SIEMENS

Opcenter Execution Electronics 2404

Integration User Guide

Guidelines

This manual contains notes of varying importance that should be read with care; i.e.:

Important:

Highlights key information on handling the product, the product itself or to a particular part of the documentation.

Note: Provides supplementary information regarding handling the product, the product itself or a specific part of the documentation.

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ID	Opcenter_EX_EL_Integration_User_Guide
Title	Integration User Guide
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Product Version	Opcenter_EX_EL_Integration_User_Guide_2404
Category	Configuration, Usage, Support
Summary	This guide contains information about the Siemens Opcenter Execution Electronics (Opcenter EX EL) application. The application extends the Siemens Opcenter Execution Core (Opcenter EX CR) application with features specific to electronics manufacturing.
Audience	This guide is intended for persons who use Opcenter Intelligence to load and analyze data from the Opcenter Execution Electronics data source. The guide is written with the assumption that the audience is also familiar with the Opcenter Execution Core application.
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1 Overview

> (i) This manual is a section of the Opcenter Execution Electronics Integration User Guide that was released with Valor Shop Floor suite. The content of the original manual has been split into three versions depending on the application it is pertinent to. Each version is released by the corresponding startup, namely Opcenter Intelligence, Opcenter Intra Plant Logistics and Opcenter Connect Electronics. You can find the complementary versions of this manual in Support Center at https://support.sw.siemens.com/en-US/ under Opcenter Intra Plant Logistics and Opcenter Connect Electronics documentation sections.

Opcenter Execution Electronics (Opcenter EX EL) is a Manufacturing Execution System (MES) service that enables Manufacturing Operations Management (MOM) capabilities.

Opcenter Intelligence Manufacturing Data Warehouse data model for Opcenter EX EL supports descriptive analysis and KPIs to implement the following use cases business logic in Opcenter Intelligence.

- Work in Progress (WIP) to show the progress of each work order, including the number of completed operations and their average duration.
- Material Traceability to provide information on boards, work orders and material placements.
- Box Build to provide a map of a genealogy of all final product related subassemblies used to build a specific box assembly node.

The instructions described in the following sections are prerequisites to load and analyze correct data from the Opcenter EX EL source. These instructions are relevant for both Opcenter Intelligence for Cloud and Opcenter Intelligence on-premise.

2 Mandatory Modeling

It is important to complete this modeling before starting Opcenter Intelligence installation.

> ⚠️ For more information on **Modeling Configuration**, see *Opcenter™ Intra Plant Logistics (IPL) Integration Guide for Opcenter Execution Electronics (EX EL)* released with *Opcenter Intra Plant Logistics Documentation* and available on **Support Center** at the link https://support.sw.siemens.com/en-US/

Opcenter Execution Electronics Items Configuration
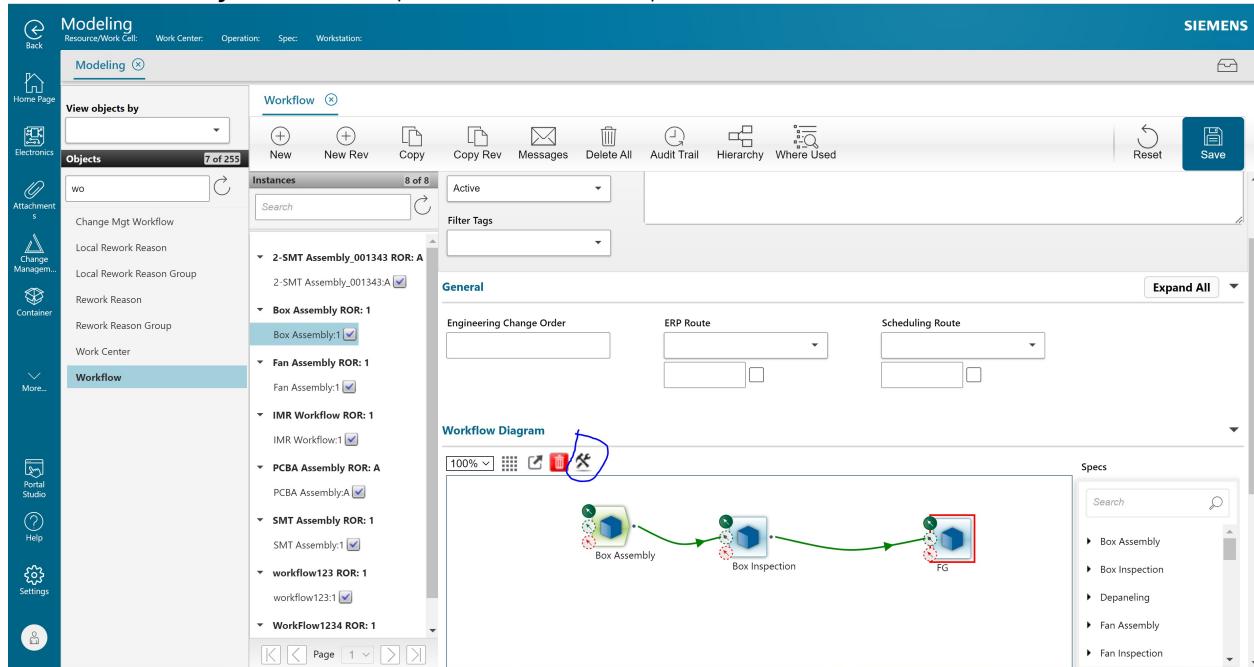
The following items need to be configured in Opcenter Execution Electronics:

- Resources
- Resource type
    - Equipment
    - Line
    - Area
- Parent Resource — (Line)
- Step
- Product
- BOM
- Part number
- Mfg order
- Defect
- Operation
- Workflow

Last Step Configuration in Workflow Modeling

To correctly visualize the WIP Dashboard issued by applying the corresponding Opcenter Intelligence Dashboard Template, you must make sure to execute the following operation in Opcenter Execution Electronics. This setting is required to correctly calculate the completion containers number for a Mfg. Order.

1. In Opcenter Execution Electronics **Workflow Modeling** page, select the last operation in the **Workflow Diagram** and click the **Modify Element** icon (outlined in blue below).

2. In the **Step Details** panel that opens, select the **Is Last Step** check box and save.

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3 Summary Tables Data Collection

To enable summary tables data collection, please do not uncheck the **Disable Reporting Summaries** field on the **Factory** page. Data will not be written to the summary tables if this field is checked. The default setting is unchecked, meaning summary tables are written to by default.

4 PCB and Panel Container Types

In order to get an accurate and full report of work-in-progress and material traceability, it is necessary to set the appropriate container level types.

ES_Level_Type

These are the **ES_Level_Types** that need to be defined:

- PCB
- Panel
- Box assembly
- Raw Material
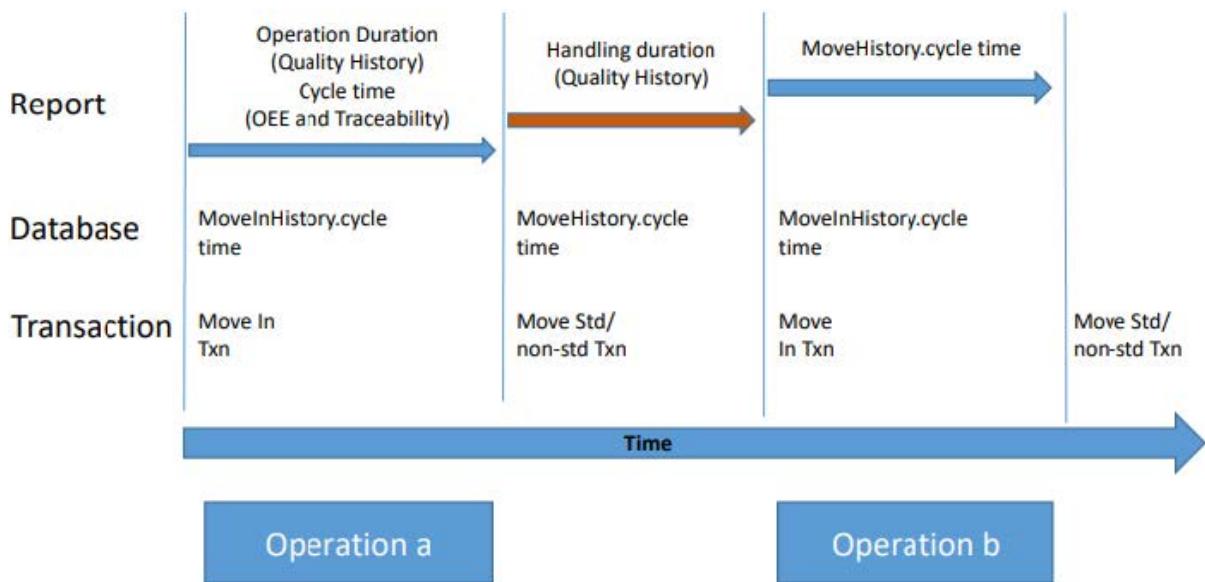
Panels and PCBs

When defining the Panel and PCB relationship:

- Begin by defining the containers as having the **Std Start Child Qty** set to 1. In this case, the container level defined for the container can use a **Level Type** of either 'Panel' or 'PCB'.
- If a **Child Container Level** is set, then the parent uses a **Level Type** of 'Panel', and the child must use a **Level Type** of 'PCB'.

5 Handling Duration

In order to get an accurate handling duration, in Operation level the **Use Queue** check box must be selected. Otherwise, the handling duration will be calculated as the difference between the Move for operation *a* and the Move for the next operation.
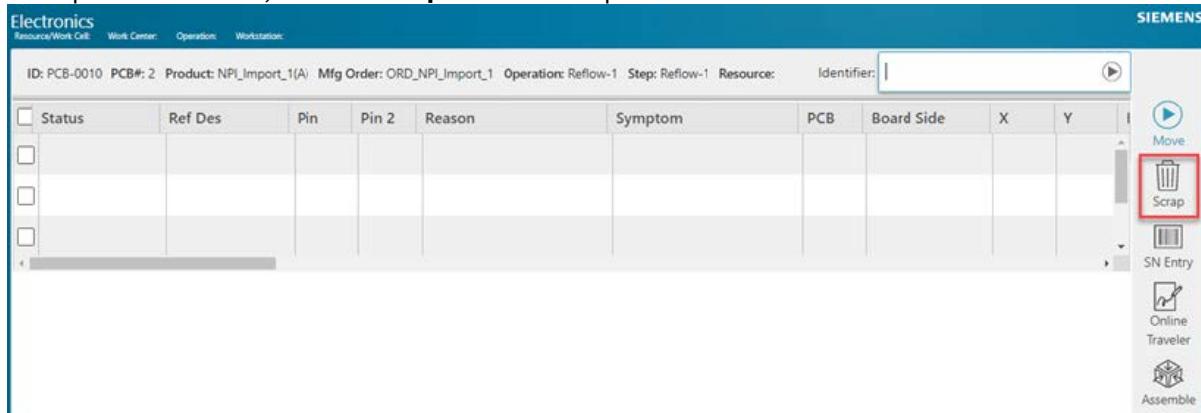
6 Reporting Scrap and Trash

There are two ways to mark boards for scrap in the Opcenter IN EL reports:

- Using the Production Client
- On the Container page

Reporting Scrap and Trash using the Production Client

1. To enable the **Scrap** button in the production client, first define the Loss reasons in the specifications or operation modeling.
2. In the production client, click the **Scrap** button to scrap a container.

3. In the next screen, add the reason for scrapping the container.

Reporting Scrap and Trash on the Container page

1. On the left menu bar, navigate to **Container** > **Change Qty**. By default, the **Change Type** of **Loss** is selected.

2. With this dialog open, either scan the container or manually fill in the values.

3. In the **Loss Reason** field drop-down menu, select **Scrap**.
4. Select the **Use Current Qty** check box. You can also enter the number in the **Loss Qty** field. Make sure that for the panel the number is higher than one.
5. Click **Submit**.

7 Supported Transactions

The table below lists all the transaction types that are supported with Opcenter Intelligence.

Business Domain	Reports	Transaction Type
Quality	• Box Build • Quality History • WIP	• Associate • Close • ComponentIssue • ComponentIssueR2 • ComponentRemove • ContainerMaint • Disassociate • ES_AutoComponentIssue • ES_BoardToTestIdTxn • ES_Suspend • ExecuteTask • isDefect • isDefectReopen • isDefectRepair • MoveIn • MoveNonStd • MoveStd • Open • Rework • Start
Traceability	• Board Traceability • Material Traceability • WO Material	• Associate • Close • ComponentIssue • ComponentIssueR2 • ComponentRemove • ContainerMaint • Disassociate • ES_AutoComponentIssue • ES_BoardToTestIdTxn • ES_Suspend • ExecuteTask • MoveIn • MoveNonStd • MoveStd • Open • Rework • Start

> ⚠️ **Note**
>
> Nonstandard transactions can also be supported in some conditions. The custom transactions must be built as a child of one of the standard transactions, and must populate the same table and fields as the standard transaction.

8 DPU, DPO, and DPMO

DPU, DPO, and DPMO are KPI metrics that express how your product or process is performing, based on the number of defects.

Definitions

DPU – Defect per Unit — the number of defects in a sample, divided by the number of units sampled.

```
DPU = [Number Of Defects]/[Container Count]
```

DPO – Defects per Opportunities — the number of defects in a sample, divided by the total number of defect opportunities.

```
DPO = [Number Of Defects]/[Number of Opportunities (Latest Upgrade)]
```

DPMO – Defects Per Million Opportunities — the number of defects in a sample, divided by the total number of defect opportunities, multiplied by one million.

```
DPMO = [Number Of Defects]/[Number of Opportunities (Latest Upgrade)] *
1,000,000
```

DPMO standardizes the number of defects at the opportunity level and is useful because you can compare processes with different complexities.

The sub-metrics used for calculating the DPO, DPMO and PU are as follows:

- **Number of Opportunities** — the number of chances for a defect to occur in a given product or service. The number of opportunities is calculated as the sum of the number of part numbers on a container, the number of pins on the container, plus the container itself.
  ```
  Number of opportunities = number of parts + number of pins + 1
  ```
  Where:
    - **Number of parts** is the number of components associated with the container. This is calculated based on the tables **Product** and **ProductMaterialListItem**.
    - **Number of pins** is the total number of pins on the container, and is taken from the **ES_PinCount** field in the **Product** table.
    - **Number of defects** is the number of defects reported. This number is taken from the **DefectHistorydetail** table.
- **Container Count** — the number of units counted for the given time period.

Configuration

The number of opportunities for containers needs to be defined in the modeling stage.

- **Number of pins** — The information for the pins is populated automatically during the NPI import, or can be added manually from the product modeling.

- **Number of Parts** — the number of parts specified in the BOM.

9 Consumption Data Collection Setting

The sending of consumption data to Opcenter Intra Plant Logistics (IPL) is controlled by the **CIO Outbound Msg Def** for the *ComponentIssue/ComponentIssueR2/ComponentReplace* definitions – and by default they use the following condition expression to control whether the message is sent:

```
Factory && Factory.isMaterialManageEnabled
```


This means that a Factory must be assigned the Employee performing the transaction, and the option must be enabled. You could also remove the Condition Expression and the messages would always be sent.