Critical manufacturing
an ASM PT company

Material Serialization

11.3

May 2026

DOCUMENT ACCESS

Public

Material Serialization

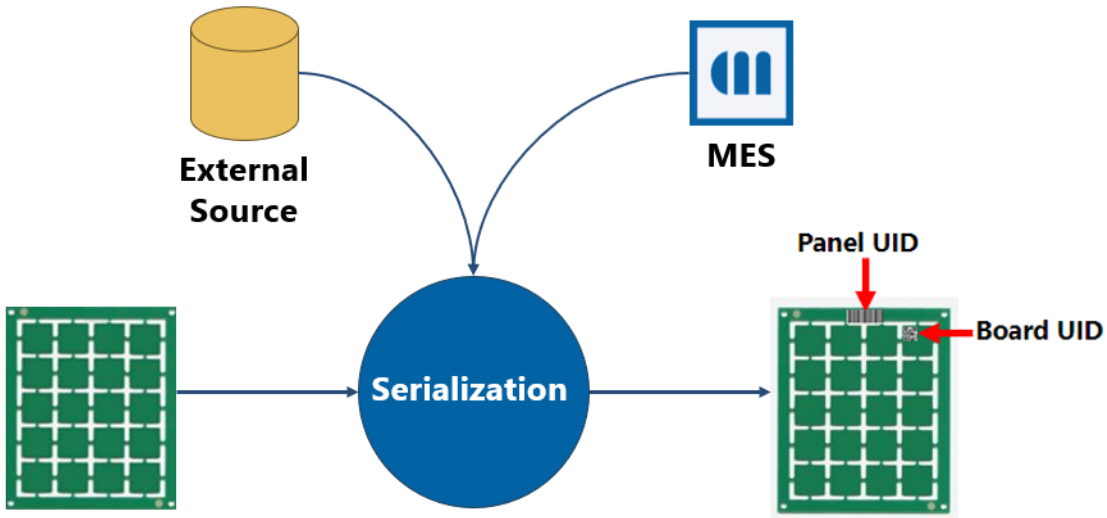
Estimated time to read: 4 minutes

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:

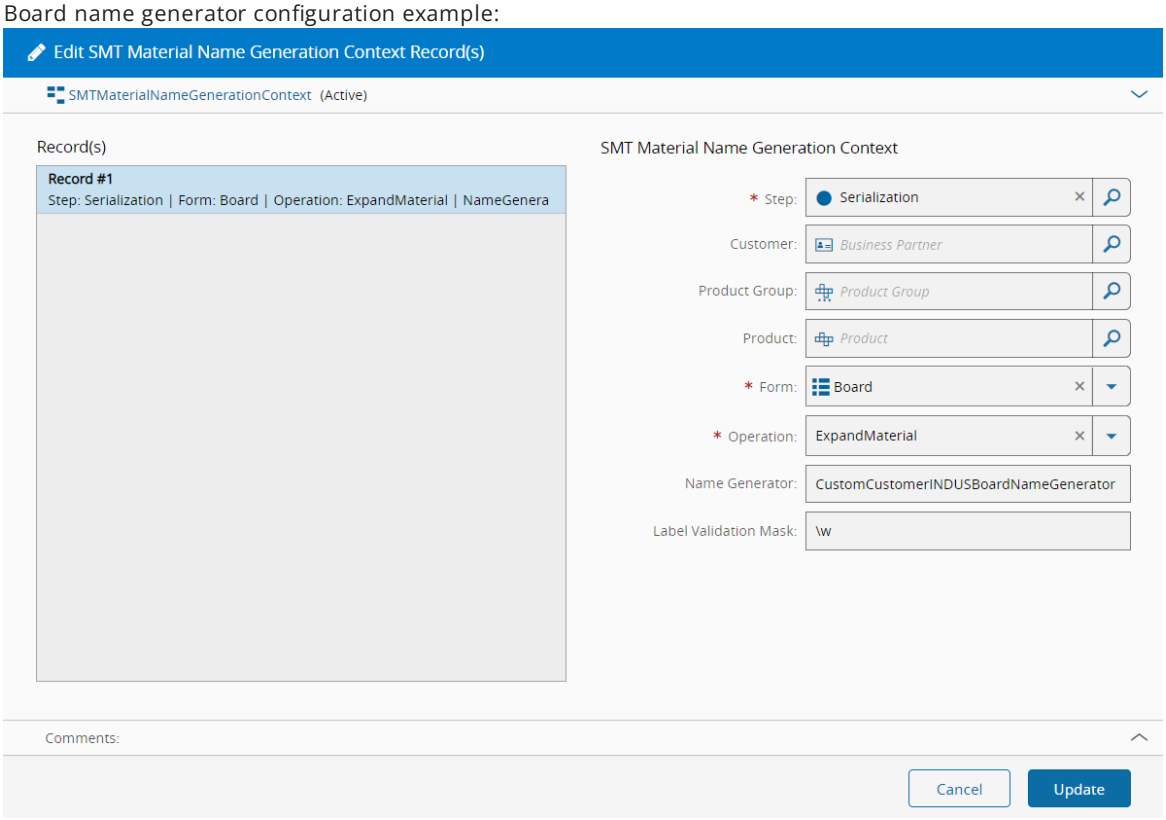
- The production step where serialization occurs
- Parent, child, and sub-child material forms
- Expand Operation: Track-In or Track-Out
- Internal or external naming
- Expansion Factors
- Special Mode usage

Configuring SMTMaterialNameGenerationContext ST

Fields:

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

Board name generator configuration example:

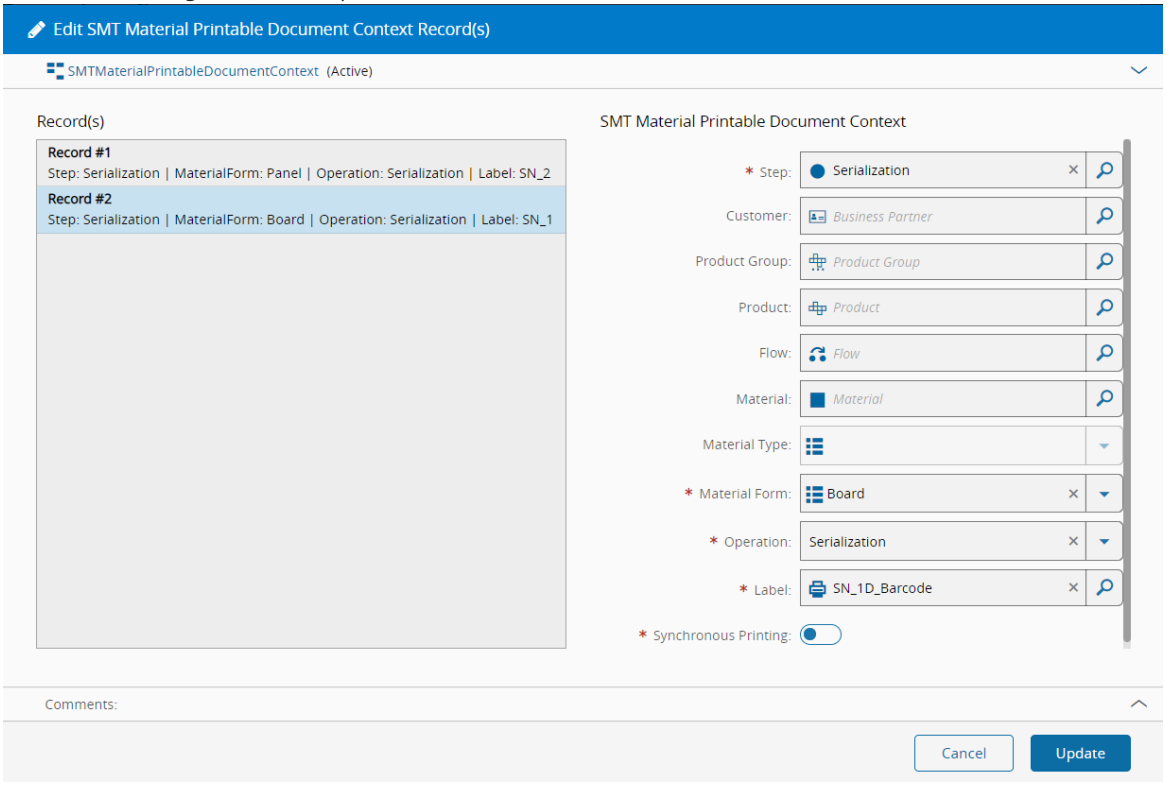


Configuring SMTMaterialPrintableDocumentContext ST

Configure:

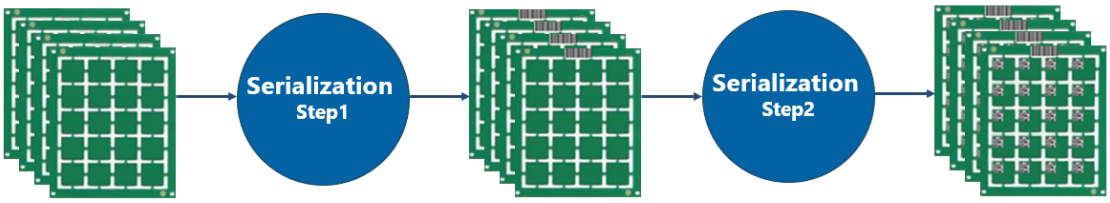
- Step
- Material Form
- Operation
- Label
- Synchronous Printing option

Board label configuration example:



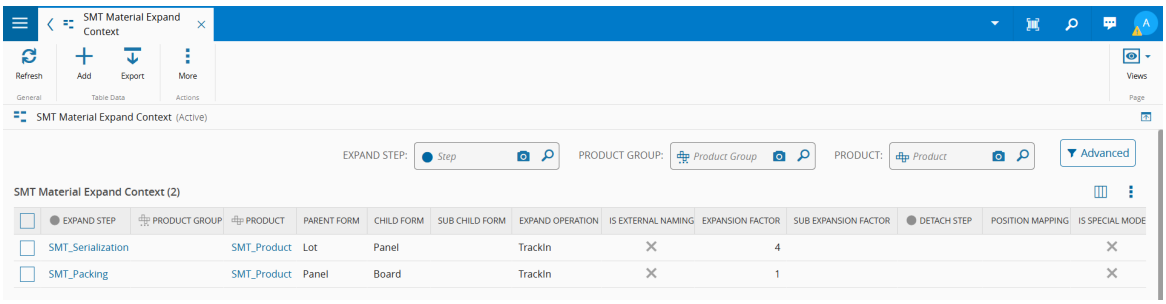
Serialization Without Special Mode

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

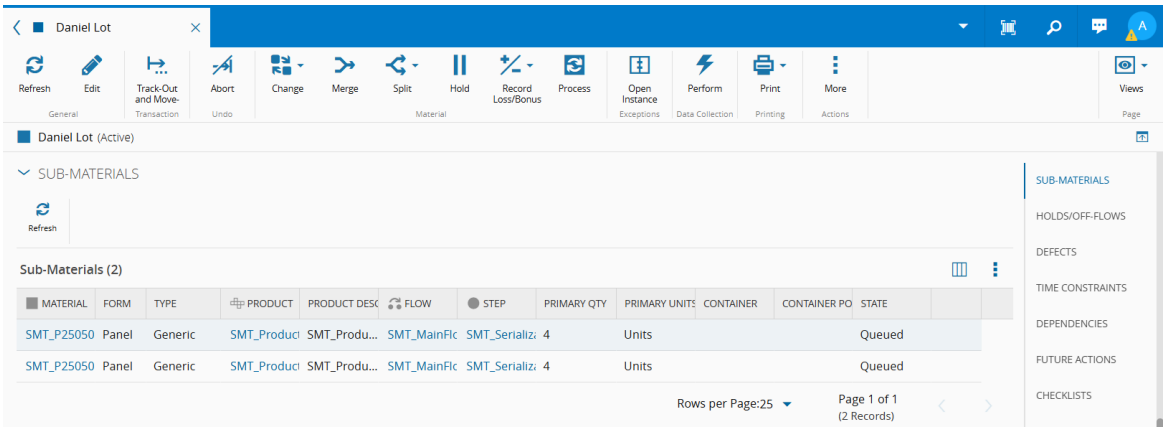


Example:

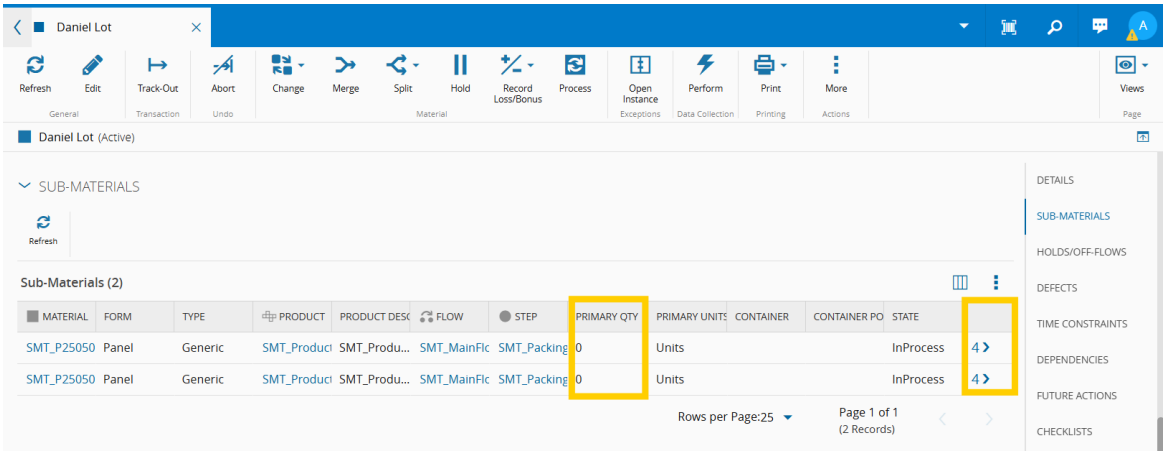
A Lot with a quantity of 8 is used as the parent material, where each Panel contains 4 Boards. Since the parent material's target quantity is defined in terms of the number of Boards needed, the configuration should be as follows:

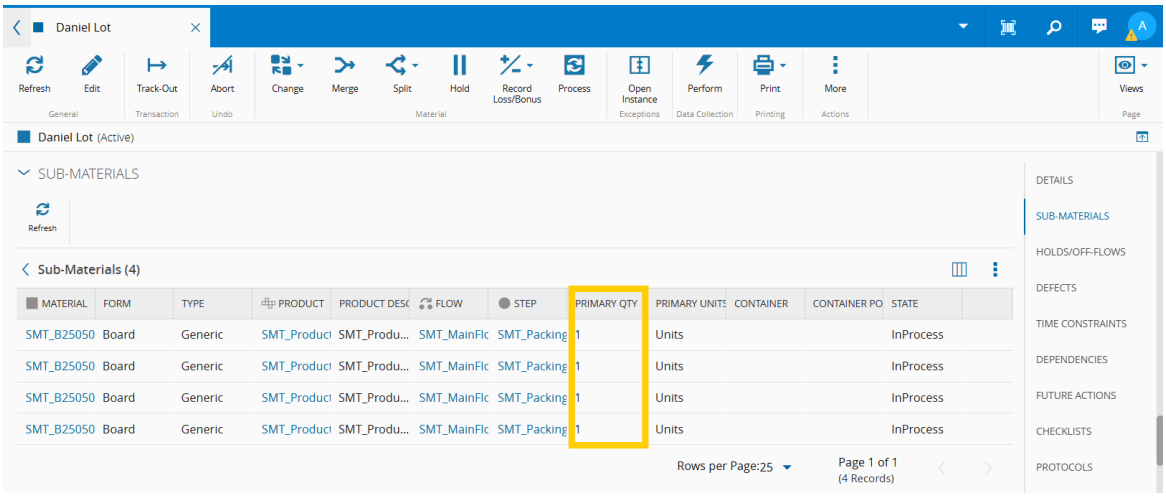


State of the lot material after tracking in the SMT_Serialization step:



State of the lot material after tracking in the SMT_Packing step:





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

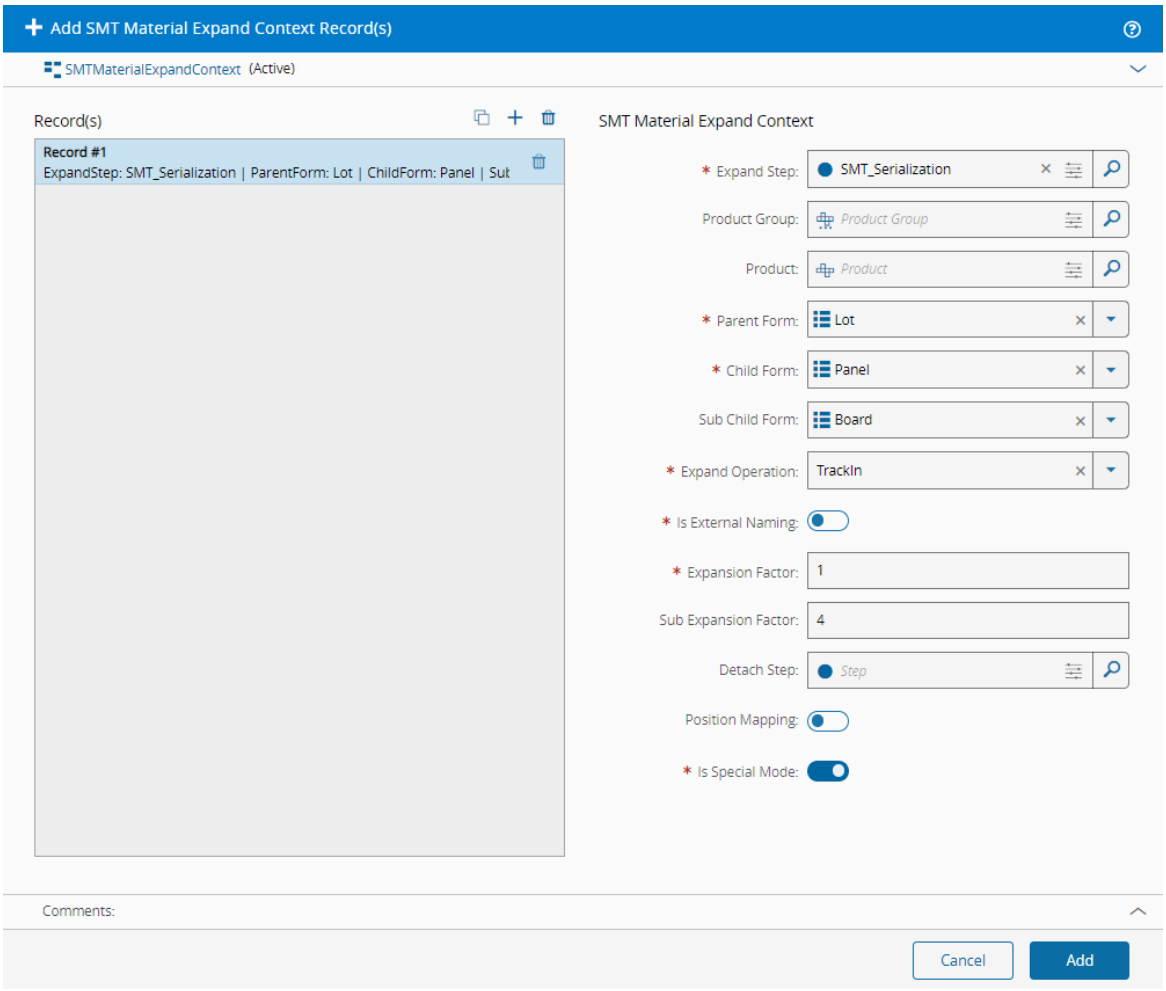
Serialization With Special Mode

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: Track-In
- Expansion Factor: 1
- Sub Expansion Factor: 4



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

Legal Information

Disclaimer

The information contained in this document represents the current view of Critical Manufacturing on the issues discussed as of the date of publication. Because Critical Manufacturing must respond to changing market conditions, it should not be interpreted to be a commitment on the part of Critical Manufacturing, and Critical Manufacturing cannot guarantee the accuracy of any information presented after the date of publication. This document is for informational purposes only.

Critical Manufacturing makes no warranties, express, implied or statutory, as to the information herein contained.

Confidentiality Notice

All materials and information included herein are being provided by Critical Manufacturing to its Customer solely for Customer internal use for its business purposes. Critical Manufacturing retains all rights, titles, interests in and copyrights to the materials and information herein. The materials and information contained herein constitute confidential information of Critical Manufacturing and the Customer must not disclose or transfer by any means any of these materials or information, whether total or partial, to any third party without the prior explicit consent by Critical Manufacturing.

Copyright Information

All title and copyrights in and to the Software (including but not limited to any source code, binaries, designs, specifications, models, documents, layouts, images, photographs, animations, video, audio, music, text incorporated into the Software), the accompanying printed materials, and any copies of the Software, and any trademarks or service marks of Critical Manufacturing are owned by Critical Manufacturing unless explicitly stated otherwise. All title and intellectual property rights in and to the content that may be accessed through use of the Software is the property of the respective content owner and is protected by applicable copyright or other intellectual property laws and treaties.

Trademark Information

Critical Manufacturing is a registered trademark of Critical Manufacturing.

All other trademarks are property of their respective owners.