FormReturn

User guide
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FormReturn Help Guide

Introduction

FormReturn Optical Mark Recognition Software, for Windows, Mac OS X and Linux, is a fully integrated program with it's own OMR form editor, for designing paper response forms, and an OMR form processor for automatically capturing hand marked responses made by respondents in checkboxes of the forms. The captured response data is stored in FormReturn and exported to an external, printable spreadsheet.

FormReturn OMR software's integration gives anyone the ability to design their own customized OMR forms, printed using a regular printer, and process completed form into response data, using uploaded images of the forms scanned with an ordinary Document scanner.

FormReturn will read and analyze these scanned form images and convert the hand marked responses to electronic data (eg, a spreadsheet of captured response information).

Form Return reconciles the captured response data with the published form template information and the records from your data table. The captured data is stored in FormReturn and can then be exported to a spreadsheet.

Assistance

If you would like assistance with FormReturn or you have any questions, click the Assistance button at the top right of FormReturn's software user interface. Fill in the form, with your contact details and type your questions in the Requirements field. We will respond as soon as we get your message.

Sales Support
We offer support in the form of online meeting, email or telephone to answer any questions you may have about using FormReturn.

Email us: support@ebstrada.com.au
Phone: +61 7 3305 0049 (Australia) +1 (408) 457-0758 (USA)
Skype us at: formreturn

Online Meeting: Organize a net meeting with us by visiting our online demonstration page. http://www.formreturn.com/online_demonstration

OMR Form Design Integration with OMR Processing of Response Data

- FormReturn is fully integrated to design, publish and print OMR response questionnaire forms or answer sheets and capture and link the response data using scanned form images, all in the one, reasonably easy to use, program.
- Once a form template has been designed, it can be used as many times as wanted, as long as it is republished in FormReturn's form editor.
- The template files as with any other document files, can be re-opened in FormReturn and changed to make new templates, to save time starting from scratch.
- When scanned form images are uploaded into FormReturn for data capture, it doesn't matter which order the forms are scanned and uploaded, the Form ID Barcode on every form page, automatically links each page to the form template publication it belongs to.
- FormReturn software can only process OMR forms which have been designed in it's own form editors, because it uses the Form ID barcode on every form page, for recognition of the page by FormReturn and the segment barcodes are used for locating where the checkbox mark areas appear on every form page.
- FormReturn OMR Forms can have form identification added to each page, so you know who each form page belongs to.
- FormReturn OMR Forms can be made anonymous but must still link to a data table.
- A form template must be recognition tested, otherwise the detection of the OMR areas may be inaccurate when forms are processed into captured data.
• A form template must be published before the template’s information will be stored in FormReturn, otherwise scanned forms won’t be recognized by the form processor.
• All forms published from a FormReturn form template need to link to a data table you have created in Source data.
• Captured Data always needs a record to be stored against, even for anonymous forms.
• If you want the forms to link to particular respondents, the respondent's records are added to a data table before publishing the form template.
• If you don’t want the returned forms to link to particular respondents (for anonymous forms for surveys), create a data table which either doesn't have any records, or you can add records to the data table which are only numbers so you can determine that all the forms from the publication have been processed.
• FormReturn OMR software uses Optical Mark Recognition to detect dark hand marks made by respondents in the checkboxes of the paper questionnaire forms. The forms are scanned and saved on your computer then uploaded into FormReturn from your computer.
• The response data captured from the checkboxes which are also called mark areas or fragments, is stored in captured data, then exported to an external spreadsheet, eliminating time consuming and inaccurate data entry of people's responses to questionnaires.
Overview

The main purpose of FormReturn software, is to automatically capture people's hand marked responses made in the checkboxes of paper questionnaire forms and store the response information from respondents as readable data which can then be exported to a spreadsheet for further analysis.

To do this, a FormReturn form template must be carefully designed, the forms completed by respondents must be clearly scanned and identified and processed by the OMR form processor.

Below is an overview of the steps needed to be taken, from designing and publishing forms, to the captured checkbox response data exported to a spreadsheet.

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1. Design Segments

The Segment is a Separate part of each form page in the template, because it contains its own barcodes for location of the Mark Areas and Key Fields. When the forms are being processed, the Optical Mark Recognition processor needs to know where to locate these areas, before it can detect and capture response marks or barcode labels.

If more than one segment is being created for the same form template, each mark area on each of the segments, must contain a completely unique Captured Data Field Name (question name). Matching field names in the captured data of the same form, will cause captured response data to be corrupted or stored in the wrong columns.

A segment can be what ever size you want as long as it will fit between the default margins of the form template allowing for the Form ID Barcode added somewhere outside of the segment.

Care must be taken when designing the segment if you want accurate detection of the checkbox response marks, by FormReturn.

Recognition Previewing the segment is an important step of the form design, because it makes sure the segment, the segment barcodes and the checkbox mark areas can be recognized, before the segment is added to the form template.

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2. Design a Form Template

A FormReturn form template is a questionnaire or answer sheet, multiple choice response form, created using FormReturn's Form Editor.
The FormReturn form template is designed, by adding a Form ID barcode and the Segment with the mark areas. Each page of the form template is linked to it’s Template Publication and the captured response data, using the Form ID Barcode which is added to the form template design.

A FormReturn form template can contain as many pages as you need, with the option for each page to contain more than one segment (for randomization of questions which are suited to different people or to discourage cheating).

a. If a form template contains more than one segment, each question mark area on the form must contain a unique Captured Data Field name (question name). Matching field names in the same form will cause captured response data to be stored in the wrong columns.

b. A segment can be whatever size you want as long as it will fit between the default margins of the form template allowing for the Form ID Barcode added somewhere outside of the segment.

Add Form Identification - or who a form belongs to.

A FormReturn form template can have an identifying component added so you know who each form belongs to. Forms are identified by matching each form page to a record in your respondent's data table, by using either:

a. Template Variable Replacement (similar to mail merge) which replaces data table field names, which have been typed on the form template, with the records from your respondent's Data table in Source Data. The captured response data from each form page will reconcile with the record printed on it. This is the Form ID Method of publication.

b. A Key Field (which can be either (i.) an OMR ID Grid - made from checkboxes for filling in a respondent's ID number or (ii.) a Barcode Area - for affixing a barcode label of your own) is added to the segment. Key Field information will be captured using OMR, and used to reconcile the captured data with the data table record it belongs to.

3. Recognition Preview the Form Template

In the print preview, FormReturn detects the barcodes, the segment and the mark areas (fragments) that have been added to the form template.

4. Recognition Test the Form Template

FormReturn detects the barcodes, the segment, the mark areas (fragments) and the response marks made in checkboxes of scanned images. To make sure all these form components can be detected by FormReturn, before you publish a form for distribution, recognition test the form template first. This is done by printing a form, filling it in yourself, scan the form and open it in the Recognition Test preview window. If you scanner has produced a clear image and everything has been added to the form correctly, the barcodes, the segment, the fragments and the hand marks you made will be accurately detected. This means the form is properly designed and can be published a printed.

5. Add Respondent's records to Source Data

Create a data table in source data which contains the records for you respondents. Or for forms that will be anonymous, create either a data table without records, or a data table with anonymous records added. The form template you design and published, will reconcile with the data table and records, and the response data captured from the forms will be stored with the record it belongs to.

6. Publish the Form Template

Publication of the form template stores the Template's information in FormReturn's database, ready for captured response data to be reconciled with.

1. A Source Data table must be chosen for the captured data to link to a respondent's record. (In the case of anonymous forms, the data table can contain empty records to link the captured response data with)

2. A publication type is chosen, which tells FormReturn which way you want the captured response data to link to your respondent's records in Source Data. There are three publication types to choose from.
7. Scan the Completed Forms

When the completed forms are returned they are scanned using a document scanner with an automatic document feeder and saved on your computer. The images are uploaded into FormReturn, which needs a clear scanned image so it can detect and recognize the barcodes and capture the response marks in checkboxes. It will only process forms with recognizable Form ID barcodes and mark areas that were added using the form editor.

1. If you scan at a too high resolution, your form images will be slower to process in FormReturn - 150 to 200 dpi is recommended, but it will depend on the type of images the scanner produces.
2. If your scanned images are not clear and sharp enough, it will cause detection issues with the software.

8. Process the Scanned Form Images

Scanned Form Images are uploaded into the Processing Queue, either manually or automatically from where they will be sent, one at a time, to the form processor in FormReturn's server. This process will be almost instant, depending on how many images you have uploaded at once.

The processing of images takes a matter of seconds which means hundreds of forms can be processed each day.

Any images unidentified by FormReturn, will be put in the Unidentified Images folder and can be re-processed manually or re-scanned, depending on the reason why they weren't recognized.

9. Manage and Export the Captured Data

Form template Publications are stored in Captured Data. **Important:** Don't delete Publication Names from Captured Data unless you are sure all the forms have been captured and exported.

When the forms from the Publication are scanned and processed, the captured data is stored with the publication the forms belong to.

The Captured response data from each form and form page along with the total (mark aggregation) score for each form, is then available to be viewed in Captured Data.

Each form page also has a preview of the scanned image stored in captured data.

Captured response data is exported to a CSV file which opens in an External Spreadsheet, depending which office package you have installed on your computer.

**Requirements of FormReturn OMR Form Processing**

A sharp, perfectly scanned image of the form pages. Optical Mark Recognition works by detecting only what it determines as black in the checkboxes and barcodes of scanned images of FormReturn forms.

FormReturn OMR Software reads and analyzes barcodes and checkbox responses from the scanned form images.

a. Each page of a form page is recognized by identification of the Form ID barcode.

b. The form processor captures and stores the response mark data from the checkboxes in the detected mark areas.

c. Captured response data is matched to the record it belongs with in the data table selected for the form template publication.

d. Captured data stores the value of the hand marked checkbox from each mark area and the score if mark aggregation was used.

**Important:** Don't delete Publication Names from Captured Data unless you are sure all the forms have been captured and exported.

**Why Forms must be designed with FormReturn's editors.**

FormReturn OMR is fast and accurate but can only process response data from form images that it recognizes. FormReturn uses:

1. A Form ID barcode added to each form page, to recognize each form page and to reconcile the captured data with the form template and respondent's data record it belongs to.
2. The Segment barcodes, to locate where the checkbox mark areas appear on the form.
3. Unbroken checkbox borders to detect and accurately capture the hand marked responses in checkboxes.

Only forms designed using FormReturn's Template editors can be recognized by FormReturn.
**User Interface**

When you first access FormReturn, you will be presented with a blank User Interface, showing the Menu Bar, the Application Toolbar and the FormReturn License registration details.

1. **Menu Bar**
   - File  Edit  Object  View  Help

2. **Application Toolbar**
   - Open File  New Segment  New Form  Source Data  Processing Queue  Captured Data  Preferences
   - The Main toolbar of FormReturn used to access the different software components.

3. **FormReturn Licensee details.**
   - Licensed to Roland Quast; EB Strada Pty Ltd
   - The details of the person and business this FormReturn License is registered to.

4. **Scan Forms Button**

5. **Assistance Button**
The Scan Forms button can be used when a TWAIN compatible scanner has been connected to FormReturn.

If you would like assistance with FormReturn or you have any questions, click the Assistance button at the top right of FormReturn's software user interface. Fill in the form, with your contact details and type your questions in the Requirements field. We will respond as soon as we get your message.
Glossary
A List of Components, Features and Functions used in FormReturn

**Add Page** button is at the bottom right of the Form Editor application window and is used to add extra pages to a Form template.

**Aggregation Rule** - set up in Mark Area properties assigns a score to any given checkbox; Eg: a score if the checkbox for the correct answer is marked.

**Anonymous** form templates - usually used in surveys when the respondents are to remain unidentified.

**Application Window** The graphical user interface of any component of FormReturn where the software's functions are performed.

**Application Toolbar** is the main toolbar in FormReturn which contains the graphic icons used to access and use the working components of FormReturn.

**Assistance Button** - Click the assistance button if you need questions answered about Formreturn or you would like to be contacted by a reseller.

**Barcodes** - are used for identifying segments and forms during data capture, namely Form ID Barcode or Segment Barcodes.

**Barcode Area** - Added to the segment for affixing a Barcode label, is a method of form identification and captured data reconciliation.

**Barcode Element Panel** - Available when a barcode is selected, controls width, height and position of a barcode on the page.

**Barcode Panel** Available when the barcode is selected, controls the type of barcode used when the Barcode Area is selected.

**Box Height** Checkbox height - in Mark area properties dialog, defines the height of each checkbox in the checkbox area. Using the standard checkbox settings is always advisable for the best possible detection.

**Box weight** Checkbox weight - in Mark Area properties dialog, defines the thickness of the border of the checkboxes. Using the standard checkbox settings is always advisable for the best possible detection.

**Box Width** Checkbox width - in Mark Area properties defines the width of each checkbox in checkbox area. Using the standard checkbox settings is always advisable for the best possible detection.

**Box roundness** Checkbox shape - in Mark Area properties dialog, is used to alter the shape of the checkboxes eg: the smaller the setting number the more square the box will be. Using the standard checkbox settings is always advisable for the best possible detection.

**Captured Data** is the hand marked response data which has been captured using Optical Mark Recognition from scanned form images and is stored in FormReturn's Captured Data component.

**Captured Data Fieldname** The name given to a Mark Area (such as a question number) to identify it when it is stored in Captured Data and exported to a spreadsheet. (Eg: Question 1 Question 2 etc.)

**Captured Value** - the mark value of the checkbox (A;B etc.) that contained the response, stored in Captured Data.

**Checkbox Tool** - for adding a mark area with checkboxes to a segment.

**Circle tool** located in the Segment Editor and Form Editor Toolbars is used to draw circular shapes.

**Columns** and **Rows** in the Mark Area properties dialog, depicts the number of vertical and horizontal checkboxes there are in the mark area.

**Components** - the working components of FormReturn software which streamline form design with captured data.

**CSV** file (Comma-Separated-Value) is used when exporting captured data to a spreadsheet. A common file type used to import data from one software application to another, using commas to separate the values.

**Data** - is a collection of typed or processed facts, figures or words such as Captured Data.

**Data Export Preferences** - choose and save your preferred data and column ordering that you would most often use.

**Data Records** are the single records in a Source Data Table located in source data.

**Deskew** is the process of removing skew (imperfections) from scanned images that can occur because of the camera being misaligned, imperfections in the scanning surface, or simply because the paper was not placed completely flat when scanned.

**Detect Barcodes** in the Preview Check panel, is selected when performing a Recognition Preview or test preview, to test if all the added Barcodes are detected on the segment and / or form template.

**Detect Segments** in the Preview Check panel, is selected when performing a Recognition Preview or test preview, to test if the Segment has been detected by FormReturn.

**Detect Fragments** in the Preview Check panel, is selected when performing a Recognition Preview or test preview, to test if the marks areas have been added correctly and are detected by FormReturn.

**Detect Marks** in the Preview Check panel, is selected when performing a test preview, to test if marks made in Checkboxes are detected on the segment and / or form template.
Dialog box is a small temporary window in a graphical user interface that appears in order to request information from the user. Eg. the ‘Create a New Form dialog’.

Duplicate - a feature of FormReturn that allows duplication of an element added to the segment or form.

Element - Any form component added to the form or segment templates, is called an element.

Empty Segment Area is added to a Form template as an empty area for adding a segment.

Error Count - is a column in Captured Data which show if any processed forms had errors.

Extension is the second part of a filename. Eg: a saved segment file will automatically have .frs as the extension and a saved form file will automatically have .frf as the extension.

Fieldname The name given to the heading for a list of records in a data table. Eg: firstname; lastname; student Id etc.

Font Directory - FormReturn uses the fonts already installed on your computer’s directory.

Font Size depicts the font size of the Mark value in checkboxes.

Font Brightness depicts the darkness of the font for the mark value in checkboxes.

Form Template is designed in the Form Editor and can contain one or more pages which can be published and printed into individual forms.

Form Components are the elements added to a segment or form template designed in FormReturn such as barcodes or fragments which are the checkbox mark areas.

Form Editor is the application of FormReturn used to design and edit forms.

Form Editor Toolbar is the selection of tools located in the Form Editor interface.

Form ID Barcode - added to each page of a form template using the barcode tool in the form editor toolbar. This is the barcode on each page of a form which identifies and links form pages to the template and the respondent they belong to.

Form Identification - can be one of three methods of identifying who the form belongs to and to reconcile the captured response data from the form with the respondent's data table record.

Form Pages Tab is located in Captured Data and is used when you want to view the captured data for each form page of the selected form along with the scanned Image of the form page.

Form Password is the Form ID Barcode value, automatically generated and used by FormReturn to identify a Publication.

Form Score is a column in Captured Data Forms interface, which shows the total score for each form processed from the publication, if the mark areas had an aggregation rule applied.

Form Template - Designed using FormReturn's form and segment editors, can contain one or more pages.

Forms Tab is located in Captured Data and is used when you want to view a list of forms from the selected Publication.

Fragments are the Mark Areas added to the form template and used for OMR capture of hand marked responses.

Fragment Padding is the white area between the checkboxes and the edges of the fragment.

Graphical user Interface is the type of application window used in FormReturn, based on graphics (picture icons and menus) instead of text. It uses a mouse and keyboard arrows as navigation devices. An example is the Form Editor Application window.

Horizontal Space located in Mark Area Properties is used for adjusting the spacing between each checkbox in the mark area. Using the default checkbox settings is always advisable as too much or too little spacing can cause errors with checkbox detection.

Icon is a graphic symbol indicating a tool or function in such as those found in FormReturn's toolbars.

Image tool is located in the Form Editor and Segment Editor Toolbars is used when you want to add an area to a form or segment for loading an image into.

Image Area Panel located in the Form Editor and Segment editor side panel when an image area has been selected, is used for loading an image into the selected Image Area.

Information button is a small blue button containing a question mark. When you see one of these buttons, you can click on it to go to the help guide for more information.

Key Field - is either an ID grid or a Barcode Area which has been added to the segment as a method form identification and captured data reconciliation with a respondent's record in Source Data. Optical Mark Recognition is used when the form is processed to detect the ID number or the barcode label.

Language Preferences Select another language in FormReturn’s Server, Database settings.

Load Segments button is used in Form Editor, to load a Segment onto an empty segment area in the Form template.

Luminance is one of the recognition settings of FormReturn used for increasing the darkness of color scanned images.

Marks is the name given to handmarked responses in checkboxes.

Mark Area panel contains the set properties button used for opening the Mark Area Properties dialog.

Mark area is the area on a Segment containing a bank of Checkboxes used for capturing response marks.
Mark Area Properties dialog box is opened by double clicking on the mark area and is used for changing the Captured Data fieldname, set the order index, change the style of the checkboxes or to apply a mark aggregation rule.

Mark Threshold is a recognition setting of FormReturn, used for setting the threshold between the black pixel count and the white pixel count of the checkboxes on a scanned image.

Mark Area Properties dialog box is opened by double clicking on the mark area and is used for changing the Captured Data fieldname, set the order index, change the style of the checkboxes or to apply a mark aggregation rule.

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Mark Threshold is a recognition setting of FormReturn, used for setting the threshold between the black pixel count and the white pixel count of the checkboxes on a scanned image.
Round Rectangle tool located in Segment Editor toolbar or Form Editor toolbars is for drawing oblong shapes on the page.
Rows and Columns in the Mark Area properties dialog, depicts the number of vertical and horizontal checkboxes there are in the mark area.

Scan Button located in the Application Toolbar, automatically starts FormReturn scanning and uploading form images directly from a TWAIN compatible scanner.

Scanning Forms - OMR can only recognize clearly scanned images to detect barcodes and hand-marks made in checkboxes.
Score Field Name similar to the Captured Data Fieldname, is the name given to the score column for each question if an Aggregation Rule was applied. (Eg: Question1_Score, Question2_Score etc.)
Segment - Created in the segment editor, contains the mark areas which will be used by FormReturn for capturing handwritten responses.
Segment Area is an empty or blank area, added to a form template with the Segment icon, for adding or loading a segment into.
Segment Barcodes are the barcodes located at the top right and bottom left of a segment. They are used in data capture of forms to locate the checkbox mark areas or fragments.
Segment Panel contains buttons for changing the segment size or the segment barcode size.
Segment Editor is the interface or area of FormReturn used to create and design new segments.
Segment Editor toolbar is located in the Segment Editor interface and contains buttons used to add elements such as checkboxes and text areas to the segment.
Segment tool located in the Form Editor Toolbar is used to add an empty Segment area to a form template opened in the Form editor for adding or loading a saved Segment into.
Select tool located in the Segment Editor and Form Editor Toolbars is used to select a group of form elements or components.

Server - FormReturn's server is used by the software for database storage of Source Data records, form Publications and form processing.
Set Properties button is located in the Mark Area panel on the Segment Editor interface visible when a Mark area is selected.
Snap to Grid - an alignment tool located in Edit of the Menu bar which is used for turning on or off a grid on the page which would be used for aligning elements as they are add to the Segment editor or the Form Editor.
Sort Captured Data >> See - Order Index
Source Data is the name given to FormReturn's database where data tables and respondent's records are stored, added or edited.
Source Data Publications is the interface located in Source Data where Publications which have been made using the selected table can be viewed.
Source Data Records is the interface located in Source Data where Records can be added or edited for the selected Data Table.
Source Data Tables are added to source data for adding and storing your respondent's data records.

Template Editors - are the interfaces of FormReturn used for designing segments and forms. They are accessed with the New segment and New form icons in the Application toolbar.
Template Variable Replacement is a method of form identification, similar to mail merge, used for replacing typed fieldnames from your data table on the form template, with source data records when the forms are published.
Ternary Operation means - ‘this applies to everything else after the colon:’ it is used in setting the Mark Aggregation Rule where it refers to, all other checkboxes after the colon get this score.
Text Area is an area added using the text tool to a Segment or Form where text can be typed.
Text Area Panel is located in the Segment and Form Editor interfaces when a Text Area is selected. It has fields to control font style, alignment and color.
Toolbar is a bar which contains the icons denoting the tools used in the interface where the toolbar is located.
TWAIN is technology used in FormReturn for automatic communication of the software with your (Twain compatible) scanner.

Upload Image and Upload Folder buttons are located in the Unprocessed Panel in the Processing Queue interface. They are used to manually upload scanned images of forms, from your computer into FormReturn.
Unidentified Images are images which have been uploaded but unable to be recognized by FormReturn, often caused by the quality of the scanned image making the Form ID Barcode unrecognizable. Scanned images must be of good clear quality for detection of barcodes and mark areas.
Unidentified Images Tab is located in the Processing Queue interface and is used to view any unidentified images not recognized by FormReturn. Clicking on an image will show the reason why it wasn't identified.
Unidentified Images table is located in the Processing Queue and stores form images which were unrecognized by FormReturn. These images will have to be manually reprocessed or deleted and re-scanned.
**Unprocessed Images Tab** is located in the Processing Queue interface and is used to view any unprocessed images still waiting to be sent to the form processor.

**Verify Form Structure** is Step 2 of the Publication process and verifies there is a Form ID Barcode located on every form page of the template you are publishing.  
**Vertical Space** located in the Mark Area Properties dialog box, is the spacing between rows of checkboxes. Using the default checkbox settings is always advisable.

**Visible Checkbox Text** located in the Mark Area Properties Dialog is used to select whether to show or hide the mark values (Eg: A,B,C or D) of the checkboxes.
Navigation Tools
FormReturn uses graphical icons and buttons for accessing the software's functions. The Navigation tools used are the mouse, the keyboard arrow keys and the Menu Bar which has a number of keyboard Navigation shortcuts.

- Using the Mouse
- Using the Keyboard
- Navigation Shortcuts in the Menu Bar

Navigate Using the Mouse
In FormReturn the mouse is the main navigation tool used.

- To click on an object, an icon, a tab or button means to move your mouse cursor to the button or tab and click on the left mouse button to select.
- To drag means to hold your finger on the left mouse button while moving the mouse across the page. Areas within the Segment Editor or the Form Editor can be moved around the page by selecting the area and dragging it using the mouse.
- Double click means to move the mouse cursor to the object and click twice on the left mouse button to select.
- Right click - click the right mouse button or with Mac, hold down the Control key and click the mouse.

Navigate Using the Keyboard
The keyboard can be used to navigate between fields using the up / down, left / right arrow keys to go to the next field. Areas within the Segment Editor or the Form Editor can be moved around the page by selecting the area and moving it with the keyboard arrow keys.

Navigation Shortcuts
FormReturn has a number of Navigation shortcuts which can be found in the Menu Bar and be used for quick and easy navigation in FormReturn. Eg: Hold down the Command key [Mac] or Control key [Ctrl Windows] simultaneously with the Z key to Undo the last action.

Example:

Windows Undo - Z
Mac Undo - Z

Undo / Redo - located in the Edit menu of the Menu Bar
File Menu in formReturn's Menu Bar

Edit Menu
FormReturn's form design, database and data capture interfaces are accessed by clicking on the icons in the Application Toolbar.

FormReturn automatically integrates Form Design and Publication of forms with Data Capture and Export of the response data from completed forms, reconciling the data with respondent's records.

 ![Image: The Application Toolbar.

**Open a saved form or segment File.**

Form and Segment files have the extension .frf and .frs respectively, and are saved on your computer wherever you choose. Double click on a FormReturn file and it will open in FormReturn, or click Open file and choose the file from your computer's directory.

**New Segment Editor**

The template editors are the Segment editor and the Form editor.

A segment, containing the checkbox mark areas, is designed in the segment editor and added as a separate component to the Form template.

**New Form Editor**

The template editors are the Segment editor and the Form editor.

The form template which will be published and printed, is designed using the form editor.

**Source Data**

Source Data is the part of FormReturn's database where respondent's records are added and stored in data tables.
5 Processing Queue

Open the Processing Queue, where scanned form images are manually uploaded and queue to be sent to the form processor in FormReturn's server.

6 Captured Data

Open Captured Data where captured response information from Published and Processed forms can be managed and exported to a spreadsheet.

7 Form Return Preferences

Open the Preferences dialogs to change the default settings for form design and captured data.
Form Editor Interface

The Form Editor is where a form template is created. A Form ID Barcode and a Segment containing the checkbox Mark Areas is added to the form template, and then it is Previewed, Published and printed.

Image: The Form Editor interface showing a designed form template with the Form ID Barcode and the Segment.
Set the Form Page Preset size (Paper size) or page dimensions, Orientation and Margins.

**Form Editor Tab**

This is where the full form template is designed. Form components which are the segment containing the checkbox mark areas, the Form ID barcode, Template Variable Replacement field names, text and images are added to the form template design. The Segment is a separate component added to the form template (similar to layers in an image) and is designed in the Segment Editor. It must be a separate part of the form page because it contains its own location barcodes called the segment barcodes, and the mark areas used for capturing checkbox responses. The segment is added.

**Recognition Preview Tab**

Click the Recognition Preview tab when the form template design is finished. The form template is previewed to check the detection of the Form ID barcode, the segment barcodes, the segment, Fragments, which are the checkbox Mark Areas, including ID Grids and Barcode Areas and any test marks you made in checkboxes for testing detection of marks.

**Publish Form Tab**

Click the Publish Form tab when the form template is finished and ready to be published. Publication of the form template stores the template's structure in FormReturn's database and displays the Publication in Captured Data. Forms that aren't published can't be processed into captured data by FormReturn as they won't be recognized.
Segment Editor Interface

The Segment Editor is where a Segment is created, which is a part of the form template. Checkbox mark areas and Key Fields [optional for form identification] are added to the segment, and then it is loaded onto the form template, which is published and printed.

A Segment is designed as a separate component to the form template, because it contains its own barcodes, called the segment barcodes. The segment barcodes are used for locating the checkbox mark areas when the forms are being processed.

*Image: The Segment Editor interface showing a designed segment.*

Segment Page Properties Panel.

2. Segment Editor Tab
3. Recognition Preview Tab
Set the segment Preset size (Paper size) and the segment dimensions.

**Segment Editor Tab**

This is where the segment is designed, by adding the checkbox Mark Areas which will be used by the form respondents. The segment is a component of the Form Template and is added to the form page, using the Segment tool in the form editor.

**Recognition Preview Tab**

The Recognition Preview is where the Segment, the Segment Barcodes and the checkbox Fragments can be checked for recognition detection by FormReturn.
Source Data Interface

Source Data is the part of form return's data base, used for storing data tables and adding respondent's records. Data Records can be added manually or imported from an external csv file.

Image: Source Data - Tables Folder.

Tables Folder 1

Records Folder 2

Publications Folder 3

Sort Filter 4

Field Names Panel 5

Tables Folder

This is where data tables are created and stored. Data tables are used for adding and storing respondent's records. Click a data table to select it.
Records Folder

Click the Records tab, to add and edit records for the selected table.

Publications Folder

This is where Publications are displayed, that have been made using the selected data table.

Sort Filter.

Limit the number of forms that are displayed at one time and click Apply.

Sort the order of the displayed forms, ascending or descending, and click Apply.

Search for a form by ID or Name and click Apply.

Field Names Panel
This is where Field Names for the selected data table are displayed. Click Add New in the Fields panel to add Field Names to a selected data table.

Field Names are a description of the type of records that will be added. (Eg: firstname or lastname)
Processing Queue Interface

The Processing Queue is accessed with the Processing Queue icon located in the Application Toolbar, and is where form images can be manually uploaded into FormReturn and where the scanned images queue while they wait to be sent to the form processor.

The processing of uploaded form images usually takes only a few seconds each, so unless a large number of images is uploaded at once, they probably won't be displayed in the Processing Queue.

*Image: Processing Queue - Unprocessed Images Folder.*
1. **Upload a form image or Folder of images**

   This is where scanned images of forms are manually uploaded into FormReturn's form processor.

2. **Unprocessed Images Folder**

   This is where uploaded scanned form images are queued while they wait to be sent to the Incoming Images Folder in FormReturn's form processor.

3. **Unidentified Images Folder**

   This is where Unidentified scanned images are stored because the Form ID Barcode was unable to be recognized or found by FormReturn. Unidentified Images can usually be manually Reprocessed and sent to Captured Data.

4. **Limit, Sort, Search Filters**

   - **Limit the number of forms that are displayed at one time and click Apply.**

   ![Limit Results](image)

   - **Sort the order of the displayed forms, ascending or descending, and click Apply.**

   ![Sort Results](image)

   - **Search for a form by ID or Name and click Apply.**

![Search](image)
Captured Data Interface

Captured Data is accessed by clicking the Captured Data icon located in the Application Toolbar, and has the tools used for managing and Exporting the Captured Data from Forms and Form Pages.

When a form template is published, the Publication is stored in FormReturn's database and displayed in Captured Data in the Publications folder. When the scanned forms are processed, they are reconciled with the Publication they belong to and the captured data is stored with the Form and Form Pages it belongs to.

*Image: Captured Data - Publications Folder.*
The Publications folder displays the publication, ID's and Names, currently stored in FormReturn's database. Processed forms and the captured data from them, will link to the Publication they belong to, and be stored in Captured Data, where they can be managed and exported to a spreadsheet. Click on a publication name and click on the Forms Folder to see the forms for the publication.

This is where Forms in a selected Publication are displayed. Click to select a form in the forms folder, then click on the form pages folder to see the form pages in the selected form.

This is where Form Pages that belong to each form are kept.

Limit the Number of files appearing at one time on the page. Sort Publications, Forms and Form Pages in ascending or descending order. Search for Names or ID numbers, of Publications, Forms or Form Pages.

Manage and Export the Captured Data from Forms and Form Pages
**General Preferences**

Click the Preferences button in the Application toolbar to open the General Preferences dialog, to change your preferences for each of FormReturn's applications.

Preference options are mostly self-explanatory and are used to change some of FormReturn's default settings, to your desired preferences.

1. **Check for Updates when FormReturn starts.**
   
   Select this box to receive updates of new versions, features and fixes for FormReturn.
Font Directories currently available in FormReturn

Font Directories

C:\Windows\Fonts

This is where FormReturn looks for fonts when the program is loading. When you have added new fonts to your computer's directory, FormReturn must be restarted before any changes will take effect.

Clear History

History

Clear recently opened files

Change Language

Language

System language

Change Language

FormReturn has been translated into a selection of languages other than English, choose your language from the drop down menu and click Change Language. After selecting your language, click the Change Language button and Restart the program.

Shutdown Option.

Shutdown

Disable confirm exit on application close

Deselecting this box, will cause a Confirm Exit dialog to open when exiting FormReturn.

Add or Remove a Font Directory

Add Font Directory

Remove Font Directory

You can choose a different system font which will replace Bitstream Vera, FormReturn's default font. This will replace the font style of the checkboxes, barcodes and the text areas. Because Bitstream Vera only has Roman glyphs, this area can be a handy feature to allow you to replace the default font with a font such as an Asian font. Remove a system font by selecting it from the list and click Remove Font Directory.

Restore Default Preferences.

Restore Defaults

Click to restore changed Preferences to default preferences.
Select a New System Font File

Select a new system font which will replace Bitstream Vera, FormReturn's default font file. This will replace the font style of the checkboxes, barcodes and the text areas, to the style of the new font. Because Bitstream Vera only has Roman glyphs, this area can be a handy feature to allow you to replace the default font with a font such as an Asian font.
Client Database Preferences Window

1. Click to open Database Preferences

2. Launch Server

3. Local Databases

4. Database Connection Details

5. Launch Form Return Server

The FormReturn Client automatically connects to the FormReturn server at startup.
When networking FormReturn on different computers, that connect to the same FormReturn server located on another computer, un-check this box and use the Database connection details, to tell FormReturn where to connect to the server.

Local Databases

If you have created another database for FormReturn to connect to, choose it from the list of local databases and click the [Set As Active Database] button.

Database Connection Details

The default FormReturn Database is called FRDB. FormReturn automatically connects to this database on startup when [Connect to database at startup] is checked.

Other databases which have been added to FormReturn's server, can be connected to.

1. Type the name of the database in the Database Name field.
2. Click the Test Connection button to see that FormReturn connects to your new database.
3. Click the Save Database Settings button to save the new database connection.

Click Restore Defaults to reset the database connection back to the original database. This will restore the original automatically generated password, which was created when the software was first installed.

Launch Form Return Server

Manually launch FormReturn's server, if it doesn't automatically launch on startup.
Editor Preferences Window

1. Editor Preferences icon.
   Click to open the Editor Preferences.

2. Default size and page settings for New Segments and Forms
   Change the preferences for the default page size and orientation of New Segments and New Forms.

3. Add, edit or Remove a Preferred Custom Segment Size

4. Add, Edit or Remove a Preferred Custom Form Size
• Click [Save Default Size Settings] for changes to take effect.
• Click Restore to restore to FormReturn's defaults.

**Add, edit or Remove a Preferred Custom Segment Size**

| Add New | Edit | Remove | Restore Defaults |

- Click Add New to open the Custom Segment size dialog.

**Add New Custom Segment Size**

- Type a name for the new custom segment size
- Change the Width or Height
- Click Save or Cancel to Escape without saving.

**Add, Edit or Remove a Preferred Custom Form Size**

| Add New | Edit | Remove | Restore Defaults |

- Click Add New to open the Custom Form Size dialog.
1. Type a name for the new custom form size

2. Edit the width, height, and margins

3. Click Save or Cancel to exit without changing.
Publishing Preferences Window

1. Select Preferred Publication Type

   - Default Publication Type: Form ID Reconciles - Append Only
   - Collate PDF Pages

2. Save Publication Settings or Restore to Defaults without changing.

   - Save Publication Settings
   - Restore Defaults
Capture Preferences Window

1. Preferred Captured Data Field Name Prefix

   Automatic Captured Data Field Naming & Duplication Defaults

   Fieldname Prefix: question

   Change the Captured Data Field Name, to a new preferred default setting, which will then be used every time a new mark area or key field is created.

2. Preferred Horizontal Duplicates and Spacing

   Horizontal Duplicates: 1
   Horizontal Spacing: 20

3. Click to Save the new Settings

4. Preferred Horizontal Duplicates and Spacing

5. Preferred Recognition Settings

6. Preferred Spacing for duplicates

7. Preferred Captured Data Field Name Prefix Counter

Click to Save new settings
Change the number of duplicates to a new preferred default setting, when fields are being duplicated.

3 Click to Save new settings

4 Click to Save the new Settings

5 Preferred Recognition Settings

Form Recognition Default Settings

<table>
<thead>
<tr>
<th>Luminance</th>
<th>Mark Threshold</th>
<th>Deskew Threshold</th>
<th>Fragment Padding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200</td>
<td>1.05</td>
<td>1</td>
</tr>
</tbody>
</table>

[ ] Perform Automatic Deskew

Change the Recognition Settings to new preferred settings, which would be the settings needed for accurately detecting images from your scanner.

6 Preferred Fieldname Prefix Counter.

Counter Starts At

7 Preferred Spacing for duplicates.

Vertical Duplicates

Vertical Spacing
Include these columns in the data export.

1. Include Columns In Export
2. Dropdown Menu: Sequence of column order

Choose the columns you want to include in the data export.

Processed Time
Source Data

Include Page Processed Time in the data export.

3. Include Page Processed Time in the data export

Change Captured data order index offset

4. Change Captured data order index offset

Include form image file names in the data export.

5. Include form image file names in the data export

Save Export Preference settings or Restore the default settings.

6. Save Export Preference settings or Restore the default settings

Export Preferences Window

Dropdown Menu: Sequence of column order
Include these columns in the data export.

Include Form ID, Form ID, and Form Score columns.

7. Include Form ID, Form ID, and Form Score columns

Dropdown Menu: Sequence of column order
Include these columns in the data export.

Include Page Processed Time in the data export.

8. Include Page Processed Time in the data export

Change Captured data order index offset

9. Change Captured data order index offset
3. Include Page Processed Time in the data export.

   - Processed Time - Order Index Offset: -1,000

4. Include Source Data columns in the data export.

   - Source Data - Order Index Offset: 0

5. CSV Output options

   - Delimiter: CSV - Comma Separated Values
   - Quotes: Double Quotes

   - Include Field Names Header

6. Include form image file names in the data export.

   - Image File Names - Order Index Offset: 0

7. Change Captured data order index offset.

   - Captured Data - Order Index Offset: 1,000

8. Save Export Preference settings or Restore the default settings.

   - Save Export Settings
   - Restore Defaults

9. Change order index of Publication ID, Form ID and Form Score columns.
<table>
<thead>
<tr>
<th>Order Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
</tr>
<tr>
<td>-2</td>
</tr>
<tr>
<td>-1</td>
</tr>
</tbody>
</table>
FormReturn Server - Database Settings

FormReturn's Server has three main uses, database storage, the form processing and as a Folder Monitor to automatically poll for and upload scanned form images from a selected folder.

The purpose of the database is:
- For storage of:
  1. Data tables containing records,
  2. Form structure
  3. Publication information
  4. Captured data.
- Remove or Create new databases. The FormReturn server can contain more than one database.
- Backing up everything stored in the database - it is advisable to regularly backup your database.
- Managing the Users of the FormReturn server.

Access FormReturn's server with the Server Icon - located in your computer's Task bar, when FormReturn in running.
Name and Status of Databases in the Server

<table>
<thead>
<tr>
<th>Local Databases</th>
<th>Form Processing DB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database Name</td>
<td>FRDB</td>
</tr>
<tr>
<td></td>
<td>active</td>
</tr>
</tbody>
</table>

To add more local databases, see Database Preferences.

Allow other computers to connect to FormReturn's server, across a network.

Network Details

<table>
<thead>
<tr>
<th>Listening Address</th>
<th>127.0.0.1</th>
<th>Use Default Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database Port</td>
<td>1527</td>
<td>Use Default Port</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Save Settings</td>
</tr>
</tbody>
</table>

See Database Connection Details in Database Preferences.

Remove a Database

Create a New Database

Backup a Database

<TODO> Insert description text here...

Add or Remove a Database User

Click [Manage Users] to open the "FRDB" Users window.
Click [Add New User] to open the [Add New DatabaseUser] dialog.
6 Restart Server
Shutdown Server
Hide Server window.

7 Change Language.

Select a Language for FormReturn from the Dropdown menu and click the Change Language button.
FormReturn Server - Form Processor Settings

FormReturn's Server has three main uses, database storage, the form processing and as a Folder Monitor to automatically poll for and upload scanned form images from a selected folder.

The Purpose of the Form Processor:

- Uploaded scanned images in the processing queue are moved to the incoming images table in the database of FormReturn's server. The images are then analyzed by the Form processor and the Processed response data is then moved to Captured Data and reconciled with the published form template it belongs to.
- Estimate the processing time of images and the time left until images are finished processing.
- To show the amount of time the Form Processor has been running. You can choose to have the form processor start automatically when the server starts up.
- To Manually upload form images using the server.

Access FormReturn's server with the Server Icon located in the computer Task bar, when FormReturn is running.

Image: FormReturn Server window.

1. Processing time of form images.

Queue Information

Example2Scans.tiff P1 processed in 4.953 seconds
Example2Scans.tiff P2 processed in 2.792 seconds
Example2Scans.tiff P3 processed in 1.903 seconds

Image: FormReturn Server window.
2. Amount of time the processor has been active.

   **Form Processor** | **Folder Monitor**

   **Form Processor Status**
   Active - Uptime: 01:20:10

   ![Start, Stop, Restart buttons]

3. Manually Upload Single form Images

   Process an individual form image file
   ![Browse button]

   Manually upload a form image directly to the server. Click Browse and look for the image file saved on your computer.

4. Manually Upload a Folder of form images

   Process a folder that contains image files
   ![Browse button]

   Click Browse and find the folder containing the images, saved on your computer.

5. Run Form Processor when Server starts.

   ![Check box for Run Form Processor When Server Starts]

   Keep this box checked, so the form processor is always ready to process images.
Form Return Server - Folder Monitor

The purpose of the Folder Monitor is to automatically poll for unprocessed form images from a folder you have created on your computer, from where they are moved to the incoming images table, in the database of FormReturn's server. The images are processed into Captured Data and sent to another folder for processed images, which has been created and saved on your computer.

Set Up Image Folders

- Create 2 folders on your computer, one for holding Unprocessed images and one for holding the Processed images.
- Set up your scanner to automatically save scanned form images, to the folder for Unprocessed images.

Select when FormReturn's server should poll for incoming images.

- Click the Start button to start formReturn's server polling for images.
- Click the Stop button to stop FormReturn's server polling for images.
- Click the Restart button if for some reason there is a problem with the server polling for images.

Select image Folders created on your computer.

- Browse for the Unprocessed images folder created and saved on your computer. This is where the images will be automatically polled from.
- Browse for the Processed Images folder created and saved on your computer. This is where the images will be sent when they have been processed.
Automatically search for and process any unprocessed images every 30 seconds.

**4 Click to automatically poll for incoming form images.**

- **Run Folder Monitor When Server Starts**

Click this box to start running the Folder Monitor, whenever FormReturn’s Server starts.

**5 Click Save Folder Monitor Settings**

- **Save Folder Monitor Settings**

Click Save to apply the settings.
Form Template Components

The components added to a form template are used by FormReturn to capture response mark data and the form identification when the forms are processed. FormReturn can recognize and capture data, from Form ID Barcodes, response marks made in checkbox mark areas, ID numbers marked into grids, barcode labels affixed inside Barcode areas and some other barcodes that are created using FormReturn.

The components which have been added to a FormReturn form template, combine together to:

1. Recognize every form page, using the Form ID Barcode.
2. Link the captured response data, from Mark Areas, with the person and the Publication the form page belongs to, using the Form ID barcode.
3. Link together multiple form pages from the same form, using the Form ID Barcode, if a Form ID Publication type is used.
4. Identify who each form page belongs to, using the Form ID Barcode, if a Form ID Publication type is used.

Creating a form template
Create a single or multiple page form template that can be recognized by FormReturn and can be scanned and captured linking the response data with the person it belongs to, by adding these three components to each page of the form Template.

1. **A Form ID Barcode** - links form pages with the form and the publication they belong to.
2. **A Segment** with the response checkboxes.
3. **A Form Identification** component (optional) - identifies the person the form belongs to.
4. **Anonymous forms** can also be created and captured in FormReturn.
5. **Text, Lines, Shapes and Images** can all be added to the Segment or the Form, as long as they don’t touch the required fields used for form recognition and capturing data, such as barcodes and mark areas.

**Form Identification and Form Distribution.**
The way in which forms are distributed determines if form identification will be preprinted on the forms, or captured when the forms are processed.

1. Preprinted form identification is called Template Variable Replacement which prints the respondent’s records from Source Data on the forms. The [Form ID Reconciles - Append Only] Publication Type is used and the printed forms must be distributed to the respondents they belong to. (For more information, see [Template Variable Replacement] in this guide)
2. Form Identification captured when the forms are processed is done by use of an OMR ID Grid, for marking in ID numbers by the respondents. The [Key Field Reconciles - Append Only] Publication Type is used and the printed forms can be distributed randomly. The ID number is filled in by the respondent and then captured. (For more information, see [OMR ID Grid] in this guide)
3. Another method of Form Identification captured when the forms are processed is a barcode label affixed to a Barcode Area. The [Key Field Reconciles - Append Only] Publication Type is used and the forms can be preprinted and used as needed. The barcode label is affixed for identifying the person being given the form. (For more information, see [Barcode Area] in this guide)
4. Anonymous Forms without any identification component can be preprinted and distributed randomly, but will reconcile with an empty or an anonymous record in Source Data, when they are processed by FormReturn. (For more information, see Anonymous Forms in this guide)

**A Publication Type** is selected when publishing the form Template. It is the method that will be used to reconcile the Captured response Data, with a respondent's record in Source Data table, and will depend on the type of form identification component added to the Template. Anonymous forms have no identification area added and will link to anonymous records in a data table or an empty data table.

1. **Form ID Barcode** [required form component]

   A Form ID barcode is added with the Barcode tool, to every form page of the form template, anywhere outside of the segment boundaries, leaving plenty of space around the barcode. The Form ID barcode is used by FormReturn for recognition of a form by FormReturn, linking each paged of a multiple paged form, and linking the captured data from each form page with the publication it belongs to.

2. **The Segment, [required component]** designed separately then added to the Form Template.

   The segment contains the mark areas which are the checkboxes. The mark areas are added using the Checkbox tool. The Segment is defined by the segment barcodes, which are used by FormReturn during form processing, to locate where the mark areas appear on the form page. The segment is designed as a separate component and added to the Form template.
The segment barcodes are recognized by FormReturn and used to locate where the mark areas appear on the page.

The segment barcodes are recognized by FormReturn and used to locate where the mark areas appear on the page.

Marks are the hand marks made in checkboxes by respondents.

FormReturn determines and detects the marks made in checkboxes using its Recognition Settings. Respondents should be instructed in the best way to fill in checkboxes for the best detection.

- An oval shaped checkbox is the easiest to fill in by a respondent.
• A dark pen or pencil must be used, because FormReturn uses a Recognition setting threshold between white and black on the scanned form image, to determine if a box contains a mark.
• If a pencil mark is rubbed out, it must be done thoroughly.

Form Identification
[optional component]

<<RespondentID>>
<<RespondentName>>

There are 3 optional methods for identification of who a form belongs to, or forms can be completely anonymous.

1. Template Variable Replacement (TVR) The most practical form identification feature in FormReturn, is used for identifying who a form belongs to. TVR replaces, field names from Source Data typed on the template, with the respondent's records (This is similar to mail merge, a unique form for each person). This is the easiest way to reconcile captured data with a respondent's record in the data table.

Example: field names are typed surrounded by the <<less than, greater than>> symbols (2 of each), which triggers FormReturn to replace the field names with the records from the data table, when the form template is published.

In Publication of the form template, the records from the Source Data will be published on the forms, making each form unique.

When the forms are processed, the Captured Response Data from each form page, will reconcile with the respondent's record.

Alternative Form Identification Methods

There are 2 other methods of form identification:
• An OMR ID Grid, for marking in and capturing respondent's ID numbers
• A Barcode Area for affixing barcode labels.

The Mark Area Fragments
(detected with a red border)

Each fragment added to the segment is a separate component of the template. Mark Areas, containing checkboxes, are added to the segment with the Checkbox tool. They are set up to capture marks made in answer to questions or for capturing identifying information such as an ID number from a grid made from checkboxes.
Template Variable Replacement [TVR] Identification and Form ID Reconciliation

Template Variable Replacement (TVR) replaces field names from your data table typed on the form template, with the records of the respondents, as a way of identifying who a form belongs to. The records are replaced during form template publication, and a unique form will be published and printed for each respondent who has a record in the data table.

The [Form ID Reconciles - Append Only] Publication Type is used when the form template is published, which means the captured response data from each form, will reconcile and append to the respondent's record in the Captured Data output. The Form ID Publication type uses the Form ID Barcode, added to each form page, to recognize the form pages and reconcile the captured response data to the form respondent's record in the data table.

Overview

- The field names are typed onto the form template, exactly as they are in the respondent's Source data table. A text area is created somewhere on the form template, as long as it doesn't touch any barcodes or mark areas or overlap the segment edges.
- The field names for the TVR are surrounded by the << less than; greater than >> symbols, to trigger FormReturn to look for the records in the source data table.
- The field names will be replaced with the respondent's records in the data table when the form template is published and printed. (similar to mail merge).
- When the Template is published, the form pages of the form for each respondent, will have a different Form ID Barcode, that links each of the pages to the respondent's form.
- The Form ID Barcode, on each form page, reconciles the captured response data, with the respondent's record it belongs to and the publication it belongs to.

Advantages of using this method:

1. The Form ID publication type uses FormReturn to it's full extent, allowing tracking of how many distributed forms from the publication have been returned and processed and who hasn't returned a form.
2. It is quick and easy to type field names in a TVR area on the form template.
3. TVR doesn't take up much extra space on the form.
4. You can make sure there is a form distributed to each person because the respondents names are already printed on every form page.
5. If a form is lost it can be reprinted.
6. Captured Data from each form, appends to the person's record it belongs to in Source Data.

Disadvantages:

A unique form is required to be printed and distributed to the respondent it belongs to.

Example of how Template Variable Replacement is added to the Template and how it works in FormReturn

Field names are typed into a text area on the form template. (Eg: <<Student_Name>> <<StudentIDnumber>>) or exactly as they are typed in the Source Data table that will be used for the Publication.

<table>
<thead>
<tr>
<th>Field</th>
<th>TVR Field Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Name</td>
<td>&lt;&lt;Student_Name&gt;&gt;</td>
</tr>
<tr>
<td>Student ID Number</td>
<td>&lt;&lt;StudentIDnumber&gt;&gt;</td>
</tr>
<tr>
<td>Class</td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td></td>
</tr>
</tbody>
</table>

When the form template is published, the publication type called "Form ID reconciles - append only" is chosen. A unique form for each respondent will be published and printed, which has the respondent's name where the TVR field names were typed.
<table>
<thead>
<tr>
<th><strong>Student Name</strong></th>
<th>Ben</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student ID Number</strong></td>
<td>12347</td>
</tr>
<tr>
<td><strong>Class</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Teacher</strong></td>
<td></td>
</tr>
</tbody>
</table>
Anonymous Forms and Form ID Reconciliation

Anonymous forms are normally used for general surveys etc, when the respondents don’t want to be identified. Captured Data from Anonymous forms reconciles with anonymous records in a Source Data table (Eg: numerical records for the number of respondents who will be completing a form).

Designing an Anonymous Form.
Each page of an anonymous form won’t have form identification for the person who completes it, but must have a Form ID Barcode added. The Form ID Barcode is used by FormReturn, to recognize each form page and to link the captured data from the processed forms to the Publication, in Captured Data, it belongs to.

Image: Example of an Anonymous form Template.
The Form ID Barcode is used as form recognition by FormReturn, and reconciling the Captured data with the Publication it belongs to.

The Form ID Barcode links multiple page forms together and reconciles the form's captured data, with the publication it belongs to.

Publishing an anonymous form.
There are a couple of ways of reconciling the captured response data from anonymous forms and storing the data with the template it belongs to.

- Single paged form Templates can be published using either a [Form ID Reconciles - Append Only] Publication, or a [Key Field Reconciles - Append or New Record]
- The form pages of multiple paged forms will only link together with a Form ID publication. When the forms are published from the Template, they are printed separately because each published form page will contain a unique Form ID Barcode, that connects the form pages of each form, together.

Form ID Reconciles - Append Only - Publication Type
Multiple paged form Templates are published with a Form ID Publication Type. Creating a Source data table with anonymous records, is the easiest way of linking together the pages of processed anonymous forms. In this Publication type, a form will be published and printed for each anonymous record which has been added to a Source Data table. Captured Data from each form page will link to the form it belongs to.

- A Form ID Barcode added to every form page of the template, this will link the pages to the forms they belong to.
- The form ID barcode and the Form ID Publication type, link the form pages and the captured response data with the form and the publication they belong to.

Create a Source Data Table with Anonymous records.
In a [Form ID Reconciles - Append Only] publication type, each form will reconcile to the record it belongs to in the Source data table.

- A data table is created with an anonymous record for as many forms that will be needed for the survey. A form for each record that has been added to the data table will be published and each form will reconcile to one of the records in the data table.

*Image: A Source data table with anonymous numerical records created for general surveys. If 100 forms are needed for the survey, create 100 anonymous records in the table.*
Example of Form ID Publication for anonymous forms: If you need 100 forms to distribute, add 100 anonymous numerical records to a data table. When you publish the form template, choose the Publication Type, Form ID Reconciles - Append Only. A hundred forms will be published which are printed. When the form images are being processed by FormReturn, the Form ID barcode on each page will keep the form pages linked to the form they belong to and the forms will link to the publication they belong to.

**Key Field Reconciles - Append or New Record - Publication Type**

A Key Field Publication publishes a single form from the template which can be reprinted or photocopied (using a recent model photocopier) as many times as needed.

For anonymous forms, create a form template with no identification component added. Add a Form ID barcode to each page of the form template, for form recognition and reconciliation of the captured response data with the publication.

**Note:** If you want to use this method but have a multiple paged form template, the pages of each form won't be linked unless a Barcode Area is added to the segment on each page. A Barcode Area is used for affixing a barcode label to each printed form page. This will keep the form pages linked to the form they belong to.

*Image: A Segment with a Barcode Area added. A barcode label is affixed to each form page after the forms are printed.*

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### Create an Empty Source Data Table

In a [Key Field Reconciles - Append or New Record] publication type, an automatically generated new record will be created for each form when the forms are processed.

- An empty data table, a data table with no records, is created in Source data and used to link with the form template when it is being published.
Example of a Key Field Publication for anonymous forms: The form template is published, choose the empty data table without any records and the [Key Field Reconciles - Append or New Record] publication type. One form from the template will be published, which is reprinted or photocopied into as many forms as you need for distribution. If you have multiple paged forms, they should have a Barcode Area added to each page for affixing a barcode label, which will link the form pages with the form they belong to.

When the scanned forms are processed by FormReturn, the Form ID Barcode is used to recognize the form page and the Publication it belongs to. An new anonymous new record will be automatically generated in the data table for each form, which will be used by FormReturn to reconcile the captured response data with.
Anonymous Forms - Key Field Reconciliation

Anonymous forms are normally used for general surveys etc, when the respondents don't want to be identified. Captured Data from Anonymous forms reconciles with anonymous records added to a Source Data table or with automatically generated New Records in an empty table in Source Data.
OMR ID Grid Key Field Identification and Key Field Reconciliation

An OMR ID grid is added to the Segment part of the form, as a key field method of form identification, for capturing respondent's ID numbers marked into the grid.

**Key Fields** are added to the Segment and used for identifying who each form belongs to. Key Fields would be used on forms which are preprinted and distributed randomly to the respondent's.

The only way to link together multiple pages belonging to the same form, using this form identification method, is to add a grid to a segment on every form page.

**Overview.**
- A grid is added to a segment and set up in the [Mark Area Properties] Dialog.
- The ID number marked into the grid by the form's respondent, is captured by FormReturn and used for reconciling the captured response data from the form, to the matching data table record.
- A Form ID Barcode is still added to every form page for recognition of the form page by FormReturn. The Form ID Barcode stores the structure of the form template, linking together each form and form page belonging to the template.

**Advantages:**
1. This type of form identification allows for the forms to be pre-printed and distributed randomly to the respondents.
2. Forms can be photocopied if the photocopier is a recent model, (scans and prints).

**Disadvantages of using this method:**
1. Mistakes could be made by respondents when marking ID numbers into the grid.
2. The grid can take up a fair amount of room on the pages.
3. Multiple page forms will need a grid added to each form page, to link each page to the respondent's form it belongs to.

*Image: An OMR ID Grid with the columns read from Left to Right. OMR ID grids are added to the segment. The numbers marked in the grid are detected as a string, which means each of the captured numbers are strung together so they represent a single number.*

*Image: A grid with the columns read from Top to Bottom.*

**How to Create an OMR ID Grid:**
Add a checkbox Mark area to the segment and double click on it to open Mark Area Properties. Make a grid that goes from top to bottom which reads the columns from Left to Right, or a grid that goes from left to right and reads the columns from Top to Bottom. Once the grid is set up, save it as a Preset style for future use.

**Publishing Form Templates containing OMR ID Grids:**
- When a form template with an OMR ID Grid is published, the Publication type called [Key Field Reconciles - Append Only] is selected.
- The captured ID numbers from the grid, will reconcile the captured response data for each form page, with the Respondent's record in the selected Source data table.
- The number captured from the grid must match an ID number stored in the data table. Any errors caused because the filled in number wasn't correct, can be manually reprocessed in Captured Data.
- It is good to have a space on the form for students to write their name in case they enter the wrong number into the grid.
- A single form will be published from the template, which can be printed into multiple copies. A recent model photocopier can be used for reproducing forms, because they produce quality images which can be recognized by FormReturn when the forms are being processed.
- The captured response data from each form page will reconcile with the respondent's record it belongs to in Captured Data.

**Design and Set up an OMR ID grid in the Mark Area Properties dialog.**

1. Click to select [This Mark Area is a Reconciliation Key] and [Combine Column Characters].
2. Change the Mark Area Properties dialog.
3. Change the Captured Data Field Name to match the field name in your data table where respondent ID numbers are stored.
4. Change the checkbox # Rows and # Columns to make a grid.
5. Save the grid settings [optional] as a Preset Style to use again.
1. Change the Checkbox # Rows and # Columns to make a grid

A grid that reads from Top to Bottom

2. Change the Captured Data Field Name to match the field name in your data table where respondent ID numbers are stored.

   The Captured Data Field Name for the grid, will be the same field name, used where ID numbers for the respondents are stored in the Source Data table.

3. Click to select [This Mark Area is a Reconciliation Key] and [Combine Column Characters].

   This tells FormReturn to reconcile the captured ID number with a record in the Source data table.

   Strings the captured numbers together as one number Eg: 12345 not 1;2;3;4;5

4. Change the Mark Values to grid's numerical values.

   A grid that reads from Left to Right

   Change the Mark values to suit the type of ID numbers that will be filled into the grid.

   A grid that reads from Top to Bottom
Save the grid settings [optional] as a Preset Style to use again.

When the Preset Style is being used again, if another data table is being used, make sure the Captured Data Field Name for the grid is changed to match the field name in the other data table being used.
Barcode Area Key Field Identification and Key Field Reconciliation

A Barcode Area is a Key field added to the segment when you want to affix your own barcode labels to the printed forms for identification.

**Key Fields** can only be added to the Segment and are used for identifying who each form belongs to. Key Fields would be used on forms which are pre-printed and distributed randomly to the respondent's.

A Barcode Area is a Key Field added to the segment with the Barcode Area too. Before the forms are distributed, an identifying barcode label is affixed inside the area. The Barcode label is used for:

1. Reconciling captured data with the person the form belongs to,
2. Identifying information only - Example: something particular about the respondent such as a medical condition.

Overview of a Barcode Area - Form Identification and Captured Data Reconciliation.

- A Barcode Area Key Field is added to the segment part of the form using the Barcode Area tool.
- The Barcode Area is set up in the [Barcode Reader Area Properties] dialog. The Captured Data Field Name must be the same as the field name used in Source data, where the respondent's records are stored.
- The Publication Type called "Key field reconciles - append or new record", is used. This means a New Record will be automatically generated in the data table if the respondent's record hasn't been added yet so there is no matching record. This is the safest Publication Type to use for this method of form identification as it makes sure all captured response data will reconcile with a record from the data table.
- A single form is published from the template and printed into multiple copies to which you will affix your respondent's barcode labels.
- The Captured Response data from each form will be reconciled and exported, with the respondent's record from Source Data.

*Image: An example of how a barcode label is detected within the barcode area.*

There is a padding around the barcode area, between the corners of the area and the detected fragment zone. This allows for the barcode label to fit neatly within the four corners of the barcode area, leaving plenty of room for detection if the scanned image was skewed. The barcode label should be affixed as straight as possible in the centre of the barcode area.

The Barcode Area is used by FormReturn to locate and capture the affixed barcode label.

- Multiple page forms will need a barcode area with an affixed barcode label, added to each form page to link each page to the respondent it belongs to.
- A single form page for each page, will be published from the template which is printed into multiple copies.
- A Barcode label is affixed neatly inside the Barcode Area.
- The captured barcode information will reconcile the captured data from each form page, to the Respondent's record in the data table.
- The captured Barcode label ID from each form page will reconcile the captured response data, with the form respondent it belongs to. The Form ID Barcode on each form page will link the pages to the Form Template they belong to.

*Image: A Segment with the Barcode Area added and the [Barcode Reader Area Properties] dialog open.*
Add a Barcode Area

Click on the Barcode Area tool and then on the segment, dragging the corners of the barcode area to size it. Use the Elements panel to make the barcode area a specifically correct size, so the Barcode label will fit neatly inside the barcode area corners.

The Barcode Area must be sized to fit the barcode label neatly within the barcode area corners.

Barcode Reader Area Properties dialog.

The Column Order is where the Respondent’s records will appear in the Captured Data order.
Set up a Barcode Area for Reconciliation of the Captured Data with Respondent's Records.

- Double click inside the barcode area to open the [Barcode Reader Area Properties] dialog.

3. Change the Captured Data Field Name

Rename the Captured Data Field Name, using the exact same field name as used in Source Data, where your respondent's records are stored. When the response data is captured, it will reconcile with the person it belongs to and store the data with the person's form in Captured Data.

The Column Order is the position of the respondent's records in the Captured Data output.

4. Make the Barcode Area a Reconciliation Key

5. The Column Order, is where the Respondent's records will appear in the Captured Data order.

FormReturn automatically generates a new column order for each field added to the segment.
Design a Scannable Form

A scannable form is one that can be successfully recognized by FormReturn and the response data captured accurately with the OMR form processor. Clear scanned images of the form pages with clear dark barcodes and checkbox Mark Areas, will have the most success at being recognized and processed into accurate captured response data by FormReturn.

What FormReturn can Detect and Capture.

FormReturn can recognize, capture and process clear scanned form images containing:
- A Form ID Barcode, a requirement by FormReturn for recognition of each form page.
- A segment with clear Segment Barcodes a requirement by FormReturn to locate the checkbox Mark Areas and Key Fields for Identification.
- The Checkboxes Mark Areas.
- Response marks made in checkboxes.
- Response marks made in ID grids.
- A Barcode label affixed inside a Barcode area.
- Some other barcodes which have been created in FormReturn.

Good Form Template Design

Good form design by keeping barcodes and mark areas clear of other dark lines or text on the form page, play an important part in detection of the form Template's OMR components.

Quality Scanned Form Images

A quality scanner which produces good form images with clear dark barcodes and checkbox response marks is what makes OMR detection and capture of response data reliable and accurate. Form Images that will be processed by FormReturn should be scanned at a resolution between 120 and 200 but no more than 300.

Image: The form template and the printed forms will always be much clearer, than the scanned images of the forms will be, that will be processed by FormReturn.

Scanned Image Detection

FormReturn requires clearly scanned form images from a quality scanner which will produce clear dark images of the barcodes and checkboxes. All scanners are different, which is why a form that will be read by OMR needs reasonable margins to allow for any skew of the image.

Keeping FormReturn's default margins and checkbox settings is always advisable.
1. If scanned images are skewed a part of a barcode or segment can be cut because it was too near the edge of the form.
2. If the checkboxes in a Mark Area are too close to each other or the checkbox borders are too thin, there is more chance of data being misread if the scanned image is even slightly skewed.
An image of the clearly scanned form page. All scanners are different and produce different qualities of images. Even if the checkboxes are completely filled by the respondent, the scanned image may still only show parts of the dark mark. FormReturn can only process what can be detected on the scanned image.

Scanned Dotted Lines are better than solid lines next to OMR components because they are less likely to interfere with detection.

Text kept well clear of Mark Areas

Bubbles fully filled by respondents. Instruct the form respondents to fully fill the checkboxes.

Plenty of margin between the form elements and the edges of the page leaves room for some skew of the scanned image.

An image of a form opened in FormReturn's captured data preview window, showing the detected segment barcode, the captured marks from the OMR ID Grid and the captured marks from the mark area of Question 1.
Recognized Segment Barcode

Dark clear scanned barcodes make good detection.

Captured Marked checkbox.

Dark clear scanned checkboxes and response marks make accurate captured response data. Response marks in checkboxes aren’t always as clear on the scanned image, as they appear on the completed forms.

Captured ID number from an OMR ID Grid
The Basic Steps of FormReturn - from Form Design to Data Capture

These are the basic steps for creating an (OMR bubble sheet) template, using Template Variable Replacement (TVR), which is similar to mail merge, for identifying who each form belongs to. A Source Data table has the respondent's records added, and their names will be published on the forms for distribution. A Form ID Publication will reconcile the captured response data with the respondent's records in the data table.

(Alternative form identification methods of FormReturn, are the addition of an OMR ID Grid or a Barcode Area containing an affixed barcode label. Anonymous forms can also be created)

1. Design a Basic Form Template.

   Click the New Segment icon to create / design a segment, adding question text with the Text tool and checkbox Mark Areas with the Checkbox tool, then Save the Segment.

   Next:

   Click the New Form icon to create / design a form template, adding the created Segment, a Form ID barcode, a Text Area for the Template Variable Replacement and Text areas for any other text included on the form template.

   i. Click the Segment tool and Click on the form template page to add an empty segment area, (this is for uploading your segment into). Double click on the empty area. In the dialog that opens, click [Add segment] and select the segment file you have created, then click the OK button.

   ii. Click the Barcode tool and Click on the page to add a form ID barcode to the top of the form template page. If more pages are being added to the template, a barcode must be added to every form page.

   iii. Add a text area for typing the Template Variable replacement fieldnames for form identification. Type the field names like this <<firstname>> <<lastname>> or the field names which are in your Source Data table (This is similar to mail merge and you must use fieldnames that are exactly the same as the fieldnames added to your Source data table)

2. Recognition Test the Form Template

   Click the recognition preview tab and the Preview check boxes, to check the detection of the segment, the Form ID Barcode and the segment barcodes, the fragments and any test marks made by you in checkboxes.

3. Add a Data Table to Source Data

   Click the Source Data icon to add a Data Table to your Source Data.
Add your respondent's records to a data table in FormReturn.
- Click the Source Data icon in the Application Toolbar.
- Click [Add New Table], to manually add fieldnames and records.

4. Publish the Form Template and Print the Forms.
When a scanned image of the form template has been successfully tested, the form template can be published, printed and distributed.
- Click the Publish Form tab in the Form Editor.

Step 2 - Verify Form Structure

i. Click to select the Table Name you created in Source Data.
ii. In Publication Name, type a new name for the publication you are about to create.
iii. Click the Check button and OK,
iv. Click the Publication Type to link each form page with the respondent it belongs to in the data table and the form publication it belongs to.
v. Click publish and PDF.
vi. Print from the PDF file and give to people to complete.

5. Scan the Forms when they have been completed by Respondents.
Scan the forms on a scanner with the resolution set at 150 dpi up to 200 dpi, and save images as PNG (preferably) or TIFF format (CCITT group 4, RLE or packbits compression only).
If you have a TWAIN compatible scanner connected to FormReturn, click the Scan Forms button.

6. Upload the Scanned Images into FormReturn
Click the Processing queue icon, then click [Upload image] in the Unprocessed Images panel. Browse for and choose the images to upload. (or Click [Upload Folder] to select a folder of images to upload ).

7. The Captured Data

9. Once the forms are processed (this may take a while if a large number of forms was uploaded), click the Captured Data icon to view the captured data. Click the publication name, then click the Form tab, Click on one of the forms, then click the Form Pages tab and click the page or pages you want to view. This will show a preview of the scanned image stored in Captured Data. For more Information see Managing Captured Data.

8. Export the Captured Data

10. To export the data, Click on the Publication tab and click on the publication to select it. Click the Export Data button and OK in the dialog that opens. A CSV file will be saved to your computer. Open the CSV file and click OK to open the data export in excel or which ever Office software you have installed on your computer.
**Tips**

Default margins is always advisable to overcome some scanning issues with skewed form images.

Default Barcodes sizes is always advisable to overcome some scanning issues such as skewed form images.

Checkbox shape and style can be changed with care, although an oval shaped checkbox has been proven to be the most easy shape to fill in by respondents, which is the best for mark detection by OMR Software.

Captured Data Field Names must be all completely unique within a single form. If a form contains multiple segments, even if they are on different pages of the form, there must be no captured data field names that are the same. Matching Captured Data Field Names will cause corruptions in the captured data output.

Publications or forms included in Publications stored in FormReturn should never be deleted, unless they are completely finished with. If a scanned form image is uploaded into FormReturn and there isn't a matching Form ID stored in FormReturn, the form won't be processed automatically.

Save Regularly: (command / control S) or Click Edit in the Menu Bar and click Save.

<table>
<thead>
<tr>
<th>Save</th>
<th>Ctrl+S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Save As...</td>
<td>Ctrl+Shift+S</td>
</tr>
</tbody>
</table>

Zoom out to see the whole segment template at one time. (Good for making selections of large areas).

| 100%     |  |

Undo to delete the last step. Hold down Ctrl+Z at the same time or click Edit in the menu bar and click Undo.

<table>
<thead>
<tr>
<th>Edit</th>
<th>Object</th>
<th>View</th>
<th>Help</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undo</td>
<td>Ctrl+Z</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redo</td>
<td>Ctrl+Y</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Form Recognition - Click the Recognition Preview Tab in the Segment and Form Editors, to preview the detection of the segment, all barcodes and mark areas, to make sure they can be recognized by FormReturn before publication and printing of the forms.

| Recognition Preview |  |

| Preview Check       |  |
| Detect Barcodes     |  |
| Detect Segments     |  |
| Detect Fragments    |  |
| Detect Marks        |  |
New Segment Editor

The segment is the questionairre part of a form template because it is the section that contains the checkboxes called Mark Areas. It is designed separately in the Segment editor, as a self contained component, which is added to the form template. In most cases it will take up the major part of the page of a form template, but can be custom sized to suit the number of questions.

A segment can be a questionnaire which contains text as well as the checkboxes, or it can be an answer sheet which contains only the checkboxes and question numbers.

Each bank of checkboxes, called the Mark Area, is added to the segment as a separate element. A segment can contain text, checkboxes, barcode areas, images and shapes, which are all elements which can be added to a segment. For good detection by FormReturn, add the segment elements in the correct way allowing plenty of room around each one.

The segment is a separate component of the form template, because it contains its own barcodes, at the top right and bottom left, which are used by FormReturn to locate where the Mark areas appear on the form page. When you are creating the segment, a recognition preview will let you see if the segment, the segment barcodes and the mark areas are detected by FormReturn before you add the segment to a new form.

Image: A segment, designed in FormReturn’s Segment Editor.
Change the Segment size or paper size (standard or custom) and click Apply Settings for the changes to take effect. The Default margins is always advisable to overcome some scanning issues.

**Segment Editor Toolbar**

- **Units of Measurement**
- **Segment Width and Height**
- **Click Apply Settings for changes to take effect**
- **Page Size**
  - Standard or Custom
- **Segment Barcode size**

Use the Drawing tools in the Segment editor toolbar, to add text, mark areas, Key fields, Images and shapes.
Create a New Segment

- Click the New Segment Icon to create a new segment.
- The [Create a New Segment] dialog will open.

1. **Type a Name for the Segment.**
   - Name: `Untitled_Segment_1`

2. **Preset Size and Measurement**
   - Preset Size: `A4 (1 block portrait)`
   - Measurement: `Pixels`
   - Choose your standard paper size or set a custom paper size. A4 paper is the standard paper size used in countries with metric measurements. Letter paper is the standard paper size used in the USA and countries with imperial measurements.

3. **Segment Width and Height.**
   - Width: `535`
   - Height: `700`
   - Customize the segment size as long as it will fit within the form Template margins, and allow enough room for the Form ID Barcode to be added in another area of the form Template.

4. **Segment Barcode size.**
   - Enable Segment Barcodes
   - Segment Barcode Scale: `0.6`
   - Scale the segment barcodes to make them larger for maximum detection if your scan quality isn't very good.

5. **Captured Data**
   - Field name Prefix and Counter:
     - Field name Prefix: `question`
     - Starts At: `1`
This is the field name used to name your checkbox mark areas. Whatever the Prefix name is, they will be numbered in order, starting with the first number on the counter.

Click **OK** to open the new segment.
Click **Cancel** to exit the new segment.
Add Segment Elements

Use the tools in the Segment Editor Toolbar, to add the checkbox Mark areas, Text areas, Key fields, Images and Shapes to the segment layout:

- Make sure checkboxes and the segment barcodes aren't touching each other or dark lines, text and images.
- Click the Recognition Preview tab when everything has been added to the segment and check the boxes in the Preview Checkbox panel. Make sure the segment border, the segment barcodes and Mark area fragments can all be detected by formReturn.

Segment Editor Features:
Use these features of the segment editor for faster form design. Click [Edit] in the Menu Bar to locate them.

1. Align
2. Duplicate
3. Snap to Grid

Image: The Segment Editor Window

Segment Editor used for creating the segment.
Recognition Preview tab

Preview Check the detection of the segment edges, the added segment barcodes and the added mark area fragments.

Alignment Toolbar

align a selection of elements

Select the elements you want to align then click the alignment tool needed.

- Align Tops of the selection of elements.
- Align Bottoms
- Align Left
- Align Right
- Align element centers, Horizontal or Vertical
- Align Horizontally or Vertically

Duplicate Text areas, Mark Areas, Images or Shapes to quickly add more.

Text areas, Mark Areas, shapes and images on the segment can all be quickly duplicated into as many as needed. This saves time instead of adding each one separately.

When you have created the first question and set up the mark area properties for the checkboxes, duplicate all elements in the first question (text areas and mark areas etc.), to quickly add the rest of the question areas. The question areas will be uniform and text can be edited afterwards.

1. Select the elements you want to duplicate. (Run the mouse over them holding down the left button, or hold Control and click on each one separately)
2. Open the Edit menu in the Menu Bar and click Duplicate, or right click on the selected elements, click Edit and then Duplicate.

*Image: Right click on the selected elements, click Edit and then click Duplicate.*
The Duplicate Elements dialog will open.

1. Click to change the number of horizontal or vertical duplicates, including the original elements.
2. Click to change the Horizontal or Vertical spacing.
3. Field name Counter Starts At 1 - All Mark Area fragments added in the Duplicate will have the Captured Data Field name Prefix of [question], starting from question1.
4. Click Duplicate to open the duplicate settings dialog.

- A default duplicate vertical spacing of 20 is perfect for answer sheets, which only contain mark areas and question numbers, to fit 20 times down the segment page.
- A vertical spacing of 2 is enough for the spacing between questions that have the question text and a mark area, similar to the image below.
Turn on Snap to Grid to align elements as they are added.

With Snap to Grid turned on, you will find the elements will click into place when they are added, making it easier to keep Mark Areas and Text areas aligned.

To select Snap to Grid from the Edit menu and turn it on:
1. Locate and click Snap To Grid in the Edit Menu of the Menu bar.
2. Click Show Grid to show the grid. (click again to hide the grid)
3. Click Adjust Grid Size to change the spacing in the grid. Click repeatedly (Ctrl+Shift+1) until you get the right size.

Segment Editor Toolbar
The segment editor toolbar has drawing tools for adding text areas, checkbox mark areas, images and drawing lines and shapes.

Select Tool

Select segment elements by clicking on them, or by dragging the mouse over them, or hold down the control / command key and click each element separately.

Text Tool.

Click the Text tool, then on the segment and drag a text area to size. Double click in the text area to start typing.

Re-size the width or height of the text area in the Segment Element Panel (available when the text area is selected), or click on the corners of the text area and drag to size.

Font, Style, Size, Alignment or Color in the Text Area Panel can be changed in the Text Area panel.
Fill the Background of the text area with a colour. Choose a colour and click the [Filled] box.

Checkbox Tool

The checkbox tool is used to add checkboxes to the segment:
1. As Mark areas for capturing checkbox response marks in answer to questions. Single and multiple checkboxes can be detected by FormReturn.
2. As an OMR ID Grid for capturing the respondent's ID numbers (A Key field for form identification).

Add a Mark Area:
Click on the Checkbox tool, then on the segment, to add a bank of checkboxes that contains 5 checkboxes, with the mark values of A, B, C, D and E.

Double click on the mark area to open the Mark Area Properties dialog. (See the [Mark Area Properties] section in this guide)

Mark Area Properties is where you can change:
1. The Captured Data Field name and Score Field name for each mark area. (These are the field names used for naming the captured response data from each checkbox mark area in the captured data export)
2. The number of checkboxes, and their size and style.
Checkbox shape and style should be changed with care, a small oval shaped checkbox (the default checkbox style) has been proven to be the most easy shape to fill in by respondents for the best mark detection by OMR Software.

3. Add an Aggregation rule. Used when a score is needed for the correct answer. (Instructions in Mark Area Properties section of this guide)

Add an OMR ID Grid  (For more information on creating a grid see [OMR ID Identification - Key Field Reconciliation] in this guide)
OMR ID Grids are added with the checkbox tool, and used as Key Fields for detecting and capturing respondent's ID numbers, marked into the grid.

Images: OMR ID Grids can read either from Left to Right or Top to Bottom.

Make an OMR ID Grid and double click on it. This will open [Mark Area Properties] for setting up the grid as a Reconciliation Key, which will capture the ID numbers and reconcile the captured data from the forms with the Respondent's records. Respondent's records must be added to a table in Source Data before the forms are processed.

Barcode Area Tool

Barcode Areas are used as Key fields for detecting and capturing barcode labels, which are affixed to the printed forms.

Reconciliation of a Barcode Label:
A Barcode Area Key Field can be used for either of two purposes:
Form Identification and Reconciliation of the captured response data with the respondent's record in the data table.
Identifying something specific about the respondent. Eg: in a healthcare assessment, a disease or symptom. which will be included in the Captured Data output and export.
Note: FormReturn can only recognise barcodes that it supports. (Code128, EAN13, EAN128, Codabar)

Add a Barcode Area:
• Click on the Barcode Area Tool and then on the Segment to add a barcode area.
Left Image: A barcode Area added to a segment. Right Image: The barcode label must fit neatly within the barcode area corners, leaving plenty of padding between it and the barcode label edges and the Barcode Area Fragment edges.

- Resize the Barcode Area by dragging a corner with the mouse or by using the Element panel, making it large enough to fit the barcode label that will be affixed, fits neatly inside the corners of the Barcode Area, leaving plenty of padding space.

**Set the Reader Area Properties for the Barcode Area:**
- Click the Set Properties button in the Barcode Reader Panel, or double click on the Barcode Area to open the [Barcode Reader Area Properties] dialog.
Affixing a Barcode Label:
When affixing the barcode label to printed forms, it should be kept well inside the barcode area corners and in the centre of the Barcode area, directly over the barcode area text. This will allow for plenty of room for barcode detection by FormReturn.

Barcode Tool
The Barcode Tool in both the segment and form design editors is used for adding either Form ID barcodes or creating a barcode of your own size and type on the form. The Form ID Barcode is added to the form template designed in the form editor.

Barcode Creation
FormReturn supports and can create many different 1D and 2D barcodes such as: Code128, EAN13, EAN128, Coda bar.
- Click on the Barcode Tool and then on the segment to add a barcode, and change it to your barcode type and size. (The Form ID barcode is only added to the form template)

Barcode Recognition
In the recognition preview, FormReturn can recognize the following barcode types: Code128. Locate the barcode panel and update the values to the barcode type and value of your choosing. You can also set the height of the barcode, barcode text display and the quiet zone (white space on the left and right of barcodes).

Other barcodes can be created and recognized in FormReturn, as either a static or dynamic barcode of your own choosing. Choose a Barcode Type from the dropdown menu.

You can put either a number that appears throughout all forms (static) or a number that is taken from a database query (dynamic).

To change Barcode Height
Uncheck - Use Default height
Show or Hide Barcode text.
Show or Remove Quiet Zone
Click Apply Settings for changes to take effect.

Image tool.

Click the Image Tool and then on the segment to add an empty Image Area. FormReturn has SVG Image support for the printing of quality graphics. (.svg, .png or .jpg files can be added to the Image area)

Select an image on your computer to load it into the image area.

- Click Retain Shape in the Image Area panel to keep the image in proportion.
- Click the Select Image button in the Image Area panel or double click on the Image Area to open the Image Properties dialog.
- Click Load Image
- Choose the Image file and it will load into the Image Properties dialog.
- Click OK to load the image into the image area on the segment.
• Resize the image using the Element panel or select and drag the corners of the image area with the mouse.

**Element**

| Width:  | 119 |
| Height: | 82  |
| X:      | 555 |
| Y:      | 51  |

**Line and Shape drawing tools.**

- **Line**
- **Rectangle**
- **Round Rectangle**
- **Circle**

Click a Tool to draw a line or shape on the page. Drag the shape to size using the mouse or change the Width and Height in the Element panel.

**Element**

| Width:  | 380 |
| Height: | 0   |
| X:      | 60  |
| Y:      | 75  |

Change a line's thickness, style and color in the Line panel. Each shape has its own panel.
Resize the circle in the Element panel or drag the circle selection corners with the mouse.

Click the Zoom buttons:
- To view the entire segment at once, when aligning elements or to moving them all at once.
- To view segment elements more closely. This can be used to see how close together elements are.

The next step is to Recognition Preview the Segment to make sure the mark areas, segment barcodes and any Key fields that have been added, can be detected by FormReturn.
Mark Area Properties

Double click on a mark area to open the Mark Area Properties dialog for each mark area. When a mark area is set up the way you want then duplicated, each duplicated mark area will have the same Mark Area Settings, but the Data Export Settings will be different and run in sequence.

[Save Current Settings as New Preset Style] will save a Mark area style, making it easy to choose the same style again when creating new mark areas in other segments.

Captured Data Field Name

Form Return uses the Captured Data field name (eg: question1) as a unique name in the captured data output, for the response data captured from each question on a form. Captured data is exported using the field names for naming the columns of data, therefore no two fieldnames on a form can be the same or the captured data will be corrupted.

When mark areas are added to the segment, the Captured Data Field Names will be automatically numbered in order of sequence.
Note: If there is more than one segment on the same form (even on another page of the same form), there can be no captured data fieldname, in any segment, the same as a captured data field name in one of the other segments within the form, or the captured response information will be corrupted.

Score Field Name

Form Return uses the Score field name as a unique name in the captured data output, for the score calculated from each question (e.g. question1_score).
When mark areas are added to the segment, the score field names will be automatically numbered in order of sequence.

Note: If there is more than one segment on the same form, there can be no score field names the same as any other within the same form template, or the calculated score data will be corrupted.

Checkbox Style.

Image: FormReturn’s default checkbox style and size at 200% zoom.

Image: Checkbox properties in the Mark Area Properties dialog.

Number of Checkbox across or down the Mark Area.

Space between checkboxes.

Checkbox Width and Height

Darkness of checkbox border

Mark Value Font Style

Checkbox Shape round or square

Show or Hide the Mark Value
Mark Value Editor for previewing the mark area and editing the mark values.

Edit the Mark Values inside the checkboxes and add mark values for new checkboxes, by clicking each one in the table, or use the arrow keys on the keyboard.

Aggregation Rule for setting a score for a marked checkbox.

The Mark Aggregation Rule or Aggregation Rule for short, is a rule-based method used to score individual questions, which are later aggregated into a single Form Score when a form is processed.

The general syntax for this rule is:

\[ \text{RESPONSE} \ ? \ \text{PLUS OR MINUS THE MARK GIVEN OR TAKEN} : \text{THE NEXT RULE TO APPLY} (\text{multiple rules can be added}) : \text{THE "FOR ALL OTHER RESPONSES" MARK} \]

This syntax allows you to have multiple rules for the one question. For instance, you can have a mark for A, a different mark for B, mutually exclusive responses, deductions and multiple response answers.

Type an Aggregation Rule when you want to give a score for the correctly marked box.

The aggregation rule can also be edited for a selection of checkboxes at one time. Select the mark areas you want to set a rule for and type it into the Mark Area panel.

Click Apply Rule to take effect.

Special Characters:
- a single quote mark means "any single response". Two quotes together " means "two or more responses". Three quotes together "" means "three or more responses" and so on.
The pipe character | means OR.
The comma character , means AND.

Aggregation Rule Examples:
A?+1 - A score of 1 (one) will be given when checkbox A is marked by the respondent.
C?+1 - A score of 2 (two) will be given when checkbox C is marked by the respondent.
B?+1:-1 - A score of 1 (one) will be given when checkbox B is marked by the respondent and a score of negative 1 (one) will be given to any other marked checkboxes in the mark area.
A?+1:B?+0.5:-1 ... A score of 1 (one) will be given when checkbox A is marked by the respondent, a score of 0.5 will be given when B is marked by the respondent, for all other answers, 1 mark will be deducted.
A?+1:""?+9999999:+0 ... A score of 1 (one) will be given when checkbox A is marked by the respondent, a score of 9999999 will be given if the respondent marks two or more checkboxes (this is the ' followed by another ' in the aggregation rule), for all other answers, a score of 0 is given.
A,B?+1:+0 ... A score of 1 (one) will be given if both A and B are selected.
A\B?+1:+0 ... A score of 1 (one) will be given if A or B or both are selected.
YES?+1:NO?-1:""?+9999999:+0 ... A score of 1 (one) will be given if the YES checkbox is selected, a score of 1 (one) will be deducted if the NO checkbox is selected, if more than one checkbox is selected, a score of 9999999 is given, for all other responses (which would be no response), 0 is the score.

Test the Aggregation Rule
- Click the Test button - type in the correct response; click Test Rule.
- Type an incorrect response; click Test Rule

Preset Styles for saving mark area styles.
Save checkbox areas and ID grids changed in Mark Area properties, as a Preset Style, so the same style can easily be used again.
• Click the [Save current settings as a preset style] button to save the mark area properties.

![New Mark Area Preset Style](image1)

• Name the style and click OK.

**Restore a Preset Style**

**Option 1:** Choose the Preset Style name from the dropdown menu and click the Restore button.

![Restore Preset Style](image2)

• De-select any of the attributes you don’t want to use this time.
• Click Restore

**Option 2:** Make a selection of mark areas you want to use the Preset Style for.

1. ![Mark Area 1](image3)
2. ![Mark Area 2](image4)
3. ![Mark Area 3](image5)
4. ![Mark Area 4](image6)

• Choose the style from the dropdown menu in the Mark Areas panel (available in the Segment Editor when a mark area is selected).

![Mark Areas](image7)

• Click Apply Style.

**Column Order of Captured Data**

**Field Names and Score Field Names**
The column order for the Captured Data Field Name and Score Field Name, is the order in which they will appear in the captured data output and captured data export.

Eg: if the column order of question1 is 1 and the column order of question1_Score is 2, they will appear next to each other in the captured response data export.

Image: Example of exported captured data on a spreadsheet.

Click OK to save and exit.

Click [Reset to Defaults] to undo any changes. Click [Cancel] to exit without saving.
**Fragments**

Fragments are the detection areas on the segment, used by FormReturn to capture data. Mark Areas OMR ID grids, and Barcode Areas that have been added to the segment are all detected separately by FormReturn as Fragments. A Recognition Preview tests that the Fragments can be detected by FormReturn before the form template is published. When the [Detect Fragments] box is ticked in the Preview Check panel, all fragments should be shown as detected with a red outline.

If any fragments are not shown as detected, go back to the segment editor and fix them. If dark text, lines, segment barcodes or other checkboxes are touching any of the fragments it causes errors in detection. If Fragments can't be detected by FormReturn on the scanned forms, the response data won't be able to be automatically processed.

- Click Fragments in the Preview Check Panel to detect all fragments in the segment.
A mark area fragment has a padding area between the checkboxes and the fragment edges. This allows for better detection of a response marks that go outside the checkbox edges or if the scanned form image is skewed.

| Question 1 | Question 2 | Question 3 | Question 4 | Question 5 | Question 6 | Question 7 | Question 8 | Question 9 | Question 10 | Question 11 | Question 12 | Question 13 | Question 14 | Question 15 | Question 16 | Question 17 | Question 18 | Question 19 | Question 20 | Question 21 | Question 22 | Question 23 | Question 24 | Question 25 | Question 26 | Question 27 | Question 28 | Question 29 | Question 30 | Question 31 | Question 32 | Question 33 | Question 34 | Question 35 | Question 36 | Question 37 | Question 38 | Question 39 | Question 40 |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|

An OMR ID Grid Fragment
An OMR ID key field fragment has a padding area between the checkboxes and the fragment edges. This allows for better detection of the grid response marks if the scanned form image is skewed.

A Barcode Area Fragment

A Barcode Area key field Fragment has a padding area between the barcode area corners and the fragment edge. This allows for better detection of the barcode label if the scanned form image is skewed.

Fragment Padding

2. The fragment padding is the white area between the edges of a checkbox and the edges of the fragment, detected with red in a preview of a mark area.

The fragment padding is the white area between the checkbox edges and the outside edges of the fragment. It is used as a type of buffer zone, to capture any response marks that accidently go outside any checkboxes as far as the fragment edge.

Fragment Edges

The Edges of the fragment are shown as detected with a red border in the Recognition Preview.
Segment Recognition Preview

The Recognition Preview of the segment, is for checking the detection of the segment, it's barcodes and fragments, to make sure they are recognized by FormReturn before the segment is added to a form template.

1. Click the Recognition Preview Tab.
2. In the Preview Check panel, click Detect Barcodes, Detect Segments and Detect Fragments and each detected element will be outlined with a coloured border when it is detected.
3. If any of the elements aren't detected, go back to the segment editor and make sure nothing touching them, such as black lines, text or images, as this will break the detection.

Image: Recognition Preview window showing the detected segment, the top right segment barcode, and the detected fragments.

Click Detect Barcodes, Detect Segments and Detect Fragments, to check their detection by FormReturn.
Add some small dark marks to checkboxes, using the circle tool in the Segment toolbar, and click Detect Marks to check their detection. (Don't forget to delete them again before adding the segment to a form.)

**Recognition panel**

The Recognition panel is where the Recognition settings can be changed. The recognition settings are used by FormReturn to determine if a checkbox contains a response mark. The default settings should normally be adequate for the detection of response marks on clearly scanned images.

![Recognition Panel](image)

FormReturn's default Recognition settings should be adequate for detection of response marks, but this will depend on the clarity of the scanned images, the style and size of the checkboxes and whether pen or pencil is used by the respondent's. (See Recognition Settings in this guide for more information.)

Clicking on a Mark Area in the Recognition Preview window will open the Mark Detection Details dialog, displaying the number of pixels counted in the checkboxes of the mark area. (See Mark Detection Details Preview)

**Recognition Preview tab.**

Click the Recognition Preview tab to open the recognition preview window.

**The Segment is shown as**

**Detected by a green outline.**

The segment is shown as detected by a green outline.

The segment barcodes are shown as detected by a blue outline.

The fragments are shown as detected by a red outline.
| Question 1 | Question 2 | Question 3 | Question 4 | Question 5 | Question 6 | Question 7 | Question 8 | Question 9 | Question 10 | Question 11 | Question 12 | Question 13 | Question 14 | Question 15 | Question 16 | Question 17 | Question 18 | Question 19 | Question 21 | Question 22 | Question 23 | Question 24 | Question 25 | Question 26 | Question 27 | Question 28 | Question 29 | Question 30 | Question 31 | Question 32 | Question 33 | Question 34 | Question 35 | Question 36 | Question 37 | Question 38 | Question 39 |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|

**The Fragments are shown as detected by a red outline.**

Each fragment should be detected with a red outline.

**Both the Segment Barcodes are shown as detected with a blue outline.**

Both of the segment barcodes should be shown as detected.
- If not, go back to the segment editor and make sure nothing is interfering with them, such as black lines, text or images.

The next step is to add the finished and detected segment to a form template.
**Mark Detection Details Preview**

The Mark Detection Details dialog is available in the Recognition Preview windows and will open when a mark area is clicked on, allowing you to see how the recognition settings affect how the checkboxes in the mark area are determined by FormReturn.

**The First image** - shows the mark detection details for default checkboxes - the black pixel count, which includes the checkbox border and the Mark value inside the box, ranges between 239 and 246. There should always be more white pixels than black pixels in an unmarked checkbox.

The Threshold % ranges well under the 40% Mark Threshold (the default setting of FormReturn) between 31% and 34% of the total pixel count (black and white together).

**Second Image** - shows the same mark area with a mark made in it using the round rectangle shape filled with a dark color. The detected checkbox has a Threshold of 1726% (well over the 40% setting) and is therefore detected as marked.

**Third image** - shows the mark detection for checkboxes set with a box weight of 1.8 - the black pixel count ranges between 292 and 299. This would make a difference to the Mark threshold settings which is why it is always good to use FormReturn's default Mark Area Properties.

*Image 1: Example of the black pixels counted for each checkbox even when none of them contains a response mark.*
Shows how checkbox images are rendered and detected by FormReturn. Not as clear as they appear of the designed segment, but they still all contain similar numbers of black pixels.

**Black Pixels Count**

<table>
<thead>
<tr>
<th>Pixels</th>
</tr>
</thead>
<tbody>
<tr>
<td>243</td>
</tr>
<tr>
<td>245</td>
</tr>
<tr>
<td>246</td>
</tr>
<tr>
<td>241</td>
</tr>
<tr>
<td>239</td>
</tr>
</tbody>
</table>

This is the number of black pixels counted for each checkbox.

**Enclosed Pixels Count**

<table>
<thead>
<tr>
<th>Enclo...</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
</tr>
<tr>
<td>600</td>
</tr>
<tr>
<td>600</td>
</tr>
<tr>
<td>600</td>
</tr>
<tr>
<td>600</td>
</tr>
</tbody>
</table>

This is the total number of enclosed pixels counted, black and white, within each checkbox's area (between the 4 red dots).

**White Pixels Count**

<table>
<thead>
<tr>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>357</td>
</tr>
<tr>
<td>355</td>
</tr>
<tr>
<td>354</td>
</tr>
<tr>
<td>359</td>
</tr>
<tr>
<td>361</td>
</tr>
</tbody>
</table>

This is the number of white pixels counted for each checkbox.

**Mark Threshold**
This is the threshold determined by the black and white pixel count. Each box contains a negative percentage. The percentage that the Mark Threshold is set at is used by the form processor to detect the marked checkbox or checkboxes. The default threshold is 40% which means any checkbox with a count of +40% or more black pixels than the white pixels, will be detected as a marked checkbox.

**Image 2:** Example of the number of pixels counted when a checkbox contains a mark.

**Image 3:** Example of the number of black pixels counted when the checkbox style has the box weight increased to make the checkbox borders thicker.
Mark Values

The values inside each checkbox.

Mark Area Settings Details for the selected Mark Area.

Mark & Score Calculation

Field Name | question1
---|---
X1, Y1 | X1 39.44 percent - Y1 25.85 percent
X2, Y2 | X2 64.30 percent - Y2 27.71 percent

Rows, Columns | 1 row(s) by 5 column(s)
New Form Editor

A form is created and designed in the Form Editor.

*Image: A form template, opened in FormReturn’s Form Editor.*
Change the page orientation or size. Click Apply Settings for the changes to take effect.

Form Editor Toolbar

Use the tools in the Form Editor toolbar for adding the form elements.

Select Tool

Select a single element by clicking on it. Select multiple elements by clicking and dragging across the elements you want to select or hold down the control key and click to select each one separately.
Shape and Line drawing tools.

Click on the tool you want and then on the page and drag to size.

Text Tool

Add a text area for typing into.
The system font file FormReturn uses is Bitstream Vera.
To change the system font in your version of FormReturn, go to the General Preferences Menu.

Image Tool

Add an image area and load an image into it.

Segment Tool

Add an empty segment area to the form template for loading the segment into.

Barcode Tool

Add the Form ID Barcode to the form template.

Add or Delete Form Pages
Scroll through Form Pages

Zoom in or out

Alignment Toolbar

Used for aligning a selection of elements to keep them neat.
Create a New Form

- Click the New Form Icon to open the [Create a New Form] dialog.

1. Click here to type a Name for the New Form
   
   Name: Untitled_Form_1

2. Choose your Paper Size
   
   Preset Size: A4

3. Click OK to create a New Form
   Click Cancel to exit without creating a New Form

4. Form Page Measurement units
   
   Measurement: Pixels

5. Page Orientation
   
   Orientation: Portrait
   Landscape or Portrait
6 Customize Page Width and Height

- Width: 595
- Height: 342

7 Default Form Page Margins

- Left Margin: 30
- Right Margin: 30
- Top Margin: 20
- Bottom Margin: 20
Add Form Components

The Form Editor Toolbar, has the tools needed to add the components which make up a form template.

1. A Text Area for the Form Title.

*Questionnaire Answer Sheet Example*

Text areas must not touch any barcodes or mark areas, or overlap the segment edges.

2. Text Area for Template Variable Replacement

`<<Student_Name>>
<<StudentIDNumber>>`

Template Variable Replacement is typed into a text area as field names taken from your Source Data table, surrounded by the << less than; greater than symbols >>.

3. The Form ID Barcode

12345-67890
Click on the Barcode Tool and then on the form template to add the Form ID Barcode. The Form ID barcode is used by FormReturn to recognize every form page that is scanned in.

An Image Added to the template.

An empty Image area is added for loading images into.

The Segment is Defined by the Segment Barcodes
The Segment defined by the top right and bottom left segment barcodes, is a separate component of the form template, containing the checkbox mark areas.

<table>
<thead>
<tr>
<th>Question 1</th>
<th>Question 2</th>
<th>Question 3</th>
<th>Question 4</th>
<th>Question 5</th>
<th>Question 6</th>
<th>Question 7</th>
<th>Question 8</th>
<th>Question 9</th>
<th>Question 10</th>
<th>Question 11</th>
<th>Question 12</th>
<th>Question 13</th>
<th>Question 14</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Form Editor Toolbar
The Form Editor Toolbar contains icons which denote the tools needed to add each of the elements to the form template.

### Select Tool
7

Click on an area to select it or click and drag the mouse over a large area for selection.

### Shape and Line Drawing Tools
8

- Circle
- Rectangle
- Round Rectangle
- Line

Drawn objects must not touch any barcodes or mark areas, or overlap the segment edges.

### Text Tool
9

Click on the text tool and then on the page and drag the text area to size. Double click to start typing.

### Image tool
10

- Click the Image tool and then on the form template page to add an empty image area.

FormReturn has SVG Image support for the printing of quality graphics. (.svg, .png or .jpg files are supported and can be added to the Image area)

- Click Retain Shape in the Image Area panel to keep the image in proportion.
- Click the Select Image button in the Image Area panel or double click on the Image Area to open the Image Properties dialog.
• Click Load Image in the Image Properties panel.
• Open the Image file and it will load into the Image Properties dialog.
• Click OK to add the image to the empty image area.

• Resize the image using the Element panel or select and drag the corners of the image area with the mouse.

• Click on the Segment tool and then on the form template to create an empty segment area for loading a segment into. The empty area doesn’t have to be as big as the actual segment, any size is ok.
- Click Load Segments in the Segment Area Panel.

The Segment Area Properties dialog will open.
- Click Add Segment and choose the segment file you want to add to the form template.
- Click OK and the segment will load into the empty segment area.

**Barcode Tool.**
- Click on the Barcode tool and then on the form template to add the Form ID Barcode.

**Add or Delete Form Template Pages**

Use the arrows to scroll through form template pages.
Use the Add + Pages button to add another form template page.
Use the Delete - Pages button to delete a form template page.

The next step is to Recognition Preview the Form template to make sure all barcodes, the Segment, the mark areas and any Key Fields can all be detected by FormReturn.
Form Recognition Preview

The Recognition Print Preview checks if the barcodes, the segment and the fragments added to the form template can be detected by FormReturn, before you do a Test Preview.

- Click the Recognition Preview Tab to open the form recognition preview window.

A Recognition Print Preview can be performed at any time during the designing of the segment or form template.

1. Determines that the Barcodes, Segments and Fragments that have been added to the form template can be detected.
2. Check your text - Sometimes if the text area isn't big enough for the amount of text you typed, some of the text will be invisible. Just make the text area a bit bigger. It doesn't matter if the edges of text areas overlap with each other, as long as they don't touch any barcodes, mark areas or overlap the segment edges.

- Click the Recognition Preview Tab.
- Click inside the Preview Check panel to detect the Barcodes - detected with blue or pink outline; the Segment - detected with green outline; the Fragments - detected with red outline)

If the segment or any of the mark areas aren't detected, go back to the segment editor fix whatever is breaking the detection of them, such as heavy black lines, text or images touching them.

*Image: The form template in the Recognition Preview window.*
Click the Recognition Preview Tab.

Recognition Preview of detected Form ID Barcode.

Set Preview Field Data

Used to temporarily replace Template Variable Replacement fields typed on the template, so you can preview and test a form as it would look when published.

- Click the Preview Data field button
- In the dialog that opens, Click Add/Edit Field
- Type the Field Name you want to edit, exactly as it appears on the template.
- Type the Value (Eg: Ben)
- Click OK
- Click Save
- Print or Save to PDF.
The new preview field name will not be saved to the template, it is for test previewing only.

### Print

**Print**

Prints the template preview to use for doing a Test Preview of the form template.

### Save as PDF...

**Save as PDF...**

Saves the template preview as a PDF file.

### Preview Check Panel

Click to select each element type in the Preview Check panel (Barcodes - detected with blue or pink outline; Segment - detected with green outline; Fragments - detected with red outline; Marks - Marked: [A])

### Detected Segment, Fragments and Marks

Recognition Preview of detected form elements.

### Recognition Settings Panel
The Recognition Settings are used by FormReturn to determine if checkboxes contain a response mark. The default settings should be adequate, but may need to be changed if there is a problem with mark detection in the Print or Test Preview.

**Template Variable Replacement Fields**

- Student_Name
- StudentIDNumber

A way of identifying who a form belongs to and reconciling captured data from the form back to that person. Fields typed onto the template, exactly as they appear in your Source data table, surrounded by the less than, greater than symbols (Eg: &lt;&lt;Student_Name&gt;&gt;), will be replaced on the published forms with the respondent's records from your Source Data table. This is the Form ID method of publication. A form for each respondent in the data table will be published and the captured response data from each form will reconcile with the person's record it belongs to.

**Detected Segment barcode**

Detected Segment barcode in the recognition preview.

The next step is to print the form page or pages, fill in the checkboxes and scan the pages to do a Test preview of the template. This will check the quality of images produced by your scanner to detect the barcodes and response marks.
Recognition Settings

Test a scanned image of the form template in the Test Preview window to see if response marks in the checkboxes can be accurately detected by FormReturn. If they aren't, the Luminance or the Mark Threshold settings can be changed.

When form images are processed by FormReturn, each checkbox is analysed to determine which ones contain response marks. FormReturn uses the Recognition Settings to determine what box is marked and also can detect any stray marks, that run outside the checkbox edges but still inside the fragment edges. FormReturn can detect a single marked checkbox in a mark area or multiple marked checkboxes in the same mark area. The default Recognition Settings will normally be adequate for detecting the response marks in the checkboxes of most scanned form images.

Detection Errors
A couple of reasons why there could be errors with response marks being detected accurately because the Recognition Settings need changing:

- If the quality of the scanned images isn't very clear, response marks may not be detected at all: the Mark Threshold setting can be increased, so the marked checkbox will be detected.
- If a scanned image is too dark, checkboxes may be determined as marked when they're not: the Mark Threshold setting can be decreased, so only marked checkboxes are determined as marked.
- If the response marks were made with a pencil that is too light, the color of the pencil mark in a colour scanned image may be detected as white: the Luminance setting can be increased to make the darkness of the pencil mark more prominent.

Sometimes a bit of playing around with the recognition settings is needed, to get the response marks on scanned forms detecting properly.

Scanning Images
A high end scanner can have the resolution set at 150 dpi, and still produce a clear image, whereas a lower end scanner may need to scan at 200 dpi or even up to 300 dpi, for the image to be clear enough.

*Image: The Recognition Panel available in either the Recognition Preview or Test Preview windows.*
The Luminance setting will only make a difference to the response mark detection in color scanned images. The setting (default 200) is used as the cut off point at which the pixels in checkboxes are determined as black or white. Some shades of grey, for instance in a pencil mark, would be determined as either black or white, depending on the heaviness of the mark and the clarity of the scanned image. If too much of the response mark is determined as white, the mark won't be detected because the difference between black and white isn't high enough.

Increasing the the luminance setting to around 210 will cause more black than white pixels to be detected. **Note:** If the Luminance is set too high, it will cause black dots to appear on the image where they shouldn't be, leading to more detection errors. Ideally the Luminance setting can be set anywhere between 100 and 220, but this will depend on the quality of the images your scanner produces.

### Mark Threshold

The Mark Threshold setting is used by FormReturn, to determine if a checkbox contains a response mark. The default mark threshold setting is 40% which means any checkbox with a count of 40% more black pixels (this includes the mark, the black checkbox and the black mark value inside each box) than the white pixels, will be determined as a marked checkbox. Normally the default mark threshold setting is adequate for determining which checkboxes contain marks, because a response mark in any checkbox would make the black pixel count greater than the 40% more of the white pixel count, which FormReturn would determine as a marked checkbox.

Click on any Mark area on the segment, to open the Mark Detection Details dialog. Look at the number of black pixels and white pixels counted in each checkbox and the percentage of the mark threshold for each checkbox.

- If an unmarked checkbox was detected as marked, decrease the Mark threshold setting.
- If a marked checkbox wasn't detected as marked, increase the Mark Threshold setting.

The quality of the scanned images which will be processed by FormReturn must be clear. If your images are quite dark, it could make the black pixel count for all of the checkboxes, whether they contain marks or not, go over the 40% Threshold, resulting in FormReturn determining empty checkboxes as marked boxes. In this case the Mark Threshold percentage will have to be increased so the black pixel count won't go over the amount of the mark threshold.

How well a respondent fills the checkboxes when they are completing the forms will also make a difference to the darkness the marks in scanned images. If a light mark was made in a checkbox and it hasn't been detected, decrease the Mark Threshold so the black pixel count of the marked checkbox will go over the Threshold setting.

### Fragment Padding

The fragment padding is the white area between the edges of a checkbox and the edges of the fragment, detected with red in a preview of a mark area. Increasing the Fragment Padding setting, increases the amount of white area around the checkboxes, allowing a larger area for detecting marks if the scanned images are skewed (not straight).
The advantage of increasing the Fragment Padding, is if the scanned image quality isn't very good it improves detection because more of the Fragment area is captured, so there is a greater chance of more accuracy with mark detection.

The disadvantage of increasing the Fragment Padding is that it takes up more room on the form, because each mark area is slightly bigger. If any other areas on the form touch or overlap the edges of the Fragment area, the risk is taken that the detection of the mark area could be broken.

**Deskew Threshold**

Keeping the Perform Deskew box checked, will automatically perform a Deskew, if the skew of the image is over the threshold. The Deskew Threshold setting determines the angle at which FormReturn will perform an automatic deskew of a scanned image.

**Automatic Deskew**

It is highly recommended that the automatic Image Deskew box is left checked, unless you are completely sure the form image scans are straight.

**Click Apply Settings to save any changes.**
**Mark Detection Details**

If the mark threshold setting for any checkbox is less than the amount of black over white pixels, increasing the setting will fix the detection of response marks.

Open the Mark Detection Details dialog by clicking on a mark area in either:
- The Recognition Print Preview, or
- The Test Preview windows or
- The form page image preview in Captured Data.

*Image: The Mark Detection Details dialog box for viewing the recognition details of checkboxes in the mark areas.*

---

**Preview Image of the scanned checkboxes.**

This is how a clear scan of the checkboxes would look in the 1 bit view which is processed by FormReturn. A Zoom on the image of the mark area clearly lets you see how the black and white pixels of the checkboxes are determined.

The black checkbox border and the Mark value font, is also included in the black pixel count of each checkbox.

**Zoom**

Zoom in on the checkboxes to look more clearly at the image quality.
The black pixel count for each checkbox in the mark area.

<table>
<thead>
<tr>
<th>Pixels</th>
</tr>
</thead>
<tbody>
<tr>
<td>399</td>
</tr>
<tr>
<td>817</td>
</tr>
<tr>
<td>362</td>
</tr>
<tr>
<td>104</td>
</tr>
<tr>
<td>368</td>
</tr>
</tbody>
</table>

The total number of enclosed pixels in each checkbox.

<table>
<thead>
<tr>
<th>Enclo...</th>
</tr>
</thead>
<tbody>
<tr>
<td>1095</td>
</tr>
<tr>
<td>1099</td>
</tr>
<tr>
<td>1087</td>
</tr>
<tr>
<td>1088</td>
</tr>
<tr>
<td>1094</td>
</tr>
</tbody>
</table>

The total pixels for each checkbox are calculated from the total area between the red dots.

The white pixel count for each checkbox.

<table>
<thead>
<tr>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>696</td>
</tr>
<tr>
<td>282</td>
</tr>
<tr>
<td>725</td>
</tr>
<tr>
<td>684</td>
</tr>
<tr>
<td>726</td>
</tr>
</tbody>
</table>

The Mark Threshold percentage calculated for each checkbox

<table>
<thead>
<tr>
<th>Thre...</th>
</tr>
</thead>
<tbody>
<tr>
<td>-43%</td>
</tr>
<tr>
<td>-190%</td>
</tr>
<tr>
<td>-50%</td>
</tr>
<tr>
<td>-41%</td>
</tr>
<tr>
<td>-49%</td>
</tr>
</tbody>
</table>

The marked checkbox contains well over the 40% threshold of black over white pixels.
The Mark Value inside each checkbox.

The darkness of the font of the mark value contributes to the black pixel count inside each checkbox.

The Mark Threshold Setting used.

The Mark Threshold is used to calculate the difference in the number of black pixels detected in the mark area, with the number of white pixels detected.

The Mark value of the detected checkbox

The aggregate Rule used and the calculated score

Captured Data Field Name used.

Location of the Checkbox and black and white %'s

Number of rows and columns in the mark area.
Test Preview the Form Template

The Test preview uses a scanned image of the form template, using the scanner that will be used when the completed forms are scanned, to test the detection of the form template before it is published. (If there is more than one page in the form template, each page must be printed, bubbles filled, scanned and viewed separately in the test preview window).

- In the Recognition Print Preview window, click the Print button to print the form template for the Test Preview. (Multiple paged templates must have each page checked.)

- When the form is printed, fill it in as your respondents would. (If they will be using pencil, use the same type of pencil)

- Scan the filled in form, save it on your computer, click the Test Preview tab and Browse for the image which will then open in the Test Preview window.

- Open the Test Preview window by clicking on the Recognition Preview tab and then click the Test Preview tab.

**Note:** A test preview doesn't capture or store any data in FormReturn, as the template hasn't yet been published. It is purely for testing the quality of images from your scanner, before publishing the form template, so that recognition settings can be changed, if needed, to get more accurate detection of Barcodes and response marks. OMR accuracy depends on clearly scanned images for it to detect the barcodes and dark response marks made in checkboxes.

**Detection Errors:**

Detection errors of barcodes or response marks can be caused by poorly scanned images or inadequate Recognition Settings.

1. Either zoom in on the image or click on the Barcode or Fragment that isn't properly detected to open the Barcode Detection Details or the Mark Detection Details dialog, to check the scan quality of the image.
2. If the image isn't very clear, try setting a higher resolution or contrast on your scanner and re-scan the form to get a clearer image.
3. Check the Resolution Settings for inaccurately detected response marks.

*Image: The detection of barcodes and response marks on a form template opened in the Test Preview window.*
Test Preview tab

1. Click the Test preview tab.
2. Click the Browse Image button
   
   - look for the scanned image of the form template saved on your computer and open it in the test preview window.
   - If there is more than one page image in the form, choose the one you want to look at and be sure to check them all.
   - Look for the detection of all Barcodes and checkbox marks.
3. Click the clear button to load the next image.

Recognition Preview tab

Scan Image button

The scan image button can be clicked if you have a TWAIN compatible scanner that is connected to FormReturn.

Browse Image button
Browse for the saved scanned image on your computer.

Clear Image button
Clears the image from the preview window.

Preview Check Panel
The boxes in the Preview check panel are clicked to check the detection of barcodes and response marks.
- Click the Detect Barcodes and Detect Marks boxes and check the form image to make sure they are properly detected.
- Quality scanners which produce clear images are an important factor of form processing using OMR software.

Unrecognized barcodes:
If the Form ID barcode or the Segment barcodes can't be detected on a scanned image, the scanned image of the form maybe isn't clear enough.

1. Open the Barcode Detection Details Dialog by clicking on the barcode.
2. Zoom to (200%) to see how clear the scanned barcode looks. This is how FormReturn sees the scanned image and it should be perfectly clear and dark, with no white spots or other imperfections. (see Barcode Detection Details in this guide)

Set a higher resolution or contrast on your scanner and re-scan the form to get a clearer image.

Undetected checkbox marks:
- Click on the mark area to open the Mark Detection Details Dialog.
If the Mark Threshold setting (40%) is higher than the calculated Mark Threshold, the marked checkbox won't be determined as marked if it's Threshold calculation is lower than the 40%. This could be caused from the mark made in the checkbox not filling the box enough. If you think your respondent's might do this, an instruction for how to fill in boxes is important.

Detected Checkboxes which don't contain marks:
If the Mark Threshold Setting (40%) is lower than the calculated Mark threshold for the checkbox, the unmarked checkbox will be determined as marked, when it isn't. This could be caused from the mark value text being to large, causing more black pixels to be counted, which means the Mark Threshold setting will need to be increased to compensate.

Detected Skew
The degree of skew of the scanned image.
Any skew over 5 degrees will be automatically corrected by FormReturn's default Deskew setting.

Recognition Settings
FormReturn uses the Recognition settings to determine if checkboxes contain response marks.

9 Detected Response Marks

Make sure all response marked are detected accurately. If a mark isn't detected properly click on it to open the mark area in the Mark Detection Details.

10 Detected Form ID Barcode.

Make sure the Form ID barcode is detected. If it isn't, click on it to open the Barcode Detection Details.

The next 2 steps are:
1. Add your respondent's records to a Source Data table.
2. Publish the Form Template.
Barcode Detection Details

Open the Barcode Detection Details Dialog by Clicking on any barcode in:
- The Recognition Print Preview,
- The Recognition Test Preview.
- The Captured Data Form Page Preview.

*Image: A segment barcode in the Barcode Detection Details Dialog, zoomed to 200%.*

This shows a clear image of the barcode, showing up any errors with the scan of the barcode. Some scanners produce white dots on the black part of the barcode. If this happens, increase the scanner's resolution setting to 200 and scan the form again to see if it fixes the barcode's detection.
This is how a clearly scanned barcode would look. The darkness of the barcode is sharp and clear. Poorly scanned images produce errors in the detection of barcodes.

### Barcode Details

<table>
<thead>
<tr>
<th>Details</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Segment Barcode</td>
</tr>
<tr>
<td><strong>Format</strong></td>
<td>CODE_128</td>
</tr>
<tr>
<td><strong>Data</strong></td>
<td>01</td>
</tr>
<tr>
<td><strong>Orientation</strong></td>
<td>0 degrees</td>
</tr>
<tr>
<td><strong>X Position</strong></td>
<td>X1: 1373 - X2: 1489</td>
</tr>
<tr>
<td><strong>Y Position</strong></td>
<td>Y1: 116 - Y2: 116</td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>158</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>27</td>
</tr>
</tbody>
</table>
Publish Form

When a scanned image of the form template has been successfully tested, the form template can be published, printed and distributed.

The publication process temporarily stores the structure of the form template in FormReturn’s database and stores the form publication in Captured Data ready for the reconciliation of the captured response data. The Form ID Barcode, generated on each page, will be used by FormReturn to recognize each form page image and reconcile the captured response data with the stored form template structure it belongs to.

IMPORTANT INFORMATION: Once a form template has been published, a newly generated barcode is created that is unique to that publication. FormReturn stores Captured Data from each form page with the Publication it belongs to. If you delete any publication from Captured Data, before the forms from that publication have been returned and processed, the Form ID Barcodes on the scanned images of the forms will have nothing to link to. This means your scanned and uploaded images will throw an error message saying Unable to Validate Form Page ID, because the detected Form ID barcodes can no longer be identified with the deleted publication. The way around this is to republish the template, print the forms again and have the respondents fill them out again, or manually reprocess each form separately, by changing each barcode, which could take a lot of time out of your day.

Tips before starting the Publication Process
1. Make sure you have set up the aggregation rule (for scoring) if you are using one.
2. Make sure you have added a form identification component to the template. (for identifying who forms belong to)
3. Make sure you have test previewed the form template, to make sure data can be detected from images produced by your scanner.
4. A data table has been added to Source Data with respondent's records, for the captured response data to reconcile with. If your forms are completely anonymous, you will create a data table with empty or anonymous records (Eg: numbers for however many forms need to be printed). The captured data will reconcile with the anonymous records.
5. Make sure you know which Publication Type you will be choosing depending on the Form Identification method being used.

Image: The Publish Form window.
Tables Panel

1. Tables Panel

Refresh to update new data.

Publications Panel

2. Publications Panel

Refresh, Print or Export existing selected publications.

Data Tables Window

3. Data Tables Window

Refresh to update new data.

Publications Window

4. Publications Window

Refresh, Print or Export existing selected publications.

Publication Process Panel

5. Publication Process Panel

The selected data table name.

6. Form ID Check

7. Recognition Settings

8. Publication Type

9. Publication Type Dropdown Menu

10. Publish and PDF

11. Sort Filter
These are the names of all the data tables that are stored in FormReturn.

- Select a data table containing the respondent's records, for reconciling the new publication with.

### Publish Form Tab

4. Publish Form

- Click the Publish Form tab to open the Publish form window to start the form Publication Process.

### Publications Window

5. Publications

<table>
<thead>
<tr>
<th>ID</th>
<th>Publication Name</th>
<th>Publication Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Example2</td>
<td>Key Field Reconciles - Append Only</td>
</tr>
</tbody>
</table>

When a data table has been selected, the Publications window displays previous publications, that have been made using the same data table.

### Publication Process Panel
1. Select a Data Table
2. Type a Publication Name
3. Click the Check button to verify there is a Form ID Barcode on every page of the form template.
4. Choose a Publication Type from the drop down menu.
5. Click the Publish & PDF button to save the publication to a PDF file which can be printed from.

**The selected data table name.**

The selected data table is used for reconciling the captured response data with. If TVR is being used as form identification, the records from this data table are the names that will be published on the forms.

**Type a Name for the new Publication**

A name for the publication is typed so you can identify which publication it is.

**Form ID Check**

This check will verify there is a Form ID barcode on each form page. A form without a Form ID Barcode can't be recognized by FormReturn.

**Recognition Settings**
These are the Recognition Settings that will be used when the forms are processed and they can be changed here if needed.

**Publication Type Dropdown Menu**

The Publication Type is selected from the drop down menu and is used by FormReturn to reconcile the captured data from the forms with the selected data table. The identification component added to the form template, will determine which publication type is used. (For more information see Publication Types in this guide)

**Publish and PDF**

Clicking Publish and PDF will publish the forms for the Publication and save them as a PDF file on your computer. The PDF file can be used for printing from at any time and lost forms can be reprinted.

**Sort Filter**

Sort Data Table names or Publication Names.

The next steps are to distribute the Published forms and scan them when they are returned.
Publication Types

The Publication type determines the way in which forms will reconcile with the respondents records in the data table, which in turn will depend on the way in which forms will be distributed to the respondent's, which will determine the identification component chosen to be added to the form template.

A data table containing respondent's records, must be created in Source Data before publication of the form template. A Publication Type must be chosen, even if the forms are anonymous in which case anonymous records are created in a data table for storing the captured data against.

**Note:** The publication type you most often use can be set as a Publishing Preference. (See Publishing Preferences)

**Form ID Reconciles - Append Only Publication Type**

A [Form ID Reconciles - Append Only] Publication Type is used for forms with Template Variable Replacement added as form identification or for Anonymous forms without an identification component added and can link multiple pages of a form together using the Form ID barcode.

It is the most straightforward way in FormReturn, for reconciling the captured response data with the record of the person the form belongs to.

- A data table is created with a record added for each of the form's respondents for the captured data to append to.
- A Template Variable Replacement component must be added to each page of the form template.
- Publication of the form template causes the data table record belonging to each form page to be stored in the Form ID Barcode so that each published form page will be unique to the person it belongs to.
- Each form page produced in the publication will have a unique Form ID Barcode.
- In Multiple page forms, the Form ID Barcode will link the form pages together with the person they belong to.

**Key Field Reconciles - Append Only Publication Type**

A [Key Field Reconciles - Append Only] publication type must have an OMR ID Grid or a Barcode Area added to the form template, which are both Key Fields used as a form identification component. The Key Field reconciles the captured data from each form with the record it belongs to in the respondent's data table.

- A data table is created with a record added for each of the form's respondents for the captured data to append to.
- An ID Grid Key Field or a Barcode Area Key Field must be added to each page of the form template.
- A single form will be published from the form template which can be printed into multiple copies. (Recent model Photocopiers can also be used for reproducing forms)
- The pages of every form will have the same Form ID Barcodes, which will link all the pages to the publication, but not to the record they belong to.
- The Key Field identification component which was added to the form template, is used for reconciling the captured response data from each form page, with the respondent's record it belongs to.
- In Multiple page forms, each page is reconciled to the respondent's record it belongs to, using the Key Field.

**Key Field Reconciles - Append or New Record Publication Type**

The [Key Field Reconciles - Append or New Record] publication type is used if there won't be a record in the data table for every respondent, or for anonymous forms which will link to an empty data table. A new automatically generated record, which can be edited after the forms are captured, will be created in the respondent's data table when the forms are processed, for reconciling the captured data of the respondents that don't have a record in the data table. This means new respondent's can still complete a form and have it link to a record in the data table.

- A data table is created for the form's respondents, with records for the captured data to append to or if there isn't one, a new record will be automatically created.
- An ID Grid Key Field or a Barcode Area Key Field must be added to each page of the form template.
- A single form will be published from the form template which can be printed into multiple copies. (Recent model Photocopiers can also be used for reproducing forms)
- The pages of every form will have the same Form ID Barcodes, which will link all the pages to the publication, but not to the record they belong to.
- The Key Field identification component reconciles the captured response data from each form page, with the respondent's record it belongs to, or a new record will be automatically created by FormReturn.
In Multiple page forms, each page is reconciled to the respondent's record or to the new automatically generated record it belongs to, using the Key Field.
Source Data Tables and Field Names

Source Data is the part of FormReturn's database where data tables, containing your respondent's records, are added and stored. A data table is selected for a Publication, and used for reconciling with the captured data from processed response forms. The processed response information will be stored with the respondent's records in the Captured Data output.

Image: Source Data window with the Tables folder open.
Click Refresh to update any newly added tables.

2 **Add New data table**

- Click Add New and type a name for the table in the Add New Table dialog.

3 **Rename a data table**

- Select a Table and click Rename to type a new name for it.

4 **Delete a Data Table**

Don't delete data tables unless you are sure the data table is completely finished with and has no outstanding unprocessed forms.

5 **Fields panel.**
Data table field names are the types of records that will be added to the data table. Eg: firstname or lastname.

- Select field names and click Delete to delete them. Hold down the shift key and click each field name to select more than one.

**Add New Field name**

- Select a Table and Click Add New to add new field names to the table or Click Edit to change a field name. The Order Index is the order of the field name in the Captured Data output. Order Index 1, will order the records for this field name in the first position.

![Add New Field dialog box](image)

- Click OK and the New Field name will be displayed in the Field Name list.

![Field Name list](image)

**Edit a Field name.**

**Delete a Field Name**

**Table ID**
Data Table ID numbers, are automatically generated when a table is added.

**Tables Folder**

Click the Tables folder to display tables stored in Source Data.

**Source Data**

Click Source Data in the Application Toolbar to open the source data window where data tables, field names and respondent's records are added and stored.

**Table Names**

<table>
<thead>
<tr>
<th>ID</th>
<th>Table Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Empty Records</td>
</tr>
<tr>
<td>4</td>
<td>Research Records</td>
</tr>
<tr>
<td>3</td>
<td>Student Records</td>
</tr>
<tr>
<td>2</td>
<td>Customer Records</td>
</tr>
<tr>
<td>1</td>
<td>Family Names</td>
</tr>
</tbody>
</table>

Tables names which have been added to Source Data.

**Click a table to select it.**

- Student Records

**Sort Filters**

Limit Filter - Click the Limit button to limit the number of data tables that appear on each page.

Sort Filter - Click the Sort button to sort Data Tables by ID or Table name.
Field name ID

<table>
<thead>
<tr>
<th>Field Name ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
</tbody>
</table>

Field Name ID numbers, are automatically generated when field names are added to a table.

Field Names added to the selected table

<table>
<thead>
<tr>
<th>Field Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>StudentIDNumber</td>
</tr>
<tr>
<td>Student_Name</td>
</tr>
</tbody>
</table>

When Field Names have been added to a Data Table, they are displayed in the Field Names panel.

Field Name Export Order Index

<table>
<thead>
<tr>
<th>Export Order Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

The order of the field names in the captured data output.
Source Data Records

Image: The Source Data Records Window.

Records panel.

1. Click the Add New button to add new records.
2. Edit a selected record.
3. Delete selected records.
4. Export all records in the selected data table to a spreadsheet via a CSV file.
5. Import Records from a spreadsheet into a source data table, via a CSV file.
6. Export selected records via a CSV file, into a spreadsheet.

Field Names

Records are displayed under the field names they are added to.
Click the Records tab to display the records in the selected data table.

Click the Add New button to add new records

Type the record name in the Value field of the Add New Record dialog.

Click Save and the typed record will be added to the Records name list.
5. **Edit a selected record**

   ![Edit]

6. **Import Records from a spreadsheet into a source data table, via a CSV file.**

   - ![Import]
   - Select a Data Table Name
   - Click the Records Tab
   - Click the Import button to open the Import Records dialog.

7. **Export selected records via a CSV file, into a spreadsheet.**

   - ![Export Selection]
   - Select the records to be exported
   - Click the Export Selection button
   - The Records will be exported to a CSV file which will open in a spreadsheet by clicking OK.

8. **Export all records in the selected data table to a spreadsheet via a CSV file.**

   - ![Export All]
   - Select the data table of records to be exported
   - Click the Records tab
   - Click the Export All button
   - The Records will be exported to a CSV file which will open in a spreadsheet by clicking OK.

9. **Delete selected records**

   ![Delete]
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Import Records Dialog

1. Create a CSV file from the spreadsheet of records to be imported into a FormReturn data table (the import will include the field names on the spreadsheet).
2. Select the data table from the Tables list in source data, where the records will be imported.
3. Click the Records tab.
4. Click the Import button in the Records panel, to open the Import Records dialog window.
5. Click the CSV Import tab.

Make sure the Separator and Quote Character values are the same as those in the CSV file.

Click Select File

Select the CSV file from your computer.

Click the Import Records button

The records from the CSV file, will be imported into the selected data table.

Click Cancel

to close the Import dialog without importing any records.
Source Data Publications

The Publications folder displays the publications which have previously been made, using a selected Table.

Image: Source Data Publications Window.
Publication ID
Publication Name

<table>
<thead>
<tr>
<th>ID</th>
<th>Publication Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Example3_Publication</td>
</tr>
<tr>
<td>7</td>
<td>Example2</td>
</tr>
</tbody>
</table>

Publication Type that was used

- Form ID Reconciles - Append Only
- Key Field Reconciles - Append Only

Sort Filters

- Limit the number of Publications displayed at one time.
- Sort the order of displayed Publications.
- Search for a Publication.

Refresh to Update Data

Rename a Publication

Delete a Publication

Print a Publication

Saves as a PDF to Print from.

Export a Publication

Create a PDF file of the Publication
Scanning Form Images

All scanners are different and there are all sorts of imperfections that can be produced in the images made by them. A quality scanner can make a big difference when it comes to producing clear images at a lower resolution which will process more quickly and accurately in FormReturn.

Quality high speed document scanners, flatbed scanners and recent model photocopiers, are all imaging devices supported by FormReturn. Although it is possible to use other imaging devices such as a fax or a digital camera, they are not recommended or supported by FormReturn as these types of images could cause inaccuracy to captured data.

Forms can be scanned and uploaded into FormReturn in any order, because the Form ID Barcode which appears on every published form page is used by FormReturn to recognize each page for reconciliation with the publication ID.

Scanning and Saving Form Images

We recommend using a higher end document scanner or any scanner that takes good quality images. The quality of scanned images must be sharp and clear for accurate OMR detection of barcodes and checkbox response marks.

- **Recommended Scanner Resolution** setting is between 150 and 200 dpi to produce a clear image that will process more quickly. *(A Test Preview will determine the best setting for your scanner).* Scanners produce different quality images at different resolution settings. Some scanners can produce images with black spots on white or white spots on black, which breaks the detection of barcodes and response marks.

- **Save as TIF, GIF or PNG files** preferably. *(don't save form images as JPEG files).* PDF files can sometimes be recognized by FormReturn, the only way to know if your PDF files can be detected, is to do a test preview. When you open a PDF image in the Recognition Test Preview window, you should be able to view every detail of the page, if the page is all white it means the image can't be recognized by FormReturn and you won't be able to save scanned images as PDF files for processing in FormReturn.

Scanning Forms for Faster Form Processing

Using a quality document scanner, with an automatic document feeder will save you time and effort and let you be confident the form images will be sharp, recognizable by FormReturn and response marks will be accurately detected.

The lowest possible resolution without affecting the image quality will mean forms will take less time to scan, take up less space on your computer and process faster in FormReturn.

A high end scanner can have the resolution set at 150 dpi, and still produce a clear image, whereas a lower end scanner may need to scan at 200 dpi or even up to 300 dpi, for the image to be clear enough.

How to Scan Forms Using the Scan Forms Button

Clicking the [Scan Forms] button in the Application Toolbar will start FormReturn scanning automatically if a Twain compatible scanner is connected.

TWAIN (Technology Without An Important Name) is technology that connects FormReturn to your scanner so they can communicate to get the correct type of image, which will automatically be saved on your computer and automatically sent to FormReturn's Processing Queue.

Click the Scan Forms button to start scanning uploading and processing forms. FormReturn running on all systems, except Mac version 10.5.8 and below, will work with TWAIN. Snow Leopard is fine. *(Unfortunately there is nothing that can be done about this, it's Apple's fault.)*

This means full automation of form processing once the forms have been placed in the scanner.
• Click the Scan Forms Button

Scan Forms

• Choose your Scanner in the drop down menu of the FormReturn Scanner dialog.
• Click the Scan button.

Forms will be automatically scanned and uploaded into FormReturn’s Processing Queue.

Manually Scanning Forms
When manually scanning forms, verify the settings of your scanner. Set your scanner to scan form images at a resolution of around 150 dpi or somewhere between 150 and 200 dpi (dots per inch), but this setting will depend on the quality of your scanner. A quality scanner can be set at a lower resolution which means faster scanning and processing of forms. Make sure the form has been tested in the Test Preview window as you may need to play around with the settings if your form images don’t process properly the first time.

When forms have been scanned and the images saved on your computer, the images can be uploaded into the Processing Queue.

Important Tips on Scanning and Saving Form Images:
• Form images that will be uploaded into FormReturn are scanned and saved in PNG, GIF or TIFF format and since version 1.1 PDF files can sometimes be recognized by the Form Processor.
• DON'T SAVE AS JPEG. Don't save your images as JPEG files. JPEG files create “artifacts” within images, this will translate into black spots where they shouldn't be, in the 1 bit conversion. It will make it harder for FormReturn to read barcodes and will also make it harder for FormReturn to count the correct number of pixels in the checkboxes. If you have to use JPEG, make sure your scanning resolution is 200 DPI and your barcodes are big enough (full size) to always be detected.
• Don't use image enhancing filters, such as a sharpening filter.
• Some scanners with automatic document feeders scan images in a imperfect straight line (Eg. the image appears to “bow”). If your scanner does this, it would be wise to get a better scanner.
• If the image is blurry, you require a better scanner.
• If you use a flatbed scanner and the foam is worn away, this may cause black spots or blurry patches. The paper must be held firmly against the glass to take a good image. You require a better scanner.
• Fax machines take low resolution images, though it is possible to increase the size of everything in the form, we don't recommend using them to take images for use with FormReturn.
• If you have problems with detection, increase the DPI (Dots per inch) of your scanner up to 300 DPI. If you still have problems, increase the size of your barcodes and fragment areas in FormReturn. If you still have problems, invest in a better scanner.

The Next step (if forms were manually scanned) is to upload them into FormReturn’s Processing Queue. The Next step for automatically scanned and uploaded forms, is to view and manage the Captured Data.
Document Scanners and Imaging Device Types

A decent document scanner for scanning OMR forms is of great significance to ensure a high rate of accuracy is achieved when the forms are recognized by FormReturn.

The types of imaging devices supported by FormReturn for the best image quality, are recent model document scanners, flatbed scanners and any recent model photocopiers or multifunction devices, which have a scan setting.

Work with the right equipment.
The type of scanner you choose will depend on how many forms you will be processing each day. When scanning large volumes of forms, high end document scanners will be faster and are recommended for FormReturn. They have automatic document feeding trays for easy paper handling and produce good quality images.

A TWAIN compatible scanner will allow you to use FormReturn's Scan Forms button when scanning forms.

Faxed images, faxed to email images and digital camera images may work but are not supported as they are not always reliable and time needs to be spent adjusting recognition settings.

1. The image quality produced must clear and sharp (no black spots on white, no white spots on black) and not bowed. Test Preview a form image, to determine if your scanned images have all these qualities, before you go ahead and process forms. The Scanners resolution settings or FormReturn's Recognition Settings may have to be changed to detect the barcodes and response marks from the images of some scanners.

2. The images from the scanner must be saved as files which are able to be recognized by FormReturn. These are TIF, GIF, PNG and sometimes PDF.

Choosing a Scanner
When choosing a scanner, Make sure it provides drivers for your computer's operating system version, for example Windows XP, or Macintosh OS X.

Flatbed scanners and Multifunction Centers (MFC)'s can be used with FormReturn - but many of these lower-end systems have issues with image accuracy, particularly blurring, image distortion and other issues. The simple rule with scanners used with software OMR and OCR systems is "you get what you pay for" - in other words the cheapest option isn't necessarily the best when you require quality.

Document Scanners
For scanning large volumes of forms a high speed document scanner with an automatic document feeder (ADF) and good paper handling would be the best type of imaging device to use. They often hold 50 to 500 sheets of paper and can scan at speeds of 10 to 200 pages per minute (ppm).

Some important features to look for when selecting a document scanner for use with FormReturn, are resolution, color, speed and paper-handling. Duplex operation is another feature of some scanners which means it can scan both sides of a double sided document.

If you did upload double sided forms into FormReturn, it would save each side as a single image and process them separately.

Production Scanners
Production Scanners deliver automation and dependability, needed for mission-critical production scanning applications. They will scan at speeds up to 90ppm/180ipm and have intelligent productivity enhancement features. A full suite of advanced image processing features including automatic color detection, content-based rotation and intelligent blank page deletion help to reduce document preparation time which saves both time and effort.

Network Document Scanners
A Network document scanner is a computer device that can be linked to your office's computer network. Instead of being connected to a single computer, it works by connecting to a network and can be configured to save images to a network file share.

Some Features of Network Document scanners:

- The scanner can be set to save the images to a file share on your computer.
- Scanned form images can be emailed.
Choosing a High Speed Document Scanner

There are many manufacturers of document scanners and some can scan at speeds of up to 80 pages per minute but most average at around 20 to 50 pages per minute. Some important features to look for when selecting a document scanner are speed, duty cycle (the number of pages the scanner is rated to process in a day) and paper-handling. Duplex operation is another feature of some scanners which means it can scan both sides of a double sided document.

When handling large volumes of forms, automatic document feeders that can often hold between 50 to 500 sheets of paper, for a low to medium cost machine, and will be more efficient and time saving than a flat bed scanner.

For testing FormReturn, we use an Epson WorkForce Pro GT-S50. At 25ppm with a 75 sheet paper tray, this scanner has an excellent set of features and works well with Windows and Mac. There is also a GT-S80 that does 40ppm.

Recommended Document Scanner Brands for OMR software

We recommend looking at the following brands of scanners:

Epson - Windows & lots of Mac compatibility:
http://www.epson.com/cgi-bin/Store/jsp/SmallBusiness/Scanners.do?BV_UseBVCookie=yes

Fujitsu - Windows & some Mac compatibility:

Canon - Some good high speed/large paper handling scanners:
http://www.usa.canon.com/opd/controller?act=OPDCategoryIndexAct&fcategoryid=2204

Panasonic - We test our forms on a Panafax DX-600 which has been very reliable. They also make good document scanners.

Kodak - Make a lot of large production scanners:

Xerox - Popular document scanner manufacturer:

Avision - A Taiwanese document scanner manufacturer, cost competitive and popular in Asia and Australia:
http://www.avision.com/usa/products/docs.html

Scanners for Mac Users

Unlike Windows users, Macintosh users may find themselves searching for a scanner that is compatible with their system. There are only a limited number of document scanners made for Mac, but this is starting to change. For your convenience we have listed some scanners and ways to get your scanner to work with FormReturn.

To start with, we think the best scanner for FormReturn is the Epson WorkForce Pro GT-S50. This scanner includes TWAIN drivers for Mac and Windows (apparently Linux support is provided by a third party called Avasys). The Epson scan software that comes with it is excellent and allows for fine-grained control over image and scanner settings as well as color dropout control. The Epson event manager software also ties in very nicely with FormReturn's folder monitor (though launching of the software takes around 20 seconds). We are using this scanner for the development of the TWAIN program for FormReturn (coming soon). A video review of this scanner working with FormReturn will also be coming soon. If you are looking for something faster, try the Epson WorkForce Pro GT-S80 (40ppm).

Another top rating Mac scanner is the Fujitsu ScanSnap 1500M, however, it has been reported that this scanner will only save as PDF or JPEG. Though you can still scan images as JPEG, a JPEG file will not provide the best quality image (but should still work at the right size/setting). We are currently waiting results from people testing this scanner with TWAIN SANE to see if this scanner can also support TIFF and PNG via Apple Image Capture and TWAIN (using the TWAIN SANE libraries). For more information about TWAIN SANE, visit: http://www.ellert.se/twain-sane/

The Canon DR-2010M (and it's bigger brother, the DR-2510M) are also Mac compatible scanners that includes TWAIN drivers and can scan up to 1500 pages per day. It has had less favorable reviews (on Amazon.com) than the Epson or
Fujitsu scanners. It is currently available in the USA and Europe. You can also use the Canon DR-2010C and DR-2050C scanners (available in most countries) with Mac, as long as you download the Mac drivers for them from the Canon website. The Canon P-150 (a portable document scanner) also has Mac/Windows and TWAIN support, but some reviews report skew issues which may make it harder to use with FormReturn.

Many scanners that aren't Mac compatible (because they don't have Mac drivers) can still work. The TWAIN SANE project currently has complete support for 333 scanners (via the SANE project libraries). For a list of SANE compatible scanners, visit: http://www.sane-project.org/sane-mfgs.html

To use a scanner once TWAIN SANE has been installed and your computer has been rebooted, go to your Applications folder and click on Image Capture once your scanner is hooked up and turned on. Please let us know if your scanner works well with TWAIN SANE and we'll add it to the list! http://www.ellert.se/twain-sane/

The other option for Mac users is to use a "Network Document Scanner" or "Network Scanner" - these machines scan images to a network file share or send images via email.

* Production Scanners
* Network Document Scanners
* Flatbed Scanners
* Photocopiers


Choosing an Imaging Device for using with FormReturn OMR

**Flatbed Scanners**

A standard Flatbed Scanner has a lid under which a single document is placed face down.

A benefit of flatbed scanners as well as scanning documents, is they can be used for scanning photos, pages from books and images that are too large can be scanned in sections.

For use with FormReturn, some flatbed scanners can come with Automatic document feeders which can scan up to 15ppm, which is more efficient and time saving when you have a number of forms to scan.

If your existing Flatbed scanner doesn't have an automatic document feeder, they can be purchased separately as an attachment.

**Photocopiers**

A feature of FormReturn is the ability to make multiple copies of an anonymous form containing a Key Field area to collect form identification. The images could be printed using your regular printer or copied using a recent model photocopier that produces quality digital images.

Photocopiers use a light lens to duplicate documents; the original technology is analog, but these days digital copiers are becoming popular. Digital photocopiers enable the user to print color copies by converting the visual data on the original document into computer code. The computer code then programs the printer that creates the final copy.

Another photocopier feature is the ability for it store everything within the copiers system, before it actually needs copying. So once all the pages have been scanned in, the machine can then be left to run while you get on with other tasks that need your attention.

The clarity of the copy depends on the resolution of the photocopier. The resolution of the photocopier determines the quality and sharpness of an image. This is measured in dots per inch (DPI). Photocopiers with 500 DPI have 500 x 500 dots per square inch. Many copiers can offer an extremely high resolution, but these are only useful for people such as designers, who need very detailed prints.

The recommended resolution of images to be uploaded into FormReturn is between 150 and 200 dpi. Forms scanned at a higher resolution will be slow to process in FormReturn.

A photocopiers speed is measured in copies per minute (cpm) so consider this to ensure the photocopier you choose will run at the appropriate speed for your requirements. The number of copies you make each day would determine the size of the photocopier you will need. If your photocopier is in constant use each day, then you should consider a copier with a large capacity tray. These larger trays can hold in excess of 1,000 sheets and are useful to avoid constantly refilling the paper tray.
The photocopier can be linked to your offices computer network so that you can print directly from your computer without leaving your seat.

Scan to email: Some photocopiers have this feature which allows the scanned form images to be emailed.

One of the best features that most copiers now come with is that they save energy while not in use.

**Scan Settings:**
Scanning forms at the lowest possible resolution, of between 150 and 200 dpi (depending on the quality of the images your scanner puts out) will mean less space will be taken up storing the images on your computer which means faster form processing in FormReturn. Whenever possible, DON'T SAVE IMAGES AS A JPG (JPEG) FILE. This format is intended for photos and produces artefacts, reducing your image quality. Preferably save as a PNG or TIF image (Group 6 preferably).

Resolution settings: The recommended resolution of scanned form images that will be read by FormReturn, would usually be between 150 and 200 dpi (dots per inch). Images scanned at a higher resolution will be slow to process in FormReturn. Most scanners will scan at resolutions of up to 1200dpi or more (suitable for photos), so it's important to check your scanners settings before any forms are scanned. A high end scanner can have the resolution set at 150 dpi, and still produce a clear image, whereas a lower end scanner may need to scan at 200 dpi for the image to be clear enough. Lower resolution images will scan and process in FormReturn more quickly.

The scanner's settings should always be tested on a test preview of your form, to make sure the settings produce images that can be detected successfully. This should always be done before publishing and scanning numerous forms for the first time. If a test preview of a scanned form image doesn't produce accurate detection of barcodes and hand marks, see Recognition settings.

Images scanned in color are recommended for detection by FormReturn, because they are sharper than black and white, which are 1 bit images.

Black and white scanned images will be faster to process in FormReturn but they won't be as sharp as color images. If you must scan in Black and White, the Recognition Settings of FormReturn may have to be played around with to get accurate detection of response marks.
Processing Queue
The Processing Queue is accessed with the Processing Queue icon and is where scanned form images are manually uploaded and temporarily queued, while they wait to be sent to the form processor in FormReturn’s server.

Manually Uploading Form Images
When scanned form images are uploaded into FormReturn, they are temporarily stored in the Unprocessed Images folder in the Processing Queue. The images are sent, one at a time, to the Incoming Images table in the Form Processor, where the form identification information and the response data are processed into Captured data.

Image: The Processing Queue Window.

Unprocessed Panel
Upload form images to be processed.
2. Manually Upload Scanned Images
   Upload a single save form image.

   Upload a folder of form images.

4. Delete selected Images from the Processing Queue.

5. Unprocessed Images Tab
   When form images are first uploaded, they are displayed as the file name or folder name, in the Unprocessed Images folder, until they are sent to the Incoming Images table in FormReturn's server.

6. Processing Queue Icon
   - Click to open the Processing Queue window.

7. Unidentified Images Tab
   Any uploaded scanned images, that can't be recognized by FormReturn, will be displayed in Unidentified Images folder, as their file name.

8. Filter Images
   Limit the number of Unprocessed images that are displayed at one time. Sort the order of the displayed Unprocessed images. Search for an Unprocessed image.
**Unidentified Images Folder**

When a form image can't be recognized by FormReturn, the scanned image will remain unprocessed and be put in the Unidentified Images Folder.

Any images with unidentified barcodes can be manually Reprocessed into Captured Data. There are a few reasons that could be given as to why images are unidentified:

**Unable to locate Form ID** - When the Form ID barcode or the Segment Barcodes aren't able to be recognized because the scan quality of the image isn't clear enough for Barcodes to be detected. Unclear or skewed image files should be deleted, re-scanned and uploaded again.

**Unable to locate Segment barcodes** - A Barcode has been obscured by a dark mark and can't be located by FormReturn. Locate the barcode ID and reprocess the image.

**Unable to Validate Form page barcode** - The Publication the images belong to, and must link to, no longer exists in Captured Data. The form template would have to be published again and each image manually reprocessed using the new Form ID Barcode numbers.

*Image: The Unidentified Images folder.*
Limit the number of Unidentified images that are displayed at one time.
Sort the order of the displayed unidentified images.
Search for an unidentified image.

Obscured Form ID Barcode

Look at the image preview to determine why the barcode wasn't identified. Barcodes on Unidentified forms can be manually Reprocessed into Captured Data.

Reprocess Unidentified Images

Reprocessing form images involves:
1. Manually selecting, detecting and processing the Form ID barcode or the Segment, depending on the error thrown.
2. Manually selecting, detecting and processing the captured response data and any errors detected in response data.

See Reprocessing Unidentified Images in this help guide.

Delete an Image
Click Reprocess Button

Unable to locate Form ID

OK
Select the Unrecognized form from the Publication
The first 2 numbers in the barcode are the Form ID
Click OK
Reprocessing Unidentified Images

Select the image file in the Unidentified Images folder.

- Click the reprocess button and an Error dialog will open with the reason why the form image is unidentified.

- Click OK in the Error dialog.

Error Reasons

1. Unable to locate Form ID
This means the Form ID Barcode can't be recognized. The barcode ID will have to be located from the Publication and the response data manually detected and any errors corrected.

- Click the Select Button in the Template panel, to open the [Select Published Form Page] dialog.
- Click the Publication the form belongs to from drop down menu.
- Locate the Page ID or type the first 2 digits of the form ID barcode into the Quick Search Field and click Search to find the form page. (The page ID number will normally be visible on the scanned image preview.)
- Click OK to open the form page in the reprocessing screen.

The form page will open in the reprocessing screen.
2. Segment Barcode Not Found
The segment barcode can't be recognized. The segment will have to be manually selected in the Reprocessing screen and the response data manually detected and any errors manually corrected.

Segment Barcode detection can be broken either from bad scans or accidents with pens.

- Click OK in the error dialog and the form page image will open in the reprocessing screen where the segment can be manually selected and the response data manually detected.

3. Unable to Validate Form page barcode.
This means the publication the form images belong to, is no longer stored in Captured Data and the Form ID barcodes don't link to a publication. (Publications shouldn’t be deleted from FormReturn before they are finished with)

Reprocessing of the forms if this happens takes time:
1. Re - publish the form template the image belongs to.
2. Manually Reprocess the forms, by matching the form pages to the Form ID's of the new publication.

Reprocessing Steps

The form page image will open in the reprocessing screen with the segment part of the page, automatically detected with a green outline.

Select Segment Area

If the segment hasn't been auto detected with a green outline, it will have to be manually selected.

- Click [Select Segment Area]

- Click on the top right segment barcode and manually select the segment, by dragging the green selection from the top right segment barcode, to the bottom left segment barcode, being careful to outline the segment neatly between the barcodes, making sure all marked data on the segment is included in the selection.

- Double click inside the selected segment area, to open the [Segment Area Selection Settings] dialog. In the dialog, choose the unlocated segment from the Segment Selection drop down menu, if there is more than one segment on the page.
- Click the [Update] button to detect the segment (in green) and the fragments (in red).
Manually Detect Response Data

Image: A Form image open in Reprocessing Screen with the selected Segment Area outlined in green.

1. Unidentified Form ID Barcode
2. Select the Segment to manually reprocess response data.

Segment Selection
- Click [Select Segment Area]
- Click on the top right segment barcode and select the segment using the green border, by dragging it from the top right segment barcode, to the bottom left segment barcode, being careful to select the segment neatly between the barcodes, including all the mark areas.
- Double click inside the selected segment area, to open the [Segment Area Selection Settings]. If there is more than one segment on the page, choose the unlocated segment from the Segment Selection drop down menu.
• Click the [Update] button to show the detected segment (in green) and the detected fragments (in red).

Selected Segment
outlined green.

To process any undetected response data or errors in response data,
  • Double click inside the selected segment area, to open the [Segment Area Selection Details] dialog. (See Segment Area Selection Settings in this guide.)

Select Form Page ID

• Click to the Select button and locate & select, the Published Form Page ID, to open the form page in the reprocessing screen.
Select the Form Page ID of the Unidentified Image. Use the Publication ID and Name as a guide to finding the right ID.

- The first 2 numbers in the Form ID barcode, visible on the scanned image preview, is the Form Page ID.
- Quick Search the image file, by typing the Form Page ID into the Form Page ID field and Click the Search button.
- If you still can't locate the Form Page ID, look at the Publication in Captured Data and it will be a form page that isn't yet processed.
- Click Yes and The form image will open in the Reprocess window.

**5 Form Page ID number**

Form Page ID:

44

When the form page has been selected, the Form Page ID will be displayed here.

**6 Image Panel**

- Select a New Image
- Rotate the current image
- Save the Image to disk.
Click the Detect Data button, to detect the response data.

If there are any Errors in the processed Values:
- Double click on the segment area to open [Segment Area Selection Settings], and manually process the error.
- Click Update.
- Click Save in the Detection Panel.

Revert data without saving

Click Save to save the reprocessed data

Saves the Reprocessed data.
Manually Detect the Response Data Values

The response data in the segment must be detected manually, before the page can be saved and the response data sent to Captured Data.

- Click the [Detect Data] button and the detected response values will be shown in the Value column. Any undetected response data or error count will have to be manually detected, before the form page is saved.

Image: A Form page image open in the Reprocessing Screen, with the detected response data shown in the Value column.
An Error displayed in the Error column.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Value</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>question1</td>
<td>A, B</td>
<td></td>
</tr>
<tr>
<td>question2</td>
<td></td>
<td>Error</td>
</tr>
<tr>
<td>question3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>question4</td>
<td>D</td>
<td></td>
</tr>
</tbody>
</table>

- If an Error is thrown in the detected response values - Double click on the Segment area to manually Reprocess the error in the [Captured Data values] dialog. (See Segment Area Selection Settings in this guide)

Check for any Errors in detected response data.

To manually reprocess errors in detected response data: (See Reprocessing Captured Response Data Errors in this guide.)
Segment Area Selection Settings dialog.

- Click the Captured Data Values boxes, to select and reprocess errors in the response mark data.
- If there is more than one segment on the form page, click the Segment Selection drop down menu to select the segment.

- Click the Detect Data button if the response mark values haven't been detected.

2 Detected Errors

3 Select the correct Marked Data Value

- Click the box the select the mark value.

4 Preview of the Mark Area Image
Detect Data

- Click Detect Data if the response mark values haven't been detected.

Segment Selection

If there is more than one segment on the form page, select the segment you want to change, from the drop down menu.

Update Captured Response Data

- Click Update to finish.
- Click Cancel to close without making changes.

Recognition Settings.

These are the Recognition setting used to process and capture the response mark data.
Manage Captured Data Publications

Click the Captured Data Icon to access processed, form response data.

Published form templates are stored in FormReturn's data base and are displayed in Captured Data, in the Publications folder.

Uploaded scanned form images that can be recognized by FormReturn, will be processed by the form processor and the response information can be seen in Captured Data.

The Captured data from the scanned forms, will reconcile with the publication and form pages it belongs to.

Click a Publication to select it and manage and export the captured response data from the forms in the publication.

Any forms that haven't yet been processed into Captured data could be either in the Unrecognized Images folder in the Processing Queue or they haven't yet been returned by the respondents.

*Image: The Publications window with the Publications stored in Captured Data.*
The Publication ID number is automatically generated by FormReturn, for differentiating between publications. Publication ID numbers will be in numerical order of when the form template was published.

The Publications folder displays a list of the form Publications, currently stored in FormReturn. The Publications stored in FormReturn, are used to reconcile and store the captured response data from the form images which belong to each publication.
- Click on a Publication to select it.
- Click the Forms tab and select a form.

The Forms folder displays the published forms in the selected Publication.
- Click on a form to see the captured data processed from the form's pages.

The Form Pages folder displays the form pages in a selected Form.
- Click the Form Pages tab to see the captured response data for each page of a selected Form and a preview of the scanned form page.

Limit, Sort and Search Filters
Limit the number of forms that are displayed at one time and click Apply.

Sort the order of the displayed forms, ascending or descending, and click Apply.

Search for a form by ID or Name and click Apply.

Publication Type

This is the Publication Type used, when the form template was published.

Refresh Data

Updates Recently processed data.

Clear Captured Data.
Clears any Captured Response data that has been reconciled with the forms in a selected publication. This doesn't delete the publications or forms, only the captured data.

**Delete Publications**

Only delete a Publication from Captured Data if you are sure it is finished with, because FormReturn uses Publications for Reconciling captured response data from uploaded form images.

**Export Captured Data**

Exports all response data captured from forms in the selected Publication, to a CSV file which will open in a Spreadsheet, depending on the office software stored on your computer.

- Click on a Publication and click the Export Data button to export the captured data.

**Rename Publications.**

Change the name of a selected Publication.

**Publication Settings**

Reset the publication settings to:

1. Update the Recognition settings to fix errors in the detection of captured data.
2. Update Captured Data Field Names.
3. Update Order Index of data columns.
4. Update the Aggregate Score Rule.
5. Download the form template file used in the Publication, from FormReturn's database.

See - Re-set Publication Settings in this guide.

**Extend Publications**

Publications can be extended to include new Source Data records which have been added to source data since the form template was published.

Click Extend to open the Extend Publication dialog.

See - Extend Publication in this guide.
Captured Data Forms
The Forms Folder displays the forms belonging to the selected publication, along with the total score for each form if an aggregation rule was set.

*Image: Forms Folder Window.*
ID and Form Password

<table>
<thead>
<tr>
<th>ID</th>
<th>Form Password</th>
</tr>
</thead>
<tbody>
<tr>
<td>44</td>
<td>474105</td>
</tr>
<tr>
<td>43</td>
<td>603504</td>
</tr>
<tr>
<td>42</td>
<td>635459</td>
</tr>
</tbody>
</table>

The ID is the form page ID, which identifies each form page in a publication. It is the first number of the Form ID Barcode, an automatically generated number, which runs in sequence for each published form page.

The Form Password is an automatically generated, random number, on each form in a publication. The Form ID Barcode is used by FormReturn for linking the respondent of the form with the data captured from the form. If the Form password was corrupted in any way, the form would not be processed.

Forms Folder Tab

The forms folder is where the forms in a publication are displayed.

Form Pages Folder

The form pages folder displays the form pages, in a selected form.

Total Form score.

<table>
<thead>
<tr>
<th>Form Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0</td>
</tr>
<tr>
<td>7.0</td>
</tr>
<tr>
<td>7.0</td>
</tr>
</tbody>
</table>

The Form score is the total score calculated for the captured responses from the pages of a form.

Limit Sort Search Filters

Limit the number of forms that are displayed at one time and click Apply.

Sort the order of the displayed forms, ascending or descending, and click Apply.
Search for a form by ID or Name and click Apply.

**Captured Data Error Count**

| Error Count | 0 | 1 |

Errors thrown in Captured Response Data can be Reprocessed, to manually correct the Mark value of the checkbox that was marked. See - Reprocess Captured Data errors, under Form Pages in this guide. Errors can be caused by bad scans or wrong marks made by the form’s respondent.

**Clear Filter**

Click the clear filter button, to display all published forms currently stored in FormReturn.

**Refresh**

Updates information from recently processed forms.

**Clear Captured data**

Clears the processed data for a selected form.
Delete selected forms

Export captured data

See - Export Captured Data in this guide.
Captured Data Form Pages

The Form Pages folder contains the captured data for each of the form pages and an image of the scanned form page.

If a form page hasn’t been processed, the Processed Time will read as unprocessed.
If you think a form page should have been processed, look for it in Unidentified Images in the Processing Queue.
Click the Preview button

If there is an error in the Error Count, captured data for those questions can be Reprocessed.
Select the form page and Click the Reprocess button.

Form Pages Tab

Form Page ID
First 2 numbers on the Form page ID Barcode.

Automatically generated ID
number of the publication.

Publication ID

193
Form barcode ID

Total Score for the correctly marked boxes on the page.

Errors detected in captured data

An Error Count means the response marks for the question the error appears against, haven’t been able to be processed.
If there are errors in the Error Count, the unprocessed response for the question, can be manually Reprocessed to correct it.

Image: Example of a discrepancy in a Mark Area Error. If FormReturn isn’t set to capture marks from more than one box, an error will occur if more than one is marked by the respondent.

Select the form page and Click the Reprocess button.

Processed Date and Time for the form page.

Limit Sort Search Filters.

Limit the number of form pages that are displayed at one time.
Sort the order of the displayed form pages.
Search for a form page.
## Captured Mark Values and Scores for each question.

<table>
<thead>
<tr>
<th>Order Index</th>
<th>Field Name</th>
<th>Captured Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>question1</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>question1_score</td>
<td>1.0</td>
</tr>
<tr>
<td>3</td>
<td>question2</td>
<td>C</td>
</tr>
<tr>
<td>4</td>
<td>question2_score</td>
<td>0.0</td>
</tr>
<tr>
<td>5</td>
<td>question3</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>question3_score</td>
<td>0.0</td>
</tr>
<tr>
<td>7</td>
<td>question4</td>
<td>C</td>
</tr>
<tr>
<td>8</td>
<td>question4_score</td>
<td>0.0</td>
</tr>
<tr>
<td>9</td>
<td>question5</td>
<td>E</td>
</tr>
<tr>
<td>10</td>
<td>question5_score</td>
<td>0.0</td>
</tr>
<tr>
<td>11</td>
<td>question6</td>
<td>A</td>
</tr>
<tr>
<td>12</td>
<td>question6_score</td>
<td>1.0</td>
</tr>
<tr>
<td>13</td>
<td>question7</td>
<td>B</td>
</tr>
<tr>
<td>14</td>
<td>question7_score</td>
<td>0.0</td>
</tr>
<tr>
<td>15</td>
<td>question8</td>
<td>C</td>
</tr>
<tr>
<td>16</td>
<td>question8_score</td>
<td>0.0</td>
</tr>
<tr>
<td>17</td>
<td>question9</td>
<td>D</td>
</tr>
<tr>
<td>18</td>
<td>question9_score</td>
<td>0.0</td>
</tr>
<tr>
<td>19</td>
<td>question10</td>
<td>E</td>
</tr>
<tr>
<td>20</td>
<td>question10_score</td>
<td>0.0</td>
</tr>
<tr>
<td>21</td>
<td>question11</td>
<td>A</td>
</tr>
</tbody>
</table>

**Page Score:** 8.0  
**Form Score:** 8.0

## Scanned image of form page. Click the Preview button to view the selected form page image.
### Questionnaire Answer Sheet Example

| Question 1 | Question 2 | Question 3 | Question 4 | Question 5 | Question 6 | Question 7 | Question 8 | Question 9 | Question 10 | Question 11 | Question 12 | Question 13 | Question 14 | Question 15 | Question 16 | Question 17 | Question 18 | Question 19 | Question 20 | Question 21 | Question 22 | Question 23 | Question 24 | Question 25 | Question 26 | Question 27 |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|

Use Zoom for a better view of the image.
- Click the Preview button to see the Mark Detection details.

#### Form Pages Panel

**Clear Filter**

Clearing the Filters will allow all form pages for every Publication in FormReturn, to be displayed at once.
Refresh

Update recently processed captured data.

Clear captured data.

Clearing the captured data from a form page, will clear any errors, allowing the image to be scanned again to fix recognition settings so the image will be processed correctly.

Preview Button

Select a form page and click the Preview button to open an enlarged image of the scanned form page.

Reprocess Button

Click the Reprocess Button to manually reprocess captured data for a selected form page.

Zoom control for scanned image

Save to Disk

Save the scanned image file to your computer.
Locate Captured Data Errors

- Open the Forms folder to check for errors in captured response data. Errors can be manually Reprocessed to correct the captured Mark value of the checkbox that has an error.

Error Count in Captured Data
1. Click on the form
2. Locate the error on the scanned image preview in Form Pages
3. Reprocess the error.

Click on the form with the error to find a description of the error and preview of the form page image.

Description of Error

!!ERROR!! The number of checkboxes found does not match the checkbox count....

Locate the error and reprocess it.
Sometimes a respondent will accidently mark the wrong box, cross it out and mark another one, which throws an error.

If an Aggregation rule has been set for one correct answer, an error will be thrown because FormReturn has detected a mark in more than one box.

- In the Form Pages folder, select the form page with the error and [Reprocess ...] to manually reprocess the error.

Click Reprocess to open form pages with errors, in the Reprocessing screen.

Open Form Pages and select the page with the error.
Reprocess Captured Data Errors

- Select the form page with an error
- Click the Reprocess button to open the form page in the reprocessing screen.
- Double click inside the selected segment area to open the Segment Area Selection Settings
- Click to select the mark area with the error
Segment Area Selection Settings

1. Select the segment from the drop down menu if the form page has more than one segment.

2. Click on the mark area with the error

3. Select the box that was marked by the respondent

Click Update to detect the response data.
<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
</tr>
</tbody>
</table>

Click Update to detect the response data.
Re-Set Publication Settings

1. Field Type
   - Type
     - Checkbox
     - Score
     - Checkbox
     - Score

2. Source Data Field Names and Captured Data Field Names
   - Old Field Name
     - StudentIDNumber
     - StudentIDNumber_...
     - question1
     - question1_score

3. Re-Set the Captured Data Field Names (Caution: this doesn't check for matching field names on the form)

4. Column Order Index

5. Re-Set the Column Order Index

6. Aggregation Rule

7. Re-Set the Aggregation Rule

8. Click Update to save changes

9. Import or Export Answer Keys

10. Save the Form Template File to Disk

11. Form Template File

12. Form Recognition Settings
   - Luminance
   - Mark Threshold
   - Fragment Padding
   - Deskew Threshold
   - Perform Automatic Deskew

13. Double click in the cells above, edit new values & update to save.

14. Import Answer Key
15. Export Answer Key
16. Update
17. Reload

18. Close
Captured Data Field Names can be changed if you are sure the changes won't conflict with other Captured data field names. It is important to make sure the field names aren't the same as other captured data field names that will be on the same form template.
Click Update to save any changes or Reload to reverse the changes.

<table>
<thead>
<tr>
<th>Column Order Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Order Index</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

Change the order index of field name columns for the data export and click Update to save changes or Reload to reverse the changes.

<table>
<thead>
<tr>
<th>Aggregation Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Aggregation Rule</td>
</tr>
<tr>
<td>B?+1</td>
</tr>
</tbody>
</table>

Change the Answer Key for the Aggregation Rule and click Update to save changes. Reload to reverse the changes.

<table>
<thead>
<tr>
<th>Click Update to save changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update</td>
</tr>
</tbody>
</table>
Recognition Settings for a Publication can be re-set if the data captured from scanned form images has detection errors from low quality scanned images, or pencil was used by the respondents or the marks aren't dark enough to be detected by FormReturn's Recognition Settings.

For color scanned images, increase the Luminance so that more black will be detected from the image and click Update. Don't increase the Luminance to any more than 200.

For normal scanned images increase the mark threshold settings to make a bigger difference between the black and white pixels detected, and click Update.

You can use the Export Answer Key to see what the CSV file should look like.

Image: Example of an answer key CSV Export file.

The first column has the Captured data field name and the Answer keys are in the second column.
The form template file and all it's settings at the time it was published, which is stored in FormReturn’s database, can be retrieved and saved to your computer.
Extend Publication

New Records which have been added to the Source data table

Click Extend Selection or Extend All, to add forms for the new Source Data records

Sort Filter for records

New Records which have been added to the Source data table

<table>
<thead>
<tr>
<th>ID</th>
<th>StudentIDNumber</th>
<th>Student_Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>12348</td>
<td>David</td>
</tr>
</tbody>
</table>
Export Data

When response data has been captured it can be easily exported to a spreadsheet via a CSV (Comma Separated Value) file. Before exporting the captured data, the Delimited File export options dialog will open. It is used to change which columns will be included and the order of the data columns in the export.

1. **Select a Publication and export the captured data.**
   - Click to select the Publication which has the captured data to be exported.
   - Click the Export Data button in the Publications panel, which is available in either the [Publications] window or the [Forms] window of Captured Data.

   - The [Delimited File Export Options] dialog will open. *(See Delimited File Export Options on this page)* Set the export options for the data export, if anything needs to be changed.
   - Click OK and a CSV file of the Captured Data Export will be saved on your computer.
   - Double click on the CSV file to open it.
   - Click OK on the CSV and the data export will open in an external spreadsheet.

   **Note:** You must have an office package such as Microsoft Office or Open Office installed on your computer, to open the CSV file in a spreadsheet.

*Image: The Delimited File Export Options dialog.*
Include or exclude Publication ID, form ID or form score in the data export.

Uncheck the boxes to exclude any of these columns in the data export.
Include or exclude the time at which each form page was processed.

Include or exclude Source Data field names in the data export or change the order index offset.

Change column order sequence.

Include or exclude the form image File Names in the data export.

Captured Data Order Index

The columns of captured data in the export, are ordered with the Order Index Offset.

Captured Data field names have an order index offset of 1,000 and over, therefore they will be the last columns in the data export.

Image: The Captured Data Export opened in a spreadsheet, showing the order of the columns included in the data export. The column order and the included data can be changed in the [Delimited File Export Options] dialog.
- The page processed time (order index -1000) will be in the first column of the export.
- The publication_id, the form_id and the form_score will be next because they have a negative order index offset (between -1 and -999).
- Source Data field names will be next because they have an order index between 0 zero to 1,000.
- Captured Data field names will be last because they have an order index offset of 1,000 and over.

CSV Output options

Order Index offset for Publication ID, Form ID and Form Score columns

The order index of determines which column the data be in, in the captured data export. The order index of -3 for the Publication ID, will place that column in the third position before 0 in the data export.

Click OK to save the export to a CSV file.

Click Cancel to escape without saving.
Order Index of Captured Data Export

All columns are optional for inclusion in the captured data export. A column order index of -1000 and less will cause those columns to come first on the CSV data export output, a column order index of between -1 and -999 will cause those columns to be next in the data export output, a column order index of between 0 and 999 will cause those columns to be next, and a column order index of 1000 and above will cause those columns to come last in the data export output.

1. **Form page processed time**
   **Order Index offset: -1,000**
   - An Order index of -1000 puts this column first in the Captured data export.

2. **Publication_id, form_id and form_score, have the Order Index offset: -1, -2 & -3**
   - An Order index of -1 up to -999, will put these columns second in the Captured data export.

3. **Source Data Fields have an Order Index offset of 0 (zero)**
   - An Order index of 1 to 999 will but these columns third in the Captured data export.

4. **Captured Data Field Names and Score Field Names have an Order Index offset of 1,000 and over**
   - An Order index of 1000 and above will cause those columns to come last in the data export output.
<table>
<thead>
<tr>
<th>question1</th>
<th>question1_score</th>
<th>question2</th>
<th>question2_score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>1B</td>
<td></td>
</tr>
</tbody>
</table>

An Order index of 1000 and above, will put these columns last in the Captured data export.