INVENSYS LEARNING SERVICES

Instructor Notes

Revision A
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InBatch 2012

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Contents

Preparation

Check for Online Seminars introducing the new features of InBatch 9.5 and InBatch 2012.

Note: To register, visit www.wonderware.com/training or call 1-866-WW-TRAIN or e-mail Wonderware Training at training@wonderware.com. These Online Seminars will be available shortly after publishing this manual.

Installation

There is a Wonderware Installation Series of Online Seminars available that includes most of the Wonderware products.

Note: To register, visit www.wonderware.com/training or call 1-866-WW-TRAIN or e-mail Wonderware Training at training@wonderware.com. These Online Seminars corresponding to the installation of InBatch will be available shortly after publishing this manual.

Class setup

This training course for InBatch 9.5 assumes that each student has their own workstation with all the necessary software installed locally.

Hardware minimum requirements

- 2 gigahertz (GHz) or faster dual core processor, or a 3 GHz or faster single core processor. A dual core processor is strongly recommended for optimal performance
- Minimum of 2 gigabytes (GB) RAM
- 30 GB of available disk space.
- Super VGA (1024 x 768) or higher resolution video adapter and monitor
- Network interface card
- CD-ROM or DVD drive
- Keyboard
- Mouse or a compatible pointing device

Software prerequisites

Note: Before installing InBatch, please consult the Readme file in the latest version you plan to install for the latest software compatibility. InBatch 9.5 can be installed using multiple Operating Systems and multiple versions of Microsoft SQL Server. Consulting the Readme file will guarantee that you configure the proper versions and Service Packs together.

- Windows Server 2003 SP2 or Windows Server 2003 R2 SP2 (with IIS properly configured)
- Microsoft SQL Server 2008 (with Reporting Services)
- Microsoft SharePoint Services 2.0 SP2
- Microsoft Excel 2003 or 2007 (recommended)

Wonderware software requirements

Note: Before installing InBatch, please consult the Readme file in the latest version you plan to install for the latest software compatibility. InBatch 9.5 can be installed using multiple Operating Systems and multiple versions of Microsoft SQL Server. Consulting the Readme file will guarantee that you configure the proper versions and Service Packs together.

The following Wonderware software products should be installed on all training computers:

- Wonderware Application Server 2012 (GR, IDE)
- Wonderware InTouch 2012 (WindowMaker and Window Viewer)
- Wonderware Historian 2012
- Wonderware Information 2012
- Wonderware InBatch 2012

Additional software

The instructor computer should have the following software available:

- Microsoft Office PowerPoint 2007 or higher
- Adobe Reader 6.0 or higher

Additional components

- At least two computers are needed with dual NICs to demonstrate the redundancy features of the product
- A network is not required

Daily schedule

This training course has been developed based on the following daily schedule:

Daily session	9 hours	Usually from 8:00 AM to 5:00 PM
Lunch	1 hour	Usually from 12:00 PM to 1:00 PM
Breaks	2 x 20 min	Around 10:00 AM and 3:00 PM

Based on the daily schedule above, the topics for this training course are estimated to break as follows:

Day 1	Module 1 – Introduction to the InBatch System Module 2 – Environment Manager Module 3 – Process Modeling
Day 2	Module 4 – Train Editor Module 5 – Materials Editor Module 6 – Recipe Editor Module 7 – Batch Management
Day 3	Module 8 – Advanced Topics on Recipe Creation and Batch Execution Module 9 – InBatch ActiveX GUI Objects Module 10 – Security System Module 11 – Phase Logic Development Module 12 – Process Logger
Day 4	Module 13 – History and Reporting Module 14 – Tag Linker Module 15 – InTouch Batch Tag Browsing & Referencing Module 16 – InBatch and System Platform

Note: Due to the density and complexity of the topics discussed in this class, as well as the depth of the labs to be done, it is expected that this class will use a full session on the last day.

Training materials

This training course is based on specific support files that need to be available and set up to successfully complete the exercises included in the training manual.

Supplied training files for instructor and students

The following file is provided as part of the training materials to the instructor and students.

Training_Operations35.aaPKG: This file will be used by students to create a Galaxy during *Lab 19 – Configuring Factory Connector*.

This file should be copied to the ArchestrA BackupGalaxies folder (**C:\Program Files\ArchestrA\Framework\Bin\BackupGalaxies**, in a default installation) as part of the class setup.

Important: The Galaxy in this file was created with Application Server 3.1 and InTouch 10.1, and will not work with previous versions of the software.

Supplied training files for instructors only

The following files is provided as training material for the instructor only:

InBatch2012RevA_Applications.zip: This file contains a backup InBatch configuration file and a System Platform Galaxy for Module 16

InBatch2012RevA_InstructorInfo.zip: This file contains the Course Description

InBatch2012RevA_EntireManual.zip: This file contains the entire Training Manual in one .pdf file

InBatch2012RevA_Presentation.zip: This file contains the slide presentation for this course

Training manual notes

This section contains important comments and suggestions about this training course, and it is intended to serve as guidance for instructors who are preparing to teach the course.

Module 1 – Introduction to the InBatch System

Section 1 – Course Overview

- Self introduction
- Ask students to do self introduction
- Introduce the course and the training materials

Section 2 – Wonderware System Platform Overview

- Discuss Wonderware System Platform and how InBatch fit in the picture
- Point out that InBatch can work with or without System Platform, but InBatch 9.0 is designed with System Platform in mind

Section 3 – Batch Control System Overview

- Base on the technical aptitude of the students, start the discussion with Control Systems, then move onto topics such as definitions and terminologies, Batch Manufacturing, Flexible Batching, S88, FDA requirements, etc.
- Summarize how InBatch is the answer to most of the requirements mentioned above.

Section 4 – Installation, Components & System Requirements

- Talk about the readme file for each of the components first, and also the installation Online Seminar that the students can watch for free.
- Draw a diagram for a typical InBatch installation (with System Platform), and discuss the components that needs to be installed on each of the different nodes.
- Also briefly discuss the option of not using System Platform.
- Mention that the System Requirements should at least meet the highest minimum requirement of all the software installed on the computer, and if more than one software components is installed, it is more than likely the requirements should be raised.

Section 5 – Architecture and Licensing

- Discuss different architectural topologies.
- Discuss database schema (briefly)
- Discuss Licensing for the components.

Section 6 – InBatch Application Maintenance

- This section is about the Config_A folder. Discuss how to back up, restore, and start a new application.

Section 7 – InBatch Configuration Utility

- Demo the functionality of the InBatch Configuration Utility (new to InBatch 9.0)

Module 2 – Environment Manager

Section 1 – Environment Manager Overview and Operation

- Discuss the different software components in Environment manager.
- Discuss the difference between Exit and Exit and Shutdown.

Module 3 – Process Modeling

Section 1 – Process Model Editor

- Brief introduction.
- Show that multiple dialog boxes can be opened simultaneously when working with the Model Editor.

Section 2 – Process Model Configuration

- Discuss the importance of Modeling.
- Discuss the suggested steps for modeling.
- Notice that instead of introducing every tab of the Model Editor we are interweaving the section materials in between labs.
- *Lab 1 – Plant Survey*
- This is a new lab. The purpose of this lab is to introduce the students to the Plant, its process, its equipments, and the functions of each piece of equipment
- The empty table provided for the lab is optional – depending on whether the students have a thorough understand of the plant or not.
- *Lab 2 – Defining the Essential Model*
- Before starting this lab, define Units and Connections. Discuss the concept of connections, and also connectionless models.
- Explain the differences between summary steps and detailed steps.
- *Lab 3 – Classes and Phases*
- Before starting this lab, discuss the Classes, and why Classes are important for nonequipment specific recipes.
- Briefly discuss attributes, and how they could be used as a restriction on equipment selection.
- Also define Phase, and discuss the different types of phases.
- Discuss “Save History”.
- *Lab 4 – Defining Equipment Status, Units of Measure and Enumeration*
- Before starting this lab, define Equipment Availability, and why an Available status is essential to the InBatch system.
- Also discuss the use of Enumeration.

Section 3 – Phases and Phase Tags

- Deep dive in Phase – discuss how phase works, and all the tags that are (or could be) associated with phases.
- *Lab 5 – Configuring Phases and Phase Tags*
- This is a long lab, plan accordingly.
- Emphasize to the student that unless they've done this before, follow the detailed steps.
- Before starting this lab, briefly discuss tags.
- Introduce the Sensor tag, which is going to be assigned as the Actual tag for the temperature control phases.
- Introduce the Agitate phase, which works as follow:
  - If Speed > 0 and Time > 0 then agitate with a time limit.
  - If Speed > 0 and Time = 0 then agitate without a time limit.
  - If the agitator were already on then change the Speed target
  - If Speed = 0 and Time = 0 then turn the agitator off
- Discuss the pros and cons of having one Agitate phase instead of three (Agit_Spd, Agit_Off and Agitate)
- *Lab 6 – Interlocks and Control Buttons*
- Before starting this lab, discuss interlocks, what it means in InBatch terminology and PLC terminology.
  - In InBatch, interlock is the same as permissive in PLC
  - In InBatch, alarm is the same as interlock in PLC
- Discuss how interlocks are essential in protecting the process and the personnel, and how they could be used as a restriction on phase execution.
- Also differentiate hard interlocks (implemented in the PLC) with soft interlocks (implemented in software).

Section 4 – Segments

- Before starting this lab, discuss segments, and how they could be used as a restriction on transfer phases.
- Discuss the two process examples in the book.
- *Lab 7 – Defining Segments*
- Before starting this lab, discuss the criteria for the segments in the description of the lab, and use the diagram to point out the segments.

Section 5 – Validating the Model and Synchronizing the database

- Discuss what is validated and what is not.
- Discuss the synchronization process.
- *Lab 8 – Validating and Synchronizing the Database*
- Help the students to fix any issues they may find during validation.

Module 4 – Train Editor

Section 1 – Use & and Operation of Trains

- Discuss the concept of Trains and how they could be used as a restriction on batch execution equipment selection.
- *Lab 9 – Creating Trains*

Module 5 – Materials Editor

Section 1 – Overview

- Discuss the Materials database in InBatch.
- Mention that using Materials is optional in InBatch.
- Discuss material assignment and how the Batch Manager utilize that information to direct transfers.
- Discuss material tracking in InBatch (FIFO, LIFO, dry model, wet model)
- *Lab 10 – Defining Materials*
- Before starting this lab, discuss Material Types, Tolerances and Material Characteristics.
- *Lab 11 – Assigning Materials to Units*
- Before starting this lab, discuss assigning Material to Units and the consequences of Batch Manager not able to locate materials.

Module 6 – Recipe Editor

Section 1 – Recipes and the Recipe Editor

- Discuss the four levels of recipes (General, Site, Master, Control)
- Discuss definitions and components of a recipe (Header, Equipment, Formula, Procedure).
- Show Recipe Editor.
- Discuss the new recipe XML export capability.

Section 2 – Creating Recipes

- Demonstrate the basic functions of the Recipe Editor.
- Cover only the tools necessary for completing Lab 12. (talk about Transitions and Loops later)
- *Lab 12 – Creating a Recipe for Hot Pepper Sauce and running batches*
- This is a long lab, plan accordingly.
- Emphasize to the student that unless they've done this before, follow the detailed steps.
- Tell student about saving the recipe before closing the Editor.

Section 3 – Recipe Validation and Approval

- Discuss what is going to be validated, and what is not (e.g. material locations will not be validated)
- *Lab 13 – Recipe Validation and Approval for Production*
- Help students to troubleshoot any validation issues
- If model changes need to be made, that discuss recipe synchronization with all the students here, otherwise wait till the end of Module 8

Module 7 – Batch Management

Section 1 – Overview

- Discuss how the batch runtime components work
- Demonstrate using the Batch Scheduler

Section 2 – Batch Display and Operation

- Discuss basic functionalities of the Batch Display
- Show different modes of batches
- Run at least one batch from beginning to end to show all the common capabilities of the Batch Display to the students
- Don't Jump

Section 3 – Restart

- Discuss restart functionalities and the .batchwr folder
- *Lab 14 – Scheduling and Running Batches*
- The student should run at least 2 batches, one of them in automatic mode.

Module 8 – Advanced Topics on Recipe Creation and Batch Execution

Section 1 – Availability and Allocations

- Review Availability (should have a brief discussion when talking about Equipment Status)
- Discuss the three different types of Allocation (Automatic, Recipe, Manual)

Section 2 – Instances

- Discuss the applications of Instancing
- Emphasize that if the Process instance is changed, the Transfer instance(s) needs to change accordingly
- *Lab 15 – Creating a Recipe for Extreme Pepper Sauce*
- This is the longest lab, plan accordingly.
- Emphasize to the student that unless they've done this before, follow the detailed steps.
- Talk about Transitions, Loops, save/load procedures/operations.

Section 3 – Batch Phase Propagation and Unit Control

- The discussion is flexible depends on time and student level.
- Introduce the two modes of Batch Phase Propagation
- Introduce Unit Control

Module 9 – InBatch ActiveX GUI Objects

Section 1 – InBatch ActiveX GUI Control

- Show how to register the ActiveX Controls
- Show how to configure an ActiveX Control
- Show where in the User's Guide to find out about properties and methods of the controls
- *Lab 16 – Building a Simple Batch Scheduler*
- Depending on the students' familiarity to InTouch, this could be a long lab.
- If time permits, show a method or two. (A good example would be the .Execute() of a button)
- Optionally, challenge the fast students to completely recreate the Batch Scheduler (with popup windows and scripting).

Section 2 – Using the BatchSecurity Control

- Introduce the ActiveX Control.
- The discussion is flexible depends on time and student level.

Module 10 – Security System

Section 1 – InBatch Security System

- Discuss the four different types of Securty: None, InBatch, OS, ArchestrA
- Mention the different licensing requirements for the different types of security
- *Lab 17 – Configuring the Security System*
- For this lab, we are only doing InBatch security, otherwise we need to have a deployed platform for ArchestrA security

Module 11 – Phase Logic Development

Section 1 – Defining & Configuring Phase Logics

- This discussion is for the PLC programmers in class. It is flexible depends on time and student participation.

Module 12 – Process Logger

Section 1 – Process Logger System

- Discuss a bit about the history of InBatch, when it was a standalone system and there was no InSQL to log process data.
- Show how to setup a configuration in the Process Logger.
- Show how to configure the Log Manager
- *Lab 18 – Enter a Process Logger Configuration*
- *Lab 19 – Configure the Log Manager*

Module 13 – History and Reporting

Section 1 – History and Archiving

- Discuss how InBatch historical system works
- Discuss how InBatch historical system is configured

Section 2 – Reporting System

- Discuss using the Wonderware Information Server as the reporting portal.
- *Lab 20 – History and Reporting*

Module 14 – Tag Linker

Section 1 – Using Tag Linker

- Discuss the functionalities of the Tag Linker

Section 2 –Exporting and Interfacing

- Introduce the Runtime and Simulation Exports (declared obsolete in the User's Guide)

Module 15 – InTouch Batch Tag Browsing & Referencing

Section 1 – Using InBatch Tags from InTouch

- Warning: the three IBT* files in the Bin folder need to be registered for this to work (e.g. regsvr32 IBTD.dll)
- Demonstrate Batch tag browsing and remote tag referencing in InTouch

Module 16 – InBatch and System Platform

Section 1 – Communicating to AppServer

- Discuss IBMX and the configuration of the Galaxy Access in Tag Linker
- Discuss how InBatch would benefit from accessing data from the Galaxy
- Discuss how AppServer scripting could help with Batch Execution and “soft” phase logics
- *Lab 21 – Configuring IBMX and communicating to AppServer*
- This is a very simple lab, designed for students who are not familiar with Wonderware Application Server.
- If time permits, discuss some of the objects in the Galaxy.
- These are the objects that can be downloaded from ArchestrA.biz

Appendix A - Redundancy

- If time and equipment permits, perform a redundancy demonstration. This should be easier now with the InBatch configuration utility.
- Otherwise mention the Appendix and direct the students to the User’s Guide for more information.