



**Critical**  
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# Material Serialization

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### DOCUMENT ACCESS

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# Material Serialization

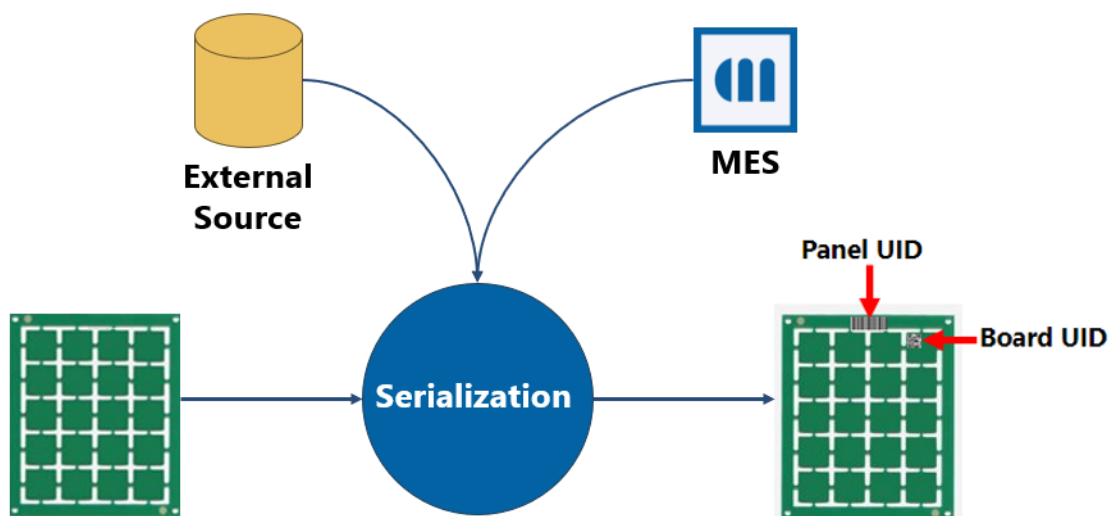
*Estimated time to read: 4 minutes*

## Overview

The **Material Serialization** feature provides a framework for assigning unique identification codes to PCB panels and boards at various stages of the manufacturing process. By utilizing specific **Smart Tables**, users can determine exactly when and how materials expand into smaller units during track-in or track-out operations.

The system supports multiple configurations, including **Special Mode**, which allows for two levels of serialization to occur simultaneously within a single production step.

This level of traceability ensures that every individual component is accurately tracked from the initial SMT line through to final assembly. The flexible setup also accommodates both internal name generation and external naming conventions to suit different factory requirements.



## Setting Up Material Serialization

The following configuration is needed:

- Enable the feature by enabling the `/SMT/MaterialSerialization/IsEnabled` config.
- Configure the `SMTMaterialExpandContext` smart table.
- Configure the `SMTMaterialNameGenerationContext` smart table.
- Configure the `SMTMaterialPrintableDocumentContext` smart table. (optional)

### Configuring `SMTMaterialExpandContext` ST

Define:

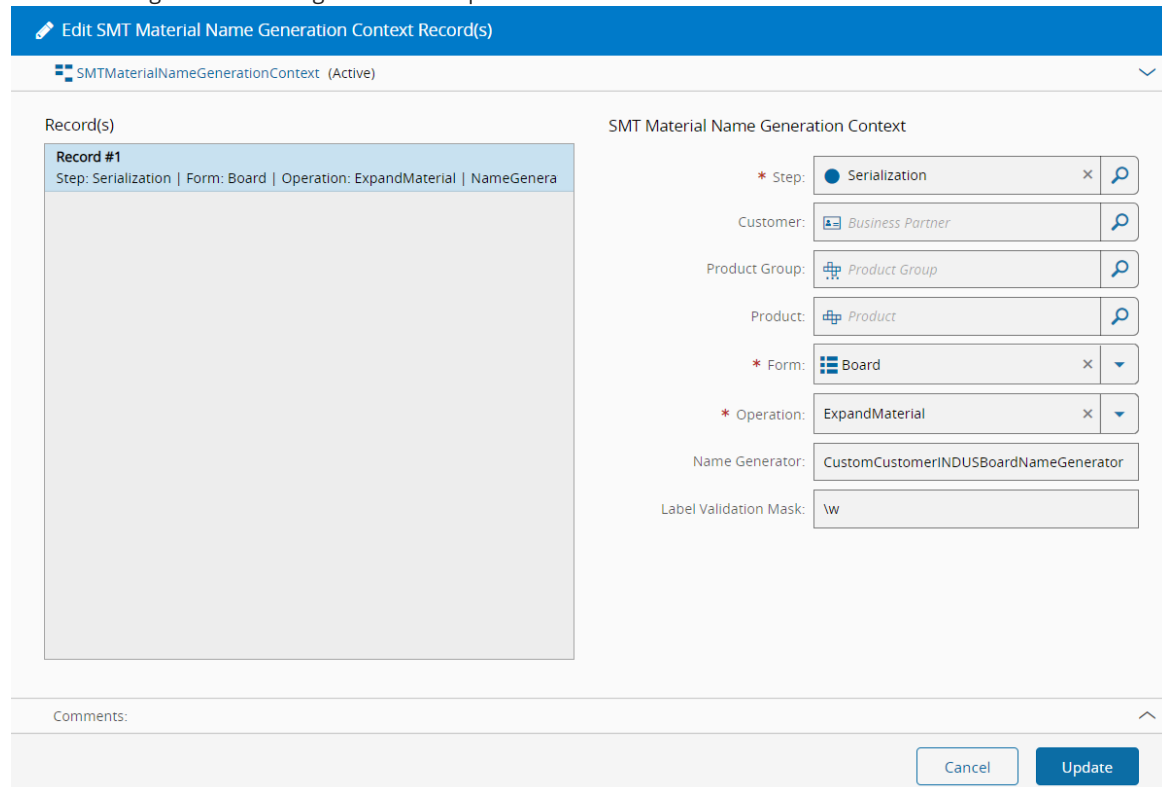
- The production step where serialization occurs
- Parent, child, and sub-child material forms
- Expand Operation: Track-In or Track-Out
- Internal or external naming
- Expansion Factors
- Special Mode usage

## Configuring `SMTMaterialNameGenerationContext` ST

Fields:

- Step
- Form
- Operation: ExpandMaterial
- Name Generator
- Optional Label Validation Mask

Board name generator configuration example:



**Edit SMT Material Name Generation Context Record(s)**

**SMTMaterialNameGenerationContext (Active)**

**Record(s)**

Record #1
Step: Serialization   Form: Board   Operation: ExpandMaterial   NameGenera

**SMT Material Name Generation Context**

- \* Step:  Serialization
- Customer:
- Product Group:
- Product:
- \* Form:
- \* Operation:
- Name Generator:
- Label Validation Mask:

Comments:

## Configuring `SMTMaterialPrintableDocumentContext` ST

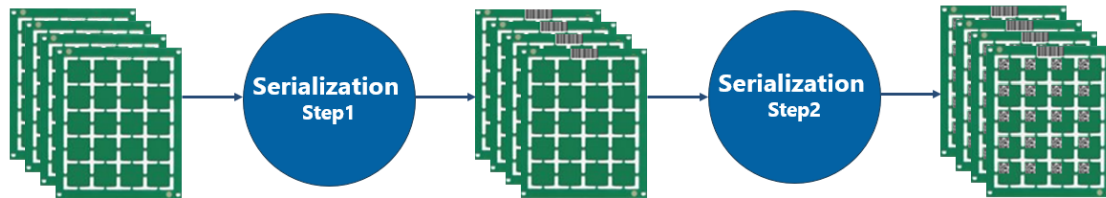
Configure:

- Step
- Material Form
- Operation
- Label
- Synchronous Printing option

Board label configuration example: Screenshot

## Serialization Without Special Mode

When ST `SMTMaterialExpandContext` has **Is Special Mode = False**, expansion occurs across multiple steps. Expansion happens in separate production steps



### Example:

Considering an example for a Panel that has 4 boards each and a lot as a parent material with quantity 8, the target of the parent material is normally defined in quantity of needed boards so in this case the configuration should be as follows:

EXPAND STEP	PRODUCT GROUP	PRODUCT	PARENT FORM	CHILD FORM	SUB CHILD FORM	EXPAND OPERATION	IS EXTERNAL NAMING	EXPANSION FACTOR	SUB EXPANSION FACTOR	DETACH STEP	POSITION MAPPING	IS SPECIAL MODE
<input type="checkbox"/>	SMT_Serialization	SMT_Product	Lot	Panel		TrackIn	×	4				×
<input type="checkbox"/>	SMT_Packing	SMT_Product	Panel	Board		TrackIn	×	1				×

State of the lot material after tracking in the the SMT\_Serialization step:

MATERIAL	FORM	TYPE	PRODUCT	PRODUCT DESK	FLOW	STEP	PRIMARY QTY	PRIMARY UNITS	CONTAINER	CONTAINER PO	STATE
SMT_P25050	Panel	Generic	SMT_Product	SMT_Produ...	SMT_MainFlc	SMT_Serializ	4	Units			Queued
SMT_P25050	Panel	Generic	SMT_Product	SMT_Produ...	SMT_MainFlc	SMT_Serializ	4	Units			Queued

State of the lot material after tracking in the the SMT\_Packing step:

Daniel Lot

Refresh Edit Track-Out Abort Change Merge Split Hold Record Loss/Bonus Process Open Instance Perform Print More Views

Daniel Lot (Active)

SUB-MATERIALS

Refresh

Sub-Materials (2)

MATERIAL	FORM	TYPE	PRODUCT	PRODUCT DESK	FLOW	STEP	PRIMARY QTY	PRIMARY UNITS	CONTAINER	CONTAINER PO	STATE	
SMT_P25050	Panel	Generic	SMT_Product	SMT_Produ...	SMT_MainFlc	SMT_Packing	0	Units			InProcess	4 >
SMT_P25050	Panel	Generic	SMT_Product	SMT_Produ...	SMT_MainFlc	SMT_Packing	0	Units			InProcess	4 >

Rows per Page:25 Page 1 of 1 (2 Records)

DETAILS  
SUB-MATERIALS  
HOLDS/OFF-FLOWS  
DEFECTS  
TIME CONSTRAINTS  
DEPENDENCIES  
FUTURE ACTIONS  
CHECKLISTS

Daniel Lot

Refresh Edit Track-Out Abort Change Merge Split Hold Record Loss/Bonus Process Open Instance Perform Print More Views

Daniel Lot (Active)

SUB-MATERIALS

Refresh

Sub-Materials (4)

MATERIAL	FORM	TYPE	PRODUCT	PRODUCT DESK	FLOW	STEP	PRIMARY QTY	PRIMARY UNITS	CONTAINER	CONTAINER PO	STATE	
SMT_B25050	Board	Generic	SMT_Product	SMT_Produ...	SMT_MainFlc	SMT_Packing	1	Units			InProcess	
SMT_B25050	Board	Generic	SMT_Product	SMT_Produ...	SMT_MainFlc	SMT_Packing	1	Units			InProcess	
SMT_B25050	Board	Generic	SMT_Product	SMT_Produ...	SMT_MainFlc	SMT_Packing	1	Units			InProcess	
SMT_B25050	Board	Generic	SMT_Product	SMT_Produ...	SMT_MainFlc	SMT_Packing	1	Units			InProcess	

Rows per Page:25 Page 1 of 1 (4 Records)

DETAILS  
SUB-MATERIALS  
HOLDS/OFF-FLOWS  
DEFECTS  
TIME CONSTRAINTS  
DEPENDENCIES  
FUTURE ACTIONS  
CHECKLISTS  
PROTOCOLS

### Result:

- 1 Lot → 1 Panels → Boards (4 boards per panel)
  - 1 Lot material with a *Primary Quantity* of 0 with 1 *Sub-Materials*
  - 1 Panels material with a *Primary Quantity* of 0 and each with 4 *Sub-Materials*
  - 4 Board materials, each with a *Primary Quantity* of 1

## Serialization With Special Mode

When ST `SMTMaterialExpandContext` has **Is Special Mode = True**, two levels of serialization occur within one step. Each material whose form matches the value defined in `Parent Form` and enters the specified `Expand Step` produces Child and Sub Child materials during that same step.



The quantities of the Child and Sub Child materials, as well as the *Primary Quantity* of each, are calculated based on the parent material's *Primary Quantity* and the configured `Expansion Factor` and `Sub Expansion Factor`.

**Example:**

- Expand Step: SMT\_Serialization
- Parent Form: Lot
- Child Form: Panel
- Sub Child Form: Board
- Expansion Operation: TrackIn
- Expansion Factor: 1
- Sub Expansion Factor: 4

+ Add SMT Material Expand Context Record(s)
?

SMTMaterialExpandContext (Active)

Record(s) + -

**Record #1** -

ExpandStep: SMT\_Serialization | ParentForm: Lot | ChildForm: Panel | Sut

**SMT Material Expand Context**

- \* Expand Step:  SMT\_Serialization x [list] [search]
- Product Group:  [list] [search]
- Product:  [list] [search]
- \* Parent Form:  x [dropdown]
- \* Child Form:  x [dropdown]
- Sub Child Form:  x [dropdown]
- \* Expand Operation:  x [dropdown]
- \* Is External Naming:
- \* Expansion Factor:
- Sub Expansion Factor:
- Detach Step:  Step [list] [search]
- Position Mapping:
- \* Is Special Mode:

Comments:

Cancel Add

- Primary Quantity: 12
- 1st Expand (Panels)
  - number of panels =  $\frac{\text{parent primary quantity}}{\text{expansion factor} \times \text{sub-expansion factor}} = \frac{12}{1 \times 4} = 3$  panels created
  - panels primary quantity = expansion factor × sub-expansion factor = 1 × 4 = with quantity of 4
- 2nd Expand (Boards)
  - number of boards = sub-expansion factor = 4 boards created
  - boards primary quantity = expansion factor = with quantity of 1

**Result:**

- 1 Lot → 3 Panels → 12 Boards
  - 1 Lot material with a *Primary Quantity* of 0 with 3 *Sub-Materials*
  - 3 Panels material with a *Primary Quantity* of 0 and each with 4 *Sub-Materials*
  - 12 Board materials, each with a *Primary Quantity* of 1



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