



**Critical**  
manufacturing  
an ASM PT company

# Line Verification

## 11.3

April 2026

### DOCUMENT ACCESS

Public

### DISCLAIMER

The contents of this document are under copyright of Critical Manufacturing S.A. it is released on condition that it shall not be copied in whole, in part or otherwise reproduced (whether by photographic, or any other method) and the contents therefore shall not be divulged to any person other than that of the addressee (save to other authorized offices of his organization having need to know such contents, for the purpose for which disclosure is made) without prior written consent of submitting company.

## Line Verification

The Line Verification feature addresses the need for systematic verification activities while a **Material** is being processed. These verifications are particularly relevant in high-sensitivity production environments, where any changes in conditions, such as operator shifts, can impact product quality.

### Info

- Maintenance Management is a separately licensed module required to access this feature.
- This feature is part one of a two-part process that pairs seamlessly with the Setup and Line Clearance feature. Check out the [Setup and Line Clearance](#) tutorial.

## Overview

In this tutorial, we will explore expand the following sections:

- Feature Overview – explaining how Line Verification works
- Scenario – presenting a simplified example to understand the logic
- Configuration – showing a step-by-step guide to trigger verifications on in-process **Materials**, after shift breaks and shift changes
- Execution – triggering in-process **Material** verification using the feature
- Final Notes – pointing out some additional insights and considerations

## Feature Overview

This feature is event-based and is triggered after a **Material** is tracked, ensuring that critical verification occurs while the **Material** is in-process.

The feature is implemented within the Maintenance Management module and is driven by a **Maintenance Plan** assigned dynamically through a context resolution of the Smart Table [MaterialInProcessVerificationContext](#), creating a **Maintenance Plan** Instance when a **Material** is tracked in. This plan outlines the specific verification activities required for each **Material** during processing. In this tutorial, we will explore the time based activities, triggered on shift change events.

Once a **Material** is tracked in, a **Maintenance Plan** Instance is created and remains active throughout the time the **Material** is in-process, until it is tracked out. During this window, there is the need to execute verification activities, such as inspecting equipment, recalibrating scales, and checking environmental conditions (for example, temperature or humidity).

## Scenario

To assess how this industry and production requirement is addressed by Critical Manufacturing [MES](#), let's consider a simplified model:

- **Shift Definition:** 6 shifts covering 24 hours.
- **Facility:** General Facility

- **Area:** Area 1
- **Flow** and **Step:** General Flow with Step 1
- **Products:** Product A
- **Resources:** Resource 1
- **Service:** Service A, required by Step 1 and Provided by Resource 1
- Role

Suppose that the process at Step 1 requires the operator with the Process Verification Role to monitor the temperature and humidity of the environment whenever a **Material** is in-process, at two specific moments: when the next shift employees return from their mid-shift break, and after a shift change. There is a scheduled and automatically triggered verification requested for the material that was left in-process.

Additionally, during shift changes, the new operators are required to:

- Confirm that all necessary durables are in the correct position
- Acknowledge the materials that are currently in line for processing at Step 1.

## Configuration

Basic entities like **Facility**, **Area**, **Services**, **Products**, **Parameters**, **Resources** and **Roles** won't be detailed.

### Useful Documentation

There are some entities whose configurations require closer attention:

- **Calendar** and **Shift Definition**
- **Step**
- **Data Collection** and **Checklist**
- **Maintenance Plan**

## Calendar and Shift Definition

This scenario assumes the existence of a **Calendar** with a **Shift Definition** that includes six shifts, covering the full 24-hour day.

Keep in mind the correct sequence when setting this up:

- First, create the Calendar.
- Then, define the Shift Definition.
- Finally, associate the Shift Definition with the Calendar.

The following images display the general configuration settings of the **Calendar** and **Shift Definition**:

Standard Calendar (Active)

DETAILS

Calendar

Name: Standard Calendar  
 Description: Standard Calendar  
 Universal State: Active  
 Data Group:

Information

Time Zone: (UTC+00:00) Dublin, Edinburgh, Lisbon, London  
 Clock-In Early Start (Minutes): 0  
 Enterprise Wide Reporting: X No  
 Dimension:  
 Fiscal Start Day: 1  
 Fiscal Start Month: January  
 Week Start Day: Monday  
 Day Start Time: 02:00 AM - Current Day

WEEK DEFINITION

Week Days (7)

DAY	SHIFT DEFINITION	COST OVERTIME FACTOR
Monday	Standard Shift	1
Tuesday	Standard Shift	1
Wednesday	Standard Shift	1
Thursday	Standard Shift	1
Friday	Standard Shift	1
Saturday	Non-Working Day	
Sunday	Non-Working Day	

### Shift Definition

Standard Shift (Active)

DETAILS

Shift Definition

Name: Standard Shift  
 Description: Standard Shift  
 Universal State: Active  
 Data Group:

Information

Calendar: Standard Calendar  
 Start Time: 02:00 AM

SHIFTS

Shifts (6)

NAME	START TIME	END TIME	COST OVERTIME FACTOR	TEAM PATTERN	CODE AND COLORS
Shift 1	02:00	06:00	1		<input type="checkbox"/> 1 >
Shift 2	06:00	10:00	1		<input type="checkbox"/> 1 >
Shift 3	10:00	14:00	1		<input type="checkbox"/> 1 >
Shift 4	14:00	18:00	1		<input type="checkbox"/> 1 >
Shift 5	18:00	22:00	1		<input type="checkbox"/> 1 >
Shift 6	22:00	02:00	1		<input type="checkbox"/> 1 >

Rows per Page: 50 Page 1 of 1 (6 Records)

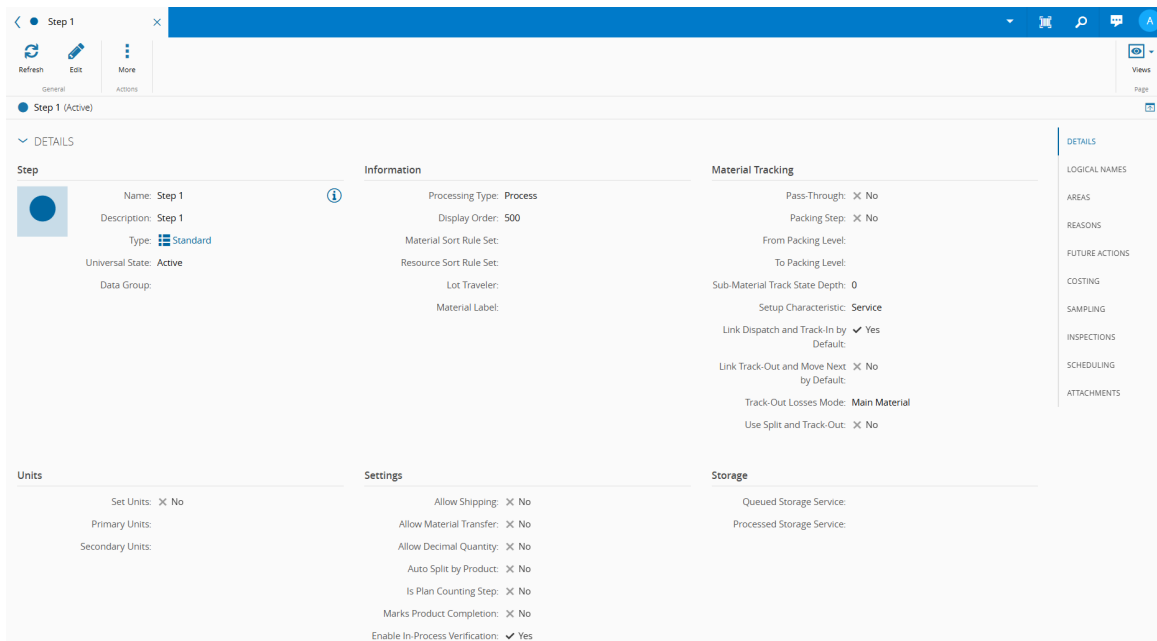
**Useful Documentation**

- [Create Calendar](#)
- [How to: Create a Calendar](#)
- [Create Shift Definition](#)
- [How to: Create a Shift Definition](#)

## Step

For a **Step** to support in-process verification, the property `Enable In-Process Verification` must be set to true under the Settings section in the details of the **Step**.

The following images display the general configuration of the **Step**.



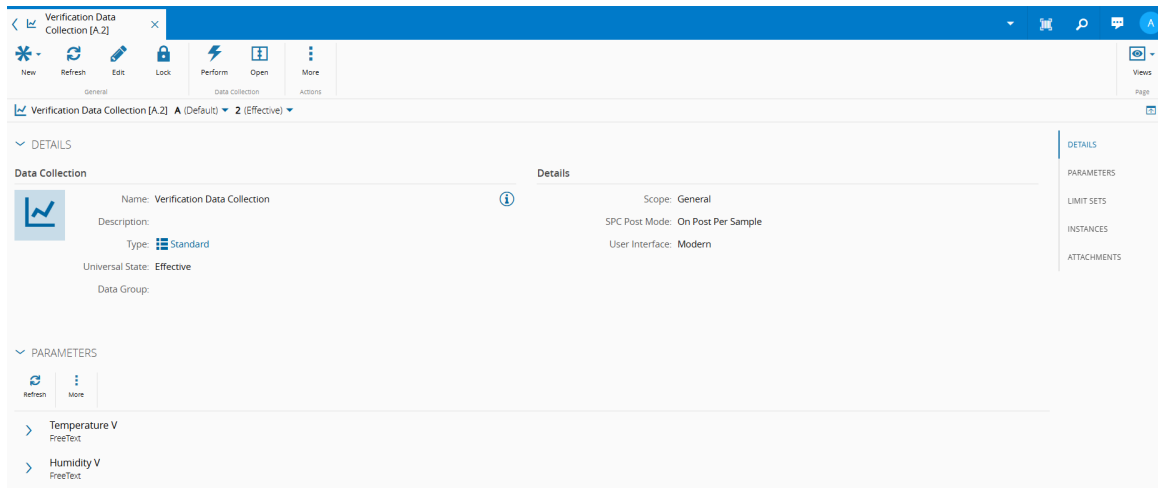
**Useful Documentation**

- [Create Step](#)
- [How to: Create a Step](#)

## Data Collection and Checklist

The Data Collection consists of gathering a sample and recording two key **Parameters**: Temperature and Humidity.

The following image displays the general configuration of the **Data Collection**.

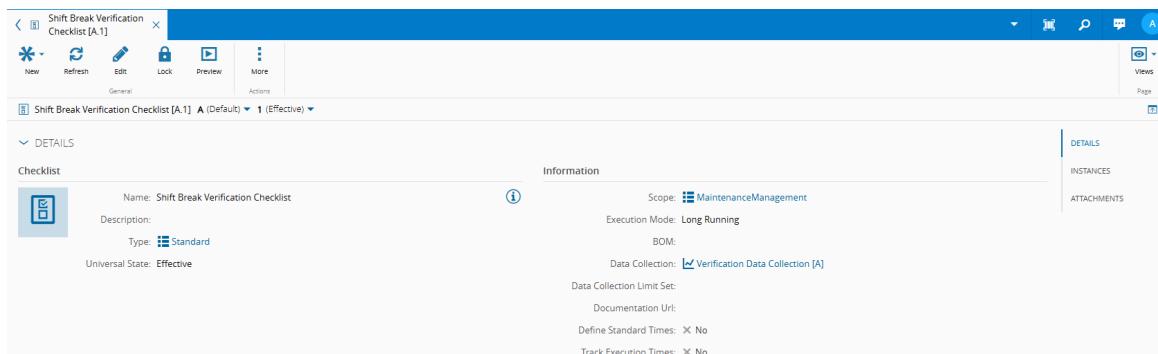


The **Checklist** is scoped under Maintenance Management and incorporates the **Data Collection**. Since the requirements differ for each scenario, there are two distinct **Checklists**.

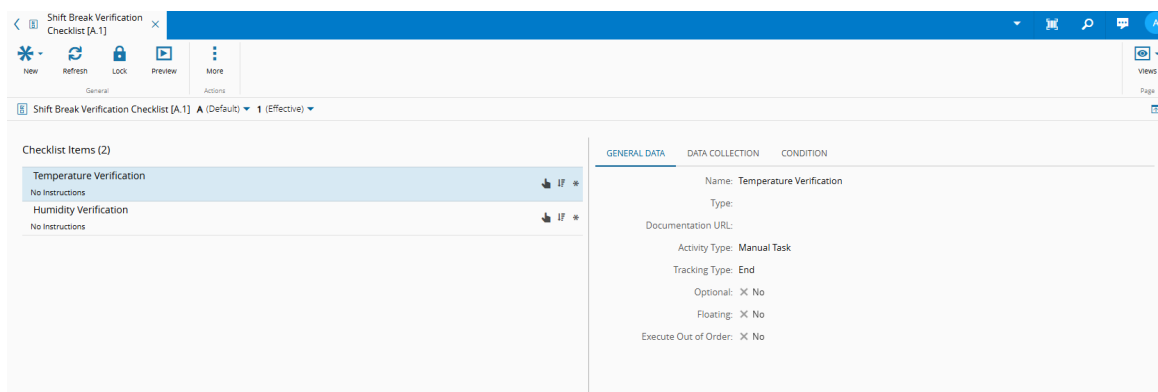
The Shift Break **Checklist** includes two items, each corresponding to the collection of one **Parameter**: temperature and humidity.

The following images display the configuration of the Shift Break **Checklist**.

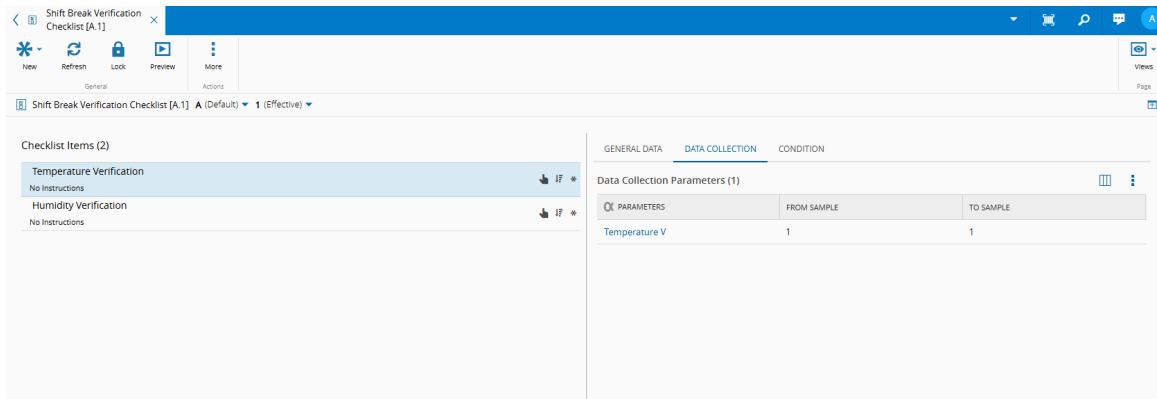
### Shift Break



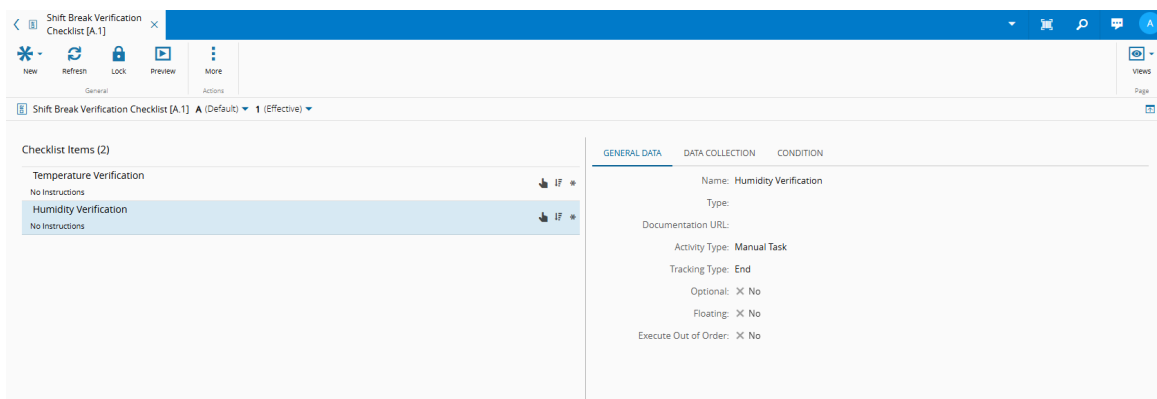
### Item 1 - General Data



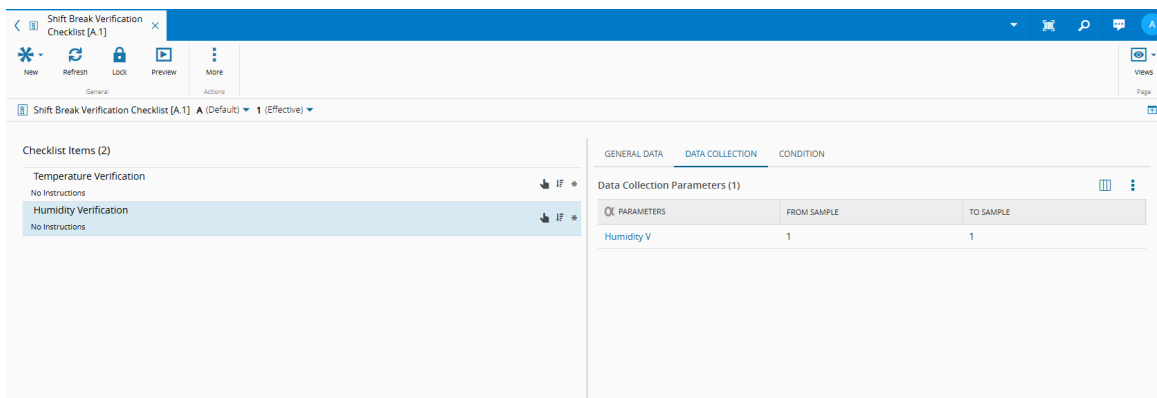
### Item 1 - Data Collection



### Item 2 - General Data



### Item 2 - Data Collection



The Shift Change **Checklist** contains four items:

- The first two are the same as in the shift break case, capturing Temperature and Humidity data.
- The remaining two require the operator to verify:
  - That Durables are in the correct position.
  - The status and acknowledgment of Work In Progress materials queued at the step.

The following images display the configuration of the Shift Change **Checklist**.

#### Shift Change

Shift Change Verification Checklist [A.1] A (Default) 1 (Effective)

**Checklist**

Name: Shift Change Verification Checklist  
 Description:  
 Type: Standard  
 Universal State: Effective

**Information**

Scope: MaintenanceManagement  
 Execution Mode: Long Running  
 BOM:  
 Data Collection: Verification Data Collection [A]  
 Data Collection Limit Set:  
 Documentation Url:  
 Define Standard Times: X No  
 Track Execution Times: X No

### Item 1 - General Data

Shift Change Verification Checklist [A.1] A (Default) 1 (Effective)

**Checklist Items (4)**

- Temperature Verification **IF \***
- Humidity Verification **IF \***
- Check durables position **IF \***
- Check incoming WIP **IF \***

**GENERAL DATA**

Name: Temperature Verification  
 Type:  
 Documentation URL:  
 Activity Type: Manual Task  
 Tracking Type: End  
 Optional: X No  
 Floating: X No  
 Execute Out of Order: X No

### Item 1 - Data Collection

Shift Change Verification Checklist [A.1] A (Default) 1 (Effective)

**Checklist Items (4)**

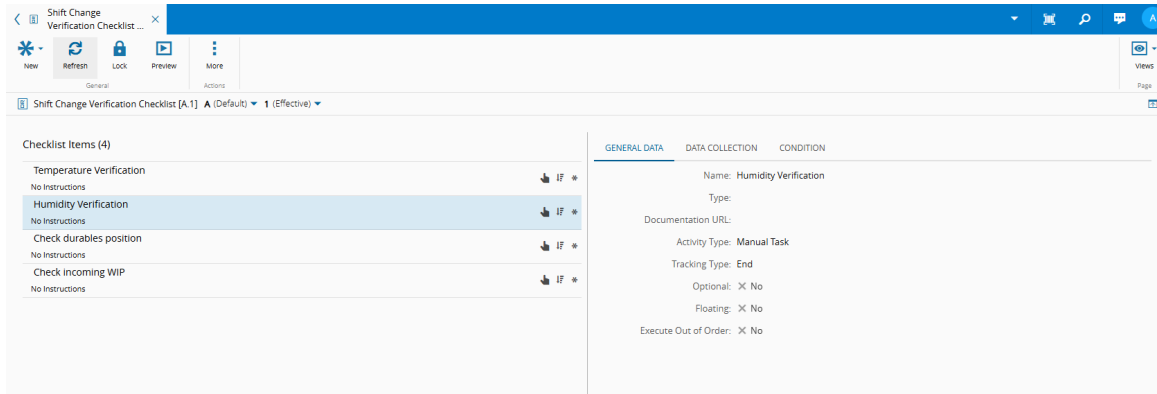
- Temperature Verification **IF \***
- Humidity Verification **IF \***
- Check durables position **IF \***
- Check incoming WIP **IF \***

**DATA COLLECTION**

Data Collection Parameters (1)

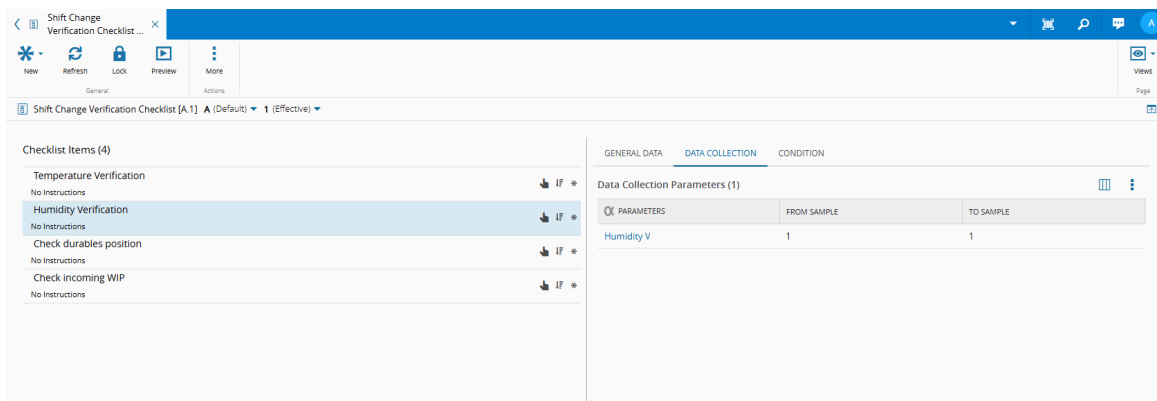
PARAMETERS	FROM SAMPLE	TO SAMPLE
Temperature V	1	1

### Item 2 - General Data



The screenshot shows the configuration page for 'Item 2 - General Data'. The left sidebar lists four checklist items: 'Temperature Verification', 'Humidity Verification' (highlighted), 'Check durables position', and 'Check incoming WIP'. The main panel has three tabs: 'GENERAL DATA', 'DATA COLLECTION', and 'CONDITION'. The 'GENERAL DATA' tab is active, showing details for 'Humidity Verification': Name: Humidity Verification, Type: (blank), Documentation URL: (blank), Activity Type: Manual Task, Tracking Type: End, Optional: X No, Floating: X No, and Execute Out of Order: X No.

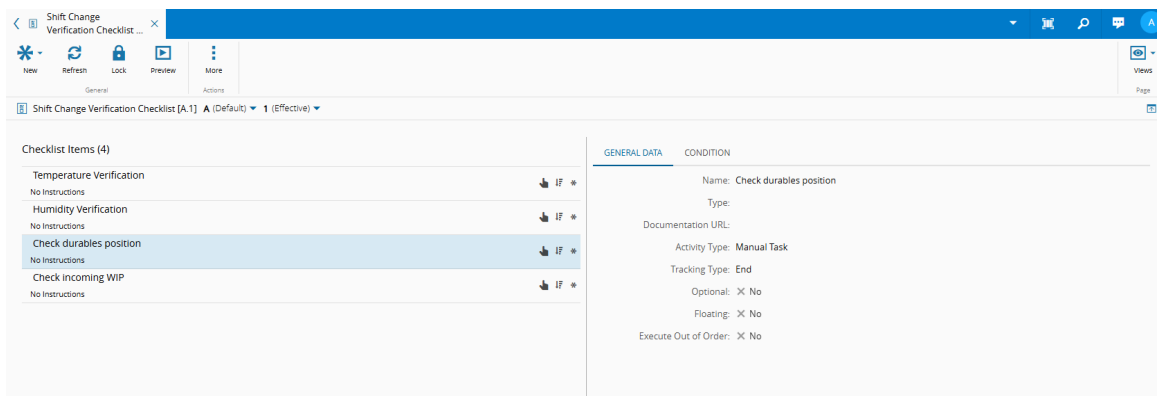
### Item 2 - Data Collection



The screenshot shows the configuration page for 'Item 2 - Data Collection'. The left sidebar is identical to the previous screenshot. The main panel has three tabs: 'GENERAL DATA', 'DATA COLLECTION', and 'CONDITION'. The 'DATA COLLECTION' tab is active, showing 'Data Collection Parameters (1)'. A table below lists parameters:

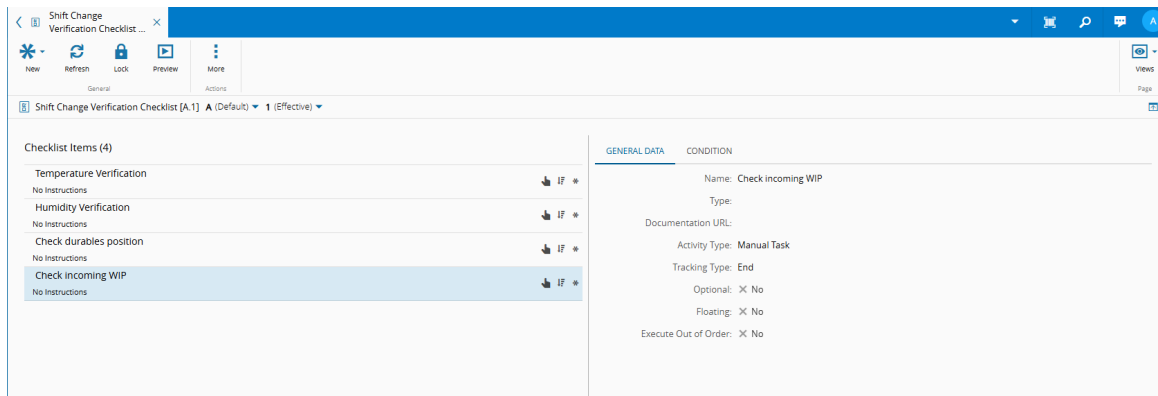
PARAMETERS	FROM SAMPLE	TO SAMPLE
Humidity V	1	1

### Item 3 - General Data



The screenshot shows the configuration page for 'Item 3 - General Data'. The left sidebar lists four checklist items: 'Temperature Verification', 'Humidity Verification', 'Check durables position' (highlighted), and 'Check incoming WIP'. The main panel has two tabs: 'GENERAL DATA' and 'CONDITION'. The 'GENERAL DATA' tab is active, showing details for 'Check durables position': Name: Check durables position, Type: (blank), Documentation URL: (blank), Activity Type: Manual Task, Tracking Type: End, Optional: X No, Floating: X No, and Execute Out of Order: X No.

### Item 4 - General Data



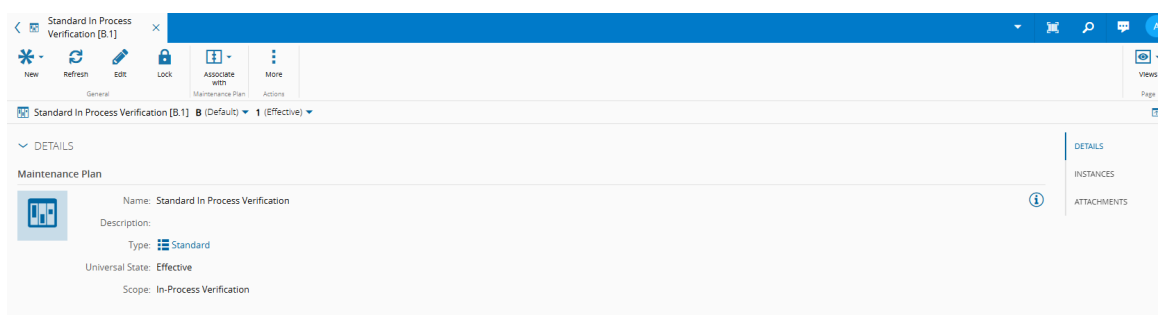
**Useful Documentation**

- [Create Data Collection](#)
- [How to: Create a Data Collection](#)
- [Create Checklist](#)
- [How to: Create a Checklist](#)

### Maintenance Plan

For this scenario, we will define a single **Maintenance Plan** of scope In-Process Verification. The associated maintenance activities must use a time based schedule type, allowing us to leverage the "On Shift Change" time due scale to implement the intended logic.

The following image displays the configuration of the **Maintenance Plan**.



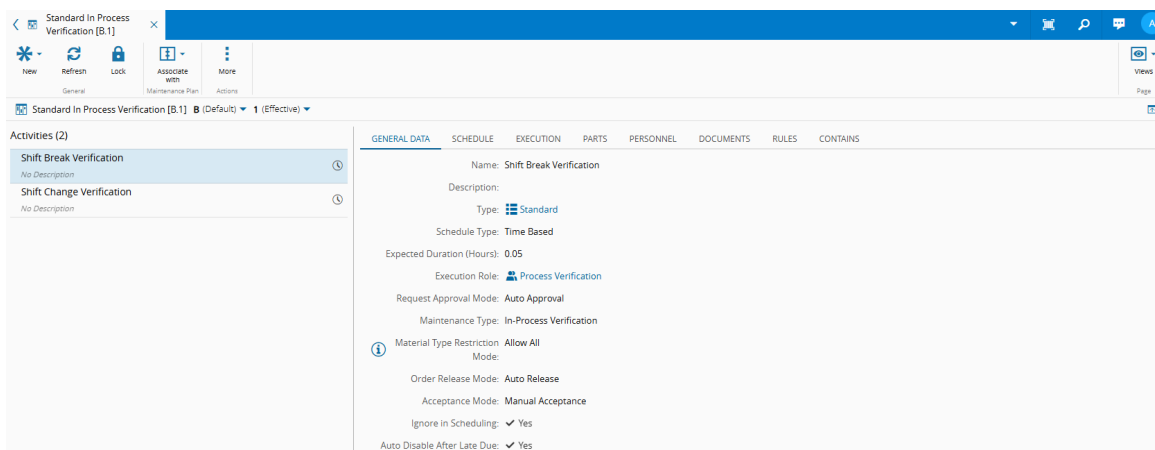
Maintenance Activities Overview:

Maintenance Activity Order	Trigger	Duration	Due Window	Tolerance	Activity
----------------------------	---------	----------	------------	-----------	----------

Maintenance Activity Order	Trigger	Duration	Due Window	Tolerance	Activity
Shift Break Verification	Halfway through the shift (offset of 50%)	3 minutes (0.05 hours)	Must be completed 15 minutes (0.25 hours) after the mid-shift break	Cannot be performed before the halfway point of the shift, but can be completed anytime within the 15-minute window	Perform Shift Break Checklist and Data Collection
Shift Change Verification	When the shift changes	6 minutes (0.1 hours)	Must be completed 15 minutes (0.25 hours) after the shift change	Early or late completion allowed within a 15-minute window	Perform Shift Change Checklist and Data Collection

The following image displays the configuration of the Shift Break Verification maintenance activity.

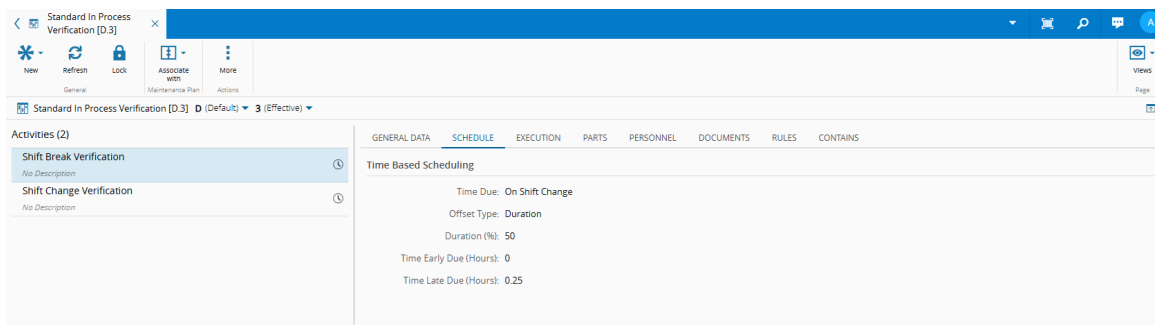
### General



The screenshot shows the 'General' configuration page for the 'Shift Break Verification' activity. The left sidebar lists 'Shift Break Verification' and 'Shift Change Verification'. The main panel displays the following configuration details:

- Name: Shift Break Verification
- Description:
- Type: Standard
- Schedule Type: Time Based
- Expected Duration (Hours): 0.05
- Execution Role: Process Verification
- Request Approval Mode: Auto Approval
- Maintenance Type: In-Process Verification
- Material Type Restriction Mode: Allow All
- Order Release Mode: Auto Release
- Acceptance Mode: Manual Acceptance
- Ignore in Scheduling:  Yes
- Auto Disable After Late Due:  Yes

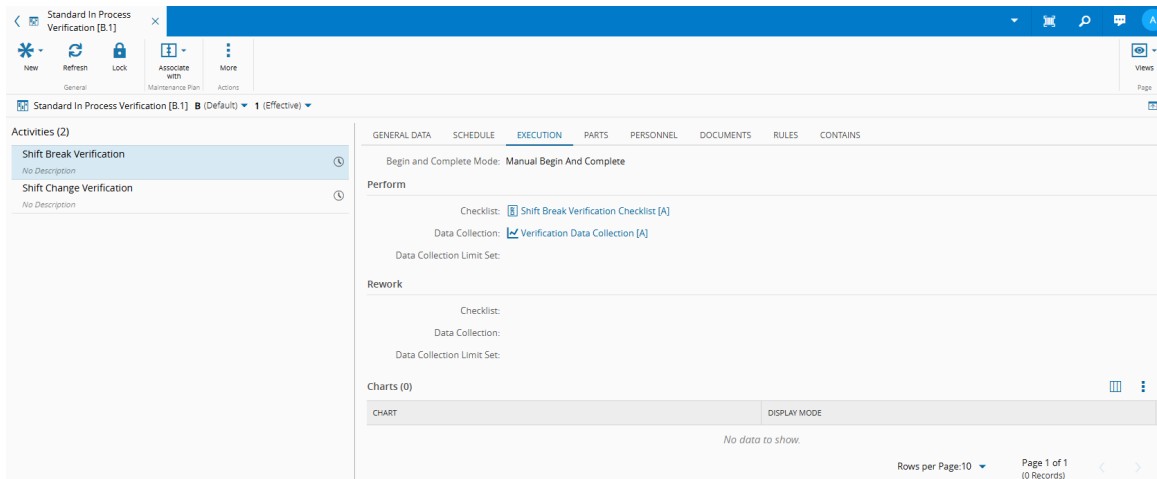
### Schedule



The screenshot shows the 'Schedule' configuration page for the 'Shift Break Verification' activity. The left sidebar lists 'Shift Break Verification' and 'Shift Change Verification'. The main panel displays the following configuration details under 'Time Based Scheduling':

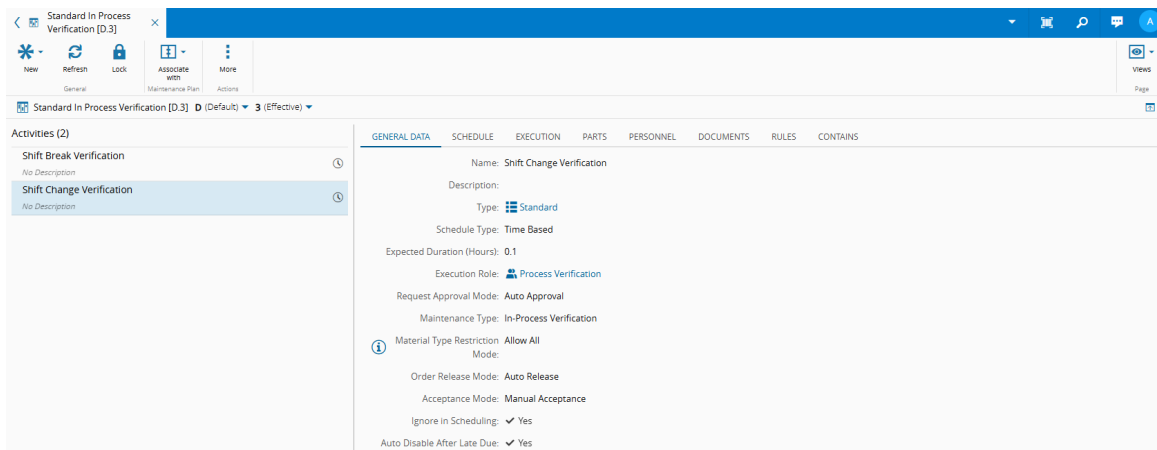
- Time Due: On Shift Change
- Offset Type: Duration
- Duration (%): 50
- Time Early Due (Hours): 0
- Time Late Due (Hours): 0.25

### Execution

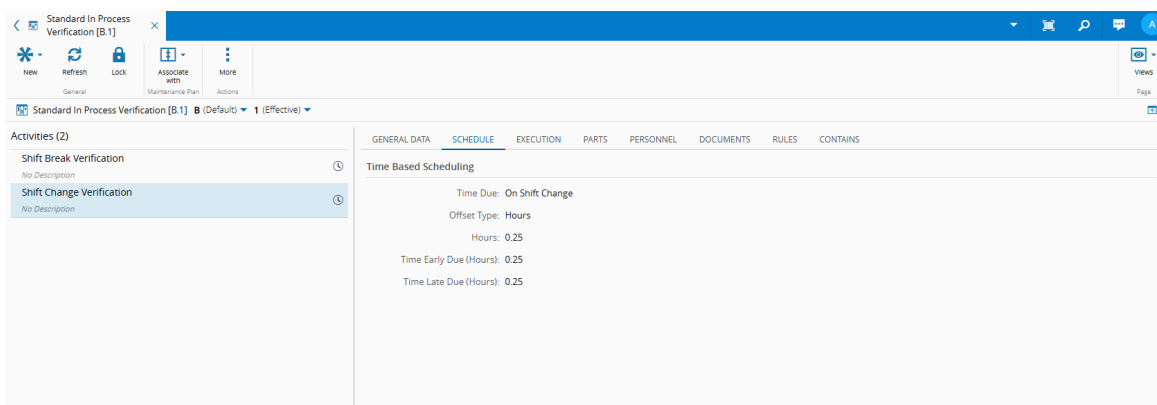


The following image displays the configuration of the Shift Change Verification maintenance activity.

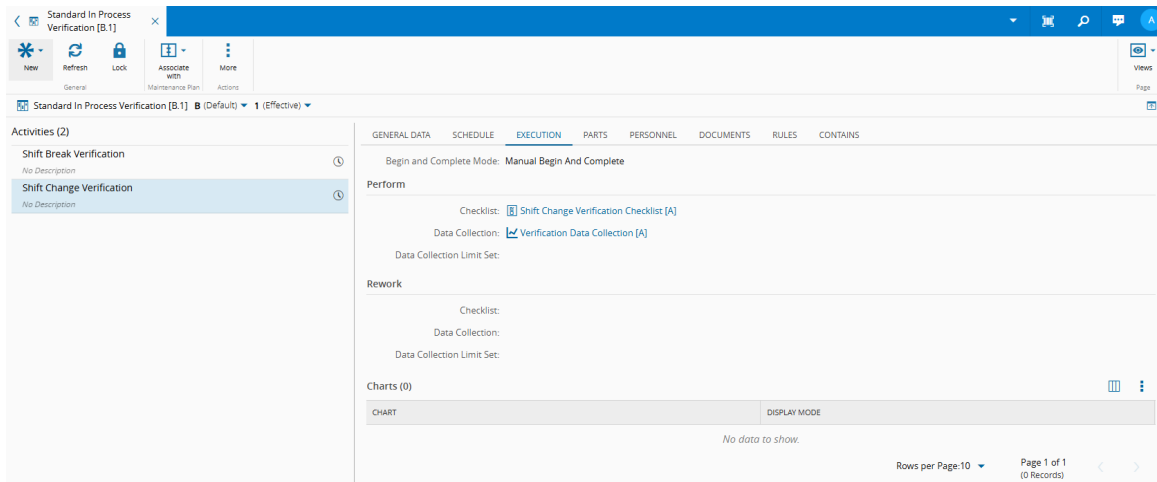
### General



### Schedule



### Execution



To connect all elements of the configuration, the system uses the Smart Table [MaterialInProcessVerificationContext](#). In this table, it is defined:

- The **Step** (which must have In-Process Verification enabled)
- Optional context variables to refine applicability
- The corresponding **Maintenance Plan** to be triggered when the **Material** is tracked-in at that **Step**

The following table displays the Smart Table configuration.

Step	Maintenance Plan	Owner Role
Step 1	Standard In Process Verification	Process Verification

#### Useful Documentation

- [How to: Assign Roles to a User](#)
- [How to: Add Value to Smart Table](#) for assigning a **Maintenance Plan** to a **Step** on the [MaterialInProcessVerificationContext](#) Smart Table
- [Create Maintenance Plan](#)

This is the [Master Data file](#) used to create this model.

## Execution

After all configurations are completed, the operation that sets everything in motion is the Track-In of a **Material** at a **Step** where in-process verification is enabled.

Once the **Material** is tracked in, navigating to the Material Maintenance View will display its Maintenance Plan Instances, as illustrated in the image below.

### Shift Change

Material P1.3

Refresh Edit View Reports Track-Out Abort Change Merge Split Hold Record Loss/Bonus Process Open Instance Perform Print View Change Begin Skip Update Schedule... More

Material P1.3 (Active)

2025 JULY

DISPLAY: NAME TYPE: ALL Pending Terminated Search

Sun	Mon	Tue	Wed	Thu	Fri	Sat
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	6:15p 09/07-Shift Change... 8p 09/07-Shift Break Verifi...			
20	21	22				
27	28	29				
3	4	5				

Name: 09/07-Shift Change Verification.0004  
 Activity: Shift Change Verification  
 Schedule Type: TimeBased  
 Schedule State: BeforeEarlyDue  
 Execution State: Released  
 Material: Material P1.3  
 Maintenance Type: InProcessVerification

Owner Role: Process Verification  
 Execution Role: Process Verification  
 Schedule Date: 07/09/2025 06:15 PM  
 Duration: 6m  
 Start Date: 07/09/2025 06:00 PM  
 End Date: 07/09/2025 06:15 PM  
 Early Due: 07/09/2025 06:00 PM  
 Due: 07/09/2025 06:15 PM  
 Late Due: 07/09/2025 06:30 PM

Activities

- USAGE BASED (0)
- AD-HOC (0)

### Shift Break

Material P1.3

Refresh Edit View Reports Track-Out Abort Change Merge Split Hold Record Loss/Bonus Process Open Instance Perform Print View Change Begin Skip Update Schedule... More

Material P1.3 (Active)

2025 JULY

DISPLAY: NAME TYPE: ALL Pending Terminated Search

Sun	Mon	Tue	Wed	Thu	Fri	Sat
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	6:15p 09/07-Shift Change... 8p 09/07-Shift Break Verifi...			
20	21	22				
27	28	29				
3	4	5				

Name: 09/07-Shift Break Verification.0004  
 Activity: Shift Break Verification  
 Schedule Type: TimeBased  
 Schedule State: BeforeEarlyDue  
 Execution State: Released  
 Material: Material P1.3  
 Maintenance Type: InProcessVerification

Owner Role: Process Verification  
 Execution Role: Process Verification  
 Schedule Date: 07/09/2025 08:00 PM  
 Duration: 3m  
 Start Date: 07/09/2025 08:00 PM  
 End Date: 07/09/2025 08:15 PM  
 Early Due: 07/09/2025 08:00 PM  
 Due: 07/09/2025 08:00 PM  
 Late Due: 07/09/2025 08:15 PM

Activities

- USAGE BASED (0)
- AD-HOC (0)

In the example, the **Material** was tracked in at 04:55 PM.

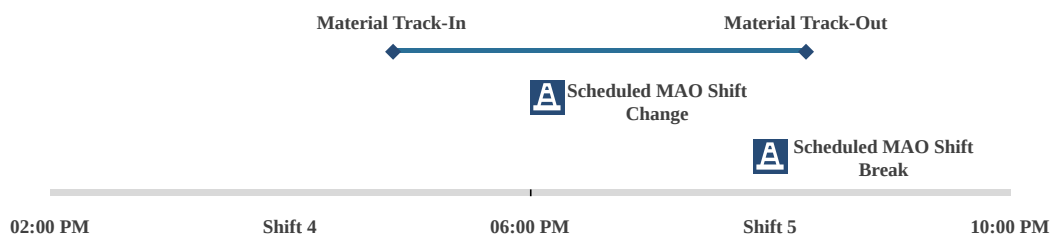
The next shift begins at 06:00 PM, so two Maintenance Activity Orders are created:

- One with a due date at 06:15 PM PM, for the Shift Change Verification
- Another with a due date at 08:00 PM, for the Shift Break Verification

If the due time arrives and the **Material** is still in process, the verification must be performed.

If a user attempts to Track-Out the **Material** without completing the required verification, the system will notify them about the pending In-Process Verification Maintenance Plan Instance.

Refer to the diagram below for a clear, visual timeline of these events.



The operations required to carry out these verifications follow the standard Maintenance Activity Order flow: Begin, Perform, and Complete.

The video below illustrates the execution of this scenario.

#### Useful Documentation

- For a more in-depth understanding of this module, please refer to the [\[\[tutorials-maintenancemanagement\]\]](#) tutorial.

#### Note

- The Material Traceability View includes a dedicated section to accommodate In-Process Verifications.
- The **Material** `In-Process Verification Maintenance Plan Instance` the reference to the associated instance.

## Final Considerations

Keep in mind the following behaviors and consequences related to the In-Process Verification Maintenance Plan Instance:

- Terminate / Abort **Material** - Terminates the instance and clears the associated property
- Split / Expand **Material** - Resets the instance in the resulting child materials
- Merge **Material** - Merge is blocked if any of the Materials involved have an active instance
- Track-In **Material** - Creates a new Maintenance Plan Instance based on the resolved **Maintenance Plan** from the In-Process Verification context of the **Material**; sets the In Process Verification Maintenance Plan Instance accordingly
- Track-Out **Material** - Validates the Maintenance Activity Orders associated with the instance; if validation passes, terminates the instance and clears the property



# 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.