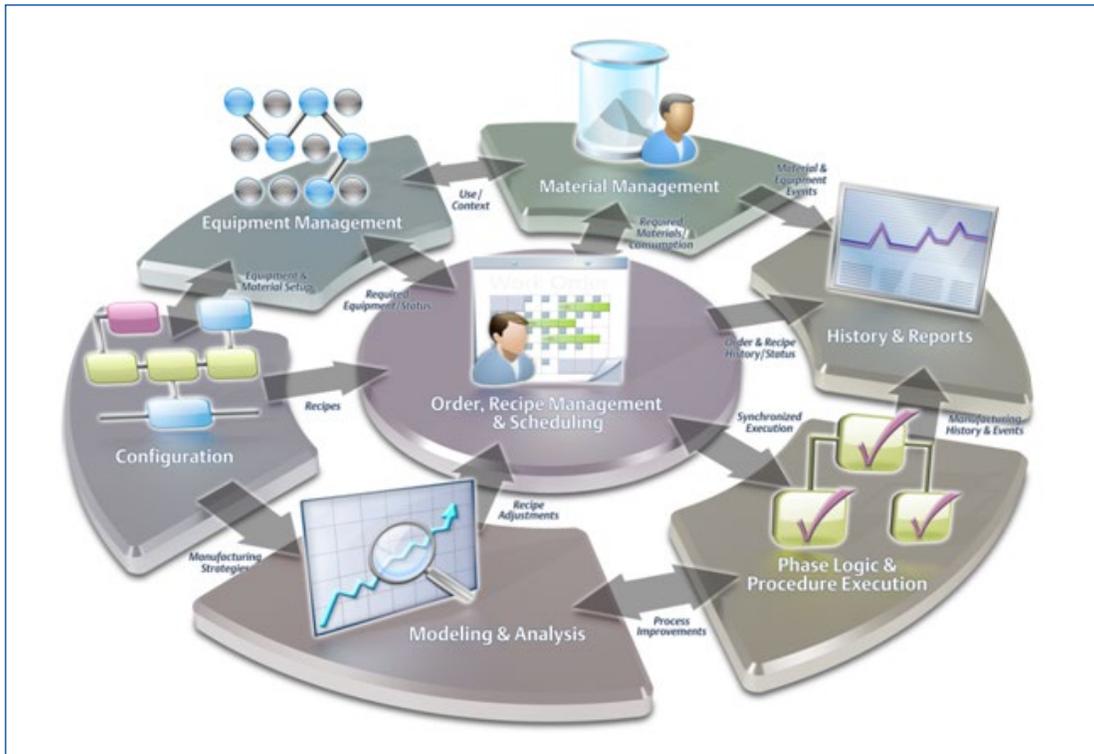


# Batch Executive



The DeltaV™ Batch Executive coordinates all activities during batch operation.

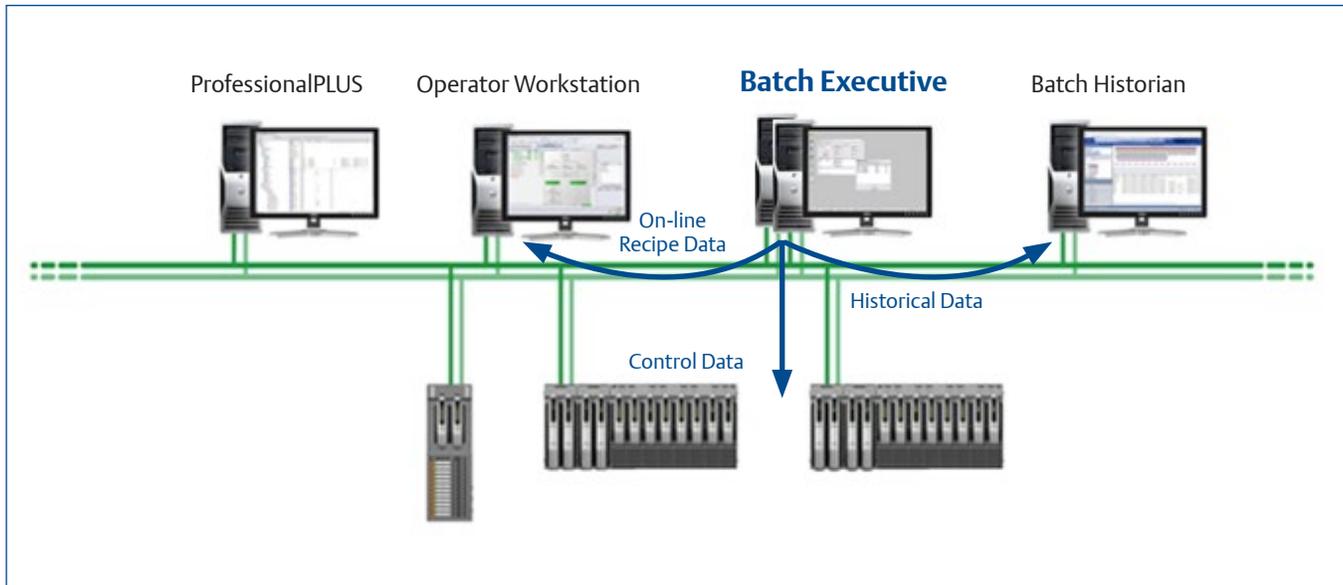
- Coordinates recipe execution
- Performs equipment arbitration
- Synchronizes phase-to-phase communication
- Facilitates manual phase control
- Generates and stores batch events
- Redundant Operation
- Supports multiple batch executives
- Displays batch information on DeltaV™ Operate graphics

## Introduction

The DeltaV Batch Executive manages everything from recipe execution to history collection. It is responsible for carrying out batch procedures, coordinating communication between phases, and allocating equipment and other resources required by a batch.

In addition, it passes recipe data to phases running in the DeltaV controllers and reads back report data from the phases. These events, along with all other recipe execution activities, are automatically generated and collected by the Batch Executive to provide detailed batch historical records.

The Batch Executive also coordinates batch activities with operations management systems, like *Syncade™ Smart Operations Management Suite*.



The Batch Executive processes and serves data to the DeltaV Batch application suite.

## Benefits

**Coordinates recipe execution.** The Batch Executive processes control recipes and manages the communication between recipe logic running on the batch server and phases running in the DeltaV controller. Recipe and phase status information is served to the Batch Operator Interface and DeltaV Operate for batch viewing and manipulation.

**Performs equipment selection.** Equipment Trains allow for automatic equipment selection by the Batch Executive during recipe execution to avoid downtime waiting for Operator selection of equipment.

**Performs equipment arbitration.** Equipment is automatically allocated during recipe execution. Arbitration information is served to the Batch Operator Interface where the operator may adjust the priority of equipment in the allocation queue, if desired.

**Synchronizes phase-to-phase communication.** Inter-phase communication messages are processed by the Batch Executive.

**Facilitates manual phase control.** The Batch Executive facilitates manual control of phases without executing an entire procedure. This provides an additional level of batch control to the power user.

**Generates and stores batch events.** During the execution of a recipe, the Batch Executive automatically generates batch history. The events are stored to files that can be read by the Batch Historian or viewed from the Batch Operator Interface.

**Redundant Operation.** For increased availability of your batch operations the Batch Executive has an *option for redundant operation*. Simply enabling the Batch Executive on a DeltaV Application Station marked as redundant for batch ensures that the application works on each of the Application Stations in active and standby roles. Failure of the active Batch Executive causes automatic failover to the standby Batch Executive, ensuring seamless batch operation in your facility. Refer to the Batch Redundancy product data sheet for additional details.

**Supports multiple batch executives.** Allows batch resources to be allocated among multiple batch executives, increasing flexibility for maintenance and upgrades.

**Batch Information on DeltaV Operate Graphics.** Users have the option of displaying batch information with other process information on DeltaV Operate graphics. Users can view active batches and their states as well as create new batches and give operational commands or perform an active step change to existing batches. Users can also acknowledge batch prompts and submit comments related to batches from DeltaV Operate.

## Product Description

The Batch Executive acts as a multi-batch process server that interfaces to the various tools within the DeltaV Batch suite of applications. Recipes, formulas, and parameters developed in Recipe Studio, as well as associated equipment trains or units defined in the DeltaV Explorer, are downloaded to the Batch Executive after recipe configuration. There is no DeltaV system limitation on the number of recipes that can be configured.

During execution of the control recipe, the Batch Executive processes all recipe management actions such as skipping and repeating steps, holding, stopping, aborting, restarting the recipe, and managing process parameters. Changes to recipes or equipment can be made without interrupting the Batch Executive processes. These changes can optionally be incorporated into running batches.

The Batch Executive also handles *phase coordination* and communication with basic control functions running in the controller. A built-in monitor automatically detects any loss of communication that occurs between the Batch Executive and the controllers and immediately notifies the operator. Recipes and phases are placed in a held state until communication is reestablished.

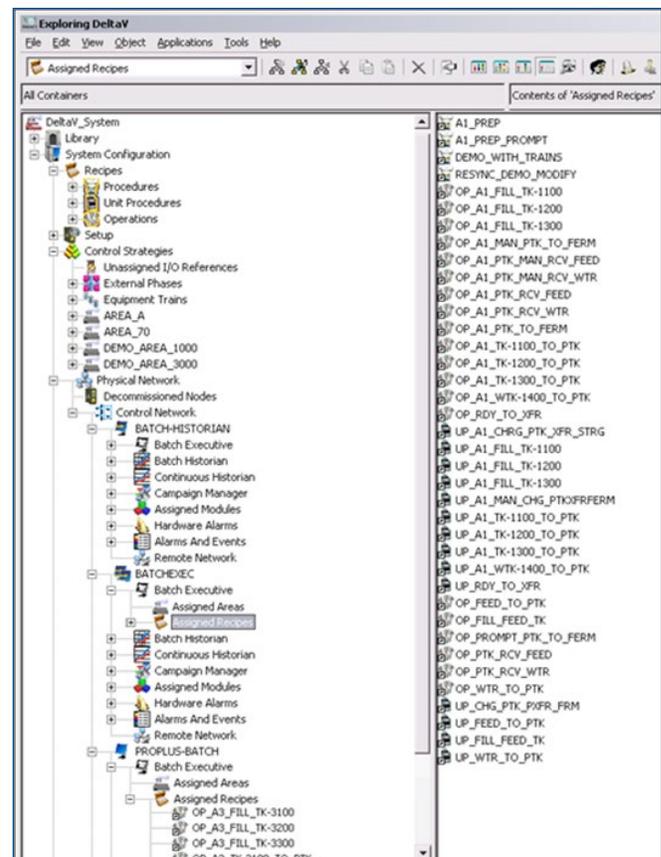
Because each active batch is run as a separate Windows process, any faults are isolated to a single recipe. A Warm Restart option allows individual batches to be restarted right where they left off.

The Batch Executive uses a first-in-first-out (FIFO) queue to handle equipment arbitration. A user at the Batch Operator Interface has the ability to manipulate the priority of equipment requested by batches within the resource allocation request list.

The Batch Executive collects and records batch events in recipe journal files. These journal files are stored on the workstation where the Batch Executive resides and are limited in size only by the available hard disk space. The files, which are used by the Batch Historian, can also be viewed at the Batch Operator Interface.

To ensure a secure operating environment, the Batch Executive runs as a Windows Service. Recipes continue to run even without a user logged on to the Batch Executive workstation, allowing only individuals with the proper privileges to access the Batch Executive.

For flexibility during maintenance and upgrades, batch resources may be allocated among multiple Batch Executives. One DeltaV System may have up to 4 Batch Executives. An example of using multiple Batch Executives is if a manufacturing facility has two production trains and each train is assigned to a different batch executive, computer maintenance and software upgrades may be implemented on one batch executive without affecting the other. All equipment needed for a recipe must be assigned to the same batch executive.



*Assigning recipes to multiple batch executives is as easy as drag and drop with the DeltaV Explorer.*

## Performance

The DeltaV system has been put through stress tests and earned a greater than 6 sigma quality rating. Batch Executive stress tests indicate that you can run up to 100 recipes simultaneously in a DeltaV system containing 2500 phases and still meet system performance standards. This means that you can create as many phases and recipes as you need to perform batch processing and not exceed system capacity limits. Controller memory, recipe size, and phase logic size impact system performance. However, by efficiently coordinating recipe communications, the Batch Executive gives you the power you need to control your process.

## Options

The Batch Executive has the capability to directly integrate with a wide variety of other applications. Contact Emerson Process Management for more information about this capability.

For batch facilities that produce multiple batches using a given recipe, the DeltaV Campaign Manager works with Batch Executive to automatically create and start batches—making production scheduling easy.

## Related Products

- **Advanced Unit Management Software.** Provides class-based Unit Modules and aliasing to make developing unit-relative equipment strategies simple.
- **Batch Historian.** Automatically collects and stores batch recipe execution data from the DeltaV Batch Executive and process alarm and event data from the DeltaV Event Chronicle.
- **Batch Redundancy.** Enables redundant DeltaV Batch capabilities for the Batch Executive and Campaign Manager, including automatic switchover to protect your batch operations from disruptions.
- **Campaign Manager.** Creates and manages a campaign by specifying the recipe, formula, equipment, and number of batches that are to be run within the campaign. A Service-Oriented Architecture Web Service is available to enable production-scheduling packages to initiate the creation of campaigns in the DeltaV system.
- **Batch Analytics.** Detects faults and predicts end of batch quality *in real time* using multi-variate models based on historical batch data.
- **Configuration Audit Trail.** A powerful tool that tracks changes and manages revision information for any item in the DeltaV configuration database, including Safety Instrumented System (SIS) items.
- **DeltaV Operate.** High performance operator graphics, trends and alarms offered in standard operating layouts and utilizing system-wide built-in security.
- **DeltaV Operate for Batch.** Batch Controls allow you to operate your batches from the same DeltaV Operate environment used to monitor and control your process.
- **Recipe Exchange.** Provides an open, programmatic interface to the DeltaV recipe management system. Recipe Exchange is based on an XML schema that provides the ability to programmatically import and export DeltaV recipes. A Service-Oriented Architecture Web Service is also available for Recipe Exchange.
- **Recipe Studio.** Powerful yet simple to use application for graphically configuring recipes (with formulas) for successful batch production.
- **Syncade™ Smart Operations Management Suite.** A new class of real-time production management software, provides an easy, flexible, integrated solution that increases plant performance by efficiently managing plant materials and equipment, coordinating production operations, improving quality operations and integrating plant information.

## Prerequisites

- One ProfessionalPLUS Station in a DeltaV system.
- Optimal performance is achieved by installing the Batch Executive on an Application Station. Consult the factory before installing the Batch Executive on a workstation other than an Application Station. A variety of hardware is available to meet your specific requirements. Call your Emerson Process Management sales office for details.

## Ordering Information

The Batch Executive is included in the following DeltaV Batch software suites\*:

Description	Model Number		
	pre-v9.3	v9.3 through v11.3	v12.3 and later
DeltaV Basic Batch	VE2234Sxxxxx	VE2238Sxxxxx	VE2247Syyyyy
DeltaV Advanced Batch	VE2235Sxxxxx	VE2239Sxxxxx	VE2248Syyyyy
DeltaV Professional Batch	VE2236Sxxxxx	VE2240Sxxxxx	VE2249Syyyyy

Where xxxxx is equal to the total number of batch DSTs in the system. xxxxx is available from 250 to 30,000 DSTs in 250-DST increments.

Where yyyyy is equal to the total number of class-based Unit Modules configured under Process Cells in the system.

Yyyyy is available in sizes of 2 Units, 5 Units, 10 Units, 20 Units, 30 Units, 50 Units, 75 Units, 100 Units, 150 Units, 300 Units, and >300 Units.

\*For additional information on the DeltaV Batch software suites, refer to the DeltaV Basic Batch, DeltaV Advanced Batch, and DeltaV Professional Batch product data sheets.

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