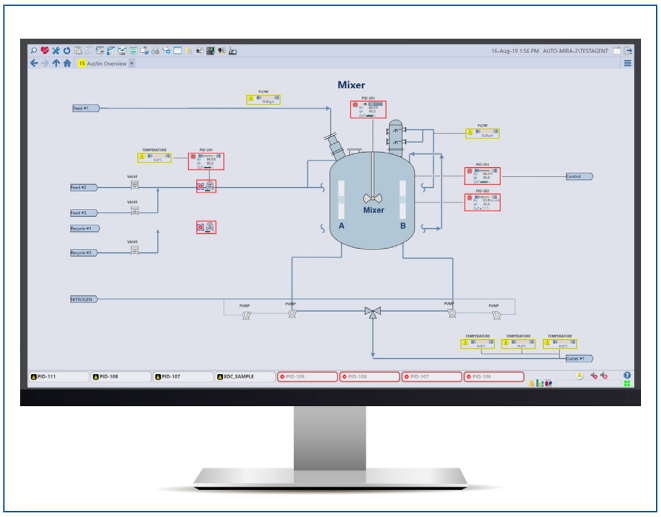
DeltaV™ Simulate

- Allows DeltaV™ configuration on a single PC or in a multi-node system
- Provides integrated simulation of Basic Process Control Systems (BPCS) and Safety Instrumented Systems (SIS)
- Enables development and testing of batch and continuous control applications in an off-line simulation environment
- Supports engineering check out, validation, and testing of field devices and OPC interfaces
- Provides an ideal environment for operator training and process simulation
- Enhances training with simulation playback
- Reduces training and testing effort
- Supports rigorous testing of control configurations, operator graphics
- Supports virtualization of DeltaV workstations and control hardware



DeltaV Simulate Suite for Training and Development.

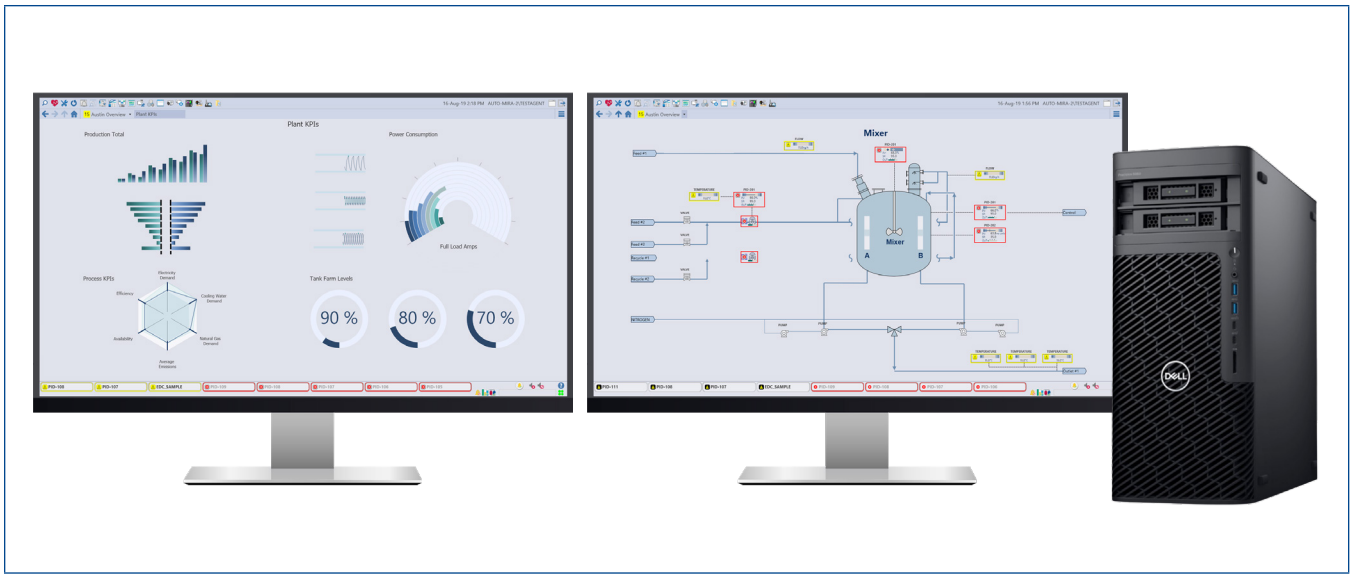
Introduction

Don't delay development of your automation system configuration, logic checkout, and operator training until your automation system is delivered. Do it now with the DeltaV™ Simulate suite of products.

DeltaV Simulate lets you use all DeltaV software for training and development without purchasing duplicate system hardware. This means you can use exactly the same software provided with your actual DeltaV system at a fraction of the system footprint and cost. With the simulate suite you can also explore features of the DeltaV system that you have not yet purchased.

Get the most out of your process simulation package using the features of DeltaV SimulatePro. Execute dynamic process simulation using DeltaV control modules or with simulation packages such as DeltaV Mimic that access data via OPC. With DeltaV SimulatePro, you can control DeltaV execution with speed-up, slow-down, save and restore functionality.

DeltaV Simulate also supports SIS simulation with a complete simulation environment for design, testing, and training of both BPCS and SIS systems.



Benefits

Allows DeltaV Configuration on a Single PC or in a Multi-Node System. All features supported by the DeltaV system—such as continuous control, batch control, advanced control and the associated workstation displays, alarms, and historian data collection—may be configured without the need for DeltaV hardware or licenses. By having access to all software, you can try every one of the powerful DeltaV capabilities in your control strategies.

Provides Integrated Simulation of Basic Process Control System (BPCS) and Safety Instrumented Systems (SIS). Now all of your BPCS and SIS control modules can be designed and tested on a common simulation platform for rigorous checkout and training.

Enables Development and Testing of Batch and Continuous Control Applications in an Off-line Workstation Environment. Check out control logic and operator interface using controller software that runs in a stand-alone ProPlus, Application Stations, or virtual machine controllers. After developing and testing your software configuration in DeltaV Simulate, you can transfer the configuration to your online system using the standard DeltaV export/import utilities.

Supports Testing of Smart Field Devices and OPC Interfaces. DeltaV Simulate Multi-Node supports the addition of DeltaV controllers, allowing you to checkout certain types of field devices, incorporate DeltaV hardware for maintenance training, and test your control configurations with smart field devices. DeltaV Simulate also supports DeltaV OPC Data Access (DA) interfaces for development and testing of applications that execute on the DeltaV Application Station. Advanced OPC tools such as OPC Mirror require separate licensing. *For more information, see the DeltaV OPC Mirror Product Data Sheet.*

Provides an Ideal Environment for Operator Training and Process Simulation. DeltaV Simulate uses the same configuration and operator graphics used by your on-line DeltaV system, and is easily integrated with dynamic process simulation to provide a realistic training environment. Process simulation may be done using DeltaV function blocks or by incorporating an OPC-compliant process simulation package such as DeltaV Mimic.

Enhances Training with Simulation Scenarios and Playback. DeltaV SimulatePro significantly enhances the operator training experience by allowing the instructor to save, restore, and playback operator entries during training sessions.

Reduces Training and Testing Effort. The DeltaV SimulatePro interface allows modules in a workstation to be initialized and set up for simulation with a single easy to use interface. Also, through this interface, the module may be easily set to execute faster/slower than real time. These features reduce the time and effort required to perform operator training or control design evaluation.

Supports Rigorous Testing of Control Configurations, Operator Graphics. Easily simulate process I/O for classic I/O, CHARMS I/O and Ethernet I/O cards for non-intrusive control system testing prior to field commissioning, without any changes to your control system configuration.

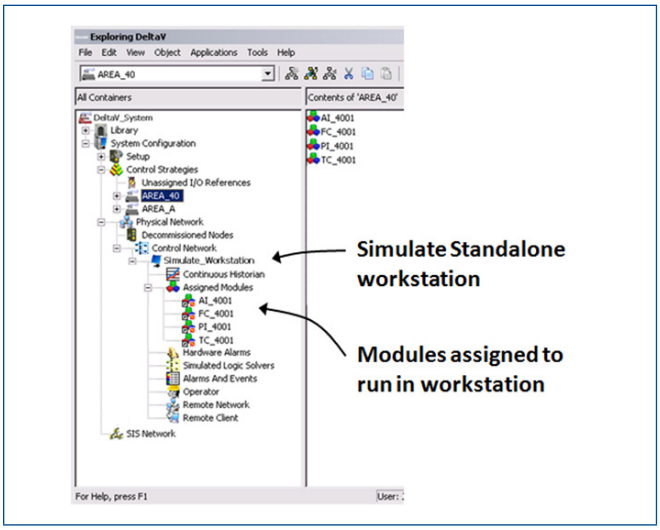
Supports Virtualization of DeltaV Workstations and Control Hardware. Reduce equipment costs and increase flexibility with virtual workstations, controllers, logic solvers, CHARMS I/O cards and Ethernet I/O cards. DeltaV Simulate virtualization is made easy with DeltaV Virtual Studio.

Product Description

DeltaV Simulate Standalone

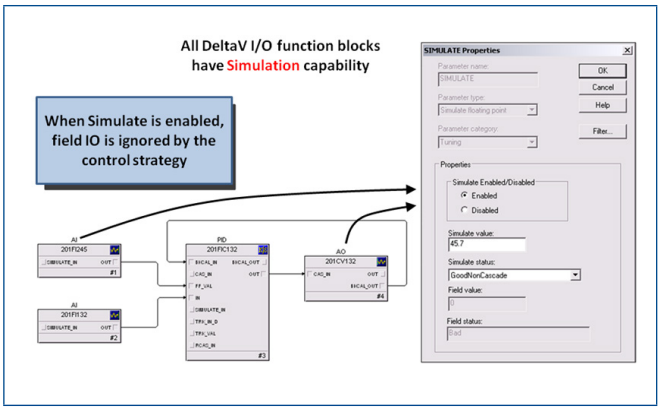
With DeltaV Simulate Standalone or DeltaV SimulatePro Standalone, all DeltaV system features are available in a single PC environment that acts as a ProfessionalPLUS Station. Using your PC, it is possible to create controllers and workstations that will be on your DeltaV system. DeltaV devices may be configured offline, including any fieldbus devices that will be included in your automation system.

With DeltaV Simulate, the transition between on-line and off-line control is easy. On-line modules are normally assigned to a controller and used to implement DeltaV system specific monitoring, process control, and calculation functions. Also, modules designed for performance calculations are normally assigned to the DeltaV Application Station. With DeltaV Simulate, process control and calculation functions are easily tested by simply reassigning the associated control modules to your PC.



Modules Assigned to the Workstation for Execution.

Function blocks used to access process inputs and outputs are designed to support simulation where applicable. Many DeltaV I/O-related blocks include a simulation parameter that can be used to enable simulation capability. When simulation is enabled, the value and status of the input may be manually entered or supplied by another function block or application.

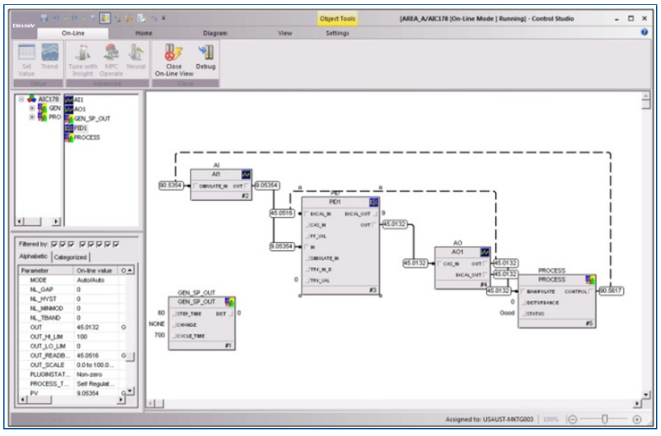


Simulation Support Provided by all DeltaV I/O Blocks.

When your Simulate workstation is downloaded, the assigned modules will automatically begin to execute at the assigned execution rate. The execution of a module in the PC may be examined from Control Studio's online mode.

DeltaV Simulate and SimulatePro support the full range of advanced control products normally requiring additional system licenses. This allows you to try out products like DeltaV InSight, DeltaV Fuzzy and DeltaV PredictPro in your simulation environment.

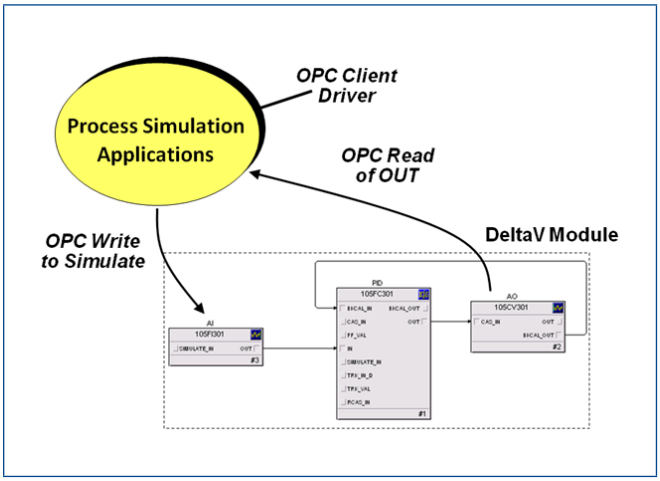
The following example shows the online view of a module in Control Studio where the process is simulated using DeltaV function blocks.



Module Execution may be Simulated and Examined.

The number of control modules that can be executed in a DeltaV Simulate Standalone workstation is limited by the memory and processing resources of the PC. In typical configurations, this capacity approximates what would be assigned to a single DeltaV controller, depending on module complexity and workstation performance.

Application packages that support an OPC interface may be used in the DeltaV Simulate environment. For example, DeltaV Mimic may be used with DeltaV Simulate for automation system checkout and operator training. The DeltaV Mimic OPC interface uses the simulate capability of the DeltaV system and I/O blocks. *Refer to DeltaV Mimic Simulated I/O Drivers product data sheet for more information.*



Process Simulation may Interface to DeltaV using OPC.

DeltaV Simulate Multi-Node

DeltaV Simulate Multi-Node allows you to add Application Stations, Operator Stations, and controllers to your simulation environment to support development, testing, and operator training. The Multi-Node environment also supports a range of virtual machine controllers and simulated I/O technologies including the Virtual PK Controller, CHARMS I/O Card, DeltaV™ Virtual Ethernet I/O Card, and DeltaV SIS components such as the SZ Controller and CHARMS Smart Logic Solvers (CSLS), enabling flexible controller-class simulation with simulated I/O resources.

DeltaV Simulate Multi-Node licenses enable communication with other DeltaV workstations on an off-line DeltaV network, while the Simulate Standalone license operates strictly as a single, isolated node without network connectivity. A license is required for each workstation in the DeltaV Simulate Multi-Node environment. DeltaV controllers and I/O cards may be connected to this network without any additional DST licenses.

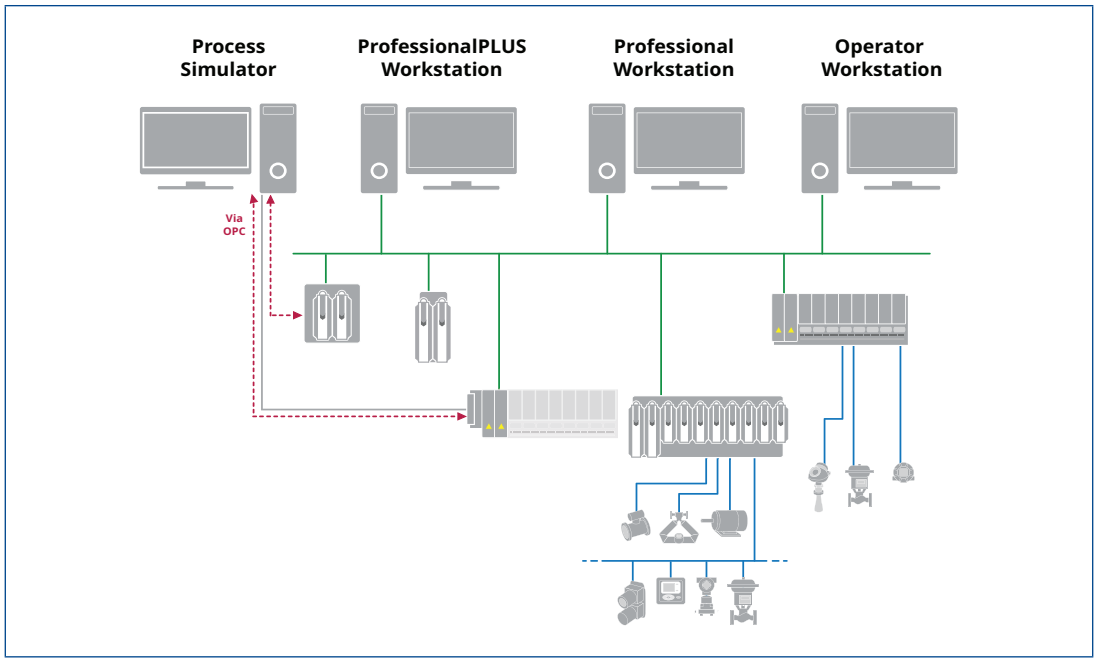
DeltaV Simulate Multi-Node supports the use of real and virtual machine controllers with simulated I/O for rigorous testing of your control configurations. For real controllers, classic I/O simulation is implemented via a Virtual I/O Module (VIM) that connects directly to the DeltaV controller I/O bus. For real and virtual machine controllers, process simulation is supported using either a CHARMS I/O card in simulate mode or a virtual CHARMS I/O card running on a host computer connected to the DeltaV network. Starting in v14.3, I/O signals in virtual machine controllers can also be simulated using DST tag name references. *Refer to the DeltaV Virtual CHARMS I/O Card Simulation and DeltaV Virtual Machine Controller Simulation product data sheets for more information.*

DeltaV SimulatePro

You can use DeltaV SimulatePro Standalone on a single PC, or assign a SimulatePro Multi-Node license to a ProfessionalPLUS and/or Application Workstation in a DeltaV Simulate Multi-Node system.

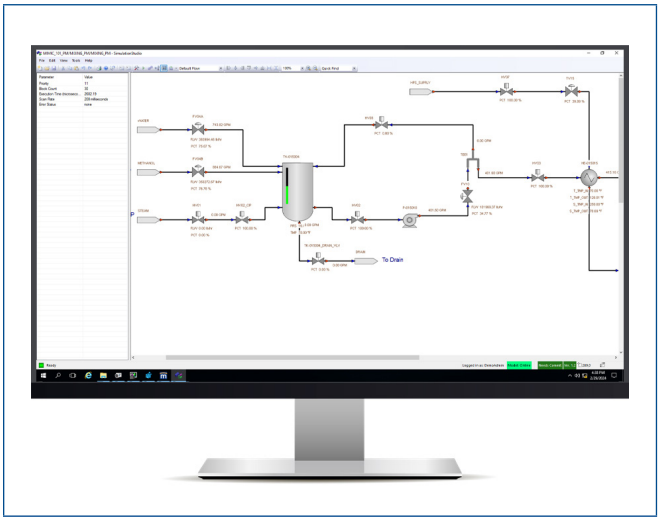
When SimulatePro capability is assigned to a workstation, you may coordinate execution of the DeltaV control modules running in the workstation with a dynamic process simulation package via OPC.

The number of control modules that can be simulated in a workstation with a SimulatePro license is limited only by the memory and processing power of the workstation. A node with SimulatePro capability assigned to it can simulate execution, in real-time, of the modules that would be assigned to approximately four MQ controllers (depending on the controllers' loading). Workstation loading, which is a function of the real-time execution multiplier setting, more than doubles at 2X execution speed.



DeltaV Simulate Multi-Node for Training and Development Systems.

Application packages that support an OPC interface may be used in the DeltaV SimulatePro environment. For example, DeltaV Mimic dynamic process simulation software may be used with DeltaV Simulate. The DeltaV Mimic interface uses the simulation capability of DeltaV I/O function blocks.

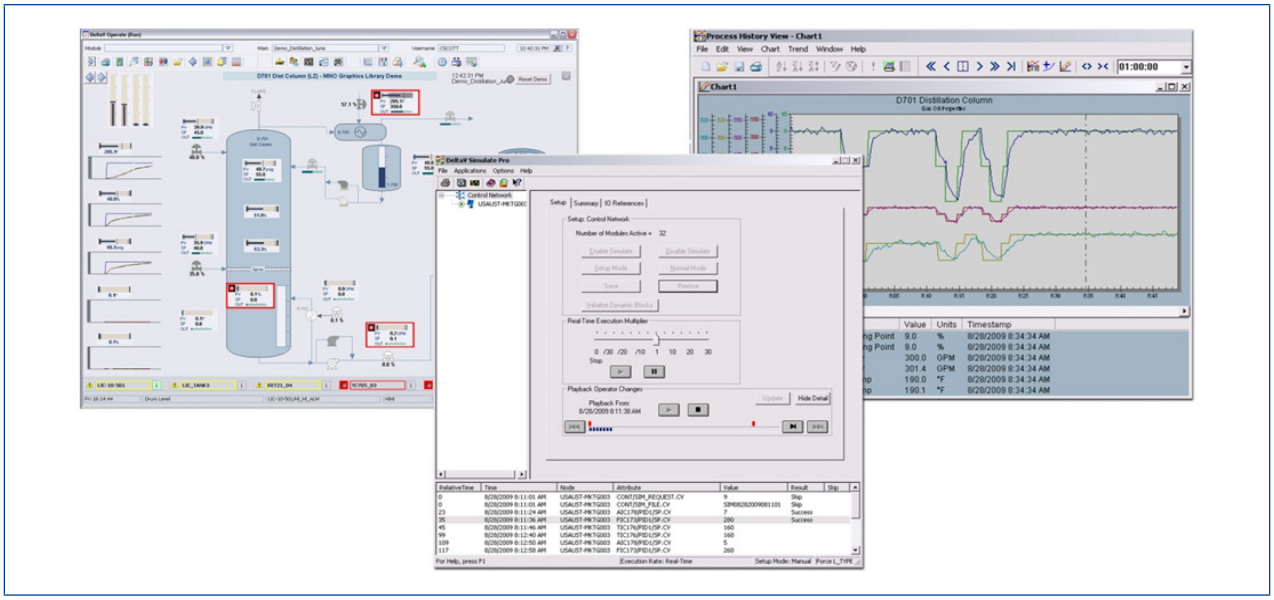


Use DeltaV MimicProcess Simulation with DeltaV SimulatePro.

A process simulation package used with DeltaV SimulatePro may read and write the parameters assigned to the module node through OPC. By writing to these parameters, the simulation package may enable/disable simulation in all I/O blocks with a single request. All dynamic blocks assigned to the node may be initialized with a single request. Also, these modules may be set to execute faster or slower than real time.

DeltaV SimulatePro has additional features to greatly enhance operator training. With SimulatePro you can snapshot, save, and restore your entire control simulation. With a single click of a mouse, one or all of the workstations in your system will freeze control execution and save every single control parameter away to be recalled later. After finishing a training scenario, an instructor can use this feature to load initial conditions back into any or all of your workstation control modules.

DeltaV SimulatePro also lets you record and playback all of the operator entries made during a simulation session. This means that after a training exercise you can go back and restore the simulation and automatically playback the simulation with all the operator entries. An instructor can also stop the simulation where an operator error was made, and allow the operator to resume operation before the error. This powerful functionality makes DeltaV SimulatePro an absolute must for operator training systems.



Use SimulatePro Interface to Save, Restore, and Play Back Operator Entries.

For control system checkout, DeltaV SimulatePro enables simulation and checkout of control strategies using Fieldbus and external I/O references. A Simulate Conversion utility is provided with SimulatePro that converts Fieldbus control blocks to their equivalent DeltaV function blocks, and external I/O references are mapped to internal DeltaV function block parameters so they can be simulated.

The following features are available in DeltaV v14.3 and above.

■ DST I/O Simulation

With DST I/O Simulation you can simulate I/O signals (for conventional and several types of bussed I/O) in a virtual machine controller by reading and writing to Device Signal Parameter using DST tag name references. Access to Device Signal Parameters is provided through a DeltaV I/O Simulate Application or via OPC. Simulation via DST tag names enable you to read and write device parameters without knowing physical I/O assignments. *For more information see product data sheet for DeltaV Virtual Machine Controller Simulation.*

■ Advanced Batch Simulation

Starting with v14, DeltaV SimulatePro supports "save and restore" of Batch Executive operations and modules using phase algorithms. Prior to v14, SimulatePro does not support "save and restore" of Batch Executive or modules using phase algorithms, which includes Unit Modules, Equipment Modules, Phase Logic Modules (PLMs), and Phase Classes.

■ Enhanced Save and Restore

DeltaV SimulatePro is enhanced in v14 to provide selective save and restore operations using XML initial condition files. This feature helps you restore simulation scenarios after control configuration changes have been made to your system.

DeltaV SIS Simulation

DeltaV Simulate supports both traditional SIS Logic Solvers (SLS1508) and SIS with Electronic Marshalling using Charms Smart Logic Solvers (CSLS). With DeltaV SIS simulation you can design and test a safety instrumented system without logic solver hardware. DeltaV SIS simulation uses the exact same logic solver modules and operator graphics that our used in the on-line system, enabling rigorous testing of configurations and operator interfaces prior to field implementation.

Simulation for DeltaV SIS Logic Solvers (SLS1508)

DeltaV Simulate for SIS Logic Solvers supports simulation of up to 32 logic solvers per workstation, with up to 32 workstations on a multi-node simulation system. Simulated logic solvers are easily configured to run directly in the ProfessionalPLUS and Application Stations, and support both simplex and redundant configurations. Simulation for SIS Logic Solvers also supports both local and global peer-to-peer communications of secure parameter references.

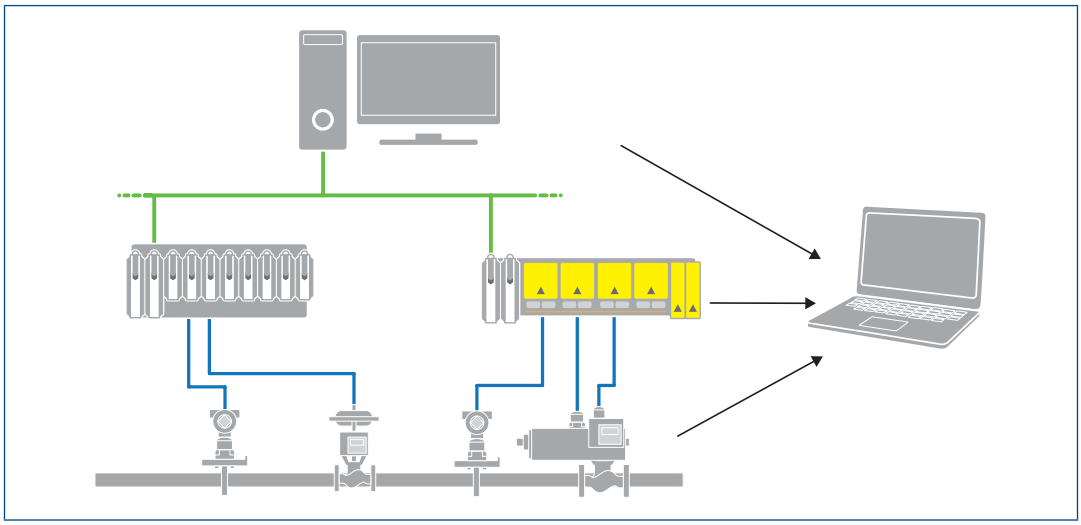
Transferring logic configurations between on-line and simulation environments is easy using DeltaV export and import functions. For additional SIS integrity, Simulate for SIS Logic Solvers supports CRC validation to insure configurations are identical between on-line and testing environments.

DeltaV Simulate for SIS Logic Solvers also provides the ability to write simulated process inputs to virtual SLS module input parameters, without any manual confirmation. Process values, signal status, and secure global parameters may be easily entered via an I/O simulator for rigorous logic checkout.

DeltaV Simulate for SIS Logic Solvers also supports the use of comprehensive process simulators. A SIS network OPC server provides the ability to read SIS output parameters and write SIS input parameters by external process simulators, like DeltaV Mimic.

Note: DeltaV Simulate for SIS Logic Solvers does not support simulation for CHARMS Smart Logic Solvers (CSLS). Simulation for CLSL is supported through virtual machine simulation described below.

Starting with v14.FP2, DeltaV SimulatePro provides improved SIS Logic Solver simulation experience, by supporting the "Save and Restore" capabilities for SIS Logic Solvers simulated in the ProfessionalPLUS and Application Stations.



Simulate for SIS on Standalone PC.

Simulation for DeltaV SIS with Electronic Marshalling

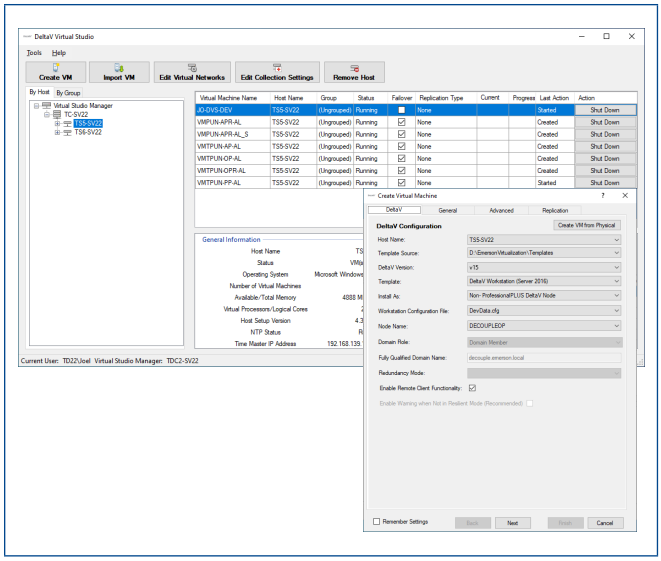
Simulation for DeltaV SIS with Electronic Marshalling uses virtual machine simulation for the DeltaV SZ Controller and Charms Smart Logic Solvers (CSLS). With virtual simulation of DeltaV SIS with Electronic Marshalling you can rigorously test safety logic and operator graphics with no configuration changes required when transferring from simulation to actual production hardware.

In addition to CSLS and SZ Controllers simulation, DeltaV SIS with Electronic Marshalling simulation includes all the network components including the Local Safety Network (LSN), the Global Safety Network (GSN) and Local Safety Network Bridge (LSNB). *For more information, see the product data sheet for DeltaV SIS with Electronic Marshalling – Virtual Simulation.*

Note: DeltaV SimulatePro – for VM Controllers supports "Save and Restore" of virtual machine SZ Controllers/CSLS. DeltaV SimulatePro – for VM Controllers does not support speedup and slow down, record and playback functions. Please refer to the DeltaV VM Controller product data sheet for more details on licensing.

DeltaV Virtual Studio

DeltaV Virtual Studio is an integrated DeltaV application environment designed for easy implementation and management of virtual DeltaV control systems for both off-line and on-line production systems. DeltaV Virtual Studio is used to create, modify, start, stop, and move DeltaV virtual machines. DeltaV Simulate Multi-Node virtual workstations are easily created and assigned to host computers using DeltaV Virtual Studio.



DeltaV Virtual Studio Application.

DeltaV Simulate Multi-Node virtual workstations are easy to create and implement using virtual machine templates. These templates allow you to easily add workstations from a single configuration dialog. Simply specify the host computer, enter a computer name, select the DeltaV workstation template, select the network connections from a drop down menu, and press OK. Within a few minutes the new DeltaV workstation will be automatically generated from a prebuilt template. *For more information, see the product data sheet for DeltaV Virtual Studio.*

Licensing

DeltaV Simulate consists of the following license options:

1. **DeltaV Simulate, or DeltaV SimulatePro Standalone.** A single PC license intended for use only in a standalone training or development system. Communications to other DeltaV workstations or to DeltaV controllers are not supported.
2. **DeltaV Simulate Standalone with Basic SIS Logic Solver Simulation.** Provides all the capabilities of DeltaV Simulate Standalone plus simulation of up to 32 logic solvers (SLS1508) assigned to a workstation; but does NOT include support for SIS Network OPC server.
3. **DeltaV Simulate ProfessionalPLUS Networked (PPN).** Same capabilities as DeltaV Simulate Standalone, but license enables communication with other DeltaV workstations and DeltaV controllers to form a multiple node training and development system.
4. **DeltaV Simulate Professional Station Networked (PSN).** The DeltaV Simulate PSN license allows you to perform engineering, configuration, and operations activities in a multi-node system. DeltaV Simulate PSN includes all of the base and optional software available on a normal Professional Station.
5. **DeltaV Simulate Operator Station Networked (OSN).** The DeltaV Simulate OSN license allows you to perform all operator activities in a multi-node system. Multiple OSN workstations allow you to simultaneously train multiple operators on the same process simulation system.
6. **DeltaV Simulate Application Station Networked (ASN).** The DeltaV Simulate ASN license includes all standard and optional components available for a normal on-line Application Station in an off-line Simulate Multi-Node environment.
7. **DeltaV SimulatePro—Multi-Node Add-on.** This license may be assigned in conjunction with DeltaV Simulate PPN or DeltaV Simulate ASN license. The SimulatePro capability enables more memory for module execution (of any type) and a user interface for coordination of module execution. SimulatePro also provides save, restore, speed-up, slowdown, playback, and simulation conversion functionality.

8. **DeltaV SIS Logic Solver SimulatePro—Add-on.** These licenses may be assigned in conjunction with DeltaV Simulate PPN, ASN, and Standalone licenses. The SIS SimulatePro capability enables simulation of up to 32 logic solvers (SLS1508) for the assigned workstation, plus support for OPC access to logic solver I/O via a SIS Network OPC server. This add-on license does not include DeltaV SimulatePro add-on features which may be added separately.

9. **DeltaV SimulatePro: For Virtual Machine (VM) Controllers Simulation—Multi-Node Add-on.** DeltaV Snapshot functionality comprising of pause, save, restore and resume functions is available for the Virtual Machine Controller based Simulate solution for OTS application. This will be available for both BPCS and SIS VM Controllers – vPK, vS-Series, vM-Series, vEIOC, and vSZ/vCSLS. Please note, this functionality is available starting DeltaV v15.FP3 and in addition will also require an install of "DeltaV Snapshot – For VM Controllers" bundle and VM embedded node templates. *Please refer to the DeltaV VM Controller Simulation Product Data Sheet (PDS) for part number details.*

Subscription Based Licensing

DeltaV Simulate Multi-Node software licensing starting DeltaV v15.LTS can be purchased as a one-year, three-year, or five-year subscription which includes software, updates, and support. DeltaV Simulate Multi-Node is to be used for off-line simulation only

To view the expiration of the Simulate Multi-Node system ID launch Watchit application and use the DongleDriver path. The expiration will appear along with the system ID.

If a Simulate Multi-Node software license is allowed to expire, the continued use of the software is not permitted. The software will continue running the currently loaded configuration in this unlicensed state, but you will not be able to download any changed configuration to the unlicensed license. Please contact your sales representative to know more about the subscription contract process.

Ordering Information

Description: DeltaV™ Simulate—Single PC	Perpetual Model Number
DeltaV Simulate, Standalone	VE9921RxxxxxLyy
DeltaV SimulatePro, Standalone	VE9922RxxxxxLyy
DeltaV Simulate, Standalone with Basic SIS Logic Solver Simulation	VE9923RxxxxxLyy
Description: DeltaV Simulate—Multi-Node	
DeltaV Simulate, ProfessionalPLUS Networked (PPN)	VX2101RxxxxxLyy
DeltaV Simulate, Professional Station Networked (PSN)	VX2102S01
DeltaV Simulate, Application Station Networked (ASN)	VX2201S01
DeltaV Simulate, Operator Station Networked (OSN)	VX2104S01
Description: DeltaV SimulatePro—Multi-Node	
DeltaV SimulatePro—Multi-Node (added to DeltaV Simulate PPN and/or DeltaV Simulate ASN to obtain the increased capabilities of SimulatePro)	VX2207S01
Description: DeltaV SIS Logic Solver SimulatePro—Add-On	
DeltaV SIS Logic Solver SimulatePro—Full SIS Simulation Add-on for DeltaV Standalone (Add-on for VE9921 or VE9922)	VE3201
DeltaV SIS Logic Solver SimulatePro—Full SIS Simulation Add-on for DeltaV Multi-Node (Add-on for VX2101 or VX2201)	VX3201

Description: DeltaV Advanced Continuous Historian - Multi-Node	
DeltaV Advanced Continuous Historian - Multi-Node	VX2208P01

Note: DeltaV SIS Logic Solver Simulate supports the DeltaV SIS Logic Solver SLS1508. DeltaV SIS Logic Solver Simulate does not support CHARMS Smart Logic Solver (CSLS). DeltaV SIS Logic Solver SimulatePro Add-on license does not include DeltaV SimulatePro features which may be purchased separately.

Product numbers with RxxxxxLyy are for multiple releases where 'xxxxx' represents the DeltaV software version (e.g., 16LTS for DeltaV v16.LTS), and 'yy' is a two-digit code representing the language (e.g., 39 for English).

DeltaV Simulate may not be used in or be connected to any system involving a live process. It must be used only for software configuration development, process and control design, system operation checkout and training in a strictly off-line environment.

DeltaV software is only tested and supported on DeltaV workstation PC's.

Subscription

DeltaV Simulate Multi-Node software licensing starting DeltaV v15.LTS can be purchased as a one-year, three-year, or five-year subscription which includes software, updates, and support.

Description: DeltaV Simulate—Multi-Node PC	Subscription Model Number
DeltaV Simulate, ProfessionalPLUS Networked (PPN)	VX2101SwxxxxxLyy_YyFYzz
DeltaV Simulate, Professional Station Networked (PSN)	VX2102SwS001_YyFYzz
DeltaV Simulate, Application Station Networked (ASN)	VX2201SwS001_YyFYzz
DeltaV Simulate, Operator Station Networked (OSN)	VX2104SwS001_YyFYzz
Description: DeltaV SimulatePro—Multi-Node	
DeltaV SimulatePro—Multi-Node (added to DeltaV Simulate PPN and/or DeltaV Simulate ASN to obtain the increased capabilities of SimulatePro)	VX2207SwS001_YyFYzz
Description: DeltaV SIS Logic Solver SimulatePro—Add-On	
DeltaV SIS Logic Solver SimulatePro—Full SIS Simulation Add-on for DeltaV Multi-Node (Add-on for VX2101 or VX2201 Subscription model numbers)	VX3201SwS001_YyFYzz
Description: DeltaV SimulatePro—Multi-Node for Virtual Machine (VM) Controllers	
DeltaV SimulatePro—Multi-Node for BPCS and SIS Virtual Machine (VM) Controllers: vPK, vM-Series, vS-Series, vEIOC, and vSZ/vCSLS. SimulatePro functionality only includes pause, save, restore and resume functions	Please refer to the DeltaV VM Controller Simulation Product Data Sheet (PDS) for part number details
Description: DeltaV Advanced Continuous Historian - Multi-Node	
DeltaV Advanced Continuous Historian - Multi-Node	VX2208Sw01_YyFYzz

Note: These subscription model numbers are for initial subscriptions only; model numbers for renewals are listed separately in the price book.

**w represents the length of the subscription term in years (1, 3, or 5).

**y represents the specific year of the subscription term (1, 2, 3, 4, or 5).

**zz represents a two-digit indicator of the year of purchase (e.g. 23).

For existing customers with perpetual Simulate Multi-Node licenses who wish to expand and/or upgrade their DeltaV Simulate solution, please contact your local sales office.

Product number with xxxxxLyy is for multiple releases where 'xxxxx' represents the DeltaV software version (e.g., 16LTS for DeltaV v16.LTS), and 'yy' is a two-digit code representing the language (e.g., 39 for English)

Related Products

- **DeltaV Virtual Studio** is an integrated DeltaV application environment designed for easy implementation and management of virtual DeltaV control systems for both off-line and on-line production systems. Virtual machine templates are provided for automatic generation and configuration of DeltaV workstations and controller hardware.
- **DeltaV Virtual Machine Controller Simulation.** For off-line use, virtual hardware controllers provide an effective way to checkout control configuration and I/O assignments for both classic I/O and CHARMS I/O cards. The virtual controllers can be named and configured the same as real controllers so that no configuration changes or module re-assignments are required. S-Series and M-Series controllers are supported for DeltaV v11.3.1 and later. PK Controllers are supported for v14.3 and later. All virtual machine controllers are available for both DeltaV Virtual Studio and VMware environments. *For more information see product data sheet for DeltaV Virtual Machine Controller Simulation.*
- **DeltaV Virtual CHARMS I/O Card Simulation.** Simulation of CHARMS I/O cards using virtual machines running in a workstation PC. Virtual CHARMS I/O cards function in DeltaV the same as real CHARMS I/O cards and can be used for rigorous checkout of I/O assignments, operator displays, and control functionality. *For more information, see product data sheet for DeltaV Virtual CHARMS I/O Card Simulation.*
- **DeltaV SIS with Electronic Marshalling – Virtual Simulation.** Provides virtualization of SIS hardware components for rigorous testing of CSLS safety logic and operator graphics. *For more information see product data sheet for DeltaV SIS with Electronic Marshalling – Virtual Simulation.*
- **DeltaV Virtual Ethernet I/O Card Simulation.** Provides DeltaV Ethernet I/O Card (EIOC) Simulation from a host computer using either DeltaV Virtual Studio or VMware, which eliminates the need for hardware during FAT or other testing scenarios. *For more information, see product data sheet for DeltaV Virtual Ethernet I/O Card Simulation.*

Note: DeltaV Virtual Machine (VM) Controllers, VM CHARMs I/O Cards, VM Ethernet I/O Cards and VM SIS SZ/CSLS components are rolled out mainly for engineering development and testing purposes. Limitations may apply if the intent is to use them continuously in development to support ongoing production. Please consult Emerson sales teams for using these VM nodes for this use case.

- **Advanced Continuous Historian (ACH).** Provides high-resolution continuous data collection and analysis for simulated control systems. Beginning with DeltaV Simulate v16.LTS, use of ACH within Simulate Multi-Node requires a separate license.

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