

Equipment Operations Module 2.1

Improve Brand Integrity and Operational Consistency

The Wonderware Equipment Operations Module helps manufacturers improve their plants' operational performance, brand integrity and manufacturing responsiveness. It does so through consistent execution of unit/line operations, improved reliability and repeatability of equipment setup, and the capturing of complete 'as built' records. The results are the ability to rapidly respond to unforeseen production events such as product recalls and tools to better leverage the ISA-95 standard.

With Wonderware's Equipment Operations Module, you can:

- Improve brand integrity through consistent execution of unit/line operations and raw material usage
- Improve time-to-volume and responsiveness through improved reliability and repeatability of equipment setup and operations
- Immediately detect deviations from specifications
- Reduce integration costs using standard structures for 'product definition' and 'production actuals' — using the ISA-95 standard for enterprise-to-control system integration
- Re-use encapsulated best practices for operational activities
- Comply with regulatory requirements using comprehensive 'as-built' records
- Rapidly respond to unforeseen production events such as product recalls

INCREASE APPLICATION FUNCTIONALITY INCREMENTALLY, AS REQUIREMENTS EVOLVE

The Equipment Operations Module is an important part of Wonderware's software solutions for Production and Performance Management. Integrated with the Wonderware System Platform, the Equipment Operations Module leverages unparalleled data source connectivity, engineering re-use and scalability of systems and applications. These capabilities are a result of the Equipment Operations Module's underlying ArchestrA software architecture. ArchestrA technology also enables Wonderware customers to increase application functionality incrementally, with low-risk, as requirements evolve.

MAKE YOUR OPERATIONS MORE CONSISTENT AND RELIABLE

In addition, this software module can enable you to execute production work orders more effectively and more consistently. You can assign each work order to a production asset or equipment such as a process unit or production line. You can better manage formula parameters and download set-points to process equipment, as well as enforce operating procedures pertaining to specific equipment.

The screenshot displays the 'Lot ID Reverse Genealogy' window for lot F2.SU.0002. It includes a table of material consumption events, a filter criteria section, and a genealogy table showing the production path from raw materials to the final product. Two 'Material Quantities for Location and Date' charts are also visible, showing pie and bar charts of material usage over time.

SUGAR1	MCAFee2_001	1/11/2007 8:41:51 AM	MaterialConsumedActual	F2.SU.0002	Feed2_001	Mix.Day.011.008.PR
SUGAR1	MCAFee2_001	1/11/2007 8:40:51 AM	MaterialConsumedActual	F2.SU.0002	Feed2_001	Mix.Day.011.008.PR
SUGAR1	MCAFee2_001	1/11/2007 8:39:44 AM	MaterialConsumedActual	F2.SU.0002	Feed2_001	Mix.Day.011.008.PR
SUGAR1	MCAFee2_001	1/11/2007 8:38:42 AM	MaterialConsumedActual	F2.SU.0002	Feed2_001	Mix.Day.011.008.PR

SL.No	Date / Time	Location	Lot	Material ID	Sublot	Quantity	Unit Of Measure	Genealogy	Reverse
1	9/6/2005 1:39:45 PM	MixUnit_001	M.249.13.39.24	CHOC1		100	GAL		
2	9/6/2005 1:37:26 PM	MixUnit_001	M.249.13.37.5	CHOC1		100	GAL		
3	9/6/2005 1:35:33 PM	MixUnit_001	M.249.13.35.13	CHOC1		100	GAL		

Material Consumed	Event Date	Location	Lot	Sublot	Serial Numbers	Segment Response
Produced: CHOC1	1/11/2007 8:40:02 AM	Mixer_001	M.011.08.39.21			Mix.Day.0 11.008.5c h.Resp
1 MILK1	1/11/2007 8:39:33 AM	Feed1_001	F1.MI.000 2			Mix.Day.0 11.008.5c h.Resp
2 MILK1.V	1/11/2007 8:38:18 AM	TV.MI.08.3 8.18	RM.MI011.0002			Rec.Day.0 11.008.5c h.Resp
1 SUGAR1	1/11/2007 8:39:44 AM	Feed2_001	F2.SU.000 2			Mix.Day.0 11.008.5c h.Resp

The Equipment Operations Module also records actual values for information related to the consumption and genealogy of materials, equipment usage, personnel, and information from any other production event — natively related to lot, batch or serial number.

ANALYZE AND REPORT ON THE ACTUAL STATE OF OPERATIONAL ACTIVITIES

The Equipment Operations Module offers immediate access to information via the Wonderware Information Server. As a result, any person in the organization (who has the proper rights) can immediately and securely analyze and report on product information and production history.

In addition, operations personnel can evaluate:

- Individual material or production resource consumption
- Formula usage and actual set-points downloaded to the process
- Comparisons of “plan vs. actual” for material consumption, cycles times, etc.
- Events related to specific process segments, equipment or personnel

The Equipment Operations Module is a natural extension to the Wonderware System Platform. For the module re-uses the powerful plant model so that information is inherently related to the relevant physical equipment represented in the plant model. The result is valuable contextual information, which provides a production context on top of process data for increased capabilities to determine root causes of production losses.

ACQUIRE COMPLETE GENEALOGY AND TRACEABILITY VIA COMPLETE ‘AS BUILT’ RECORDS

The Wonderware Equipment Operations Module can help manufacturers face many challenges related to complying with new governmental and institutional regulations, and initiatives designed to protect public health and safety.

Complete “as built” records are readily available to help you meet regulatory requirements for record accuracy and availability, product quality, and traceability throughout the lifecycle of a product — from raw materials to finished goods.

Furthermore, to reduce the cost of business-to-manufacturing integration and support standardization efforts, the structure of the production database follows the naming conventions and modeling structures of the ISA-95 “Enterprise-Control System Integration” standard.

KEY CAPABILITIES	ADVANTAGES
Data Collection and Equipment Setup Management	The Equipment Operations Module leverages Wonderware’s industry-leading data source connectivity and the powerful integration capabilities of the Wonderware System Platform. This powerful module, in tandem with the Wonderware System Platform, automatically collects data related to production events and related processes — helping to ensure accurate, consistent and timely information.
Adoption of Industry Standards	Wonderware consistently supports industry standards for data collection and communications. ISA-95 standards are fully incorporated into the Equipment Operations Module.
Flexible Plant Model	ArchestrA technology enables Wonderware customers to augment an application’s functional capabilities or application size by simply adding to the existing plant model. Your plant model can naturally evolve as your plant’s needs or physical structure change.
Real-Time Visibility	Wonderware’s Equipment Operations Module offers immediate access and visibility into your production processes and history. It also offers Web-based reporting on material consumption, formula usage, set-points, comparisons of “plan vs. actual” consumption or cycle times, and production events. These reports can easily be made available to production personnel at all levels. In addition, full traceability and genealogy information is available through the Wonderware Equipment Operations Module. So you can quickly comply with governmental regulations concerning health and safety.

KEY CAPABILITIES	ADVANTAGES
Total Cost of Ownership	ArchestrA Object technology facilitates fast changes and additions to systems, to increase capabilities or size without extensive engineering changes. This approach decreases implementation and maintenance costs, and accelerates project schedules. Pre-configured production event objects, powerful ArchestrA Graphics and Web-based reports delivered with the Equipment Execution QuickStart provide a powerful head-start in creating a Production Management Solution for your facility.

ARCHITECTURE

The Equipment Operations Module runs on the Wonderware System Platform, the common strategic platform for networked Supervisory HMI, SCADA and Production and Performance Management Solutions. It is composed of the following major components.

Formula Management

The Equipment Operations Module provides:

- A centralized repository for managing formula information including formulas and information pertaining to Import / Export
- The ability to upgrade RecipeManager solutions within Wonderware's InTouch HMI
- Consistent interpretations and enforcement of operating guidelines and procedures, resulting in more accurate equipment setup according to product specifications
- Flexibility for operator adjustments within limits specified by management
- Automatic downloads to PLCs and control systems, with accurate log records of downloaded set-points
- The ability to link downloaded formula information with business processes — leveraging the ISA-95 structure using Production Requests and Segment Requirements

Production Events

To assist Wonderware customers with tracking production events, the Equipment Operations Module:

- Automatically records real-time production events and saves them in a database
- Immediately detects deviations from specifications for:
 - ◆ Consumption of raw materials
 - ◆ Production of intermediate and finished lots or batches
 - ◆ Transfer of materials between operations
 - ◆ Registering equipment parameters during processing
 - ◆ Recording the responsible personnel during shift changes

- Provides traceability across production processes and areas, as well as different systems through complete "as built" records, leveraging the ISA-95 structure for Production Responses and Segment Responses
- Creates a library of re-usable component templates, which can be configured, replicated and deployed — enabling rapid application development
- Linking captured information with business processes

ADOPTING PROVEN PRACTICES THROUGH WONDERWARE QUICKSTARTS

Wonderware components can be implemented in many ways to accomplish a wide variety of tasks, especially in the area of Production and Performance Management.

Wonderware has developed application examples called QuickStarts that are associated with the latest Wonderware functional modules. These QuickStarts facilitate the sharing of proven practices, specifically in terms of how to deploy the capabilities of multiple Wonderware components to address typical industry requirements. These QuickStarts are design tools for engineers and system integrators looking to adopt best practices and kick-start their design process.

Wonderware QuickStarts are working application examples that demonstrate the flexibility of the Wonderware software. They show you how to assemble specific Wonderware components to deliver some of the most commonly requested functionality.

THE EQUIPMENT EXECUTION QUICKSTART

The Equipment Execution Quickstart demonstrates how the Equipment Operations Module can be applied in a process manufacturing scenario that addresses the execution of an assigned production work order to a piece of equipment.

The Equipment Execution QuickStart provides several components in pre-configured examples of:

- Equipment Setup and Formula Management
- Equipment Setup and Downloads
- Equipment-State and Machine Monitoring
- Production Event Capturing

The Equipment Execution QuickStart package contains pre-defined:

- Templates and unit/work cell definitions and sample deployments
- InTouch screens for equipment management
- Configuration with content and reports from the Wonderware Information Server (formerly known as Wonderware's SuiteVoyager software)

This scenario enables an operator or technician to:

1. Create and administer equipment and product parameters.
2. Select specific equipment.
3. Choose parameters appropriate for the desired product.
4. Modify the parameter set with allowable tolerances.
5. Download the adjusted parameters to the selected equipment.
6. Interact with and control the process, monitor conditions, and initiate events.
7. Save the current parameter set.
8. View reports of the execution conditions and events.

The screenshot displays the 'Execute Process' interface for 'Mixer_002'. The top left shows the Wonderware logo and 'Equipment Execution' with a timestamp of '12/2006 12:28:28 PM'. The main area is divided into several sections:

- Equipment Status:** Stopped
- Process:** MixingOperation
- Process Status:** Initial
- Production Schedule ID:** [Redacted]
- Production Request ID:** [Redacted]
- Production Lot ID:** [Redacted]
- Prod. Target:** 0 kg
- Prod. Actual:** 0 kg
- Percent of Target:** 0%

Below these are fields for 'Downloaded Formula Name' and 'Process: MixingOperation'. A table lists parameters with their target and actual values:

Parameter Name	Material ID	Lot Code	Target Value	Actual Value
Flour	Flour		0 kg	0 kg
ManualAdditive1			0 kg	0 kg
ManualAdditive2			0 kg	0 kg
ManualAdditive3			0 kg	0 kg
Milk	Milk (2%)		0 kg	0 kg
Sugar	Sugar		0 kg	0 kg
MixingSpeed	---		0 RPM	0 RPM
MixingTime	---		0 sec	0 sec
Product			0 kg	0 kg

On the right side, there are buttons for 'Trend Data', 'Alarm Data', 'Start Equipment', 'Hold Equipment', 'Stop Equipment', and 'Complete Process'. At the bottom, there is a navigation bar with buttons for 'Home', 'Formula Admin.', 'Select Equipment', 'Select Formula', 'Download Formula', and 'Execute Process'.



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