model.
- The response blocks library can be used in building logic or signal responses for sensors. Engineers drag relevant process control equipment and response blocks to a diagram, and then connect them together to create the dynamic response for a sensor.
- Automatically sets up OPC communication between simulation objects and control objects to exchange data and stimulate IO back to the control system.
- Run dynamic simulation of sensors through engineered models.
- Automatically initiates tuning parameters for the created models, where gain is scaled from IO ranges in related control equipment.
- Use of boundary limits to keep simulation loops stable, set within high and low alarm limits in control system sensor.
- Save and load of model states for scenario testing and engineering.

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The recommended use of ABB Ability™ Simulation models is in engineering, test phases and operator training.

SYSTEM 1

APPLICATION IAT & FAT WITH
I/O and Device Feedback

SYSTEM 2

APPLICATION IAT & FAT WITH
I/O and Device Feedback

SYSTEM IAT WITH
Loop Feedback*

SYSTEM FAT WITH
Loop Feedback*

Commissioning

OPERATOR FAMILIARIZATION
I/O and Device Feedback

OPERATOR TRAINING
Loop Feedback*

* Note: Loop Feedback is an option in ABB Process Model Engine, extending the I/O and Device Feedback features.

The situation
There is an increased focus on health and safety, project savings and operational benefits on plants.

Control object feedback

Dynamic simulation

800xA SYSTEM

I/O AND DEVICE FEEDBACK

LOOP FEEDBACK

Application testing

Operator training

The problem
How to reduce risk with complex control systems, achieving a cost-effective implementation of new or upgraded control systems.

How to train operators and share knowledge in very early phases of the project.
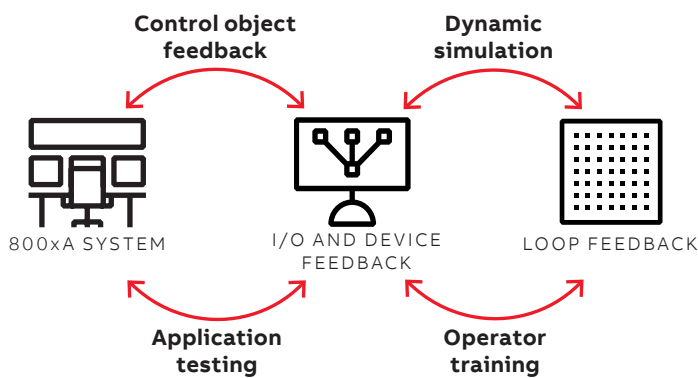
The solution
Loop Feedback provides a very efficient and realistic test environment for control system tests early in the project. This will allow system operator training to be conducted early in the project execution.

The benefits

- Fast and easy to create and integrate a process model for the full or some areas of a control system scope.
- Extended simulation for operator training and scenario testing.
- Automatically populates simulation objects, reflecting control devices and sensors in the control system.
- Early dynamic testing of the control application.
- No need for deep knowledge of simulating thermo-dynamics, chemistry, mass balances and fluids.
- Captures and shares system operator knowledge.
- Increase system durability with best practices and proper operation.

ABB

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Contact

Sales Support:
simulator.sales@no.abb.com

Technical Support:
contact.center@no.abb.com

www.abb.com

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