

# Compliance Suite Adhoc
# User Guide

December 2022
FIS Compliance Suite Product Group

# Table of Contents



**About This Document**

# 1 Introduction

FIS Compliance Suite Adhoc is a reporting tool that enables users of FIS Compliance Suite applications to create custom reports based on data in those applications. Reports can be designed to display as charts, data only, or a combination of both. Users can choose the fields to include on a report, set field display order, define formulas to be used in the report, and define any filters to be available on the report. Reports can be run and viewed on demand or scheduled to run on a set interval such as daily, weekly, monthly, quarterly, or annually.

These are the available menu choices associated with Adhoc, which are described in detail in this guide:

- **Viewer** – Lists the reports that have been defined in the system. The user can run and view a report on demand from this screen. The user can also create and associate a new or append an existing case to a report. It also provides a manager/supervisor the ability to review reports created by users who report to the manager/supervisor.
- **Editor** – From this screen the user can create a new, copy and/or modify an existing, or delete a report definition.
- **Scheduler** – From this screen the user can schedule reports to run on a selected interval (daily, weekly, etc.); the user can also execute a scheduled report on demand.
- **Log** – From this screen the user can view reports that were executed via the Scheduler.
- **Queue History** – From the screen the user can view historical reports that were generated in the 12.x release of the Adhoc module.

## 1.1 Page- and Field-Level Help

Many pages (i.e., screens) provide Help information at both the page level and the field level. To see page-level Help, click on the "**?**" symbol in the upper-right corner of the page. Field-level Help is viewable by hovering over  where present.

## 1.2 Customizing the Display

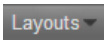
The Editor screen can be customized through the use of Report Layouts. In addition, the number of results returned in a screen search can be set with the records-per-page screen display control.

Reports can be customized through the use of Report Layouts.

### 1.2.1 Layouts

Report Layouts (referred to simply as "Layouts") support user-configurable Filters and Results sections. An unlimited number of Layouts can be created and maintained by system users. A Layout created by a user can be shared with and utilized by other system users as desired.

***Creating a Layout***

To create a Layout, hover over the 

link (upper right side of screen below the menu bar) and click 

. Then follow the steps below to complete the Layout. Note that filter attributes can be saved as part of the Layout definition either by defining them before clicking 

(to create a Layout) or by creating the Layout first, defining the attributes of the columns

in the Filters section on the screen, and then updating the Layout definition (see Updating a Layout).

1. In the Report Layout box that is displayed, enter a name for the Layout in the Name field.
2. Select the desired Scope: Private renders the Layout usable by only the user who creates the Layout; Role renders the Layout usable by other users with the same role; Global renders the Layout usable by all system users.
3. Clicking Default causes the Layout to be automatically used each time the user navigates to the screen via the system menu or sub-menu.
4. Select the desired Filter Mode: Rows causes the active filter columns to be drawn left to right in the Filters section on the screen; Cols causes the active filter columns to be drawn top to bottom in the Filters section on the screen.
5. Enter a number for Filter Cols. The number entered indicates the number of columns to be drawn in the Filters section on the screen.
6. Add filter columns to the list of Active Filters from the list of Available Filters by dragging column icons one by one from the Available Filters section and dropping them into the Active Filters section; or move them all by clicking next to the Available Filters section header. If they are moved one by one, they display on the screen in the order in which they are shown in the Active Filters section in the Layout. Once a column is dropped into the Active Filters section, it can be moved to a different position in the order simply by dragging and dropping it into the desired position. (The position order in the Active Filters section is determined in left-to-right and top-to-bottom sequence.) Note that if no filter columns are dropped into the Active Filters section, all of the Available Filters display on the screen by default.
7. Add search result output columns to the last of Active Outputs from the list of Available Outputs in the same manner as with Active Filters (see above). The same behavior applies to these sections as with Active and Available Filters in the Layout definition.
8. Once all attributes of the Layout are defined as desired, click Save at the bottom left side of the Report Layout box. Clicking Cancel before Save results in no new Layout being created or no changes being applied to an existing Layout.

### *Editing a Layout*

To edit a Layout, select the Layout to be edited from the list of saved Layouts, hover over the Layouts link, and click Edit. Then modify the Layout attributes and click Save.

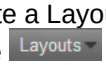
### *Copying a Layout*

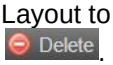
To copy a Layout, select the Layout to be copied from the list of saved Layouts, hover over the Layouts link, and click Copy. Then give the newly copied Layout a name, modify other Layout attributes as desired, and click Save.

### *Updating a Layout*

Updating a Layout is different from Editing. Editing a Layout allows the user to modify the attributes of the Layout definition; whereas updating a Layout allows the user to modify the attributes of the columns in the Filters section on the screen. To update a Layout, select the Layout to be updated from the list of saved Layouts. Modify the filter attributes in the Filters section on the screen. Then hover over the Layouts link and click Update.

***Deleting a Layout***

To delete a Layout, select the Layout to be deleted from the list of saved Layouts. Then hover over the 

link and click 

.

### 1.2.2 Records-Per-Page Display Control

For system performance reasons, the number of records to be displayed in the results of on-demand (i.e., not scheduled) reports is limited to a maximum number of one thousand records. By default, results display twenty records per page. Control the maximum number of records to be displayed by selecting the desired number of records from the drop-down list on the bottom-left side of the page. Once a number is selected that is different from the number previously displayed, the page is automatically refreshed with the selected number of results records displayed.

## 1.3 Other Screen Controls

If more records are returned via a search than what display on the screen, the additional records are made available to view a batch at a time. To view additional records, click a number in the page footer according to how far into the entire set of results that records are to be displayed; or click one of these icons  in the page footer to navigate left and right through the results block by block. To navigate to the first or last block, click one of these icons  in the page footer.

To sort search results by the data contained in a particular column, click on the header at the top of the column. This toggles the information between ascending and descending order. To sort by a different column, click on a different column header.

## 1.4 Filtering Information

Adhoc supports filtering of search results. Filters allow users to view a specific set of data and are typically used to focus search results on particular points of interest. In addition, Filters are defined on a report then viewed and used on a report in Viewer. (For information on defining filters on a report, see Layouts in Editor. For information on using filters on a report, see Viewer.)

Click  and  next to Filters on a report header to toggle between Filter display and hide modes.

Filters are set in one of the following ways:

**Free-entry filters**

Free-entry filters allow users to enter text (such as names, account numbers, or a custom date) on which the records are to be filtered. Some of these fields require that the data be entered in a specific format (e.g. dates must be in "mm/dd/yyyy" format).

**Wild-Card Searches**

Free-entry filters support wild-card searches. A wild-card search is used to retrieve a set of results that matches a partial value. A special character, % (percent symbol), is used to indicate a partial value. There are three types of partial searching: *begins with*, *ends with*, and *contains*.

A "begins with" search requires the % after a character string. For example: to find all security issues for the common stock of IBM, one would select LIKE from the operator drop-down list and then enter 459200% in the Cusip field.

An "ends with" search requires the % before a character string. For example: to find all clients with last name Smith, one would select LIKE from the operator drop-down list and then enter %Smith.

A "contains" search requires only the HAS operator and any character string. For example: to find all trades in American Funds, one would select HAS from the operator drop-down list and then enter Amer. Note that this search would return all records that contain Amer in the specified field (i.e., not only American Funds).

☞ Wild-card searches DO NOT apply to the hierarchy free-entry fields such as Unit or Rep.

**Drop-down lists**

Drop-down lists allow users to select from a pre-defined list of values. On drop-down lists with an "IN" operator, users have the option to select more than one value from the list. To select more than one value, select IN; then select the values from the related pick list provided.

**Other filter operators**

The filter operator **>=<** supports the filtering of a range of values between two values that are specified by the user. For example, if the user selects the operator **>=<** and enters the dates 01/01/2013 and 01/01/2014, the search returns results for which the data contains a date greater than or equal to 01/01/2013 and less than (but not equal to) 01/01/2014.

The filter operator **>i<** supports the filtering of a range of values between two values that are specified by the user. For example, if the user selects the operator **>i<** and enters the dates 01/01/2013 and 01/01/2014, the search returns results for which the data contains a date greater than or equal to 01/01/2013 and less than or equal to 01/01/2014.

The filter operator NOT supports an exclusion search. For example, a search with operator NOT and the value "Jon" in a name field would return the rows for which the name was not equal to "Jon."

The filter operator LIST is provided on date-based filters. When the LIST operator is selected, a set of pre-determined date ranges and a custom date range function are provided in a drop-down list.

To view specific information, select the desired filter criteria and click 

. Multiple filters can be used in conjunction with each other by selecting criteria from them before clicking 

.

☞ The 

button is only available to entitled users. Clearing the filters clears all defaults—including the submit date. This could potentially result in an excessively long-running query—depending on the amount of historical information currently in the system; therefore, it is disabled for most users.

**Reset - Default Values**

The default values for the status and submit date fields are pre-set and controlled within the entitlement screens. They are used to limit and control the data returned via searches within Review and Audit.

If the expected data is not returned initially on a filtered search, change the filter values including those on status and/or submit date (as available) to alter the search results.

**Multiple Filters**

When multiple filters are used together, they work as though they are joined together by AND conjunctions. In other words, the results returned are those that meet all filter criteria selected. The more narrow the filter criteria selected, the smaller the list of results are returned.

## 1.5 Screen-to-Screen Navigation

Navigating from one screen to another is supported via several methods:

**Menus/Sub-Menu**: Screens display by clicking a menu—such as “Adhoc”—and then selecting a menu option.

**Hyperlink**: Some screens contain hyperlinks that, upon being clicked, navigate to a screen providing further detail. Hyperlinks can be easily identified as text that is shaded differently from the text in adjacent columns and, when the mouse is pointed over the top of them, display an underline below the hyperlink.

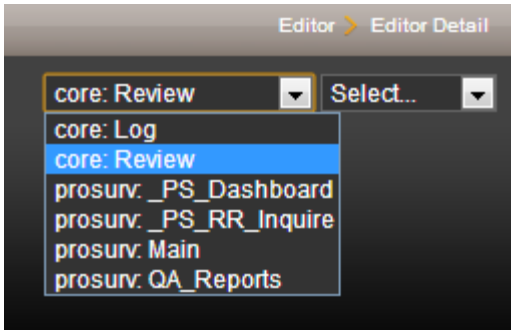
(**Pencil Symbol)**: Some sections contain the symbol that, upon being clicked, navigates to a screen that provides detail that can edited.

**Bread Crumbs**: As the user navigates from summary to detail screens, hyperlinks are displayed in the upper-right corner of the screen that provide the path that the user most recently navigated so that, as desired, the user can conveniently reverse the navigation one or more steps, as applicable. These are called “bread crumbs” because they help guide the user back to the navigation starting point or to any point along the path.

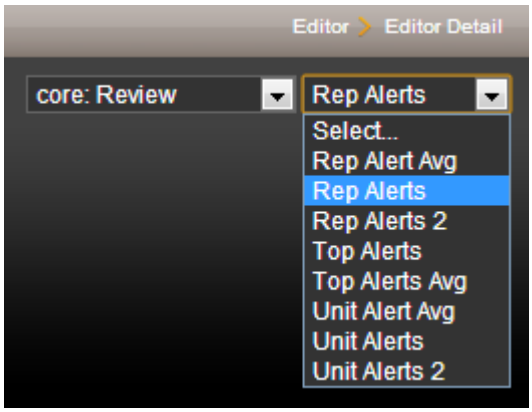
# 2 Viewer

The **Adhoc Viewer** screen allows on-demand execution of a non-scheduled report.

To generate a report in **Viewer**, select the application/group from the drop-down in the upper-right corner of the screen.

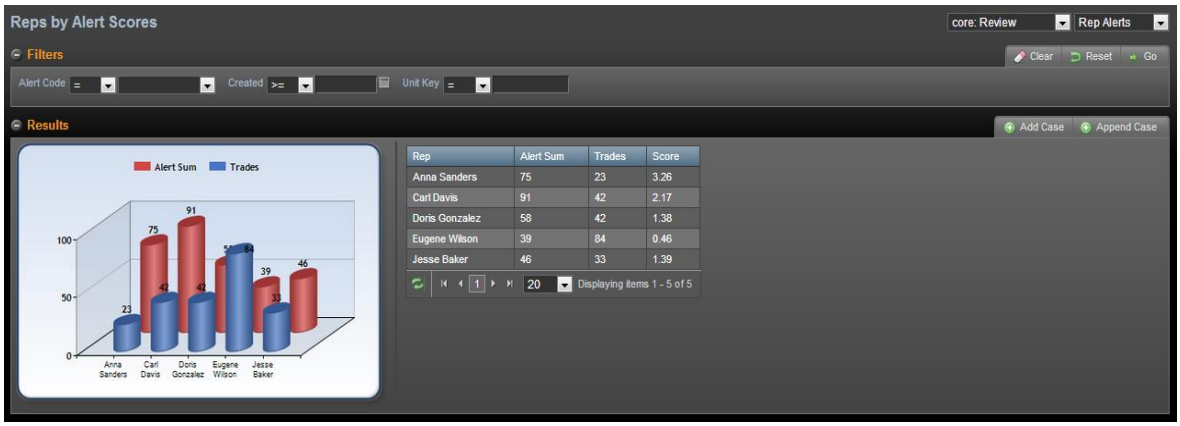



Then select the desired report from the report drop-down.




Only the selections in these two drop-down lists that the user is entitled to view are displayed.

Upon selecting the report, the report generates and the report results are displayed automatically. Results are displayed according to any default filter settings that are defined in the report.




Default report filter values are set as part of the report definition in Editor. Setting or changing any filter criteria and clicking Go re-generates the report and displays the results according to the new filter criteria that were defined.

To clear all filters and go back to the default filters, click Reset.

Clicking Clear removes any filter criteria.

The Clear button is only available to entitled users. Clearing the filters clears all defaults—including the submit date. This could potentially result in an excessively long-running query—depending on the amount of historical information currently in the system; therefore, it is disabled for most users.

## 2.1 Cases

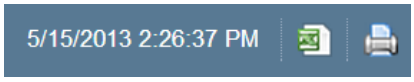
Any report can be attached to a Case. To attach a report to an existing case, click Append Case to display the **Append Case** window. Then select the case to which the report is to be attached from the drop-down list of existing cases and click Save.

To attach a rendered report to a new Case, click Add Case to display the **Add Case** window. Then follow the steps below to define the new case:

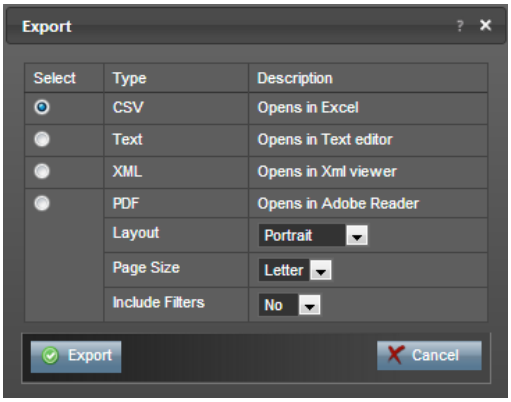
1. Enter the case Description.
2. Enter the Unit Key, Rep Code, and/or User Key of the case Subject. These values are used in filtered searches for the case.
3. Enter optional case information for additional filtered search criteria:
    - Account – the Account Number on the case
    - Client ID – the Client Identifier on the case
    - Security Key – the CUSIP or other Security Key value on the case
    - Total Value – the total asset or other value on the case
    - Product Type – the Product Type on the case
    - Product Sub-Type – the Product Sub-Type on the case
4. Select the Severity. This is the initial severity value on the case, which can be changed later.
5. Set the Case Routing parameters for the case:
    - Route – the ID of the selected Route
    - Stop Type – the stop type for the Route
    - Stop Key – the stop key for the Route
6. Click Save to complete the Case. Once the Case is complete, the reviewer's user ID and the review date—are captured for the Case.

## 2.2 Exporting Information

Adhoc reports and many Adhoc screens support the ability to export the data within the current result set to an external file.




To export the information, click in the footer section of the screen. Then select **CSV**, **Text**, **XML**, or **PDF** according to the desired export format.



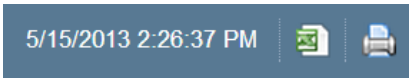

With PDF exports, the user has the option to include the filter parameters at the top of the export report. Selecting "Yes" on Include Filters causes the filter parameters to be displayed.

The other export formats prompt the user to either open the exported file and view its contents or save it to a desired location. The **CSV** export opens in MS Excel; **Text** opens in Notepad; **XML** opens in Windows Explorer; and **PDF** opens in Adobe Acrobat Reader.

(The supporting applications must be available within the user's computer in order to see the reports.)

## 2.3 Printing Information

To print information displayed on a screen, click  in the footer section of the screen.




In the Print window that opens, enter appropriate settings and click 

to print the screen. (Note: In order to print the width of the window, the printer orientation must be set to "Landscape.")

Clicking **Cancel** at any time cancels the print operation.

# 3 Editor

The **Adhoc Editor** screen is used to create new and maintain or delete existing report definitions.

The ability to view a report definition in Edit mode is controlled by the entitlements for the user's role. Edit entitlements are controlled at the report scope level. For example, a user may be allowed to edit reports of Private scope but not reports that have been shared at the Role or Global level.

Click 

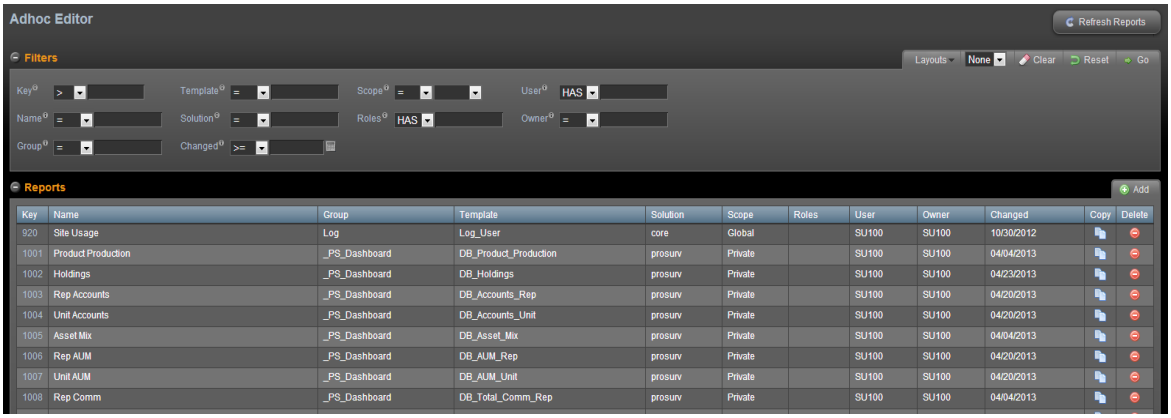
(upper-right corner of the screen) to cause the server to refresh the report cache if any newly added reports are not displayed in the filtered search results.

To delete an existing report, click  on the row representing the report to be deleted.

To copy an existing report, click  on the row representing the report to be copied. Then make the desired changes to create a new report similar to the copied report.

## 3.1 Filtering Reports

**Adhoc Editor** includes an array of filters that support the searching for reports in the system. Click  next to Filters to display the available filter criteria. (For more information on using Filters, see Filtering Information.)



**Adhoc Editor Filters**

This is the list of individual filters available on **Adhoc Editor** with related information.

| Filter Name | Functionality |
|---|---|
| **Key** | Filters for reports by report key. Each report record is assigned a unique key by the system. |
| **Name** | Filters for reports by name. Each report is given a name when it is created. |
| **Group** | Filters for reports by group. Each report is included in a group when the report is created. |
| **Template** | Filters for reports by the template used. Each report utilizes a template that defines the data that are accessed from the database. An unlimited number of templates can exist for any given solution. |
| **Solution** | Filters for reports by solution. Each report is based on a solution, which provides the general context (e.g., Core, ProSurv) of the report. |
| **Changed** | Filters for reports by the date that the report definition was last changed. The date can be entered manually by clicking  and selecting the date from the calendar. To select a date range, select **>i<** or **<=>** from the drop-down box and then enter the start and end dates using the calendar. If only the first date is entered, the search returns report from that date forward. Alternatively, select LIST from the operator drop-down and then select a date option from the list. |
| **Scope** | Filters for reports by scope. Each report is given a scope, which controls the accessibility of the report by system users. |
| **Roles** | Filters for reports by the user role. |
| **Owner** | Filters for reports by the user key of the report creator. |

## 3.2 Create a New Report

To create a new report definition (i.e., not copying an existing report), click 

. In the **Add Report** window that opens, select the Solution, which provides the general context (e.g., Core, ProSurv) of the report. Then select the Template to be utilized by the report from the list of templates associated with the selected solution.

Once the solution and template are selected, click 

. Click 

at any time to cancel the operation.

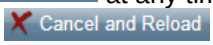
Once the new report is added, the system automatically navigates to the **Adhoc Editor Detail** screen to complete the new report workflow. Complete the new report definition by populating the remaining attributes of the report as defined on **Adhoc Editor Detail** (for information on the attributes of an Adhoc report, see Adhoc Editor Detail).

## 3.3 Adhoc Editor Detail

The user can access the **Adhoc Editor Detail** screen by clicking the report key hyperlink from the Reports section of the **Adhoc Editor** screen or by clicking 

on the **Adhoc Editor** screen and

completing the initial Add Report workflow (for information on creating a new report, see Create_A_New_Report).

Click  at any time during report definition to save the report attributes that were entered. Click  at any time during report definition to discard the report attributes that were entered and reload any report attributes last committed to the database for the report.

Below is a list of sections that are provided on **Adhoc Editor Detail**.

- Summary Information
- Custom Fields
- Filters
- Filter Templates
- Outputs

### 3.3.1 Summary Information

The Summary Information section defines the general attributes or parameters of the report. Three groups of attributes are displayed in the Summary Information section, each defined in its own window:

- Main
- Chart
- Print

**Main Attributes**

To populate or change the report's Main attributes, click  on the control bar in the upper-right corner of the screen. Then follow the steps below to populate the attributes displayed in the Summary Editor window:

1. Enter the report Name. The Name is the report label that appears in the list of reports in Viewer.
2. Enter the report Title. The Title is the label that appears at the top of the report in Viewer.
3. Select the Template utilized by the report. The template defines the data that are accessed from the database for the report. (Once a template is selected upon report creation, it cannot be changed).
4. Select the report Type, which provides the high-level structure of the report; options are:
    - Standard – a select-type report that executes SQL not including any aggregation or grouping logic.
    - Summary – a summary-level report that executes the SQL aggregate functions selected in the Logic in Outputs
    - Summary roll-up – a summary roll-up report that allows users to create grouping/aggregated reports that include Subtotals and Totals based on the data values selected. Selected aggregated data values (i.e. Net Worth, Commission, Trade Amount) are summarized and sub-totaled by the grouped data values (i.e. Rep Code, Product Types, etc.). The subtotal breaks use the ===Total === label. To use this value in a subsequent formula, the new formula must reference the summary value with the label ===Total ===. (Note: Formula variables are case sensitive.)

- Summary Totals – a report that includes Group By total lines, which executes a sum of all of the individual line items on the report and also provides a total sum of groups of data; for example, commission totals by rep code by unit
- Pivot – a report that takes the normally aggregated/grouped results and pivots the grid to display the aggregated data as columns. These reports support the ability to create three-dimensional graphical reports. They typically comprise three distinct data points, including two dimensions—or entities—and one fact or measure (or multiple measures as long as their data values are on compatible value scales). Pivot reports can only be exported as CSV or text files.
- Pivot Totals – The Pivot Totals report type is a combination of Summary Totals and Pivot report types. In addition to Pivoting the grouped rows to columns, subtotals are also included. (Note: Pivot Totals reports can only be exported as CSV or text files.)

5. Select the Group in which the report is to be included. Groups provide a means by which to organize reports for general contextual reference. To create a new Group, select _New_ and enter the Group name in the provided field.
6. Select the Scope. The Scope controls the accessibility of the report by system users; options are:
   - Private – When this is selected, the report is accessible only to the user who created the report.
   - Role – When this is selected, the report is accessible to users with the role(s) selected for the report. To share a report with users by role, select the scope of Role; then select one or more roles from the drop-down list provided. Based on the configured entitlements, users can share reports with only the roles to which they have access or with all roles configured within the system.
   - Global – When this is selected, the report is accessible to all system users. Based on configured entitlements as described under Role sharing, users must be entitled in order to share reports globally—regardless of role.
7. Select the Role(s) that can be used to access reports for which scope is selected as Role. Access permissions are assigned to each user by the role that the user has in the context of the application.
8. Enter the number of Filter Columns. This controls the number of columns used in the Filters section on the screen.
9. Select the Filter Layout. This controls how the filters are displayed: left to right or top to bottom.
10. Select Filter Save, as applicable. Selecting this option enables Layouts to be defined on a report. (For information on report Layouts, see Layouts.)
11. Click 

to save the Main attributes.

**Chart Attributes**

To populate or change the report's Chart attributes, click 

on the control bar in the upper-right corner of the screen. Then follow the steps below to populate the attributes displayed in the Chart Information window:

Chart Main Information Section:

1. Select the Mode. The Mode controls whether and where the chart is displayed relative to the results data table. Options are:
   - None: The chart is not displayed (i.e., only the results grid is displayed)
   - Only: Only the chart is displayed (i.e., the results grid is not displayed)
   - Mixed: The chart is displayed below the results grid
   - Mixed-Top: The chart is displayed above the results grid
   - Mixed-Left: The chart is displayed to the left of the results grid

- Mixed-Right: The chart is displayed to right of the results grid

2. Select the Style. The Style controls the background color scheme that is used in drawing the chart.
3. Select the Colors. The Colors controls the foreground colors that are used in drawing the chart.
4. Enter the Title. The Title is displayed at the top of the chart on the report.
5. Enter the Width. The Width controls the horizontal dimension (in pixels) of the chart.
6. Enter the Height. The Height controls the vertical dimension (in pixels) of the chart.
7. Enter the Category Range. The Category Range controls which variable is used for the category on the chart.
8. Enter the Row Range. The Row Range is a zero-based indexed that limits the rows that are rendered on the chart. Examples:
   - 0: Show all rows (1 to end)
   - 0-4: Show the first five rows
   - 14-19: Show rows 15 – 20
   - !0: Show only the last row
   - !0-4: Show the last five rows
9. Select the 3D style (as applicable). The 3D controls the three-dimensional display characteristics of the chart objects. Options are:
   - No: Renders the chart as two-dimensional
   - Yes: Renders the chart as three-dimensional with no additional features
   - Cluster: Renders the chart with the X-axis data points clustered horizontally together
   - Right-Angle: Renders the chart as three-dimensional with a right-angle vantage point
   - Cluster-Right: Renders the chart with the X-axis data points clustered horizontally together with a right-angle vantage point
10. Select the values for Grid X, Grid Y, and Grid Y2. These control the type of grid lines drawn for each axis.
    - None: Renders the report with no grid lines
    - Major: Renders the report with wide grid lines
    - Minor: Renders the report with narrow grid lines
11. Select Transpose, as applicable. Using this setting transposes the legend values with the values in the X axis.
12. Select Legend, as applicable. This controls where the legend is displayed on the chart. Options are:
    - None: Renders the chart with no data legend
    - Top: Renders the chart with the data legend positioned above the chart
    - Bottom: Renders the chart with the data legend positioned below the chart
    - Left: Renders the chart with the data legend positioned to the left of the chart
    - Right: Renders the chart with the data legend positioned to the right of the chart
13. Select Interlaced, as applicable. This provides shading for an interval. Options are:
    - None: Renders the chart with no axis shading
    - Primary X: Renders the chart with shading at data point intervals on the X-axis
    - Primary Y: Renders the chart with shading at data point intervals on the Y-axis
    - Secondary Y: Renders the chart with shading at data point intervals on the Y2-axis

Chart Series Information Section

This section is used to define how the data series are plotted/displayed on the chart. A chart can be defined with one or more Chart Series depending on the number of display columns on the chart. In the picture below, two chart series are defined: one for each display column. One of the series is plotted as a Column type; the other as a Spline type.


| Rep | Alert Sum | Trades | Score |
|---|---|---|---|
| Anna Sanders | 75 | 23 | 3.26 |
| Carl Davis | 91 | 42 | 2.17 |
| Doris Gonzalez | 58 | 42 | 1.38 |
| Eugene Wilson | 39 | 84 | 0.46 |
| Jesse Baker | 46 | 33 | 1.39 |

1 20 Displaying items 1 - 5 of 5

1. Select the chart Type. The chart Type controls the structure of the chart. Options include Pie, Line, Stacked Bar, Bubble, Box Plot, and Pyramid, among several others. For a description of each type of chart, see the online help on the Chart Information window.
2. Select the Drawing setting. This controls the style of the graphed data components on the chart. Options are:
    - Plain: Renders the chart with no drawing effect
    - Emboss: Renders the components with an embossed-like drawing effect
    - Cylinder: Renders the components with a cylindrical drawing effect
    - Concave: Renders the components with a concave drawing effect
3. Select Point Labels. This setting controls how data point labels are displayed relative to the graphed data points that the labels represent. Options are:
    - None: Renders the chart with no data point values displayed
    - Top: Renders the chart with data point values displayed on top of the graphed data points
    - Bottom: Renders the chart with data point values displayed on just below the top of the graphed data points
    - Left: Renders the chart with data point values displayed top-left of the graphed data points
    - Right: Renders the chart with data point values displayed top-right of the graphed data points
    - Inside: Renders the chart with data point values displayed above-left of the graphed data points
    - Outside: Renders the chart with data point values displayed above-right of the graphed data points
4. Select the Point Widths. This controls the size of the points on the chart. Options are:
    - Auto: Renders the chart with the graphed data components determined by the system
    - Two: Renders the chart with the size of the graphed data components set at two points
    - Four: Renders the chart with the size of the graphed data components set at four points
    - Six: Renders the chart with the size of the graphed data components set at six points
    - Eight: Renders the chart with the size of the graphed data components set at eight points
    - Full: Renders the chart with the size of the graphed data components set at the maximum points that fits all components in the space provided in the chart
5. Select the Axis. Options are:
    - Primary: The Primary Y axis

- Secondary: The Secondary Y axis; used when charting a second data point requiring its own axis

6. Enter the Columns. This controls which columns in the report data set are displayed on the chart. Example: If there are three data columns defined in the report, entering "1-2" displays the first two columns of the three.
7. Enter the Threshold value. This setting is used on Pie charts as a low threshold. All results below the entered value are grouped in a single slide of the chart.
8. Enter a Highlight value. This setting is used to highlight a single value within a series on the chart.
9. Click Save to save the Chart attributes.

**Print Attributes**

To populate or change the report's Print attributes, click Print on the control bar in the upper-right corner of the screen. Then follow the steps below to populate the attributes displayed in the Print Information window:

1. Select the print Mode. Options are:
   - Standard: Prints the report using the system-determined column widths
   - Custom: Prints the report using the user-determined column widths—as defined in the Column Width attribute (see below)
2. Select the Layout. Options are:
   - Portrait: Prints in standard portrait orientation, which means that the print copy is positioned to read parallel to the short sides of the paper
   - Landscape: Prints in standard landscape orientation, which means that the print copy is positioned to read parallel to the long sides of the paper
3. Select the Page Size, which indicates the selection among standard paper sizes. Options are:
   - Letter: Paper size 8 ½" by 11"
   - Legal: Paper size 8 ½" by 14"
4. Enter the Column Width values as a percentage of the total print area. This controls the width of the data table columns on the printed page. Example: If the report contains four columns and all four columns are to be given equal spacing, enter "25; 25; 25; 25".
5. Click Save to save the Print attributes.

### 3.3.2 Custom Fields

Custom Fields (i.e., columns) can be defined and used as Filters (see Filters) and Outputs (see Outputs) in the report definition. Custom Fields are typically used on reports to provide the ability to include report content that is not stored in the database but can be dynamically created via the use of Logic functions when the report is generated. This feature provides significant added flexibility in generating reports. To add a Custom Field, click Add on the Custom Fields section header. To edit an existing Custom Field, click on the row representing the existing Custom Field. Then complete the steps below to populate the attributes of the Custom Field.

1. Enter the Key. This is the dynamic column name and is typically entered as a compound name such as "Score_Avg." When the report is generated or viewed, the column name is displayed without the "_" character.

2. Select the Mode. Options are:
    - Calc: Supports numeric SQL functions, including SUM, MIN, MAX, COUNT, etc.
    - Formula: Support a wide range of logic functions

    (For details on the above Mode functions, see Appendix A: Formula and Calc Logic Functions and Operators.)
3. Select the Type. This controls the data type of the field.
4. Enter the Length. This controls the length of the column. If no value is entered, the system dynamically determines the length based on the attribute of the Field Variable used.
5. Select Summary, as applicable. Selecting a column as Summary makes the field a Total row on the report. This can be used with a function that sums other columns within the report. (For more information on Functions, see Appendix A: Formula and Calc Logic Functions and Operators.)
6. Enter the Title. This is the label that is displayed on the report.
7. Enter the Alias, as applicable. Alias is used when a pseudonym to the column name is to be used in the SQL that is generated when the report is executed. Aliases are commonly used to simplify column names in SQL that would otherwise be less user-friendly.
8. Select the Formatter. This controls the data type for the filter as displayed on the report. For example, if the database column is defined as Date/Time but the desired filter format is Date, select Date from the Formatter list and the filter operates as if the database column were defined as Date (i.e., not Date/Time).
9. Select the Sort Order, as desired. Options are:
    - None: The report is rendered with no sort control for the given Output
    - Desc: The report is rendered with the data in the Output sorted in descending order
    - Asc: The report is rendered with the data in the Output sorted in ascending order
10. Select the Display. Options are:
    - None: Renders the report without displaying the field
    - Edit: (Not applicable for filter display)
    - View: Renders the filter in View mode; the field is not interactively editable on the report
11. Enter the literal value for the filter's label to be displayed on the report. If a Label is used, the value entered displays instead of the system-generated label for the filter column.
12. Enter the Default Filter, which is a parameter that constrains the results returned by the report.
13. Select the Default Op. The operator selected is displayed as the default operator of the filter as displayed on the report.
14. Select an entry from the list of Choices. A Choice is a map of data value to display value. In other words, for each data value the report will display a corresponding display value. This is useful when data values do not inherently represent a meaningful business term.
15. Select the Display Filter. Options are:
    - None: Renders the report without displaying the filter associated with the field

- Edit: Renders the filter in Edit mode; the filter associated with the field is interactively editable on the report
- View: Renders the filter in View mode; the filter associated with the field is not interactively editable on the report

16. Enter the Logic from the available functions based on the Mode selected above. Example Calc logic: cast(sum(score) as numeric) / count(score)

### 3.3.3 Filters

Reports can include filters that can be used interactively to alter the results of a generated report. Reports can include filters based on a pre-defined set of available filter fields included within the report template. To add a filter to a report, click 

on the filter section header and then follow the steps below to complete the operation. The number of filters that can be defined for a report is limited only by the available fields defined within the report template.

1. Select any filter to include in the report by clicking on the column name. Available filters include columns that are defined within the report template and any columns that are defined as Custom Fields (see Custom Fields for more information). To add multiple filters in bulk, select each column from the list while holding down the <Ctrl> key.
2. Once the desired column is selected, click 

to complete the operation.
3. Click  on the row represented by the newly added filter.
4. Enter the literal value for the filter's label to be displayed on the report. If a Label is used, the value entered displays instead of the system-generated label for the filter column.
5. Select the Default Filter, which is a parameter that constrains the results returned by the report. The value is selectable when parameters exist as defined in the template for a given data column. For example, the data column Alert Code provides the selection of Commission, Large Order, Share Class B, Bulletin Board, and Tax Bracket because those are the alerts that are related to Alert Code.
6. Select the Formatter. This controls the data type for the filter as displayed on the report. For example, if the database column is defined as Date/Time but the desired filter format is Date, select Date from the Formatter list and the filter operates as if the database column were defined as Date (i.e., not Date/Time).
7. Select the Default Op. The operator selected is displayed as the default operator of the filter as displayed on the report.
8. Select an entry from the list of Choices. A Choice is a map of data value to display value. In other words, for each data value the report will display a corresponding display value. This is useful when data values do not inherently represent a meaningful business term.
9. Select the Display Filter. Options are:
    - None: Renders the report without displaying the filter
    - Edit: Renders the filter in Edit mode; the filter is interactively editable on the report
    - View: Renders the filter in View mode; the filter is not interactively editable on the report
10. Enter the Alias, as applicable. Alias is used when a pseudonym to the column name is to be used in the SQL that is generated when the report is executed. Aliases are commonly used to simplify column names in SQL that would otherwise be less user-friendly.

11. Select the Ops entries for the filter. The selected entries are rendered on the report in the list of available operators on the filter.

The left-to-right order of the filter columns at the top of the report is determined by the top-to-bottom order of the filters as displayed in the Filters section on **Adhoc Editor Detail**. To change the top-to-bottom order, click  or  on the row representing any given filter.

 The inclusion of a Date filter on all reports is strongly recommended. Without a date filter, generating a report could take a long time, consume excessive system resources, and return more data than is desired.

The operator field controls the method by which the filter value is evaluated. The list of available operators is defined by the template. Hold down the control key to select multiple operators for a filter. (For more detail on filter operators, see Filtering_Information.)

### 3.3.4 Outputs

Outputs are the data columns that are output to a report. Every report must have at least one Output. To add an Output, click 

on the Outputs section header. To edit an existing Output, click  on the row representing the existing Output. Then complete the steps below to populate the attributes of the Output.

1. Enter a Title, as desired. The value entered displays as the column label. If no value is entered, the system displays by default the column name as the column label.
2. Enter an Alias, as applicable. Alias is used when a pseudonym to the column name is to be used in the SQL that is generated when the report is executed. Aliases are commonly used to simplify column names in SQL that would otherwise be less user-friendly.
3. Select a Formatter, as desired. This controls the data type for the Output as displayed on the report. For example, if the database column is defined as Date/Time but the desired Output format is Date, select Date from the Formatter list and the Output is formatted as if the database column were defined as Date (i.e., not Date/Time).
4. Select the Sort Order, as desired. Options are:
    - None: The report is rendered with no sort control for the given Output
    - Desc: The report is rendered with the data in the Output sorted in descending order
    - Asc: The report is rendered with the data in the Output sorted in ascending order
5. Select the Display. Options are:
    - None: The report is rendered with the field not displayed
    - View: The report is rendered with the field displayed
    - Edit: (Not applicable for filter display)
6. Enter Logic, as desired. Logic enables SQL logic to be added to the Outputs that are displayed on the report. Logic can be added to an Output in lieu of adding logic to a Custom Field that is used as a Filter. (For information on Logic features, see Appendix A: Formula and Calc Logic Functions and Operators.)
7. Click 

to complete the definition of the Output.

The top-to-bottom order of Outputs determines the left-to-right order of the columns in the data table output. To change the order of the columns, click  or  on the row representing any given Output.

### 3.3.5 Testing A Report

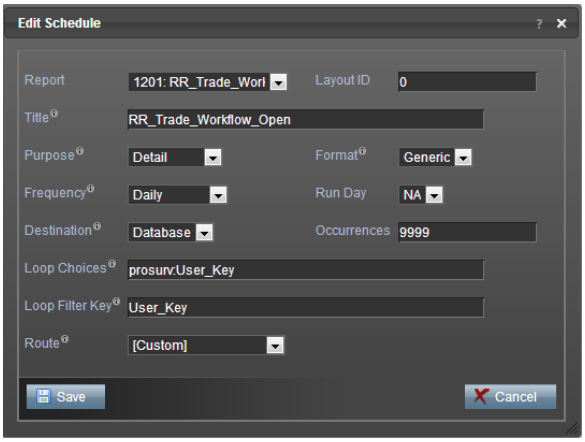
A report definition can be tested by clicking Test on the Summary Information section header bar (upper-right corner of the screen).

The labels are the report field(s) included in the SQL Group By clause generated for the report. These values display along the bottom of a bar chart. (The column(s) included in the Group By clause are those that do not contain an aggregate function in the SQL.)

The legend is built from the remaining viewable data points displayed on the report as designated in Columns in Chart Series Information in Chart Attributes.

The values are the "facts" or data to be charted. They are populated from the remaining (i.e., third, fourth, fifth, etc.) viewable data points listed on the report fields. (Note: Pivot Charts have only one fact graphed—whereas summary reports can have one or more facts graphed.)

# 4 Scheduler




The **Scheduler** screen is used to schedule reports to generate at defined intervals and to generate scheduled reports on demand.

To generate a report on demand, click the Run hyperlink from the Action column in the Schedule section on the row represented by the selected report. The report is generated while the user waits.

To schedule a report, click Add on the Schedule section header. To change the settings for a report that has already been scheduled, click on the row represented by the report to be changed. Then follow the steps below to complete the definition for the scheduled report.

1. Select the Report from the list of available reports that the user is entitled to view.
2. Enter the report Title.
3. Select the schedule Purpose. Options are:
    - Download: The report is available for download, with no other special handling required as with the other options
    - Dashboard: When a scheduled report is set with a purpose of Dashboard, it becomes available to add as a Dashboard widget; the Dashboard retrieves the most recently available scheduled report output
    - Case: Automatically creates a Case when the report is generated and attaches the report to the Case; the Case can then be managed as usual; with comments, routing, etc.
    - Detail: Used only on reports rendered in conjunction with the Rep Inquire detail page
4. Select the schedule Frequency.

5. Select the Destination of the report that is generated. Options are:
    - Server: The report is stored in a system-defined location on the file server
    - Database: The report is stored on the system database

    (For the details on the location of each of these, consult with the system administrator.)
6. Enter the Loop Choices of the report, as applicable. Used in conjunction with the Loop Filter Key, Loop Choices allows a report to be generated for each entry in a Choices list. For example, if a report were built to run using data relevant to Reps, the Loop Choice that represents a column in the database that is used by a Choice that includes all Reps in the system, a report generates for every rep in the system. So if there are 1000 Reps in the system, 1000 separate reports are generated.
7. Enter the Loop Filter Key, as applicable. Used in conjunction with Loop Choices, Loop Filter Key is the name of the data column that maps to the data value used by the Loop Choices attribute used by the report, if any.
8. Select the Route for the generated report from the available Routes defined in the system; or select [Custom] to create a custom Route. If [Custom] is selected, enter the Stop Type and Stop Key for the custom Route.
9. Enter the Layout ID. Entry of a Layout ID allows the report to utilize a Layout that controls the format of the Filters section and any pre-set filter parameters. (Note: To ensure a correctly functioning report, any Layout selected here should contain the same columns as exist in the report definition.)
10. Select the Format of the report. This determines the format of the output for the generated report. Selecting Generic allows the format to be manually determined by the user upon download from the **Scheduler Log** screen (for more information, see Log).
11. Select the Run Day, which is applicable for frequencies of Weekly, Monthly, Quarterly and Annually.
12. Enter the number of Occurrences that the scheduled report is to be generated. If the report is to be generated in perpetuity, enter 9999.
13. Click Save to save the Schedule attributes.

### Scheduler Filters

This is the list of individual filters available on **Scheduler** with related information.

| Filter Name | Functionality |
|---|---|
| **Title** | Filters for schedules by report Title. |
| **User Key** | Filters for schedules by the User Key of the user who created the schedule. |
| **Loop Choices** | Filters for schedules by Loop Choice. (See Scheduler for an explanation of this column.) |
| **Purpose** | Filters for schedules by Purpose. (See Scheduler for an explanation of this column.) |
| **Format** | Filters for schedules by Format. (See Scheduler for an explanation of this column.) |
| **Loop Filter Key** | Filters for schedules by Loop Filter Key. (See Scheduler for an explanation of this column.) |
| **Destination** | Filters for schedules by Destination. (See Scheduler for an explanation of this column.) |

| | |
|---|---|
| **Frequency** | Filters for schedules by Frequency. |
| **Route** | Filters for schedules by Route. |

# 5 Log

The **Scheduler Log** screen is used to view reports that were generated via the Scheduler by the logged-in user and any other reports that the user is entitled to view. For managers, this includes reports that were scheduled by users who report to the manager.

**Scheduler Log Filters**

This is the list of individual filters available on **Scheduler Log** with related information.

| Filter Name | Functionality |
|---|---|
| **Started Date** | Filters for reports by the date that the report started to be generated. The date can be entered manually by clicking  and selecting the date from the calendar. To select a date range, select **>i<** or **<=>** from the drop-down box and then enter the start and end dates using the calendar. If only the first date is entered, the search returns report from that date forward. Alternatively, select LIST from the operator drop-down and then select a date option from the list. |
| **Ended** | Filters for reports by the date that the report finished generating, which could be different from the Started Date. The date can be entered manually by clicking  and selecting the date from the calendar. To select a date range, select **>i<** or **<=>** from the drop-down box and then enter the start and end dates using the calendar. If only the first date is entered, the search returns report from that date forward. Alternatively, select LIST from the operator drop-down and then select a date option from the list. |
| **ID** | Filters for reports by the ID of the report. This is a system-generated identifier. |
| **Report ID** | Filters for reports by the template used. Each report utilizes a template that defines the data that are accessed from the database. An unlimited number of templates can exist for any given solution. |
| **Status** | Filters for reports by the status of the report generation process. |
| **User** | Filters for reports by the user key of the user who scheduled the report. |
| **Mode** | Filters for reports by how the report was generated—whether scheduled or on demand via the Scheduler screen. |

The Reports section includes these columns:

- Download – click on  to download and view/export the data from the report; in the window that displays, select the format in which to view/export the data and click 

to complete the view/export operation
- ID – the unique ID of the report that was generated

- Started – the date and time that the report started to be generated
- Ended – the date and time that the report finished generating
- Report ID – the ID of the report defined in **Editor**
- Attachment ID – For internal purposes only
- Mode – the method by which the report was generated—whether scheduled or on demand
- Status – the status of the report generation process
- User – the User Key of the user who scheduled or generated the report

# 6 Report Queue

The **Report Queue** screen is used to view historical reports that were generated in the 12.x release of the Adhoc module.

**Scheduler Log Filters**

This is the list of individual filters available on **Report Queue** with related information.

| Filter Name | Functionality |
|---|---|
| **Run Date** | Filters for reports by the date that the report finished generating.<br>The date can be entered manually by clicking  and selecting the date from the calendar. To select a date range, select **>i<** or **<=>** from the drop-down box and then enter the start and end dates using the calendar. If only the first date is entered, the search returns report from that date forward. Alternatively, select LIST from the operator drop-down and then select a date option from the list. |
| **Report Name** | Filters for reports by the name of the report. |
| **Report Group** | Filters for reports by the group name of which the report is a part. |
| **Owner Name** | Filters for reports by the User Name of the person who created the report. |
| **Owner Key** | Filters for reports by the User Key of the person who created the report. |
| **Status** | Filters for reports by the status of the report generation process. |
| **Title** | Filters for reports by the title of the report. |
| **Filename** | Filters for reports by the name of the file exported to output as generated under Scheduler. |
| **Note Count** | Filters for reports by the number of Notes that were entered on the report. |

# 7 Appendix A: Formula and Calc Logic Functions and Operators

This appendix lists the Functions and Operators that are used in Formula and Calc Logic as defined in Custom Fields and Outputs in **Editor**.

## 7.1 Formula Functions

The functions included in this section are usable in Custom Fields when Mode is Formula.

### 7.1.1 Lookup, Conditions, Loops

These functions are used for table manipulation.

**Index Of:** INDEXOF(*column, value [, flag]*)
returns the index (row number, zero based) in column that matches the given value.
*(if flag equals 1 then a -1 value is put in the result where no match is found).*

**Example:**
*VariableX = 24; 34; 15; 7*
INDEXOF(VariableX, 15) ==> 2

INDEXOF(VariableX, 19, 1) ==> -1

**Value At:** VALUEAT(*column, index [, default]*)
returns the value at the given index (row number, zero based) in column.
*(if the default value is provided it will be returned for any out of bound index).*

**Example:**
*VariableX = 24; 34; 15; 7*
VALUEAT(VariableX, 1) ==> 34

VALUEAT(VariableX, -1, 99) ==> 99

**Join:** JOIN(*values, ...*)
returns a single list comprised of all the given values.

**Example:**
*VariableX = 14; 9*
*VariableY = 12; 33; 8*
JOIN(VariableX, 5, VariableY) ==> 14; 9; 5; 12; 33; 8

**Same:** SAME(*values*)
returns true (1) if all given values are the same.

**Example:**
*VariableX = 5; 5; 5*
SAME(VariableX) ==> 1

*VariableX = A; A; B*
SAME(VariableX) ==> 0

**Unique:** UNIQUE(*value*)
returns an array of unique values found.

**Example:**

*VariableX = 1; 1; 3; 5; 7; 7; 8; 9; 10*
UNIQUE(VariableX) ==> 1; 3; 5; 7; 9; 10

*VariableX = January; January; February; June; June; December*
UNIQUE(VariableX) ==> January; February; June; December

**Regex:** REGEX(*value, pattern*)
returns True (1) if the value matches the given pattern.

**Example:**

*VariableX = abc; Xyz; AbA*
REGEX(VariableX, "^[A-Z][a-z]*") ==> 0; 1; 0

**Filter:** FILTER(*values, condition*)
returns a subset of the values based on the given condition.

**Example:**

*VariableX = 14; 12; 9; 25; 6*
*VariableY = Y; Y; N; Y; N*
FILTER(VariableX, VariableY = "Y") ==> 14; 12; 25

**IF:** IF(*condition, trueResult, falseResult*)
returns the true or the false result based on the given condition.

**Example:**

*VariableX = 5; 10; 15*
*VariableY = 25; 50; 75*
*VariableZ = 1; 2; 1*
IF(VariableZ < 2, VariableX, VariableY) ==> 5; 50; 15

**FOREACH:** FOREACH(*variable, formula_logic*)
loops through each value in the variable and executes the given formula logic.

**Related Keywords:**
_SubIndex - Represents current loop iteration index. (zero based)
_SubValue - Represents current value from variable based on loop iteration index.
_SubTotal - Represents cumulative value of current and previous values from variable.

**Example:**

*VariableX = 1; 3; 8*
FOREACH(VariableX, _SubValue * 2 + _SubIndex) ==> 2; 7; 18

### 7.1.2 Standard Math

These functions are used for numeric manipulation.

**Count:** COUNT(*values*)
returns the number of values given.

**Example:**

*VariableX = 14; 12; 9; 25; 6*
COUNT(VariableX) ==> 5

**Count IF: COUNTIF(*condition*)**
returns the number of values that meets the given condition.

**Example:**
*VariableX = 14; 12; 9; 25; 6*
COUNTIF(VariableX > 10 AND VariableX < 25) ==> 2

**Minimum: MIN(*number, ...*)**
returns the smallest number from the list of given numbers.

**Example:**
*VariableX = 4; 7; 8*
*VariableY = 5; 1; 9*

**Maximum: MAX(*number, ...*)**
returns the largest number from the list of given numbers.

**Example:**
*VariableX = 4; 7; 8*
*VariableY = 5; 1; 9*
MAX(VariableX, VariableY, 3) ==> 9

**Sum: SUM(*number, ...*)**
returns the sum of all the given numbers.

**Example:**
*VariableX = 4; 5; 3*
SUM(VariableX) ==> 12

*VariableX = 4; 7; 8*
*VariableY = 5; 1; 9*
SUM(VariableX, VariableY, 3) ==> 37

**Average: AVERAGE(*number, ...*)**
returns the average value of all the given numbers.

**Example:**
*VariableX = 7; 8; 3*
AVERAGE(VariableX) ==> 6

*VariableX = 4; 5*
*VariableY = 3*
AVERAGE(VariableX, VariableY) ==> 4

**Absolute Value: ABS(*number*)**
returns the positive value of the given number.

**Example:**
*VariableX = -1; 5; -240*
ABS(VariableX) ==> 1; 5; 240

**Round: ROUND(*number, precision*)**
returns the given number rounded to the nearest indicated decimal place.

**Example:**

*VariableX = 4.50; 7.445; 1.005*
ROUND(VariableX, 2) ==> 4.50; 7.45; 1.01

*VariableX = 125.0; 10025.0; 12818.0*
ROUND(VariableX, -2) ==> 100.0; 10000.0; 12800.0

**Round Up: ROUNDUP(*number, precision*)**
returns the given number rounded up to the nearest indicated decimal place.

**Example:**

*VariableX = 4.50; 7.445; 1.005*
ROUNDUP(VariableX, 0) ==> 5; 8; 2

**Round Down: ROUNDDOWN(*number, precision*)**
returns the given number rounded down to the nearest indicated decimal place.

**Example:**

*VariableX = 4.50; 7.445; 1.005*
ROUNDDOWN(VariableX, 0) ==> 4; 7; 1

**Square: SQR(*number*)**
returns the square of the given number.

**Example:**

*VariableX = -23*
SQR(VariableX) ==> 23

*VariableY = -2; 0; 5; -9*
SQR(VariableY) ==> 2; 0; 5; 9

**Square Root: SQRT(*number*)**
returns the square root of the given number.

**Example:**

*VariableX = 25*
SQRT(VariableX) ==> 5

*VariableY = 25; 36; 49*
SQRT(VariableY) ==> 5; 6; 7

**Sine: SIN(*number*)**
returns the sine of the given number. (radian based)

**Example:**

*VariableX = 16*
SIN(VariableX) ==> -0.29

*VariableX = 45, 60*
SIN(VariableX) ==> 0.85; -0.30

**Cosine: COS(*number*)**
returns the cosine of the given number. (radian based)

**Example:**
*VariableX = 16*
COS(VariableX) ==> -0.96

*VariableX = 45, 60*
COS(VariableX) ==> 0.53; -0.95

### 7.1.3 String

These functions are used for string manipulation.

**Substring: SUBSTRING(*strings, start_position, length*)**
returns a part of the given strings based on starting position and length.

**Example:**
*VariableX = "abcdef"; "ghijkl"*
*VariableY = 2; 4*
SUBSTRING(VariableX, VariableY, 2) ==> "cd"; "kl"

**String Position: STRPOS(*strings, comparison_value*)**
returns the index of the starting location where the comparison value is found.

**Example:**
*VariableX = "Now is the time"; "He is there"*
STRPOS(VariableX, "s the") ==> 5; 4

**String Length: STRLEN(stirngs)**
Returns the integer value of the length, or number of characters in the strings

**Split**: **SPLIT(strings**)

**Trim: TRIM(strings, [trim_mode])**
Trims blank characters off the left or right of the string depending on the Trim Mode.

**Lowercase: TOLOWER(*strings*)**
returns all given values in lowercase format.

**Example:**
*VariableX = "123 Main Street"; "anytown USA"*
TOLOWER(VariableX) ==> "123 main street"; "anytown usa"

**Uppercase: TOUPPER(*strings*)**
returns all given values in uppercase format.

**Example:**
*VariableX = "123 Main Street"; "anytown USA"*
TOUPPER(VariableX) ==> "123 MAIN STREET"; "ANYTOWN USA"

### 7.1.4 Date

These functions are used for date manipulation.

**Today:** Today()
returns the current date and time.

**Day:** DAY(*date*)
returns only the day portion of the given date.

**Example:**
*VariableX = 1/7/2003*
DAY(VariableX) ==> 7

**Weekday:** WEEKDAY(*date*)
returns the day of the week the given date falls on.

**Example:**
*VariableX = 1/1/2003*
WEEKDAY(VariableX) ==> 4

**Yearday:** YEARDAY(*date*)
returns the day of the year the given date falls on.

**Example:**
*VariableX = 2/15/2003*
YEARDAY(VariableX) ==> 46

**Month:** MONTH(*date*)
returns only the month portion of the given date.

**Example:**
*VariableX = 1/7/2003*
MONTH(VariableX) ==> 1

**Year:** YEAR(*date*)
returns only the year portion of the given date.

**Example:**
*VariableX = 1/7/2003*
YEAR(VariableX) ==> 2003

**Hour:** HOUR(*date*)
returns only the hour portion of the given date/time.

**Example:**
*VariableX = 1/7/2003 15:05:02*
HOUR(VariableX) ==> 15

**Minute:** MINUTE(*date*)
returns only the minute portion of the given date/time.

**Example:**
*VariableX = 1/7/2003 15:05:02*
MINUTE(VariableX) ==> 5

**Age: AGE(*date*)**
returns the number of years since the given date as a real number.

**Example:**
*Current Date = 4/1/2002*
*VariableX = 1/1/2000*
AGE(VariableX) ==> 2.25

**Days Since: DAYSSINCE(*date*)**
returns the number of days since the given date.

**Example:**
*Current Date = 1/3/2000*
*VariableX = 1/1/2000*
DAYSSINCE(VariableX) ==> 2

*VariableX = 1/6/2000*
DAYSSINCE(VariableX) ==> -3

**Days Until: DAYSUNTIL(*date*)**
returns the number of days until the given date.

**Example:**
*Current Date = 1/3/2000*
*VariableX = 1/12/2000*
DAYSUNTIL(VariableX) ==> 9

*VariableX = 1/1/2000*
DAYSUNTIL(VariableX) ==> -2

**Days Between: DAYSBETWEEN(*date*)**
returns the number of days between 2 dates.

**Example:**
*VariableX = 1/1/2000*
*VariableY = 1/10/2000*
DAYSBETWEEN(VariableX, VariableY) ==> 9

**Hours Since: HOURSSINCE(*date*)**
returns the number of hours since the given date/time.

**Example:**
*Current Date/Time = 1/1/2003 14:00:00*
*VariableX = 1/1/2003 12:00:00*
HOURSSINCE(VariableX) ==> 2

*VariableX = 1/1/2003 20:00:00*
HOURSSINCE(VariableX) ==> -6

**Hours Until:** HOURSUNTIL(*date*)
returns the number of hours until the given date/time.

**Example:**
*Current Date/Time = 1/1/2003 14:00:00*
*VariableX = 1/1/2003 17:00:00*
HOURSUNTIL(VariableX) ==> 3

*VariableX = 1/1/2003 09:00:00*
HOURSUNTIL(VariableX) ==> -5

**Seconds Since:** SECONDSSINCE(*date*)
returns the number of seconds since the given date/time.

**Example:**
*Current Date/Time = 1/1/2003 15:00:00*
*VariableX = 1/1/2003 14:59:35*
SECONDSSINCE(VariableX) ==> 25

*VariableX = 1/1/2003 15:01:10*
SECONDSSINCE(VariableX) ==> -70

**Seconds Until:** SECONDSUNTIL(*date*)
returns the number of seconds until the given date/time.

**Example:**
*Current Date/Time = 1/1/2003 15:00:00*
*VariableX = 1/1/2003 15:00:45*
SECONDSUNTIL(VariableX) ==> 45

*VariableX = 1/1/2003 14:59:10*
SECONDSUNTIL(VariableX) ==> -50

**Seconds Between:** SECONDSBETWEEN(*date*)
returns the number of seconds between 2 date/times.

**Example:**
*VariableX = 1/1/2000 15:00:00*
*VariableY = 1/10/2000 15:01:12*
SECONDSBETWEEN(VariableX, VariableY) ==> 72

### 7.1.5 Financial Math

The functions included in this section are usable in Custom Fields when Mode is Formula. These functions are used for financial numeric manipulation.

**Future Value:** FV(*rate, numPayments, payment, presentValue*)
returns the future value based on given inputs.

**Present Value:** PV(*rate, numPayments, payment, futureValue*)
returns the present value based on given inputs.

**Payment:** PMT(*rate, numPayments, presentValue, futureValue*)
returns the payment based on given inputs.

**Future Value with Interest Factor Annuity:** FVIFA(*rate, numPayments, growthRate*)
returns the future value factor based on given inputs including the growth interest rate.

**Present Value with Interest Factor Annuity:** PVIFA(*rate, numPayments, growthRate*)
returns the present value factor based on given inputs including the growth interest rate.

## 7.2 Operators

The functions included in this section are usable in Custom Fields when Mode is Formula.

### 7.2.1 Math

These functions are used for numeric manipulation.

**Add:** *number* **+** *number*
returns the sum of the given numbers.

**Example:**
*VariableX = 2; 4; 6*
*VariableY = 2*
*VariableZ = 1; 2; 3*
VariableX + VariableY ==> 4; 6; 8
VariableX + VariableZ ==> 3; 6; 9

**Minus:** *number* **-** *number*
returns the difference of the given numbers.

**Example:**
*VariableX = 2; 4; 6*
*VariableY = 2*
*VariableZ = 1; 2; 3*
VariableX - VariableY ==> 0; 2; 4
VariableX - VariableZ ==> 1; 2; 3

**Multiply:** *number* ***** *number*
returns the product of the given numbers.

**Example:**
*VariableX = 2; 4; 6*
*VariableY = 2*
*VariableZ = 1; 2; 3*
VariableX * VariableY ==> 4; 8; 12
VariableX * VariableZ ==> 2; 8; 18

**Divide:** *number* **/** *number*
returns the quotient of the given numbers.

**Example:**
*VariableX = 2; 4; 6*
*VariableY = 2*
*VariableZ = 1; 2; 3*
VariableX / VariableY ==> 1; 2; 3

VariableX / VariableZ ==> 2; 2; 2

**Modulus:** *number* **%** *number* -or- **MOD(***number, number***)**
returns the remainder after division of the given numbers.

**Example:**
*VariableX = 3; 4; 5*
*VariableY = 1; 2; 3*
MOD(VariableX, VariableY) ==> 0; 0; 2

*VariableX = 6; 7; 9*
VariableX % 3 ==> 0; 1; 0

**Power:** *number* **^** *power* -or- **POW(***number, power***)**
returns the numbers raised to the given power.

**Example:**
*VariableX = 2; 3; 4*
*VariableY = 2*
*VariableZ = 1; 2; 3*
POW(VariableX, VariableY) ==> 4; 9; 16
POW(VariableX, VariableZ) ==> 2; 9; 64
VariableX ^ VariableZ ==> 2; 9; 64

### 7.2.2 Comparison

The functions included in this section are usable in Custom Fields when Mode is Formula. These functions are used for alphanumeric manipulation.

**Less Than:** *value* **<** *value*
returns true (1) if the first value is less than the second.

**Example:**
*VariableX = 3; 4; 5*
*VariableY = 9*
*VariableZ = 1; 8; 2*
VariableX < VariableY ==> 1; 1; 1 (true; true; true)
VariableX < VariableZ ==> 0; 1; 0 (false; true; false)

**Less Than or Equal:** *value* **<=** *value*
returns true (1) if the first value is less than or equal to the second.

**Example:**
*VariableX = 3; 4; 5*
*VariableY = 4*
*VariableZ = 1; 8; 2*
VariableX <= VariableY ==> 1; 1; 0 (true; true; false)
VariableX <= VariableZ ==> 0; 1; 0 (false; true; false)

**Greater Than:** *value* **>** *value*
returns true (1) if the first value is greater than the second.

**Example:**

*VariableX = 3; 4; 5*
*VariableY = 2*
*VariableZ = 1; 8; 2*
VariableX > VariableY ==> 1; 1; 1 (true; true; true)
VariableX > VariableZ ==> 1; 0; 1 (true; false; true)

**Greater Than or Equal:** *value* **>=** *value*
returns true (1) if the first value is greater than or equal to the second.

**Example:**

*VariableX = 3; 4; 5*
*VariableY = 4*
*VariableZ = 1; 8; 2*
VariableX >= VariableY ==> 0; 1; 1 (false; true; true)
VariableX >= VariableZ ==> 1; 0; 1 (true; false; true)

**Equal:** *value* **=** *value*
returns true(1) if the 2 values are not equal.

**Example:**

*VariableX = "Hello"*
*VariableY = "Goodbye"*
*VariableZ = "Goodbye"*
VariableX = VariableY ==> 0 (false)
VariableY = VariableZ ==> 1 (true)

**Not Equal:** *value* **<>** *value*
returns true (1) if the 2 values are not equal.

**Example:**

*VariableX = "Hello"*
*VariableY = "Goodbye"*
*VariableZ = "Goodbye"*
VariableX <> VariableY ==> 1 (true)
VariableY <> VariableZ ==> 0 (false)
VariableX != VariableY ==> 1 (true)

**In:** *value* **IN** *set*
returns true (1) if the value is in the given set.

**Example:**

*VariableX = 3; 7*
*VariableY = 3; 5; 9*
VariableX IN VariableY ==> 1; 0 (true; false)

**Like:** *value* **LIKE** *template*
returns true (1) if the value matches the given template.

**Example:**

*VariableX = "Discount Investment Account"*
VariableX LIKE "%Investment%" ==> 1 (true)
VariableX LIKE "%Investment" ==> 0 (false)

*VariableY = "Start"; "End"; "Start and End"*
VariableY LIKE "Start%End" ==> 0; 0; 1 (false; false; true)

### 7.2.3 Group

The functions included in this section are usable in Custom Fields when Mode is Formula. These functions are used for alphanumeric manipulation in groups.

**Comma:** (,)
Used to separate values in a list.

**Left Parentheses:** (
Used to start grouping values together

**Right Parentheses** )
Used to close the group of values.

**And:** *condition* **AND** *condition*
returns true (1) only if both conditions are true.

**Example:**
*VariableX = 3*
VariableX > 2 AND VariableX < 9 ==> 1 (true)
VariableX > 5 AND VariableX < 9 ==> 0 (false)

**Or:** *condition* **OR** *condition*
returns true (1) if either condition is true.

**Example:**
*VariableX = 3*
VariableX = 2 OR VariableX = 3 ==> 1 (true)
VariableX = 2 OR VariableX = 4 ==> 0 (false)

### 7.2.4 FOREACH Values

The functions included in this section are usable in Custom Fields when Mode is Formula. These functions are used with FOREACH formulas.

**Foreach:** **FOREACH(***variable, formula_logic***)**
Loops through each value in the variable and executes the given formula logic.

**Related Keywords:**
_SubIndex - Represents current loop iteration index. (zero based)
_SubValue - Represents current value from variable based on loop iteration index.
_SubTotal - Represents cumulative value of current and previous values from variable.

**Example:**
*VariableX = 1; 3; 8*
FOREACH(VariableX, _SubValue * 2 + _SubIndex) ==> 2; 7; 18

## 7.3 Calc Functions

The functions included in this section are usable in Custom Fields when Mode is Calc and in field logic in Outputs.

### 7.3.1 Aggregates

These functions are used for numeric aggregation.

**Sum:** SUM(*number, ...*)
returns the sum of all the given numbers.

**Example:**
*VariableX = 4; 5; 3*
SUM(VariableX) ==> 12

*VariableX = 4; 7; 8*
*VariableY = 5; 1; 9*
SUM(VariableX, VariableY, 3) ==> 37

**Average:** AVG(*number, ...*)
returns the average value of all the given numbers.

**Example:**
*VariableX = 7; 8; 3*
AVERAGE(VariableX) ==> 6

*VariableX = 4; 5*
*VariableY = 3*
AVERAGE(VariableX, VariableY) ==> 4

**Minimum:** MIN(*number, ...*)
returns the smallest number from the list of given numbers.

**Example:**
*VariableX = 4; 7; 8*
*VariableY = 5; 1; 9*

**Maximum:** MAX(*number, ...*)
returns the largest number from the list of given numbers.

**Example:**
*VariableX = 4; 7; 8*
*VariableY = 5; 1; 9*
MAX(VariableX, VariableY, 3) ==> 9

**Count:** COUNT(*values*)
returns the number of values given.

**Example:**
*VariableX = 14; 12; 9; 25; 6*
COUNT(VariableX) ==> 5

**Standard Deviation: STDDEV(*column*)**
returns the standard deviation of the given column.

**Example:**
*VariableX = 16*
SIN(VariableX) ==> -0.29

*VariableX = 45, 60*
SIN(VariableX) ==> 0.85; -0.30

**Day: DAY(column)**
returns only the day portion of the given date.

**Example:**
*VariableX = 1/7/2003*
DAY(VariableX) ==> 7

**Month: MONTH(*column*)**
returns only the month portion of the given date.

**Example:**
*VariableX = 1/7/2003*
MONTH(VariableX) ==> 1

**Year: YEAR(*column*)**
returns only the year portion of the given date.

**Example:**
*VariableX = 1/7/2003*
YEAR(VariableX) ==> 2003

**String Length: LEN(*column*)**
Returns the integer value of the length, or number of characters in the strings

**Left Trim: LTRIM(*column*)**
Trims blank characters off the left of the string.

**Right Trim: RTRIM(*column*)**
Trims blank characters off the right of the string.

**Uppercase: UPPER(*column*)**
returns all given values in uppercase format.

**Substring: SUBSTRING(*column, start, length*)**
returns a part of the given string based on starting position and length.

**Example:**
*VariableX = "abcdef"*
SUBSTRING(VariableX, 2, 2) ==> "bc"