

LISTEN.
THINK.
SOLVE.®

FactoryTalk® Batch

Rune Høgild & Per Jensen



Agenda

1. Why a FactoryTalk Batch solution?

2. Tools for the engineers

3. Demo

4. The Process Operators interface

2. Demo

What benefits can FT Batch give?

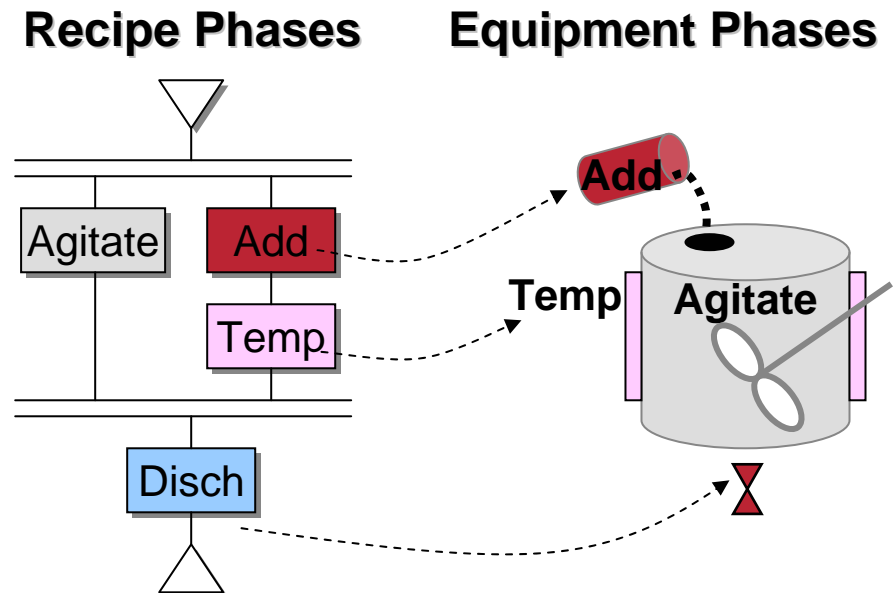
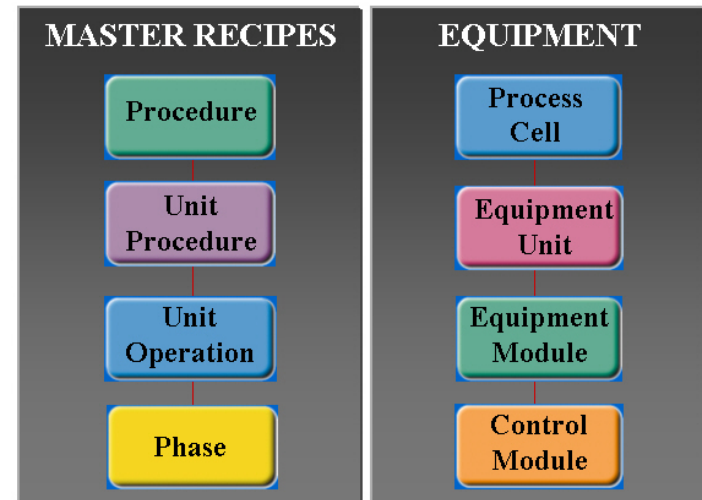
- Optimum asset utilisation / Flexible production plant
- Increased throughput
- Reduced work-in-progress
- Reduced overtime
- Reduced reliance on key individuals
- Reduced inventory
- Reduce time-to-market

- Improved traceability
- Documentation of every executed batch
- Audit trail

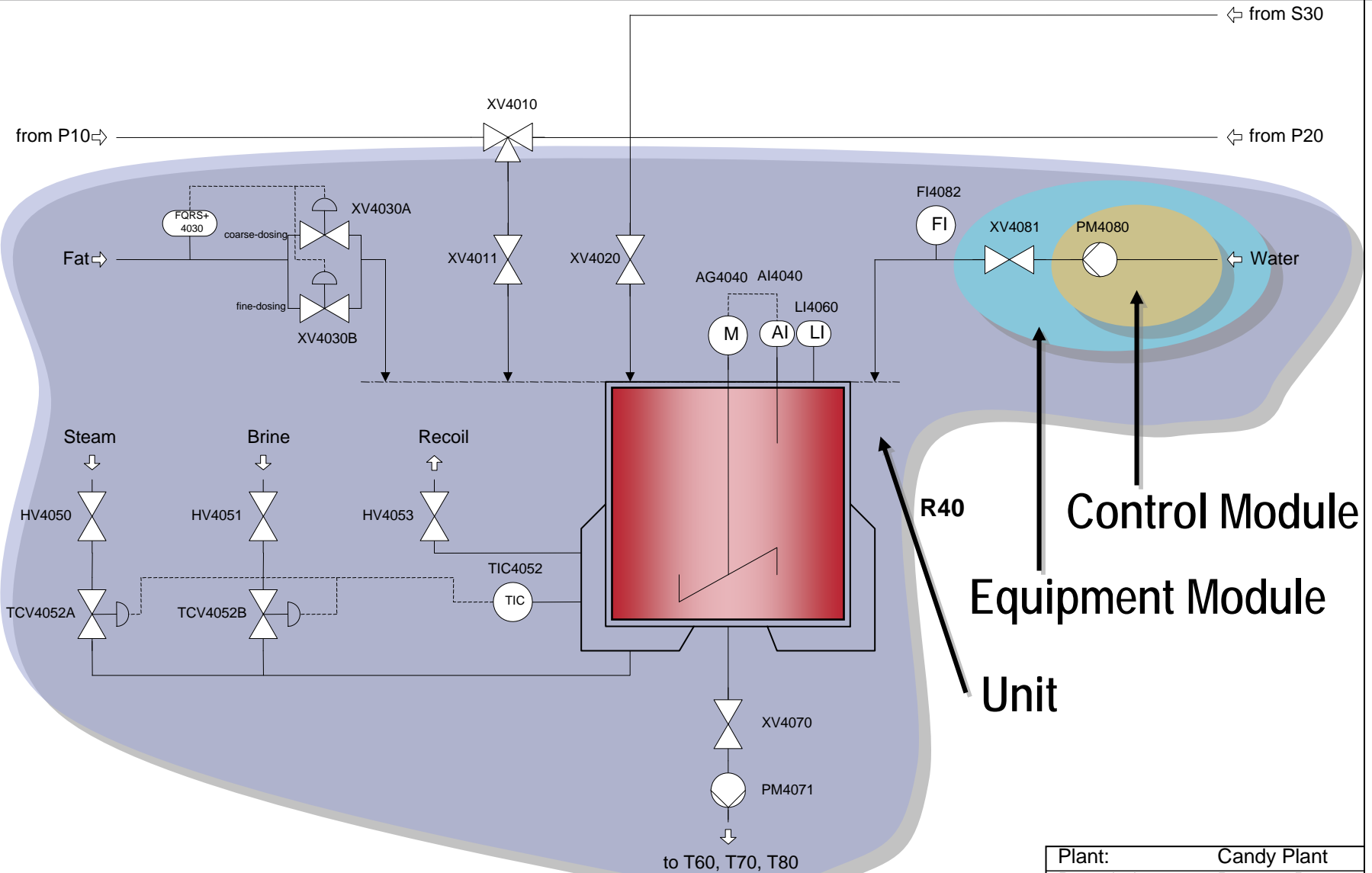
FT Batch is build to fulfill the standard S88

Key S88 Concept:

- Separate:
 - Product Knowledge – the recipes
 - from Equipment Capabilities
- S88 goal
 - Allow recipe development without a detailed knowledge of the control systems.
 - 'No control system programming' for every recipe change or modification.
- Result
 - Same equipment - multiple products
 - ➔ Flexible Manufacturing!

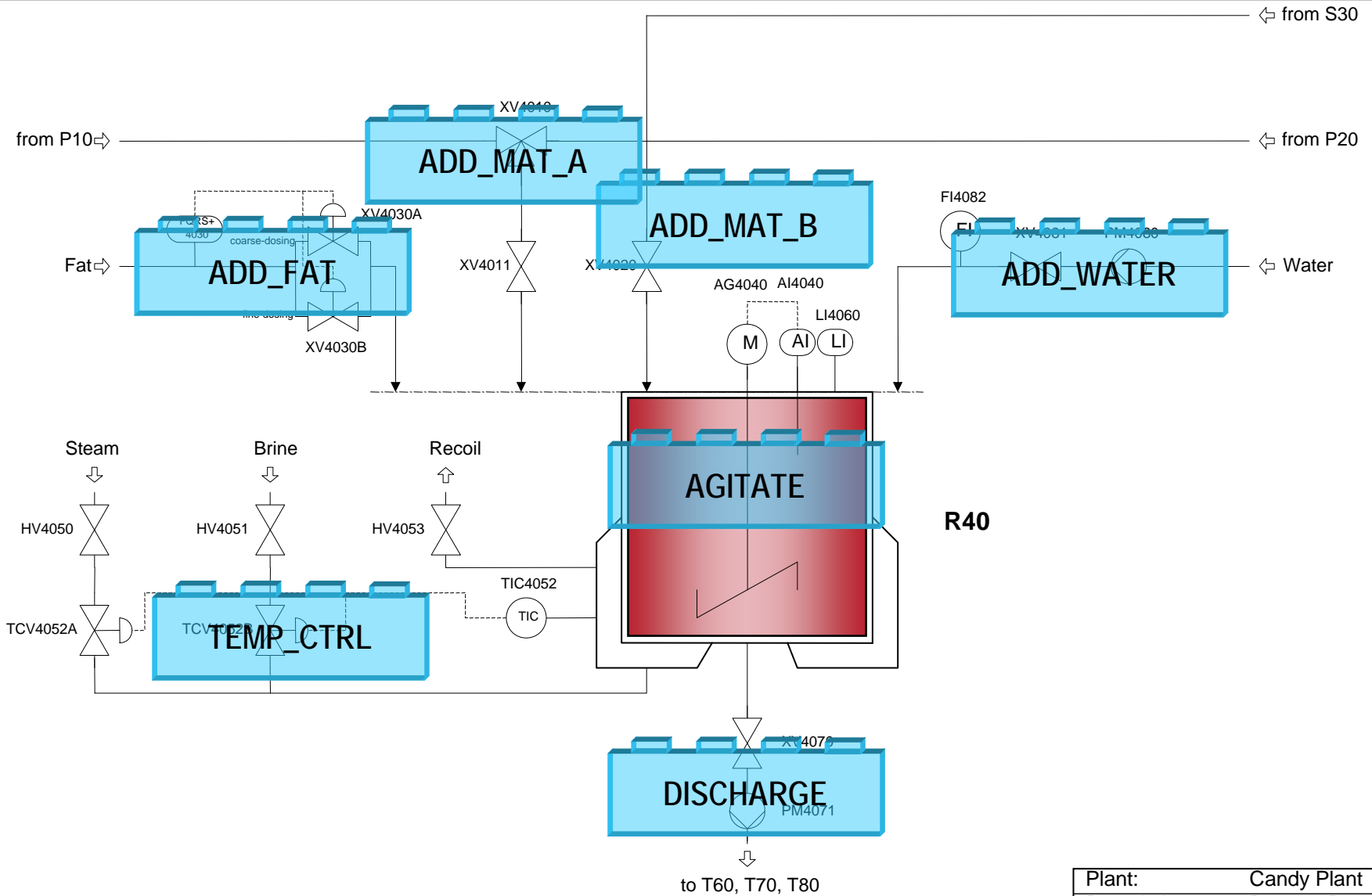


S88 allows you to modularize your plant



Plant:	Candy Plant
Description:	Reactor R40
Doc. Nr.:	100.40
Rev.:	21. Oct. 1998

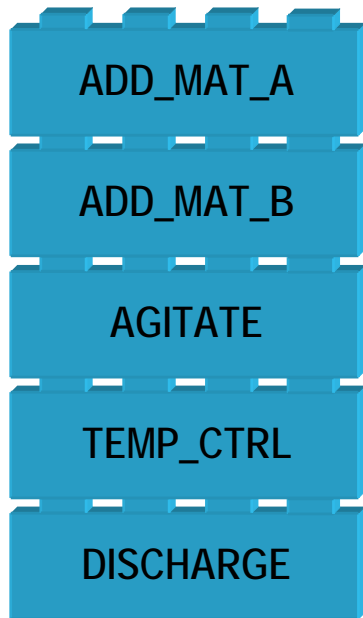
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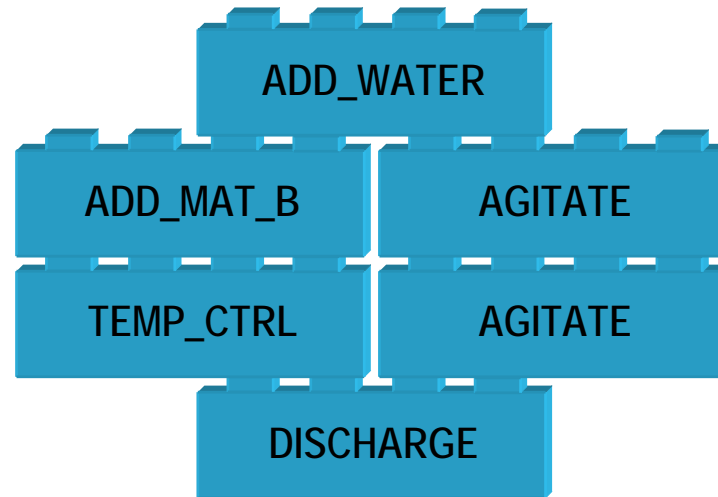
Plant:	Candy Plant
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...to achieve high flexibility in production...

- Product A

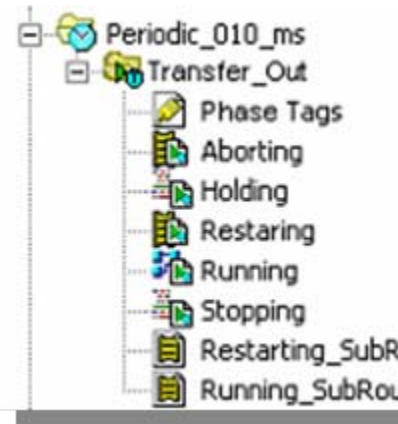


- Product B

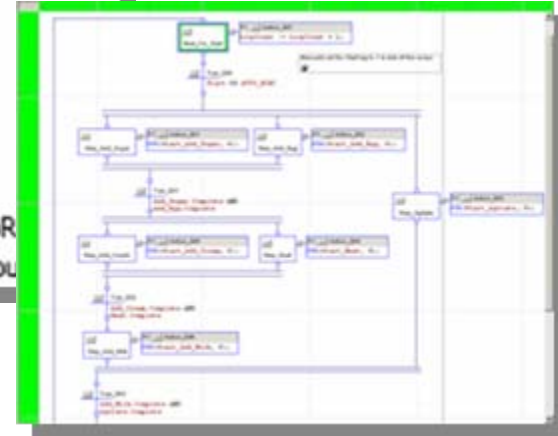


ControlLogix PhaseManager is the Foundation

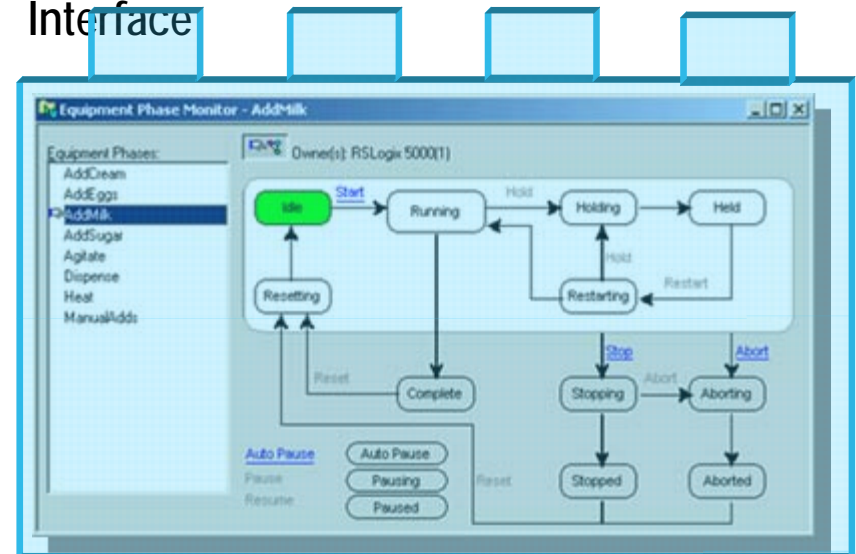
- PhaseManager embeds S88 standardized (Equipment) Phase State Model and management in the Logix controller
- Enables Premier Integration between ControlLogix and FT Batch
- Building Block for continued integration between ControlLogix and the Distributed Batch Architecture



Application Code

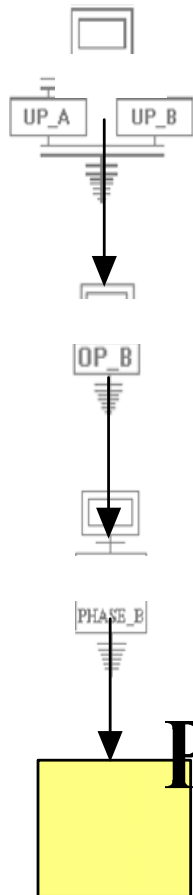
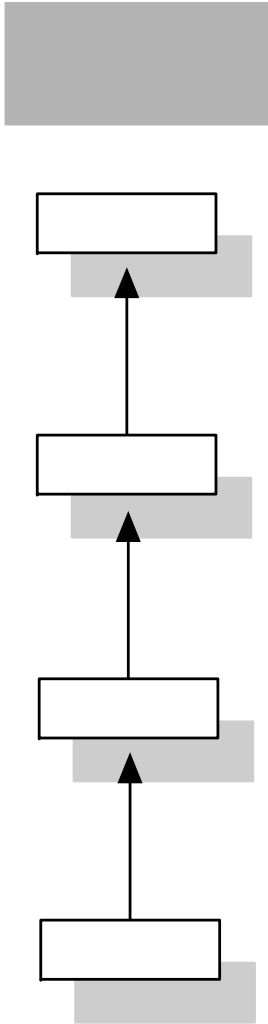


Standard Phase Interface



Recipe Editor

FactoryTalk Batch
Recipe Editor



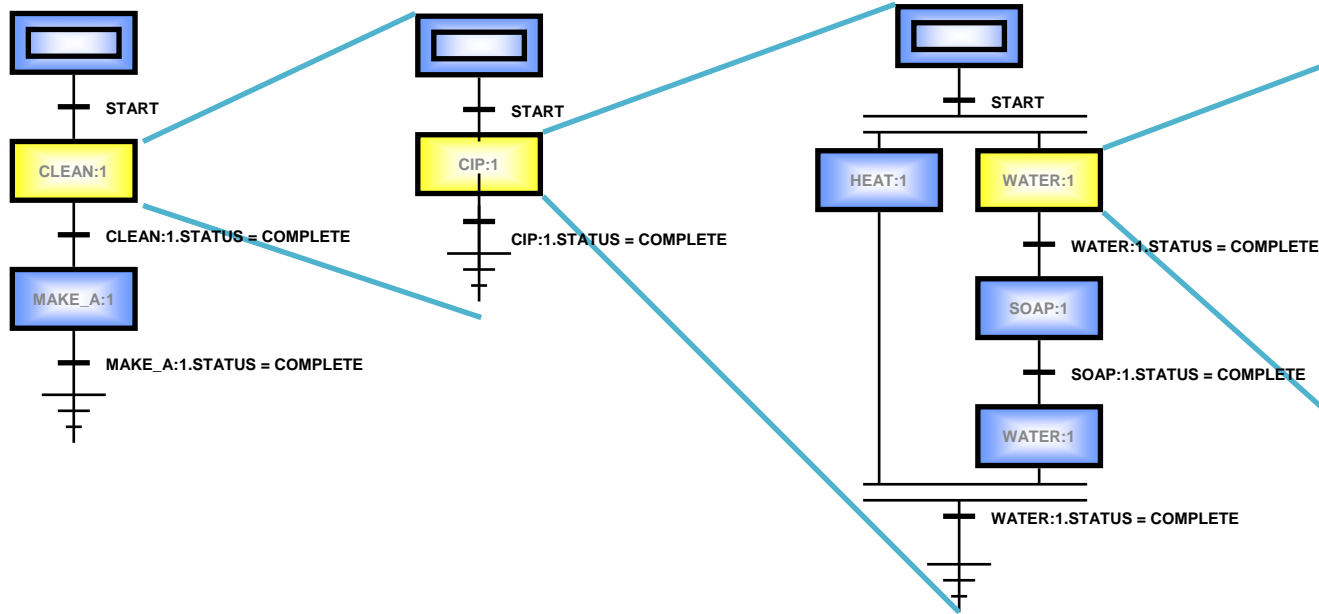
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SP
Pro
Model

Recipe Editor

ISA-88 Procedural Model

Batch (PC)

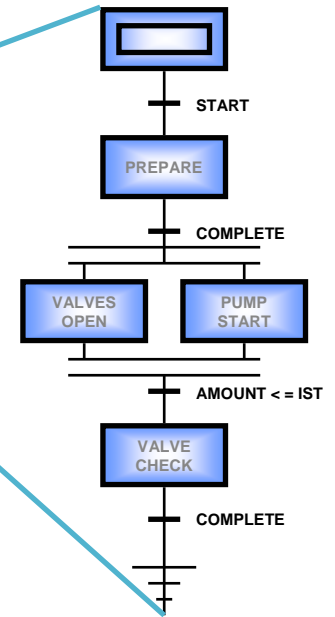


Procedure:
MAKE_PRODUCT_A

Unit Procedure:
CLEAN

Operation:
CIP

Process Connected Device (PLC)



Phase: Rinse



Boosting Business Agility: Faster Time To Market

- FactoryTalk Batch's recipe development tools let you develop new formulations or modify existing ones quickly and easily
 - Run pilot batches during product development
 - Create variants of a standard recipe to give consumers more options
 - Test market potential products for customer acceptance
 - Scale it up to full production when it's ready
- Change the ingredients, quantities and sequences with no re-programming!

Boosting Business Agility: Recipes

- Comprehensive recipe management tools allow you to develop new formulations quickly
 - Migrate to less expensive ingredients
 - Change formulations based on seasonal cost variations, fluctuations in commodity markets
- Recipe development and execution can be done by process people - with no programmer involvement!
- Keep your formulations where they belong: Close to the Vest!
 - Since OEM's and Integrators develop only generic control code, you don't have to share your formulations
 - Safeguard your intellectual property

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4. Benefits for the operator

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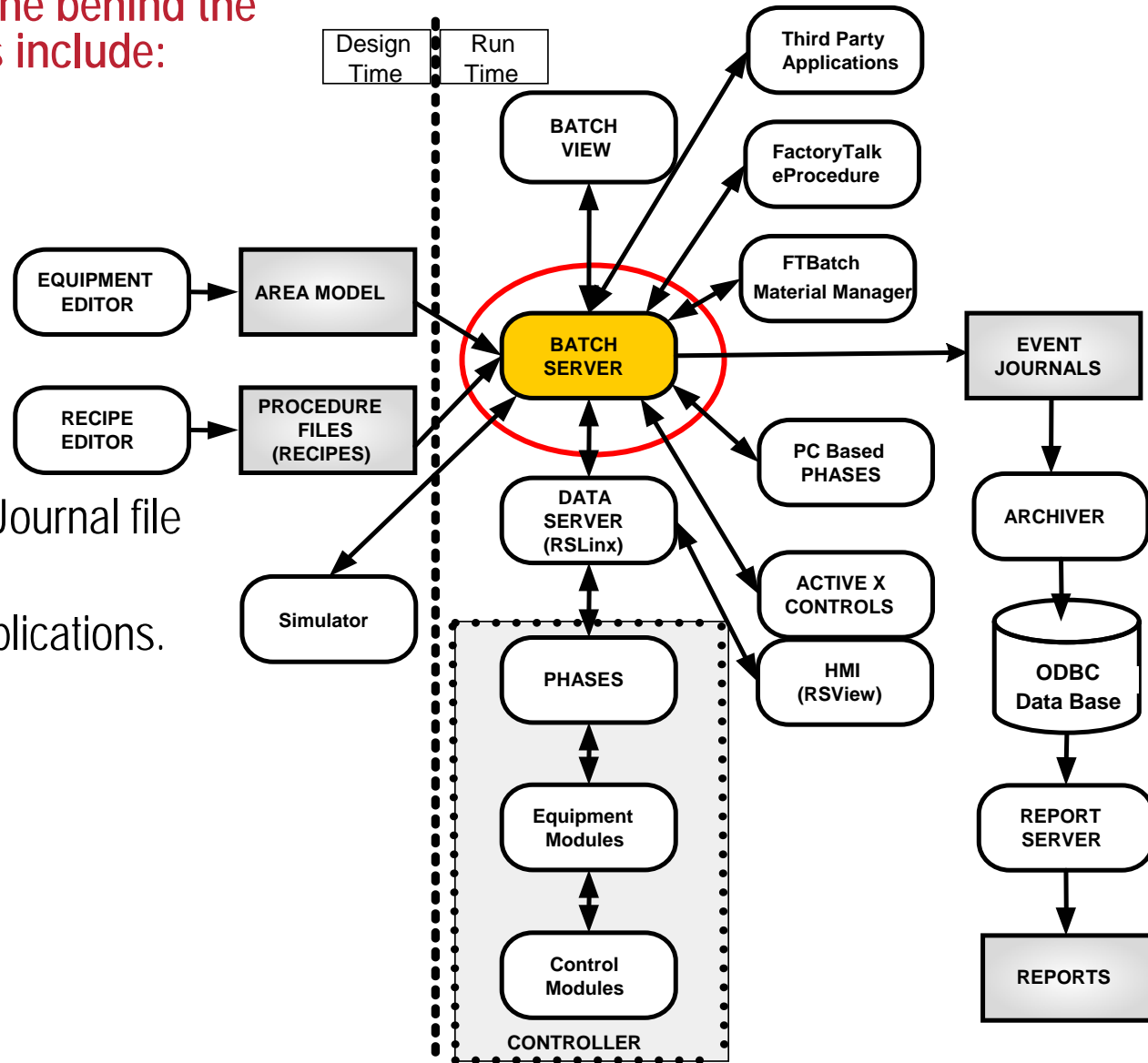
Benefits to the engineer

- S88 gives you the overview and breaks down the P&I diagram
- Phase Managers state model forces you to structure the code in Logix according to the standard ISA S88
- Bottom up approach - You can do a project without FT Batch and attach FT later on when the plant grows
- Reuse of code means....
- Decrease SAT and commissioning
- Easy to validate the code
- Use more time on functional descriptions – less on programming
- No "spaghetti program code" but easy to understand code
- Better documentation and easy trouble shooting

The FactoryTalk Batch Server

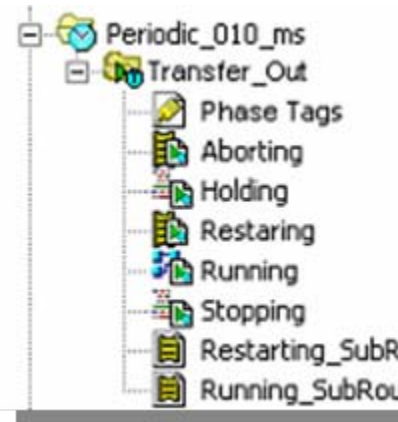
The Batch Server is the engine behind the product. Its responsibilities include:

- Batch creation
- Recipe execution
- Equipment arbitration
- Data collection into an Event Journal file
- Communication with other applications.

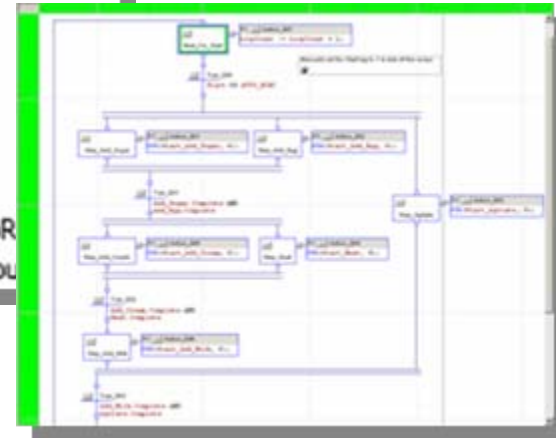


PhaseManager Feature of RSLogix 5000

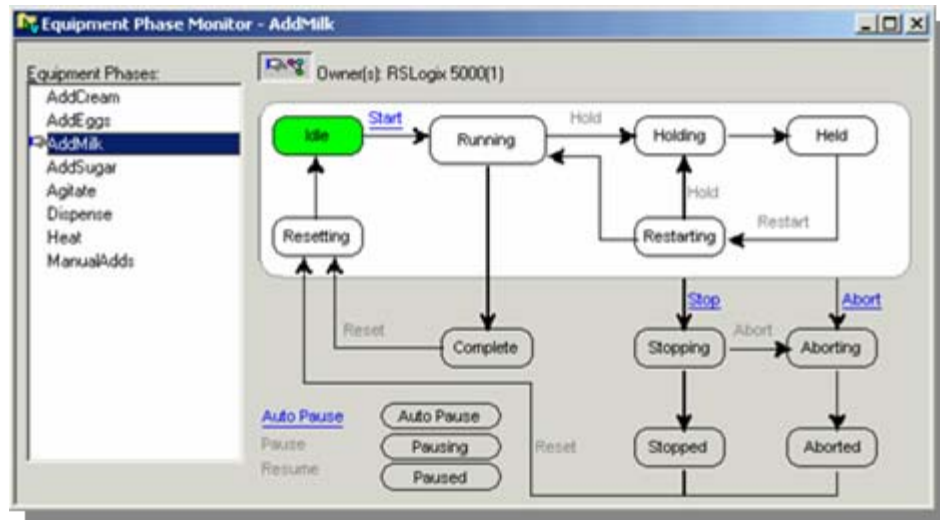
- PhaseManager embeds standardized (Equipment) Phase State Model and management in the Logix controller
 - Provides a modular framework for executing Phases in a Logix controller
 - Phase control executed as state machine model, using Phase State Routines (Running, Stopping, etc.)
 - Manages transitions between these standard, allowable States
 - Is the "PLI" to FT Batch
- Phase Monitor provides a monitoring and troubleshooting view of individual phases



Application Code



Standard Phase Interface



FactoryTalk Batch/PhaseManager Benefits

- Synchronization with controller phases with Batch area model
- Automatic tag addressing in FactoryTalk Batch Equipment editor
- Leverage enhanced communications; CIP messaging for more robust communication.
- Embedded PLI, no PLI programming or mapping required
- Reduction in Engineering effort to implement batch automation project.
 - Design and Commissioning
- Reduction in operation, maintenance and training costs

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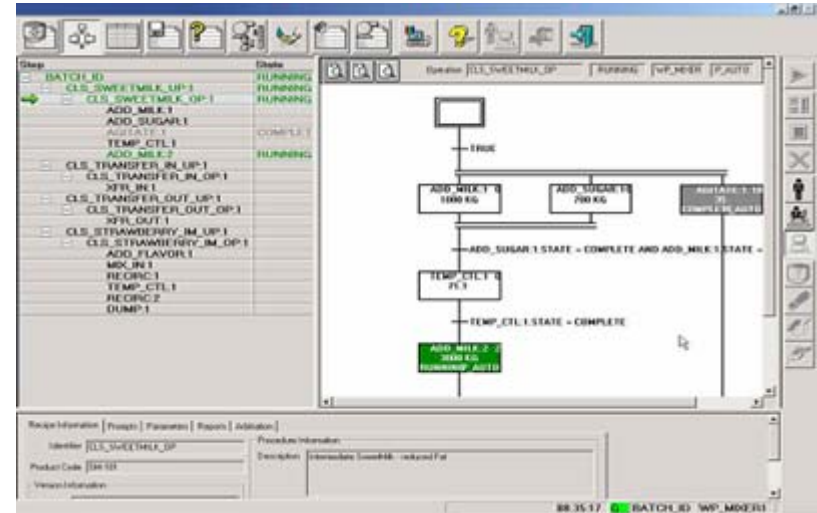
2. Demo

The Process Operators interface to FT batch

1. Batch View Client
2. FactoryTalk View or third party SCADA via ActiveX controls
3. Any other application via API

The FactoryTalk Batch View client

The Batch View is a powerful, easy-to-use 'thick client' for controlling batches and the Batch Server functions.



The standard interface features and functions of Batch View include:

Batch List View – a list view of all current control recipes (batches) and their present states.

Procedure as SFC View – a graphical representation of a single control recipe.

Procedure as Table View – a spreadsheet view of a single control recipe.

Event Journal View – a real-time electronic batch record that provides detailed event data about a particular batch and allows queries to be made against the information.

Prompts – a list of all prompts in all control recipes, which currently require operator input.

Phase Control – an interactive display that allows manual execution of individual recipe phases.

Arbitration – a view of current resource allocations. This can be manipulated by the operator.

Alarm Summary – a display of all failure/error messages sent to or generated by Batch for the current control recipes.

Phase Summary – a global view of all the equipment phases configured within the area model and their current states.

Configuration – a means of configuring the View windows to meet the operator's needs.

Help – the Batch online help system.

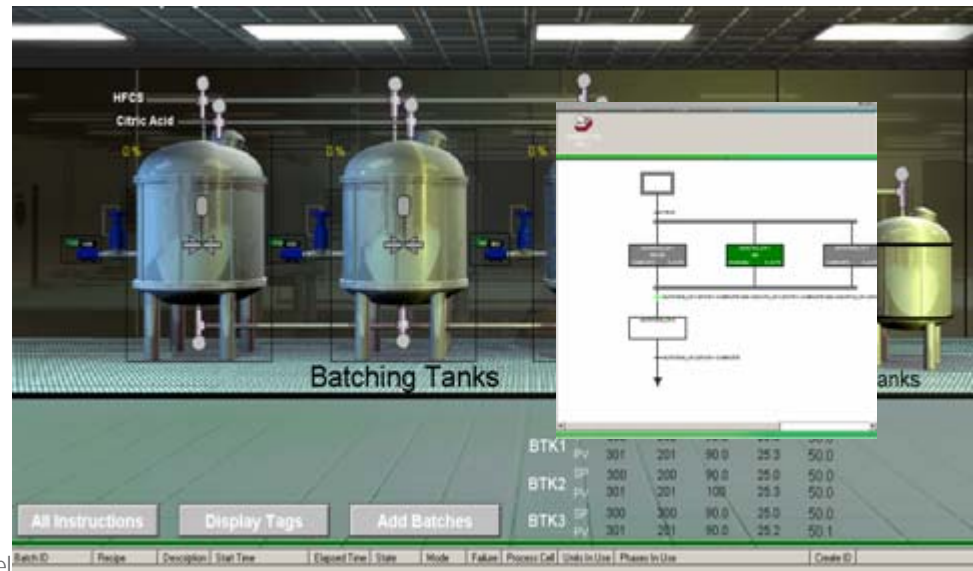
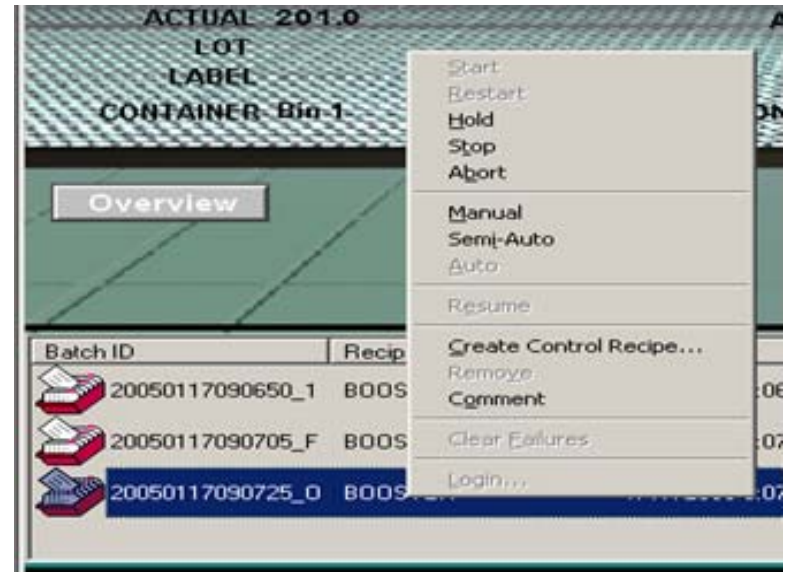
Human-Machine Interface – a configurable hot link to the Human-Machine Interface (HMI).

Login – opens the security login dialog box to change operators on-the-fly.

Batch Active X Controls

The ActiveX controls communicate with the Batch Server, and allow monitoring and control of a recipe without running Batch View.

- Control recipe list
- Prompts list
- Procedural view
- Signature list



Additional FactoryTalk Batch Functionality

- Batch Archiver
- PC Based Phases
- FactoryTalk eProcedure
- FactoryTalk Batch Material Manager

All are included with each FactoryTalk Batch License

FactoryTalk Batch Archiver

Collects data from the event journals and stores it in an OPC compliant Database

Server Options

Cross Invocation Descriptors and Defaults | Hyperlink Descriptors and Defaults | Material Policies

Project Settings | Restart Control | Batch Reporting | Archiver Event Filters | Batch Server

Batch Filters

<input type="checkbox"/> Active Step Change Commenced	<input type="checkbox"/> Permissive Msg Received	<input checked="" type="checkbox"/> Signature Completion
<input type="checkbox"/> Arbitration	<input type="checkbox"/> Permissive Msg Sent	<input type="checkbox"/> Signature Request Creation
<input type="checkbox"/> Attribute Change	<input type="checkbox"/> Phase Logic Arbitration	<input checked="" type="checkbox"/> Signature Signoff Successful
<input checked="" type="checkbox"/> Automatic Removal	<input checked="" type="checkbox"/> Prompt	<input checked="" type="checkbox"/> Signature Signoff Unsuccessful
<input checked="" type="checkbox"/> Batch Deletion	<input checked="" type="checkbox"/> Recipe Header	<input checked="" type="checkbox"/> Signature System Cancellation
<input checked="" type="checkbox"/> Comment	<input checked="" type="checkbox"/> Recipe Parameter Deviation	<input checked="" type="checkbox"/> State Change
<input checked="" type="checkbox"/> File Name	<input checked="" type="checkbox"/> Recipe Value	<input checked="" type="checkbox"/> State Command
<input type="checkbox"/> Message	<input checked="" type="checkbox"/> Recipe Value Change	<input type="checkbox"/> Step Change Activity
<input checked="" type="checkbox"/> Mode Change	<input checked="" type="checkbox"/> Report	<input checked="" type="checkbox"/> Unit Bind
<input checked="" type="checkbox"/> Mode Command	<input checked="" type="checkbox"/> Report Comment	<input checked="" type="checkbox"/> Unit Unbind
<input type="checkbox"/> Owner Change	<input checked="" type="checkbox"/> Report Parameter Deviation	<input checked="" type="checkbox"/> Unit Creation Bind
<input type="checkbox"/> Param Download Verify	<input checked="" type="checkbox"/> Response	<input type="checkbox"/> Unit Verified
<input type="checkbox"/> Param Download Verify Fail	<input type="checkbox"/> Scale Factor	<input type="checkbox"/> User
<input type="checkbox"/> Permissive Msg Cancel	<input type="checkbox"/> Signature Cancellation	

MaterialTrack Filters

<input checked="" type="checkbox"/> Material Bound	<input checked="" type="checkbox"/> Material Tracking	<input type="checkbox"/> Promise Event
<input checked="" type="checkbox"/> Material Unbound	<input type="checkbox"/> Loss of Material Server	
<input type="checkbox"/> Material Reporting	<input type="checkbox"/> Loss Of Material Tracking	

eProcedure Filters

<input checked="" type="checkbox"/> Instruction Complete	<input type="checkbox"/> Reactivate Step Request
<input checked="" type="checkbox"/> Reactivate Step	

OK Cancel

Batch PC-based Phases

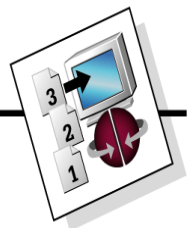
- The FactoryTalk Batch PC-based phase option allows you to design PC-based Visual Basic (or Visual C++) phases for use in FactoryTalk Batch recipes.
- This option can be for a variety of tasks such as:
 - Connecting to a Laboratory Information Management System (LIMS)
 - Connecting to a database for lookup information
 - displaying a document from a document management system

What is FactoryTalk eProcedure?

- Automated operator instructions for manual processes
- Integrates automated batch recipe execution with Manual Instructions
- Provides instructions to your operators using web interface
- Automates the process without the need to automate the equipment!
- Included with each FactoryTalk Batch license
- If used stand alone (as 100% manual instructions) requires no additional control software

FactoryTalk[®] eProcedure[®]

Process Management for
Manual Operations

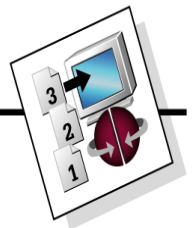


Benefits Summary of FactoryTalk eProcedure

- Improved product consistency
 - Consistent enforced sequential processing of manual operations
- Inspection and Validation savings due to:
 - Use of formalized and verifiable procedures
 - Automatic logging and time stamping of procedure execution
 - Comprehensive electronic signatures
 - Captures information as events happen, rather than relying on operator memory
- Incremental role out of an automated control system
 - Design and build ISA-88 equipment and procedure models and modularly add automation to equipment without changes to procedures

FactoryTalk® eProcedure®

Process Management for
Manual Operations



FactoryTalk Batch Material Manager

- Active Material Management / Inventory System
 - May be used stand alone as a plant floor/daytank material management system
 - Can be synchronized into a Plant wide Material Management system through the Material server API
- Benefits of utilizing FactoryTalk Batch Material Manager in your Batch solution
 - Enables Material allocation for batch recipes
 - Automates pull of raw material to batch operations
 - Records critical data about material and equipment usage into the FT Batch journal
 - Provides for lot tracking and material genealogy
 - Sub-lot tracking also can be enabled
 - Allows user defined priorities of materials
 - Such as shelf-life, price, pH value, quality index, etc.

Benefits Summary of FactoryTalk Batch Material Manager

- Brings the advantages of Modular Batch Automation to real-time materials management.
- Automated material execution increases decreases cycle times and improves material usage efficiency
- Sub-lot tracking reduces costs of product recall
 - Instead of total lot recall
 - Machine tracking keeps other equipment operational during recall
- Flexible storage locations
 - Reduce the number of recipes by more than 50%
 - Simplifies recipe creation and maintenance.
- Reduces the complexity of phase programming.
 - Controller code engineering effort significantly reduced

FactoryTalk[®] Batch Material Manager

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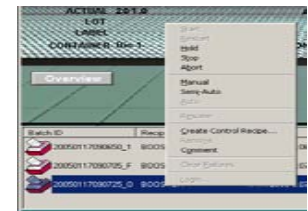
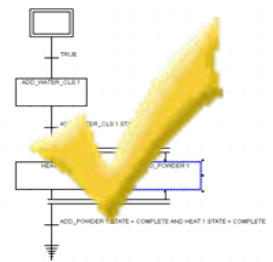
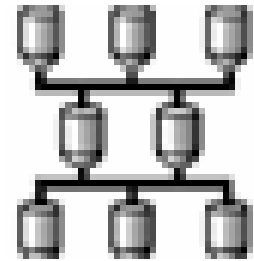
What's New in FactoryTalk Batch V10.0

Released Dec 2008



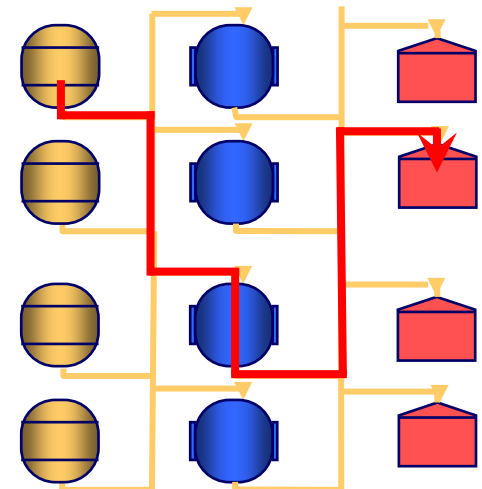
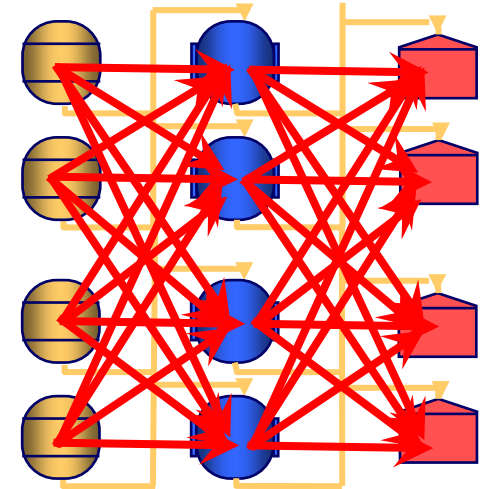
FT Batch v10.0 - New Capabilities

- Smart Binding
 - Configurable requirements and preferences in unit selection for optimal procedural flow and recipe management
- Timer steps
 - Built in timer capabilities to reduce engineering and validation costs
- Recipe validation
 - Checks for invalid structures and pathways in procedures
- Batch creation wizard enhancements
 - More efficient control recipe creation
- Client support for Vista & Terminal Services



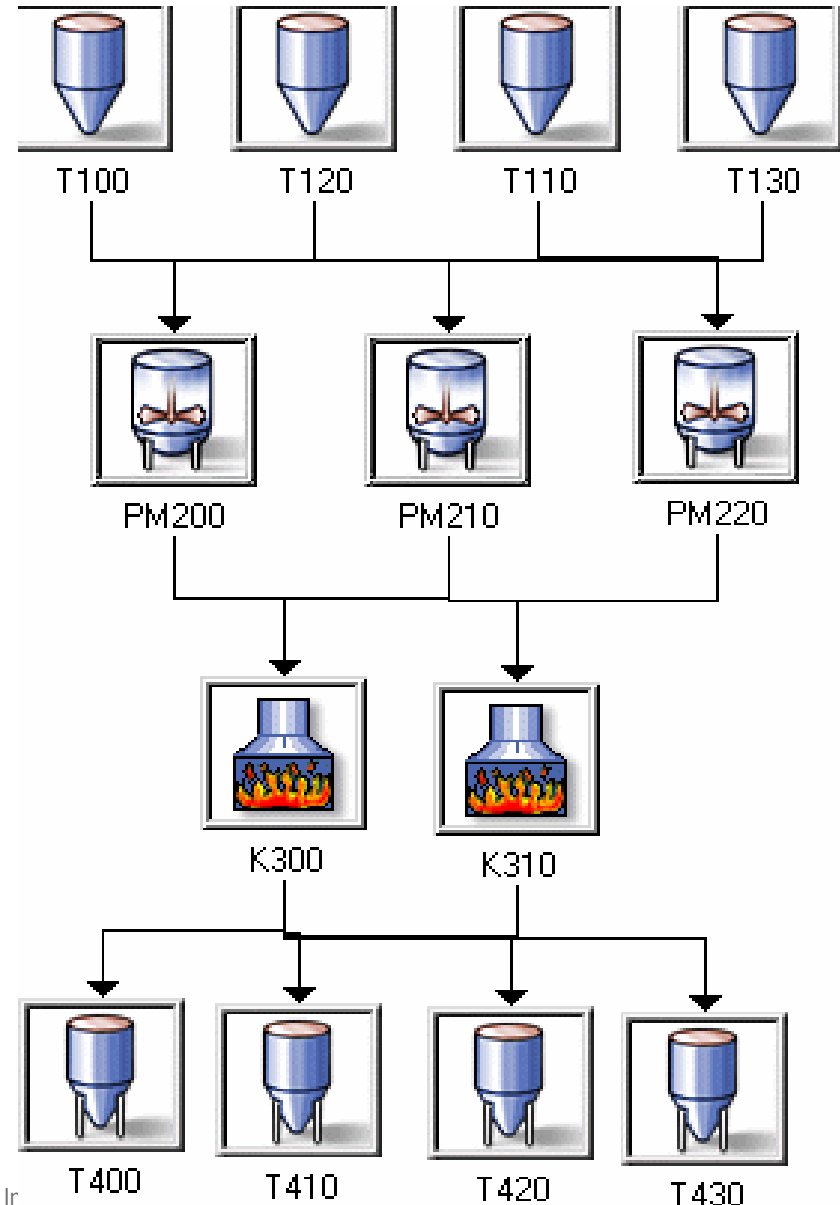
FactoryTalk Batch Smart Binding

- The enabling technology that builds equipment (unit) binding requirements and preferences into Batch procedures to optimize procedure execution
- Decisions can be based on:
 - Preferences
 - Requirements
- Use “Smart Binding” to address:
 - Cost Concerns (use the “warmest” reactor)
 - Clean-in-place Requirements (“peanut-free” product)
 - Unplanned Unit unavailability (route procedure around unit maintenance, cleaning or repair)
 - Unit/Recipe Compatibility (requires a Glass Lined Reactor)
 - Avoid using Unit with unneeded functionality (recipe does not need the one unit with a ribbon style agitator)



Smart Binding Benefits

- Reduce Recipe Management
 - Define all recipes as class based, then set specific requirements through unit attributes
- Improve energy efficiency
 - Select cleanest or warmest unit for reduced heating requirements
- Improve quality and reduce rework
 - Eliminate product transfer routing errors by operators through prebuilt binding requirements algorithms
- Improve Process efficiency
 - Reduction in Batch cycle time due to reduced dynamic routing decision time
 - Unit requirement and preferences algorithms can react dynamically to changing unit conditions after schedule has been initiated



Questions

