Automation Engine

AE Kongsberg Workflow

ESKO✳

Contents

1. Intro

This chapter describes the workflows where you use Automation Engine to send data to be produced on an Esko Kongsberg cutting table.

Important: This chapter assumes you are familiar with a Kongsberg cutting table and it's front end application **iPC** (i-cut Production Console). Learn more in the *On Line Help of Kongsberg iPC*.

Note: These workflows require that the version of **iPC** is v2.0 or higher.

1.1. Workflow Overview and Types

Workflow Overview and related Pilot Views

When you set up a Kongsberg table as a *Device* in Automation Engine, you can send cutting data to it's iPC by using the *Submit to Kongsberg Table* task.

The iPC operator sees these items appear in his "My Job List" and can decide when to start its production. The iPC communicates back to Automation Engine about the status of this job and the attributes used for its production.

Note: Each iPC is dedicated to one table.

These Pilot Views are used in Kongsberg workflows:

- *Devices* shows your Kongsberg tables (and CDI imagers), their general status and their workload.

- *Table Queues* shows the queue of each of your Kongsberg tables in a time line or list view. You can re-order and delete entries.

- *Sheets* shows a historical overview of all jobs that were processed on your Kongsberg table(s). You can resubmit them and you can export (parts of) this history to an XML file to be interpreted by external systems (order management, calculation, etc.).

- *Orders* (part of the Views category **Sign & Display**). This view shows an overview of the status of all parts of a Job order that were processed by the *Gang Run Merger*. It helps to monitor orders where multiple graphics need to be printed and cut. This view is documented in the chapter on *Gang Run Printing for Sign & Display*.

Workflow Types

Kongsberg tables are used in many different types of production. When using Automation Engine in this workflow, we here categorize these workflows by how and which files you submit to the iPC:

- *Submitting single CAD files*. Each CAD file (ARD or MFG) becomes an item in iPC's **My Jobs** list.

- *Submitting nested layouts*. The iPC Job is a layout created by the Gang Run Printing module.

- *Cutting CDI Plates*. Typically done to cut DFS PlatePatcher plates (corrugated) or to produce staggered cut plates (rotative sleeves).
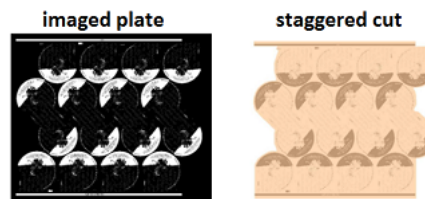
1.2. Submitting Single CAD Files

Concept

In this workflow, Automation Engine sends ARD of MFG files directly to the iPC. Each input file arrives as one job in the iPC My Job list.

This workflow is often used when producing packaging, POP material or box samples.
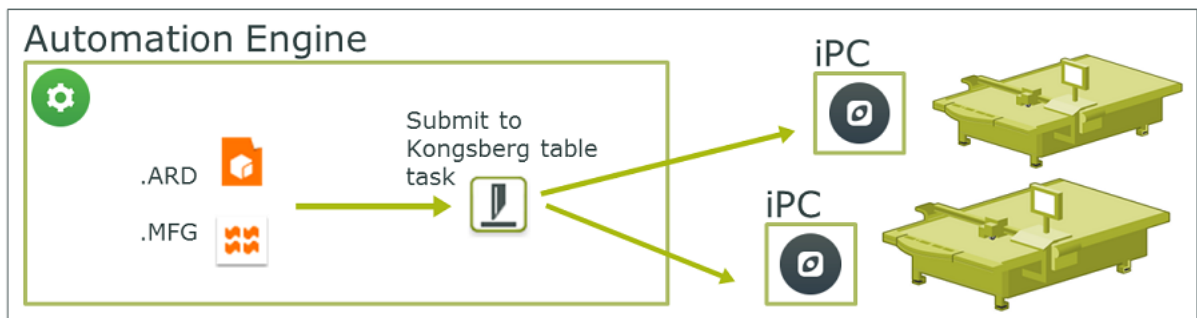
These are its main steps:

1. The ARD or MFG file may be created in ArtiosCAD or exported from Plato or i-cut Layout. The MFG may be the result of manual nesting done in those applications.
2. There may or may not be graphics involved:

    a. From such interactive applications or via an Automation Engine task, the graphics (PDF data) is exported as well and then printed. The printed sheet is made available at the Kongsberg table.

    b. When producing blank samples of a box or shape, there are no PDF data and the required material is available at the Kongsberg table.

3. The cutting file is sent to the iPC by using the **Submit to Kongsberg Table** task. You there choose the table, the amount of copies and other production parameters.
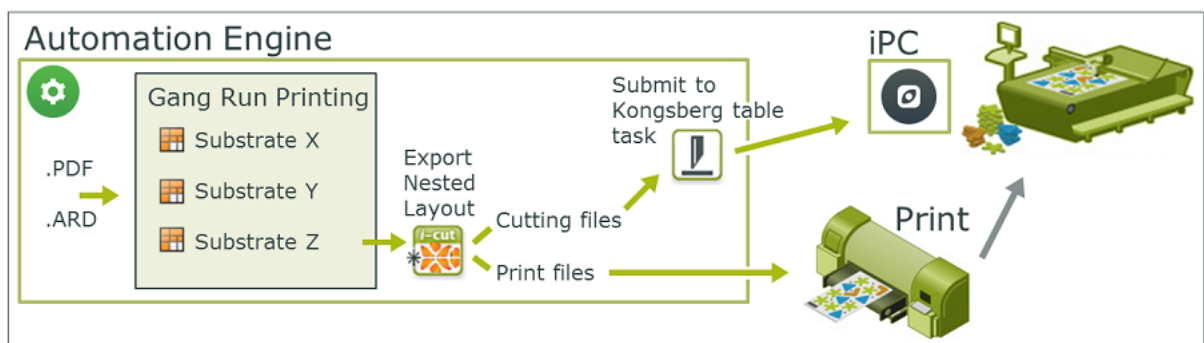
Main Workflow Steps

1. Submit ARD or MFG files to iPC. Learn more in *Submit To Kongsberg Table task* on page 17.
2. When successfully submitted, an entry appears in the *Table Queues view*.
3. The iPC operator places the printed or blank sheet on the table and starts the matching cutting job. An entry appears in the *Sheets View*.

1.3. Submitting Nested Layouts

Concept

This workflow merges files together before submitting them as one layout to the iPC. The merging is done by the Gang Run Printing merger. This merger can also make layouts where items are nested to optimize material usage.

This workflow is often used when producing signage.

Note: ARD cad files sent to this merger will only merge with other ARD files.

Main Workflow Steps

1. In the Gang Run Printing merger, set up merge queues per substrate, define how and when they can make layouts and how they should export the resulting nested layout.

Note: This tool and workflow is explained in the chapter *Gang Run Printing for Sign & Display*.

2. You then use the *Submit to Gang Run* task to send files to a substrate queue.
3. The substrate queue's output workflow needs to contain at least these tasks:

• The *Export Nested Layouts task* creates print files that are then printed (unless the layout is of ARD files) and it also creates *cutting files of the type "JDF (Kongsberg)"*.

• The *Submit to Kongsberg Table task* then needs to submit the cutting files to the Kongsberg table.

An example:
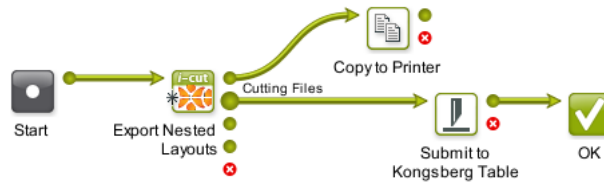
4. As soon as the JDF cutting file is submitted to the iPC, an entry appears in the *Table Queues View*.
5. The iPC operator places the print on the table and starts the matching cutting job. An entry appears in the *Sheets View*.

> **Tip:** To easily find which cutting job matches which print job,you can use the **i-cut Marks** in I-cut Layout to add a special barcode to the printout that contains the name of the cutting file. When the iPC operator then scans that barcode, iPC automatically loads the matching cutting job.

> **Note:** See a more detailed example of such a workflow at the end of this chapter in *Workflow Example* on page 21.

1.4. Cutting CDI plates

Concept

In this workflow you use a Kongsberg table to cut a flexo plate that you made on a CDI. This is often used when the flexo plate contains separations with a staggered cut or contains small parts of a DFS PlatePatcher workflow.

> **Note:** Learn more about using Automation Engine to automate your CDI workflow in the chapter *Flexo CTP Workflow*.
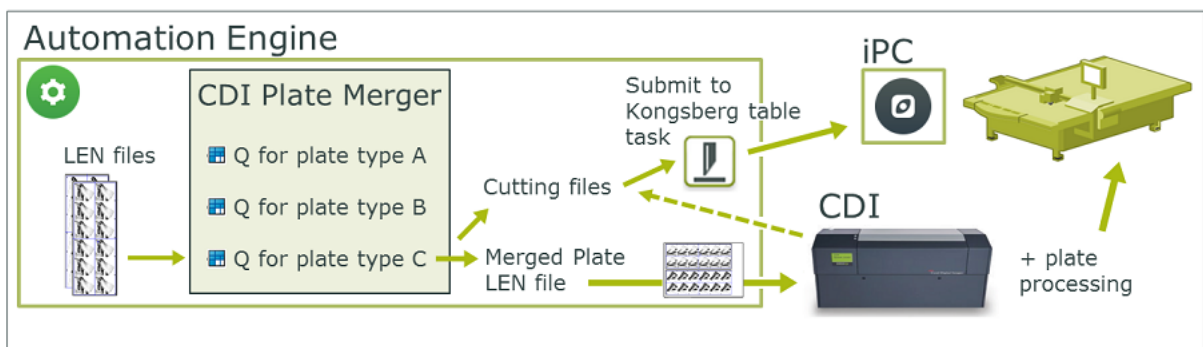
The output workflow of a *CDI Merge Queue* creates a special XML file containing the cutting instructions. When the CDI sends a signal that the (merged) plate was imaged, a workflow starts that *submits that XML file to the Kongsberg table*.

Main Workflow Steps

1. A RIP creates LEN files, one for each separation that needs to be imaged on the flexo plate.
2. If needed, LEN files can be processed using *specific Automation Engine tasks*.
3. They are then *submitted to a specific queue of the Plate Merger*. Selecting the option **Apply cutting workflow** triggers the generation of the cutting data further in the workflow.

   Note: The option **Apply cutting workflow** is also used as a grouping key in the Plate Merger.

4. When the **Merge Queue** decides on a layout, it starts a workflow that creates a **Merged Plate** LEN file. Now, as was requested when submitting its parts, also a cutting XML file is created.
5. The merged plate LEN file is submitted to the CDI.
6. When the CDI signals that the plate was imaged, the cutting XML file is automatically submitted to the Kongsberg's iPC (when this was so asked in the *CDI Plate Merger configuration*).

   Note: The flexo plate cutting workflow is also possible when the Kongsberg table is not known as a Device (i.e. its iPC is not on-line). Learn more in the description of the option 'Apply Cutting Workflow' in the *Submit to Plate Merger task*.

7. The flexo plate is post-processed and then moved to the Kongsberg table.
8. The cutting job is already in the iPC My Jobs list. The iPC operator loads the plate and starts the cutting.

2. Kongsberg Related Views

These views were introduced in *Workflow Overview and Types* on page 3. We here describe them in detail.

2.1. Devices (Kongsberg)

Tip: You can also open the view **Devices** as a Tool: Go to **Tools** > **Devices** to monitor and manage your devices in a separate window.

Adding a Kongsberg Device

Follow these steps to add a Kongsberg table in this view:

1. In Devices View, click on ⬚.
2. Select the category **Kongsberg Tables**.
3. In **Server**, enter the name of the computer or the IP address of the iPC workstation of that specific Kongsberg table.
4. Click **Add** to confirm. The status box of the newly created device appears.

Note: Adding a Kongsberg device requires a license per device.

Information and functionality
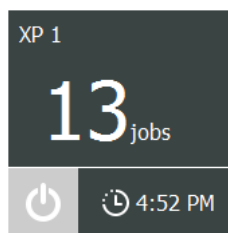
The device status box shows:

- The **name of the device**. By default this is the name of the iPC workstation. Open the **Info** panel to change it to a custom name.

- The **amount of jobs in its queue**. This is the amount of jobs in iPC's **My Jobs** list (processing and waiting).

  Note: These jobs could have been added via Automation Engine or manually by the iPC operator.

- A **device status icon**.

  - ⬚ : Retrieving the status.

- ⬜ : Offline, there is no connection with iPC computer (switched off, network problem)

  Note: Technically this means that Automation Engine can not contact the "Kongsberg Queue Server" (KBQS).

- 🔴 : The device is online (computer can be accessed, KBQS is running) but the iPC application is not started.

- ⬜ : Idle, the table is online and ready to produce (KBQS is running and iPC is started).

- ⬜ : Producing. One job in the queue is in status 'started'.

- ⬜ : Trying to connect to the device (to the KBQS service on the computer).

- The **Estimated time** when the current job load will be finished (how long the device is scheduled to be busy). This time includes the manual table operations that are needed between jobs.

  Note: This setup time is configured in iPC: Go to **Edit** > **Options** > **Estimation Settings**.

Double click a status box to open the device's **Info** panel.

Right-click a status box to choose one of these options:

- **Info** (or press 🔵). This dialog shows details about the device (version, settings, etc.). You can add a **Description** to illustrate or help identify this device.

- **Delete** (or press 🚫). You will be asked to confirm.

  Note: Deleting a device will not remove the related entries in the *Sheets View*.

- **New Device...**. An alternative to clicking 📋.

2.2. Table Queues

Concept

This view shows the content of the **My Jobs** list of the iPC of the Kongsberg tables that you configured in the *Devices* view.

You can see these queues in a time line view or in a list view.

The total number of jobs is mentioned in the bottom bar.

When a table is not on-line, an 🔵 icon appears behind its name and the corresponding queue will be shown empty. The view updates as soon as the table is on-line again.

When selecting a job (click or use arrow navigation), the right pane shows a preview and its key properties. When ARD or MFG files were submitted, a preview will only be available after the job was verified or saved in iPC.

This view is independent from whether the Pilot is in **Container** mode or in **Selected Job** mode (it always shows the complete queue).
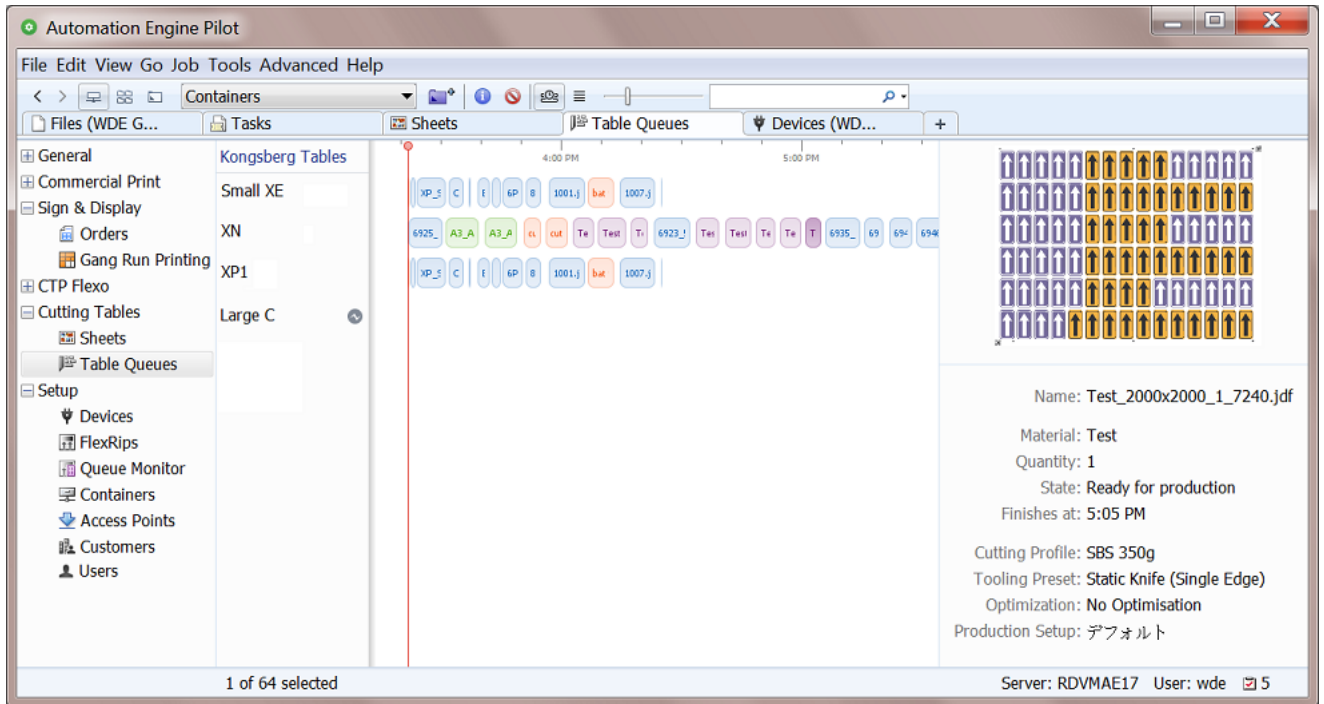
- **Time Line View**

    - The red vertical line represents the current time. After selecting an entry, you can use your keyboard's arrow buttons to pan over the time axis to see details of the other scheduled jobs in that queue.
    - When a job is being processed on the table, the time line view shows that job entry moving gradually to the left of the red line. When the job is completely produced on the table, the entry will have moved completely to the left side and disappear from this view once the iPC operator closes the job (confirms that all copies have been produced).
    - The default color of a job entry is blue. Learn about conditional coloring below.
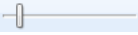   - The size of a job entry reflects the job's estimated duration. iPC can only deliver this info when the job is **Ready for production**. Learn about the different statuses below.

        When an iPC operator still needs to prepare that job in iPC, its estimated duration is not available yet. It is then shown with a default width (corresponding to 10 minutes) and filled with a striped pattern. See this example where the entry on the right is not ready yet: .

    - Use the slider to increase or decrease the size of the queue entries.

    - The space between each entry reflect the setup estimation time as configured on that iPC (**Edit** > **Options** > **Estimation**).

    - When you use the filter, the jobs that don't match the search criteria are dimmed.

    - When the iPC operator starts a job that was not shown as the first one in this (and his) queue, then that job automatically re-positions itself to the front of the queue.

- ≣ **List View**

  This view makes it easier to read details and to sort entries before selecting them. Most of the information is retrieved from iPC.

  Note: As in many views in the Pilot, you can

  - re-arrange columns by dragging their title to a new position
  - sort them by clicking on a column title
  - right-click a column title and choose to **Hide** this one or any other. In the list that appears, select **Select Columns...** if you want to change or re-arrange multiple items.

  - use filters and optionally save them as a *Smart View*.

  - define your preferred unit in **Edit** > **Preferences** > **Units**.

  The shown units follow the choice you made for this Pilot in **Edit** > **Preferences** > **Units**.

  Possible statuses:

  - ⚠ **Waiting for verification**: This is shown when status in iPC is "Pending for estimation" or "Check if ready for production". *

  - ✂ **Not ready for production**: For example the job was submitted but iPC could not determine the cutting line in the PDF because it was set in the wrong spot color.

  - ▱ **Ready for production**: In the queue to be produced.

  - ▶ **Started**: Being produced.

  - ⏸ **Paused**: For example because a new sheet is needed before continuing the job.

  - ⏸ **Suspended**: The job was not (completely) done yet, but another job will be produced first.

Conditional Coloring

In Time Line view, coloring the entries helps to get a quicker understanding of the queues. You could for example set a color per type of **Material** or per **Tooling Preset**. See an example in above screenshot.

Follow these steps to color entries (for all available Kongsberg tables):

- Right-click the name of any of the tables and choose **Conditional Coloring**.

- **Add** one or more rules.

- Use **Move up/down** to control the order in which they are executed. For example, when the first rule colors some entries red, then the second rule can only affect the other entries, etc.

Deleting, Moving and Splitting Jobs

Tip: Selections that you make remain active when you switch the ▦ / ☰ view modes. An example: In the ☰ List view mode, sort per column and then make a multiple selection. Then switch to the ▦ Time Line view mode where the selection is kept and then move the selected entries to the front of the queue.

⚠️ **Attention:** There is no 'undo' for any of these functions.

Note: When making these changes, both the related Views in the Pilot and the list of jobs on the respective iPC stations update automatically.

Tip: You can also execute below mentioned actions on selections that you made with the filter.

When entering a search text in the filter, the search is done on the job's **Name** and **Material**.

- **Deleting Jobs**. Select and press '**Delete**' (or right-click and choose '**Delete**') to delete jobs from the queue. This also deletes them from the iPC job list. You will be asked to confirm.

  Note: When a job is open in iPC, it cannot be removed.

  In the *Sheets view*, the deleted jobs will show up as ▣ '**Aborted**'.

- **Moving a job to a different position in the same queue**. You can re-arrange the queue by using drag and drop, even on multiple selected jobs. This also updates their order in the iPC jobs list.

  To move a job to the front of the queue, right-click the job and choose '**Cut Next**'.

- **Moving a job to a different queue**. When a table needs to undergo maintenance, or when you manually want to balance the production load, you can drag and drop one or multiple queue entries to another table queue.

  Note: When a job is open in iPC, it cannot be moved to another queue.

  Note: This function requires an iPC version higher than 2.0.

- **Splitting a Job**. Another way to manually balance the workload of your tables, is to split a job. A job that requires a large number of sheets to be produced, can so be spread over multiple tables.

  Follow these steps:

  1. In the queue (both in List or in Time Line view), right-click a job and choose **Split Job...**.
  2. The '**Split Job**' dialog opens. By default, the job will be split in two parts each having half of the total number of copies.

     - Click **+** to split into more parts.

     - Click **-** to remove the selected part.

     - Slide the **resize control** (the small circle) to the left or right to modify the number of copies of those parts.

     - Enter the number of **Copies** in the edit field. Press '`Tab`' to confirm the value. Press '`Enter`' to **Split** the job and close the dialog.
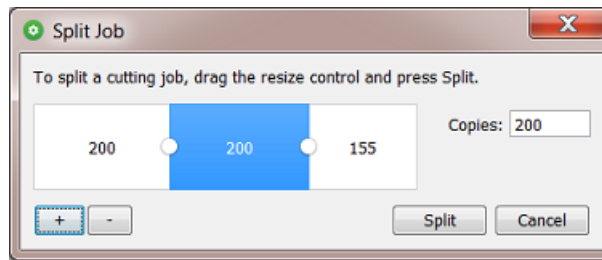
3. Click **Split** to confirm and close the dialog.

Note: When a job is open in iPC, it cannot be split.

2.3. Sheets

Concept

The Sheets view gives a historical overview of all jobs that were produced on your Kongsberg tables. It shows all closed jobs in iPC, both those successfully finished and those aborted during cutting.

Each sheet is a row. Each entry gives information about a cutting job and how it was processed on the table: start and finish time, number of copies produced, table name etc.

This view does not do live updates. To see updates of newly finished jobs, refresh the view via **View** > **Refresh** or press **F5** or **CMD-R** .

When a table was offline when it finished a job, the sheet entry will show up in this view once the connection has been restored.

Entries in this view are cleaned up automatically according to the rule set in the *Configure tool item for Devices database*.

The details pane on the right shows a preview and some key properties of the selected sheet (drag its left edge to enlarge it).

The bottom bar indicates how many sheets there are (total or selected or filtered).
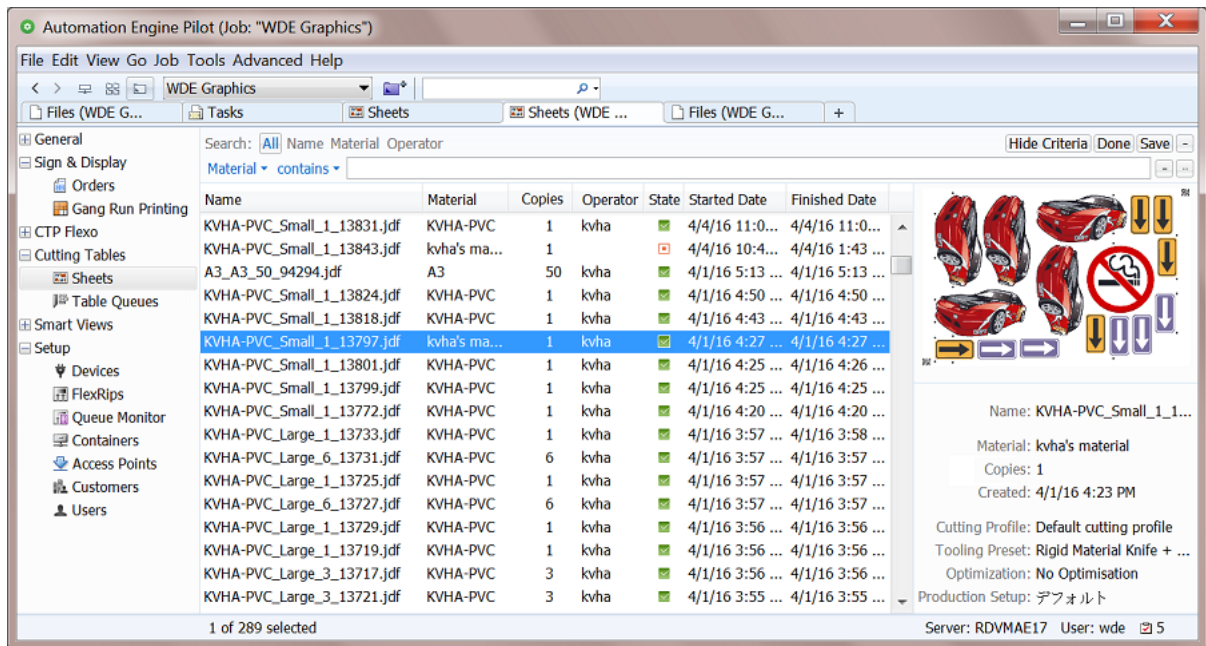
Note: As in many views in the Pilot, you can

- re-arrange columns by dragging their title to a new position
- sort them by clicking on a column title
- right-click a column title and choose to **Hide** this one or any other. In the list that appears, select **Select Columns...** if you want to change or re-arrange multiple items.

- use filters and optionally save them as a *Smart View*.

- define your preferred unit in **Edit** > **Preferences** > **Units**.

Columns

- **Name**. This is the name of the cutting job.

  Note: When the name ends with `.jdf`, this means that this job was created by the *Submit to Kongsberg table* task. Otherwise (where the name ends with `.acm, .cut, .ard...`), this means that the job was manually added to iPC's My Jobs list or that a job entered by the task was changed in iPC before being produced.

- **Customer**: When the sheet was created via a gang run queue that received a Customer ID when files were submitted, then the corresponding customer name is used. When an ARD or MFG was directly submitted to a Kongsberg table, the customer name is extracted from the information inside the ARD or MFG file.

- **Customer ID**: This is the ID that was specified in the *Submit to Gang Run task*. When jobs with different customer IDs are nested on one sheet, the sheet's customer ID will be a concatenation of all customer IDs.

- **State**: Final state of the job: ☑ finished or ☑ aborted.

- **Operator**: IPC user who started the job.

- **Table Name**: Name of the device on which the job was produced.

- **Material**: Name of the material used to produce the job.

- **Copies**: Total requested number of copies for this sheet/layout (as specified in the '*Submit to Kongsberg table*' ticket or as set in iPC).

  > **Note:** *This example of a workflow using Gang Run* helps to understand the difference between quantities and copies.

- **Copies Produced**: Number of successfully produced copies of this sheet/layout.

- **Copies Rejected**: Number of unsuccessful copies while producing this job.

- **Estimated Duration**: Estimated time to produce all copies of the job.

- **Created Date**: Time/date when the job was submitted in the table queue (ISO 8601 UTC).

- **Started Date**: Time/date when the table started cutting.

- **Finished Date**: Time/date when the job was finished or aborted.

- **Media Height / Width**: Height and width of the used sheet.
  - When the job was submitted to iPC by Automation Engine, then this is the media size as specified in the submitted JDF (the sheet size of gang run layouts, the sheet size from submitted MFG files, the blank size of submitted ARD files)
  - When the job was added by iPC, then iPC sets the media size.

- **Mapping Preset**: Used to import the job on iPC.

- **Optimization**, **Cutting Profile**, **Production Setup**, **Tooling Preset**: Attributes used to produce the job.

Launching Tasks

When you right-click an entry, you can choose to launch a **New Task** on that entry.

- When you want to produce a sheet again, choose the *Submit to Kongsberg task* and define its options. Choose "**From Input File**" when you want a value to be taken from the input JDF, it will then be the same as the value used before.

- The *Export Kongsberg Cutting History task* does not base the data it exports on the entry that you selected but only on the options that you set in the ticket. This task does require an input file however, but does not use it for its output. This also means that there is no need to launch this task from this view.

- Choose **Other...** to launch another task type. Once you have launched it, this task type then also appears in the initial list.

  > ⚠️ **Attention:** These tasks, with exception of the *Export Kongsberg Cutting History task*, use the sheet's JDF file as input file (even when the sheet Name mentions another file format0. These JDF files are present in the **Media Root Folder** as defined in the *Configure tool item for Device Databases.*.

2.4. Orders

The Orders view is part of the Views category **Sign & Display**. This view is documented in the chapter on *Gang Run Printing for Sign & Display*. Find a direct link *here*.

3. Kongsberg Related Tasks

3.1. Submit To Kongsberg Table task

Concept

This task submits the input file to the **My Jobs** list of the chosen iPC (Kongsberg table). This also creates an entry for this iPC job in the *Table Queues view*.

> **Note:** This page is part of a *separate chapter on using Automation Engine in a Kongsberg workflow*. We advise to first learn about its concepts and workflow types in this *intro*.

In iPC, the order of the submitted jobs is decided by the priority of this task, as was selected in the ticket: **Low**, **Normal**, **High** or **Immediate**. Submitted jobs with a same priority are in iPC sorted by their due date.

Input File Types

- **ARD or MFG files**. One iPC job is created per input file. The task wraps the ARD or MFG in a JDF file before sending it to the iPC. Learn more about this workflow in *Submitting Single CAD Files* on page 4.

  > **Note:** The media size of the JDF is set to the sheet size of the MFG file or to the bounding box of all cut lines of the ARD file.

  When available, the board description, grain direction and customer info is read from the ARD or MFG file and used in the iPC job.
- **JDF for digital cutting**. This type of JDF file is created in these two cases:
  - By the **Export Nested Layouts** task (used in the *workflow started by a Gang Run Substrate queue*).
  - Or by resubmitting a cutting job from the *Sheets view*.
- **XML cutting request**. This file is created by the CDI Plate Merger and describes how the flexo plate should be cut. *Automation Engine's workflow for CDI Imagers* can submit such an XML to the Kongsberg table at the moment it is informed that the CDI plate was imaged. Learn more in *Cutting CDI plates* on page 6.

Settings

- **Kongsberg Table**: Select a table (iPC) form the list of *devices* that you configured earlier.

  > **Note:** The submitted job will also enter the queue even when the selected table is offline at that moment (see its status in *Device view*).
- **Kongsberg Job Name**: Define the name of the job as it will appear in the **My Jobs** list of the chosen iPC.

- **Due Date**: You can set a due date for the job. This time will then be mentioned for that job in iPC. You can choose an absolute or relative time.

    When you select a due date "**From Input File**":

    - When the input file is an ARD or MFG, or when the task is started from the *Sheets view*, then the job is submitted without due date.

    - Otherwise the value from the input JDF file is used (the cutting file type "JDF for Kongsberg" created by the *Export Nested Layouts task*).

- **Copies**: Define the number of sheets to cut. When you keep the default "**From Input File**", this number will be taken from the input file's attributes. When no such information is available, the amount will be 1.

    Note: When the task is started by resubmitting it from the *Sheets view*, "**From Input File**" then re-uses the previously used value (as present in the input JDF file).

- **Material**, **Mapping Preset** and **Cutting Profile**: Click ▤ to select the wanted resource from the list. This list is automatically updated with the resources you created in iPC.

    Note: When you here type in the name of a resource that does not exist, it will show up in iPC's **Job Info** with this warning icon: ⊕ .

    Note: Any changes that you do in iPC to a Job's resources are communicated to Automation Engine. The updated settings automatically show up in the *Sheets* and *Table Queues* views.

3.2. Export Kongsberg Cutting History

Concept

This task exports information about finished cutting jobs to an XML file. External systems can use these XML reports to get job status information or calculate production statistics.

Note: This tasks needs an input file. However, the only use of this input file is to resolve the SmartName `[File]` in the setting **File Name**.

You can launch this task manually or as part of a workflow. An external system can decide to launch it itself by using a *Web Service Access Point*.

Note: The task always runs outside of a Job context, even when launched from within an Automation Engine Job.

Settings

- **Output in**: When no folder is specified, the file is written in the root folder of the `ExampleJobContainer`.

- **File Name**: Use SmartNames to define the name of the output XML. When that XML already exists, it is overwritten and the task ends with a warning.

    - `[File]` results in the name of the task's input file.

- `[File Number]` is relevant when you use the advanced option **Records per File** (see below).

- In **Export history records that match the following criteria**, create one or multiple rules that specify which kind of data should be exported.

  This filter tool is the same as used to create view filters in many places in the Pilot. See an example on filtering *here*.

- **Advanced...**. These options define the structure of the XML.

  - **Columns**: Click on 🗐 to select which columns you want to export into the XML file. By default, all columns are exported.

    Note: When using a SmartName, it needs to resolve to the internal name(s) of the column(s). To find these internal names, right-click in the **Columns** field, choose **Copy Parameter Value** and paste this in a text file.

  - **Sort By**: Select a column type by which you want to sort the jobs.

  - **Order**: Select the order of the columns.

  - **Records per File**: Define the maximum of records that the XML file may contain. When there are more records than that number, extra XML files are created and they get an extra number at the end of their name (using the SmartName `[File Number]`).

  Example

```
<?xml version="1.0" encoding="UTF-8" ?>
- <!--
    Generated by Automation Engine 16.0.0 ALPHA - Build 622 - Mar 23 2016
    on host RDVMAE17 at 2016-03-24T15:28:04.458Z
  -->
- <CutJobs>
  - <CutJob>
      <Operator>Administrator</Operator>
      <Status>FINISHED</Status>
      <CreationDate>2016-03-08T13:39:15.773Z</CreationDate>
      <AmountProduced>1</AmountProduced>
      <Optimisation>SampleMaking</Optimisation>
      <Amount>1</Amount>
      <ProductID>Test</ProductID>
      <Mapping>Default mapping</Mapping>
      <FinishDate>2016-03-21T07:38:16.018Z</FinishDate>
      <CuttingProfile>SBS 350g</CuttingProfile>
      <Name>Test_2000x2000_1_7322.jdf</Name>
      <StartDate>2016-03-21T07:38:04.627Z</StartDate>
      <TableName>rdvmae14</TableName>
      <EstimatedCuttingTime>587</EstimatedCuttingTime>
      <ToolingPreset>Rigid Material Knife + Crease</ToolingPreset>
      <IDFields><?xml version="1.0" encoding="UTF-8"?><IdentificationFields></IdentificationFields></IDFields>
      <JobPartID>AmericanCars-Test_2000x2000_1_7322</JobPartID>
      <MediaY>2000.0</MediaY>
      <MediaX>2000.0</MediaX>
      <ProductionSetup>Multi-zone</ProductionSetup>
      <EstimatedBeforeFirstCopy>29</EstimatedBeforeFirstCopy>
      <ID>57821cfe-ef3b-4a5f-a634-9b3712df0ae6</ID>
      <JobID>AmericanCars</JobID>
      <EstimatedAfterLastCopy>58</EstimatedAfterLastCopy>
    </CutJob>
  + <CutJob>
  + <CutJob>
  + <CutJob>
  ...
```

Note: Dates and times are described in the format of ISO 8601 (YYYY-MM-DDThh:mm:ssTZD).

Note: The elements **JobID**, **JobPartID** and **ProductID** do not relate to Automation Engine's Job or Product concepts, but to terminology in iPC.

4. Workflow Example

This example helps to clarify terms like quantity, copies, layouts, order, JDF and sheets.

We here illustrate a workflow where the Gang Run mode creates layouts of what needs to be printed and where the printed sheets are then cut on a Kongsberg table.

Note: This example workflow does not include steps like creating an Automation Engine Job, arrival and preflighting of the graphics, an approval stage nor feedback to a business system.

Each step provides links to pages describing the used features.

4.1. Step 1 - The Order

Your sales department confirms a production order for 50 large Esko logos on thick PVC material.

A PDF was delivered with a correct trim box. The PDF is small and needs to be printed 10 times bigger.

4.2. Step 2a - Submitting the PDF to the Gang Run

The PDF with the Esko logo is submitted to a gang run queue, requesting a **Quantity** of "50". The Orders view immediately shows this new entry.

These steps are needed:

1. *Create a substrate queue* for the requested PVC material. Add available sizes and define its nesting settings.
2. Create the queue's output workflow. You minimally need these steps and options:

- In the *Export Nested Layouts* step, set the option **Save Cutting Files** to "**JDF File (Kongsberg)**".

- The output pin for the cutting files continues to the Submit to Kongsberg Table step.

- In the *Submit to Kongsberg Table* step, make sure you keep the option **Copies** to "**From Input File**".
3. *Attach the created workflow* to the substrate queue.
4. In Files view, select the PDF and open a *Submit to Gang Run* ticket.

- Define a **Quantity** of 50 and **Scale** the file to 1000%. Request that the cut path will be created from the file's trim box.

- In the *Extra* tab, enter a logic **Order ID**.

5. Launch the **Submit to Gang Run** task.

4.3. Step 2b - First Appearance in the Orders View

As soon as the PDF is submitted to a substrate queue, a new item appears in the Orders view. This initial status shows that all of the requested quantity is still "In Gang Run".

Layouts are usually calculated quickly, after which the status changes again, which is why this status is only visible briefly.
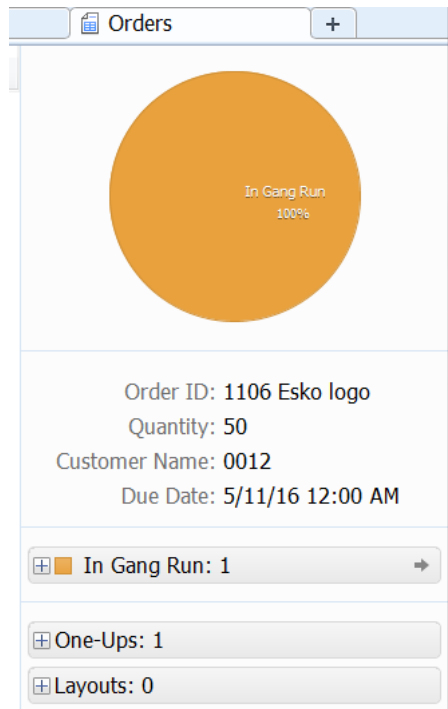
4.4. Step 3 - Quantity vs. Layouts

In our example that requests a **Quantity** of 50 logos, the substrate queue decides, based on its substrate sheet size, to create 2 **Layouts**:

- 1 layout PDFPLA file with 8 logos, representing the sheet that needs to be printed 6 times (totaling 48 logos).
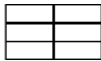

- 1 layout PDFPLA file with the remaining 2 logos, representing the sheet that needs to be printed 1 time.

4.5. Step 4 - Files Created

The output workflow of the substrate queue starts with creating the files that are needed to print and to cut this order.

The Export Nested Layouts task creates:

• 2 PDF files (one with 8 logos and one with 2 logos)
• 2 JDF files and 2 cutting files. Each JDF includes a reference to its own cutting file:

   • one describes how to cut a sheet with 8 logos

   • one describes how to cut a sheet with 2 logos.

In the Orders view, you can see the new status "in Output Workflow" and the names of the created files:
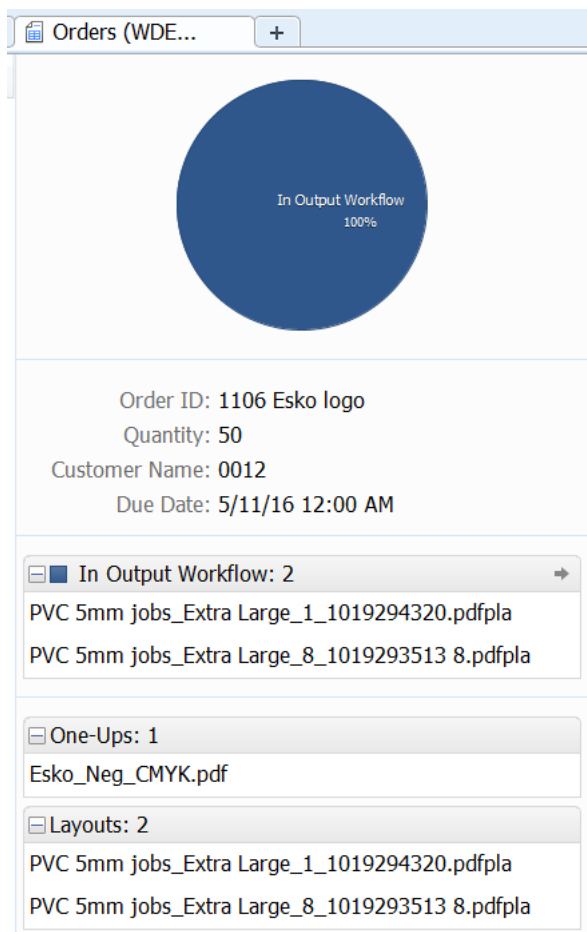
## 4.6. Step 5 - Each JDF is a Job entry in the Table Queues view

A JDF (Job Definition Format) file describes what needs to happen and also assures the bidirectional communication between Automation Engine and the iPC.

The output workflow ends by submitting the 2 JDF files to the Kongsberg table.

Two job entries immediately appear in the *Table Queues* view.

In below screenshot, see how one job entry looks much larger than the other. The selected entry needs to cut 8 copies of the PVC "sheet" containing 6 logos and will therefore take much longer to produce than the other one:
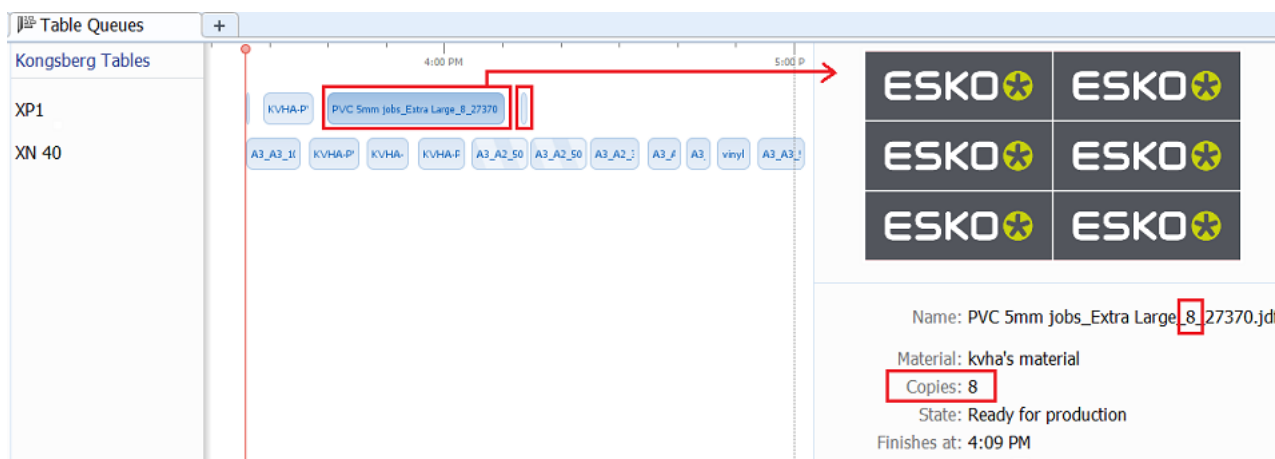
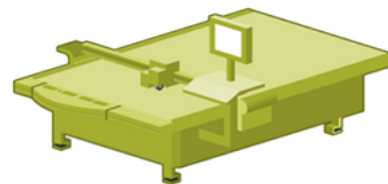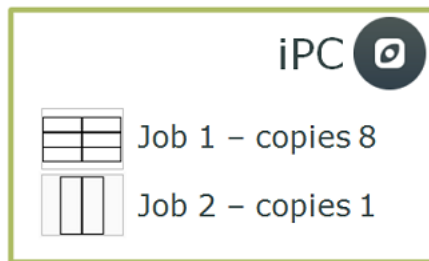## 4.7. Step 6 - Logos are Printed and Moved to the Table

The 2 print PDF files created by the Export Nested Layouts task are printed.

The 9 sheets (8 copies and 1 copy) are made available near the Kongsberg table.
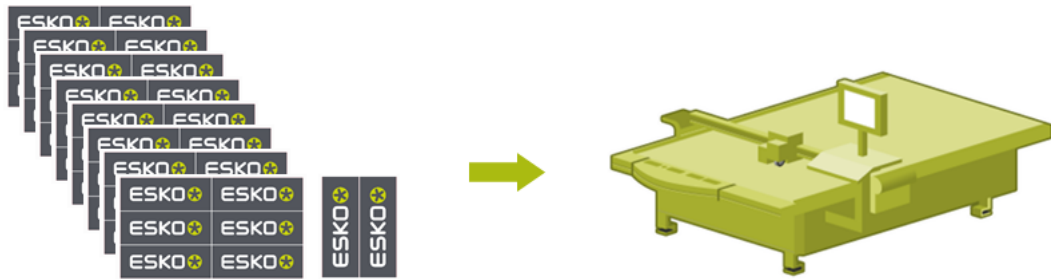
4.8. Step 7 - The iPC Operator Produces the Jobs

The iPC operator places the printed PVC sheet on the table and starts the matching cutting job for that type of sheet.

4.9. Step 8 - The Sheets View shows the Production Results

When the iPC has finished producing a job, this job appears in the Sheets view.

In below screenshot, the Sheets view shows that both jobs were produced and also shows how many copies of that type of sheet were produced.