

SCE Training Curriculum

Siemens Automation Cooperates with Education (SCE) | 09/2015

PA Module P03-03 SIMATIC PCS 7 – Batch Control



Matching SCE Trainer Packages for these curriculum

- SIMATIC PCS 7 Software block of 3 packages Order No. 6ES7650-0XX18-0YS5
- SIMATIC PCS 7 Software block of 6 packages Order No. 6ES7650-0XX18-2YS5
- SIMATIC PCS 7 Software Upgrade block of 3 packages
 Order No. 6ES7650-0XX18-0YE5 (V8.0 → V8.1) or 6ES7650-0XX08-0YE5 (V7.1 → V8.0)
- SIMATIC PCS 7 Hardware Set including RTX Box Order No. 6ES7654-0UE13-0XS0

Please note that these trainer packages may be replaced with subsequent packages. An overview of the available SCE packages is provided at: <u>siemens.com/sce/tp</u>

Continuing education

For regional Siemens SCE continuing education, contact your regional SCE contact partner. <u>siemens.com/sce/contact</u>

Additional information relating to SIMATIC PCS 7 and SIMIT

In particular, Getting Started, videos, tutorials, manuals and programming guide. <u>siemens.com/sce/pcs7</u>

Additional information relating to SCE

siemens.com/sce

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We would like to thank the Technical University Dresden, particularly Prof. Dr. Leon Urbas and Annett Krause, MS, as well as the Michael Dziallas Engineering Corporation and those who provided support in preparing this SCE training document.

BATCH CONTROL WITH RECIPES

TRAINING OBJECTIVE

In this chapter, the students learn to model a production batch process hierarchically. They can define recipes for control of batch plants and production of batch products including the necessary process steps and implement these afterwards in the PCS 7 control system.

THEORY IN BRIEF

Industrial manufacturing processes can be generally classified as continuous processes, processes with unit production or batch processes. Batch processes result in the continuous production of finite amounts of products (*batches*), in which quantities of input materials with the use of one or more devices are subject to a defined sequence of processing activities (*process operations, process steps*). In this module we are looking at the computer-generated mapping of a specified sequence and automation of batch processes through *recipes*.

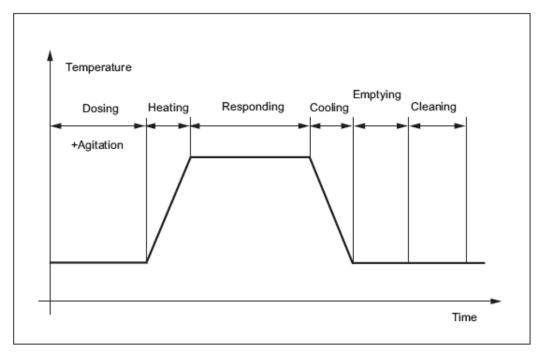


Figure 1: Chronological sequence of a batch process

General and site recipes are sources of information for the creation of plant-specific master recipes; they provide production information without reference to specific production equipment.

They describe the materials, the requirements for the devices as well as the necessary chemical and physical transformations for manufacturing of a product in form of a production rule.

A batch production log includes information on batch production and associated business information. A batch production log is generated to meet a business requirement. The contents of a batch production log are specified by the business requirement.

THEORY

HIERARCHICAL MODELING

The batch processes in the process industry include a large number of devices, the process steps that can be executed on them and, therefore, create a wide variety of products. To manage the sheer quantity, it is therefore useful to structure the world of batch processes hierarchically; it will serve as a basis to reuse blocks and components that have already been developed on different levels.

A *process* consists of one or multiple *process stages* that are organized as structured group and can run in series or parallel or both at the same time. A process stage is part of a process that should best run independent of other process stages. Each process stage consists of a structured group of one or multiple *process operations*. Process operations describe connected processing activities that are necessary to achieve a milestone. Each process operation can be subdivided into a structured group of one or multiple *process steps* which execute the processing required for the process operation. Process steps describe smaller, reusable processing processes that are combined to form a process operation.

CONCEPTS OF THE BATCH-BASED CONTROL STRATEGY

Basic control

Basic control includes the control that is to bring about and maintain a specific operating state of the devices and the process. Basic control includes closed control loops, interlocks, monitoring, exception handling, and repeatable discrete controls or procedural controls; it can respond to process conditions that impact the control outputs or could trigger corrective actions; it can be enabled, disabled or modified by instructions of the operator, through procedural controls or coordination controls (see modules P01-04 to P01-08).

Procedural control

Procedural control determines that equipment-based actions take place in a structured sequence so that a process-based task is executed. Procedural controls are characteristic for batch-based processes. They are a type of control that enables devices to execute a batch process.

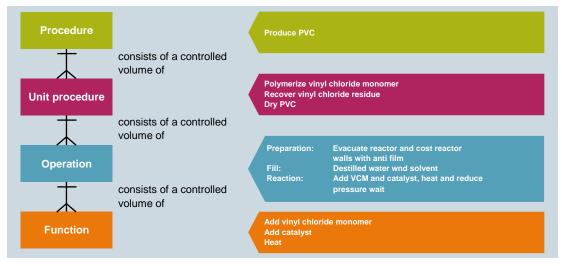


Figure 2: Procedural control model with example [3]

Procedure

The procedure is the highest level in the hierarchy; it specifies the strategy for executing a comprehensive processing action, such as the production of a batch. It is determined by an ordered set of unit procedures. One example for a procedure is "Produce product".

Unit procedure

A unit procedure consists of an ordered set of operations which cause a connected production sequence to take place in a unit. We assume that only one operation is active in a unit at any time. An operation is completely executed in a single unit. However, multiple unit procedures can take place in a procedure concurrently, each in a different unit.

Operation

An operation is an ordered set of functions that specify a larger processing sequence; they cause the materials to be processed to transition from one state to another which usually involves a chemical or physical change. It is often desirable to place the limits of an operation at points in the procedure where normal processing can be safely interrupted.

Examples for operations are:

- Preparation: Evacuate and clean reactor.
- Fill: Add distilled water and solvent.
- Reaction: Add and heat educt1 and educt2.

Function

A function is the smallest element of a procedural control that can execute a process-oriented task. A function can be subdivided into smaller parts. The steps and transitions as described in IEC 60848, document a method to define subdivisions of a function. A step can output one or multiple instructions or cause one or multiple measures, for example:

- Switching on and off closed control loops and state-oriented types of basic control, and specification of their setpoints and initial values;
- Setting, deleting and changing of alarm limits and other limit values;
- Setting and changing of control constants, control modes and types of algorithms;
- Reading of process variables, such as gas density, gas temperature and volume flow from a flowmeter, and calculating the mass flow through the flowmeter;
- Checking the operator authorization.

Execution of a function can result in:

- Commands to the basic control,
- Commands to other functions (either in the same or a different equipment entity) and/or
- Collection of data.

The goal of a function is to bring about or define a process-oriented action, whereas the logic or the sequence of steps that make up a function is device-specific. Here are some examples of functions:

- Stirring
- Dosing
- Heating

RECIPES AND RECIPE TYPES

It makes a lot of sense for a company with many production sites to create standardized recipes that are in effect for all sites and define exactly how a batch product is to be created. Because chemical plants are usually solitary operations for cost reasons due to the mandatory adaptation to the local situation regarding power and educt supply, structures are necessary that

a) enable an abstract definition mostly independent of the specific plant as well as

b) an easy adaptation and mapping to the specific equipment.

Thus the option exists to finally get from a still very abstract general recipe, via the site and master recipe, to a concrete control recipe.

General recipe

The general recipe is a recipe on the enterprise level that serves a basis for recipes on the lower levels. The general recipe is created without specific knowledge of the plant equipment that is going to be used to manufacture the product. It determines the raw materials, their relative quantities and the required processing, however, without reference to a specific factory or the equipment available in this factory. It is created by persons who are familiar with the chemistry and the processing requirements that are typical for the respective product and reflects their interests and thoughts.

Site recipe

The site recipe is specific to a specific factory. It is a combination of factory-specific information and the general recipe. It is usually derived from a general recipe to meet the requirements of a specific production site and offers a level of detail required for factoryrelated, long-term production planning.

Master recipe

The master recipe is the recipe level that is geared towards a plant or a group of equipment in a plant. A master recipe can be derived from a general recipe or the site recipe. It can also be created as an independent unit when the recipe creator has access to the information that is generally made available in the general recipe or in the site recipe.

SIMATIC Batch distinguishes here between flat and hierarchical recipes. This subdivision gives you the option to build recipes on one another.

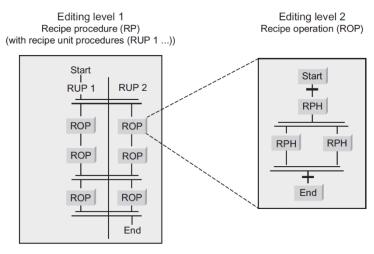


Figure 3: Implementation of the hierarchical structure [3]

Control recipe

The control recipe is created as a copy of a specific version of the master recipe; it is subsequently modified as necessary through information for disposition planning and execution to make it specific for an individual batch. It includes product-specific process information as it is required for the production of a specific batch. It offers the level of detail as required for the start and monitoring of the equipment procedure objects of a plant. It may have been modified to reflect the actual raw material qualities and the actually used equipment. The selection of units and corresponding scaling can take at any time before this information is required.

Because changes to the control recipe based on information regarding production planning, equipment and plant operators can be made for quite some time, a control recipe may be subject to multiple changes during the batch production.

Application in PCS 7

A simplified model with two types of recipe is used in SIMATIC BATCH:

- Master recipe
- Control recipe

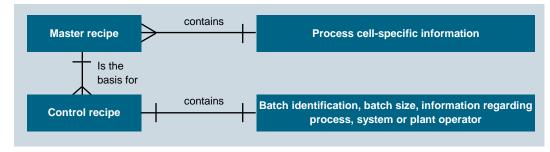


Figure 4: Difference between control recipe and master recipe [3]

PHYSICAL MODEL

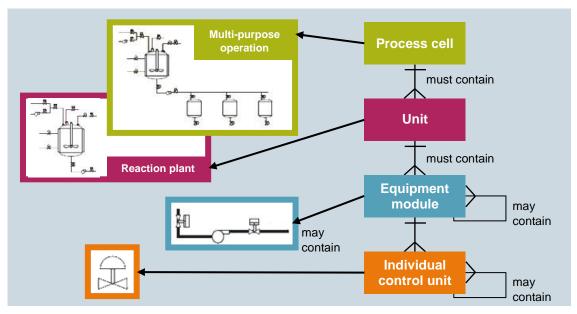


Figure 5: Physical model with example [3]

Process cell

A process cell is the combination of all equipment for the production of a batch. The line is a frequently encountered subset of process cells. A line is a combination of all units and other devices that can be used by a specific batch. Lines can remain the same from batch to batch or they can be modified for each batch.

Unit

A unit consists of equipment modules and individual control units. A unit is an independent device group usually arranged around a larger processing device such as a stirrer tank or a reactor. Characteristics of a unit:

- A unit can execute one or multiple processing activities such as reaction, crystallization or solution.
- Units largely work independently of one another.
- A unit frequently includes a complete batch at a specific point in the processing sequence of the batch.
- A unit can never process more than one batch at a time.

Equipment module

An equipment module can consist of individual control units and subordinate equipment modules. An equipment module is usually arranged around a part of a processing equipment, such as a filter.

Characteristics of an equipment module:

- Can be part of a unit or an independent equipment group within a process cell
- Can execute a finite number of specific smaller processing activities, such as dosing and weighing
- Does not have to but can include the raw materials of a batch

Individual control unit

An individual control unit is a combination of measuring devices, actuators and other individual control units as well as the associated processing equipment that is operated as an individual unit as far as control engineering is concerned.

An individual control unit can also be made up of other individual control units. A dosing individual control unit, for example, could be a combination of multiple automatic switching valve individual control units.

There is no mapping for the individual control unit in the procedural model and in the process model.

This means it cannot be addressed in SIMATIC BATCH.

MONITORING & EVALUATION

A crucial element of batch production is the collection and archiving (for example, with StoragePlus or a Central Archive Server) of the production data. The data is required for official requirements regarding traceability of the produced batch as well as for the operational analysis of the production process. It is important in this regard to save the continuously generated process data (temperatures, pressures, etc.) as well as the event-related process and status information and to have it at hand for a correlative evaluation.

The most basic form of documentation is the batch report. In addition to the recipe specifications and the actually produced actual data, it usually includes the runtimes of the procedure modules (start, end) and any additional process and operating checkback signals, if available. Depending on the market segment (pharma, food), a tamperproof historization and archiving of data must be proven.

SPECIAL CHARACTERISTICS

Due to the procedural requirements of a BATCH control on a PCS7 project, a basic control as it was carried out until now cannot be transferred to a BATCH project. This distinction is made with the help of SFC types or the configuration of individual CFCs for each function. It is necessary for both versions to identify any interruption option and to bring them to a defined state in a downstream shutdown routine. Additional information on this type of configuration is available in [3].

LITERATURE

- Fittler, H, & Uhlig, R. (2004) Rezeptfahrweise, Führung von Chargenprozessen. In Früh, K.F., U. Maier (Hrsg.). Handbuch der Prozessautomatisierung. Oldenbourg. (Manual of Process Automation)
- [2] DIN EN 61512-1 (Status 2000-01): Batch Oriented Operation.
- [3] SIEMENS (2014): Process Control System PCS 7: SIMATIC BATCH V8.1. A5E32336114-AA. (http://support.automation.siemens.com/WW/view/en/103173731)

STEP BY STEP INSTRUCTIONS

TASK

Similar to the recipe from the chapter 'Sequential Control Systems', we want to create and program a batch control recipe for the production of a batch.

For this chapter, the recipe is reduced to the following sequence:

- 1. First, 250 ml will be drained from the educt tank =SCE.A1.T1-B001 to the reactor =SCE.A1.T2-R001.
- 2. Then 150 ml will be drained from the educt tank =SCE.A1.T1-B002 to the reactor =SCE.A1.T2-R001.
- 3. The liquids in the reactor =SCE.A1.T2-R001 are now stirred with the stirrer for 20 seconds.
- 4. Finally, this mixture will be drained to the product tank =SCE.A1.T3-B001.

TRAINING OBJECTIVE

In this chapter, the student learns the following:

- Setting up batch components
- Adapting the structure for production of a batch in the plant view
- Creating output and input materials in the SIMATIC Batch Control Center
- Creating a control recipe in the SIMATIC Batch Control Center
- Creating, releasing, starting a batch in the SIMATIC Batch Control Center

PROGRAMMING

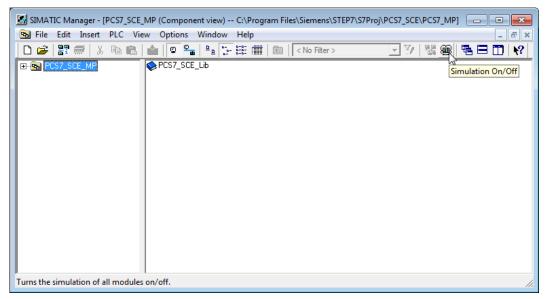
 As source project you will use a project that already includes all CFC and SFC blocks that you need later for the production of batches with the SIMATIC Batch Control. This project is now retrieved at the beginning in the SIMATIC Manager. (→ File → Retrieve)

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2. As template we are using the project 'PCS7_SCE_0303_Vorl_R1505_en.zip'. (\rightarrow PCS7_SCE_0303_Vorl_R1505_en.zip \rightarrow Open)

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3. Next, click the icon '1' to start the PLC simulation S7-PLCSIM. (\rightarrow)

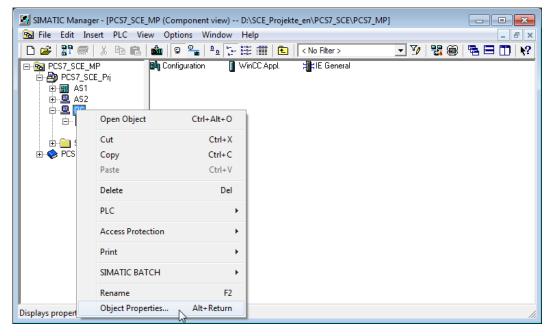


 In S7-PLCSIM, select 'PLCSIM(TCP/IP)' as interface and check if 'PLCSIM(TCP/IP)' is also set in the SIMATIC Manager. (→ PLCSIM(TCP/IP))

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Press F1 to get Help.	PLCSIM(TCP/IP

 Now select the 'Object Properties' of the PC station that includes an Operator Station (here: OS). (→ OS → Object Properties)



6. In the general properties under 'Computer name' enter the local computer name. $(\rightarrow \text{Computer name: Local computer name} \rightarrow \text{OK})$

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Author:	Krause	
Date created:	10/01/2012 08:13:57 AM	
Last modified:	05/12/2015 09:25:57 AM	
Comment:		*
Computer name	,	
Computer name	identical to PC station name	
Computer name:	PCS70SClient3	
OK	Cancel	Help

Note: The generated batch process cell data is also loaded to this computer later.

7. Now start the WinCCExplorer by selecting under OS \rightarrow WinCC Appl. \rightarrow OS(1) 'Open Object'. (\rightarrow OS(1) \rightarrow Open Object)

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- 8. In the Explorer, select the 'Properties' of the 'Computer'. (\rightarrow Computer \rightarrow Properties)

9. Then click the 'Properties' of the computer once again. (\rightarrow Properties)

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10. In the next dialog, click 'Use Local Computer Name' for Computer Name (\rightarrow Use Local Computer Name \rightarrow OK)

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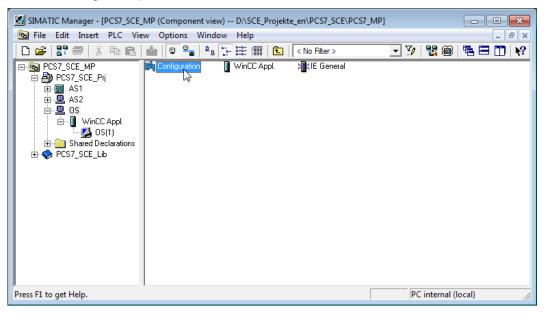
11. Exit the Explorer and close the project. (\rightarrow File \rightarrow Exit \rightarrow OK)

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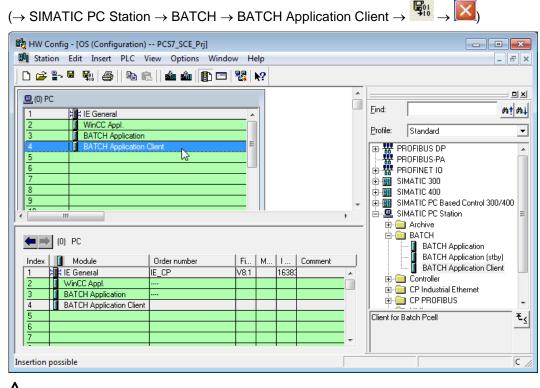
12. To create the batch components, you select the PC station and open the configuration. (\rightarrow OS \rightarrow Configuration)



13. In the hardware configuration you drag the 'BATCH Application' from the catalog in the folder 'SIMATIC PC Station/BATCH' to slot 3. (→ SIMATIC PC Station → BATCH → BATCH Application)

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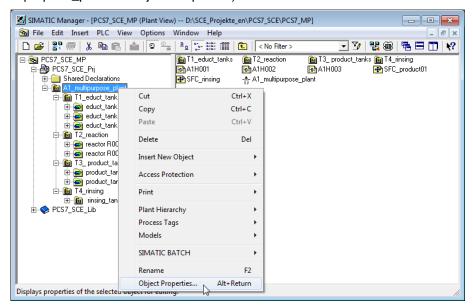
14. You drag the 'BATCH Application Client' to slot 4. Then you 'save and compile' the modified configuration and close the application.



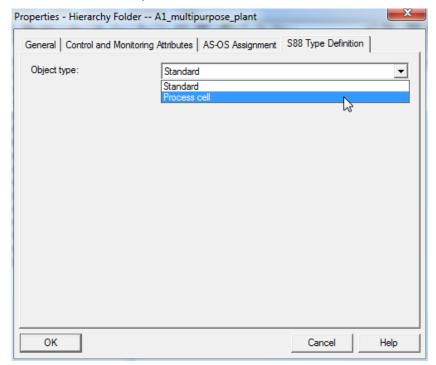
Notes:

- A 'BATCH Application' must be configured in the hardware configuration for each PC on which a batch server application is running.

- If the batch server and the batch client are to run on one PC, you set up a 'BATCH (Server) Application' and a 'BATCH Application Client' in the hardware configuration. Enter the name of the local PC as runtime computer name.
- A batch client can also run on a PC station on which no Operator Station is installed.
- 15. In the following steps, the S88 Type Definition of the corresponding folders takes place in 'Process cell' and 'Unit'. To do this, you change to the plant view, highlight the folder 'A1_multipurpose_plant' and select its properties. (→ View → Plant View → A1_multipurpose_plant → Object Properties)



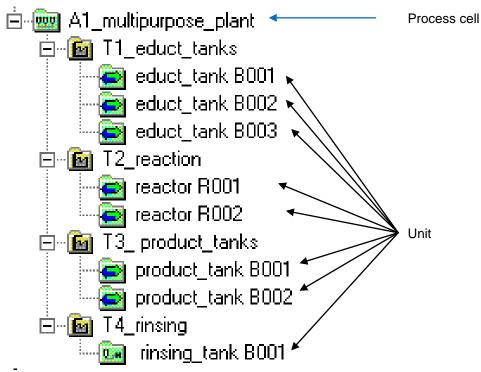
16. Under the item 'S88 Type Definition', you enter 'Process cell' for this folder. (→ S88 Type Definition → Process cell → OK)



17. In the entire third hierarchy level, you enter the S88 Type Definition 'Unit'. (→ S88 Type Definition → Unit → OK)

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	ок	Cancel Help

18. As a result the S88 Type Definitions 'Process cell' and 'Unit' should be allocated as seen below.



19. Our project already includes three SFC types. These can be found in the component view in the 'Charts' folder of the SIMATIC 400 station. The SFC type 'Filling' is used for filling the reactors from the educt tanks, the SFC type 'Emptying' is used to empty the reactors, and 'Stirring' is used for stirring the reactors.

È-∰ PCS7_SCE_Pri È-∰ AS1	🔁 @(1)	1 10		🏹 🔡 📾 🖷	E 🔟 🕅	
È-∰ PCS7_SCE_Pri È-∰ AS1		🚱 @[2]			— ш , j	
	A1T1L002 MATT2H005 MATT2H005 MATT2H001 MATT2L001 MATT2T001 MATT2X005 MATT3X001 MATT4X003 MATT4X03	@CPU_RT MATTIL003 MATT2H006 MATT2H006 MATT2H002 MATT2L002 MATT2X002 MATT2X006 MATT2X006 MATZX006 MATX2X002 MATX4X002 MATX4X002 MATX4X004	(3) (3) (4)	Image: A (4) Image: A (4) </th <th>값 응 전 전 전 전 전 전 전 전 전 전 전 전 전</th> <th>값 (6) (1) (1) (1) (1) (1) (1) (1) (1</th>	값 응 전 전 전 전 전 전 전 전 전 전 전 전 전	값 (6) (1) (1) (1) (1) (1) (1) (1) (1

20. Our project already includes CFCs and SFCs so that these three SFC types are already instantiated. You must still assign a batch category to the SFC types in the 'Object Properties' so that the S88.01-relevant information for batch is later created automatically during type generation. In the Options you now assign the batch category 'EPH', allow operator instructions and enable the possible control strategies. (→ Filling → Object properties → Options → Category: EPH → Allow operator instructions → Control strategy selection: Filling_R001 and Filling_R002 → OK)

Properties SFC type	B	×
General AS Operating Parameters Options Version		
SIMATIC BATCH Category EPH VinCC Create block icon:		
Allow operator instructions SIMATIC IT MES-relevant		
Control strategy selection		
Filling_R002		
OK C	Cancel	Help



Note: The category 'EPH' defines the SFC type as Equipment Phase in batch. Both of our SFC types are equipment phases that terminate automatically.

21. The category 'EPH' is also assigned to the SFC types 'Emptying' and 'Stirring'.
 (→ Emptying/Stirring → Object properties → Options → Category: EPH → Allow operator instructions → Control strategy selection: ... → OK)

Properties SFC type	and the second s	×
General AS Operating Parameters Options Version		
Category EPH Create block icon:		
Allow operator instructions	,	
MES-relevant		
Control strategy selection		
 ✓ Decanting ✓ Rinsing 		
	0 1	
OK	Cancel	Help
*0		
Properties SFC type		×
		X
General AS Operating Parameters Options Version	8-1	x
General AS Operating Parameters Options Version WinCC SIMATIC BATCH	8	×
General AS Operating Parameters Options Version Version		×
General AS Operating Parameters Options Version SIMATIC BATCH WinCC Category EPH Create block icon: Image: Allow operator instructions Image: Construction of the second secon		
General AS Operating Parameters Options Version Version SIMATIC BATCH WinCC Create block icon:		
General AS Operating Parameters Options Version SIMATIC BATCH WinCC Category EPH Create block icon: Image: Allow operator instructions SIMATIC IT Image: MES-relevant MES-relevant		
General AS Operating Parameters Options Version SIMATIC BATCH WinCC Category EPH Create block icon: I Allow operator instructions SIMATIC IT MES-relevant Control strategy selection		
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General AS Operating Parameters Options Version SIMATIC BATCH WinCC Category EPH Create block icon: I Allow operator instructions SIMATIC IT MES-relevant Control strategy selection		

22. Next, we compile the AS and OS in the project as shown in the figure below.

Compile and Download Objects				- 🗆 🗙
Selection table:				
Objects	Status	Operating Mode	Compile	Download
E By PCS7_SCE_Prj				
AS1				
00 Hardware	undefined		×	
🖃 – 🚺 CPU 414-3 DP		STOP	×	×.
Blocks				
Charts	undefined		V	V
Connections	undefined		¥	×
OS			V	
00 Configuration	undefined		V	
BATCH Application			\checkmark	
Connections	undefined		V	
🖃 – 🚺 WinCC Appl.			¥	
Connections	undefined		v	
💋 OS(1)		Not open		
Settings for Compilation/Download Update	View	-	ct Objects	Deselect All
Edit Test Status Operating Mode Image: Compile only Image: Compiletion error is detected		ngle Object All	Select All	Deselect All
Compliation error is detected				
Start Close				Help

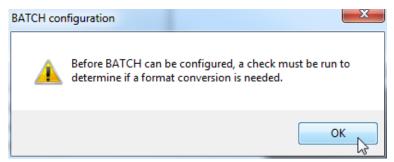
X Compile and Download Objects - Editor Datei Bearbeiten Format Ansicht ? * Date: 05/12/2015 time: 09:41:55 AM Compile: PCS7_SCE_Prj\AS1\Hardware -> Object was compiled without errors Date: 05/12/2015 time: 09:42:00 AM Compile: PCS7_SCE_Prj\AS1\CPU 414-3 DP\Connections -> Object was compiled without errors Date: 05/12/2015 time: 09:42:04 AM Compile: PCS7_SCE_Prj\OS\Configuration E -> Object was compiled without errors Date: 05/12/2015 time: 09:42:09 AM Compile: PCS7_SCE_Prj\OS\BATCH Application\Connections -> Object was compiled without errors Date: 05/12/2015 time: 09:42:13 AM Compile: PCS7_SCE_Prj\OS\WinCC Appl.\Connections -> Object was compiled without errors Date: 05/12/2015 time: 09:42:18 AM Compile: PCS7_SCE_Prj\AS1\CPU 414-3 DP\S7 Program(1)\Charts -> Object compilation was executed (with warnings) Refer to the log for the single objects for more information. Date: 05/12/2015 time: 09:46:36 AM Compile: PCS7_SCE_Prj\OS\WinCC Appl.\OS(1) -> Object was compiled without errors

23. In the following steps we will make the settings for batch. To do so, select the multiproject in the 'Plant View'. (\rightarrow Plant View \rightarrow SCE_PCS7_MP \rightarrow SIMATIC BATCH \rightarrow Open configuration dialog...)

🔄 SIMATIC N	Manager - [PCS7_SCE_MP (P	lant View) D:\SCE_Projek	te_en\PCS7_SCE\PCS7_MP]		
🔁 File Ed	it Insert PLC View O	ptions Window Help			_ 8 ×
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E-B PCSZ	SCE MP		PCS7_SCE_Prj	PCS7_SCE_Lib	
₽- ₽	Cut	Ctrl+X			
	Сору	Ctrl+C			
	Paste	Ctrl+V			
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	Multiproject	+			
	PLC	•			
	PCS 7 License Informati	on			
	Shared Declarations	+			
	Plant Hierarchy	+			
	Process Tags	+			
	Models	+			
	SIMATIC BATCH	+	Open configuration dial	og	
Functions fo	Rename	F2	Compile/download	43	1.

BATCH configuration	×
Do you want to configur	e SIMATIC BATCH?
Yes	No

24. First there is a check to determine if a format conversion is needed. (\rightarrow OK \rightarrow Start \rightarrow Close)



Cł	neck/convert ES data				
	Objects to be checked/conv	verted:			
	Project	Path	in the program	Convert format	Compile
	🖻 Chart folder				
	PCS7_SCE_Prj	D:\SCE_Projekte_en\PCS7_SCE\PC	S7 Program(1) S7 Program(2)		
	Shared Declarations	·	•		
	PCS7_SCE_Prj	D:\SCE_Projekte_en\PCS7_SCE\PC		0	
	Start Clos	e			Help
L					
	neck/convert ES data	verted:			
	Objects to be checked/conv		in the program	Convert format	Compile
		rerted: Path	in the program	Convert format	Compile
	Objects to be checked/conv Project	Path	in the program S7 Program(1)	Convert format	
	Objects to be checked/conv Project			1	Compile
	Objects to be checked/conv Project Chart folder PCS7_SCE_Prj Shared Declarations	Path D:\SCE_Projekte_en\PCS7_SCE\PC	S7 Program(1)	ок ок	
	Objects to be checked/conv Project Chart folder PCS7_SCE_Prj	Path	S7 Program(1)	ок	
	Objects to be checked/conv Project Chart folder PCS7_SCE_Prj Shared Declarations	Path D:\SCE_Projekte_en\PCS7_SCE\PC	S7 Program(1)	ок ок	

25. The batch types are now propagated and thus distributed to the individual projects of the multiproject. (→ Batch types → Propagate)

Process cell data	Properties		
PCS7_SCE_MP S7 Programs	🛃 Batch types		
Stations	Description		
A1_multipurpose_plant	Last changed on	12.05.2015 09:52:22 (UTC +2:00)	
	Batch types Propagate Generate New Delete	Log Additional fun Generate Print	ctions
OK Apply		Cancel	Help

Note: If the button is grayed out, close the dialog with 'OK' and open the configuration first in one of the hierarchy folders, e.g. 'A1_multipurpose_plant'. Close the dialog again with 'OK' and open the configuration once again on the multiproject level. The button should now be enabled.

	ect 🛛 🗸 Includ	e Pati	n Batch p	orocess cell	Type statu	us Result	
PCS7_	SCE_Prj 🗸 🗸	D:\SCE_Pr	ojekte 🔄 A1_mu	ltipurpose_plant	Not up-to-date	e 🥥	
P	ropagate types for	entire process cell					
	Batch process cells in	n the projects:					
	Project		Path	Batch pro	cess cell	Type status	Result
	PCS7_SCE_Pr	i 🗸	D:\SCE_Projekte	A1_multipu	urpose_plant	Up-to-date	🔵 ОК

26. Select the project, click 'Start' and then 'Close'. (\rightarrow SCE_PCS7_Prj \rightarrow Start \rightarrow Close)

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27. Now we can generate the batch types. (\rightarrow Batch types \rightarrow Generate)

Configure Batch process cell 'A1_multipurpose PCS7_SCE_MP/A1_multipurpose_plant/Batch		The Court Court	
Process cell data	Properties		
PCS7_SCE_MP	🚽 Batch types		
S7 Programs	Description		
A1_multipurpose_plant	Last changed on	12.05.2015 09:52:22 (UTC +2:00)	
	Batch types Propagate Generate New Delete	Log Ar Generate V Conception Error(s) Conception Warning(s) Display	dditional functions Print
OK Apply		Cancel	Help .::

28. We select our project, click 'Start' and then 'Close'. (\rightarrow SCE_PCS7_Prj \rightarrow Start \rightarrow Close)

Project	🗸 In	clude	Path	Process	cell	Type status	Result	
PCS7_SCE	_Prj	V	D:\SCE_Projekte	💮 🚋 A1_multipur,	ose_plant	Up-to-date		
(ienerate ty	pes for en	tire process cell					
	Process ce	lls in the pr	ojects:					
	Pro	oject		Path	Pro	ocess cell	Type status	Result
	E PCS	7_SCE_Prj		D:\SCE_Projekte	应 A1_m	ultipurpose_plant	Up-to-date	🔵 ОК
Start								

- Configure Batch process cell 'A1_multipurpose_plant' in 'PCS7_SCE_MP' PCS7_SCE_MP/A1_multipurpose_plant/Batch types/Phase types/Emptying Process cell data Properties PCS7_SCE_MP 🙀 Emptying S7 Programs Description Allow operator instruction A1_multipurpose_plant V ŧ 🗠 🛅 Data types Units of measure Operation types Phase types
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 Phase typ Process tag types Equipment properties Phase type Log Batch instances Generate -Propagate. Batch instances 8 🛛 Generate Error(s) New <u>A</u> 0 Waming(s) Delete Display OK Apply Cancel Help
- 29. The three 'Phase types' 'Emptying', 'Filling' and 'Stirring' from the project are now visible.

30. Next, select the 'Batch instances' to show the assignment of the archive tags with 'Merge' in the multiproject. (\rightarrow Batch instances \rightarrow Merge)

PCS7_SCE_MP/A1_multipurpose_plant/Batc Process cell data	Properties		
PCS7_SCE_MP	Batch instances		
S7 Programs	Description		
A1_multipurpose_plant	Last changed on		
Data types Tota types Operation types Prase types Filing Filing Process tag types			
Equipment properties	Batch instances Merge	Batch instances Merge * Image * Imag	Log

31. We select our project, click 'Start' and then 'Close'. (\rightarrow SCE_PCS7_Prj \rightarrow Start \rightarrow Close)

Me	ge/CompileA1_m	ultipurpose_plant			107 No 1			
B	atch process cells in	the projects:						
ΙГ	Project	V Include	Compile	Path	Batch process cell	Type status	Compile status	
	PCS7_SCE_Prj	V	\checkmark	D:\SCE_Projekte	ݵ A1_multipurpose_pla	nt Notup-to-date 🥥	Compilation OK	
	M	erge/CompileA1_m	ultipurpose_plant	t		7.5		
		Batch process cells in						
		Project		Compile		Batch process cell	Type status	Compile status
		PCS7_SCE_Prj	\checkmark	V	D:\SCE_Projekte	A1_multipurpose_plant	Up-to-date	Validation warning
	Start							
	~							
		Start	Close					Help
								.::

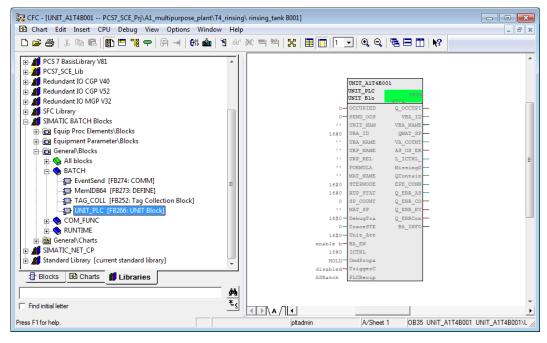
32. You can now take a look at the created instances under 'Batch instances'. Errors and warnings can be displayed under 'Log' just as in the previous steps. (\rightarrow Log \rightarrow Display \rightarrow OK)

Configure Batch process cell 'A1_multipurpos		The local Times
Process cell data	Properties	
PCS7_SCE_MP S7 Programs	🙍 Batch instances	
	Description	multipurpose plant for training of prozess control technology with P
A1_multipurpose_plant	Last changed on	12.05.2015 09:57:14 (UTC +2:00)
Operation types Operation type Operation type	Batch instances Batch instances Merge	Log Merge () T Error(s) () Warning(s) Display
OK Apply		Cancel Help

33. The following errors are detected.

(C:\Projekt	1		x ⇒ ⇒				
	Process cell A1_multipurpose_plant	Units 8		og Date,Time erge 12.05.2015, 09:		1 Erro	Result Error(s) 0 Warning(s)	
	No. ID Error 1 439 UNIT_BLOCK block missing in folder [A1_multipurpose_plant/Batch instances/T4_rinsing/ rinsing_tank B001]							Remedy

34. To remedy this error, close the BATCH_configuration with 'OK' and add a CFC with a UNIT_Block (UNIT_PLC) to the folder 'rinsing_tank B001'. To do so, create a new CFC and call it 'A1T4B001_UNIT'. Now add a UNIT_Block from the blocks or the SIMATIC BATCH Blocks library. Label the block A1T4B001.



 $\underline{\mathbb{N}}$

Note: If you were to start the BATCH configuration and the merging of the batch instances once again, you would definitely receive warnings that are generated because the AS and OS were not compiled after inserting the blocks.

35. The next step therefore is the compilation of all objects which also removes the warnings. (\rightarrow SCE_PCS7_MP \rightarrow PLC \rightarrow Compile and Download Objects...)

SIMATIC Manager - [PC	CS7_SCE_MP (Plant View) D:\SCE	E_Projekte_en\PC	S7_SCE\PCS7_MP]		
🖻 File Edit Insert P	LC View Options Window	Help			_ 8 ×
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□• PCS7_SCE_MP □ PCS7_SCE_MP	Cut	Ctrl+X	PCS7_SCE_Pri	PCS7_SCE_Lib	
📮 🧰 Shared	Сору	Ctrl+C			
⊞- <mark>(क</mark>) Enu ⊡ Unit	Paste	Ctrl+V			
Equ ⊡-ree A1_mult	Delete	Del			
	Multiproject	+			
	PLC	+	Compile and	Download Objects	
	PCS 7 License Information				6
	Shared Declarations	×			
⊡- <u>@</u> <u>T</u> 3_	Plant Hierarchy	۱.			
	Process Tags	•			
⊡ <u>6</u> <u>14</u>	Models	+			
E♦ PCS7_SCE	SIMATIC BATCH	×			
	Rename	F2			
Compiles/downloads t	Object Properties	Alt+Return			1.

36. The object 'A1_multipurpose_plant' has been added in the following dialog. Select 'Compile' and 'Download' for all components as shown below. In row 'A1_multipurpose_plant', click 'Edit' for the compilation and download settings.

Compile and Download Objects				
Selection table: Objects	Status	Operating Mode	Compile	Download
PCS7_SCE_MP	Status	Operating mode	Compile	Download
- By PCS7_SCE_Prj				
Dun Hardware	undefined			
CPU 414-3 DP	undenned	STOP		✓
Blocks			18.1	
Charts	undefined			Image: A start of the start
Connections	undefined			
OS				
Configuration	undefined			
BATCH Application			V.	
E- WinCC Appl.			V	
Connections	undefined		Image: A state of the state	
OS(1)		Not open	Image: A state of the state	
A1_multipurpose_plant	undefined			
Settings for Compilation/Download Update	View I Si	Log	elect Objects Select All	Deselect All
Compile only IV Do not load if compilation error is detected				
Start Close				Help

 $(\rightarrow A1_multipurpose_plant \rightarrow Edit)$

37. In the window 'Merge/Compile', select 'Generate types before compilation'. $(\rightarrow Merge/Compile \rightarrow Generate types before compilation)$

Set	tings					×
	Merge/Compile Trans	ferred Download				
	Generate types be	fore compilation				
	Batch process cells in	the projects:				
	Project	V Include	Compile	Path	Batch process cell	Type statu
	PCS7_SCE_Prj	\checkmark	1	D:\SCE_Projekte	🔏 A1_multipurpose_plant	
	•					,
C	ОК				Cancel	Help

38. For 'Transferred', select 'Transfer messages'. (\rightarrow Transferred \rightarrow Transfer messages)

Settings	×
Merge/Compile Transferred Download	
Transfer messages to 'OS(1)'	
The messages may not have been transferred yet.	
OK Cancel	Help

- 39. For 'Download', select all components that can be selected.
 - $(\rightarrow \text{Download} \rightarrow \text{OK})$

Compon		PC station	T	arget system	verify	Status	
·	atabase Serve						
	- 2000	PCS7_SCE_Prj\OS		-		Not downloaded	
Master	S Offline					Not downloaded	
	nline	PCS7_SCE_Prj\OS		local}		Not downloaded	
	Project						
Standby							
	🛐 Online						
) Batch Se	erver						
Master		PCS7_SCE_Prj\OS		local}		Not downloaded	
Standby							
Batch Cl	ient						
		PCS7_SCE_Prj\OS		local}		Not downloaded	

40. Now, click 'Start' in 'Compile and Download Objects' and confirm the message windows as seen in the previous chapters. (\rightarrow Start \rightarrow Close)

Compile and Download Objects				×
Selection table:				
Objects	Status	Operating Mode	Compile	Download
B PCS7_SCE_MP				
□-B) PCS7_SCE_Prj				
⊟-∰ AS1			V	
🛄 u Hardware	undefined		V	
□- 🚺 CPU 414-3 DP		STOP	1	×
Blocks				
p Charts	undefined		Image: Second	V
Connections	undefined		×	M
⊡- <u>⊈</u> OS			X	
Configuration	undefined		I	
BATCH Application			×	
E- WinCC Appl.			×	
Connections	undefined		V	
S(1)		Not open		
🖌 A1_multipurpose_plant	undefined		V	
Connections Connections Connections Configuration BATCH Application BATCH Application BATCH Application Connections Solutions	View L		Objects	Deselect All
Compile only 🔽 Do not load if compilation error is detected				
Start Close				Help

Note: If another project has already been loaded, you must also restart the PC. Otherwise, the other project remains loaded, and you have no access to the batch data.

41. Now open the OS. (\rightarrow OS(1) \rightarrow Open Object)

SIMATIC Manager - [PCS7_S	SCE_MP (Component view) D:\SCE_Projekte_en\PCS7_SCE\PCS7_MP]	
弦 File Edit Insert PLC	View Options Window Help	_ 8 ×
🗋 D 🛩 🎛 🛲 🗶 🖻 i	🔁 🏜 🗣 🐾 º₂ 🏗 🏥 🔁 < No Filter > 💽 🏹 🎇	👜 🖷 🗖 📢
□-œ PCS7_SCE_MP □-œ PCS7_SCE_Prj □-œ AS1 □-œ AS2 □-œ OS □-œ US □-œ WinCC Applic	-∱-A1_multipurpose_plant -∱-educt_tank_B001 -∱-reactor -∱-reactor_R002 -∱-T1_educt_tanks -∱-T2_reaction -∱-T3_pro -∱-T4_rinsing	
	Open Object Ctrl+Alt+O	
È	Cut Ctrl+X	
	Copy Ctrl+C	
	Paste Ctrl+V	
	Delete Del	
	Insert New Object PLC	
	Access Protection	
	Compile Ctrl+B	
Opens selected object.	Display compilation log	//

- 42. In the Explorer you must create a user for batch in 'User Administrator'.
 - $(\rightarrow$ User Administrator \rightarrow Open)

WinCCExplorer - D:\SCE_Projekte_en\PCS7_SCE\PCS7_Prj\winc	proj\OS(1)\OS(1).mcp	
File Edit View Tools Help		
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OS(1)	Name	Туре
	No 11 1 1	
🗄 📲 Tag Management	No objects exist	
🖶 🗄 Structure tag		
Graphics Designer		
Tag Logging		
User Administrator		
Cross-Kererence		
Redundancy Properties		
- Picture Tree Manager		
- Lifebeat Monitoring		
S Project Editor		
Component List Editor		
Yeb Navigator		
, OS(1)\User Administrator\	, 0 object(s)	

43. Under 'Administrator-Group', create a user with the login: 'scebatch' and a password 'scebatch'. (\rightarrow Administrator-Group \rightarrow New User \rightarrow scebatch \rightarrow ock)

ile <u>E</u> dit <u>V</u> iew <u>H</u> elp		guration Studio								
User Administrator	~	🕴 Users [Adm	ninistrator-Group	5] Fin	d		ہ ⊲		Properties - Group	×
		User name	Group name	Password	Logon with sma	arl Type o	of auto 🔺		Selection	_
Administrator-Gro	up	1 Administrator				None			Object type	Gr
Administrator		lew User	-1						Object name	A
T Administrator	1	Le Osci						0	General	-
	📭 c	opy							Group name	A
		aste							Login	-
		aste							Logon with smart card	
	D	elete						0	Logout	
		ename							Type of automatic logoff	N
	ĸ	ename							Period of time before automatic logof	f
	кП Б	xport							Web	-
									WebNavigator	E
		11							WebNavigator start picture	Т
		12							WebUX	Ľ
		13					E		Start Picture of WebUX	
		14							Web language	
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		18								
		19								
		20								
		21		_						6
		22	C	hange Pas	sword					
		23								_
Tag Management		24								-
		25			New passwo	ord: •	••••	•••	•	
Alarm logging		26								
		27			Verify passwo	rd 🗖				
Tag Logging		28			verity pussive	· · · ·			•	
III 🗰 🛄	•		Authorizations		Securi	ita i	(05)	~~~		-
Ready NUM			Autorizacione		secun	ity: Lo	w (35	%)		
								-		-
									OK Cancel	

<u>File E</u> dit <u>V</u> iew <u>H</u> elp								
User Administrator «	-	Authorizations [sceb Fir	nd	م	•	🕴 Properties - User		»
🖃 🛉 User Administrator		Function	Enable	A1_multipurpose_plant		Selection		
Administrator-Group	1	User administration	V	V		Object type	User	
Administrator	2	Authorization for area				Object name	scebatch	
scebatch		System change				General		
	4	Monitoring				User name	scebatch	
		Process controlling				Group name	Administrator-	-Group
		Higher process controlling				Password	•••••	
		Report system				🗆 Login		
		Web Access - monitoring only				Logon with smart card		
		Highest process controlling				Value of the tag logon		
		Advanced operation 1				Logout		
		Advanced operation 2				Type of automatic logoff	None	
	12	Auvanced operation 2				Period of time before automa	itic logoff	
	12					🗆 Web		
					Ε	WebNavigator		
	14					WebNavigator start picture		
	15					WebUX		
	16					Start Picture of WebUX		
	17					Web language		
	18							
	19							
	20							
	21							
	22							
	23							
Tag Management	24							
	25							
Alarm logging	26							
HHH	27					You can change the passwo	ord of the selected us	ser
Tag Logging	28	1						
The new password must be between 6 and 24 characters in length.								

ile <u>E</u> dit <u>V</u> iew <u>H</u> elp					_			
User Administrator «	-	Authorizations [sceb Fi	nd	م	•	๛ Properties - Au	Ithorization	
📲 🙀 User Administrator		Function	Enable	A1_multipurpose_plant	*	Selection		
🖃 👬 Administrator-Group	1	User administration	V	V		Object type	Authorization	
Administrator	2	Authorization for area	V	V		Object name	Advanced operation 2	
scebatch	3	System change	V	V		General		
	4	Monitoring	V	V		Owner	scebatch	
	5	Process controlling	V	V		Owner type	User	
	6	Higher process controlling	V	V		ID	1102	
	7	Report system	V	V		Function	Advanced operation 2	
	8	Web Access - monitoring only	V	V		Enable		
	9	Highest process controlling		V		Authorization		
		Advanced operation 1		V		A1_multipurpose_p	ant 🗸	
		Advanced operation 2	V	✓				
	12							
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	14				=			
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	20							
	21							
	22							
	22							
Tag Management	23							
ag management	24							
Alarm logging	25							
	26							
Tag Logging	27							
	28				-			

44. Now enable all options for A1_multipurpose_plant.

45. Then exit the User Administrator. (\rightarrow File \rightarrow Exit)

Set Up Project Documentation horizations [sceb Fi		nd 🔎 🗸			🖙 Properties - Authorization			
Preview Project Documenta	ation	ction	Enable	A1_multipurpose_plant	*	Selection		
Print Project Documentatio	on	r administration	V	V		Object type	Authorization	
		norization for area	V	V		Object name	Advanced operation 2	
Exit		em change	V	V		General		
4	4 M	Ionitoring	V	V		Owner	scebatch	
	5 P	rocess controlling	V	V		Owner type	User	
	6 H	igher process controlling	V	V		ID	1102	
	7 R	eport system	V	V		Function	Advanced operation 2	
	8 V	Veb Access - monitoring only	V	V		Enable Authorization		
	9 H	ighest process controlling	V			A1_multipurpose_		
	10 A	dvanced operation 1	V	V		A1_multipurpose_	pianc	
	11 A	dvanced operation 2	1	V				
	12							
	13							
	14				Е			
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
i	24							
	25							
Tag Management								
Alarm logging								
Alarm logging	26							
	26 27 28							

46. Now you still have to check your screen resolution. Open the 'OS Project Editor' to do so. (
 → OS Project Editor → Open)

WinCCExplorer - D:\SCE_Projekte_en\PCS7_SCE\PCS7_Prj\winc	proj\OS(1)\OS(1).mcp	
File Edit View Tools Help		
🗋 🖂 🔳 🕨 🐰 🧰 🏥 🖧 🌫 藤 🥅 🖀 🕯		
⊡ <u></u> → OS(1)	Name	Туре
🗄 📲 Tag Management	NO NO	o objects exist
🗄 🗄 🗄 Structure tag		
Tag Logging		
Global Script		
Text Library		
Cross-Reference		
User Archive		
Lifebeat Monitoring		
Component List E Open		
一		
Web Navigator		
OS(1)\OS Project Editor\	0 ob	ject(s)

47. To test our recipe later more or less realistically, start the SIMIT Simulation with a doubleclick on the PC desktop. (→ SIMIT-SCE-PA-Demo 7)



48. Now set the CPU in S7-PLCSIM to RUN-P and activate the runtime in the

S7-PLCSIM1	
File Edit View Insert PLC Execute Tools Window Help	
🛛 徳 徳 徳 徳 御 徳 御 御 本 夜 🗅 🗳 🖥 🖗 PLCSIM(TCP/IP) 🖃	X 🖻 🖬
CPU Image: CPU	
Press F1 to get Help.	Default: //

WinCCExplorer. (\rightarrow S7-PLCSIM \rightarrow RUN-P \rightarrow \blacktriangleright Activate)

WinCCExplorer - D:\SCE_Projekte_en\PCS7_SCE\PCS7_Prj\wind	proj\OS(1)\OS(1).mcp	
File Edit View Tools Help		
D > II 🔪 X 🤨 II - > 部 🥅 🖀 🍸	?	
Activate	Name	Туре
Computer	Gomputer	Computer
🗄 🛄 Tag Management	III Tag Management	Tag Management
🖶 🗄 🗄 Ei Structure tag	E Structure tag	Structures
- 👌 Graphics Designer	Å Graphics Designer	Editor
	🗹 Alarm Logging	Editor
	Tag Logging	Editor
	📕 Report Designer	Editor
Global Script	Global Script	Editor
Text Library	Text Library	Editor
📃 Text Distributor	📇 Text Distributor	Editor
🗰 User Administrator	🙀 User Administrator	Editor
Cross-Reference	Cross-Reference	Editor
Redundancy	Redundancy	Editor
User Archive	User Archive	Editor
Time synchronization	UTime synchronization	Editor
	Horn	Editor
- Picture Tree Manager	Picture Tree Manager	Editor
Lifebeat Monitoring	Lifebeat Monitoring	Editor
	* OS Project Editor	Editor
Component List Editor	Component List Editor	Editor
	器SFC	Editor
一一一日本 SFC	S Web Navigator	Editor
Activates the project.	 22 object(s)	

49. Enter 'scebatch' as login and password in our example. (\rightarrow scebatch \rightarrow OK)

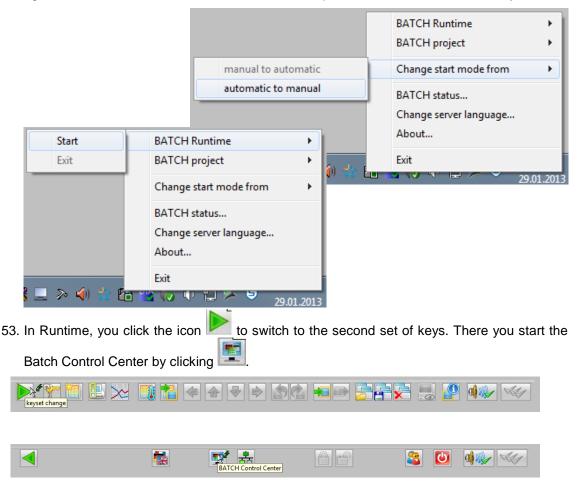
System Login	
Login scebatch	ОК
Password *******	Cancel
	Logout

50. If all settings you have made so far are correct, the 'BATCH Launch Coordinator' is automatically displayed in the taskbar with the status of the batch applications.



- 51. If this should not be the case, you can also start it manually. (\rightarrow Start \rightarrow SIMATIC \rightarrow BATCH Launch Coordinator)
 - Realtek Siemens Automation 🚟 Automation License Manager Komponenten Konfigurator Security Controller Documentation Options and Tools SIMATIC 🎝 SIMATIC Manager BATCH Matthe Batter Launch Coordinator BATCH Contro 荜 Rezepteditor BATCH Launch SIMATIC BATCH 퉬 DiagBase Dokumentation Produkt-Hinweise SIMATIC Logon SIMATIC NET SIMATIC PDM STEP 7 Back Q Search programs and files
- 52. Depending on the settings, SIMATIC BATCH is started automatically after the OS is started, and your work is done here. If you still want to manipulate the process, you can do so with a

right click on the icon in the taskbar and start up or shut down BATCH manually.



54. If not all start conditions for the BATCH Control Center are met, you will be informed about it in a display. For example, here the SIMATIC BATCH application has not been started yet. In this case, close the OS application, establish the start conditions and start the BATCH Control Center again. (→ Close application)

	Computer	Redunda	Status of the applications / Notes		
Online data storage s	. PCS7OSC	Standalone	Ready to start		
Offline data storage	PCS7OSC	Standalone	Ready to start		
Project data storage	. PCS7OSC	Standalone	Ready to start		
SIMATIC BATCH appli	. PCS7OSC	Standalone	Ready to start		
📆 🔲 Ignore status	of BATCH Serve	er applications		Work without re	dundant partne
			have at least the 'operational' status. On have the 'operational' status.	nline actions are	possible only w

55. First you have to log in. To do so, use your login information for the computer (here: plt-admin).

SIMATIC Logon Serv	ice - One-time logon	
User name:	plt-admin	
Password:	******	
Log on to:	PCS7OSCLIENT3 (this computer)	•
ок	Log off Change password Cancel	

Note: If *Simatic Logon* has not been installed yet, steps 55-59 are obsolete. Before you continue with the instruction, install the *SIMATIC Logon Service*.

- SIMATIC BATCH: Control Center - • × Program Edit Control Planning Options View Window Help 🔍 Log off ... 🔨 | 🕼 | 😫 🔍 | 🎄 | 🚓 | 📀 🗙 | 🗩 🖉 🗑 | 🗎 🏚 Permission management.. Roles management ... Backup ... Restore ... Export ... Import... Logbook ... Active applications ... Compress data Start Recipe Editor Start viewer for archived batches Always on top Migration <u>S</u>ettings 🜔 🙎 olt-admin 8:28 AM Open roles management
- 56. Then open the 'Roles management' under 'Options'.

 \wedge

Note: If *Roles management* is grayed out, note the following: User must be a member of the Windows user group *Logon_Administrator*. Make this setting now.

SIMATIC Logon Role Management					? ×
File Edit ?					
┣▣ Φ₲× ?					
Configured roles and assignment types	Role: Super user				
Roles Roles Pactory manager Roles	Groups and users	Roles	Domain / Computer	Description	
Available assignment types	No selection				
B.					

57. In the 'Super user' role, right-click 'Groups and users' to open the menu command 'Edit'.

58. In the next dialog, click on 'List' and then select your user. You add yourself to the role with the arrow key.

Edit groups and users				×	
Role: Super user					
Domain / Computer: PCS7	Search pa OSCLIENT3 (this comput 🔻 Stop	th Name:	*		
Available groups and users Name Doma	Edit groups and users				×
	Domain / Computer:	PCS7OSCLIENT: Stop	Search		*
OK	Available groups and use Name Cogon_Administr None Performance Log Performance Mon Performance Mon Performance Mon Replicator Remote Desktop Replicator Siemens TIA Engi III	Domain / Comput PCS7OSCLIENT3 PCS7OSCLIENT3 PCS7OSCLIENT3 PCS7OSCLIENT3 PCS7OSCLIENT3 PCS7OSCLIENT3 PCS7OSCLIENT3 PCS7OSCLIENT3	=	Configured grou	ps and users Domain / Computer
	OK		Can	icel	Help

59. Exit the dialog with 'OK'. Then you must save your changes and close Roles Management.

	Role: Super user						
			Search path				
	Domain / Computer:		-	Name:	*		
	bomain y compater i	PCS7OSCLIENT3 (this	comput 🔻	- Harrier			
	List	Stop					
	Available groups and user	s	С	onfigured group	os and users		
	Name	Domain / Computer		Name	Domain	/ Computer	
	Logon_Administr Logon_Administr Network Configur None	PCS7OSCLIENT3 PCS7OSCLIENT3 PCS7OSCLIENT3		😨 plt-admin		SCLIENT3	
	Performance Log	PCS7OSCLIENT3					
	Performance Mon	PCS70SCLIENT3 PCS70SCLIENT3	-				
	Remote Desktop						
	Replicator	PCS7OSCLIENT3					
	Replicator						
	Replicator	PCS7OSCLIENT3					
	CREplicator Siemens TIA Engi SIMATIC BATCH	PCS7OSCLIENT3 PCS7OSCLIENT3	Cancel			Help]
	Replicator Siemens TIA Engi SIMATIC BATCH	PCS7OSCLIENT3 PCS7OSCLIENT3				Help)
t ?	Replicator Siemens TIA Engi SIMATIC BATCH COK COK Kole Management	PCS7OSCLIENT3 PCS7OSCLIENT3				Help	2
t ?	Replicator Siemens TIA Engi SIMATIC BATCH COK COK Kole Management	PCS7OSCLIENT3 PCS7OSCLIENT3				Help	2
t ? D 🗗 🗙	Replicator Siemens TIA Engi SIMATIC BATCH COK COK Kole Management	PCS7OSCLIENT3 PCS7OSCLIENT3				Help	
t ? CP Ca × re all chang coles	Replicator Siemens TIA Engi SIMATIC BATCH () Nole Management () Role Management () Role Management	PCS7OSCLIENT3 PCS7OSCLIENT3		Don	nain / Computer	Help	
t ? C C C X e all chang oles S Uper use C Group Factory in Shift man Operatory Process e Automatio Emergence	Replicator Siemens TIA Engi SIMATIC BATCH COK Cole Management COK Provide Management COK Cole Management COK Cole Management COK Cole Management COK Cole Management Cole M	PCS7OSCLIENT3 PCS7OSCLIENT3	Cancel		nain / Computer 70SCLIENT3		
e all chang oles Super usu Factory n Shift man Operator Process e Automati Emergence roups and u	Replicator Siemens TIA Engi SIMATIC BATCH Cok Sole Management Cok Role Management C	PCS7OSCLIENT3 PCS7OSCLIENT3	Cancel Cancel				
e all chang oles Super usu Factory n Shift man Operator Process e Automati Emergence roups and u sssignment t	Replicator Siemens TIA Engi SIMATIC BATCH Cok Simanagement Cok Robe Management Cok Robe Management Cok	PCS7OSCLIENT3 PCS7OSCLIENT3 Role: Super user Groups and users plt-admin	Cancel Cancel Roles Super user				
e all chang oles Super usu Factory n Shift man Operator Process e Automati Emergence roups and u sssignment t	Replicator Siemens TIA Engi SIMATIC BATCH Cok Simanagement Cok Robe Management Cok Robe Management Cok	PCS7OSCLIENT3 PCS7OSCLIENT3 PCS7OSCLIENT3 Role: Super user Groups and users plt-admin Available domains and oppu	Cancel Ca				
t ? e all chang oles Super usu Factory n Shift man Operator Process e Automati Emergence roups and u sssignment t	Replicator Siemens TIA Engi SIMATIC BATCH Cok Simanagement Cok Robe Management Cok Robe Management Cok	PCS7OSCLIENT3 PCS7OSCLIENT3 Role: Super user Groups and users plt-admin	Cancel Ca				
t?	Replicator Siemens TIA Engi SIMATIC BATCH Cok Simanagement Cok Robe Management Cok Robe Management Cok	PCS7OSCLIENT3 PCS7OSCLIENT3 PCS7OSCLIENT3 Role: Super user Groups and users plt-admin Available domains and oppu	Cancel Ca				

S

60. Next, select the item 'New process cell...' in the 'Program' menu. The 'A1_multipurpose_plant' is added to the project.

😨 SI															
	-		Control	Plann				Window							
	<u>N</u> ew pr			6	25	48		2 -	M II	⊪∎×∣∌∌	9 🕲 🚭	🗎 t			
							- × ×						Shortcut	ts 🔻 🗙	Overview
	Print Print p		Str	9+P											
12				_											
	Printer	setup.													
	Exit		Alt	+F4											
									S	elect a process	cell				
									S	Select a process Available proce					
									S			Date created			Version
									2	Available proce	ss cells:	Date created 5/12/2015 10:	:30:03 AM (UT	°C +2:00)	Version
									S	Available proce	ss cells:		:30:03 AM (UT	°C +2:00)	Version
									S	Available proce	ss cells:		:30:03 AM (LT	°C +2:00)	Version
									S	Available proce	ss cells:		:30:03 AM (UT	°C +2:00)	Version
									S	Available proce	ss cells:		:30:03 AM (UT	°C +2:00)	Version
									S	Available proce	ss cells:		:30:03 AM (UT	C +2:00)	Version
Creat	es a new	proces	ss cell						2	Available proce	ss cells:		:30:03 AM (UT	C +2:00)	Version
Creat	es a new	proce	ss cell						2	Available proce	ss cells:	5/12/2015 10:	:30:03 AM (UT	°C +2:00)	Version 03.01.00
Creat	es a new	proces	ss cell						2	Available proce	ss cells:	5/12/2015 10:	:30:03 AM (UT	c +2:00)	Version

Note: If batch data is still present, you can delete them with the steps from the following instruction: <u>http://support.automation.siemens.com/WW/view/en/18794587</u>. Then restart.

61. Now open the menu of the process cell to specify the new input and output materials for the recipes. (→ Materials → New)

SIMATIC BATCH: Control Center		x
Program Edit Control Planning Options View Window Help		
: 🔨 ♠ 😫 🔍 幸 ಈ @ 🖓 🗄 🗄 🕕 № 🖡 🕨 ▶ = 🗙 ⊅ ⊅ 🖄 🛃 🛅 ♠		
Project: PCS7_SCE_MP	Shortcuts 🔻 🗙 Overview	- ×
Al_multipurpose_plant Ubraries Master recipes Formulas Orders Meternal Qreate folder		
Creates a new material	🖸 😫 olt-admin 8:34 A	M Ja

Unrestricted for Educational and R&D Facilities. © Siemens AG 2015. All Rights Reserved. P03-03_Batch Control_V8.1_S0915_EN_2.docx

62. First you enter 'Educt001' with the code 'E001' and usage as 'Input material'. (\rightarrow Educt001 \rightarrow E001 \rightarrow Input material \rightarrow OK)

General Quality 🥖 C	hange Log	
Name:		
Educt001		
Code:		
E001		
Description:		
		*
٠		Ŧ
∢ Usage ☑ Input material	Output material	

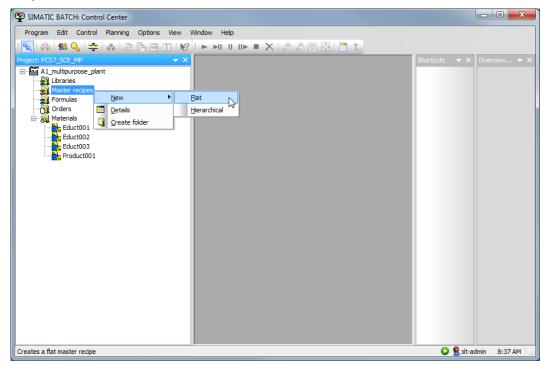
63. You then enter 'Educt002'/'Educt003' as additional input materials.(\rightarrow Materials \rightarrow New \rightarrow Educt002/Educt003 \rightarrow E002/E003 \rightarrow Input material \rightarrow OK)

Material properties		
General Quality 🥖 Change Log		
Name:		
Educt002	Material properties	×
Code:	General Quality 🖋 Change Log	
E002	Name:	
Description:	Educt003	
	Code:	
	E003	
	Description:	
		~
•		
Usage		
Input material Output material		
		-
Pri		•
	Usage	
	OK Print Cancel	Help
	Print Cancel	

64. Define 'Product001' with the code 'P001' as 'Output material'. (\rightarrow Materials \rightarrow New \rightarrow Product001 \rightarrow P001 \rightarrow Output material \rightarrow OK))

New material	×
General Quality 🖋 Change Log	
Name:	
Product001	
Code:	
P001	
Description:	
	*
4	Ψ
	F
Usage Input material Usage Usage	
Print Cancel	Help

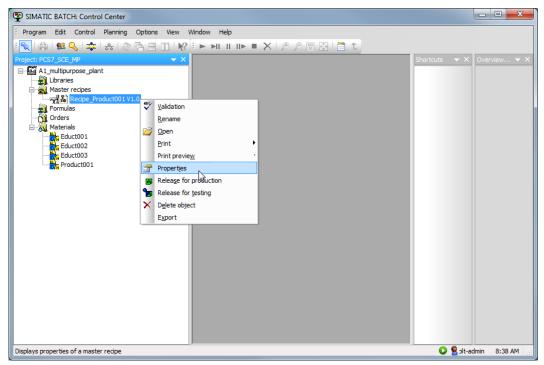
65. Now you create a new 'Master recipe'. Our recipe is to be of the type 'Flat' so that the unit class/unit can be assigned individually to each recipe step. (→ Master recipe → New → Flat)



66. You name the recipe 'Recipe_Product001'. (\rightarrow Recipe_Product001 \rightarrow OK)

Creating a new master recipe	×
Folder	
Master recipes	
Name:	
Recipe_Product001	
Version:	
V1.0	
OK Cancel	Help

67. Now you open the properties of the recipe. (\rightarrow Recipe_Product001 V1.0 \rightarrow Properties)



68. First you specify the assignment by clicking 'New' in the corresponding tab. Enter the unit 'Educt_tank_B001' as name for the first recipe assignment. Then select 'Edit'.

Properties of 'Recipe_P	roduct001_V1.0'
() Output mate) Dependencies ᇔ General	rial 🔮 Parameters 🕂 Transfer parameters Process tags 🖉 Change Log 🔗 ESIG Allocations 🙀 Product 🍕 Input material
Properties of 'Recipe_Product001_V1.0'	Diff roduce a subscripterior
Image: Constraint of the second se	e Unit Unit class Start Run time Strategy
	4 m
III Description from row 1:	Edit References
Edit La References New	Print Cancel Help
Melete OK Print Cancel Help	

69. Select 'educt_tank B001' in the equipment selection and in the preferred unit and confirm your selection with 'OK'.

roperties of 'Recipe_Product001_V1.0'	×
Allocation Tree structure: Class view Equipment selection:	Strategy: Preferred unit
	educt_tank B001
	4
ОК	Print Cancel Help

	🛛 👹 Output material	💮 Pa	rameters	Tr.	ansfer parame	ters
		Process t	ags 💋	Change Lo	。 🖉	ESIG
	흃 General	Allocations	🚽 😽 Pro	duct N	👹 Input ma	terial
				15		
.ist:		Unit	Unit class	Start	Run time	Strat
1	Recipe assignme Educt_tank_B001	educt_tank B001	Unit class	00 (s)	00 (s)	Preferre
2		educt_tank B002		00 (s)	00 (s)	Preferre
_		reactor R001		00 (s)	00 (s) 00 (s)	Preferre
•		m				Þ
<)	ription from row 3:	m				Þ
∢)esc	ription from row 3:	11				Þ
∢)esc	ription from row 3:	m			Ed	
∢)esc	ription from row 3:				Ed	
< Desc	zription from row 3:				Ed	it
∢ Desc	ription from row 3:	m				it
< Desc	ription from row 3:				Referen	it

70. Repeat steps 68 and 69 for the other units as shown in the figure below.

71. Next you first define a product with product code, reference quantity, unit of measure, minimum and maximum quantity of a batch. (→ Product → Product: Product001 → Product Code: P001 → Reference quantity: 400 → Unit of measure: ml → Minimum quantity of a batch 300 → Maximum quantity of a batch 1000)

💷 💷 Output mate	erial	💮 Par	ameters	1	- Transfe	r parame	eters
Dependencies		Process ta	ags	/ Chang	-		ESIG
흃 General		Allocations	👘 🖏 🖗	Product		Input ma	aterial 🕟
Product:				ality			1
Product001							•
Product code:							
P001							
Reference quantity fo	or quantit	tv scaling:	Uni	t of measure	e:		
400			m				•
Minimum quantity of a	a batch:		Ma	ximum quan	tity of a ba	tch:	
300 Description of the pro	ml oduct:		10	000		ml	*
			11	000		ml	
300 Description of the pro			1			ml	

72. Then you define the first input material. (\rightarrow Input material \rightarrow New)

Properties of 'Recipe_	Product00	1_V1.0'				x
💓 Output mat	terial	② Para	meters	Tran	sfer parameters	;
Dependencie		Process tag	js 🥖	Change Log	ES	IG
픓 General	T	llocations	📸 Prod	uct	🗿 Input materi	al
	7.0		N IN			
List:						
Name M	laterial (s	Code (set)	Low recipe	Quantity (s	High recipe	Unit
4						•
Description:						
				*		
					New	
				- Ψ.		
				P	Delete	
ОК		Print		Canc	el He	lp .:

73. Once you have named it, the material Educt001 is selected. (\rightarrow Name: Input material 1 \rightarrow Material $\overrightarrow{aa} \rightarrow$ Educt001 \rightarrow OK)

🐗 Output mater	rial	Paramet	ers	Trans	fer parameters
		rocess tags		ange Log	
흃 General	I Alloca		Product	dinge 20g	Input material
BB OCHERA	W HIDCO	dons	UH HOUGE		
ist:					
Name	Material (s	Code (set)	Low recipe	Quantity	(s High recipe
1 Input material 1	<u></u>			0	
	- Lo	2			
• [m			
<					
<		III			,
<		m		A	,
< Description from row 1:		III		*	,
<escription 1:<="" from="" row="" td=""><td></td><td>111</td><td></td><td>4</td><td>,</td></escription>		111		4	,
< escription from row 1:		111		•	,
< lescription from row 1:		III		•	,
< escription from row 1:		111		*	,
< escription from row 1:					
< Description from row 1:		III			New
<		***		A	New
< escription from row 1:				*	
<pre> vescription from row 1: </pre>		III		•	New

Select the material			-			—	٢
Material:		Input material:	Yes		•		
Code:		Output material:	<ne< td=""><td>eutral</td><td>> •</td><td></td><td></td></ne<>	eutral	> •		
Folder: <pre></pre>					-		_
3 entries found						Filter	
Materials	Code		Ι	0	Folder		
Educt001	E001				Materials		
Educt002	E002		х		Materials		
Educt003	E003		x		Materials		
•							F.
ок					Cancel	Help].

74. After you have selected the second material, Educt002, you also specify the quantity and the unit of measure of the input materials. (→ Name: Input material 2 → Material ... → Educt002 → OK → Quantity: 250 → Quantity: 150 → Unit of measure: ml → Unit of measure: ml)

💓 Output mater	rial	② Paramet	ers	Transfe	r parameters
		Process tags		ange Log	🖉 ESIG
😽 General	Alloca	itions	Reproduct		Input material
List:					len to lei
Name 1 Input material 1	Material (s	Code (set)	Low recipe	Quantity (s	High recipe U
		5		. v	
•		III			Þ
< Description from row 1:					Þ
• Description from row 1:				•	Þ
• Description from row 1:				*	Þ
Construction from row 1:		m		*	Þ
✓ Description from row 1:		m		_	Þ
Construction from row 1:		m		^	, P
Escription from row 1:		m		Î	New
Escription from row 1:		111		Î	New
Escription from row 1:		m		* *	New Delete
		m		¢ ¢	

75. Then you define the output material. (\rightarrow Output material \rightarrow New)

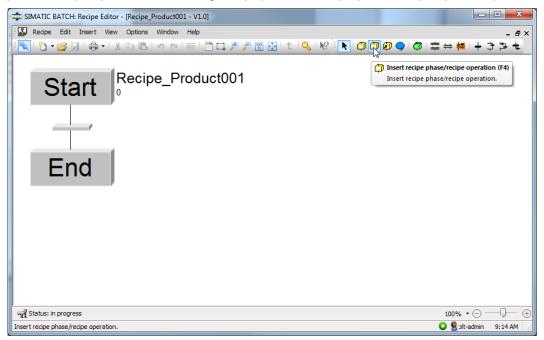
Properties of 'Recip	pe_Product00	01_V1.0'				×
흃 General		Allocations	📸 Prod	luct	🗿 Input mate	rial
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						•
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			1			
ОК		Print		Canc		elp

76. After you have selected the output material, you also specify its quantity and unit of measure. (→ Output material → Name: Output material → Material → Product001 → OK → Quantity: 400 → Unit of measure: ml)

흃 General	U A	Allocation	IS	- 📩	Prod	uct		🛛 In	put mater	rial
Dependencies	s (🙆 Proc	ess tag			Change			🔣 ES	
🐗 Output mate	erial	٢	🖉 Paran	neters		÷	Trans	fer p	parameter	s
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Name 1 Output material	Product	al (set	P001	Low re	400	intity (s	High	re	Unit of I	me
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scription from row 1	:		III				*			,
scription from row 1	:		III				*			,
scription from row 1	:		III				*			,
e [:		III				*			,
scription from row 1	:		III				*		New	,
	:		III				*		New	,
e escription from row 1	;		m			,	*		New	,

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- 77. Now open the recipe. (\rightarrow Recipe_Product001 V1.0)

78. The recipe is created in a recipe editor. Here you can create linear and parallel structures as well as loops. Our recipe is linear and consists of 4 recipe operations. Now add four 'recipe phases/recipe operations' with drag&drop. (→ Insert recipe phase/recipe operation)



79. Change the mode to 'Select'. (\rightarrow Select)

SIMATIC BATCH: Recipe Editor - [Recipe_Product001 - V1.0]		
Recipe Edit Insert View Options Window Help		_ 8 ×
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Start Recipe_Product001	Select Selects objects by clicking or lasso	
5		
NOP		
6 NOP		
7		
NOP		
NOP		
9		
End		
ංස් Status: in progress Selects objects by clicking or lasso	82% • • • • • • • • • • • • • • • • • • •	

80. Now select the first recipe phase/recipe operation and select its properties. $(\rightarrow NOP \rightarrow Properties)$

• · · · · · · · · · · · · · · · · · · ·		_ D _X
CIMATIC BATCH: Recipe Editor - [Recipe_Product001 - V1.0]		
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abo Add comment		
NOP		
Resolve substructure		
Hide in substructure		
Properties		-
ন্দুর্গু Status: in progress	100%	· 🖂 — 🖵 🕀
Displays the properties of the object selected for editing	🕒 🙎 olt-	admin 11:13 AM

81. In the properties under 'General' select the unit 'Educt_tank_B001' and the phase 'Filling (EPH)' with the control strategy 'Filling'. (→ General → Unit name: Educt_tank_B001 → Phase: Filling (EPH) → Control strategy: Filling_R001)

roperties of 'Filling'	-	X
Transfer para		
General	👹 Input material	Output material Derameters
Phase:		Control strategy:
Filling (EPH)		▼ Filling_R001 ▼
Unit name		Edit assignment
Educt_tank Educt_tank Educt_tank Reactor_R0	B002	New assignment
Planned runtime	Monitoring time:	Runtime scaling:
00	00	•
S	S	Release unit on completion
Description of the ph	ase:	Continue
OK	Print	Cancel Help

82. Under 'Parameters', select the value 250 ml for the 'Filling quantity'. (\rightarrow Parameters \rightarrow FillingQuantity \rightarrow 250 \rightarrow OK)

	rties of 'Filling		4=		-	
	Transfer pa		All Descrip			Synchronization
Ē.	General	🚽 👹 Inpu	ut material	🛛 🐗 Output r	naterial	Parameters
.ist:						
	Name	Low recipe		e High reci	ipe lim Unit (of mea
1	FillingQuantit	0	X 250	1000	🗶 ml	
Desc	ription from ro	w 1:				
Desc	ription from ro	w 1:				
Desc	ription from ro	w 1:				
Desc	ription from ro	w 1:				4 4

83. Now this recipe phase/recipe operation is given a comment. (\rightarrow Add comment \rightarrow Filling of reactor R001 from educt tank B001 \rightarrow OK)

🔹 SIMATIC BATCH: Recipe Editor - [Recipe_Product001 - V1.0]	
Recipe Edit Insert View Options Window Help	- 8×
1 🔨 🔁 • 💕 🖬 🚓 • 👗 🛍 🛍 🍏 rv 🎟 🗂 🗔 🌮 🔊 🐼 1 1 1 🔍 1 🎗	? [] [] [] [] [] [] [] [] [] [
Start Recipe_Product001	E
6 Cut Strg+X Copy Strg+C Insert Strg+V Delete Entr	Add comment
NOP abo Add comment	Description:
Resolve substructure Hide in substructure Broperties Alt+Eingabe	Filling of reactor R001 from educt tank B001
Adds comments to the selected structure	
	OK Cancel

84. We are also setting up the second recipe phase/recipe operation with the preferred unit 'Educt_tank_B002', the phase Filling (EPH) and the control strategy Filling_R001. For 'FillingQuantity', select the value 150 ml.

Properties of 'Filling_2'	
Transfer parameters	2
Filling (EPH)	Control strategy Filling_R001
Unit name Unit n	Properties of 'Filling_2'
Planned runtime Monitoring ti 00 00 s s s	List: Name Low recipe limi Value High recipe lim Unit of mea 1 FillingQuantit 0 X 150 1000 X ml
OK	Description:
	OK Print Cancel Help

85. You set up the third recipe phase/recipe operation with the preferred unit 'Reactor_R001' and the phase Stirring (EPH) with control strategy 'Stirring'. For 'Duration', select the value 20s.

Transfer parameters	All Description 🚫 ESIG 😳 Synchronization
👼 General 🛛 👹 In	nput material 🧐 Output material 🎯 Parameters
Phase:	Properties of 'Stirring'
Unit name	Image:
□ № Educt_tank_B00: □ № Educt_tank_B00:	List:
Reactor_B001	Name Low recipe limi Value High recipe lim Unit of mea 1 Duration 0 X 20 50 X s
Planned runtime Mc 00 0 5 5	
Description of the phase:	
•	Description:
ОК	_

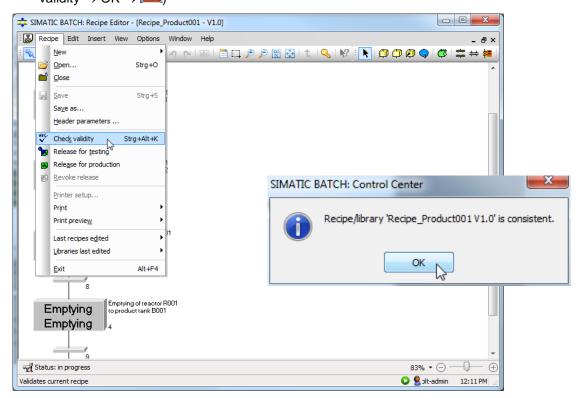
86. You set up the fourth recipe phase/recipe operation with the preferred unit 'Reactor_R001', the phase Emptying (EPH) and the control strategy 'Emptying'. You do not have to assign any parameters here.

	imeters 🛛 🔠 Descrij		Synchronization
👼 General	付 Input material	🛛 🗐 Output materi	al 💮 Parameters
Phase:		Control strategy	
Emptying (EPH)	•	Emptying	-
		Decanting	
Unit name		Emptying Rinsing	de la constanción de la constancica constanción de la constanción de la constanción
Educt_tank	-		New assignment
Planned runtime	Monitoring time:	Runtime scaling:	
Reactor_B	Monitoring time: 00 s	Runtime scaling:	

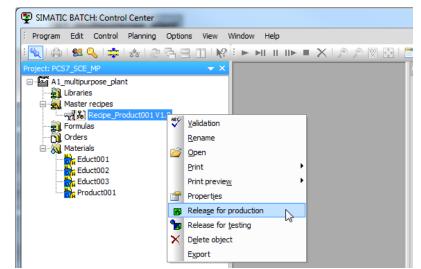
87. Once you have labeled the recipe phases/recipe operations as seen here, you save the recipe. (\rightarrow)

SIMATIC BATCH: Recipe Editor - [Recipe_Product001 - V1.0]		• x
Recipe Edit Insert View Options Window Help		- 8 ×
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Save(Strg+S) Saves the active object.		*
Filling Finneduct tank B001		
Filling_R001		
6		
Filling of reactor R001		
Filling Filling Filling_R001		
		=
7		=
Stirring Stirring In reactor R001 for 20 s		
Stirring ₃		
8		
Emptying Emptying of reactor R001 to product tank B001		
Emptying to product tank B001 Emptying 4		
		-
Status: in progress 83% *	Θ-	- (-
Saves the active object.	admin	12:11 PM

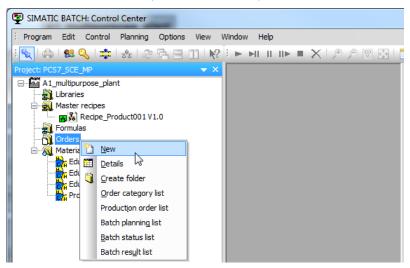
88. Next, you should check the recipe for validity before you close it. (\rightarrow Recipe \rightarrow Check validity \rightarrow OK \rightarrow \bigotimes)



- 89. Now the 'Recipe_Product001 V1.0' is released for production.
 - $(\rightarrow \text{Recipe}_\text{Product001 V1.0} \rightarrow \text{Release for production})$



90. Next, you enter a new order folder. (\rightarrow Orders \rightarrow New)



91. You name the order folder 'SCE_orders'. (\rightarrow SCE_orders \rightarrow OK)

New order category	×
Seneral	
Name:	
SCE_orders	
Description:	
	~
	-
OK Print Cancel	Help .::

- SIMATIC BATCH: Control Center Program Edit Control Planning Options View Window Help 🔨 | 슈 | 磐 🔍 | 후 | ᇡ | 종 🖓 🕾 🗄 🖽 🛛 | 😥 🖡 ► 🖬 🗉 🕨 = 🗙 | 🤊 9 및 수 A1_multipurpose_plant 🛐 Libraries Master recipes Bar Recipe_Product001 V1.0 Formulas Orders SCE Materials <u>R</u>ename Educt001 Educt002 Educt003 b <u>N</u>ew 6 Details Product001 Properties X Delete object Production order list Batch planning list <u>B</u>atch status list Batch res<u>u</u>lt list
- 92. You create a new order in the new order folder. (\rightarrow SCE_orders \rightarrow New)

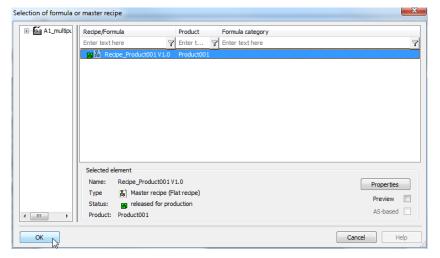
93. You name the order 'order01'. (\rightarrow order01 \rightarrow Batches)

Create order		_	x
General Batches			
Name:	Planned quantity:	Actual quantity:	Unit of measure:
order01	0	0	
Earliest start for the batches:	Latest end for the bate		Batches:
05/12/2015 11:55:35 AM (UTC +2:00 -	05/13/2015 11:55:35	AM (UTC +2:00 💭 🔻	0
Description:			
			^
			*
ОК		Print Cano	el Help

94. You create a new batch in the order. (\rightarrow New)

Create order							×
General 🗋 Bato	hes						
List:							
Name		Status	Release	Mode	Start	Min	Quantity
	m						
Description:							
						*	No. of copies: 1
							Сору
							Automatic
							New
						-	
•						*	Delete
				_			
ОК					Print	Cance	el Help

95. You assign the 'Recipe_Product001 V1.0' to the batch. (\rightarrow Recipe_Product001 V1.0 \rightarrow OK)



96. For each batch you can specify the product and the quantity, and select parameters. (\rightarrow Product: Produkt001 \rightarrow Quantity: 400 \rightarrow Parameter)

С	reate	orde	er	(and the last	-			-			x
Γ	Gene	eral	Batd	nes							
	List:										
			Name		Mode	Start	Min	Quantity	Max	Product Product00	F
	1	D	Batch	Parameter	Operation 💂	05/12/ 🗢 🖵	300	9 400	1000	Product00	R
				- 0							
	4					1					•
	, Descri	iptior	n from row	1:							
		-							^ No.	of copies:	1
										Сору	
										Automatic	
											51
										New	
										Delete	
									P		
	(OK						Print	Cancel	Help	

97. If multiple units are available for specific recipe allocations, you can specify these under 'Allocations'. (→ Allocations)

	🛛 🎯 Output materi	ial	- 🕘 P	Parameters		Trans	fer par	ameters	
Allocations				👹 Input material					
ist:									
	Recipe assignm	Unit		Unit class	Start	Run	time	Strategy	
1	Educt_tank_B001	educt_tank B	3001		00 (s)	00 (s)		Preferred u	
2	Educt_tank_B002	educt_tank B	3002		00 (s)	00 (s)		Preferred u	
3	Reactor_B001	reactor R00	1 🔻		00 (s)	00 (s)		Preferred u	
		reactor R001	- II						
		reactor reductor	2						
			- 0						
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∢ (esc	ription from row 3:		III			*	[Pef	Edit	
∢ [ription from row 3:		III				Ref		
∢ [ription from row 3:		III			•	Refi	Edit	
∢ [ription from row 3:					*	Ref	Edit erences	
	ription from row 3:					*		Edit erences New	
∢ [lesc	ription from row 3:		III			*		Edit erences	
	ription from row 3:					*		Edit erences New	

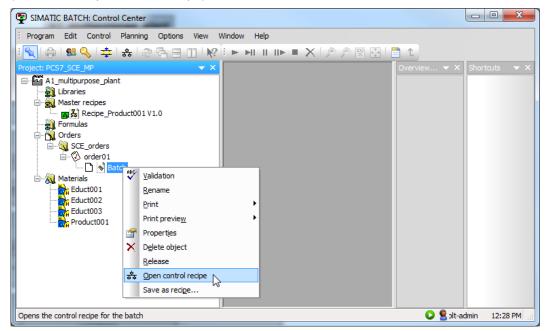
98. The used materials and their quantities can be set under 'Input material'. (\rightarrow Input material \rightarrow Quantity: 250 \rightarrow Quantity: 150)

Prope	roperties of 'Batch'							
	👹 Output mate	rial N	Paramet	ers	HE T	ansfer para	ameters	
		locations			🖑 Input	material		
List:								
	Name	Material (c	Code (set)	Lowr	Quantity (s	High r Ur	uit of me	
1	Input material 1	Educt001			250	ml	in or me	
	Input material 2	Educt002			150	ml		
•								Þ.
Desc	ription from row 2:							
								*
4							Þ	Ŧ
	ОК		(Print	t Ca	incel	Help	

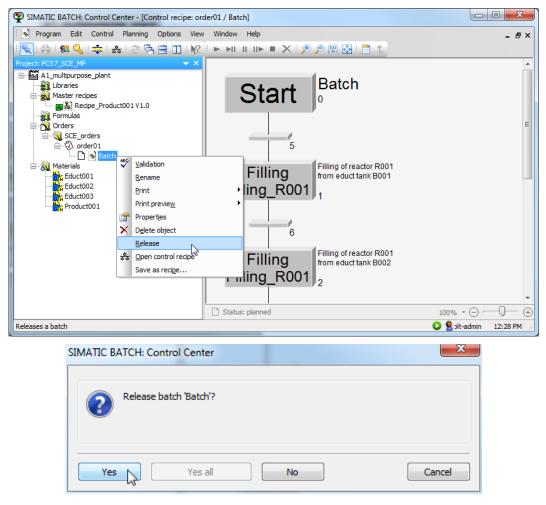
99. The output material and its quantity are selected under 'Output material'. (\rightarrow Output material \rightarrow Quantity: 400 \rightarrow OK \rightarrow OK)

		llocations					🖑 Input	mat	terial		
	🎯 Output mate	erial		🖉 Paran	neters		Т	rans	fer para	amete	ers
ist:	Name	Matoria	(cot)	Code	(cot)	Lowr	Quantity	10	High r	Uni	tofm
1	Output material	Product0)1	P001	(SEL)	LOWI	400	()	mynr	ml	L OI II
_				:				à			
•	[,
•				III							,
∢ esc	cription from row 1	:									,
< esc	cription from row 1	:									,
< lesc	cription from row 1	:		III							
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∢ esc	cription from row 1	:		III							
∢ esc	cription from row 1	:									
∢ esc	cription from row 1	:		111							
	cription from row 1	:									
∢ esc	cription from row 1	:									
	cription from row 1	:									

100. Now you open the control recipe for the 'Batch' to monitor and start it at a later time. (\rightarrow Batch \rightarrow Open control recipe)



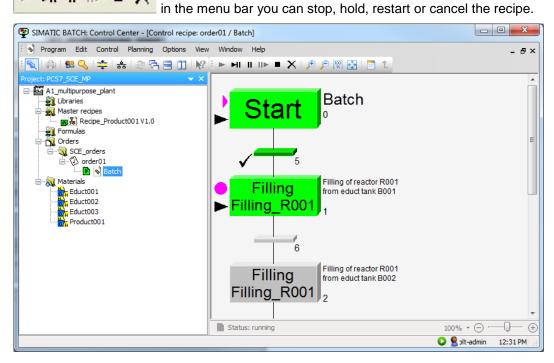
101. Now release the batch. (\rightarrow Batch \rightarrow Release \rightarrow Yes)



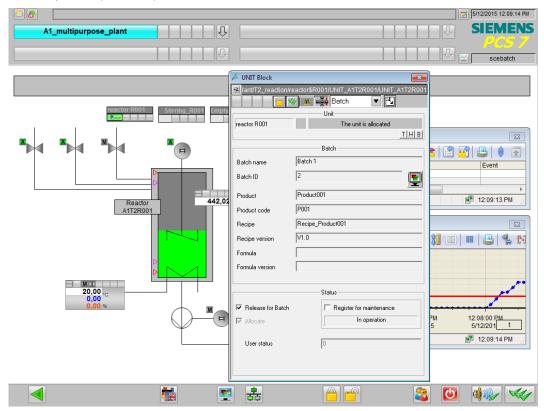
102. Start the process by clicking \blacktriangleright . (\rightarrow Start batch \rightarrow Yes)

SIMATIC BATCH: Control Center - [Control recipe: order01 / Batch]	
Program Edit Control Planning Options View Window Help	- @ ×
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Project: PCS7_SCE_MP Start batch Start a batch Start a batch	<u>^</u>
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i interest of the second seco	
Anterials	
Filling R001 Filling R001	
Product001	
6	
SIMATIC BATCH: Control Center	X
Start batch 'Batch'?	
Starts a batch	
Yes Yes all No	Cancel

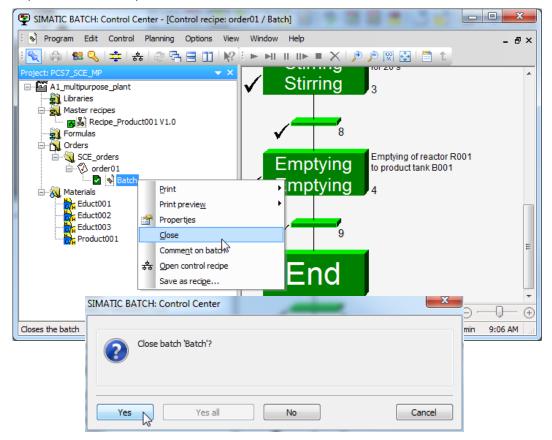
103. Now you can monitor the processing of the recipe. With the commands



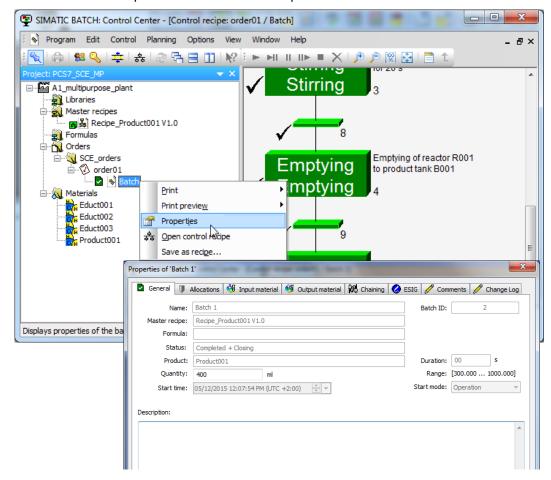
104. In Runtime, you can view the allocation of the objects by the batch in the 'Batch' view of the faceplates. (\rightarrow Batch)



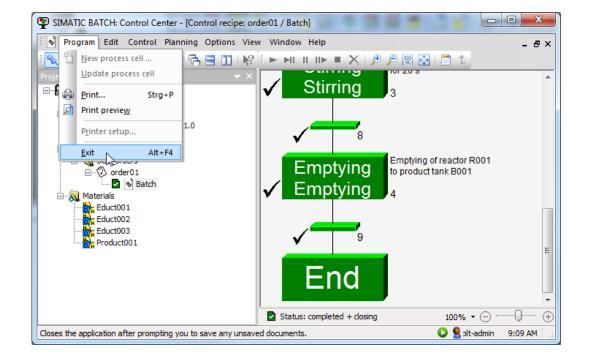
105. Once a batch has been completely processed, it must still be closed to collect the batch-specific measured values and message data and write them to the hard drive. (→ Batch → Close)



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106. You can view the production data under 'Properties'. Exit the BATCH CONTROL Center.



EXERCISES

In the exercises, we apply what we learned in the Theory section and in the Step by Step Instructions. The existing multi-project from the step by step instructions (PCS 7_SCE_0303_R1505_en.zip) will be used and expanded for this.

Note: The project PCS 7_SCE_0303_R1505_en.zip can only include the contents of the step by step instruction up to step 48; all other steps have to be executed manually. You can restore the steps 60 to 89 by restoring the backup

PCS7_SCE_0303_Batch_Backup_R1505_en.sbb, if the process cell was reset. The steps starting at 90 must be executed manually.

The steps 67 to 89 (control recipe only) can be restored by importing the file PCS7_SCE_0303_Export_Rezept_R1505-en.sbx.

Note: All previous batch data is to be deleted due to possible overlaps with other projects.

EXERCISES

The following exercises are based on the step by step instructions. The corresponding steps of the instruction can be used to assist with each exercise.

- 1. Implement a new material, Product002 (P002), in the Batch Control Center.
- 2. Create a new master recipe 'Recipe_Product002' with the following properties:

Allocation	
Unit 1	Educt_tank B001
Unit 2	Educt_tank B002
Unit 3	Educt_tank B003
Unit 4	Reactor R002
Product	
Product002	500ml / 300ml / 1000ml
Input material	
Input material 1	E001 (150 ml)
Input material 2	E002 (250 ml)
Input material 3	E003 (100ml)
Output material	
Output material 1	Product002 (500ml)

- 3. Now create the following recipe:
 - First, 150 ml will be drained from educt tank =SCE.A1.T1-B001 to the reactor =SCE.A1.T2-R002.
 - Then 250 ml will be drained from the educt tank =SCE.A1.T1-B002 to the reactor =SCE.A1.T2-R002.
 - Then 100 ml are drained from the educt tank =SCE.A1.T1-B003 to the reactor =SCE.A1.T2-R002.
- The liquids in the reactor =SCE.A1.T2-R002 are now stirred with the stirrer for 10 seconds.
- Finally, this mixture will be drained to the product tank =SCE.A1.T3-B002.
- 4. Check the validity of the recipe and release it for production.
- 5. Create an Order02 and edit the batch of the Product002.
- 6. Release the batch, open the control recipe and start production.
- 7. Finally, close the batch.