eFLOW Collect

User Guide

Version 5.2

Contents

About the Collect station

The purpose of the Collect station is to import image files from external devices, create eFLOW collections and load them to the eFLOW workflow. The Collect station is an eFLOW entrance point, and is never preceded by other stations in the workflow.

Collect is built into the eFLOW workflow using the Design module. The eFLOW installation includes sample eFLOW applications with ready-made workflows that include the Collect station.

Collect imports images into eFLOW as a sequence of three steps:

1. Input images from defined locations
2. Process the images to create collections
3. Send the collections on to the workflow

Collect provides a configuration window in which you can control various aspects of the station's operation, such as which file types are input, how collections and forms are separated, and how images are enhanced to improve recognition quality. See Configuration for more information.

Collect can run in standby mode or in manual mode. The mode can be determined by activating or deactivating the **Standby** option in the main menu.

In standby mode, Collect gets, processes and sends collections automatically. In manual mode, the user performs the actions of getting, processing and sending collections manually by clicking the appropriate buttons or menu commands.

Manual operation

This section explains how to operate the Collect station manually.

1. In eFLOW Launch or LaunchPro, select the application you want to work with, then select the Collect station.

   The Collect main window opens.
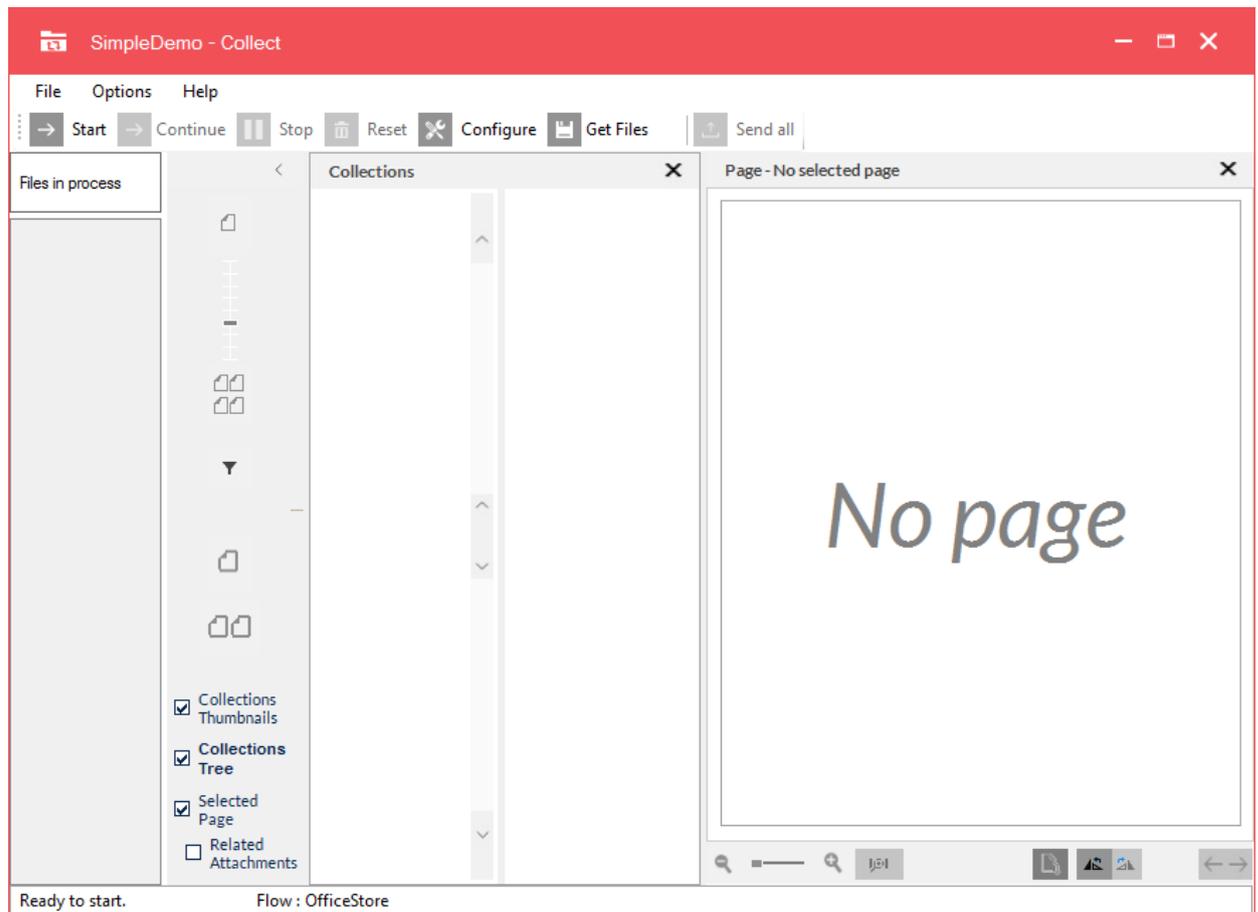
2. In the **Options** menu, make sure that **Standby** is <u>not</u> activated.
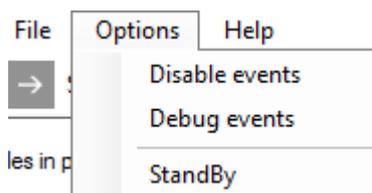
3. Click the **Get Files** button.

4. Navigate to the folder where the files are stored, and select the files.

   The eFLOW SimpleDemo application provides sample TIF files that you can use. They are located in the installation folder in the subfolder *…\Sample Applications\SimpleDemo\Images*.

   The selected files are displayed in the **Files in process** pane.

5. (Optional) At this point, you can put files on hold or delete them. Right-click and select the appropriate menu entry.
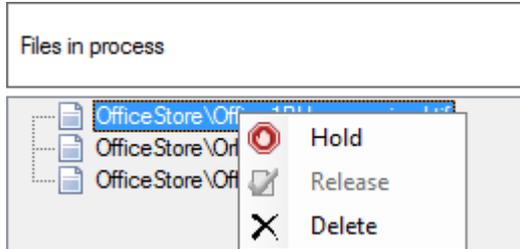
Putting files on hold prevents Collect from processing the files. You can release held files to enable them to be processed.

You can only delete one file at a time. If you want to remove all files, click the **Reset** button on the toolbar.

6. Click the **Start** button.

Collect creates collections from the image files and displays these collections.

7. (Optional) If the Organize module is integrated in your Collect station, you can rearrange collections, forms and pages, or make modifications to forms and pages. See the *Organize User Guide* for more information.
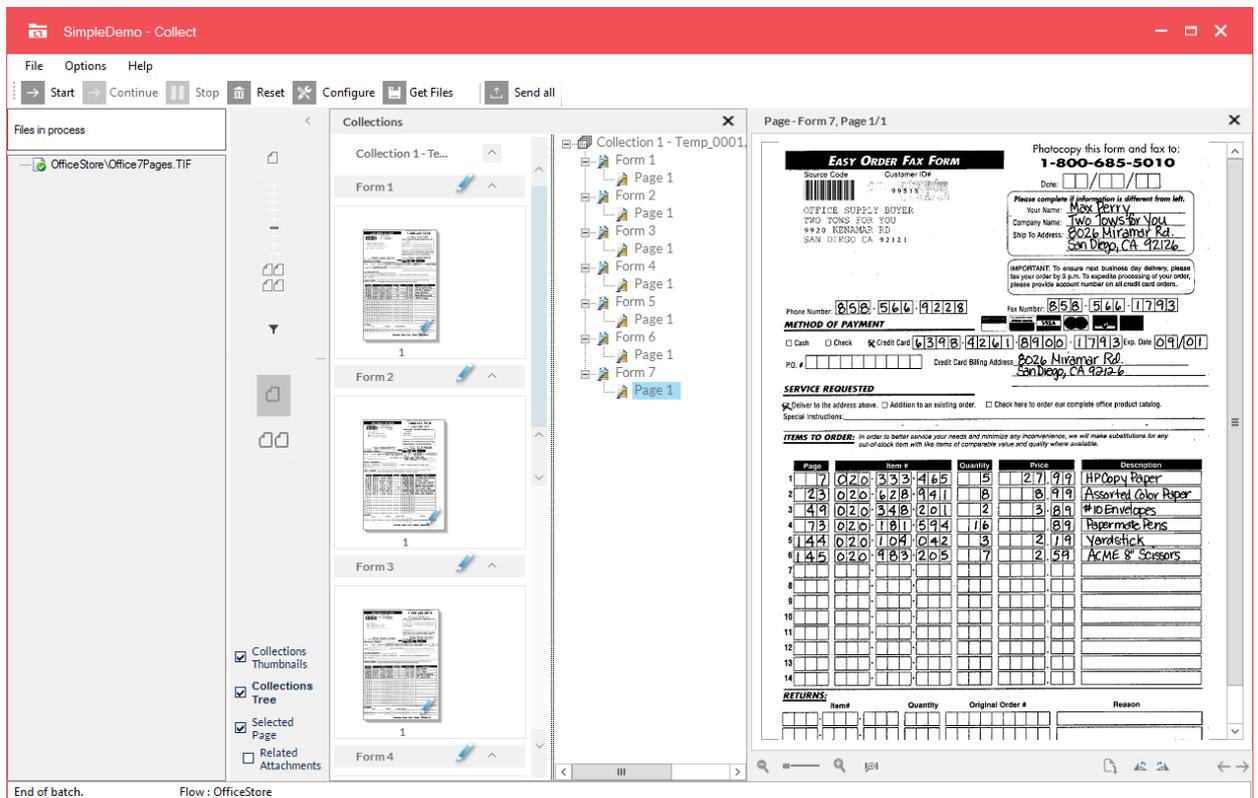
8. Click the **Send All** button to send the collections into the eFLOW workflow.

Standby operation

This section explains how to operate the Collect station in standby (that is, automatic) mode.

1. In eFLOW Launch or LaunchPro, select the application you want to work with, then select the Collect station.

    The Collect main window opens.
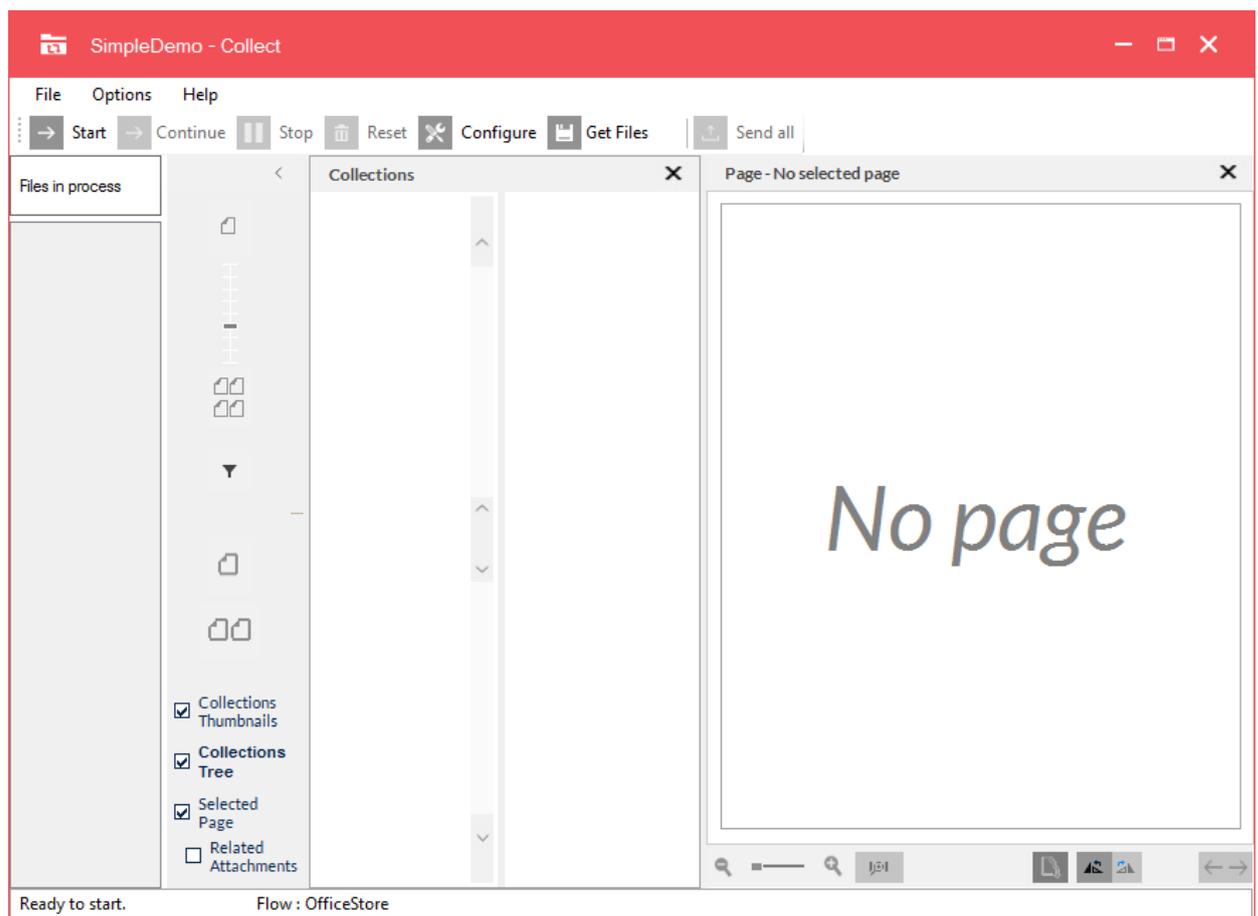
2. Define the locations in which Collect should look for files:

    a. Click the **Configure** button .

    b. In the configuration tree, click the **Config** entry under the flow you are configuring.

    c. In the **Search Paths** box, type the paths of the locations, one per line. To move to a new line, click with the mouse or press the D*OWN* arrow key on the keyboard; pressing the E*NTER* key does not move to the next line.

> **Note:** Collect automatically inputs files it finds in these locations. Collect only inputs defined file types from the search paths. The default file type is TIF. If you want to input other files types, you must define these in the configuration. See File types for more information. You may also want to define separators to indicate at which page a collection or form ends and the next one starts.

    d. Click the **OK** button at the bottom of the **Configuration** window to save your changes.

3. In the **Options** menu, make sure that **Standby** is activated.
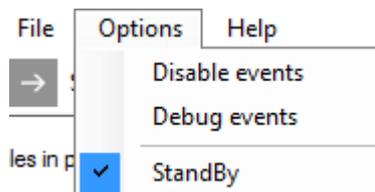
4. Click the **Start** button.

Collect automatically starts getting files from the search paths and places them in its temporary file storage. It then immediately adds these files to collections and sends them onwards to the eFLOW workflow. It also automatically applies any defined settings for separators and image enhancements.

This work cycle continues as long as there are input files in any of the search paths, and as long as you do not click the **Stop** button.

Configuration overview

This section provides an overview of the Collect station configuration.

Server and client configuration

Collect can be configured with a server configuration and an almost identical local configuration. The local configuration is saved on the client, that is, the computer on which the station runs. Providing separate configurations for the server and clients enables you to provide each Collect station with a default configuration, and then make individual changes for each station, as required. You make the server configuration in the WorkFlow Designer in the eFLOW Design module. You make the local configuration though the **Configuration** window of each station.

Most server settings can be overridden locally. Those that are intended to retain their server settings are displayed read-only in the client when you open the **Configuration** window.

You can reset the client configuration to the defaults by clicking the **Reset** button in the client's **Configuration** window, or by deleting the XML configuration file for the eFLOW application in the *AppData\Configuration folder*, for example:

C:\ProgramData\TIS\eFlow 5\AppData\Configuration\SimpleDemo.XML

For more information on the server configuration see the *Design User Guide*.

Configuration window

To open the **Configuration** window, in the Collect station, click the **Configure** button , or select the menu item **File > Configure**.
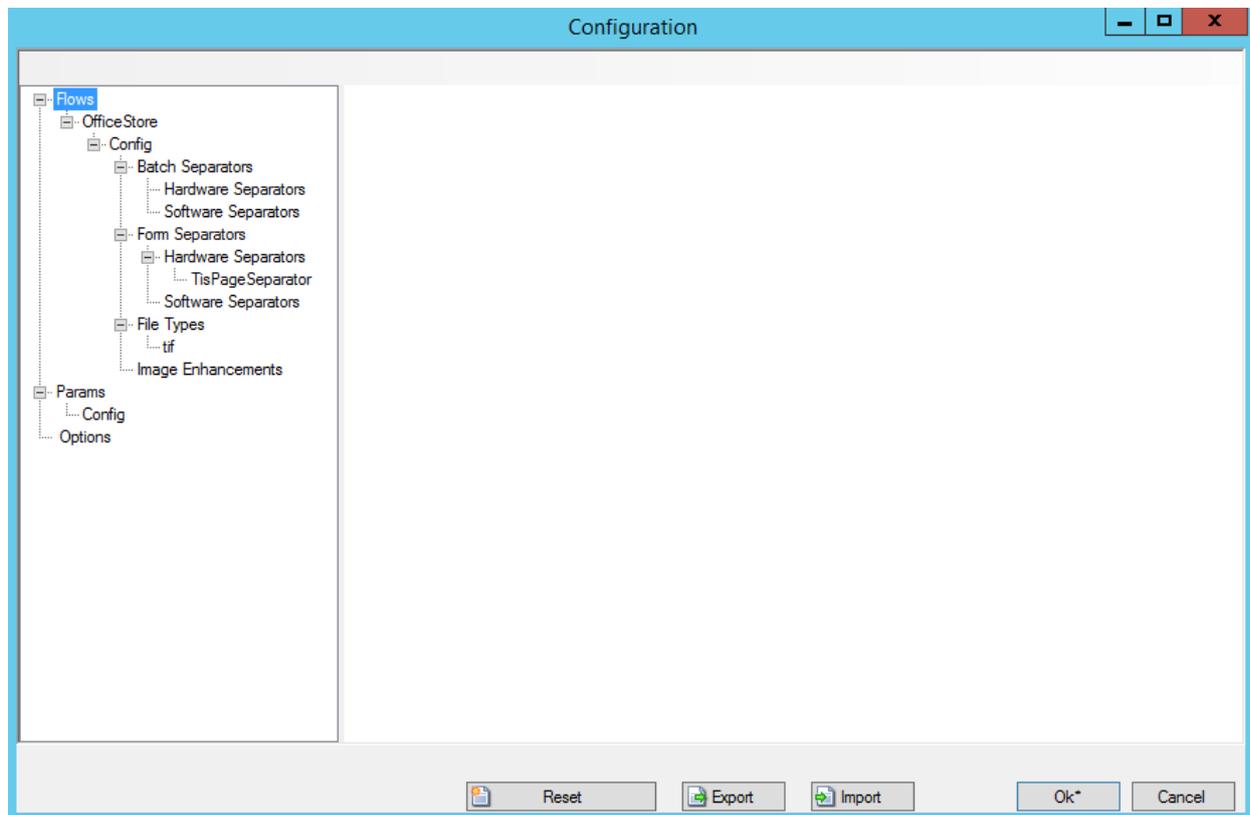
The configuration settings are displayed in a tree, with the following main entries:

Entry	Description
Flows	Lists all flows defined in the eFLOW application. You can provide a separate configuration for each flow, using the following subentries: **Batch Separators**: Enables you to define hardware and software separators to indicate at which page one collection ends and the next collection starts. **Form Separators**: Enables you to define hardware and software separators to indicate at which page one form ends and the next form starts. See Separators for more information. **File Types**: Defines which image types Collect imports, and which output file types are created from each input image type. See File types for more information. **Image Enhancements**: Enables you to apply enhancement filters to improve the quality of the input images. See Image Enhancements for more information.
Params	Global parameters that are relevant to all flows. See Parameters and options.
Options	Global options that are relevant to the user interface. See Parameters and options.

Use the buttons at the bottom of the **Configuration** window to save, import, export and reset the configuration.

Button	Description
Reset	Resets all configuration values to the default values defined on the server.
Export	Exports the current configuration to an XML file.
Import	Imports a saved XML configuration file.
OK	Saves all changes and closes the **Configuration** window.
Cancel	Discards all changes and closes the **Configuration** window.

Flow settings

The general settings for a flow are displayed when you click on the flow name in the configuration tree. These settings are defined on the server side, that is, in the Design module, and cannot be changed in the client configuration. See the *Design User Guide* for an explanation of these parameters.

Flow configuration settings

To configure the search paths and other settings for a flow, in the configuration tree, click the **Config** entry below the flow name.

Setting	Description
Search paths	Add the paths to the locations where Collect should look for files when in standby mode. You can add any number of paths, but only one per line. To move to a new line, click with the mouse or press the DOWN arrow key on the keyboard; pressing the ENTER key does not move to the next line. Collect automatically inputs files it finds in these locations. Collect only inputs defined file types from the search paths. The default file type is TIF. If you want to input other files types, you must define these in the configuration. See File types for more information. There is no default setting; in a fresh eFLOW installation, no search path is defined.
End of Batch on EOF	Input files can contain multiple images. This setting specifies whether Collect concludes an entire collection once it has input the final image in a file. ☑ Checked (default): A collection is concluded by the final image in a file. ☐ Cleared: Collect continues to add images from all further files to the current collection. In this case, collections can only be separated by separators. See Separators for more information.
Ignore Resolution	Specifies whether Collect ignores the default **Image Resolution** setting in the Design module when inputting files. See the *Design User Guide* for information on the **Image Resolution** setting. ☑ Checked: Collect inputs and creates collections even from images whose resolutions are not the same as the **Image Resolution** setting. ☐ Cleared (default): Collect ignores all files whose resolutions are not the same as the **Image Resolution** setting. A warning message is written in the log.
Copy attachments directly	Specifies whether Collect avoids the entire process of checking whether format conversion of attachments is required. The format conversion process outputs a file in a different format from its input format, for example, to save color JPEG files as gray-scale images. ☑ Checked (default): Collect avoids the checking process. This improves the speed of importing files. ☐ Cleared: Collect performs the checking process. Use this setting only if you require format conversion for attachments.

Setting	Description
Skip Missing Attachments	Specifies whether Collect inputs image files (and all their attachments) if any expected attachments are missing. Once you have defined the attachments, Collect "expects" to find the complete set of attachments for each image and for each collection, as defined. For example, if JPG attachments are defined, and an inputted TIF contains 10 page images, Collect will expect to find one JPG attachment for each of the 10 page images, according to the file naming format. See Attachments for more information. This setting specifies what action Collect takes if any expected attachments are missing. ☑ Checked: Collect ignores missing attachments and continues inputting the main file, whose images are used to make a collection, together with attachments that were found. ☐ Cleared (default): Collect stops inputting even the main image file.
Show Input Form Before Batch	You may want to associate information with batches that varies from batch to batch. This is accomplished with a form that contains the fields you need. In eFLOW this form is called an input form. The form is defined in the Design module using the **Input Form** property. When you define a form as an input form, Collect assigns this form once for each batch. This setting specifies where Collect inserts the input form. ☑ Checked: Inserts the form at the beginning of the batch. ☐ Cleared (default): Inserts the form at the end of the batch.

File types

You must define the input file types (such as TIF or JPG files) that Collect should look for in the input search paths. For each input file type you define, you must also define one or more output file types. Each input image is matched to an input file type and then mapped to one or more output file types, which are then used to build collections.

For example, you can configure Collect to select TIF files as input and then output them also as TIF, that is, to preserve their format. Or you can configure Collect to select JPG files as input and then output them as a different file type, such as PNG. You can output a single input file type to multiple output file types; Collect creates an output file for each output file type you define. The default input file type is TIF, and the default output file type is also TIF.

You must define input and output file types for each separate eFLOW application and for each separate flow.

Add an input file type

1. In the **Configuration** window, right-click on the **File Types** entry and select **Add**.

2. Select the file type from the list.
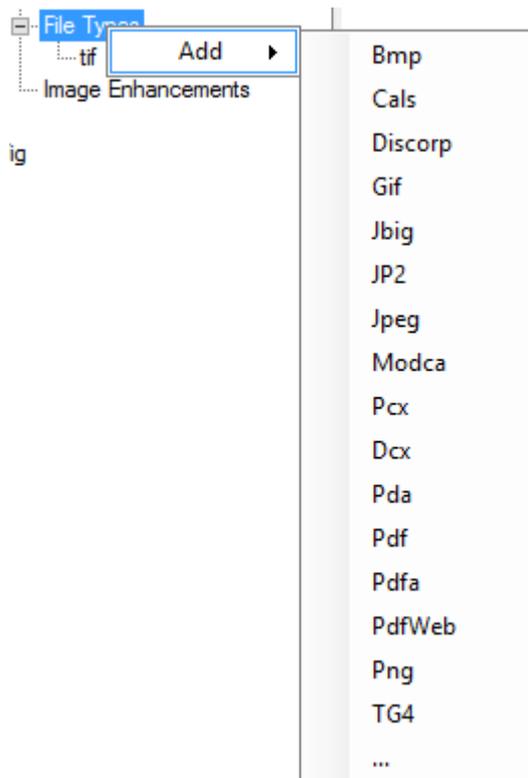
To add a custom file type (that is, a type not available in the **File Types** list):

   a. Select the ellipsis entry (**...**) at the bottom of the list.

   b. In the **Custom file type** dialog box, enter the file extension and click **OK**.

3. Click the **OK** button at the bottom of the **Configuration** window to save your changes.

Remove an input file type

1. In the **Configuration** window, right-click on the **File Types** entry and select **Remove**.

2. Select the file type from the list.

> Note: The **Remove** button is not available if you have only defined one file type.

3. Click the **OK** button at the bottom of the **Configuration** window to save your changes.

Add an output file type

1. In the **Configuration** window, under **File Types**, click on the input file type for which you want to define the output file type.

2. Click the **Add file type** button ⊕..

   A new blank entry is added to the **Output Types** list.

3. Click on the new entry and in the **File type** list, select the output file type. The corresponding **File extension** is entered automatically.

4. (Optional) Select values from the **Color** and **Compression** lists.
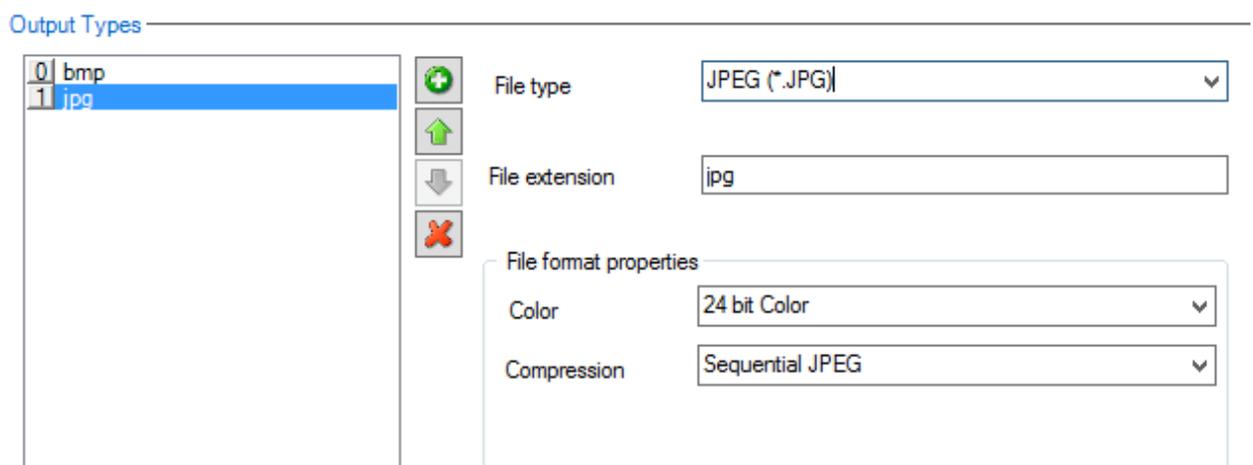
5. (Optional) If you add several output file types, you can change the order of the files in the list by clicking the **Move up** ⬆ and **Move down** ⬇ buttons.

6. Click the **OK** button at the bottom of the **Configuration** window to save your changes.

Remove an output file type

1. In the **Configuration** window, under **Files Type**, click on the input file type.

2. In the **Output Types** list, click on the output type and click the **Delete** button ✖.

3. Click the **OK** button at the bottom of the **Configuration** window to save your changes.

Attachments

Attachments are additional files that are associated with the main page file, or are associated with the entire collection as a whole. There are two types of attachments:

- Page attachments: One or more attachments related to the page, such as a JPG as a color version of the page attached to the TIF page file.

- Collection attachments: One or more attachments related to the whole collection, such as a text file providing an explanation about the whole collection. Also known as file attachments.

Collect selects attachments from the search paths, using the names of input files to discover the association between the main page file and its associated attachments.

Page attachments

Collect looks for page attachments related to each inputted main page file. The page file is typically a TIF file.

The file name for page attachments must be of the following format.

<page file name>_p####.<filetype>

where:

- *<page file name>* is the name of the main page file.

- *_p####* is a numerical counter in hexadecimal, which runs from 0001 to FFFF (meaning that for each page file there is a theoretical maximum of FFFF attachments).

- *<filetype>* is the file type of the attachment. This file type must be defined in the **File Types** section in the **Configuration** window. See File types for more information.

Collects ignores all files of the attachment file type that do not have exactly the correct name format.

For example, if the page file name is *<TestData>.tif*, Collect inputs the attachment *TestData_p0001.jpg*, which has the correct name format, but not the attachment *TestData.png*, which is missing the numerical counter.

For multi-page files, Collect looks for attachment files according to the number of pages in the file. For example, if the TIF input file has 10 pages, and JPG files are configured to be attachments, then Collect expects to find 10 JPG attachments. If Collect finds a TIF file named *TestData.tif*, it looks for JPG files whose name has the format *TestData_p####.jpg*. Thus, if Collect finds 10 images in the TIF file, it looks for 10 JPG files named according to the range *TestData_p0001.jpg* to *TestData_p0010.jpg*.

Collection attachments

Collect looks for collection attachments related to the entire collection. Collection attachments are indicated by file name prefixes that are identical to the file name of a page file.

For example, when Collect is configured to look for TIF and PDF files in the source folder, Collect looks for TIF page files, and related PDF files to be attachments for the TIF. If Collect finds a TIF file named *TestData.tif* then it looks for collection attachment files whose name is defined by the format *TestData.<filetype>*.

Thus, if Collect finds a file whose name is *TestData.pdf*, that file will be taken as a collection attachment for *TestData.tif*.

Custom input file types for attachments

Collect provides a number of predefined input file types. If the input file type you want to add as an attachment is not one of the predefined types, you can define a custom input file type. See Add an input file type.

> **Note:** You cannot convert custom file types to other types, since the custom type is not known in advance and so a conversion filter is not available.

View attachments

In manual operation mode, you can use the GUI **Page** view to view individual pages of a collection. If you have defined attachment file types, the viewer becomes a tabbed window when the viewed page has one or more attachments. An additional tab opens to display each attachment found for the page file.

Separators

A collection, or batch, is the logical work unit of eFLOW, which is passed from one station to the next. However, the input stream of images into the Scan and Collect stations is unstructured. This input stream is a sequence of images from files into Collect, or a sequence of scanned pages into Scan. Separators are therefore used to indicate at which page one batch ends and the next batch starts.

Similarly, within a single batch, separators are needed to indicate at which page one form ends and the next form starts.
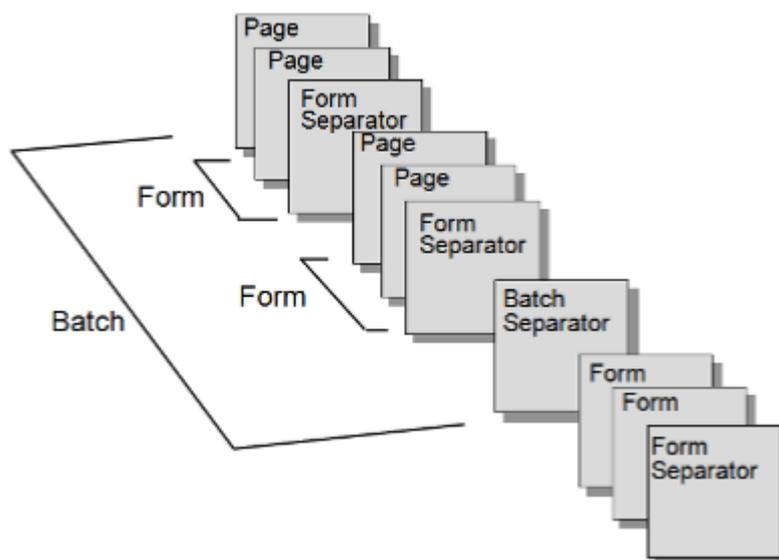
Separators can be implemented in any conceivable way of marking where a batch or form starts and ends.

For example, a separator can be a specially designed page, a blank page, a specific barcode, or a specific number of forms or pages. For example, if you want to group sets of one hundred pages during input, then inserting a batch separator page after each set of one hundred pages will mark each set as a separate batch.

There are two general categories of separators: hardware separators and software separators.

The **Batch Separators** and **Form Separators** entries in the **Configuration** window enable you define hardware and software separators to separate batches and forms. The same types of separators are available for both batches and forms.

You must define any batch separators and form separators that you require for each separate eFLOW application and for each separate flow. Separators you define for one flow are not applied to any other flows.

You can define up to four different types of hardware separators and three different types of software separators, of the same type, or of different types and in any combination. The station separates the batch or form as soon as the first separator is found; it does not check the rest of the separators, and continues to the next page.

An integrated testing tool for is provided for software separators to help you verify that your separator definitions will correctly detect the separator pages.

Separator types

The following types of separators are available.

Hardware separators

> **Note:** For the Collect station, only the **TisPageSeparator** applies.

Separator	Description
TisPageSeparator	Defines the batch or form as a fixed number of pages. When the station has counted the specified number of pages, it concludes the batch or form.
TisHardwareJobSeparator	A job separator is a specific feature defined by scanner hardware. Selecting this option defines job separators as separators for batches or forms. When the station finds a job separator, it concludes the batch or form.
TisHardwareBarcodeJobSeparator	Defines a page with a barcode as a separator for batches or forms. When the station finds a page with a barcode, it concludes the batch or form.
TisHardwarePatchcodeJobSeparator	Defines a page with a Kodak patchcode as a separator for batches or forms. When the station finds a page with a Kodak patchcode, it concludes the batch or form.

Software separators

Separator	Description
Barcode	Defines a page with a barcode as a separator for batches or forms. When the station finds a page with a barcode, it concludes the batch or form.
Blank page	Defines blank pages as separators. When the station encounters a blank page, it concludes the batch or form.
Patchcode	Defines a page with a Kodak patchcode as a separator for batches or forms. When the station finds a page with a Kodak patchcode, it concludes the batch or form.

Separator actions

When the Scan or Collect station has identified a page (or page side) as being a separator or containing a separator, it has to decide what to do with the separator page (or page side) itself. The station can perform one of the following actions on the separator page. You specify which action should be taken when you define the separator.

Action	Description
None	Does not separate the batch or form. This is the default action.
AddInOldDocument	Adds the separator page as the final page of the current batch or form.
AddInNewDocument	Adds the separator page as the first page of the next batch or form.
DiscardSide	Discards the separator page; it is not included in any batch or form. If the pages are double sided, then sides are counted, rather than pages, and only the separator side is discarded. The other side becomes the final page of the current batch or the first page of the next batch or form.
DiscardPage	Discards the separator page; it is not included in any batch or form. If the pages are double sided, then sides are counted, rather than pages, but the whole page is discarded.

Define a hardware separator

1. In the **Configuration** window, under **Batch Separators** or **Form Separators**, click on **Hardware Separators**.

2. In the hardware separators dropdown list, select one of the four types of hardware separators (see Separator types).

3. Click the **Add** button .

    The hardware separator is added to the hardware separator list and to the configuration tree under **Hardware Separators**.
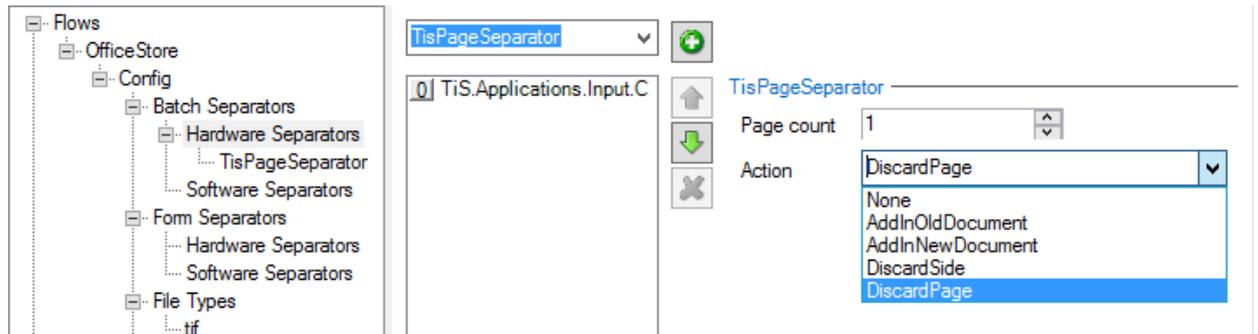
4. Select the appropriate **Action** (see Separator actions). For a the page count separator (**TisPageSeparator**), you must also specify the number of pages after which the batch or form is concluded.

    If you add more than one separator, you can use the **Move up** and **Move down** buttons to change their order in the separators list. The station searches the input pages for defined separators in the order they appear in this list, from top to bottom. To achieve the best performance, you should position the most probable separator types at the top of the list.

5. Click the **OK** button at the bottom of the **Configuration** window to save your changes.

Load a sample image for testing software separators

Loading a sample image when defining software separators helps you to verify that your separator definitions will correctly detect the separator pages.

1. In the **Configuration** window, under **Batch Separators** or **Form Separators**, click on **Software Separators**.

2. Click the **Open** button above the **Separators** tab.

3. Locate and select the image file you want to use and click the **Open** button.

    The image is displayed on the right of the window.

    For multi-page images, you can select the page to use from the dropdown list. Click the zoom buttons to increase or decrease the image size.

4. As you change the settings for the separator, watch for the indicator that signals whether your sample page has been successfully identified as a separator. Continue to adjust the settings until the indicator changes from **Page is not Separator** to **Page is Separator**.

Blank page

Separation action

| None ⌄ |

Page is not Separator

See Define a software blank page separator for a detailed example.

> **Note:** If you later select a different separator type to define, you will probably have to load a different sample image to verify your new separator.

Define a software blank page separator

When you define a software blank page separator, you specify how white the page must be to be considered as "blank", that is, the maximum amount of black allowed on a page. You can also specify margins to exclude from the image when determining whether or not the image is blank.

There are two methods for detecting blank pages:

- Automatically from a preset
- Manually from a **Black Area Ratio**. The ratio is the number of black pixels present on the image divided by the number of all region pixels.

To define a blank page separator:

1. In the **Configuration** window, under **Batch Separators** or **Form Separators**, click on **Software Separators**.

2. In the **Separators** tab, click on the **Blank page** button.

3. Load a sample image to test the settings.

4. Select a **Separation action** (see Separator actions).

5. Use one of the following settings to define the blankness:

   - **Preset Settings** (see Define blankness from a preset).
   - **Black area ratio** (see Define blankness from a black area ratio).

6. (Optional) Use the **Margins** sliders to specify margins to exclude when determining whether the image is a blank page.

7. When the indicator changes to **Page is Separator**, click the **Add** button.
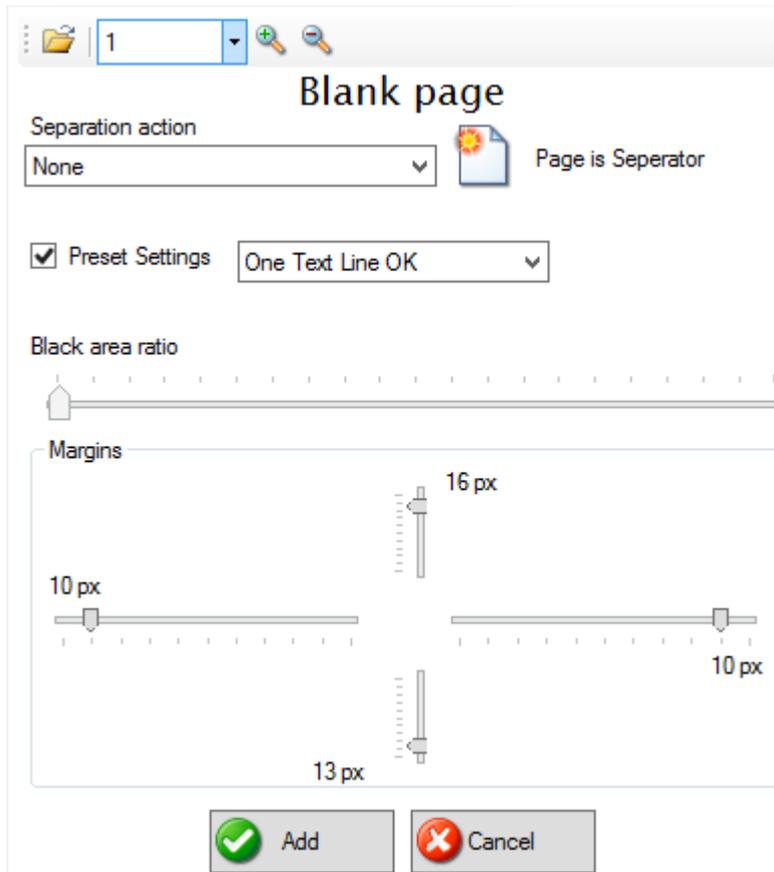
The new separator appears in the **Is Separator** list.
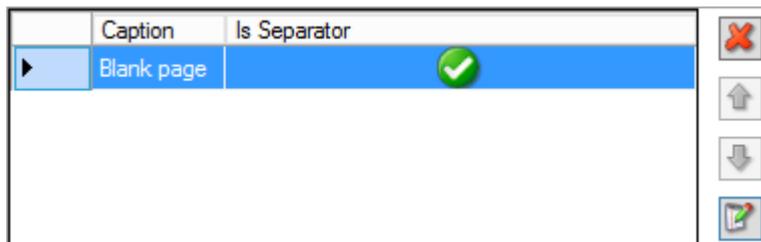
8. Click the **OK** button at the bottom of the **Configuration** window to save your changes.

Define blankness from a preset

This example demonstrates how to define a blank page separator using a preset.

1. Select the **Preset Settings** checkbox to enable the **Preset Settings** list.

2. Select a setting from the **Preset Settings** list to define the "blankness" threshold.

Value	Description
Pristine White **Dirty White** **Very Dirty White**	Determines how "white" a page must be to be considered a blank page. If you select any of these values, a page containing any text lines is not considered blank.
One Text Line OK **Two Text Lines OK**	A page with one or two lines of text is considered blank. The station does not take into consideration how "white" the rest of the page is.

In this example, we have selected **Very Dirty White**. However, the sample separator page is "dirtier" than that, because it has a line of text. Accordingly, the separator indicator at the top right of the parameters area displays **Page is not Separator**.
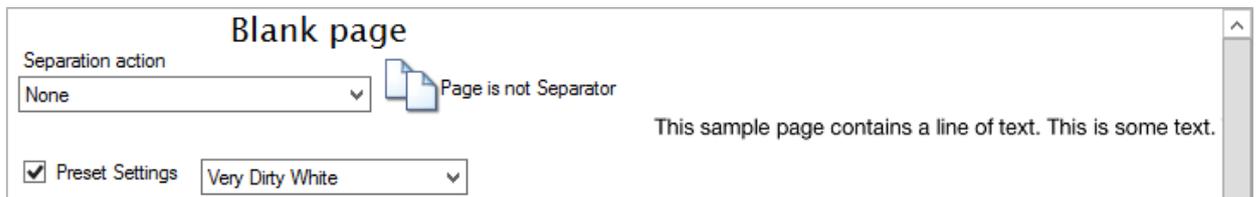
3. From the **Preset Settings** list, select **One Text Line OK**. This allows a page with one text line to be considered as "blank".

The sample separator page is now recognized as a valid blank page separator and the separator indicator changes to **Page is separator**.
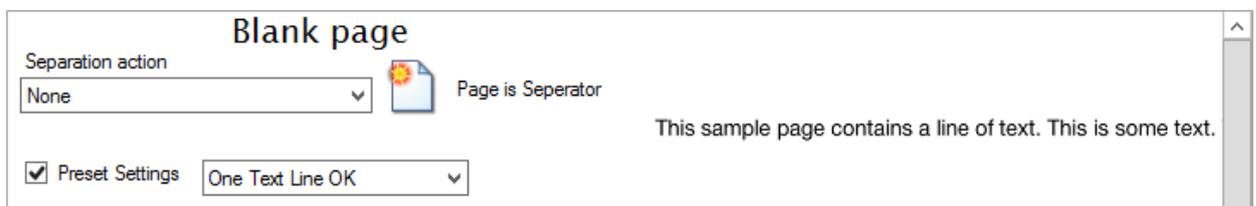
Define blankness from a black area ratio

This example demonstrates how to define a blank page separator manually using the **Black area ratio** slider.

The ratio is the number of black pixels present on the image divided by the number of all region pixels. The ratios available are continuous from the lowest ratio setting on the left of the slider, which allows the least amount of black, to the highest ratio setting on the right, which allows the most amount of black. For example, if the type of blank pages you are expecting in the input will have quite a lot of black dots, you will need to drag the slider further to the right to allow more blackness.

1. Clear the **Preset Settings** checkbox to enable the **Black area ratio** slider.

2. Drag the slider to the right to until the separator indicator changes to **Page is separator**.
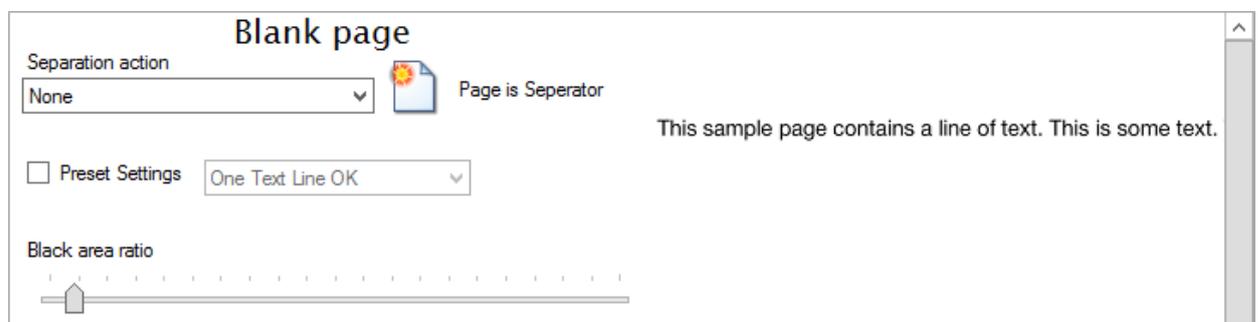

Define a software barcode separator

1. In the **Configuration** window, under **Batch Separators** or **Form Separators**, click on **Software Separators**.

2. In the **Separators** tab, click the **Barcode** button.

3. Load a sample image to test the settings.

4. Select a **Separation action** (see Separator actions).

5. Select the settings and bar code types you want to use.

6. When the indicator changes to **Page is Separator**, click the **Add** button.

    The new separator appears in the **Is Separator** list.

7. Click the **OK** button at the bottom of the **Configuration** window to save your changes.

Barcode separator settings

Parameter	Description
Decode barcode	Specifies whether or not to decode the barcode. If this option is selected, runtime page information will contain the barcode value and not only the type. Currently it is not possible to perform separation based on the barcode value. You can use the barcode only as a regular separator type, just like a blank page. **Note:** This means that it is not currently possible to use the same barcode type with different values for batch and form separation. All barcodes of the same type will be treated as the same barcode separator.
Use checksum	Specifies whether or not to calculate the barcode's checksum.
Orientation	Specifies whether the barcode can be horizontal or vertical or both. Correctly specifying the barcode's expected direction helps the station to find the barcode on the page faster.
Barcode Types	Specifies the barcode's type. Scan and Collect provide a number of barcode types to look for. Specifying the barcode's expected type helps the station to find the barcode on the page faster.
Result Barcodes	Displays the barcode's characteristics when the barcode is identified as a known barcode type.

Define a software patchcode separator

Note: Collect does not distinguish between different patchcode types as different separators.

1. In the **Configuration** window, under **Batch Separators** or **Form Separators**, click on **Software Separators**.

2. In the **Separators** tab, click the **Patchcode** button.

3. Load a sample image to test the settings.

4. Select a **Separation action** (see Separator actions).

5. When the indicator changes to **Page is Separator**, click the **Add** button.

   The new separator appears in the **Is Separator** list.

6. Click the **OK** button at the bottom of the **Configuration** window to save your changes.

Edit a separator

1. In the **Configuration** window, in the **Batch Separators** or **Form Separators** section, click on

Hardware Separators or **Software Separators**.

2. Select the separator. For software separators, click the **Edit** button .

3. Make changes to the settings.

   If you add more than one separator, you can use the **Move up** and **Move down** buttons to change their order in the separators list. The station searches the input pages for defined separators in the order they appear in this list, from top to bottom. To achieve the best performance, you should position the most probable separator types at the top of the list.

4. Click the **OK** button at the bottom of the **Configuration** window to save your changes.

Remove a separator

1. In the **Configuration** window, in the **Batch Separators** or **Form Separators** section, click on **Hardware Separators** or **Software Separators**.

2. Select the separator and click the **Delete** button .

Image enhancements

Sometimes images must be graphically enhanced before you can obtain optimum results with eFLOW. The Scan and Collect stations provide a large number of user customizable image enhancement filters, such as the **Deskew** filter for correcting alignment, or the **Noise Removal** filter, for removing dots and specks on the image. See Enhancement filters for a full list of the available filters.

You must define any image enhancement filters that you require for each separate eFLOW application and for each separate flow. The filters are applied to each incoming image, one by one, in the order you define them.

An integrated testing tool is provided to help you customize your filters using sample images. You can see the effects of applying filters on the sample image.

There are no ideal procedures for selecting the most appropriate filters. You must use trial and error to test the effect of the filters.

Note: Actions you perform on the sample image are not saved to its disk file.

Load a sample image for testing filters

1. In the **Configuration** window, click on **Image Enhancements**.

2. Click the **Open** button above the **Enhancemts** tab.

3. Locate and select the image file you want to use and click the **Open** button.

   The image is displayed on the right of the window.

   For multi-page images, you can select the page to use from the dropdown list. Click the zoom buttons to increase or decrease the image size.

   As soon as the image is loaded, it responds to the way you adjust the filter settings.

4. Click the **OK** button at the bottom of the **Configuration** window to save your changes.

Add an image enhancement filter

1. In the **Configuration** window, click on **Image Enhancements**.

2. Load a sample image to test the filter.

3. Select the appropriate tab for the type of enhancement you want to make: **Enhancemts**, **Color** or **Sizing**.

4. Click on the appropriate button for the filter you want to add. For example, in the **Enhancemts** tab, click the **Noise** button.
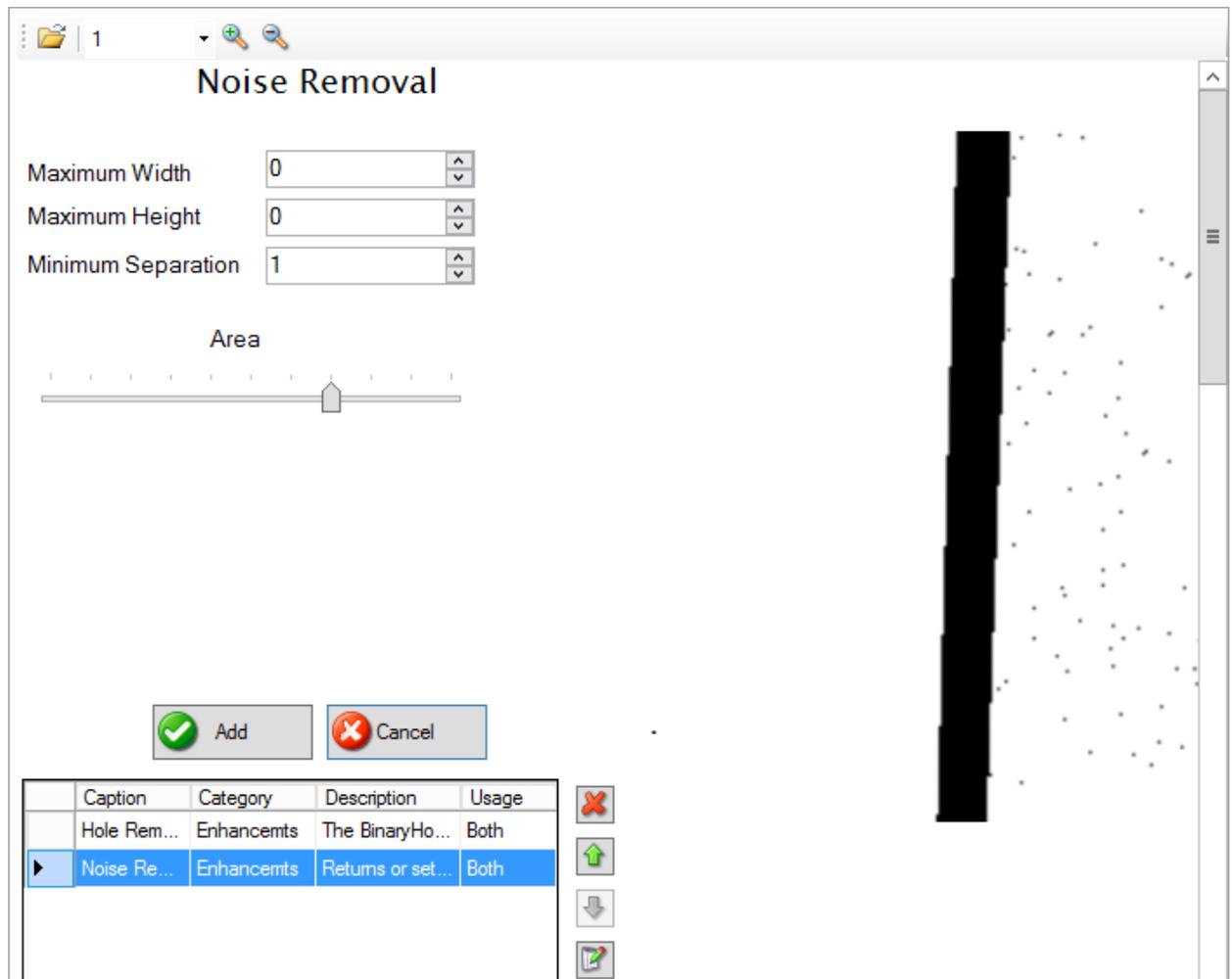
5. Adjust the filter settings. See Image enhancement filters for information on the settings for each filter.

   As you adjust the settings, the image responds to display the effect of the changes.

6. Click the **Add** button.

   The filter appears in the filter list at the bottom of the screen.

7. Click the **OK** button at the bottom of the **Configuration** window to save your changes.

Edit an image enhancement filter

1. In the **Configuration** window, click on **Image Enhancements**.

2. In the filter list at the bottom of the window, select the filter, then click the **Edit** button.

3. Make changes to the settings.

   To change the order of the filters, use the **Move up** and **Move down** buttons. The filters are applied to each incoming image, one by one, in this order.

4. Click the **OK** button at the bottom of the **Configuration** window to save your changes.

Remove a filter

1. In the **Configuration** window, click on **Image Enhancements**.

2. Select the filter and click the **Delete** button .

Enhancement filters

This section describes the available image enhancement filters in the Scan and Collect stations.

See Image enhancements for information on using the image enhancement filters.

Content enhancement filters

Content enhancement filters affect the content of images. For example, they can remove lines and borders, remove "noise", such as dots and specks, or straighten a slanted image.

Black Overscan Removal filter

The **Black Overscan Removal** filter removes the black area around an image when a page is scanned using an overscan option. Unlike the **Border Removal** filter (which inverts the black pixels, making them white) and the **Crop** filter (which removes white space from around the edge of the image), the **Black Overscan Removal** filter removes the overscan area from your image.

This filter also reduces the physical size of the scanned image and the image file size by eliminating the black border generated by scanners with black backgrounds.

The table below describes the parameters you can adjust for this filter.

Parameter	Description
Check Inverted	Select this option to prevent overscan removal on color-inverted images.

Border Removal filter

The **Border Removal** filter detects and removes black edges that sometimes appear around images during scanning or photocopying. This filter looks for black around the edge of an image (that is, its borders) and changes the black to white. It does not change the size of the image.

The table below describes the parameters you can adjust for this filter.

Parameter	Description
Check Inverted	Select this option to prevent border removal on images that appear to be inverted.
Same processing values	Select this option to set all process limits to the value of the slider of the left process limit (see **Process limits** below).
Process limits	Drag the sliders to define the size limit for the border in each direction.

Deskew filter

The **Deskew** filter can be used to straighten binary or color images that show a slant from their correct orientation. The filter returns the angle that the image was deskewed. Skewing can occur if the original document was skewed when it was fed into the scanner, fax machine, or photo-copier.

The **Deskew** filter examines the image and determines the skew angle. The skew angle is measured between the actual edge of the image data and the horizontal or vertical axis. The image data is then rotated to correct the skew angle.

Deskewing an image makes the image contents more legible and can improve OCR results. The **Deskew** filter can also be used, without detecting a skew angle, to rotate an image a specified number of tenths of a degree (from -44.9 degrees to +44.9 degrees), either after detecting skew externally or just to rotate the image to an arbitrary desired angle.

To achieve the best image quality after image processing and to find the optimal balance between processing speed and accuracy, you should test this filter with sample images that are similar to the real images you expect to process, and then fine tune the parameters for each filter to find the values most suitable for your document type.

The result of applying this filter is always a binary (black & white) image.

The table below describes the parameters you can adjust for this filter.

Parameter	Description
Vertical	Select this option if the text on the pages is horizontal, or is a mix of both directions. Applicability: When **Auto deskew** and **Text based** are both selected.
Horizontal	Select this option if the text on the pages is vertical, or is a mix of both directions. Applicability: When **Auto deskew** and **Text based** are both selected.

Parameter	Description
Text based	Select this option if the source image is a text file. The **Deskew** filter algorithm is optimized for features that look like lines of text. If an image contains graphics, the filter may incorrectly detect the skew. For images that contain graphics, clear this option. If you are processing pages that contain both text and graphics areas, you must decide which type of object to use for determining skew: ■ Select this option if the page contains primarily text, even though it may have some tables and lines. ■ Clear this option if the page contains large black areas. Applicability: When **Auto deskew** is selected.
Auto deskew	Select this option if you want **Deskew** to work automatically. It will use the **Vertical**, **Horizontal** and **Text based** parameters to decide how to best deskew the image. Selecting this option disables the **Auto deskew** value. Clear this option if you want to work with **Deskew** manually. Clearing this option enables the **Auto deskew** value.
Deskew value	Click the **Up** or **Down** arrows to specify a rotation in degrees, clockwise or anti-clockwise respectively, to apply to the image. This option is enabled if you clear the **Auto deskew** checkbox.

Dilation filter

The **Dilation** filter expands the area of black objects in an image, causing the line strokes of characters to become bolder. Using this filter may improve image quality and the legibility of text. Performing dilation can increase the file size.

The table below describes the parameters you can adjust for this filter.

Parameter	Description
Horizontal	Select this option to dilate black areas in the horizontal direction. For example, the line strokes of characters get wider (that is, bolder) in the horizontal direction.
Vertical	Select this option to dilate black areas in the vertical direction. For example, the line strokes of characters get taller (that is, bolder) in the vertical direction.
Diagonal	Select this option to dilate black areas along both diagonals. Applying this option tends to have the same effect as horizontal and vertical combined.

Parameter	Description
Amount	Specifies the number of times to apply the **Dilation** filter to the image.
	Positioning the slider at the far-left side applies the dilation filter one time to the image. The slider has a continuous range; it does not just jump between the notches.
	Usually, one notch to the right causes text of a standard size (10pt to 12pt) to become bolder. However, a further notch to the right causes such text to become illegible.

Erosion filter

The **Erosion** filter trims the area of black objects, causing the line strokes of characters to become thinner. Using this filter will reduce the file size, but you could lose a lot of detail from the image content.

The table below describes the parameters you can adjust for this filter.

Parameter	Description
Horizontal	Select this option to trim black areas in the horizontal direction. For example, the line strokes of characters become thinner (that is, less bold) in the horizontal direction.
Vertical	Select this option to trim black areas in the vertical direction. For example, the line strokes of characters become shorter (that is, less bold) in the vertical direction.
Diagonal	Select this option to trim black areas along both diagonals. Applying this option tends to have the same effect as horizontal and vertical combined.
Amount	Specifies the number of times to apply the **Erosion** filter to the image.
	Positioning the slider at the far-left side applies the filter one time to the image. The slider has a continuous range; it does not just jump between the notches.
	Usually, one notch to the right causes text to become thinner. One more notch to the right causes text lines to disappear.

Halftone Removal filter

The **Halftone Removal** filter removes a background, such as a halftone or dither pattern, from an image or a graphic object on the image.

This filter has no parameters.

Hole Removal filter

The **Hole Removal** filter removes images that look like punched binder holes from the edges of the image. The algorithm searches for objects that look like binder holes around the edges of the image. Similar objects in other areas of the image are not removed.

This filter has no parameters.

The result of applying this filter is always a binary (black & white) image.

Line Removal filter

The **Line Removal** filter works with lines on form-based image images. It is called "line removal" but it can be used to reconstruct somewhat damaged lines as well as completely remove lines.

The line reconstruction can be configured to reconstruct horizontal and vertical lines, "redrawing" them straight with smooth edges.

The **Line Removal** filter allows you to eliminate horizontal and vertical lines that are part of the image, leaving all the characters intact.

The table below describes the parameters you can adjust for this filter.

Parameter	Description
Remove	Select this option to remove lines.
Repair	Select this option to repair graphics and text overlapped by the removed lines.
Reconstruct	Select this option to remove lines, repair overlapped graphics and text, and redraw straight lines in place of removed lines.
Remove Form	Select this option to remove lines, redraw straight lines, and reconnect lines that were previously connected. Commonly used for tables and forms.
Horizontal, Vertical:	The following descriptions apply to both the horizontal line group and the vertical line group.
Enable	Select this option to detect and either repair or delete [horizontal/vertical] lines. The values of the other [horizontal/vertical] line detection parameters are ignored if this parameter is disabled.

Parameter	Description
Straight line	Select this option to use the straight-line processing algorithm on [horizontal/vertical] lines.
	The optimized straight-line processing algorithm provides faster processing of straight lines that are longer than 100 pixels. The algorithm is particularly well-suited for forms and light paper.
	■ When enabled: the filter uses the height or width of the bounding rectangles around line-like objects to determine if that object is a line.
	■ When disabled: the filter breaks the line-like object into small segments and uses the curvature, maximum gap, and a number of fixed parameters to determine whether the segments make up a line.
	Note: When this parameter is enabled, all other line processing parameters except **Minimum Length** are ignored.
Minimum Length	Specifies the minimum detectable length of [horizontal/vertical] lines.
	If a "line" is shorter than this minimum length, it is not considered a line.
	■ Specify a smaller value to detect and process more line-like objects.
	■ Specify a larger value to detect and process fewer lines-like objects.
	Units: Pixels
	The default is to operate on only those lines that are longer than 50 pixels.
Maximum Gap	Specifies the maximum white space allowed between two [horizontal/vertical] line-like objects for them to be considered a single line.
	If a gap is longer than this maximum, the two line-like objects are not considered a single line.
	Units: Pixels
	Note: This property is not used when **Straight line** is enabled.

Parameter	Description
Curvature	Specifies the maximum deviation from a straight line allowed for a [horizontal/vertical] line-like object to be considered a line.
	If a deviation is greater than this maximum, the line-like object is not considered a line.
	The left-side of the slider is a lower curvature. A lower value for this property causes the filter to identify only lines with a smaller curvature, and so will operate on a smaller number of curved lines.
	The right-side of the slider is a higher curvature. A higher value for this property causes lines with greater curvature to be still identified as lines, and so will operate on a larger number of curved lines.
	Choose a curvature value that operates on unwanted lines while preserving other desirable features on your pages.
	This curvature setting is fine tuning: there is a relatively small difference between the minimum curvature and maximum curvature.
	Units: Pixels
	Note: Not used when **Straight line** is enabled.

Noise Removal filter

The **Noise Removal** filter searches for noise in the image and deletes it. Noise appears as dots and specks on the image, and the filter helps to "clean them off". The parameters teach the filter what is considered as noise. Take care to not lose essential detail from the image content, which the filter may accidentally consider as noise.

The result of applying this filter is always a binary (black & white) image.

The table below describes the parameters you can adjust for this filter.

Parameter	Description
Maximum Width	Specifies the maximum width of a black area that is considered as a speck of noise. Units: pixels
Maximum Height	Specifies the maximum height of a black area that is considered as a speck of noise. Units: pixels

Parameter	Description
Minimum Separation	Defines the minimum separation between a noise object and other non-noise parts of the image. Values: **0**: Removes all noise objects that fit within the **Maximum Width**, **Maximum Height**, and **Area** property settings. This may cause small text elements on the page, such as broken characters, punctuation, and the dots on the letters i and j, to be removed. **>0**: Preserves elements that would otherwise be considered noise that occur in the vicinity of text characters. This may improve readability and OCR accuracy.
Area	Specifies the maximum percentage that an object can occupy of the above area (defined by the above width and height) and still be considered as noise. This property is especially useful if you want to detect long narrow objects that may appear both vertically and horizontally on a page, such as lines, decorative banners, and highlight areas. For example, to remove colored banners that are either 5" x 1" or 1" x 5", you could set **Maximum Width** and **Maximum Height** to 5 inches. However, that means a 5" x 5" picture would also be detected as noise and removed. To avoid this problem, set **Area** to 20 so that only the banner area is detected as noise, regardless of its orientation. Unit: Percent

Invert Image filter

The **Invert Image** filter inverts an image. What is black becomes white, and what is white becomes black.

This filter has no parameters.

Skeleton filter

The **Skeleton** filter reduces black objects in an image to one-pixel-thick skeletonized versions. Using this filter can reduce file size, but it can seriously distort the image. It should be used with caution and is usually only appropriate when performing certain types of OCR.

This filter has no parameters.

Smoothing filter

The **Smoothing** filter removes bumps and spurs that appear on text characters or graphic objects in an image. The filter looks for any pixel that is surrounded by five or six other connected pixels of the opposite color, and then inverts that center pixel based on the filter configuration. Smoothing is a good way to improve legibility without losing a lot of image details.

The table below describes the parameters you can adjust for this filter.

Parameter	Description
Trim fast	Select this option to remove black noise pixels before removing white ones. If this option is not selected, white noise pixels will be removed before black ones.
Corner black	Select this option to remove black noise pixels from the corners of objects.
Corner white	Select this option to remove white noise pixels from the corners of objects.

Threshold filter

The **Threshold** filter can be used to convert a 24-bit color or gray scale image to a binary image. All of the pixels in a color image that are darker than the threshold specified by the **Brightness** and **Contrast** properties are converted to black, and all of the pixels that are lighter than the threshold are converted to white.

The table below describes the parameters you can adjust for this filter.

Parameter	Description
Brightness	Specifies the brightness threshold.
	The slider's left-hand side is a darker threshold, and the right-hand side is a lighter threshold. The more you drag the slider to the left, the more the threshold becomes a darker threshold, so more of the page's dots are considered brighter than that threshold and they are converted to white. If you drag the slider far enough to the left, at some point the whole page becomes all white.
	The more you drag the slider to the right, the more the threshold becomes a lighter threshold, so more of the page's dots are considered darker than that threshold and they are converted to black. If you drag the slider far enough to the right, at some point the whole page becomes all black.
Contrast	Specifies the contrast threshold.
	Contrast is the ratio of the luminance of the brightest color in the image to that of the darkest color. If pure white is present, the brightest color is the white. If pure black is present, the darkest color is the black.
	This parameter is used the same way as for brightness.

Parameter	Description
Dither	Select this option to dither the image before applying the **Threshold** filter. Dither is an intentionally applied form of noise used to randomize the sampling error created from digital sampling. The resulting image is expected to be smoother and more true to the original.
Preserve text	Select this option to specify that text is more important to preserve.
Preserve image	Select this option to specify that images are more important to preserve.
Preserve barcode	Select this option to specify that barcodes are more important to preserve.Content enhancement filters Content enhancement filters affect the content of images. For example, they can remove lines and borders, remove "noise", such as dots and specks, or straighten a slanted image.

Color Enhancement Filters

Color enhancement filters modify the colors in an image. Currently, only the **Color Dropout** filter is available, which replaces one color with a different color.

Color Dropout filter

The **Color Dropout** filter transforms specified colors in an image into other colors. The filter maintains a list of color mappings to make when it runs.

The table below describes the parameters you can adjust for this filter.

Parameter	Description
	Opens a **Color** selection box. Use this to select a color. When you click **OK**, the color is added to the list.
	Removes the selected filter.
Magnitude	The radius of the color sphere for the selected color. The color sphere object is a dimensional model that uniformly arranges color in space.

Size Enhancement Filters

Size enhancement filters modify the geometry of the entire image page. For example, they can rotate or scale the page.

Rotation filter

The **Rotation** filter rotates the image. The difference between the **Rotation** filter and the **Deskew** filter is that the **Deskew** filter is used for rotating small angles only.

The table below describes the parameters you can adjust for this filter.

Parameter	Description
Apply	Apply the rotation to both sides of a page. Applicable to: Double-sided pages.
Rotation Method	You can allow the system to decide how much to rotate the image, or you can manually predefine the rotation.
Auto detect	Select this option to automatically detect if the image requires rotation and, if so, rotate it to straighten it up. Clear this option to enable the **Fixed angle** option.
Mirror	Flips the image about a vertical axis whose angle is given by **Fixed Angle** below. This operation has no effect if **Fixed Angle** is 0.
Fixed angle	Specifies the angle of a clockwise rotation of the image. If you also click on **Mirror** after setting this angle, you can get the rotation with a mirror flip.

Scaling filter

The **Scaling** filter resizes images while preserving the original aspect ratio. After you specify the desired width and height, the image area is resized so that it fits within those boundaries, while maintaining the aspect ratio.

This operation does not just fit the page into the viewer; this permanently resizes the image and is preserved in the collections sent to the workflow.

The table below describes the parameters you can adjust for this filter.

Parameter	Description
Standard Sizes	Resizes the image to fit the page size you select, either making it larger or shrinking it, as appropriate.
Custom size	Resizes the image to a custom size.

Parameter	Description
Width	Specifies the width of the scaled image.
Height	Specifies the height of the scaled image.

Parameters and options

This section describes the parameters and options available in the Collect station Configuration window.

Parameters

The following general parameters for the Collect station are available in the **Configuration** window. These parameters are relevant to all flows.

Parameter	Description
Active Function Keys	Shortcut key combinations for running custom code blocks. This is a common feature in eFLOW stations; however it should be used with care in stations such as Scan and Collect, which are specifically intended to be run in an automatic mode.
Allow Unattended	In **Unattended** mode, Collect runs in a Windows service mode. Collect starts to run, inputs files, processes the files, and then sends them automatically. Collect does not display a user interface. You can set this value on the server-side only in the Design module.
Caption	Displays a custom caption for the Collect GUI. You can set this value on the server-side only in the Design module.
Idle Interval	Specifies the length of time that the station has to be idle to cause the **Idle** event to be fired. By default, this event has no effect on the work cycle of Collect.
Max file count	Specifies the maximum number of files that Collect can automatically input at once from the search paths when running in standby mode. The default value is 20. To improve performance, this value should be set according to project requirements.

Parameter	Description
Name	You can set this value on the server-side only in the Design module.
Polling Time Interval	Specifies how often Collect looks in the search paths when running in standby mode. Collect looks in the search paths once per interval period. When Collect finds files, it puts them in the *Temp* folder. Assuming there are files in the search path, but none yet in the *Temp* folder, the maximum time it can take for a collection to be created, from the moment that the user enables standby mode, is: Polling Time Interval + Standby Interval
Show collection organizer UI	Specifies whether the Organize GUI should be shown. You can set this value on the server-side only in the Design module. Setting this parameter to **False** can improve the Collect station performance.
StandBy	Specifies whether the default operational mode is set to Standby mode or Manual mode (that is, it sets the default Standby mode to **True** or **False**. You can set this value on the server-side only in the Design module. **Note:** Users can override this value temporarily by changing the setting of the **Standby** menu item. The next time the user opens the Collect station, it will again use server settings.
StandBy Interval	Specifies how often Collect checks the *Temp* folder for files when running in standby mode. Collect looks in the *Temp* folder once per interval period. The content of the *Temp* folder is displayed in the **Files in process** list. Assuming there are files in the search path, but none yet in the *Temp* folder, the maximum time it can take for a collection to be created, from the moment that the user enables Standby mode, is: Polling Time Interval + Standby Interval
Timer Interval	Period of the **Timer** event in Collect. By default, this event has no effect on the work cycle of Collect.

Options

The following options for controlling the Collect station user interface are available in the **Configuration**

window.

Option	Description
Enable offline mode	Setting this option to **True** allows continued input of images even if the connection with the eFLOW server is temporarily lost. The images are sent to the server when the connection is restored. **Note:** This option is only available in the Design module station configuration.
Fast scan mode	Setting this option to **True** speeds up scanning. Setting this option to **False** causes the image thumbnails to be displayed immediately while scanning, not only at the end of batch. However, this slows down the station.
Preview delay	Specifies how often an image should be shown in the page viewer when the station is running. Displaying an image slows down processing. In addition, a user can only observe the images at a much slower rate anyway. For example, if the value is set to 7 then the image is displayed only every 7th image.

Optimizing performance

Fine-tuning the following settings can result in a dramatic change in the performance of the Collect station.

Setting	To improve performance
Copy attachments directly	Specifies whether Collect avoids the entire process of checking whether format conversion of attachments is required. Select this setting when both B/W and color images are imported. You should not use this setting if format conversion of color files is required.
Polling time interval	This setting specifies how often Collect looks in the search paths for files. Adjusting this setting can improve performance.

Setting	To improve performance
Max file count	This setting specifies the maximum number of files that Collect automatically inputs at once from the search path. Increasing or decreasing the value of this setting can improve performance. The optimal values of the *Max file count* and *Polling time interval* settings depend on the original file size and the speed at which new files are added to the search path folders.
Standby interval	This setting specifies how long Collect checks the *Temp* folder for files. Decreasing the value of this setting can improve performance if there are too many files in the *Temp* folder at any time.
Show collection organizer UI	This setting determines whether the Organize GUI is displayed. Disabling this setting can improve performance. It should be disabled when Collect runs in standby mode.