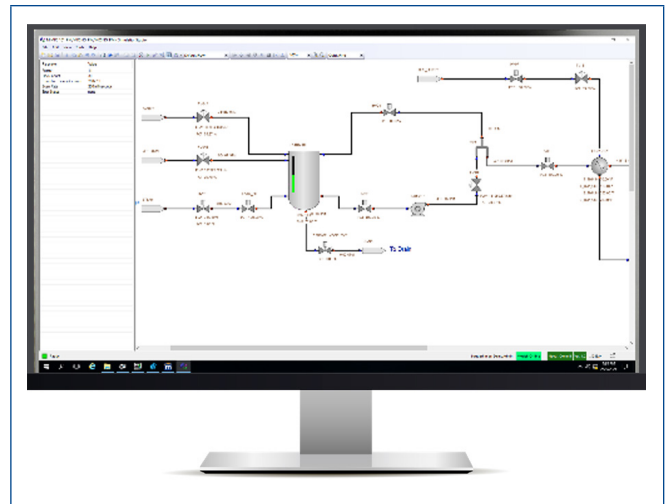# DeltaV™ Mimic Process – Core

- Intuitive unit operation modeling objectives

- Scalable from medium to high fidelity simulation

- Intuitive configuration parameters allowing for quicker model building

- Includes common process plant unit operations

- Easy handling of individual stream component properties

Introduction

DeltaV™ Mimic Process – Core includes high-fidelity, dynamic models of common unit operations, including vessels, pumps, valves, and heat exchangers. These objects can be used for application software testing, operator training, and process or operation improvements.

Benefits

- **Intuitive unit operation modeling objectives –** This set of modeling objects comes with modeling infrastructure that makes the development of accurate models quick and easy. Process flowsheets can be built in PFD objects or IEC1131 block user interface.

- **Scalable from medium to high fidelity simulation – **Mimic Process allows for models with rigorous mass and heat balance as well as simplified reaction kinetics and vapor-liquid equilibrium. Users can configure these objects physical specifications to match actual equipment and process data within the block capabilities.

- **Intuitive configuration parameters allowing for quicker model building –** Mimic Process – Core allows selection of certain configuration parameters for each object individually so the user can input them in the form that it exists in the plant design data. Parameters include units, size, elevation, and other physical specifications, while also including initial composition of the vapor, solid, and liquid phases.

- **Includes common process plant unit operations found in the process industries –** Mimic Process – Core includes unit operations commonly found in process industries, including the more common objects such as vessel, valve, pump, and heat exchangers. Additional unit operations can easily be added.

- **Easy handling of individual stream component properties –** Streams pass an array of information between the modeling objects including component concentration and activity, physical properties, and piping design information. They connect unit operation models and pass complete process data between them.

![DELTAV™]

![EMERSON]

Product Description

Mimic Process – Core includes the following common unit operations:

- **Advanced Source, Advanced Sink –** dynamic termination or boundary condition start/end for process streams.

- **Bin –** dynamic model of an open to atmosphere storage container.

- **Compressor –** dynamic model of centrifugal and axial compressors with discharge curve characterization and performance view.

- **Conveyor –** dynamic model of bi-directional, variable-speed, fixed-length belt conveyors.

- **Dynamic Heat Exchanger –** shell and tube heat exchanger models with flash (VLE) calculations for single or multi component streams.

- **Air Cooled Heat Exchanger –** forced draft, air cooled dynamic heat exchanger with flash (VLE) calculations for single or multi component streams.

- **Spiral Wound Heat Exchanger –** heat exchanger calculating the thermodynamics and interactions of up to eight process lines and one shell line.

- **Plate and Frame Heat Exchanger –** high precision heat exchanger with stream fouling and ambient temperature loss controls and flash calculation.

- **Flow Panel –** represents a physical interface between multiple pipes, providing the ability to map one input to an output and change this association online via an array parameter.

- **Fuel –** represents a fuel for use in Furnace. Can be characterized for gas, oil, coal, wood, or other fuel source.

- **Furnace –** combustion model and heat transfer for up to 8 fuels.

- **Orifice Plate –** reduces pressure or restricts flow along a stream.

- **Pipe Delay –** statically or dynamically provides stream flow delay.

- **Pump –** dynamic model of process pumps with pump curve characterization and performance view.

- **Regulator –** represents a pressure regulator designed to maintain a target pressure drop or pressure.

- **Stream Input, Stream Output –** boundary blocks for handling stream inputs and outputs to the process model.

- **Stream Tee –** combines up to 8 streams and then splits results into up to 8 outgoing streams.

- **Valve –** dynamic pressure, flow calculation across throttling valves configured to the installed valve characteristics.

- **Pressure Reducing Valve –** dynamic model of transfer between steam headers. Includes an option for Fisher Valves where direct coefficients from Fisher Controls Severe Service Catalog can be used to configure the model.

- **Vessel –** complete mass, heat, and pressure balance for process vessels. For solids modeling, the vessel supports initial particle size distribution based on either Rosin-Rammler or Gates-Gaudin-Schuhmann models to assist with specification of the initial material.

Additional Unit Operations

Mimic Process provides access to additional unit operations. Please see the product data sheets for the following to find additional information.

- Mimic Process – Separations

- Mimic Process – Power

- Mimic Process – Reactions

- Mimic Process – Solids

- Mimic Process – Bioreactor

Infrastructure

Mimic Process – Core includes modeling infrastructure that makes the development of accurate, dynamic process models in Mimic quick and easy. This infrastructure includes:

- Thermodynamic Properties Database
- Process Streams
- Component Sets
- Engineering Unit Handling
- Dynamic Flow Solver

Thermodynamic Properties Database

The Thermodynamic Properties Database includes over 1700 commonly used chemical compounds. The database contains all relevant thermodynamic properties and has been validated against the National Institute of Standards and Technology (NIST) database, managed by the United States Department of Commerce and AIChE Design Institute for Physical Properties (DIPPR). When a component is selected, Mimic Process selects the appropriate thermodynamic property to use in the model. In addition, the thermodynamic property can be selected for use in a calc block for custom modeling.

The component property editor allows the user to add proprietary component thermodynamic data or pseudo component for use in a component set.

Process Streams

Mimic Process connections are made with Streams. Streams pass an array of information between the modeling objects including component concentration and activity, physical properties, and piping design information. The single Stream connection allows the user to quickly connect unit operation models and pass complete process data between them.

Component Sets

Component sets provide a simplified method for selecting and managing stream components. Component sets are selected and managed in Explorer under the library section. Any combination of chemical components found in the Thermodynamics properties database can be grouped together. Once the component set is defined, it can be used in any Mimic Process feature by selecting the given name of the component set.

Engineering Unit Handling

Mimic Process models allow the user to select the engineering units for each object individually so the user can input configuration parameters in the form that it exists in the plant design data. Within each object, the dynamic simulation calculations are solved in SI units and then displayed to the user in the selected units. Differences between objects are resolved by the Mimic server on the Stream connection. This sophisticated system saves time in building and maintaining dynamic simulations in Mimic.

Dynamic Pressure Flow Solver

Mimic Process – Core includes a dynamic pressure / flow solver that solves the flows and pressure balances throughout the Mimic Process flowsheet. When the Pressure Flow option is selected, in a Mimic Process model, the pressure and flow is calculated based upon the objects used and process conditions, including pressures, pipe length, diameter, fittings, dynamic viscosity, and density of material.

Product Support

Mimic Product Support is delivered through Guardian™. Guardian is Emerson's digital platform for addressing the end-to-end lifecycle needs of automation & control software and asset performance management solutions. The Guardian digital experience enables users to quickly connect to product support; securely manage subscriptions; get intuitive views into system health; and explore additional software and services that propel performance.

Ordering Information

DeltaV Mimic is licensed on a Flexible Subscription Unit (FSU) basis. An FSU is a currency that can be used to access any Mimic feature licensed on an FSU basis, with each feature requiring its own number of FSUs. The FSU subscription is offered in one-year, three-year, and five-year terms. To purchase, extend, or expand a license, please contact your Emerson Sales Representative.

Related Products

- DeltaV

- DeltaV Mimic Foundation

- DeltaV Mimic Test Bench

- DeltaV Mimic Train

- DeltaV Mimic Simulated I/O Drivers

- DeltaV Mimic Synchronize

- DeltaV Mimic Aspen HYSYS Link

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