

# Report Writer

## User Guide



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# 1

## Report Writer Basics

This chapter is designed to orient you to some of the basic properties of the OpenMFG report writer—whether you’re running the version embedded within the OpenMFG ERP Suite, or the standalone OpenRPT application.

### Opening the Report Writer

---

To access the report writer embedded within the OpenMFG ERP Suite, select the “Reports” option from the System Module’s Master Information section, as shown below:

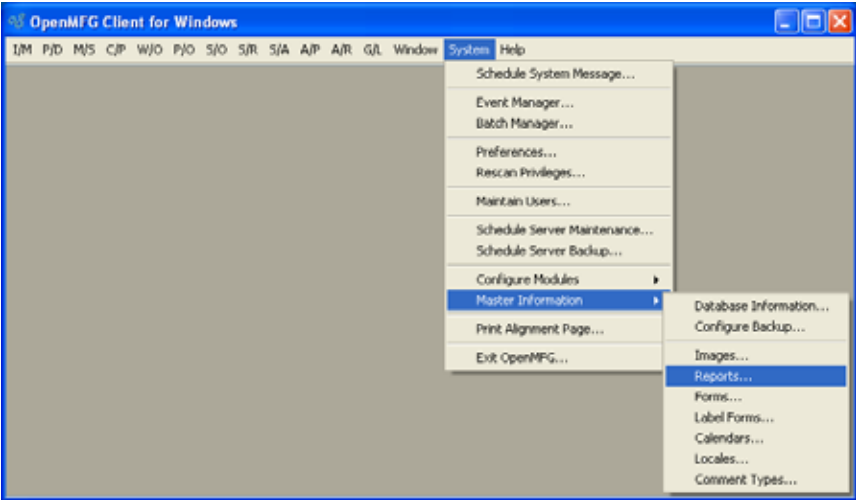


Figure 1.1: Opening the Embedded OpenMFG Report Writer

After you select the “Reports” option, the report definitions master list will appear, as shown below. The report definitions master list serves as the starting point for working with OpenMFG reports.

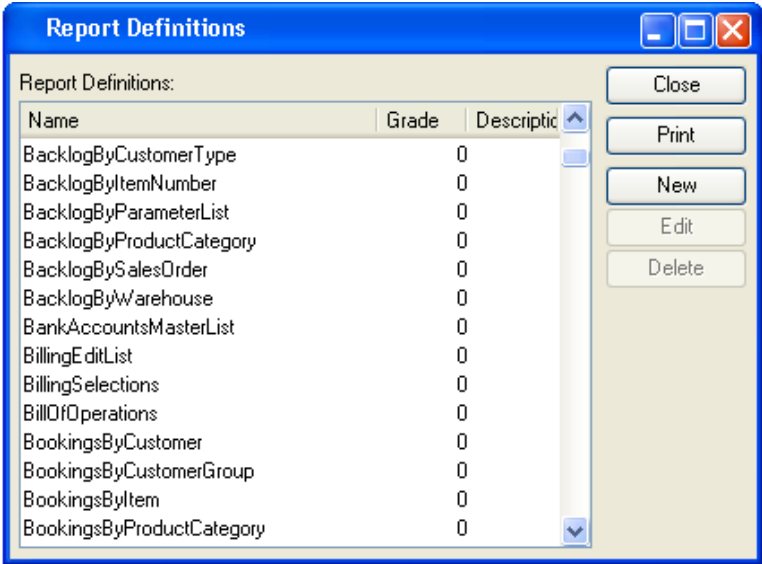


Figure 1.2: OpenMFG Report Definitions Master List



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The report definitions master list displays information on all existing OpenMFG reports, including report name, grade, and description.

---

### Tip

Standard OpenMFG report definitions are delivered with a grade of “0”. By default, the OpenMFG client runs the highest numbered grade. To ensure that you can always return to the baseline version of a report, save your report definitions with a grade higher than 0.

---

To open the standalone OpenRPT application, locate the OpenRPT executable file on your system. Then, in a Windows environment, double-click on the file to open it and reach the application desktop, as shown in the following screenshot:

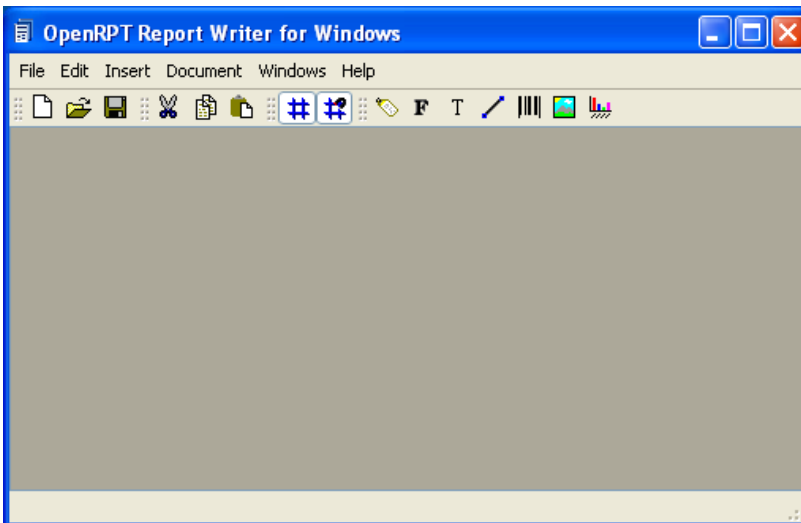


Figure 1.3: OpenRPT Application Desktop

## The Toolbar

---

In this section, we will explore the various options found on the report writer’s toolbar. The toolbar options are the same regardless of whether you’re running the embedded OpenMFG

report writer or OpenRPT. For now, we will focus only on the toolbar functionality. In subsequent chapters, we will explain how to modify existing reports and also how to create new reports.

To see the toolbar using the OpenMFG report writer, we must first open a report definition. The term “report definition” refers to the files created by the report writer. Page layout, database queries, and so on are all parts of a report definition. For this exercise, we’ll open a new report by selecting the NEW button from the report definitions master list. The following screen will appear:

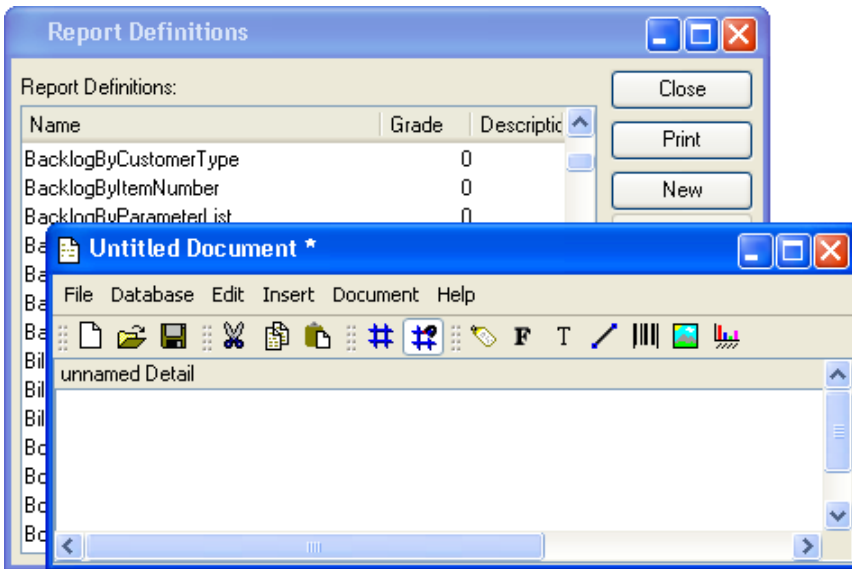


Figure 1.4: Blank Report Definition Featuring Toolbar

---

**Note**

All the functionality accessible using the toolbar buttons is also available from the drop-down menus.

---

For the remainder of this section, we will examine each of the buttons on the report writer toolbar. The following screenshot shows a close-up view of the toolbar:

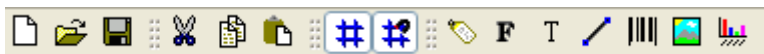


Figure 1.5: Report Writer Toolbar Buttons

As we look at the functionality related to each toolbar button, we will be moving from left to right—beginning with the New File option.

## *New File*


	<p>Clicking the “New File” option opens a new instance of the report writer. Select this option to create a new report definition. We will discuss creating new report definitions in the Advanced Topics chapter.</p>
---	--

Table 1.1: New File Button

## *Open File*


	<p>Use the “Open File” option to open a report definition stored on your local or network drive. Reports may be stored on local or network drives for backup or editing purposes. If you want to open a report stored in your OpenMFG Database, use the EDIT button found on the report definitions master list. For details on editing existing reports, see the Getting Started chapter.</p>
---	--

Table 1.2: Open File Button

## *Save File*


	<p>The “Save File” option enables you to save report definitions to your local or network drive, where they may be stored for backup or editing purposes. This option will not save report definitions to a database. To learn more about saving reports to a database, see the “Saving to a Database” section. Report definitions are saved using the Extensible Markup Language (XML) format.</p>
---	---

Table 1.3: Save File Button

## *Cut*


	The “Cut” option enables you to click on an object in a report definition, remove it, and then, using the “Paste” option, insert it to another part of the report.
---	--

Table 1.4: Cut Object Button

## *Copy*


	The “Copy” option enables you to click on an object in a report, copy it (leaving the original in place), and then, using the “Paste” option, insert it into another part of the report.
---	--

Table 1.5: Copy Object Button

## *Paste*


	The “Paste” option enables you to insert into the report definition an object that has been cut or copied using the “Cut” option or the “Copy” option.
---	--

Table 1.6: Paste Object Button

## *Show Grid*


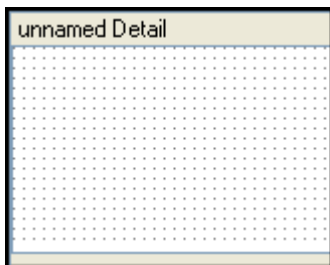
	The “Show Grid” option enables you to turn grid lines on for visual reference when aligning objects in a report definition. This option is a toggle, meaning grid lines may be turned on or off using this button.
---	--

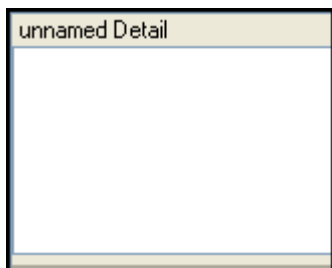
Table 1.7: Show Grid Button

Clicking the “Show Grid” button turns grid lines on. The following screenshot shows a report definition with grid lines turned on:



**Figure 1.6: Grid Lines On**

Clicking the “Show Grid” button a second time turns grid lines off, as shown in the following screenshot:



**Figure 1.7: Grid Lines Off**

If you want to change the properties of your grid lines, the report writer gives you the ability to do so. To change your grid line settings, select the “Preferences” option from the Edit menu. The following screen will appear:

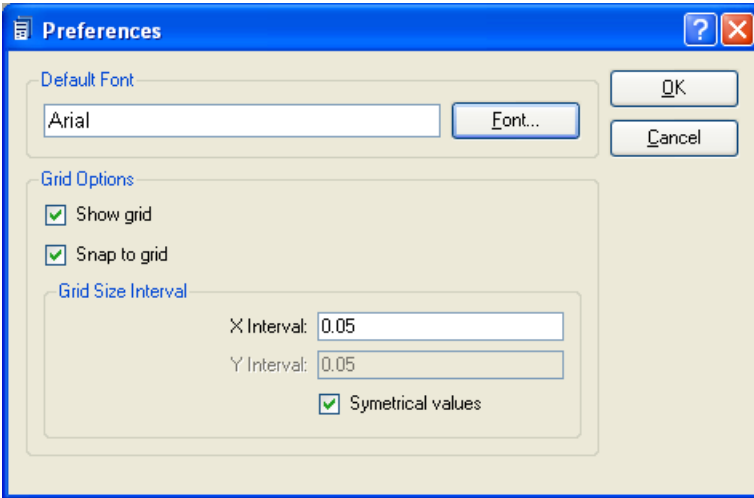


Figure 1.8: Report Preferences

When establishing your report definition preferences, you are presented with the following options:

**Default Font:** Select the default font to be used in the report definition by clicking on the FONT button located to the right of the field.

- Selecting the FONT button will bring up the “Select Font” screen, where you may specify font name, font style, font size, and font effects. Even though a default font is specified, you may override the default font on an object-by-object basis.

**Grid Options:** Indicate your grid line settings, using the following parameters:

- **Show grid:** Selecting this option turns grid lines on. If this option is not selected, grid lines will be turned off. The “Show Grid” button accomplishes the same result.
- **Snap to grid:** Selecting this option aligns objects to the grid. If this option is not selected, grid lines will not be aligned to the grid. The “Snap to Grid” button accomplishes the same results.

**Grid Size Interval:** Specify the distance (measured in inches) between the points of your grid lines, using the following parameters:

- **X Interval:** Enter an interval for the horizontal axis of your grid, measured in inches.
- **Y Interval:** Enter an interval for the vertical axis of your grid, measured in inches.

- **Symmetrical values:** Select if you want the X axis and the Y axis to use the same interval between points. If selected, you will not be able to enter an interval for the Y axis.

To the far right of the screen, the following buttons are available:

**OK:** Select to save your settings.

**CANCEL:** Closes the screen without saving any changes, returning you to the application desktop.

## *Snap to Grid*


	The “Snap to Grid” option forces objects to align to the grid when grid lines are turned on. This option is a toggle, meaning snap to grid functionality may be turned on or off using this button.
---	---

Table 1.8: Snap to Grid Button

## *Labels*


	The “Label” option enables you to create new Label objects. Label objects are used to display descriptive information on a report definition, such as titles, headings, etc.
---	--

Table 1.9: Label Button

To create a new Label object, first select the Label button. Then click in the section of the report definition where you want the Label to be located. Doing so will create the Label object in that section.

---

### Note

For more information on using Label objects in report definitions, see the Getting Started chapter.

---

Once the Label object has been created, you may then define the Label object's properties. To define a Label object's properties, double-click on the Label object. The following screen will appear:

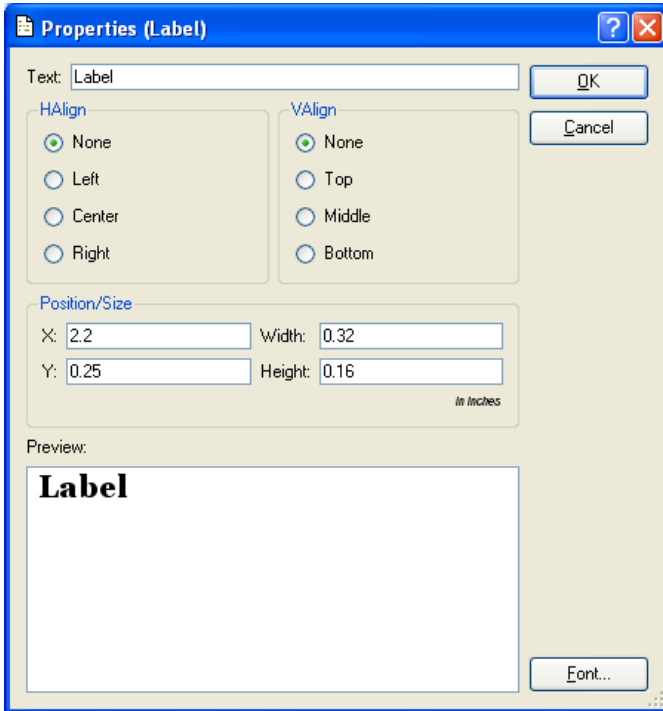


Figure 1.9: Label Properties

When defining the properties of a Label object, you are presented with the following options:

**Text:** Enter the text of the Label.

- Text entered here will display in the “Preview” section of the screen.

**HAlign:** Specify how you want text to be aligned horizontally within the Label object:

- **None:** Select if you do not want to specify a horizontal alignment.
- **Left:** Select to align text on the left margin.
- **Center:** Select to align text in the center.
- **Right:** Select to align text on the right margin.

**VAlign:** Specify how you want text to be aligned vertically within the Label object:

- **None:** Select if you do not want to specify a vertical alignment.



- **Top:** Select to align text on the top margin.
- **Middle:** Select to align text in the middle.
- **Bottom:** Select to align text on the bottom margin.

**Position/Size:** Specify how you want the Label object to be positioned and sized within the section where it is located.

- **X:** Specify the distance, measured in inches, from the section's left border to the upper-left-hand corner of the Label object.
- **Width:** Specify the width of the Label object, measured in inches.
- **Y:** Specify the distance, measured in inches, from the section's top border to the upper-left-hand corner of the Label object.
- **Height:** Specify the height of the Label object, measured in inches.

---

#### Tip

The position and size of a Label object may be modified manually when editing a report definition.

---

**Preview:** Displays a preview of the Label text, using the specified font.


- Selecting the FONT button will bring up the “Select Font” screen, where you may specify font name, font style, font size, and font effects.

To the far right of the screen, the following buttons are available:

**OK:** Select to save your settings.

**CANCEL:** Closes the screen without saving any changes, returning you to the application desktop.

## *Fields*

	The “Field” option enables you to create new Field objects. Field objects are used for pulling dynamically generated data into a report from the database the report writer is connected to. For example, a Field object may be used to include running totals in a report. By definition, Field objects are designed to handle a single line of data. For multiple lines of data, use a Text Area object.
--	--

**Table 1.10: Field Object Button**

To create a new Field object, first select the Field button. Then click in the section of the report definition where you want the Field to be located. Doing so will create the Field object in that section.

---

**Note**

For more information on using Field objects in report definitions, see the Getting Started chapter.

---

Once the Field object has been created, you may then define the Field object’s properties. To define a Field object’s properties, double-click on the Field object. The following screen will appear:

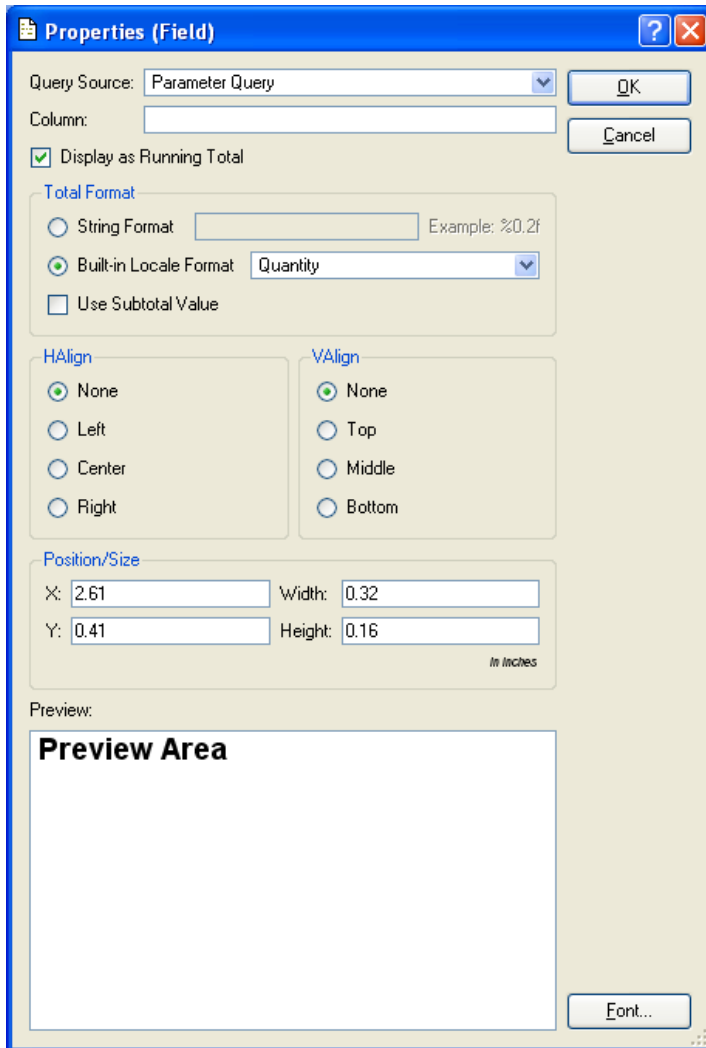


Figure 1.10: Field Properties

---

### Note

By definition, Field objects are designed to handle a single line of data. For multiple lines of data, use a Text Area object.

---

When defining the properties of a Field object, you are presented with the following options:

**Query Source:** Select a query source from the drop-down menu by clicking on the arrow to the right of the field.

- Query sources are used to populate report definition objects with dynamic data from the database the report writer is connected to.

**Column:** Specify the name of the database column you want to use from the selected query source.

- A query source may refer to multiple columns in its SELECT statement. By indicating a specific column, you instruct the query source to return data only for that specified column. Other columns appearing in the SELECT statement will be ignored.

---

#### Note

For more information on query sources and the link between database fields and report definition objects, please see the Getting Started chapter.

---

**Display as Running Total:** Select if you want the data retrieved from the database to be displayed as a running total.

- No running total will be used if this option is not selected.

---

#### Note

When running totals are calculated for columns designated as Boolean, the “true” values are assigned a value of “1,” while “false” values are assigned a value of “0.”

---

**Total Format:** If the “Display as Running Total” option is selected, specify one of the following formatting options:

- **String Format:** Enter a string format to use when formatting the total.

- **Built-in Locale Format:** Select this option and then choose one of the available options from the drop-down menu by clicking on the arrow to the right of the field. Built-in Locale Formats may only be available in some installations.
- **Use Subtotal Value:** Select if the running total represents a subtotal.

**HAlign:** Specify how you want text to be aligned horizontally within the Field object:

- **None:** Select if you do not want to specify a horizontal alignment.
- **Left:** Select to align text on the left margin.
- **Center:** Select to align text in the center.
- **Right:** Select to align text on the right margin.

**VAlign:** Specify how you want text to be aligned vertically within the Field object:

- **None:** Select if you do not want to specify a vertical alignment.
- **Top:** Select to align text on the top margin.
- **Middle:** Select to align text in the middle.
- **Bottom:** Select to align text on the bottom margin.

**Position/Size:** Specify how you want the Field object to be positioned and sized within the section where it is located.

- **X:** Specify the distance, measured in inches, from the section's left border to the upper-left-hand corner of the Field object.
- **Width:** Specify the width of the Field object, measured in inches.
- **Y:** Specify the distance, measured in inches, from the section's top border to the upper-left-hand corner of the Field object.
- **Height:** Specify the height of the Field object, measured in inches.

---

### Tip

The position and size of a Field object may be modified manually when editing a report definition.

---

**Preview:** Displays a preview of the Field, using the specified font.

- Selecting the FONT button will bring up the “Select Font” screen, where you may specify font name, font style, font size, and font effects.

To the far right of the screen, the following buttons are available:

**OK:** Select to save your settings.

**CANCEL:** Closes the screen without saving any changes, returning you to the application desktop.

## Text Areas


	The “Text Area” option enables you to create new Text Area objects. Text Area objects are used for pulling dynamically generated, multi-line data into a report from the database the report writer is connected to. By definition, Text Area objects are designed to handle multiple lines of data.
--	--

Table 1.11: Text Area Button

To create a new Text Area object, first select the Text Area button. Then click in the section of the report definition where you want the Text Area to be located. Doing so will create the Text Area object in that section.

---

### Note

For more information on using Text Area objects in report definitions, see the Getting Started chapter.

---

Once the Text Area object has been created, you may then define the Text Area object’s properties. To define a Text Area object’s properties, double-click on the Text Area object. The following screen will appear:

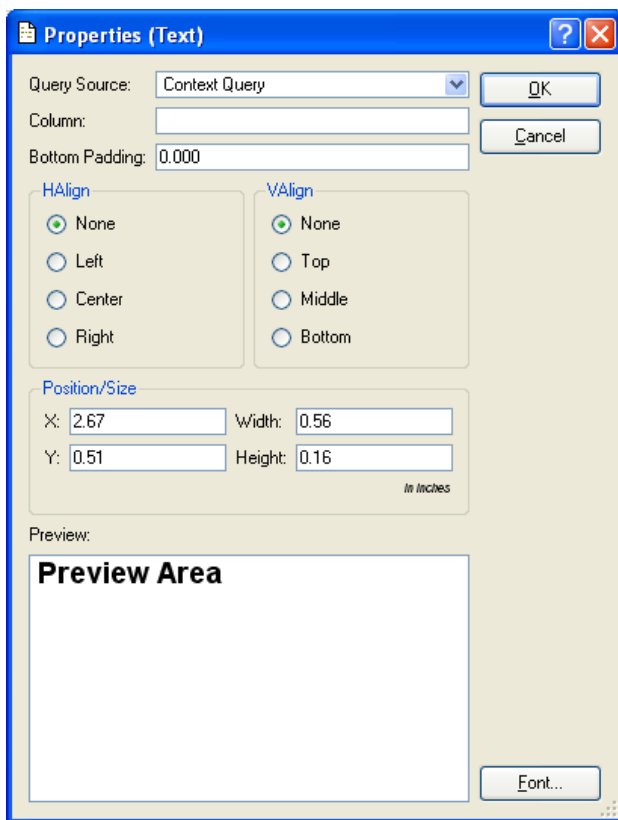


Figure 1.11: Text Area Properties

---

### Note

By definition, Text Area objects are designed to handle multiple lines of data.

---

When defining the properties of a Text Area object, you are presented with the following options:

**Query Source:** Select a query source from the drop-down menu by clicking on the arrow to the right of the field.

- Query sources are used to populate report definition objects with dynamic data from the database the report writer is connected to.

**Column:** Specify the name of the database column you want to use from the selected query source.

- A query source may refer to multiple columns in its SELECT statement. By indicating a specific column, you instruct the query source to return data only for that specified column. Other columns appearing in the SELECT statement will be ignored.

---

#### Note

For more information on query sources and the link between database fields and report definition objects, please see the Getting Started chapter.

---

**Bottom Padding:** Specify the minimum amount of space between the last line of text in the Text Area object and the end of the section where the Text Area object is located, measured in inches.

- The amount of space between the last line of text and the end of a section will always be equal to at least the bottom padding value.

**HAlign:** Specify how you want text to be aligned horizontally within the Text Area object:

- **None:** Select if you do not want to specify a horizontal alignment.
- **Left:** Select to align text on the left margin.
- **Center:** Select to align text in the center.
- **Right:** Select to align text on the right margin.

**VAlign:** Specify how you want text to be aligned vertically within the Text Area object:

- **None:** Select if you do not want to specify a vertical alignment.
- **Top:** Select to align text on the top margin.
- **Middle:** Select to align text in the middle.
- **Bottom:** Select to align text on the bottom margin.

**Position/Size:** Specify how you want the Text Area object to be positioned and sized within the section where it is located.



- **X:** Specify the distance, measured in inches, from the section’s left border to the upper-left-hand corner of the Text Area object.
- **Width:** Specify the width of the Text Area object, measured in inches.
- **Y:** Specify the distance, measured in inches, from the section’s top border to the upper-left-hand corner of the Text Area object.
- **Height:** Specify the height of the Text Area object, measured in inches.

---

### Tip

The position and size of a Text Area object may be modified manually when editing a report definition.

---

**Preview:** Displays a preview of the Text Area object, using the specified font.

- Selecting the FONT button will bring up the “Select Font” screen, where you may specify font name, font style, font size, and font effects.

To the far right of the screen, the following buttons are available:

**OK:** Select to save your settings.

**CANCEL:** Closes the screen without saving any changes, returning you to the application desktop.

## Lines


	<p>The “Line” option enables you to create new Line objects. Line objects are used for drawing vertical, horizontal, and diagonal lines.</p>
---	--

Table 1.12: Line Button

To create a new Line object, first select the Line button. Then click in the section of the report definition where you want the Line to be located. Doing so will create the Line object in that section. Once the Line object has been created, click on the object and drag it with your mouse. As you will see, dragging the Line object draws the Line in any direction and to any length you wish.

---

### Tip

If you hold down the SHIFT key on your keyboard when you are dragging a Line object, this will force the Line to straighten out. Also, once a Line has been inserted, you may change its orientation by clicking and dragging the whole Line or either one of its end points.

---

After you have inserted a Line object into a report definition, you may then define the width of the Line object. To define the width of a Line object, double-click on the Line object. The following screen will appear:

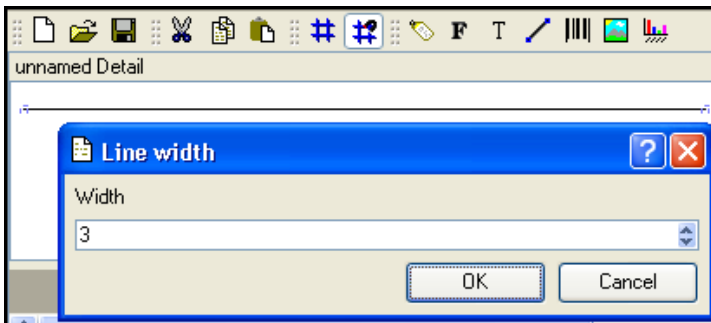


Figure 1.12: Line Width

When defining the width of a Line object, you are presented with the following options:

**Width:** Specify the width of the Line, measured in pixels, by entering a number either manually or by using the arrows to the right of the field.

- The maximum Line width is 100 pixels.

At the bottom of the screen, the following buttons are available:

**OK:** Select to save your settings.

**CANCEL:** Closes the screen without saving any changes, returning you to the application desktop.

## Bar Codes


	The “Bar Code” option enables you to create new Bar code objects. Bar code objects are used to represent dynamic information stored in a database in Bar code format.
---	---

Table 1.13: Bar code Button

To create a new Bar code object, first select the Bar code button. Then click in the section of the report definition where you want the Bar code to be located. Doing so will create the Bar code object in that section.

---

### Note

For more information on using Bar code objects in report definitions, see the Getting Started and Advanced Topics chapters.

---

Once the Bar code object has been created, you may then define the Bar code object’s properties. To define a Bar code object’s properties, double-click on the Bar code object. The following screen will appear:

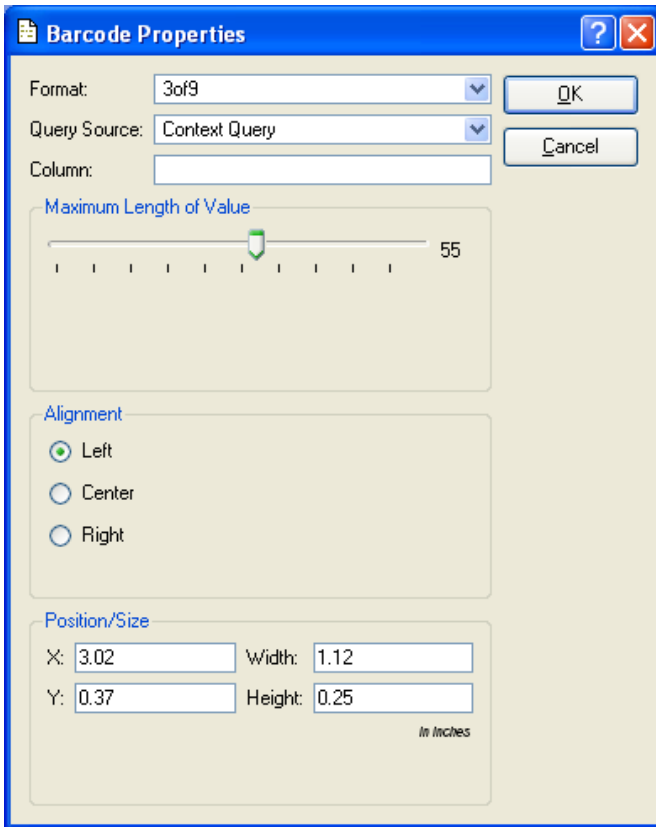


Figure 1.13: Bar Code Properties

When defining the properties of a Bar code object, you are presented with the following options:

**Format:** Select one of the Bar code formatting options from the drop-down menu by clicking on the arrow to the right of the field.

- The report writer supports the following Bar code formats: 3of9, 3of9+, 128, ean13, ean8, upc-a, and upc-e.

**Query Source:** Select a query source from the drop-down menu by clicking on the arrow to the right of the field.

- Query sources are used to populate report definition objects with dynamic data from the database the report writer is connected to.

**Column:** Specify the name of the database column you want to use from the selected query source.

- A query source may refer to multiple columns in its SELECT statement. By indicating a specific column, you instruct the query source to return data only for that specified column. Other columns appearing in the SELECT statement will be ignored.

---

#### Note

For more information on query sources and the link between database fields and report definition objects, please see the Getting Started chapter.

---

**Maximum Length of Value:** Specify the maximum number of characters you expect your Bar code data to contain.

- The length of the Bar code will not exceed the value entered here. If fewer characters than the maximum number are used, the Bar code will be aligned within the Bar code object based on the alignment specified below.

**Alignment:** Specify how you want the Bar code to be aligned horizontally if its length is fewer characters than the maximum length specified above:

- **Left:** Select to align the Bar code on the left margin of the Bar code object.
- **Center:** Select to align the Bar code in the center of the Bar code object.
- **Right:** Select to align the Bar code on the right margin of the Bar code object.

---

#### Note

Bar codes always fill the entire vertical space specified for a Bar code object. As a result, no vertical alignment is required.

---

**Position/Size:** Specify how you want the Bar code object to be positioned and sized within the section where it is located.

- **X:** Specify the distance, measured in inches, from the section's left border to the upper-left-hand corner of the Bar code object.

- **Width:** Specify the width of the Bar code object, measured in inches.
- **Y:** Specify the distance, measured in inches, from the section’s top border to the upper-left-hand corner of the Bar code object.
- **Height:** Specify the height of the Bar code object, measured in inches.

To the far right of the screen, the following buttons are available:

**OK:** Select to save your settings.

**CANCEL:** Closes the screen without saving any changes, returning you to the application desktop.

## Images


	The “Image” option enables you to create new Image objects. Image objects are used to insert either static or dynamic Images into a report definition. Static Images—a company logo displayed in the Report Header, for example—are embedded within the report definition. Dynamic Images—pictures of products, for example—are pulled from the database the report writer is connected to.
---	---

Table 1.14: Image Object Button

To create a new Image object, first select the Image button. Then click in the section of the report definition where you want the Image to be located. Doing so will create the Image object in that section.

---

### Note

For more information on using Image objects in report definitions, see the Advanced Topics chapter.

---

Once the Image object has been created, you may then edit the Image object’s properties. To edit an Image object’s properties, double-click on the Image object. The following screen will appear:

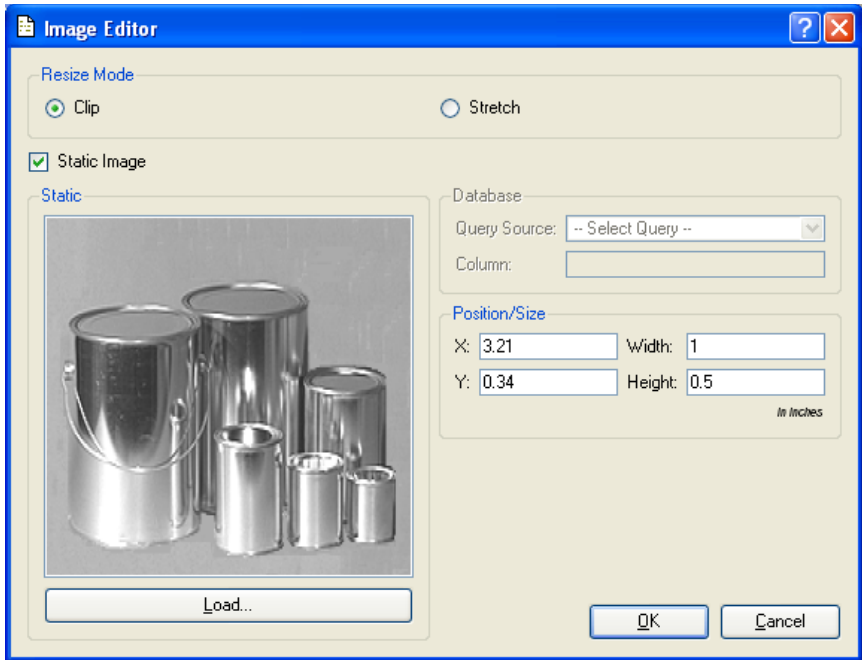


Figure 1.14: Image Editor

When editing the properties of an Image object, you are presented with the following options:

**Resize Mode:** Specify one of the following resizing preferences:

- **Clip:** Select to have the Image imported as-is into the Image object. If selected, no resizing of the Image will occur.
- **Stretch:** Select to enable manual resizing of the Image once it has been imported into the Image object. When manually resizing an Image, the Image's aspect ratio will be maintained.

**Static Image:** Select if the Image you are importing is a static Image.

- Static Images are Images which are embedded within a report definition. They are not pulled dynamically from a database. An example of a static Image would be a company logo inserted on the top of a standard Form.

**Database:** Specify the following information if the Image you are importing will be pulled dynamically from a database the report writer is connect to:

- **Query Source:** Select a query source from the drop-down menu by clicking on the arrow to the right of the field. Query sources are used to populate report definition objects with dynamic data from the database the report writer is connected to.

---

**Note**

For more information on query sources and the link between database fields and report definition objects, please see the Getting Started chapter.

---

- **Column:** Specify the name of the database column you want to use from the selected query source. A query source may refer to multiple columns in its SELECT statement. By indicating a specific column, you instruct the query source to return data only for that specified column. Other columns appearing in the SELECT statement will be ignored.

---

**Note**

OpenMFG users can store Images in an OpenMFG Database using the client interface. Images imported this way are stored in the `image_data` column of the `images` table, using the UU encoding format.

---

**Position/Size:** Specify how you want the Image object to be positioned and sized within the section where it is located.

- **X:** Specify the distance, measured in inches, from the section's left border to the upper-left-hand corner of the Image object.
- **Width:** Specify the width of the Image object, measured in inches.
- **Y:** Specify the distance, measured in inches, from the section's top border to the upper-left-hand corner of the Image object.
- **Height:** Specify the height of the Image object, measured in inches.



---

### Note

The position and size of an Image object may be modified manually when editing a report definition.

---

At the bottom of the screen, the following buttons are available:

**OK:** Select to save your settings.

**CANCEL:** Closes the screen without saving any changes, returning you to the application desktop.

## Graph Editor


	<p>The “Graph” option enables you to create new Graph objects. Graph objects are used to insert Graphs into a report definition using dynamic data stored in a database the report writer is connected to.</p>
---	--

Table 1.15: Graph Button

To create a new Graph object, first select the Graph button. Then click in the section of the report definition where you want the Graph to be located. Doing so will create the Graph object in that section.

---

### Note

For more information on using Graph objects in report definitions, see the Advanced Topics chapter.

---

Once the Graph object has been created, you may then edit the Graph object’s properties. To edit a Graph object’s properties, double-click on the Graph object. The following screen will appear:

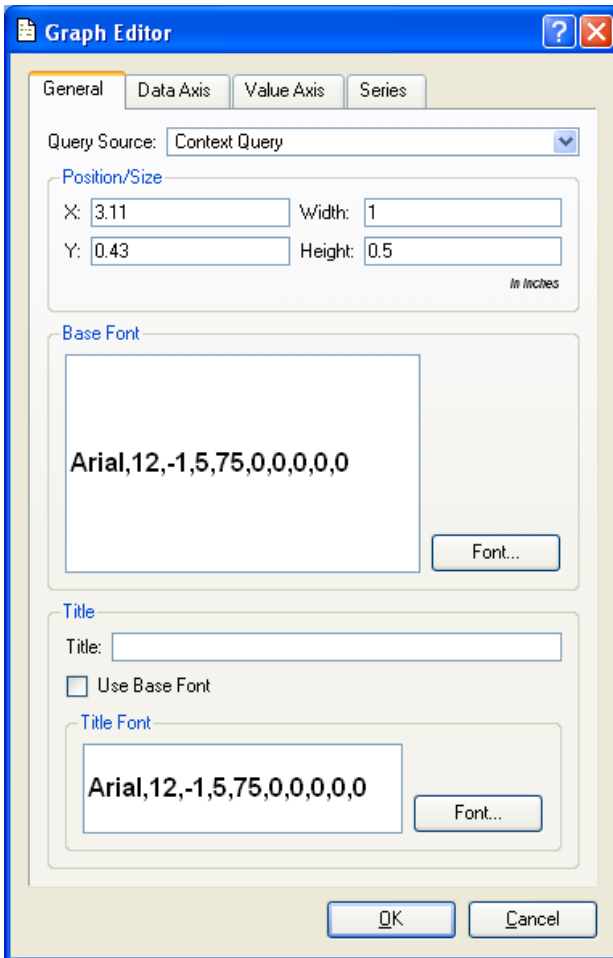


Figure 1.15: Graph Editor

When editing the general properties of a Graph object, you are presented with the following options:

**Query Source:** Select a query source from the drop-down menu by clicking on the arrow to the right of the field.

- Query sources are used to populate report definition objects with dynamic data from the database the report writer is connected to.

---

### Note

For more information on query sources and the link between database fields and report definition objects, please see the Getting Started chapter.

---

**Position/Size:** Specify how you want the Image object to be positioned and sized within the section where it is located.

- **X:** Specify the distance, measured in inches, from the section's left border to the upper-left-hand corner of the Image object.
- **Width:** Specify the width of the Image object, measured in inches.
- **Y:** Specify the distance, measured in inches, from the section's top border to the upper-left-hand corner of the Image object.
- **Height:** Specify the height of the Image object, measured in inches.

---

### Tip

The position and size of a Graphic object may be modified manually when editing a report definition.

---

**Base Font:** Select the base font to be used in the Graph object by clicking on the FONT button located to the right of the field.

- Selecting the FONT button will bring up the "Select Font" screen, where you may specify font name, font style, font size, and font effects. The base font may be used throughout the Graph object.

**Title:** Specify the following details for the Graph object's title:

- **Title:** Enter the title you want to appear centered at the top of the Graph.
- **Use Base Font:** Select to use the specified base font. If not selected, the title font will be used.

- **Title Font:** Specify the font to be used for the Graph object's title by clicking on the FONT button located to the right of the field. Selecting the FONT button will bring up the "Select Font" screen, where you may specify font name, font style, font size, and font effects.

At the bottom of the screen, the following buttons are available:

**OK:** Select to save your settings.

**CANCEL:** Closes the screen without saving any changes, returning you to the application desktop.

To define the properties of the Graph object's data axis—that is, the horizontal axis running along the bottom of the Graph—select the "Data Axis" tab at the top of the "Graph Editor" screen. The following screen will appear:

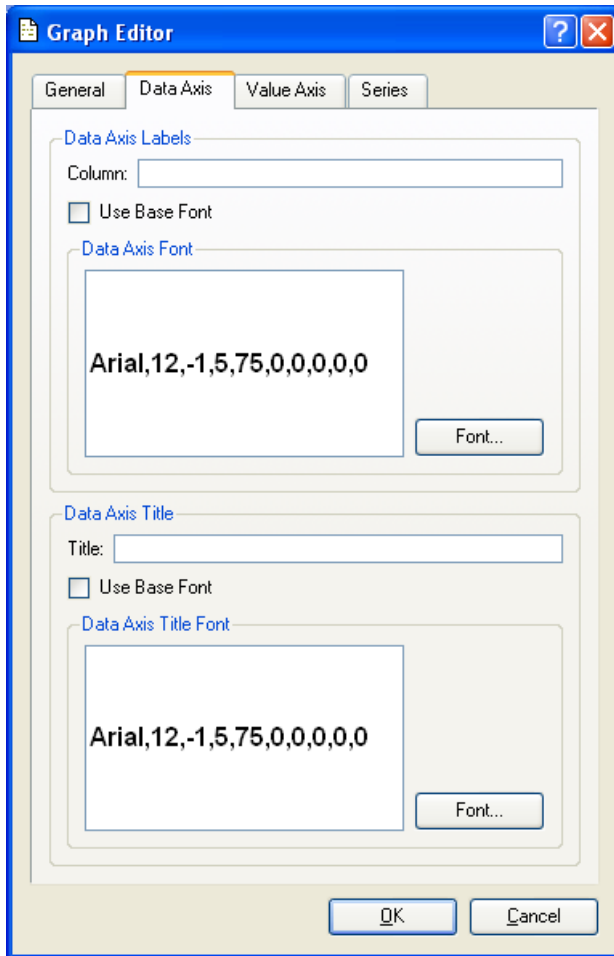


Figure 1.16: Graph Editor Data Axis

When editing the data axis properties of a Graph object, you are presented with the following options:

**Data Axis Labels:** Specify the following details for the data axis labels:

- **Column:** Specify the name of the database column you want to use from the selected query source. A query source may refer to multiple columns in its SELECT statement. By indicating a specific column, you instruct the query source to return data only for that specified column. Other columns appearing in the SELECT statement will be ignored.

---

### Note

The term “data axis labels” refers to the identifying information which describes each of the items in a Graph’s series. For example, if a Graph displays information about a series of Item Numbers, then data axis labels would be used to identify each of the Items in the series.

---

- **Use Base Font:** Select to use the specified base font. If not selected, the data axis font will be used.
- **Data Axis Font:** Specify the font to be used for the data axis labels by clicking on the FONT button located to the right of the field. Selecting the FONT button will bring up the “Select Font” screen, where you may specify font name, font style, font size, and font effects.

**Data Axis Title:** Specify the following details for the data axis title:

- **Title:** Enter the title you want to appear centered along the bottom of the Graph’s data axis.
- **Use Base Font:** Select to use the specified base font. If not selected, the data axis title font will be used.
- **Data Axis Title Font:** Specify the font to be used for the data axis title by clicking on the FONT button located to the right of the field. Selecting the FONT button will bring up the “Select Font” screen, where you may specify font name, font style, font size, and font effects.

At the bottom of the screen, the following buttons are available:

**OK:** Select to save your settings.

**CANCEL:** Closes the screen without saving any changes, returning you to the application desktop.

To define the properties of the Graph object’s value axis—that is, the vertical axis running along the left-hand side of the Graph—select the “Value Axis” tab at the top of the “Graph Editor” screen. The following screen will appear:

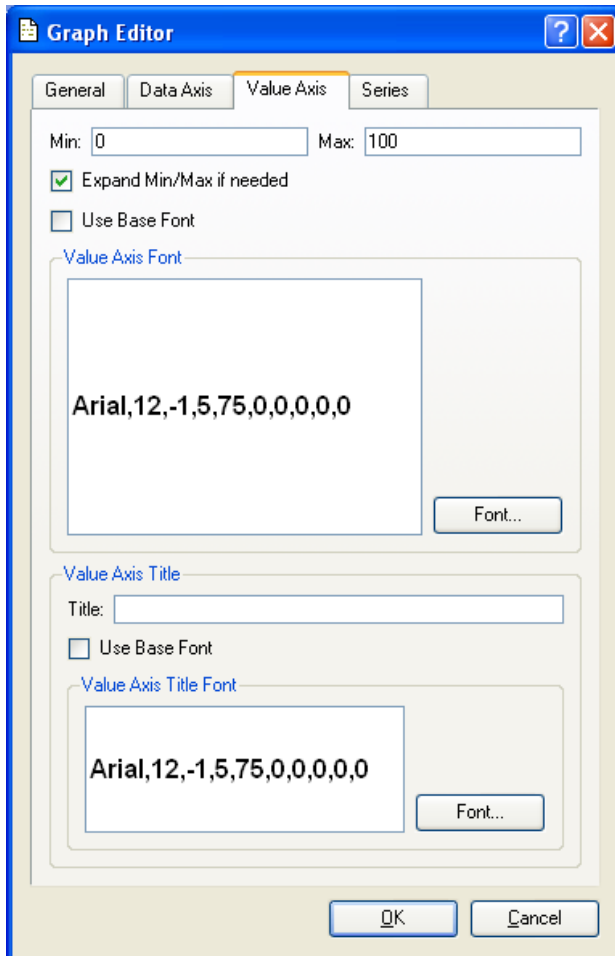


Figure 1.17: Graph Editor Value Axis

When editing the value axis properties of a Graph object, you are presented with the following options:

**Min:** Specify the minimum value you want to have appear on the Graph object's value axis.

**Max:** Specify the maximum value you want to have appear on the Graph object's value axis.

**Expand Min/Max if needed:** Select to allow data represented in the Graph to expand beyond the minimum and maximum values specified if needed.

- If not selected, data will be restricted to the limits specified for the minimum and maximum values.

**Use Base Font:** Select to use the specified base font. If not selected, the value axis font will be used.

**Value Axis Font:** Specify the font to be used for values in the value axis by clicking on the FONT button located to the right of the field.

- Selecting the FONT button will bring up the “Select Font” screen, where you may specify font name, font style, font size, and font effects.

**Value Axis Title:** Specify the following details for the value axis title:

- **Title:** Enter the title you want to appear centered along the left-hand margin of the Graph’s value axis.
- **Use Base Font:** Select to use the specified base font. If not selected, the value axis title font will be used.
- **Value Axis Title Font:** Specify the font to be used for the value axis title by clicking on the FONT button located to the right of the field. Selecting the FONT button will bring up the “Select Font” screen, where you may specify font name, font style, font size, and font effects.

At the bottom of the screen, the following buttons are available:

**OK:** Select to save your settings.

**CANCEL:** Closes the screen without saving any changes, returning you to the application desktop.

To define the properties of Graph object series, select the “Series” tab at the top of the “Graph Editor” screen. The following screen will appear:



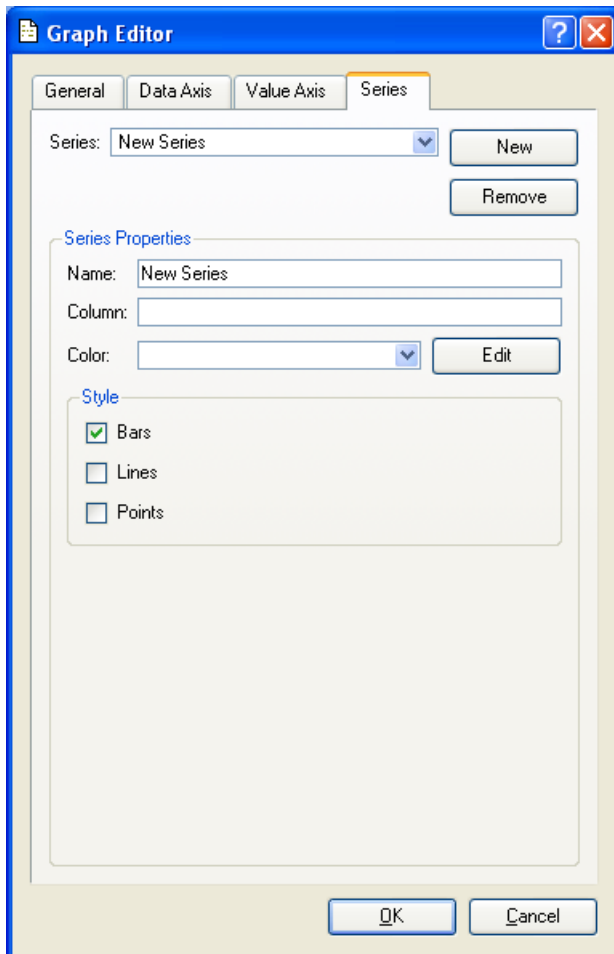


Figure 1.18: Graph Editor Series

When editing the properties of a Graph object series, you are presented with the following options:

**Series:** Select a series from the drop-down menu by clicking on the arrow to the right of the field.

- Each Graph must contain at least one series—and may contain multiple series. Using multiple series enables you to compare and contrast information from different database columns within a single Graph. To create a new series, select the NEW

button. By default, a new series will be given the name “New Series.” You may edit this default name within the “Name” field below. To remove a series from the list of series, select the REMOVE button.

---

### Note

You may assign different properties to each series in a graph (e.g., different colors) to make a clear visual distinction between series.

---

**Series Properties:** Specify properties for the selected series using the following options:

- **Name:** Displays the name of the series. You may edit the name of the series using this field. Any editing changes will be saved automatically.
- **Column:** Specify the name of the database column you want to use from the selected query source. A query source may refer to multiple columns in its SELECT statement. By indicating a specific column, you instruct the query source to return data only for that specified column. Other columns appearing in the SELECT statement will be ignored.
- **Color:** Specify the color you want to use to represent data in the series. Selecting the EDIT button will bring up several color definition screens. You have the ability to specify multiple colors, using either the included color wheel or standard RGB values.
- **Style:** Specify one of the following options to be used for representing items in the series: “Bars,” “Lines,” or “Points.”

At the bottom of the screen, the following buttons are available:

**OK:** Select to save your settings.

**CANCEL:** Closes the screen without saving any changes, returning you to the application desktop.

## Managing Report Definitions

---

Report definitions created using the report writer are saved in Extensible Markup Language (XML) format. This is a universal standard file format, which simplifies the process of file

sharing. Report definitions may be loaded into the report writer from a database, saved locally as XML, transferred via email or other method, and then uploaded for use in a different database. In this section, we will describe how to manage report definitions—moving them from a database to a local drive and back to a database again.

## Loading Reports from a Database

For the purposes of this exercise, we will assume we are connecting to an OpenMFG Database, using the OpenMFG report writer. However, you would follow similar steps using the standalone OpenRPT application connected to a different database.

To begin with, let's load an existing report definition into the report writer from an OpenMFG Database. From the Master Information section of the System Module, select the “Reports” option. The master list of report definitions will appear, as shown below:

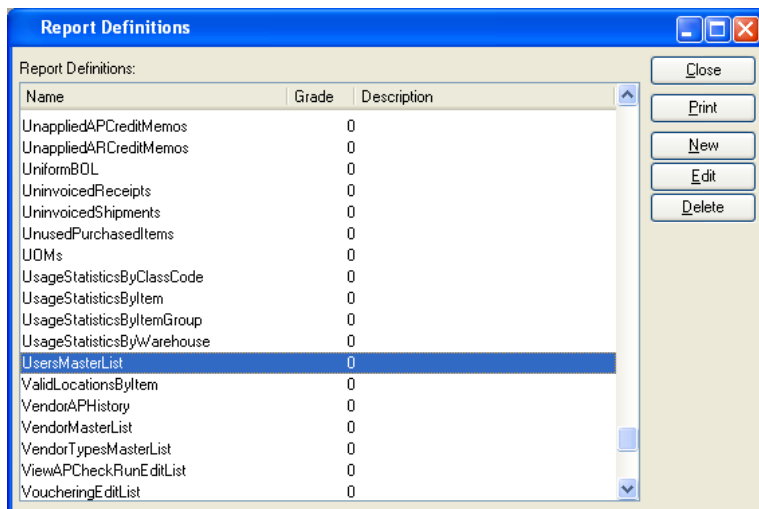


Figure 1.19: Master List of Report Definitions in OpenMFG Database

We will be working with an OpenMFG report definition called “UsersMasterList.” This is a report which details information about OpenMFG user accounts. We can load the report definition into the report writer simply by opening it. To open the report definition, double-click on it—or highlight it and then select the EDIT button. The following screen will appear:

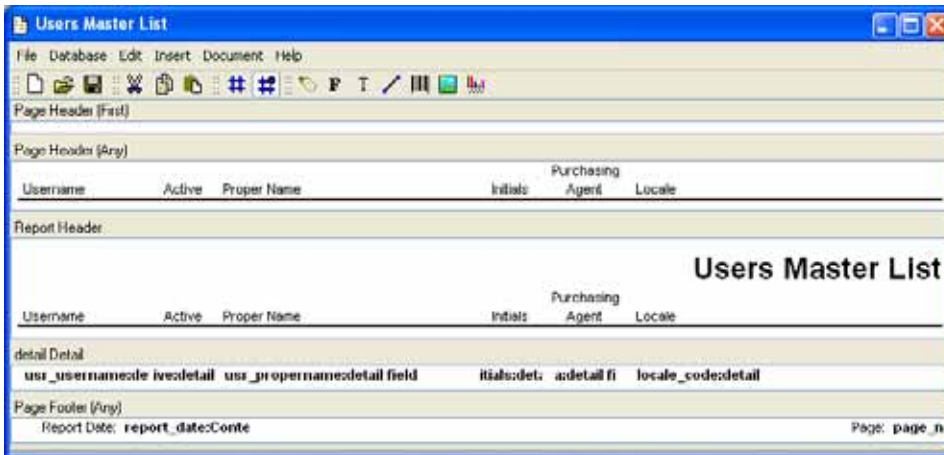


Figure 1.20: Load Report Definition from Database

The “UsersMasterList” is now loaded into the report writer. Our next step will be to save the report definition to a local drive.

### *Saving to XML*

Now that we have loaded the “UsersMasterList” report definition into the report writer, let’s save it to our local drive in XML format. To do so, select the “Save As” option from the “File” drop-down menu. The following screen will appear:

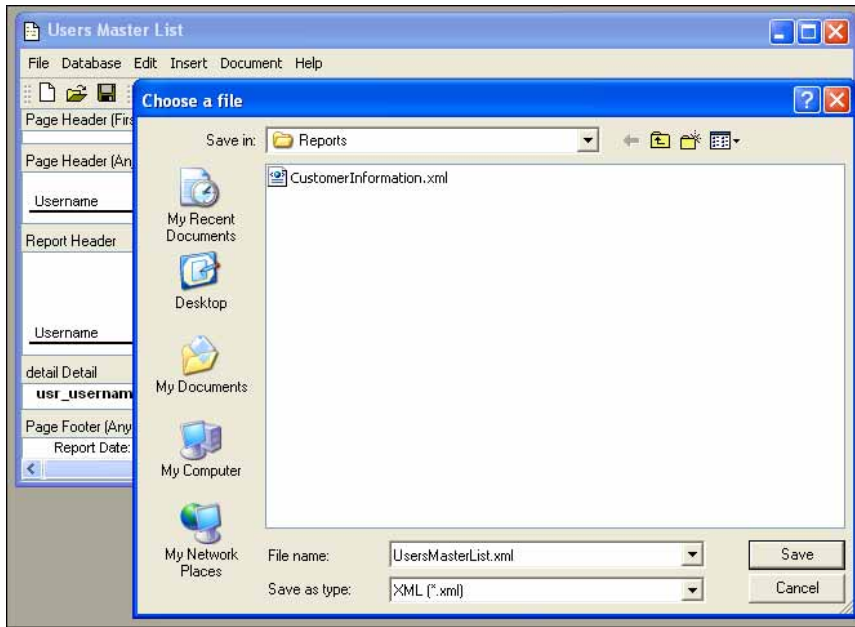


Figure 1.21: Save Report Definition to XML Format

As you can see from Figure 1.21, our operating system prompts us to name the file and also specify a storage location. We navigate to a directory where other report definitions are stored and then give the file the same name it had when it was stored in the database. We also add the “.xml” extension to the end of the file name.

---

### Tip

The names of report definition files are case-sensitive. To ensure accuracy, keep this in mind when sharing report definition files from one database to another.

---

Using an XML-compatible browser, we can now open the report definition and view the XML code, as shown in the following screenshot:

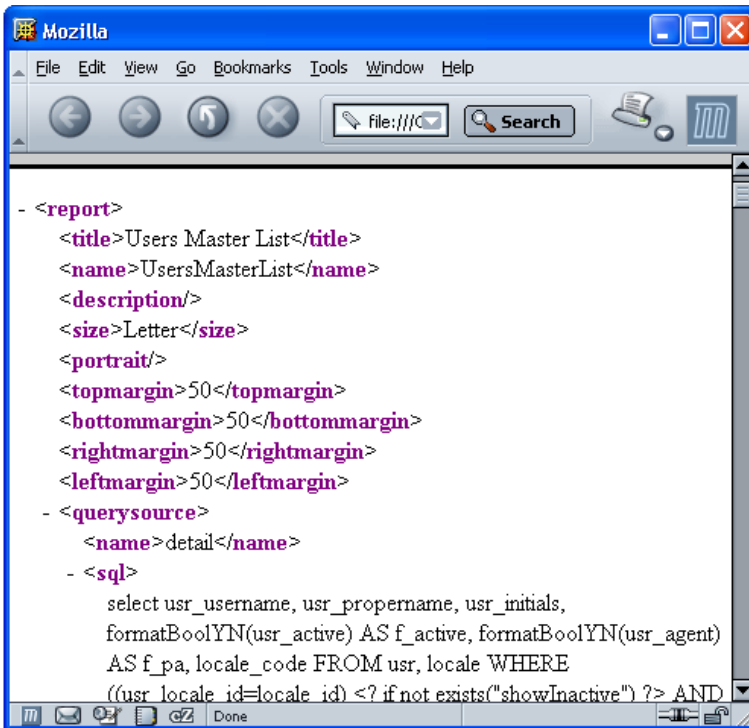


Figure 1.22: Report Definition XML Rendered in a Browser

So, we have stored the report definition on our local drive in the portable XML format. We are now able to share the file with other users, load it into the report writer for editing, or save it to another database.

## *Loading from XML*

Before we can save a locally-stored report definition to another database, we must first load the XML file into the report writer. To load a locally-stored report definition into the report writer, select either the “Open File” button or the “Open” option from the “File” drop-down menu. The following screen will appear:

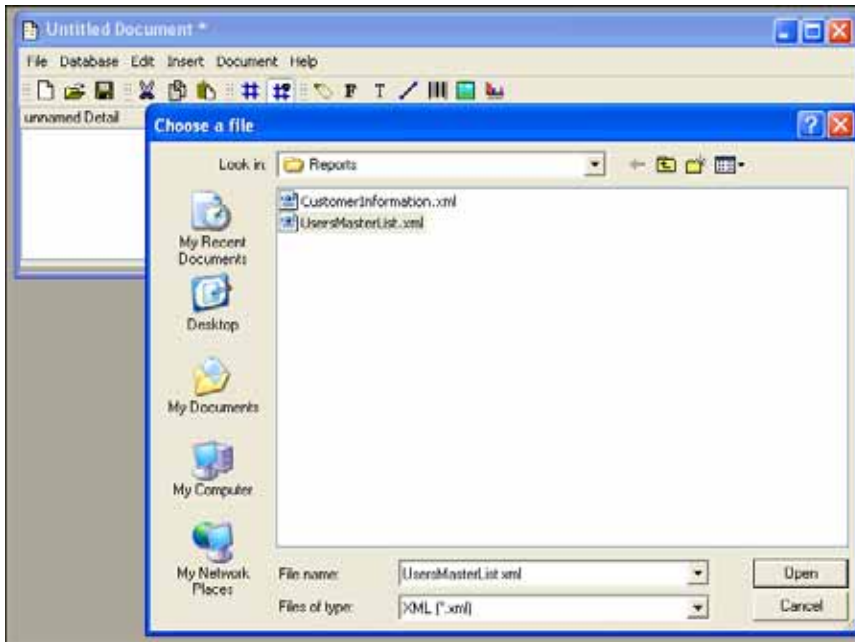


Figure 1.23: Loading XML File into the Report Writer

As Figure 1.23 shows, our operating system prompts us to locate the file we want to load into the report writer. Once we locate and select the file, the report writer loads it, as shown in the following screenshot:

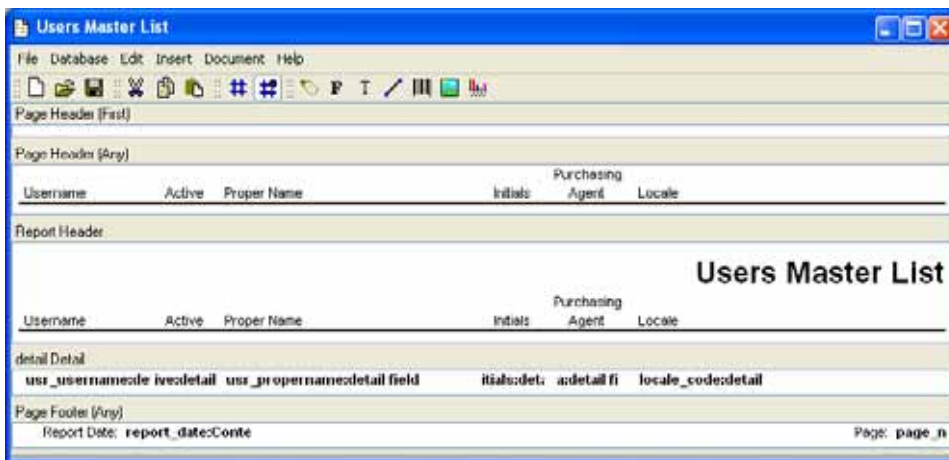


Figure 1.24: Report Definition Loaded from XML File

Now that the report definition has been loaded into the report writer, we can transfer it to a database—which we will do in our next step.

### *Saving to a Database*

Next we will save the XML report definition to an OpenMFG Database. With the report definition loaded into the report writer, select the “Save to DB” option from the “Database” drop-down menu, as shown below:

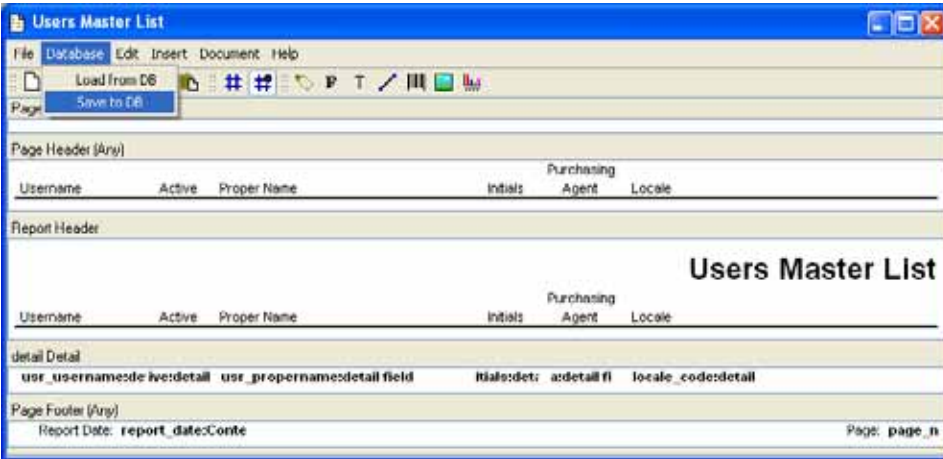


Figure 1.25: Saving Report Definition to Database

Because in this example we are connected to an OpenMFG Database, a large number of report definitions are already stored on the database. The complete list of stored report definitions appears in the next screen, which appears after we select the “Save to DB” option from the “Database” drop-down menu:



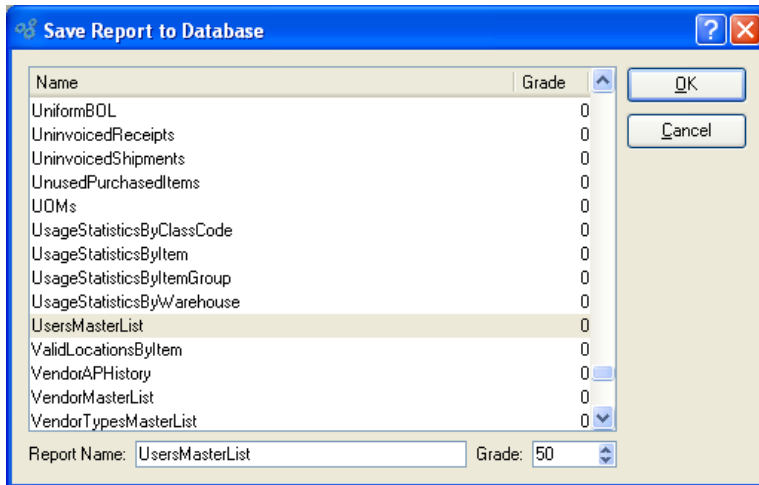


Figure 1.26: Save Report to Database with a Higher Grade

OpenMFG can only generate reports using report definitions which are saved to its database. To distinguish between different versions of a report definition, the report writer employs grades. By default, OpenMFG uses the report definition with the highest grade.

---

### Tip

Standard OpenMFG report definitions are delivered with a grade of “0”. By default, the OpenMFG client runs the highest numbered grade. To ensure that you can always return to the baseline version of a report, save your report definitions with a grade higher than 0.

---

Because our OpenMFG Database already contains one version of the “UsersMasterList” report definition, let’s save our current version with a grade of 50. This will clearly mark our current version as the default version OpenMFG should use. To see the two versions with their different grades, open the “Load from DB” option from the “Database” drop-down menu. The following screen will appear:

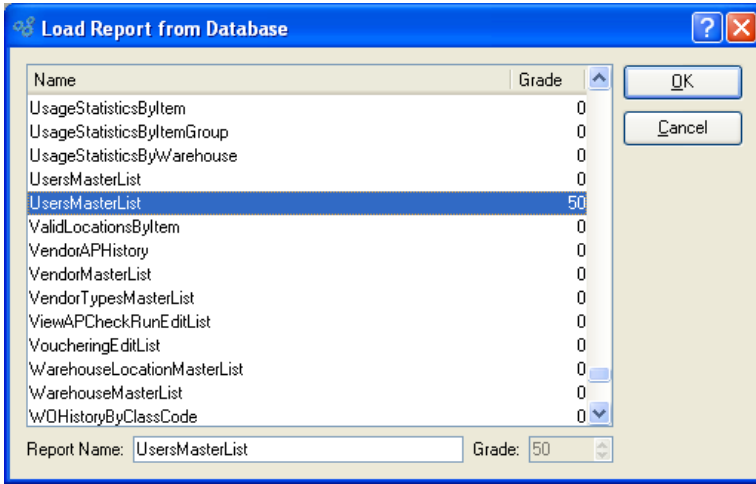


Figure 1.27: Note Multiple Grades for a Single Report

Keep in mind once again that OpenMFG will use the “UsersMasterList” report definition with grade 50 when executing this report.

## Parts of a Report Definition

---

Report definitions are structured documents used to extract data from a database and then print that data on one or more pages. The report writer gives you the ability to define simple or complex structures. In this section, we will look at the parts of a report definition.

### *Section Editor*

Report definitions created using the report writer consist of three basic sections. Those three sections are as follows:

- **Headers:** Headers are frequently used for titles, column headings, and key report information—such as Customer contact information on an Invoice. Headers may contain queries, but unlike the Detail sections of a report, Headers will only display the first row returned for a query.
- **Footers:** Footers often contain summary data—such as totals.

- **Detail Sections:** Detail sections typically contain the core information found in a report. Detail section information is typically represented in the form of multiple rows of values that were returned by a query.

To add sections to or remove sections from a report definition, use the section editor. To access the section editor, open a report definition and select the “Section Editor” option from the “Document” drop-down menu. The following screen will appear:

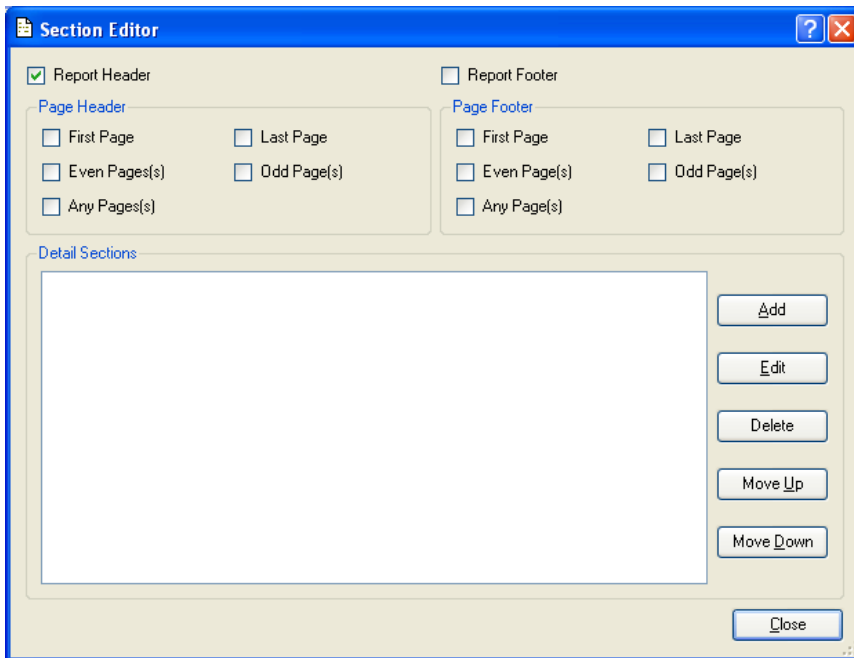


Figure 1.28: Section Editor

As you can see in Figure 1.28, the section editor contains controls for each of the three basic section types. In the following examples, we will discuss all the controls found on the section editor screen.

## *Report Headers*

Report Headers are commonly used to create report titles. Report Headers have the following characteristics:

- Always print on the report
- Always print at the top of the page, directly below Page Headers

- Directly precede first Detail section
- Only print on the first page
- Only display the first row of data returned by a query

For the purposes of this exercise, we will assume we are working with a blank report definition having no sections currently defined. To add a Report Header to a report definition, select the “Report Header” option from the section editor screen. The Report Header section will be added to the report definition, as shown in the following screen:

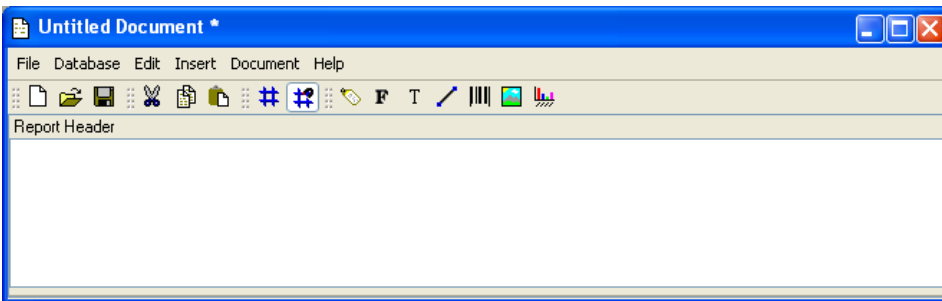


Figure 1.29: Report Header Section

When a section is added to a report definition, the name of the section appears in the upper-left-hand corner of the section. As you can see from Figure 1.29, our newly-added section is clearly labeled “Report Header.”

To remove a Report Header from a report definition, simply uncheck the “Report Header” option on the section editor screen.

## *Page Headers*

Page Headers are commonly used to contain column headings. Page Headers have the following characteristics:

- Always print at the top of a page
- Always contain the first information printed on a page
- Directly precede Report Headers
- Only display the first row of data returned by a query
- Allow multiple types for different pages
- Only one allowed per page

To accommodate the requirements of multi-page reports, the report writer supports the following five different types of Page Headers:

- **First Page:** Prints at the top of the first page of a report
- **Even Page(s):** Prints at the top of even pages of a report
- **Any Page(s):** May be used to print at the top of any page of a report
- **Last Page:** Prints at the top of the last page of a report
- **Odd Page(s):** Prints at the top of odd pages of a report

Again, only one Page Header may be printed per page. When a report definition contains more than one Page Header, the report writer recognizes the Page Headers in the following order of precedence: 1) First Page; 2) Last Page; 3) Even Page(s); 4) Odd Page(s); 5) Any Page(s).

---

#### Tip

If your report definition includes both “Even Page” and “Odd Page” Page Headers, don’t include an “Any Page” Header. Based on the report writer’s precedence rules, the “Any Page” Header would never print in this scenario.

---

To add a Page Header to a report definition using the section editor, select the type of Page Header you want to add from the “Page Header” section of the screen. For this exercise, we will add a first Page Header, as shown in the following screen:

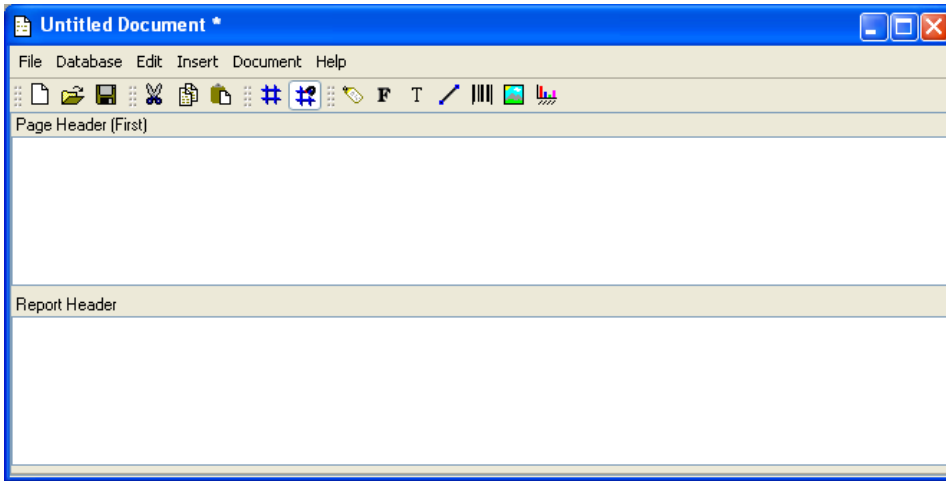


Figure 1.30: First Page Header Section

As you can see in Figure 1.30, the Page Header section is added above the Report Header section. If subsequent Page Header sections are added, they will also be placed above the Report Header section, but below the “First Page” Header.

To remove a Page Header from a report definition, simply uncheck the Page Header option you selected on the section editor screen.

## ***Report Footers***

Report Footers are commonly used to display report totals. Report Footers have the following characteristics:

- Always print on the report
- Always print at the bottom of the page, directly above Page Headers
- Directly follow the last Detail section
- Only print on the first page
- Only display the first row of data returned by a query

To add a Report Footer to a report definition, select the “Report Footer” option from the section editor screen. The Report Footer section will be added to the report definition, as shown in the following screen:

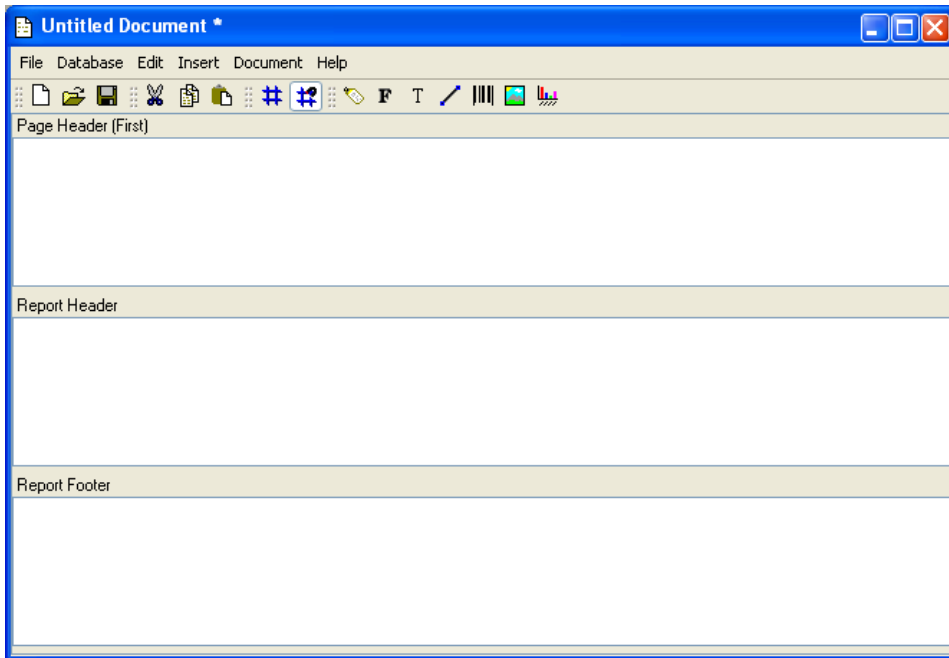


Figure 1.31: Report Footer Section

As you can see from Figure 1.31, the Report Footer section is added below the Report Header section. To remove a Report Footer from a report definition, simply uncheck the “Report Footer” option on the section editor screen.

## *Page Footers*

Page Footers are commonly used to contain report totals. Page Footers have the following characteristics:

- Always print at the bottom of a page
- Always contain the last information printed on a page
- Directly follow Report Footers
- Only display the first row of data returned by a query
- Allow multiple types for different pages
- Only one allowed per page

To accommodate the requirements of multi-page reports, the report writer supports the following five different types of Page Footers:

- **First Page:** Prints at the bottom of the first page of a report
- **Even Page(s):** Prints at the bottom of even pages of a report
- **Any Page(s):** May be used to print at the bottom any page of a report
- **Last Page:** Prints at the bottom of the last page of a report
- **Odd Page(s):** Prints at the bottom of odd pages of a report

Again, only one Page Footer may be printed per page. When a report definition contains more than one Page Footer, the report writer recognizes the Page Footers in the following order of precedence: 1) Last Page; 2) First Page; 3) Even Page(s); 4) Odd Page(s); 5) Any Page(s).

---

### Tip

If your report definition includes both “Even Page” and “Odd Page” Page Footers, don’t include an “Any Page” Footer. Based on the report writer’s precedence rules, the “Any Page” Footer would never print in this scenario.

---

To add a Page Footer to a report definition using the section editor, select the type of Page Footer you want to add from the “Page Footer” section of the screen. For this exercise, we will add a first Page Footer, as shown in the following screen:



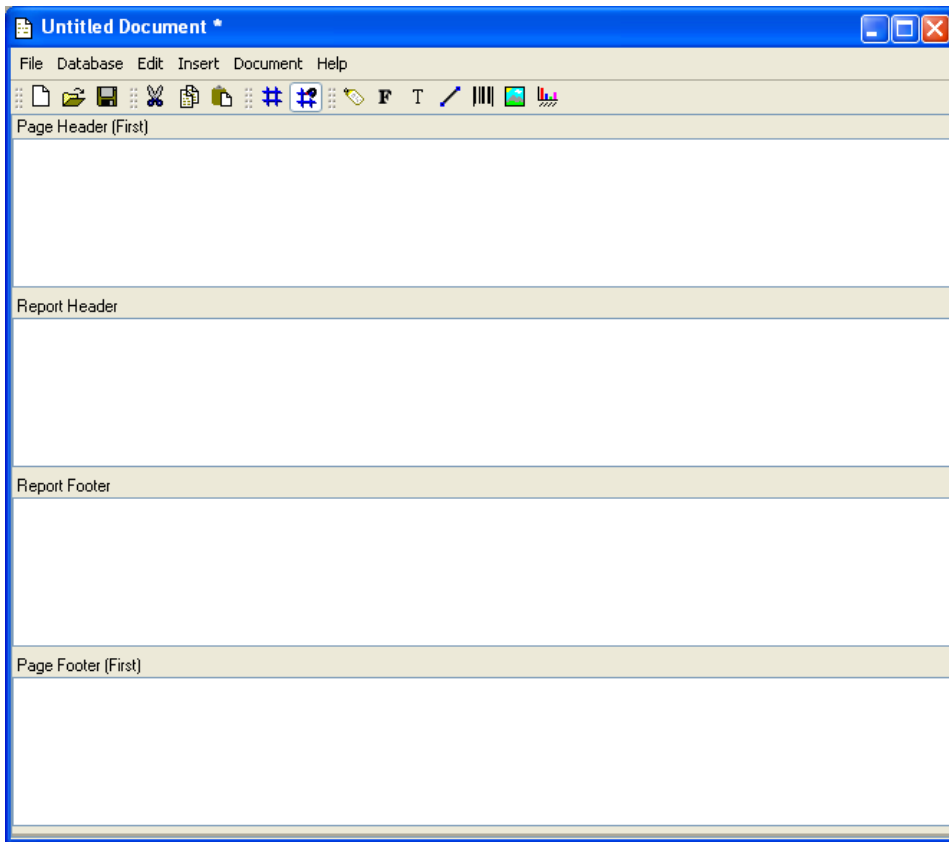


Figure 1.32: Page Footer Section

As you can see in Figure 1.32, the Page Footer section is added below the Report Footer section. If subsequent Page Footer sections are added, they will also be placed below the Report Footer section, but above the “First Page” Footer.

To remove a Page Footer from a report definition, simply uncheck the Page Header option you selected on the section editor screen.

## ***Detail Sections***

The core information in a report is displayed in its Detail section. Detail sections have the following characteristics:

- Generally print in the middle of a page

- Always contain the core information for a report
- Display multiple rows of data returned by a query
- Unlimited allowed

---

**Note**

The report writer allows you to incorporate an unlimited number of Detail sections into a report definition, although most contain just one.

---

The section editor handles Detail sections differently than it handles Header and Footer sections—that is, the process for adding and managing Detail sections is more involved. The following screen shows the section editor with a Detail section added:

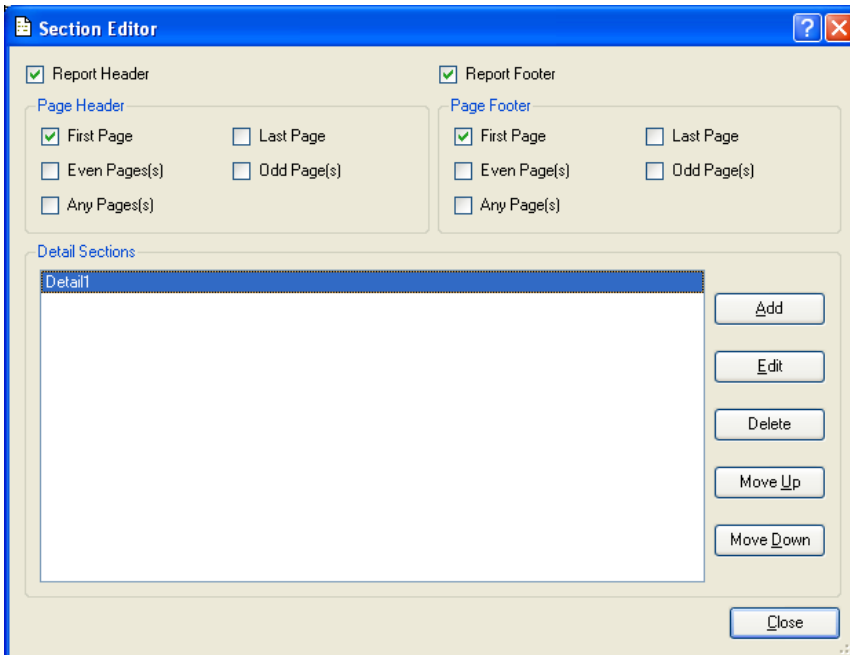


Figure 1.33: Section Editor with Detail Sections Added

When adding a Detail section to a report definition, you are presented with the following options:

**Detail Sections:** Displays the names of Detail sections added to the report definition.

- Detail sections may be added, edited, removed, or moved up and down.

To the far right of the screen, the following buttons are available:

**ADD:** Opens screen for adding a new Detail section to the report definition, as described below.

**EDIT:** Enables you to edit highlighted Detail section. The edit screen is the same as that for adding a new Detail section—except that when editing, the fields will contain Detail section information.

**DELETE:** Highlight a Detail section and then select this button to remove the Detail section from the list.

**MOVE UP:** Highlight a Detail section and then select this button to move the Detail section up the list.

**MOVE DOWN:** Highlight a Detail section and then select this button to move the Detail section down the list.

**CLOSE:** Closes the screen, returning you to the application desktop.

To add a new Detail section to a report definition, select the ADD button. The following screen will appear:

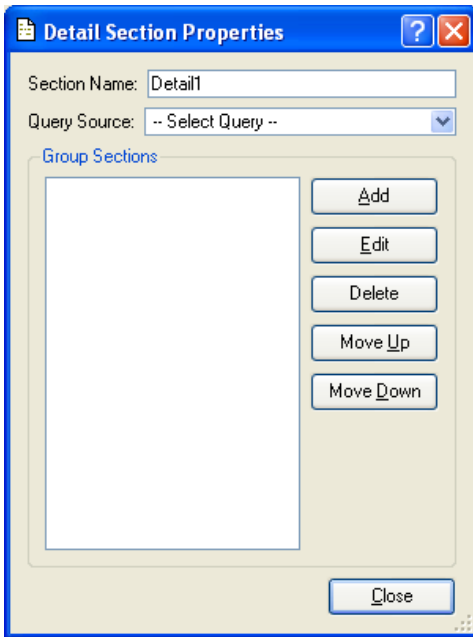


Figure 1.34: Add New Detail Section

When adding a new Detail section to a report definition, you are presented with the following options:

**Section Name:** Enter a name to identify the Detail section.

**Query Source:** Select a query source from the drop-down menu by clicking on the arrow to the right of the field.

- Query sources are used to populate report definition objects with dynamic data from the database the report writer is connected to.

---

#### Note

For more information on query sources and the link between database fields and report definition objects, please see the Getting Started chapter.

---

**Group Sections:** Displays the names of Group sections added to the report definition.

- Group sections may be added, edited, removed, or moved up and down.

To the far right of the screen, the following buttons are available:

**ADD:** Opens screen for adding a new Group section to the report definition, as described below.

**EDIT:** Enables you to edit highlighted Group section. The edit screen is the same as that for adding a new Group section—except that when editing, the fields will contain Group section information.

**DELETE:** Highlight a Group section and then select this button to remove the Group section from the list.

**MOVE UP:** Highlight a Group section and then select this button to move the Group section up the list.

- The Group section appearing at the top of the list is considered the first, or outermost Group section. During processing, the outermost section is handled first, followed by the next innermost section, and then the next innermost, etc.

**MOVE DOWN:** Highlight a Group section and then select this button to move the Group section down the list.

- The Group section appearing at the bottom of the list is considered last, or innermost Group section. During processing, the outermost section is handled first, followed by the next innermost section, and then the next innermost, etc.

**CLOSE:** Closes the screen, returning you to the application desktop.

When a Detail section has been added using the section editor, the report writer incorporates the Detail section into the report definition, as shown in the following screen:

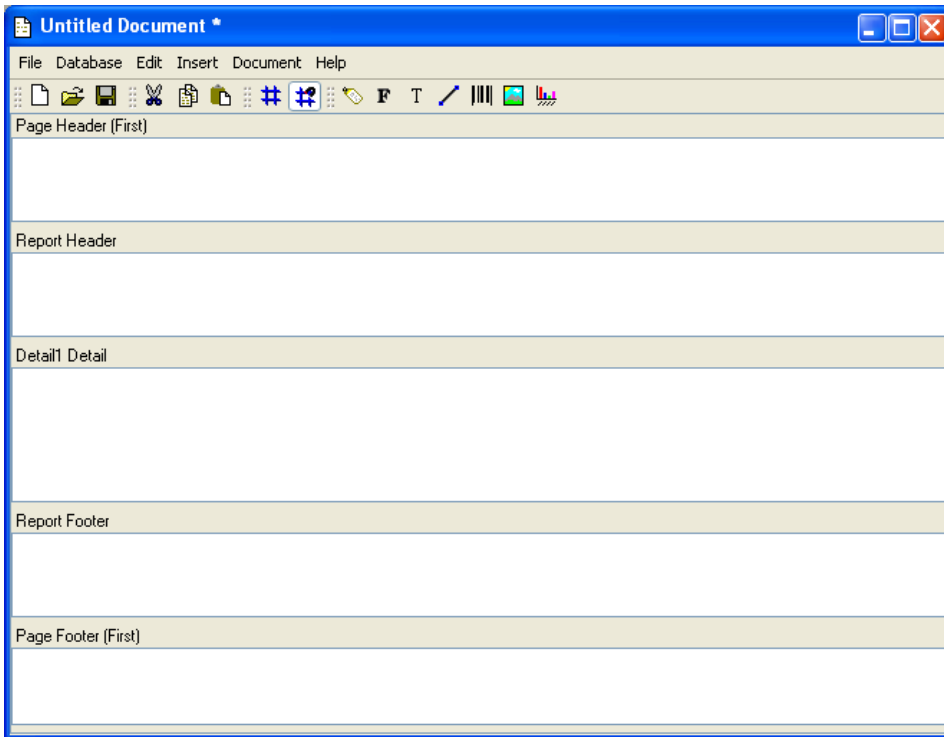


Figure 1.35: Detail Section

As you can see in Figure 1.35, the Detail section has been added to the report definition. The Detail section appears in the middle of the page, sandwiched between the Report Header and Report Footer.

## *Group Sections*

While most reports can be defined using a single Detail section having multiple columns and rows of data, others require summary data—such as subtotals. For reports requiring summary data, the report writer supports Group sections. Group sections have the following characteristics:

- Always associated with Detail sections
- Defined by Group Headers and Group Footers
- Group Headers always print above Detail sections
- Group Footers always print below Detail sections

- Reference database column on which Group Headers and Group Footers will break
- Force new Group Header each time the value of the referenced column changes
- Force a new Group Footer each time the value of the referenced column changes
- Unlimited allowed

To add a Group section to a report definition, select the ADD button from the “Detail Section Properties” screen. The following screen will appear:

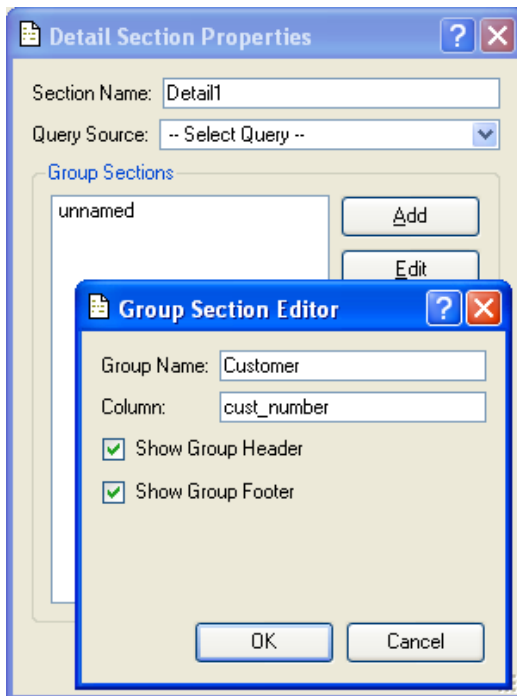


Figure 1.36: Group Section Editor

When adding a Group section to a Detail section, you are presented with the following options:

**Group Name:** Enter a name to identify the Group section.

**Column:** Specify the name of the database column you want to use from the selected query source.

- A query source may refer to multiple columns in its SELECT statement. By indicating a specific column, you instruct the query source to return data only for that specified column. Other columns appearing in the SELECT statement will be ignored.

---

**Note**

For more information on query sources and the link between database fields and report definition objects, please see the Getting Started chapter.

---

**Show Group Header:** Select to include a Group Header in the report definition.

- The Group Header will print above the Detail section. If not selected, no Group Header will be included in the report definition.

---

**Tip**

Be sure to specify a Group Header and/or a Group Footer. Without either, no Group section will print on the report definition.

---

**Show Group Footer:** Select to include a Group Footer in the report definition.

- The Group Header will print below the Detail section. If not selected, no Group Footer will be included in the report definition.

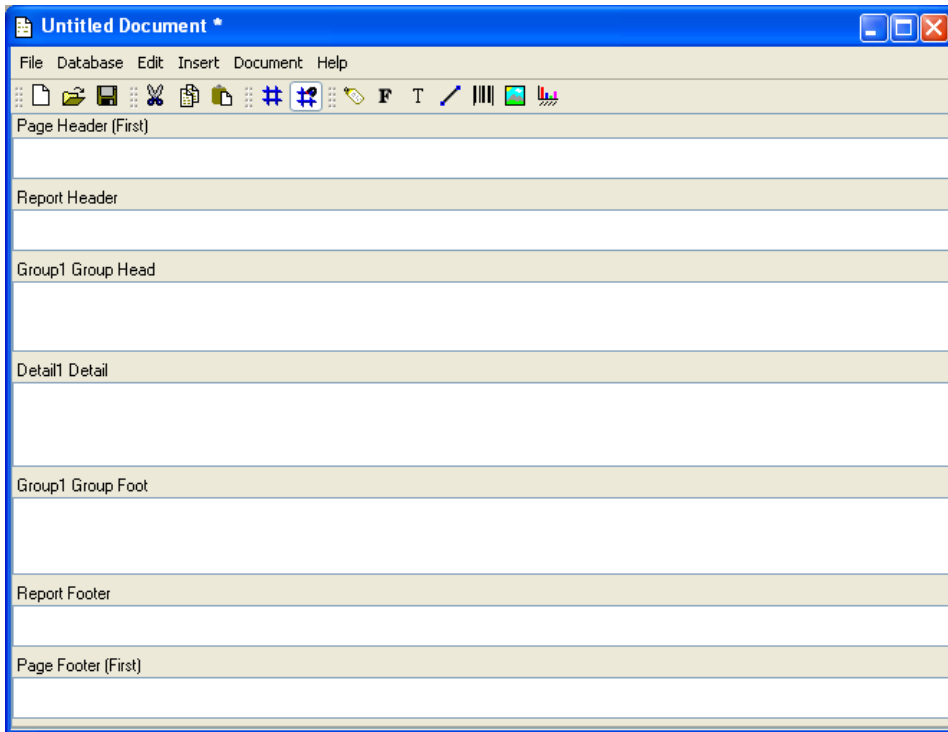
At the bottom of the screen, the following buttons are available:

**OK:** Select to save your settings.

**CANCEL:** Closes the screen without saving any changes, returning you to the application desktop.

When a Group Header and Group Footer have been added using the section editor, the report writer incorporates both sections into the report definition, as shown in the following screen:





**Figure 1.37: Group Headers and Footers**

As you can see in Figure 1.37, the Group Header has been added above the Detail section, and the Group Footer has been added below the Detail section.

To better understand the relationship between Detail sections and Group Headers and Group Footers, let's look at a sample report generated from data in an OpenMFG Database. The following Sales Analysis report is called "Time Phased Sales History by Customer by Item":

Time Phased Sales History By Customer By Item						
Cust./Cust. Type: <b>All Customers</b>						
Product Category: <b>All Product Categories</b>						
Calendar: <b>3MonthsBack</b>						
	<b>3 Months Back</b>		<b>07/11/2004</b>		<b>08/10/2004</b>	
	<b>2 Months Back</b>		<b>08/11/2004</b>		<b>09/10/2004</b>	
	<b>1 Month Back</b>		<b>09/11/2004</b>		<b>10/10/2004</b>	
	<b>Today</b>		<b>10/11/2004</b>		<b>10/11/2004</b>	
Cust Number: <b>TTOYS</b>			Sales Rep. #: <b>RAY</b>			
Cust. Name: <b>Old Towne Toys</b>			Sales Rep. Name: <b>Ray Perkins</b>			
Period	Qty.	Sales	Costs	Margin	Margin %	
Item Number: <b>YTRUCK1</b>		Warehouse: <b>WH1</b>				
<b>Yellow Tough Truck</b>						
<b>08/11/2004-09/10/2004</b>	<b>1,450.00</b>	<b>41,225.00</b>	<b>13,499.50</b>	<b>27,725.50</b>	<b>67.25</b>	
<b>09/11/2004-10/10/2004</b>	<b>600.00</b>	<b>17,400.00</b>	<b>5,586.00</b>	<b>11,814.00</b>	<b>67.90</b>	
Item Totals:	<b>2,050.00</b>	<b>58,625.00</b>	<b>19,085.50</b>	<b>39,539.50</b>	<b>67.44</b>	
Item Number: <b>RTRUCK1</b>		Warehouse: <b>WH1</b>				
<b>Red Tough Truck</b>						
<b>09/11/2004-10/10/2004</b>	<b>1.00</b>	<b>29.50</b>	<b>10.61</b>	<b>18.89</b>	<b>64.03</b>	
Item Totals:	<b>1.00</b>	<b>29.50</b>	<b>10.61</b>	<b>18.89</b>	<b>64.03</b>	
Customer Totals:		<b>58,654.50</b>	<b>19,096.11</b>	<b>39,558.39</b>	<b>67.44</b>	
Cust Number: <b>ZTOYS</b>			Sales Rep. #: <b>RAY</b>			
Cust. Name: <b>Zell Toy Factory</b>			Sales Rep. Name: <b>Ray Perkins</b>			
Period	Qty.	Sales	Costs	Margin	Margin %	
Item Number: <b>RTRUCK1</b>		Warehouse: <b>WH1</b>				
<b>Red Tough Truck</b>						
<b>10/11/2004-10/11/2004</b>	<b>1.00</b>	<b>29.50</b>	<b>10.61</b>	<b>18.89</b>	<b>64.03</b>	
Item Totals:	<b>1.00</b>	<b>29.50</b>	<b>10.61</b>	<b>18.89</b>	<b>64.03</b>	
Customer Totals:		<b>29.50</b>	<b>10.61</b>	<b>18.89</b>	<b>64.03</b>	
Report Totals:		<b>58,684.00</b>	<b>19,106.72</b>	<b>39,577.28</b>	<b>67.44</b>	

Figure 1.38: Sample Report Showing Group Headers and Group Footers

The “Time-Phased Sales History by Customer by Item” report contains a Detail section with two Group sections associated with it. The outermost Group section refers to Customer information. The second, innermost Group section refers to Item information. Basically, if you study the report shown in Figure 1.38, you will see that the sections are printed in the following descending order:

1. Group Header (Customers)
2. Group Header (Items)

3. Detail Section (Dates/Amounts)
4. Group Footer (Items)
5. Group Footer (Customers)

Because the report contains data for two Customers, you can see in the screenshot that the sequence of sections repeats itself twice. You can also see that Group Footers are used to provide both Item and Customer subtotals. As we mentioned earlier, Group sections are commonly used for summary information.

---

#### **Note**

Group Headers and Group Footers are powerful features which enable you to generate reports which provide multiple levels of detail and roll-up values. However, you will find that most report definitions will conform to the following basic structure:

- Page Header: Any Page(s)
  - Detail Section
  - Page Footer: Any Page(s)
- 

The report shown in Figure 1.38 is the actual report printed from data in an OpenMFG Database. The following screenshot shows the report definition used to generate the sample report.

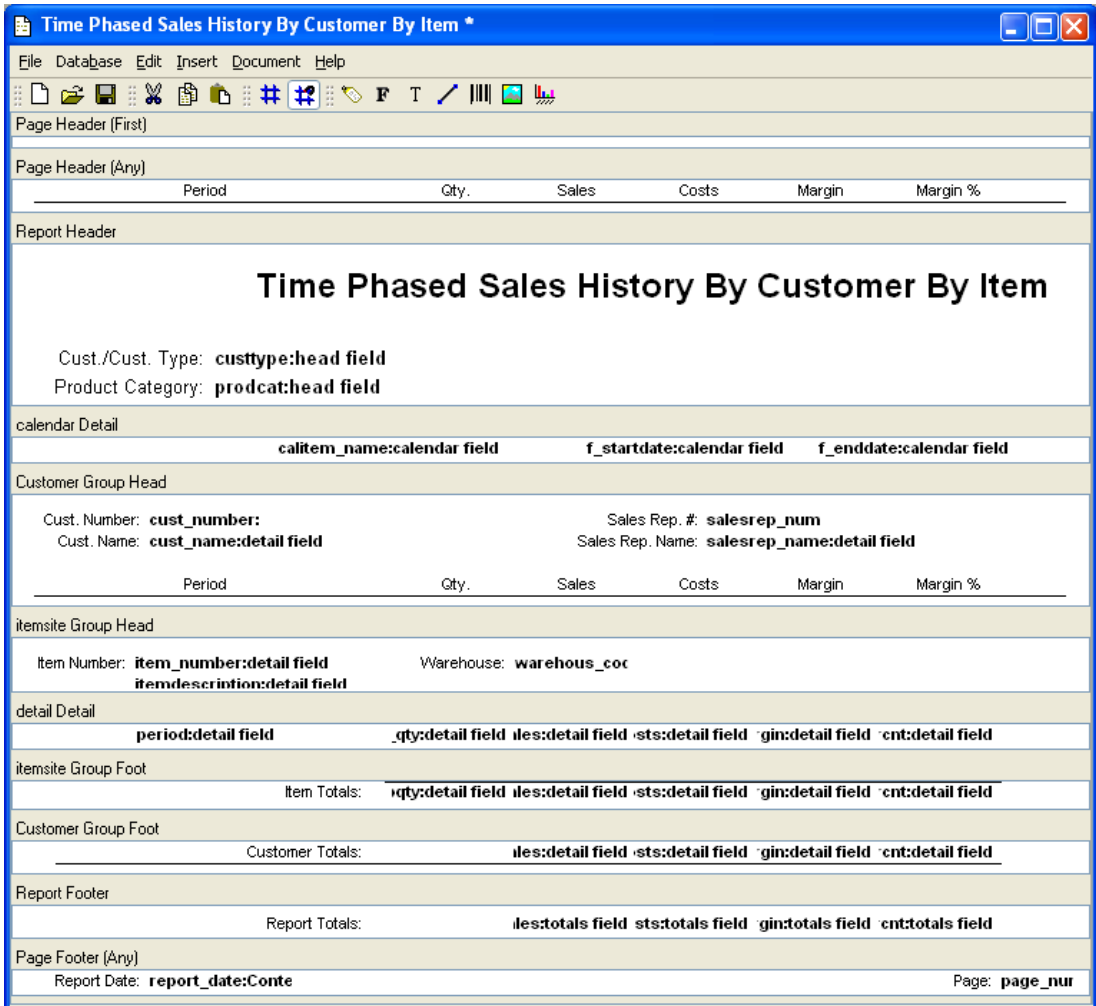


Figure 1.39: Report Definition Used for Sample Report

If some aspects of the report definition shown in Figure 1.39 seem confusing, don't worry. We will be covering the mechanics of report writing in subsequent chapters.

---

# 2

## Getting Started

In this chapter, we will be taking a hands-on approach to illustrate fundamental report writer functionality. The exercises will focus on the embedded OpenMFG report writer, connected to an OpenMFG Database. However, the fundamentals described here also apply to the stand-alone OpenRPT application.

### Modifying an Existing Report

---

The best way to illustrate report writer functionality is to work with an existing report definition—rather than create a new one from scratch. So, for this first exercise we will be modifying a report definition called “UsersMasterList.” The “UsersMasterList” report definition is a stock OpenMFG report designed to provide information about OpenMFG users.

---

#### Note

The data used in this exercise is pulled from a sample OpenMFG Database.

---

To begin, we must first log in to OpenMFG. By logging in, we automatically connect to an OpenMFG Database. The user information we will be working with is stored in the OpenMFG Database.

We can access the “UsersMasterList” report by selecting the “Reports” option from the “Master Information” section of the System Module. Scroll down the master list of report definitions until you reach the “UsersMasterList” report. Highlight the report, then select the EDIT button. The following screen will appear:

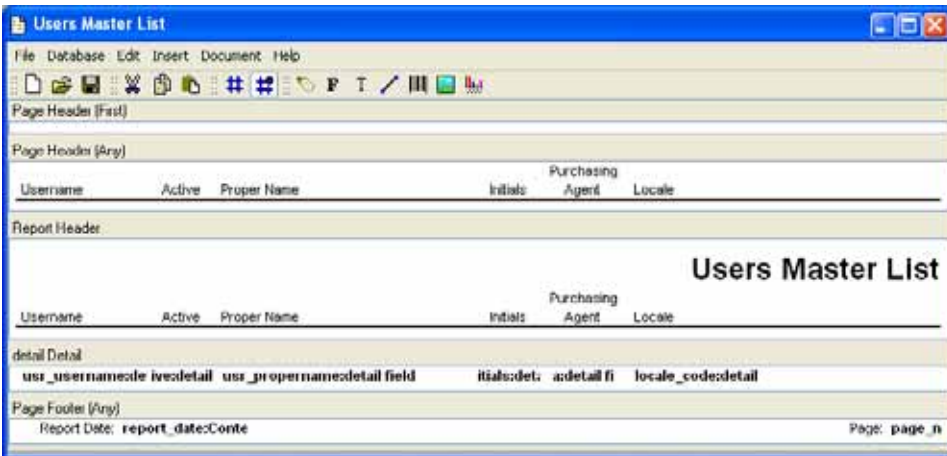


Figure 2.1: Users Master List Report Definition

In the Report Writer Basics chapter, we discussed the importance of grades—and how multiple versions of the same report may be stored on a database using different grades. By default, OpenMFG uses the report definition having the highest grade.

To differentiate our working version of the “UsersMasterList” report definition from the standard version, we will save it with a different grade. To save a report definition with a different grade, select the “Save to DB” option from the “Database” menu. The following screen will appear:

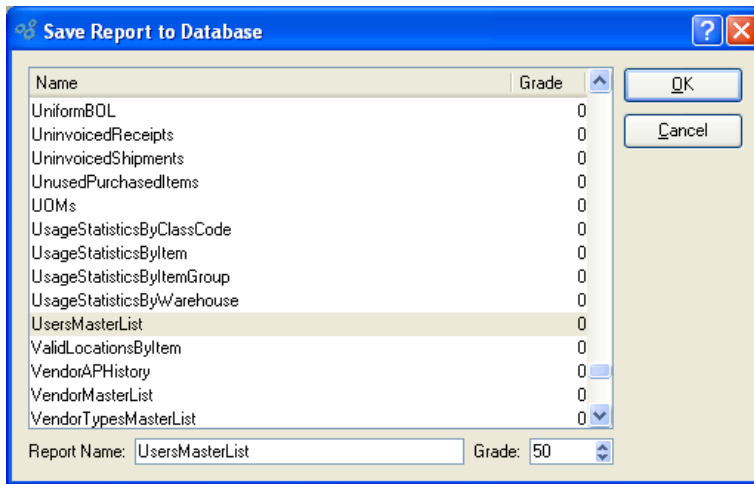


Figure 2.2: Save Report to Database with a Higher Grade

We will keep the same name, but change the grade to 50. When we select the OK button, the report definition is saved to the database.

### Tip

If you want to save your changes to the database, be sure to select the “Save to DB” option. Report definitions stored on a local or network drive may also be saved to a database in this way.

We have now made a copy of the report definition—and assigned it a high grade (“50”). When OpenMFG runs the report, it will use our version of the report definition because ours has been assigned the highest grade in the sample database.

## Query Sources Overview

The report writer uses Structured Query Language (SQL) to retrieve information from a database. In this section, we will look at how report definitions use SQL queries to collect the information which is displayed in a report.

To view the SQL query associated with the “UsersMasterList” report definition, select the “Query Sources” option from the “Document” menu. The following screen will appear:

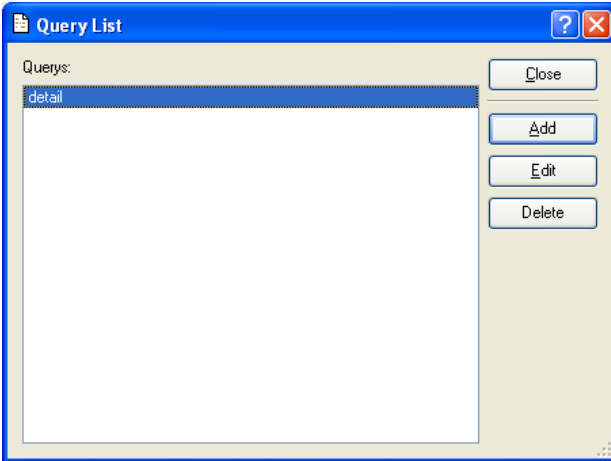


Figure 2.3: Query List

The query master list shows all the queries defined for a report definition. In this case, only one query has been defined. To view the query, double-click on it—or highlight it and then select EDIT. The following screen will appear:

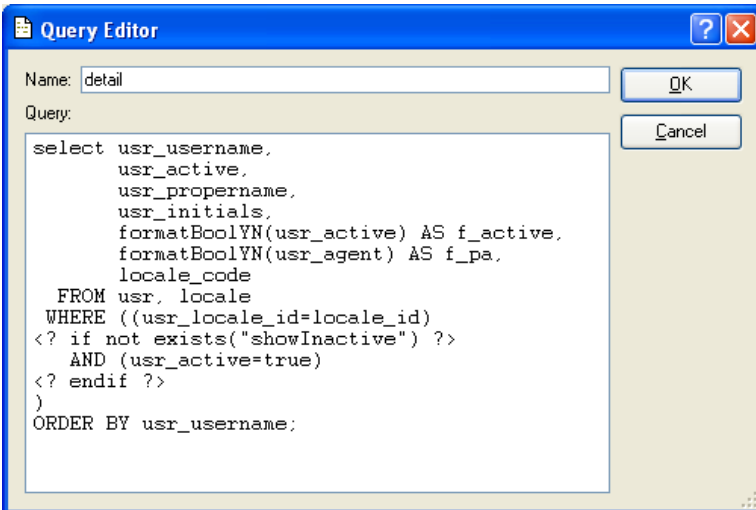


Figure 2.4: Query Editor Showing SQL Statement

The basic SQL query structure used by many report definitions reads as follows: SELECT (column) FROM (table) WHERE (condition) and, optionally, ORDER BY (column). The query shown in Figure 2.4 follows this basic format.



Readers familiar with SQL may have noticed portions of the statement surrounded by `<?...?>` tags. These tags signal the use of MetaSQL. MetaSQL is an embedded query language designed to make SQL queries dynamic. The MetaSQL language was developed by OpenMFG for use by the report writer.

---

#### Note

For more information on MetaSQL, the embedded query language designed by OpenMFG to make SQL queries dynamic, please see the Advanced Topics chapter.

---

We could edit the query shown in Figure 2.4, using the query editor. But at this point, we simply want to familiarize ourselves with the query. We will be making cosmetic changes to the report in the next sections.

## *Editing Labels*

Label objects contain static text displayed in a report. Text is considered static if it resides in a report definition and is not pulled dynamically from a database. A report title is an example of static text contained within a Label object. In our next exercise, we will show how to modify a report title.

To change the title appearing on the “UsersMasterList” report definition, locate the Label object containing the title in the Report Header section. The title of the report is “Users Master List.” Double-clicking on the object will open the Label properties screen. We will change the text of the Label and align the text on the left margin, as shown in the following screen:

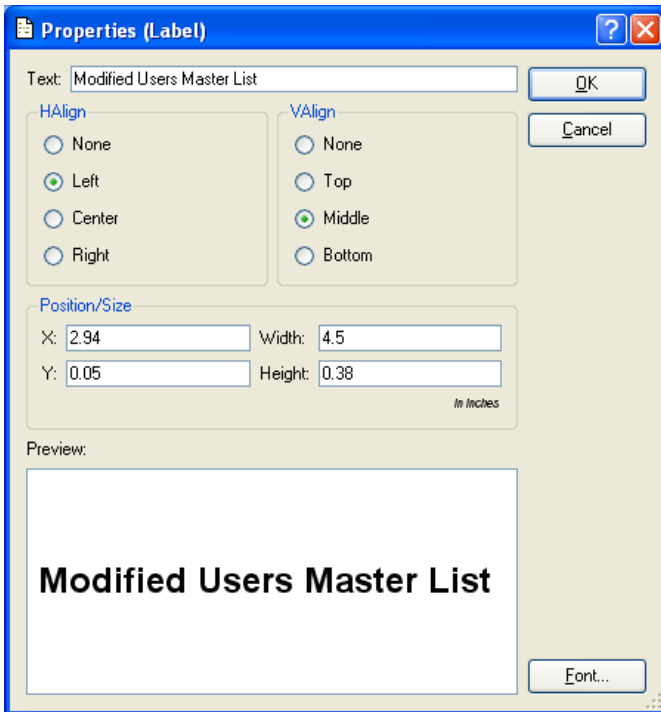


Figure 2.5: Modified Label Properties

After we have made the changes, we select the OK button. The changes are now applied to the Label object. Finally, we click on the Label object and drag it to the left-hand margin of the report definition—then save the report definition to the database. All these changes appear in the following screenshot:

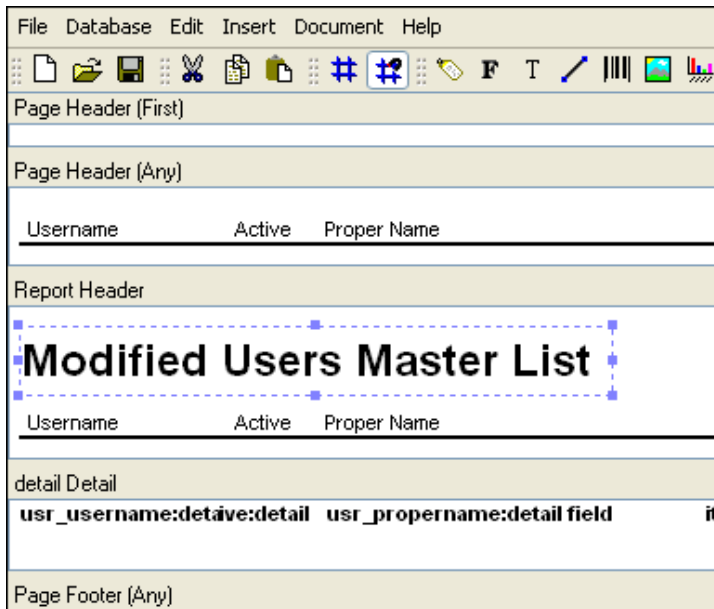


Figure 2.6: Report Definition Showing Updated Label

### Tip

Using your mouse, you can click on a Label object and drag it to a new position. Or you can resize a Label object, using the handles on the perimeter of the object.

## Editing Fields

Field objects contain dynamic information retrieved from a database. The dynamic information is pulled into the Field using query sources. For this exercise, we will be making a cosmetic change to the user name Field. The user name Field is the Field used to print user names on the “UsersMasterList” report. Later, we will add a new Field object.

Our goal in this exercise is to increase the font size used to print user names on the “UsersMasterList” report. By default, these names are printed in 8-pt font. We will be increasing the font size to 14-pt.

To begin, we must first locate the Field object which contains the user name Field. We find it partially obscured on the left-hand margin of the Detail section. It is the Field having the name “usr\_username:detail”, as shown in the following screen:

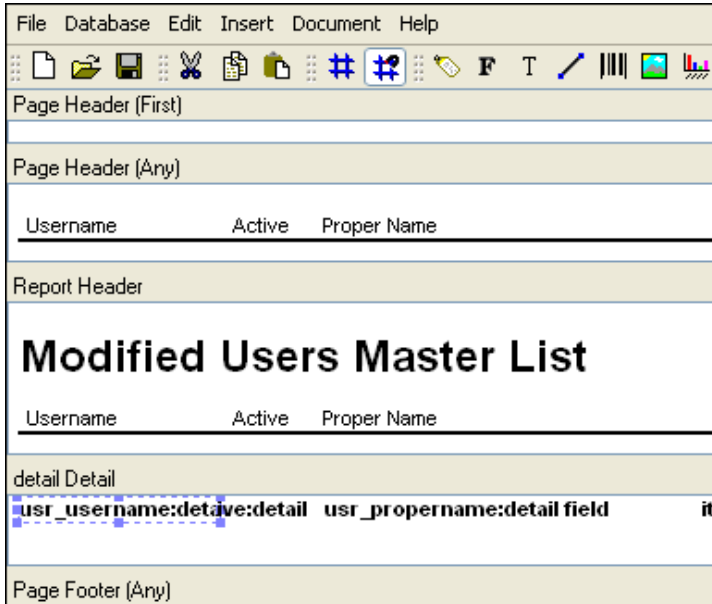


Figure 2.7: Standard Size Font for User Name Field

---

**Note**

Don't be concerned if Field objects overlap, causing the names which identify them to become partially obscured. This is common when Field objects are located adjacent to each other.

---

To edit the properties of the user name Field, we double-click on the Field object. The following Field properties screen will appear.

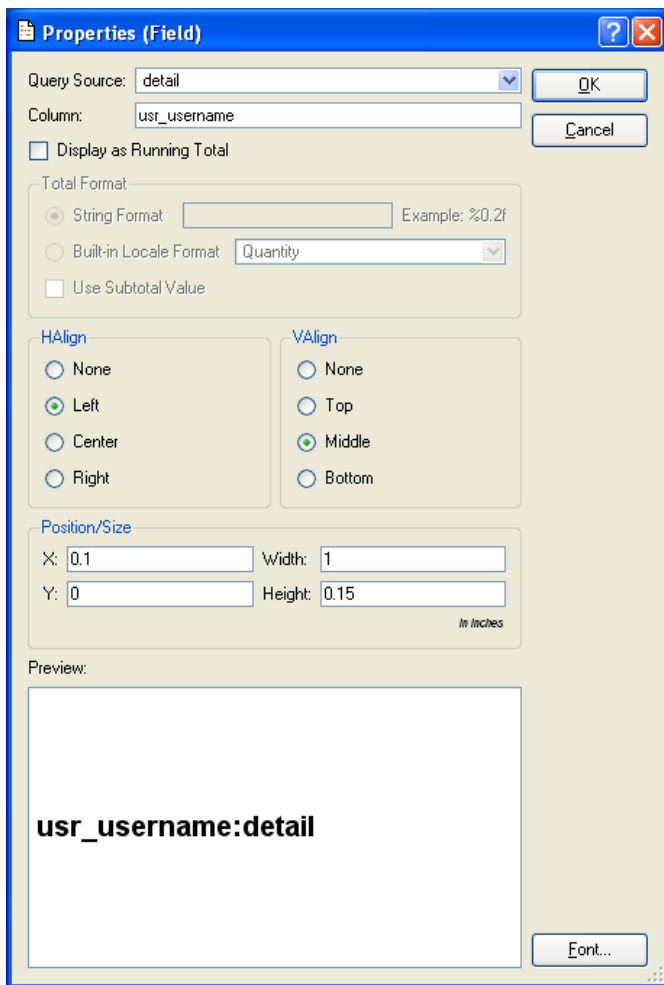


Figure 2.8: Field Properties

As you can see in Figure 2.8, the query source being used to populate the Field is the “detail” query source. This is the same query source we looked at in the “Query Sources Overview” section. The “detail” query uses SQL to retrieve user information from the database the report writer is connected to. The column referenced in Figure 2.8—that is, `usr_username`—is one of the columns mentioned in the “detail” query’s SELECT statement. Only this column will be used when retrieving data into the Field. All other columns referenced in the SELECT statement will be ignored.

**Note**

This explains how Field names are determined: They begin with the name of a column referenced in a query source, and are followed by the name of the very same query source. And so, in our current example, we get “usr\_username:detail.”

---

For now, we are concerned only with changing the font size used to print user names on the “UsersMasterList” report. We select the FONT button at the bottom of the screen and specify a 14-pt font size. After we select the OK button, we see the change reflected in the report definition, as shown below:

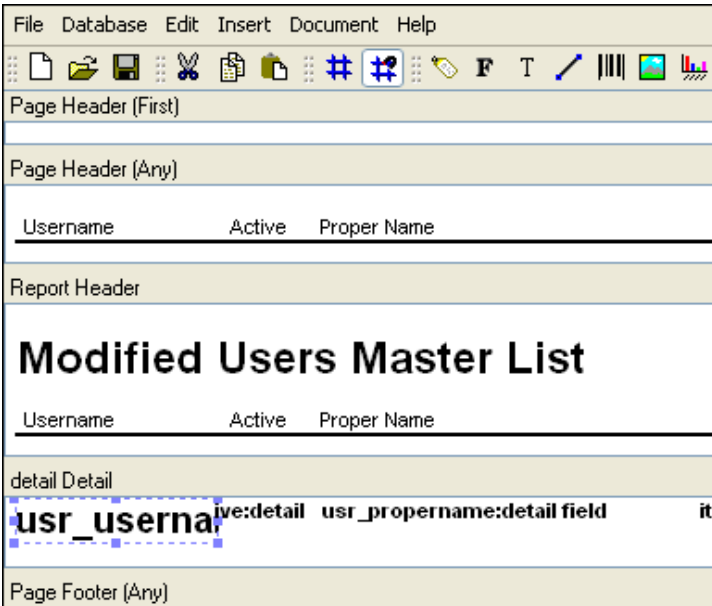


Figure 2.9: Enlarged Font Size for User Name Field

For now, we won’t worry about the length of the Field. We will, however, adjust the height of the Field object to accommodate the larger font. Once we have saved our changes to the database, we can run the report and see how our updates have affected the printed results.

To run the report from within OpenMFG, open the “Maintain Users” option from the System Module menu. After selecting the PRINT button, the report will print out as follows:



<b>Modified Users Master List</b>					
Username	Active	Proper Name	Initials	Purchasing Agent	Locale
<b>jsmith</b>	Yes	John Smith	JS	Yes	Default
<b>mfgadmin</b>	Yes	OpenMFG Administrator	admin	Yes	Default
<b>rjones</b>	Yes	Roy Jones	RJ	No	Default

Figure 2.10: Modified Report Output

As you can see in Figure 2.10, the user names have in fact been printed in 14-pt font, as expected. The information contained in other Fields—active status, proper name, initials, etc.—still appears in the default 8-pt font. Notice that the printed title of the report has also been modified, per our report definition changes.

## *Adding Bar codes*

Now that we have made a few cosmetic changes to a report definition, we are now ready to make a more significant change. In this next exercise, we will add a Bar code object to print user names in Bar code format.

The mechanics of adding a Bar code object  are the same as adding a human-readable Field object . When we are done, we will have a report that looks like the following:

### Modified Users Master List




Username	Active	Proper Name	Initials	Purchasing Agent	Locale
<b>jsmith</b> 	Yes	John Smith	JS	Yes	Default
<b>mfgadmin</b> 	Yes	OpenMFG Administrator	admin	Yes	Default
<b>rjones</b> 	Yes	Roy Jones	RJ	No	Default

Figure 2.11: Preview of Report with Bar Codes Added


We will be adding the Bar code object just below the Field object containing the human-readable user name. To do so, we first need to expand the lower boundary of the “UsersMaster-List” Detail section.

---

#### Tip

To expand the height of a section, simply hold your mouse over the lower boundary of the section. When the double arrows of the resize cursor appear, use your mouse to expand the section.

---

Once the Detail section has been expanded, we select the Bar code button  from the toolbar and then click in the section just below the user name Field. We have now inserted the Bar code object into the report definition, as shown in the following screen.



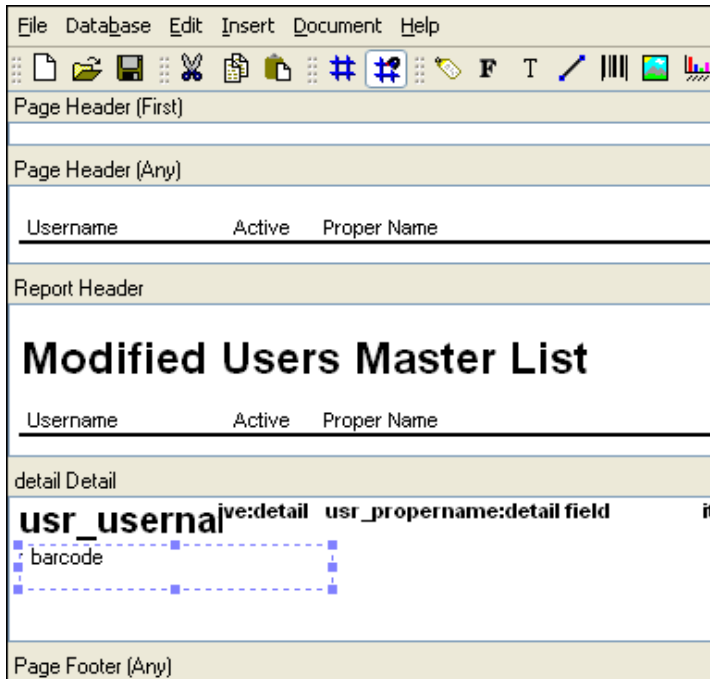


Figure 2.12: Bar Code Object Inserted into Report Definition

We must now specify the properties of the Bar code object. To do so, we double-click on the Bar code object. The following screen will appear:

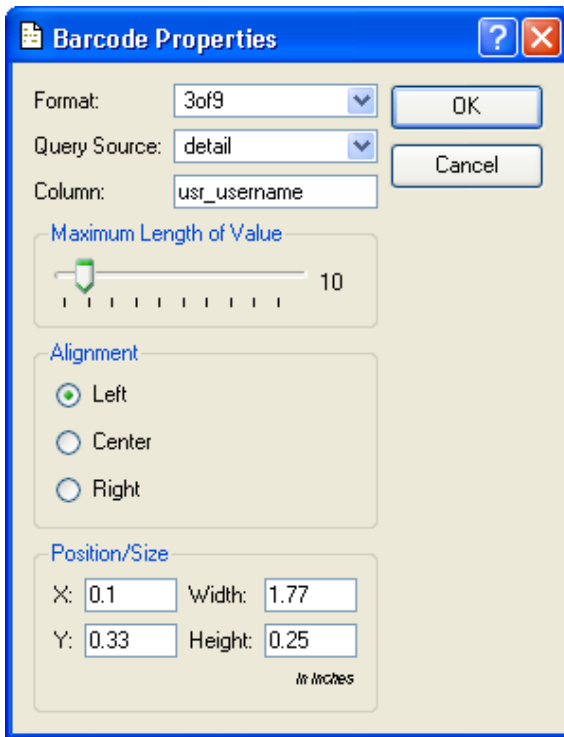


Figure 2.13: Bar Code Properties

Like Field objects, Bar code objects contain dynamic information retrieved from a database. As you can see in Figure 2.13, the Bar code properties screen requires a Query Source and column name. The dynamic information we need for this exercise is the same as we needed in the “Editing Fields” section—namely, user names retrieved from the `usr` table. The only difference here is that we will be representing user names in Bar code format. We enter the following parameters:

**Format:** 3of9

- The report writer supports the following Bar code formats: 3of9, 3of9+, 128, ean13, ean8, upc-a, and upc-e.

**Query Source:** detail

**Column:** `usr_username`

**Maximum Length of Value:** 10

- Specifies the maximum number of characters the Bar code is expected to contain.

After we select the OK button, we see the Bar code object has been updated in the report definition, as shown below:

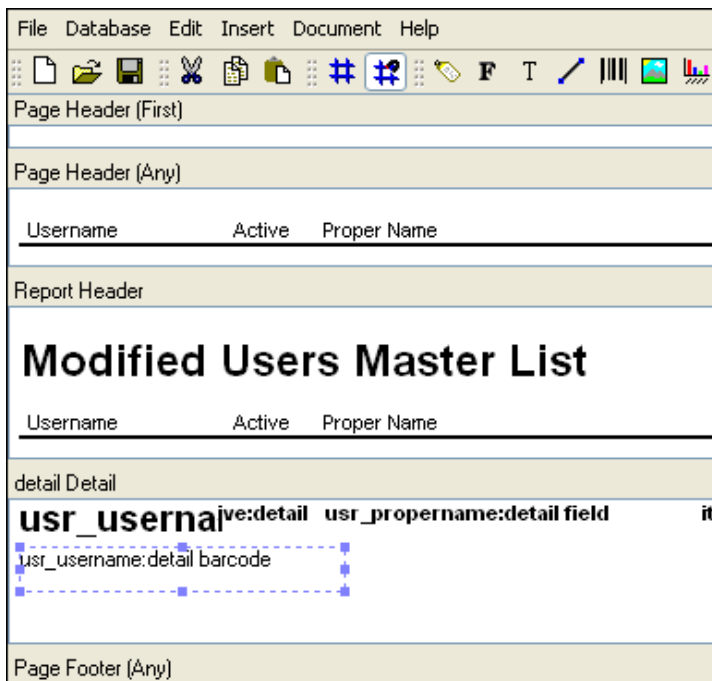


Figure 2.14: Detail Section with Bar Code Added

As you can see, the Bar code object is now identified with the name “usr\_username:detail barcode.” This name refers to the column and Query Source which will be used to generate user name data in Bar code format. Before we save our changes to the database, we click on the right side of the Bar code object and drag it to make it longer.

We have now successfully created a Bar code object that will print in “3of9” format—one of several widely-used Bar code formats supported by the report writer. Now let’s print the report and see the results.

To print the Users Master List, select the “Maintain Users” option from the System Module menu. When the master list of users appears, select the PRINT button. The following screen shows a portion of the printed report:




Username	Active	Proper Name	Initials	Purchasing Agent	Locale
<b>jsmith</b> 	Yes	John Smith	JS	Yes	Default
<b>mfgadmin</b> 	Yes	OpenMFG Administrator	admin	Yes	Default
<b>rjones</b> 	Yes	Roy Jones	RJ	No	Default

Figure 2.15: Report with Bar-Coded Username

As you can see, the final result matches the result we expected to see when we began this section. The user names on the Users Master List are now both human-readable and machine-readable.

## Column Headings

---

The “UsersMasterList” report definition utilizes three different Header types: Page Header (First), Page Header (Any), and Report Header. The following screenshot shows how each of these Headers fits within the report definition:

Page Header (First)			
Page Header (Any)			
Username	Active	Proper Name	Initials
Report Header			
<b>Modified Users Master List</b>			
Username	Active	Proper Name	Initials

Figure 2.16: Technique for Managing Report Title and Column Headings

You may be wondering if we need both a Page Header (First) and a Page Header (Any)—particularly since the Page Header (First) is empty. But this technique actually serves a useful purpose, as explained below:

**Page Header (First):** This is blank because the Report Header, which always displays on the first page only, contains column headings. The Page Header (Any) also contains column headings. Following the report writer’s rules of precedence, a Page Header (First), if defined, prints in place of a Page Header (Any). This logic ensures the Page Header (Any) does not print on the first page—and so we avoid having two sets of column headings on the first page.

---

### Note

For more information on precedence and other Header details, see the “Report Headers” and “Page Headers” sections in the Report Writer Basics chapter.

---

**Page Header (Any):** This Header contains the column headings that appear on the second page and all subsequent pages. The Page Header (Any) will not print on the first page because a Page Header (First) is defined.

**Report Header:** The Report Header displays on the first page only. In this case, the Report Header contains both a report title and report columns.

## Modifying Column Headings

For this exercise, we will change the wording of the “Locale” column heading. As you can see in the following screenshot, this column heading appears in both the Page Header (Any) and Report Header sections:

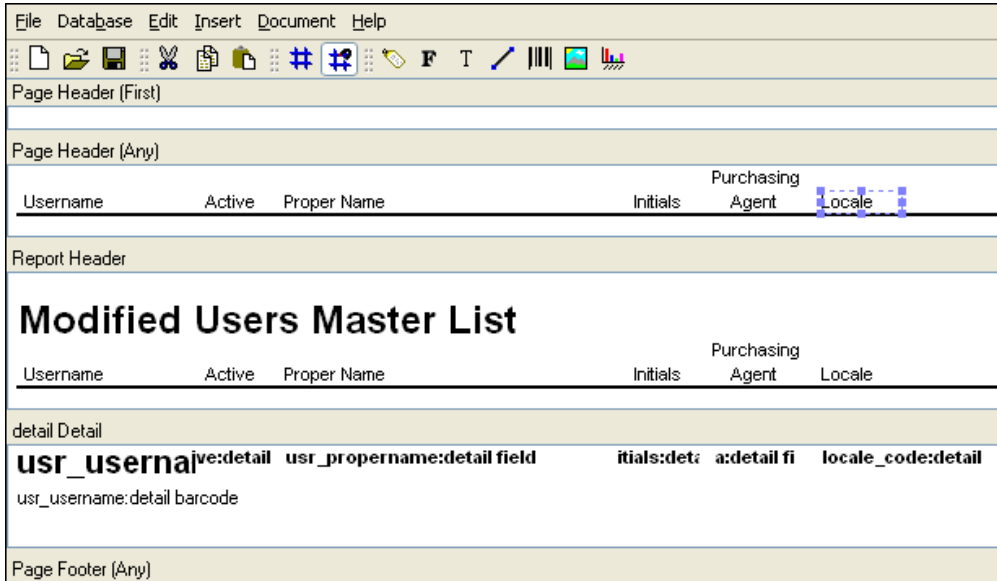


Figure 2.17: Locale Column Heading Selected

A Locale is frequently used to define a user’s language. And so, for the purpose of this exercise, let’s change the column heading from “Locale” to “Language.” To edit the column heading, double-click on the Label object which contains the text. The following screen will appear:

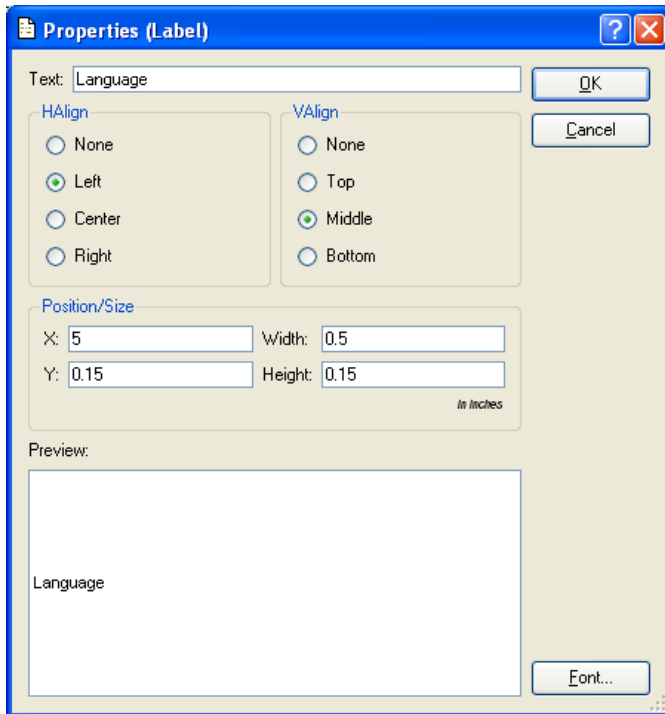


Figure 2.18: Label Properties for Column Heading

As you can see in Figure 2.18, we have entered the new wording in the “Text” field. We make the same change to the “Locale” column heading found in the Report Header. And after saving the changes to the database, we see them both applied to the report definition, as shown below:

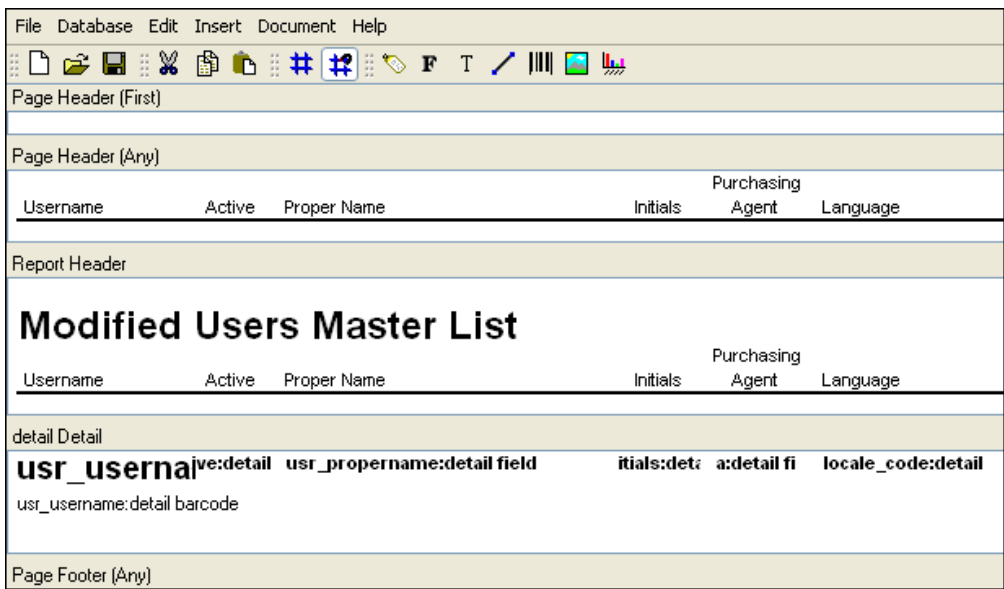



Figure 2.19: Label Changed for Locale Column Heading

The techniques used to edit Label objects are the same regardless of where a Label object is located in the report definition.

### *Adding Column Headings*

Over the course of the next few sections, we will perform the steps necessary to add email addresses to our Users Master List. The first step is to add a column heading. The new “Email Address” column heading will ensure the data we retrieve from the database is labeled appropriately.

To add the new column heading, we select the Label button  from the toolbar and then click in the Page Header (Any) section. We place the Label object to the right of the “Language” column heading, as shown in the following screen:



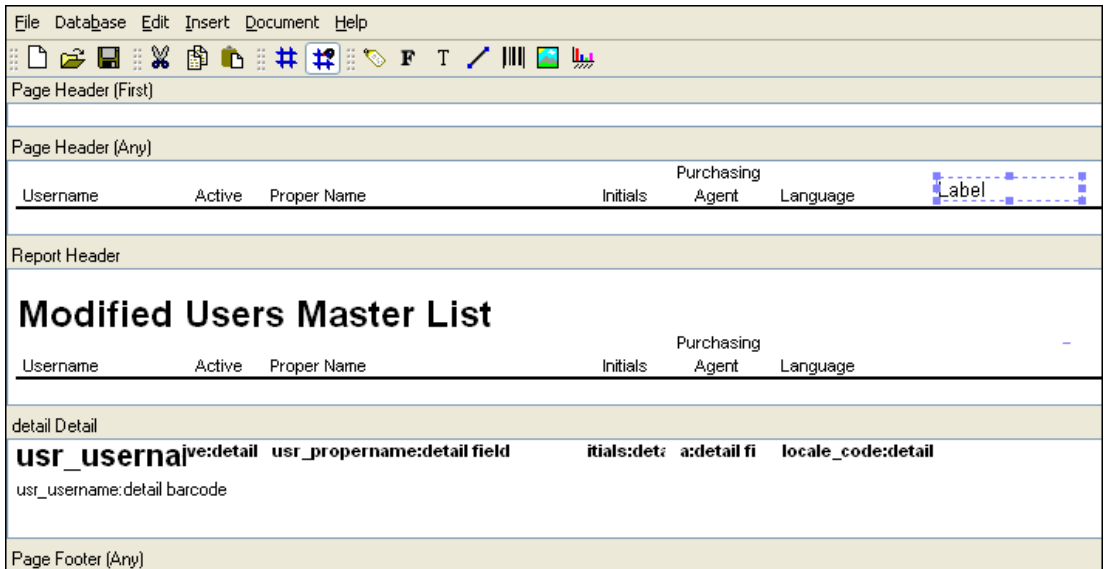


Figure 2.20: Adding New Column Headings

Now that we have placed the Label object, we must define its properties. Double-clicking on the Label object opens the Label properties screen:

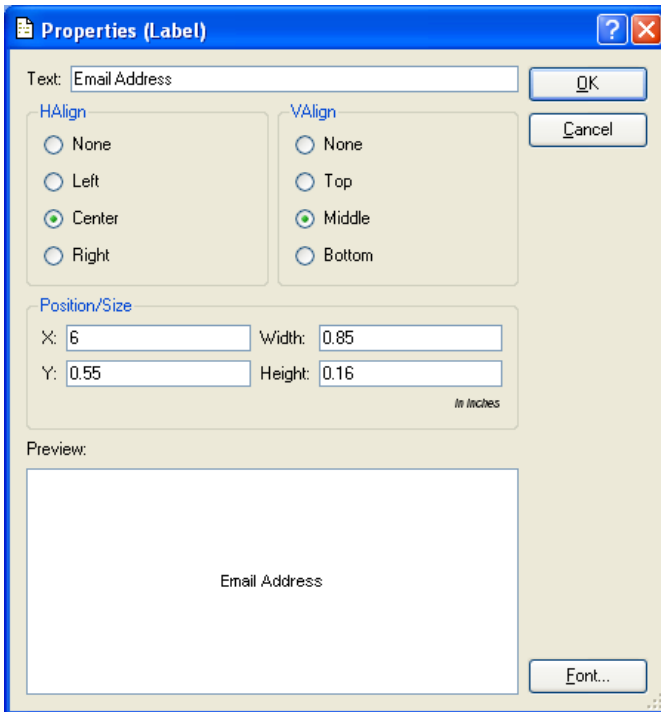


Figure 2.21: Column Heading Properties

As you can see in Figure 2.21, we have entered “Email Address” in the “Text” field. This is the text which will appear as a column heading. We repeat the same steps to add the same new column heading to the Report Header section. And after moving the Label objects into place using our mouse and saving the changes to the database, the column headings are located where we want them, as shown in the following screen:

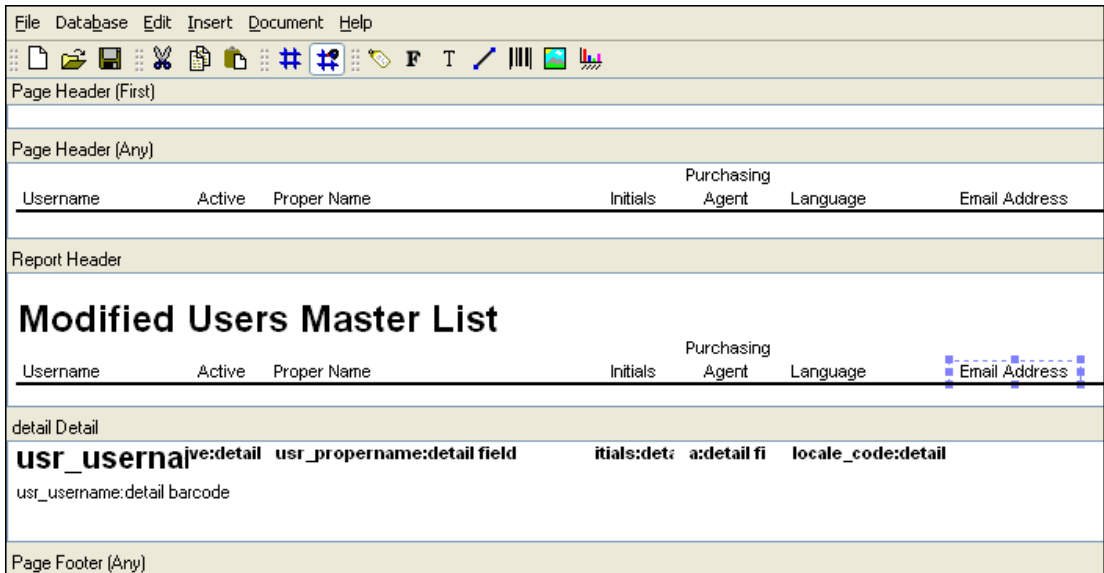


Figure 2.22: Email Address Labels Added to Report Definition

Adding column headings for email addresses is only the first step in the multi-step process of inserting email addresses into the report. In the following sections, we will examine how to retrieve the needed information from the database.

## Modifying Query Sources

We’ve successfully added a column heading called “Email Address” to our report definition. Now we need to work on retrieving user email addresses from the database. To begin, let’s look at the Query Sources defined for this report definition. To view the available Query Sources, select the “Query Sources” option from the “Database” menu. The following screen will appear:

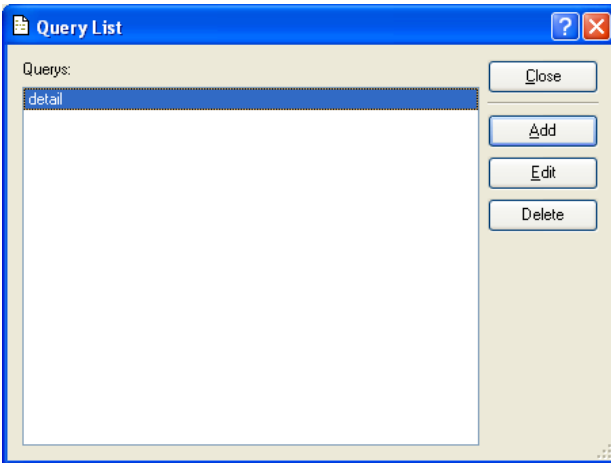


Figure 2.23: Query List

As we have seen before, the “detail” Query Source is the only Query Source defined for the “UsersMasterList” report definition. To open the Query Source for editing, simply double-click on it, or highlight it and select the EDIT button. The following screen will appear:

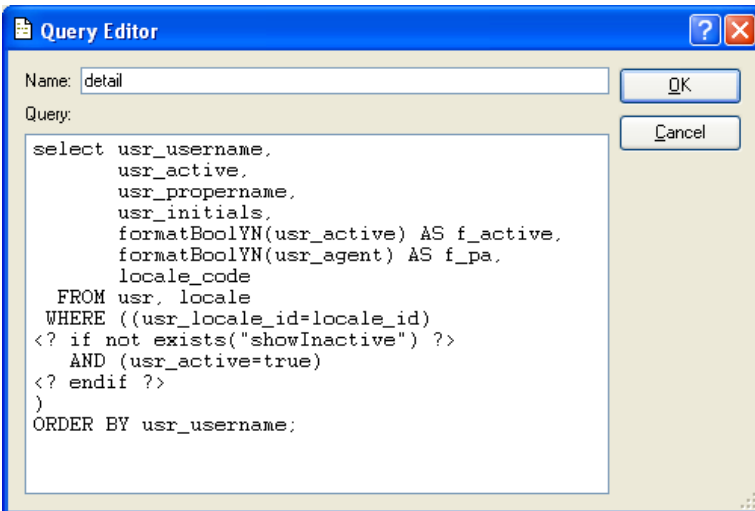


Figure 2.24: Query Source for “UsersMasterList” Report

Because we are familiar with our sample database, we know the `usr` table has a column called `usr_email`, which stores user email addresses. However, if we look closely at the `SELECT` statement in Figure 2.24, we do not see references to the `usr_email` column. Without a ref-

reference to the `usr_email` column, we will not be able to retrieve user email address information from the database. We need to add that reference to the `SELECT` statement.

## Editing SQL Statements

As we saw in the previous section, the `SELECT` statement in our Query Source does not refer to the `usr_email` column. Without that column reference, we will not be able to retrieve user email address information from the database. In this section, we will edit the `SELECT` statement so the `usr_email` column is referenced.

The SQL found in the “Query” display of a Query Source is straight text. It can be edited in the same way as any text can be edited. We simply click in the `SELECT` statement after the reference to the `usr_initials` column. Then, after hitting `ENTER` to create an extra line, we type in the `usr_email` reference, as shown below:

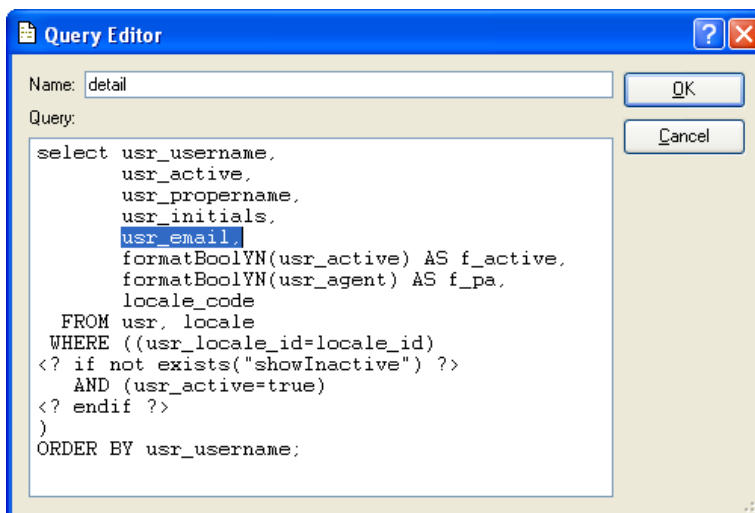


Figure 2.25: Email Column Added to SQL `SELECT` Statement

We are careful to add a comma “,” at the end of the `usr_email` reference, to indicate the column is one in a series of columns data may be retrieved from. To save the edited SQL, select the `OK` button. Finally, we save all report definition changes to the database.

In our next step, we will add a new `Field` object to the `Detail` section of the report definition. The `Field` object will handle the display of user email addresses retrieved from the database.

## Retrieving Data

Field objects are used to display dynamic data retrieved from a database. Typically, they are placed in the Detail section of a report definition. In this section, we will add a Field object to handle our user email addresses.

To add a Field object to the report definition, we select the Field button **F** from the toolbar and then click in the Detail section. We place the Field object to the far-right of the section, lined up beneath the “Email Address” column heading, as shown in the following screen:

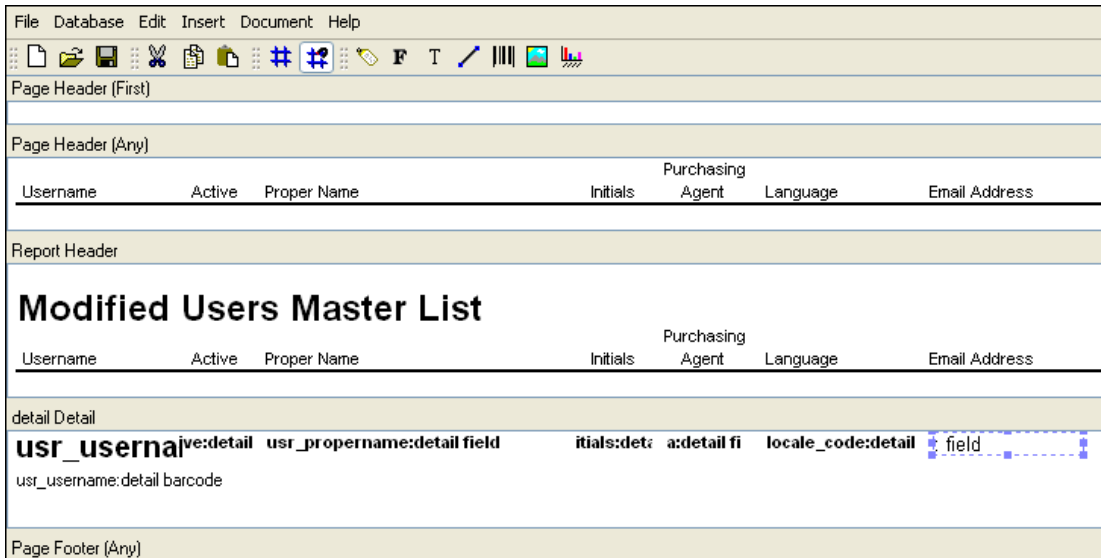


Figure 2.26: New Field Added to Report Definition

Now that we have placed the Field object, we must define its properties. Double-clicking on the Field object opens the Field properties screen:

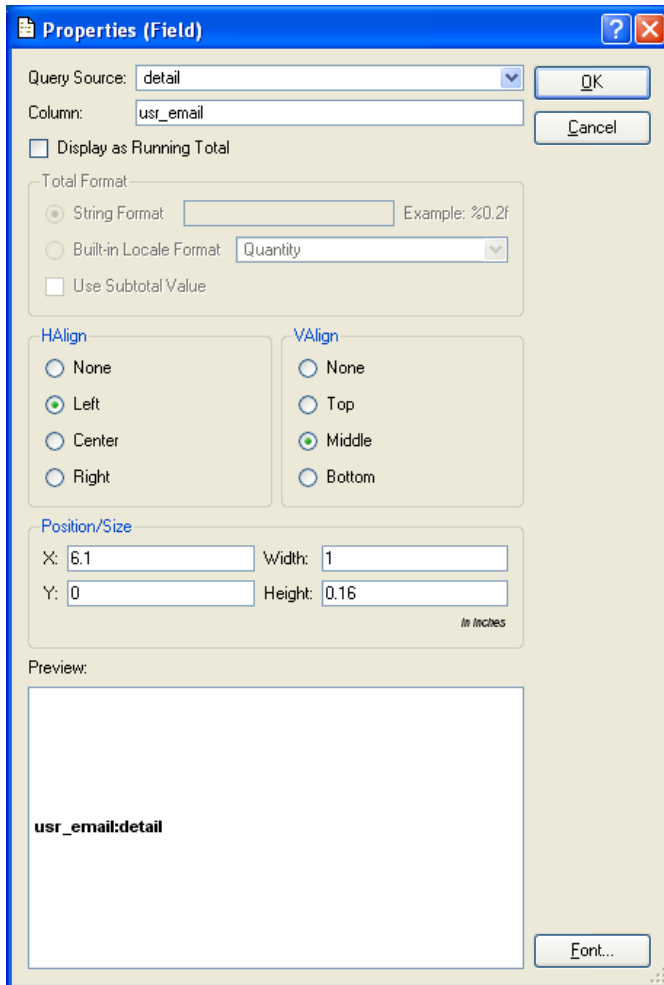


Figure 2.27: Properties for Email Address Field

As you can see in Figure 2.27, we have filled in the following information:

**Query Source:** We selected the “detail” query from the list of available Query Sources. This is the query whose SELECT statement includes the newly-added reference to the `usr_email` column.

**Column:** Here we enter the name of the `usr_email` column—since this is the column whose data we need for the Field object. A column must be referenced in the SELECT statement of the associated Query Source to successfully retrieve data from the database.

**Preview:** The preview shows us both the name assigned to the Field object (“usr\_email:detail”) and also the font choice. To make the font consistent with the other Field objects in the report definition, we select the FONT button and specify 8-pt bold Arial.

After we select the OK button, we see the Field object has been updated in the report definition, as shown below:

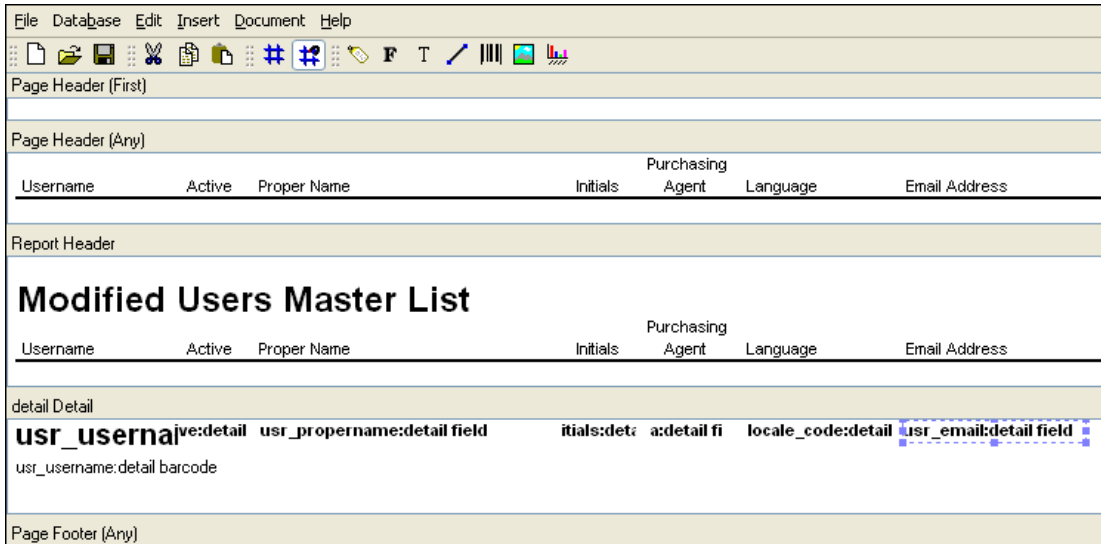


Figure 2.28: Field Object for Displaying User Email Addresses

We have now added the Field object to the report definition—and aligned it correctly beneath the “Email Address” column headings. Once we save the report definition changes to the database, we will be ready to run the report and see the results.

To run the Users Master List report from OpenMFG, select the “Maintain Users” option from the System Module menu. After selecting the PRINT button, the following report is generated:






Modified Users Master List						
Username	Active	Proper Name	Initials	Purchasing Agent	Language	Email Address
jsmith	Yes	John Smith	JS	Yes	Default	jsmith@company.com
						
mfgadmin	Yes	OpenMFG Administrator	admin	Yes	Default	admin@company.com
						
rjones	Yes	Roy Jones	RJ	No	Default	rjones@company.com
						

Figure 2.29: Email Address Appearing on Printed Report

As you can see in Figure 2.29, the user email addresses have been successfully added to the report.

## Total Fields

We have seen how Field objects may be used to retrieve text (i.e., user email addresses) from a database. In this section, we will show how to create running totals using Field objects.

Our goal for this exercise is to provide a running total of all active users. There are currently three active users in the database. We will add a fourth user and make that user inactive, as shown in the following screen:

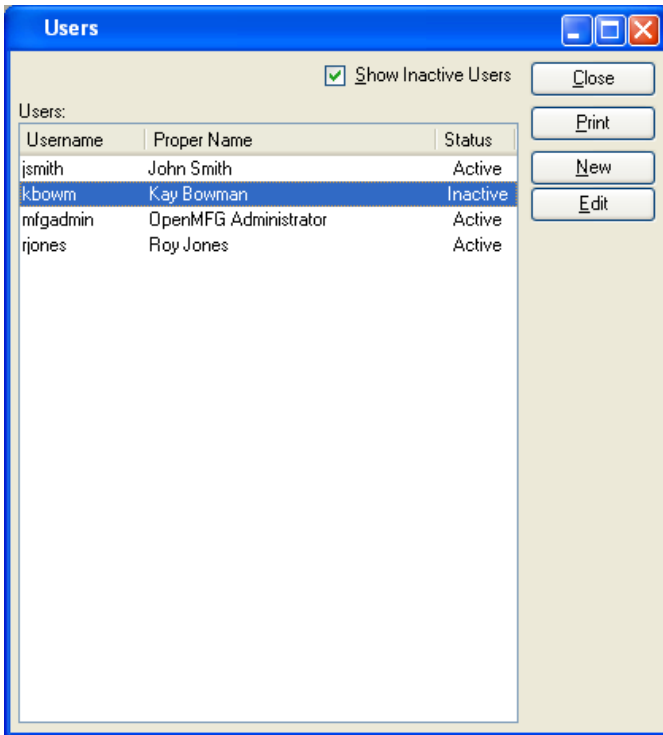


Figure 2.30: Master List of OpenMFG Users

If we are successful, the Field object should ignore the inactive user and include only the three active users in the running total.

To begin, we will create a Report Footer section in the report definition. As you may recall, Report Footers print only on the last page of a report—which is exactly what we want. We want the running total to print at the end of the report.

---

**Note**

For more information on Report Footers, see the “Report Footers” section in the Report Writer Basics chapter.

---

To create a Report Footer section, we select the “Section Editor” option from the “Document” menu. The following screen will appear:

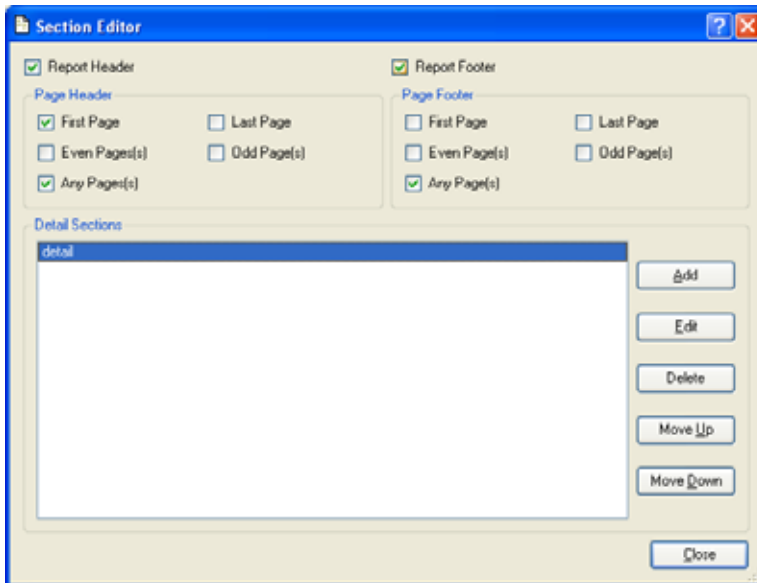


Figure 2.31: Add Report Footer Using Section Editor

As you can see in Figure 2.31, we have selected the “Report Footer” option. Selecting this option causes a Report Footer to be added to the report definition, as shown in the following screen:

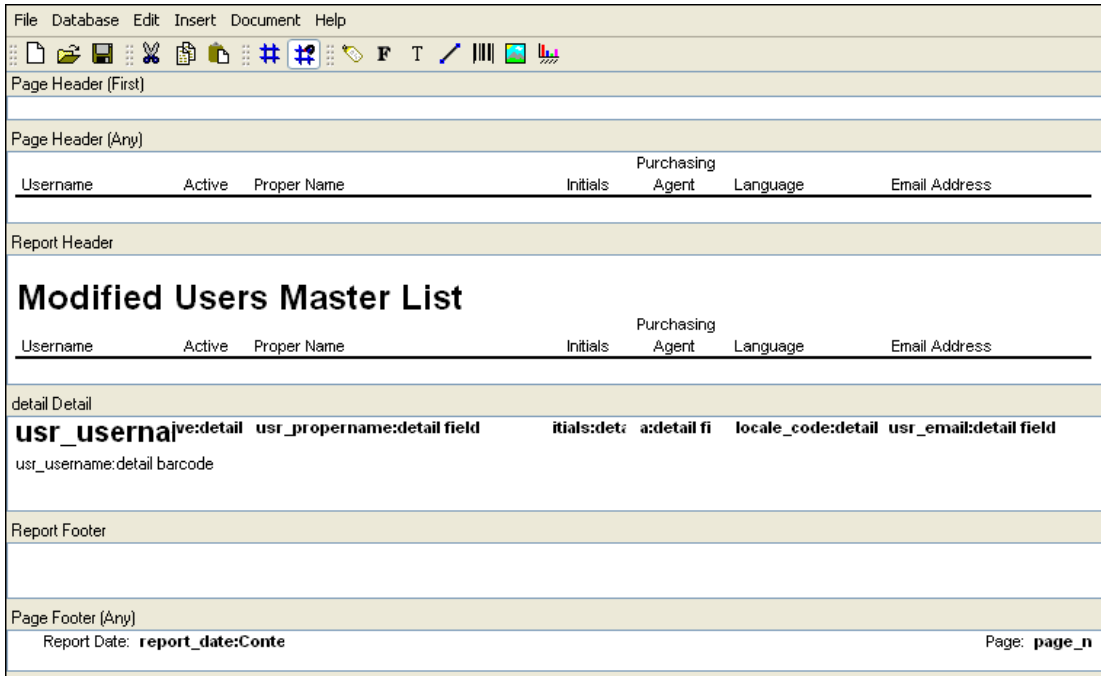


Figure 2.32: Report Footer Section Added to Report Definition

Now that we have added the Report Footer section, our next step is to add a Field object to the section. The Field object will display the running total of all active users.

To add a Field object to the report definition, we select the Field button **F** from the toolbar and then click in the Report Footer section. We place the Field object in the section, as shown in the following screen:

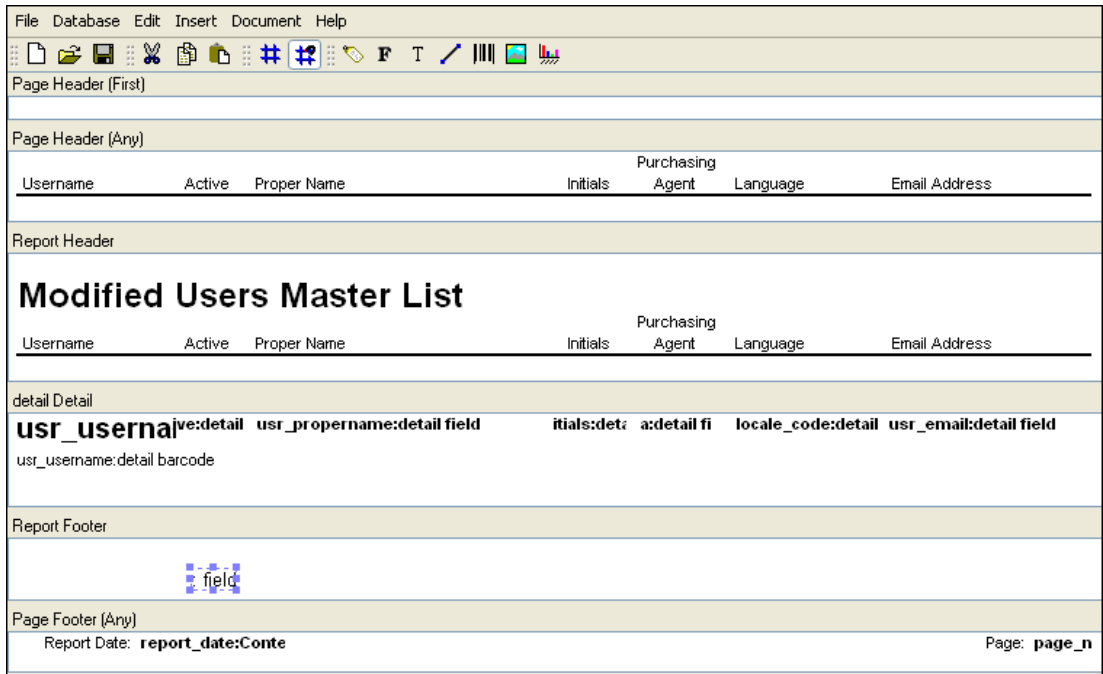


Figure 2.33: Field Object Added to Report Footer Section

Now that we have placed the Field object, we must define its properties. Double-clicking on the Field object opens the Field properties screen:

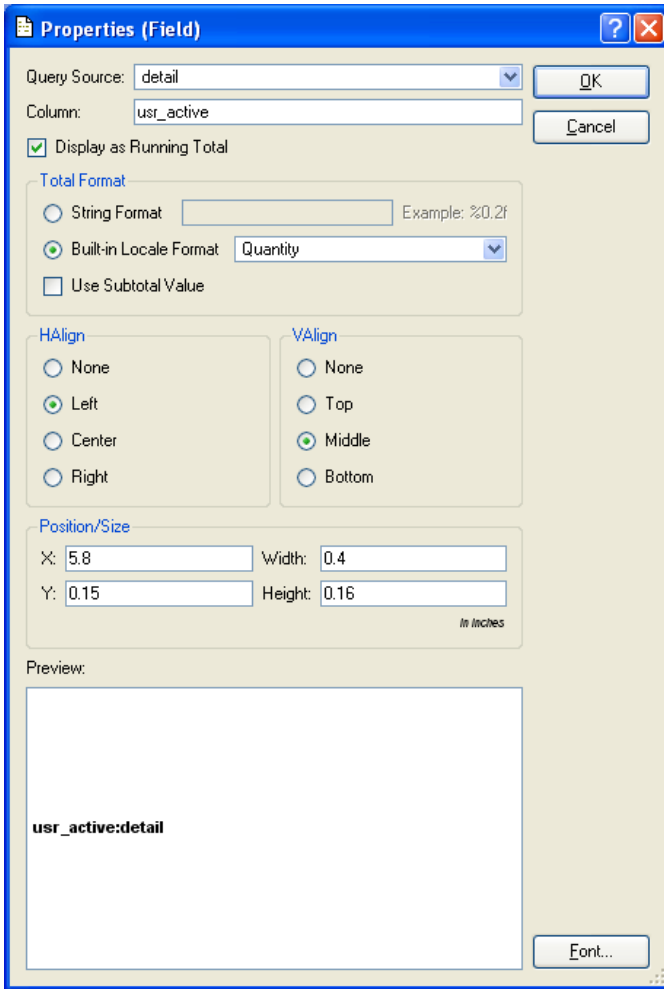


Figure 2.34: Properties for Running Total Field

As you can see in Figure 2.34, we have filled in the following properties for the running total Field object:

**Query Source:** We selected the “detail” query from the list of available Query Sources. This is the query whose SELECT statement includes the reference to the `usr_active` column.

**Column:** Here we enter the name of the `usr_active` column—since this is the column whose data we need for the Field object. A column must be referenced in the `SELECT` statement of the associated Query Source to successfully retrieve data from the database.

**Display as Running Total:** By selecting this option, we indicate we want the records on active users to be displayed as a running total. When the running total is calculated, active users will be assigned a value of “1,” while inactive users will be assigned a value of “0.”

---

### Note

When running totals are calculated for columns designated as Boolean, the “true” values are assigned a value of “1,” while “false” values are assigned a value of “0.” In this example, active users would be assigned a value of “1”, while inactive users would be assigned a value of “0”.

---

**Built-in Locale Format:** We specify we want the running total to be displayed as a quantity.

**Preview:** The preview shows us both the name assigned to the Field object (“`usr_active:detail`”) and also the font choice. To make the font consistent with the other Field objects in the report definition, we select the `FONT` button and specify 8-pt bold Arial.

After we select the `OK` button, we see the Field object has been updated in the report definition, as shown below:

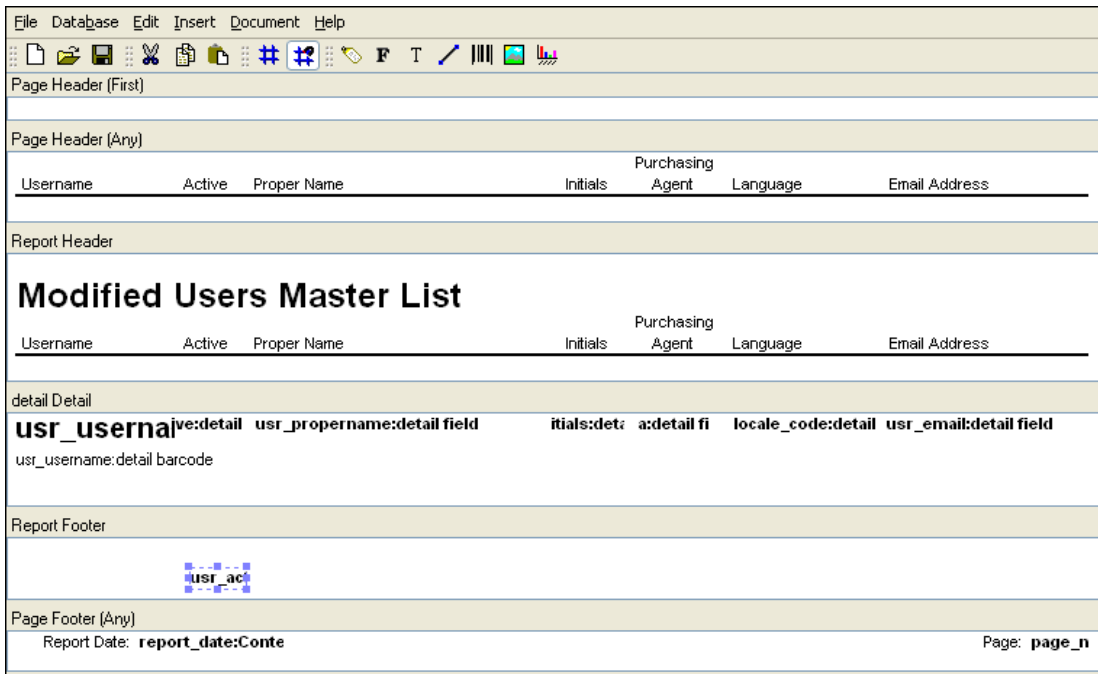



Figure 2.35: Running Total Field Added

We have added the Field object which will retrieve data from the `usr_active` column and display the information as a running total. Next, we need to insert a Label object to appropriately identify the Field.

To add the new Label, we select the Label button  from the toolbar and then click in the Report Footer section. We place the Label object to the left of the “usr\_active:detail” Field, as shown in the following screen:



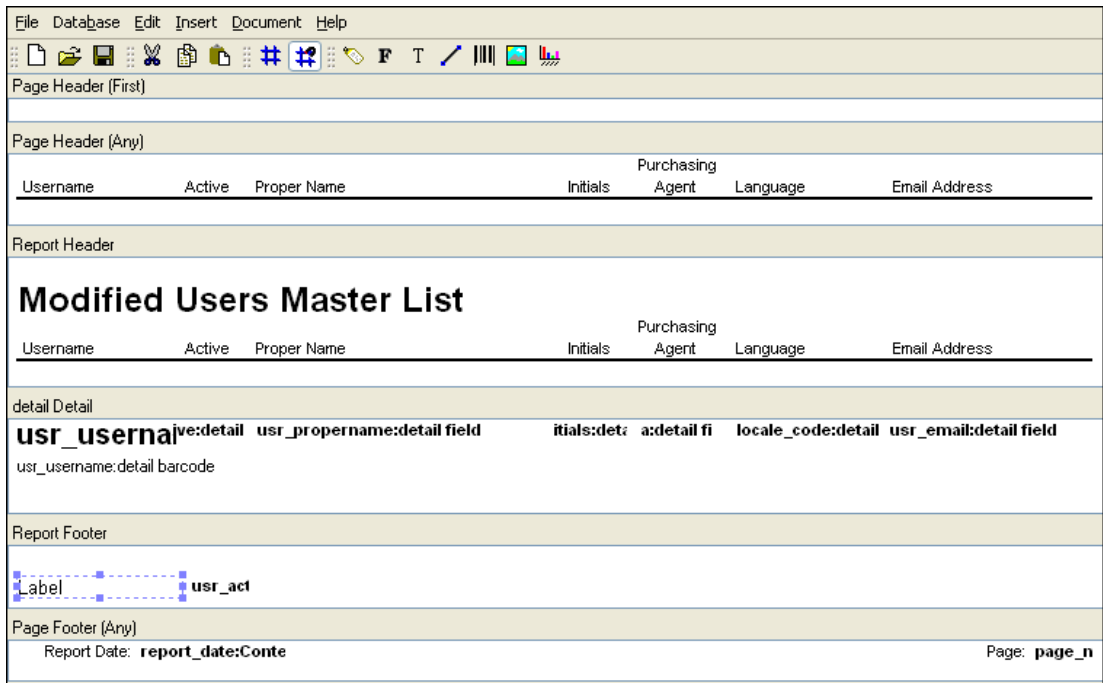


Figure 2.36: Label Object Added Next to Running Total Field

Now that we have placed the Label object, we must define its properties. Double-clicking on the Label object opens the Label properties screen:

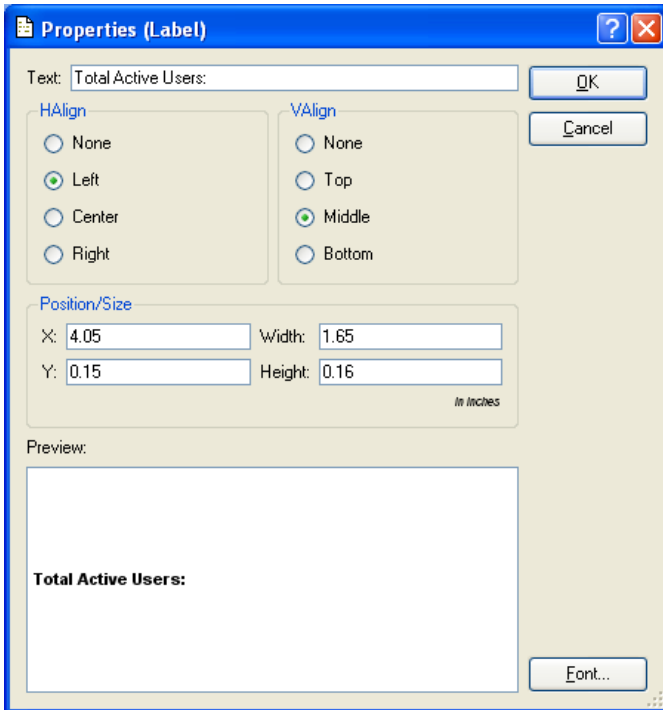


Figure 2.37: Running Total Label Properties

As you can see in Figure 2.37, we have entered “Total Active Users:” in the “Text” field. This text identifies the running total, as shown in the following screen:

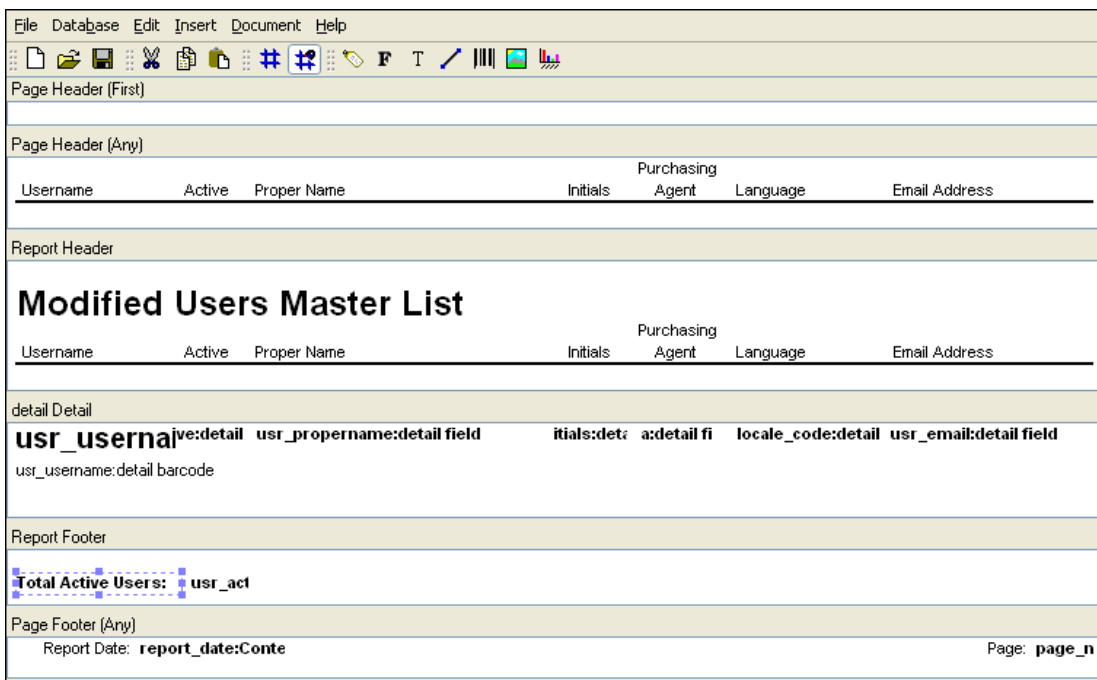


Figure 2.38: Label Object Identifying Running Total

We have now added the running total to the report definition—and labeled it appropriately. Once we save the report definition changes to the database, we will be ready to run the report and see the results.

To run the Users Master List report from OpenMFG, select the “Maintain Users” option from the System Module menu. After selecting the PRINT button, the following report is generated:






Username	Active	Proper Name	Initials	Purchasing Agent	Language	Email Address
jsmith 	Yes	John Smith	JS	Yes	Default	jsmith@company.com
kbowm 	No	Kay Bowman	KB	No	Default	kbowm@company.com
mfgadmin 	Yes	OpenMFG Administrator	admin	Yes	Default	admin@company.com
rjones 	Yes	Roy Jones	RJ	No	Default	rjones@company.com
Total Active Users:		3.00				

Figure 2.39: Running Total Appearing on Printed Report

If we scrutinize Figure 2.39 closely, we see the appearance of the report would benefit if we added a horizontal line separating the user names from the running total. In the next section, we will add a separator line.

### *Adding Horizontal Lines*

Lines make reports easier to view. In this section, we will add a horizontal Line to separate the user names from the running total at the bottom of the report.

To add a Line, we select the Line button  from the toolbar and then click in the Report Footer section.

---

#### Tip

If you hold down the SHIFT key when you are dragging a Line object, this will keep the Line perfectly straight. Also, to reposition a Line, simply click in its mid-point and drag the object to a new location.

---

We place the Line just above the running total field—and then drag the Line using our mouse from the left margin to the right margin. Finally, we double-click on the Line object to adjust its properties. The following screen appears:

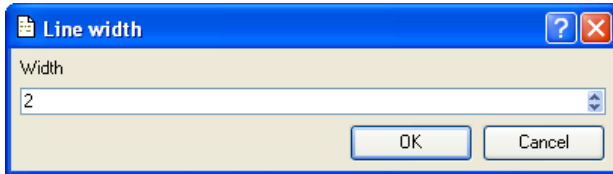


Figure 2.40: Setting Line Properties

In the “Width” field, we set the width of the Line to “2.” Line widths are measured in pixels. After saving our changes to the database, we print the Users Master List report. The following screenshot shows our result:

Modified Users Master List						
Username	Active	Proper Name	Initials	Purchasing Agent	Language	Email Address
jsmith	Yes	John Smith	JS	Yes	Default	jsmith@company.com
kbowm	No	Kay Bowman	KB	No	Default	kbowm@company.com
mfgadmin	Yes	OpenMFG Administrator	admin	Yes	Default	admin@company.com
rjones	Yes	Roy Jones	RJ	No	Default	rjones@company.com
Total Active Users:		3.00				

Figure 2.41: Line Added Above Running Total Field

We are almost done modifying the “UsersMasterList” report definition for this chapter. However, we still want to display a total of all users—as a complement to the running total of active users. We will add this additional information in the next section.

## Counter Fields

---

The last change we will make to the “UsersMasterList” report definition in this chapter is to add a total count of all displayed users. This total will complement the running total of active users, which we have already added, since the “UsersMasterList” report may display both active and inactive users.

To provide this total information, we will add a COUNTER variable to the “detail” Query Source. The COUNTER variable will increment by 1 for every row returned by a query. For example, if a column contains 10 rows of data, the COUNTER will total “10” after the query has been run.

To add the COUNTER, we open the “detail” Query Source by double-clicking on it from the list of available Query Sources. Next, we add the COUNTER to the query’s SELECT statement, as shown in the following screen:

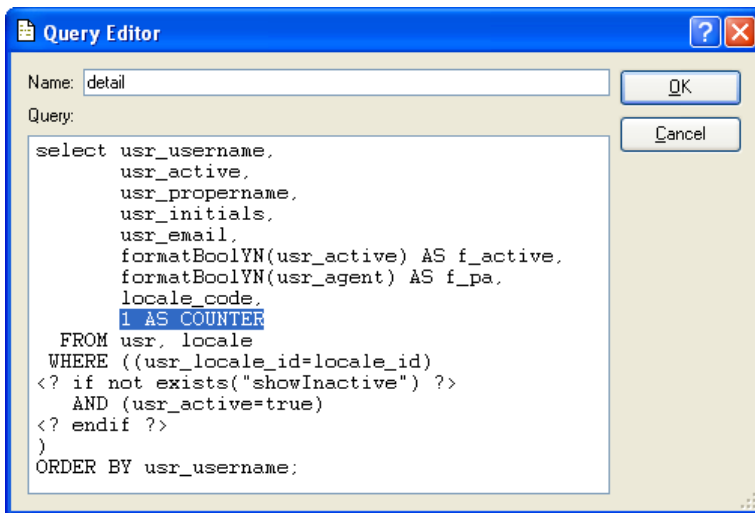



Figure 2.42: Counter Added to Query Source

As you can see in Figure 2.42, the COUNTER syntax is highlighted at the end of the SELECT statement. The “1 AS COUNTER” syntax indicates two things: 1) For every row of data retrieved from the database, that row will be assigned a value of “1,” and 2) the result set of retrieved rows will be stored in memory in a temporary column we have called COUNTER.

Notice we have been careful to add a comma after the reference to the `locale_code` column. The comma separates the COUNTER from the other items in the SELECT statement series. We do not insert a comma after the COUNTER line.

Now that we have inserted the COUNTER into the Query Source, we are ready to add a Field object to display the results.

To add a Field object to the report definition, we select the Field button  from the toolbar and then click in the Report Footer section. We place the Field object in the section, as shown in the following screen:

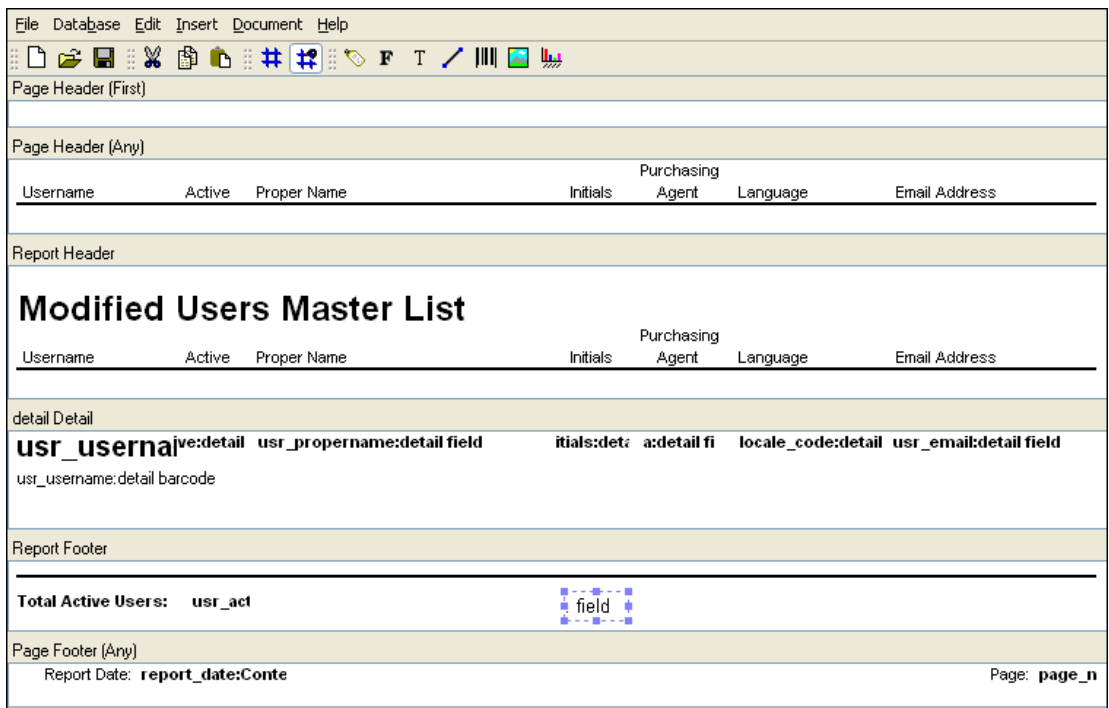


Figure 2.43: Counter Field Added to Report Footer Section

Now that we have placed the Field object, we must define its properties. Double-clicking on the Field object opens the Field properties screen:

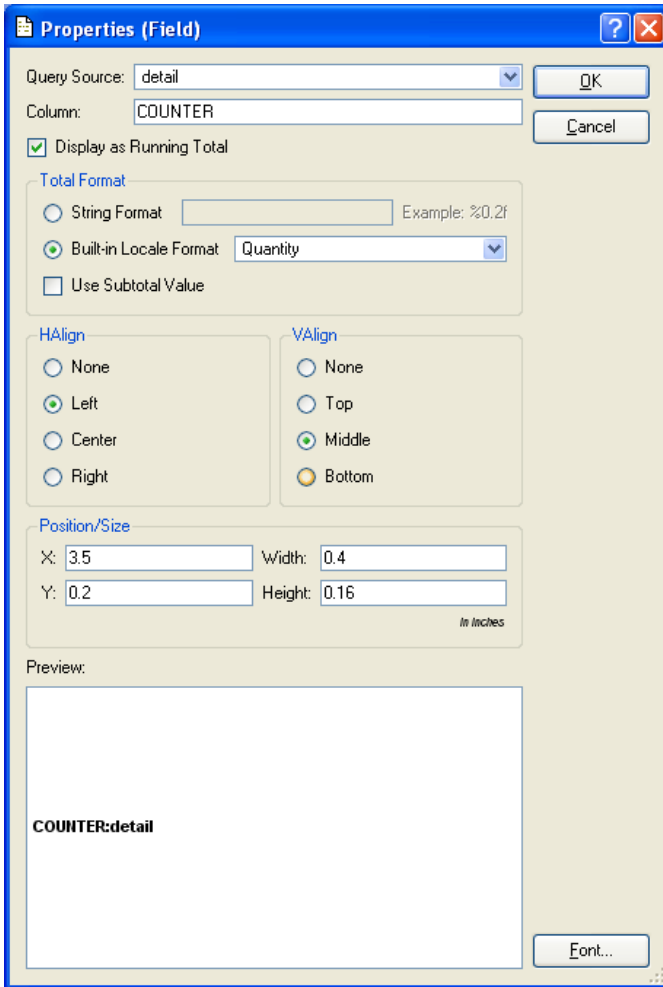


Figure 2.44: Properties for Counter Field

As you can see in Figure 2.44, we have filled in the following properties for the COUNTER Field object:

**Query Source:** We selected the “detail” query from the list of available Query Sources. This is the query whose SELECT statement includes the reference to the temporary COUNTER column.



**Column:** Here we enter the name of the temporary COUNTER column—since this is the column whose data we need for the Field object. A column must be referenced in the SELECT statement of the associated Query Source to successfully retrieve data from the database.

**Display as Running Total:** By selecting this option, we indicate we want all the records written to the COUNTER column to be displayed as a running total. When the running total is calculated, each record (i.e., displayed user) will be assigned a value of “1.”

**Built-in Locale Format:** We specify we want the running total to be displayed as a quantity.

**Preview:** The preview shows us both the name assigned to the Field object (“COUNTER:detail”) and also the font choice. To make the font consistent with the other Field objects in the report definition, we select the FONT button and specify 8-pt bold Arial.

After we select the OK button, we see the Field object has been updated in the report definition, as shown below:

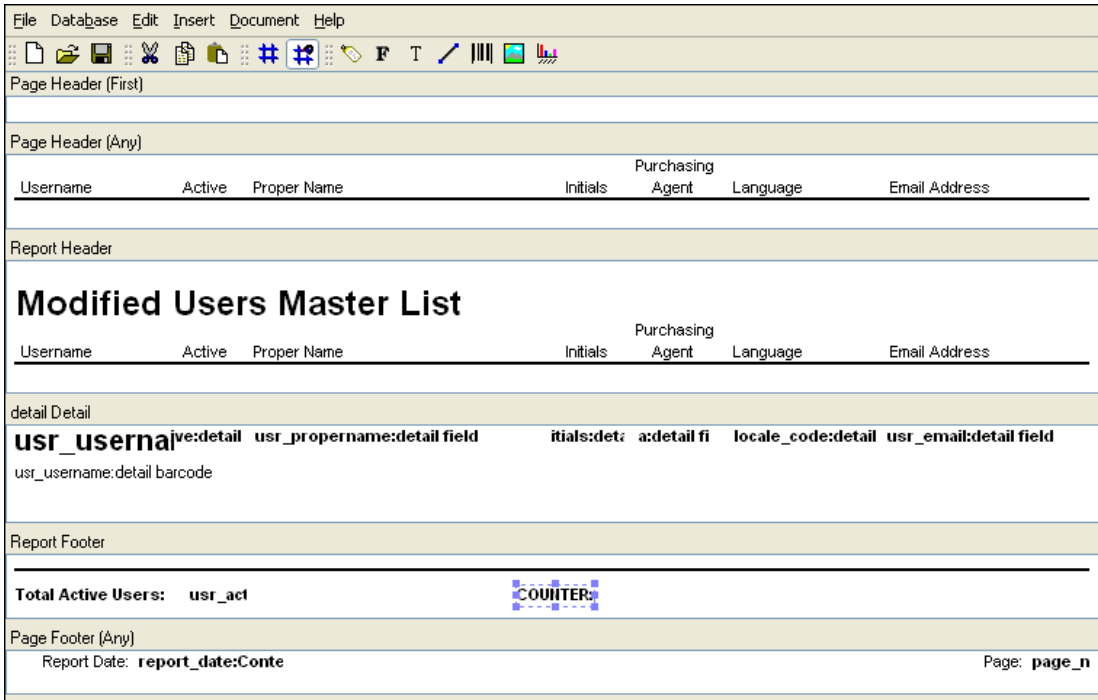



Figure 2.45: Counter Field Added to Report Footer Section

We have added the Field object which will retrieve data from the COUNTER column and display the information as a running total. Next, we need to insert a Label object to appropriately identify the Field.

To add the new Label, we select the Label button  from the toolbar and then click in the Report Footer section. We place the Label object to the left of the “COUNTER:detail” Field, as shown in the following screen:

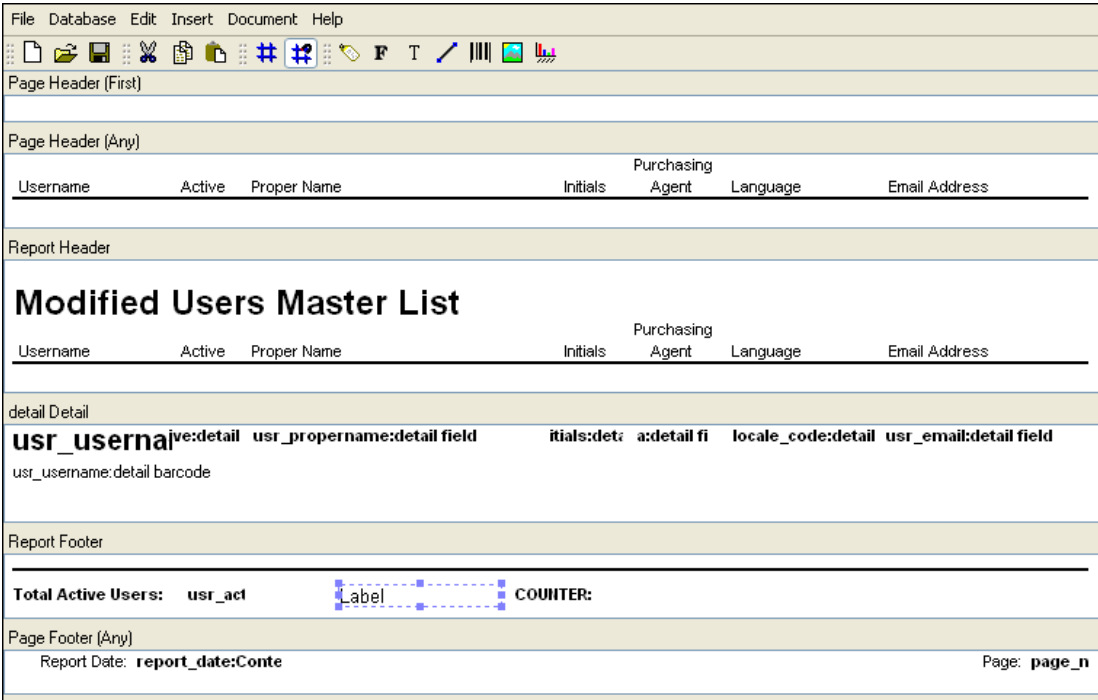


Figure 2.46: Label Object Added Next to Counter Field

Now that we have placed the Label object, we must define its properties. Double-clicking on the Label object opens the Label properties screen:

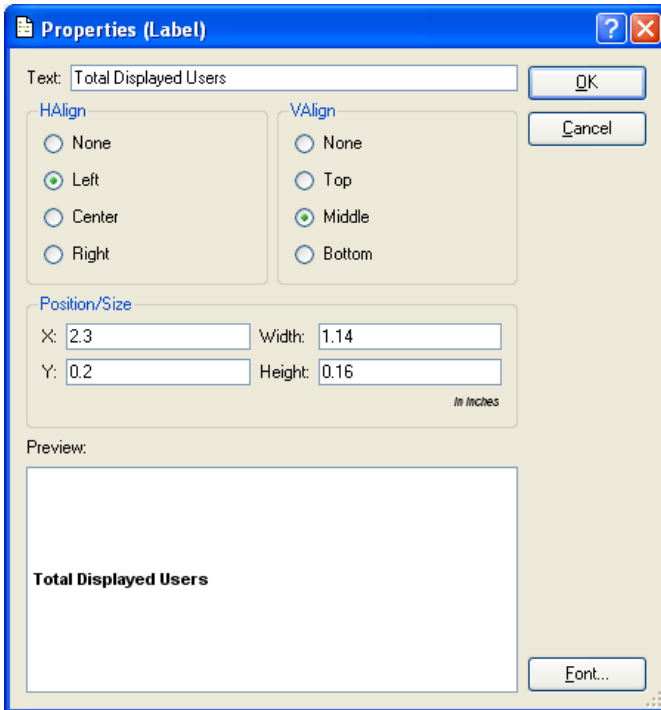


Figure 2.47: Counter Label Properties

As you can see in Figure 2.47, we have entered “Total Displayed Users:” in the “Text” field. This text identifies the running total, as shown in the following screen:

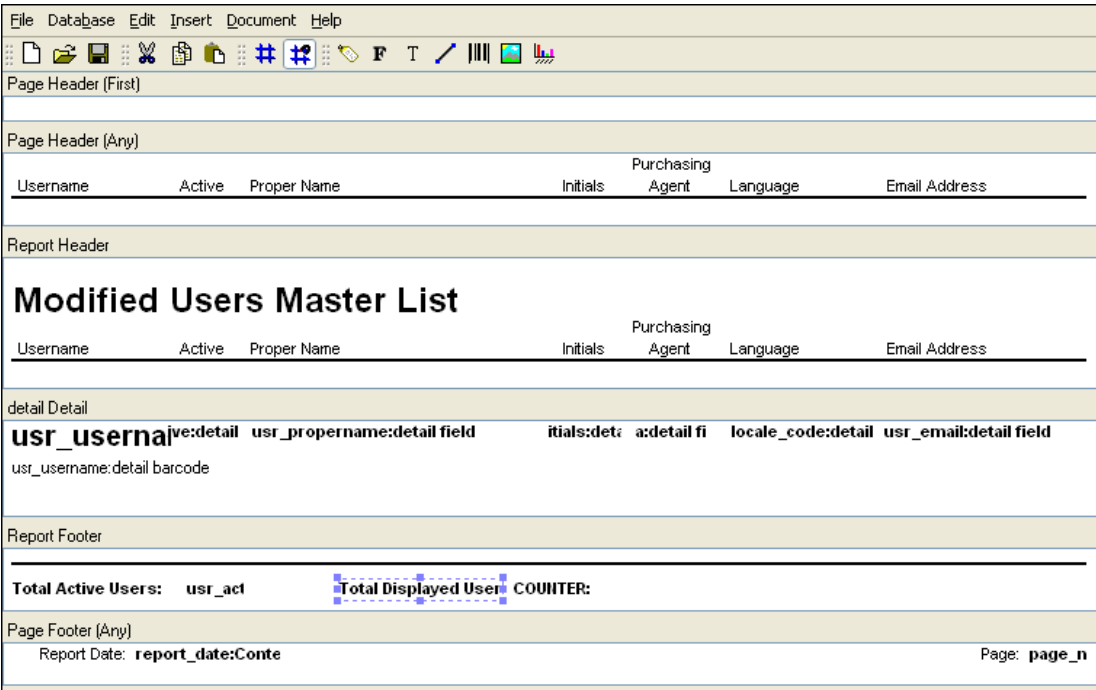






Figure 2.48: Label Object Identifying Counter

We have now added a COUNTER to the report definition—and labeled it appropriately. Once we save the report definition changes to the database, we will be ready to run the report and see the results.

To run the Users Master List report from OpenMFG, select the “Maintain Users” option from the System Module menu. After selecting the PRINT button, the following report is generated:

<b>Modified Users Master List</b>						
Username	Active	Proper Name	Initials	Purchasing Agent	Language	Email Address
<b>jsmith</b> 	Yes	John Smith	JS	Yes	Default	jsmith@company.com
<b>kbowm</b> 	No	Kay Bowman	KB	No	Default	kbowm@company.com
<b>mfgadmin</b> 	Yes	OpenMFG Administrator	admin	Yes	Default	admin@company.com
<b>rjones</b> 	Yes	Roy Jones	RJ	No	Default	rjones@company.com

---

Total Active Users: 3.00      Total Displayed Users 4.00

Figure 2.49: Counter Appearing on Printed Report

We have now reached the end of the exercises contained in the Getting Started chapter. Over the course of this chapter we have taken a hands-on approach to learning fundamental report writer functionality. You should now understand how the report writer retrieves information from a database and displays that information in printed form. More advanced functionality will be explored in subsequent chapters.

---

# 3

## Advanced Topics

In this chapter we will cover a range of advanced topics. We touched on some of these topics in earlier chapters. Others will be presented here for the first time. Subjects covered in this chapter include the following:

- MetaSQL
- MetaSQL Editor
- OpenRPT
- Watermarks and Background Images
- Barcodes
- Graphs

### MetaSQL

---

MetaSQL is a scripting language developed by OpenMFG for use by the report writer. The language is designed to handle dynamic database queries. MetaSQL statements are embedded within standard SQL—for example, within the Query Source of a report definition. When a report is run, a parsing engine interprets the MetaSQL using a list of named parameters. The parsed result is standard SQL, which in turn is sent to the target database. The following diagram illustrates this process:

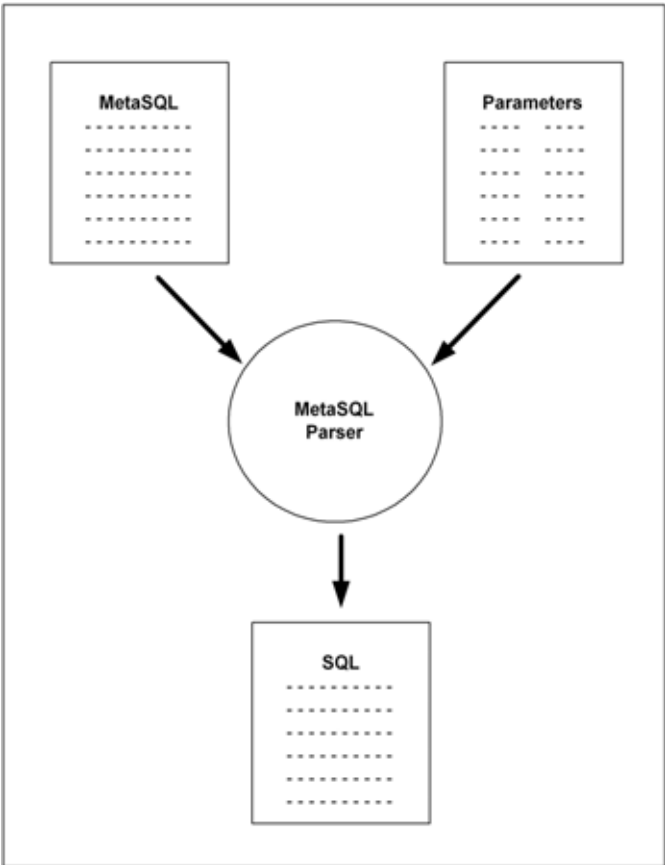


Figure 3.1: MetaSQL Parser Handles Embedded MetaSQL

Dynamic queries are queries which contain conditional statements. Query results will vary depending on how the conditions are satisfied. For example, a report may return one result if a user makes one selection—or a different result if the user makes a different selection. The report results are conditional upon choices made by the user. The MetaSQL scripting language enables you to allow for and incorporate this conditionality into your report definitions.

### *MetaSQL in Practice*

To illustrate how dynamic, conditional queries are handled using MetaSQL, let’s examine a sample report definition called “UsersMasterList”. This is the same report definition we have worked with in previous chapters.



The “UsersMasterList” report definition is called whenever someone using the OpenMFG application wants to print a copy of the users master list. That OpenMFG master list appears in the following screenshot:

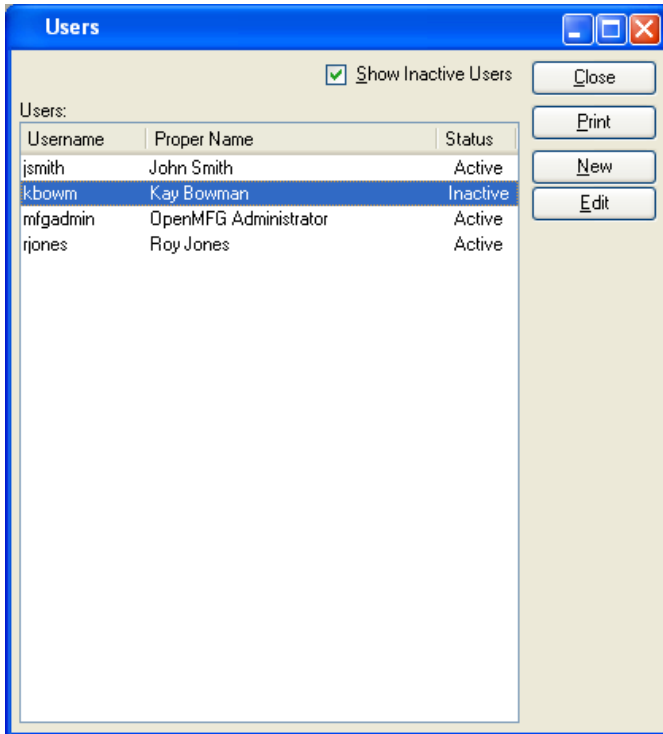


Figure 3.2: Master List of OpenMFG Users

When someone selects the PRINT button, the information displayed on the screen is printed out using the “UsersMasterList” report definition.

If you look closely at Figure 3.2, you can see the option “Show Inactive Users” is selected. As a result, the users master list is displaying both active and inactive users. The “Show Inactive Users” option is an example of a dynamic condition. If the option is selected, one list of users will be displayed. If it’s not selected, another list of users will be displayed. Logically, the report definition must accommodate either of these two conditions.

The report definition uses MetaSQL to handle these conditions. Let’s look at the Query Source for the “UsersMasterList” report definition to understand how MetaSQL is embedded within a report definition:

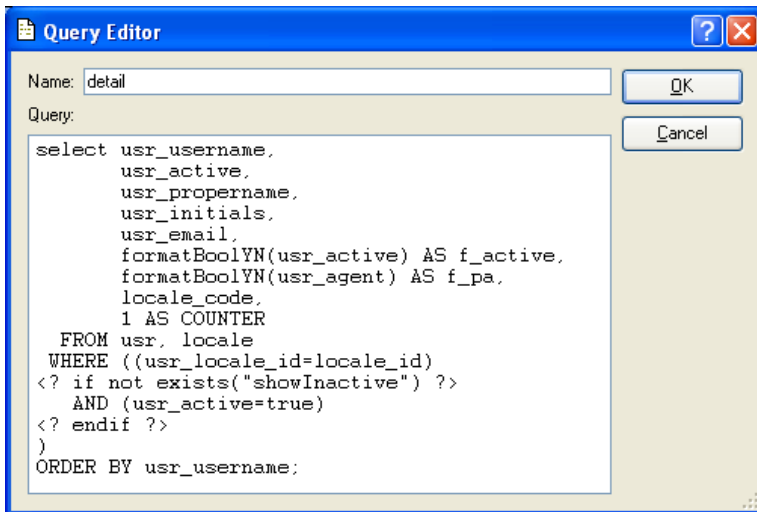


Figure 3.3: Query Source for UsersMasterList Report Definition

To locate embedded MetaSQL in a Query Source, simply look for the `<? and ?>` tags. These are the tags used to identify MetaSQL statements. As you can see in Figure 3.3, the `WHERE` clause contains several MetaSQL tags. Let's examine the `WHERE` clause to gain a better understanding for how MetaSQL works:

**WHERE clause:**

```
WHERE ((usr_locale_id=locale_id)
<? if not exists("showInactive") ?>
      AND (usr_active=true)
<? endif ?>
)
```

**MetaSQL:**

MetaSQL is always contained inside `<? and ?>` tags. Our sample `WHERE` clause contains the following two lines of MetaSQL:

- 1) `<? if not exists("showInactive") ?>`
- 2) `<? endif ?>`

**MetaSQL Statements:**

`if not` – This statement begins a MetaSQL condition.

`endif` – This statement ends the condition.

### **MetaSQL Function:**

`exists` – This MetaSQL function takes the name of the parameter provided. In this case, the provided parameter is named `showInactive`.

### **Parameter:**

`showInactive` – The conditionality of the report centers on this parameter. It is this parameter which determines whether inactive users should be included in the report. Like all valid parameters referenced in a MetaSQL statement, the parameter `showInactive` originates from within the source code of the application utilizing the report writer. In this case, that application is OpenMFG—and the parameter is included in the source code for the Users Master List screen. When an OpenMFG user sends a print request from the Users Master List screen, the MetaSQL parser interprets the existing conditions—namely, is the `showInactive` parameter being used, or not? The parser then uses this information to produce standard SQL meeting the specified conditions. This standard SQL, which has been stripped of its MetaSQL elements by the parser, is then delivered to the target database for processing.

---

### **Tip**

The OpenMFG application automatically generates a parameter list whenever a user submits a print request. The parameter list will contain as many (or as few) parameters as pertain to the screen the print request was sent from. When a MetaSQL statement in an OpenMFG report definition refers to a parameter, that parameter should be one which would appear on the generated parameter list.

---

s would refer in OpenMFG report definitions includes a named parameter, the parameter refers to one of the

### **Resulting SQL:**

If a user selects the “Show Inactive Users” option, the MetaSQL parser will send the following standard SQL to the target database:

```
SELECT usr_username,
       usr_propername,
       usr_initials,
       formatBoolYN(usr_active) AS f_active,
       formatBoolYN(usr_agent) AS f_pa,
       locale_code
FROM   usr, locale
WHERE  ((usr_locale_id=locale_id)
AND    (usr_active=true))
ORDER BY usr_username;
```

If the user does not select the “Show Inactive Users” option, the MetaSQL parser will send the following standard SQL to the target database:

```
SELECT usr_username,
       usr_propername,
       usr_initials,
       formatBoolYN(usr_active) AS f_active,
       formatBoolYN(usr_agent) AS f_pa,
       locale_code
FROM   usr, locale
WHERE  ((usr_locale_id=locale_id))
ORDER BY usr_username;
```

---

### Note

You may have noticed the AND is excluded in the second example. This occurs because in the second example the value of the parameter `showInactive` is false.

---

As the “UsersMasterList” example demonstrates, static report definitions can be made to handle dynamic conditions using MetaSQL. In the following sections, we will examine the range of MetaSQL building blocks.

## *MetaSQL Syntax*

MetaSQL syntax is comprised of control statements and functions. Control statements contain standard SQL which will be used if certain conditions are met. Functions are generally used to evaluate parameters. Collectively, control statements and functions are referred to as “statements.” When these statements are embedded within standard SQL, they create MetaSQL.

As we have mentioned previously, MetaSQL statements are bracketed between an opening angle bracket and question mark pair (“<?”) and a closing question mark and angle bracket pair (“?>”). All content within (and including) the opening and closing character pairs is referred to as a “tag.” Each tag is comprised of a single statement and also any additional arguments, parameters, or modifiers which apply to the statement. The first word following the tag opening (i.e., “<?”) is the statement. Any additional text after the statement up to the closing angle bracket (“?>”) is broken into tokens and processed accordingly.

---

### Tip

You don’t need to worry about inserting excess blank spaces when writing MetaSQL statements. The MetaSQL parser ignores excess blank spaces.

---

Next we will look at the range of available control statements and functions, offering descriptions for how each may be used.

## Control Statements

Control statements form blocks which contain standard SQL and MetaSQL tags. While control statements are not directly responsible for producing output, they do determine whether their contents should be outputted or not. The complete list of available MetaSQL control statements is described below:

- `if` – Use the `if` statement to begin a conditional control block. One or more tokens (i.e., single elements) should follow this opening statement. Individual tokens may be separated from each other using the “and” and “or” tokens. Explicit token groups should be enclosed within parentheses “( )”. You can reverse the boolean result of a token group by placing a “not” token directly preceding the token group. If the aggregate sum of all the token groups in a control block is a true value, then the contents of the `if` block will be executed. If the condition is false, then the next following `elseif` or `else` condition will be evaluated, assuming one exists.
- `elseif` – Place an `elseif` statement within an `if` block to divide the `if` block into multiple blocks. An `elseif` statement behaves in the same manner as an `if` statement. Any number of `elseif` conditions may be included within an `if` block.
- `else` – An `else` condition, if present, is executed when both the `if` condition and any `elseif` conditions are false. At most, there may be one `else` condition included within an `if` block.
- `endif` – Use this statement to end an `if` block.
- `foreach` – This statement operates on the parameter which immediately follows it. If the parameter represents a list of values, the `foreach` block will be executed once for each value in the list. If the parameter represents a single value, then the block will be executed once. If no values exists, the block will not be executed.
- `endforeach` – Use this statement to end a `foreach` block.

## Functions

Functions are independent statements which perform specific operations. If a function returns a value, the value will be outputted. The complete list of available MetaSQL functions is described below:

- `value` – This function operates on the parameter which immediately follows it and returns the value of that parameter. If the parameter is called within a `foreach` block and the parameter represents a list, the function will return the current item of that list. If the parameter is called outside of a `foreach` block and the parameter represents a list, the value will default to the first entry. If the parameter named does not exist, then a blank or null value will be returned.

- `exists` – This function operates on the parameter which immediately follows it and returns true if that parameter exists. If the parameter does not exist, then the function returns false. If the parameter is null or blank, the function will still return true because the parameter exists.
- `reExists` – This function takes a regular expression and returns true if one or more parameter exists which match the regular expression. The regular expression is case-sensitive.
- `isFirst` – This function operates on the parameter which immediately follows it. If the parameter is called inside a `foreach` block and the parameter represents a list, the function will return true if the item returned by the call would be the first item in the list. If the parameter is called outside a `foreach` block—or if the parameter specified does not represent a list but does exist—then the function will return true. In all other situations, the function will return false.
- `isLast` – This function operates on the parameter which immediately follows it. If the parameter is called inside a `foreach` block and the parameter represents a list, the function will return true if the item returned by the call would be the last item in the list. If the parameter is called outside a `foreach` block and the parameter represents a list, the function will return true only if the list contains one item. In all cases, the function will return true if the parameter does not represent a list, but instead represents a single parameter. If the parameter does not exist—or in any other case—this function will return false.
- `continue` – This function will cause the innermost loop to execute to the end and continue as normal. If this statement is used outside of a loop, the function has no effect. If a number is specified, the specified number determines how many loops will be continued. If the number of specified loops is greater than the number of nested loops, then the function will continue the outermost loop.
- `break` – This function will cause the current loop to execute to the end and stop. If the function is used outside of a loop, the function will have no effect. If the number of loops is specified, that determines how many loops will be terminated. If the number of loops to break is greater than the number of nested loops, then all loops will broken.

## MetaSQL Editor

---

As we have seen, MetaSQL is a non-standard language embedded within standard SQL. MetaSQL cannot be executed directly on a database, but must first pass through and be interpreted by the MetaSQL parser. The MetaSQL parser then generates standard SQL which is sent to the target database for processing.

The MetaSQL Editor is a tool designed to facilitate the process of writing report definitions having MetaSQL elements. Using the MetaSQL Editor, report authors can develop complex queries, test them with different values for parameters, and then view the resulting standard SQL. Report authors can save time and effort using the MetaSQL Editor to test any portion of a complex query having MetaSQL elements.

---

### Note

The MetaSQL Editor is a multi-platform tool, running identically on Windows, Linux, and Mac. For testing report definitions linked to the OpenMFG application, the MetaSQL binary file should be installed in the same directory as the OpenMFG client.

---

The example we will be using in this section focuses on running the MetaSQL Editor against an OpenMFG database. However, the MetaSQL Editor source code can be modified to work with other database applications.

## Connecting to a Database

The MetaSQL Editor can be an extremely useful tool for report authors who want to test the accuracy of their MetaSQL statements during the process of writing report definitions. To open the MetaSQL Editor, run it from the location where it is installed. The following screen will appear:



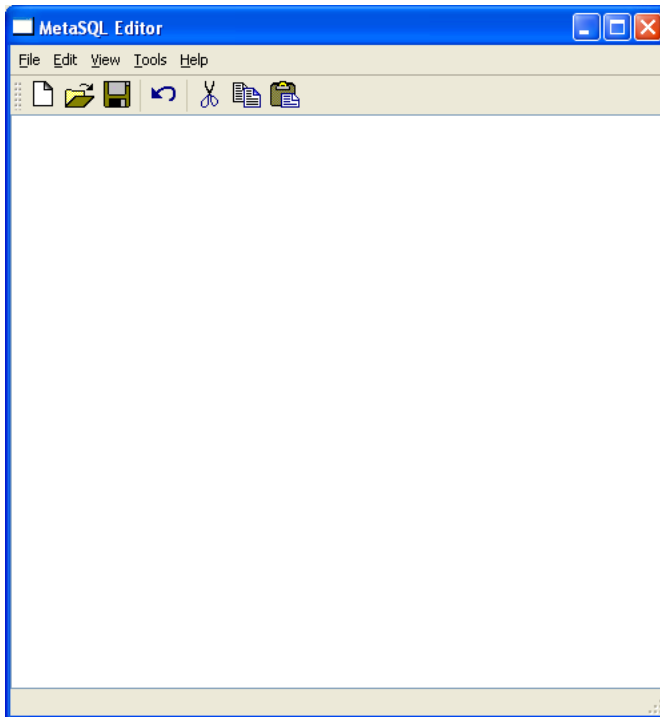


Figure 3.4: MetaSQL Editor

To perform tests using the MetaSQL Editor, you must first connect to your target database. To connect to a database, select the “Database” option from the “File” submenu, as shown in the following screen:

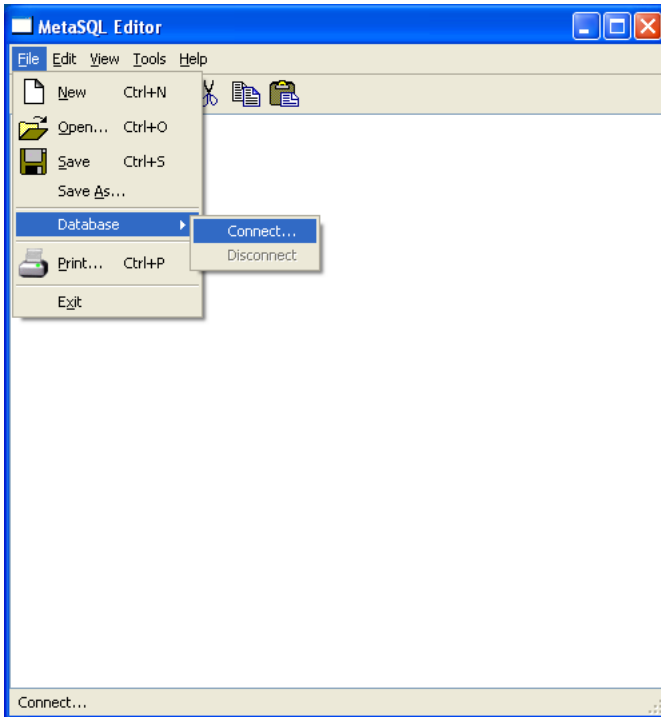


Figure 3.5: Connecting to a Database

For the purposes of this example, we will be connecting to an OpenMFG database. That explains why, when we select the “Connect” option, we are brought to a database login screen which has been customized for the OpenMFG application. OpenMFG users will be familiar with this login screen. Under the **OPTIONS** button, users may specify server, database, and port connection information. And then, as shown in the following screenshot, users are required to enter a valid username and password:



Figure 3.6: MetaSQL Editor - Connecting to the Database

Once we have successfully connected to our target database, we can begin testing the accuracy of embedded MetaSQL statements using the MetaSQL Editor.

## Entering a Query

For this exercise, we will demonstrate the MetaSQL Editor functionality using a very basic and simple query. The goal of the exercise is to leave you with an understanding of fundamental MetaSQL Editor mechanics. You are free to perform more complex and extensive testing on your own.

Now that we are connected to a database—in this case, an OpenMFG database—we can write a simple query and then test the results. To enter a query, simply type in the MetaSQL Editor's main text field, as shown in the following screen:

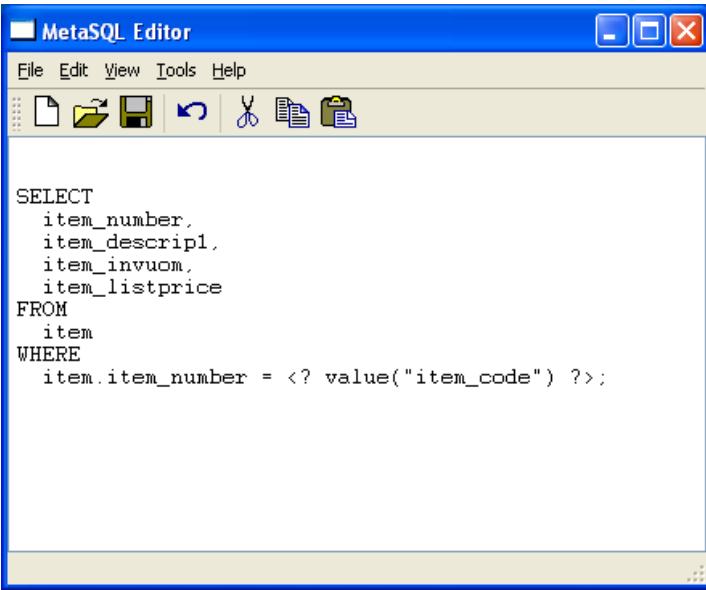


Figure 3.7: Simple SQL Query with Embedded MetaSQL

---

**Note**

Test queries may be saved for future use by selecting either the SAVE or SAVE AS options from the “File” menu.

---

As you can see in Figure 3.7, the query begins with standard SQL. We are seeking to SELECT four pieces of Item information FROM the item table. Our MetaSQL is inserted within the WHERE clause. The MetaSQL states that the item\_number for the selected Item must match a specified item\_code. The term item\_code is a parameter. We can set different values for the item\_code parameter using the MetaSQL Editor—and then run the query to test the results.

However, before we run the query, we must first define the parameter item\_code and assign it a value.

## Defining Parameters and Values

Earlier in this chapter we discussed parameters and how they enable reports to respond to dynamic conditions presented by application users. The MetaSQL Editor enables you to simulate these dynamic conditions, by defining parameters and assigning values to them.

Let's assign a value to the parameter we entered in our MetaSQL example—namely, the parameter `item_code`. In our example, we are simulating a situation in which an OpenMFG user inputs an `item_code`. The `item_code`, in turn, corresponds to an `item_number` in the `item` table.

Before we can test our MetaSQL, we must first create the parameter `item_code`. To create a parameter, we open the “Parameter List” option from the “View” menu. The following screen will appear:

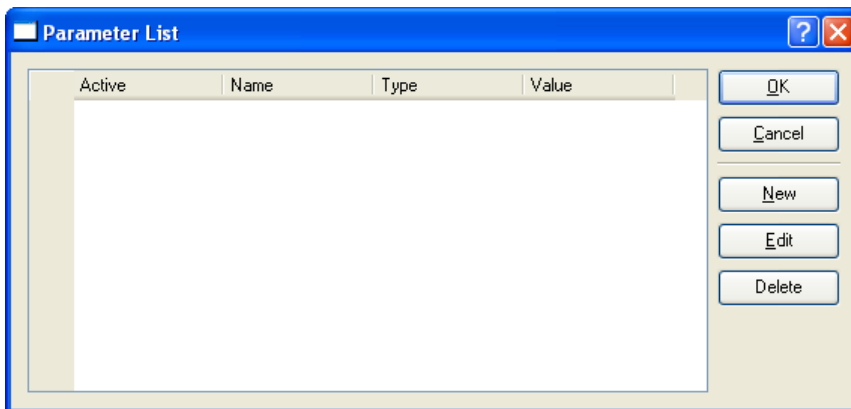


Figure 3.8: Parameter List

---

### Note

Parameters will be saved only for the duration of the current MetaSQL Editor session. Once the MetaSQL Editor is closed, any saved parameters will be erased.

---

The parameter list screen displays information on all parameters which have been created for testing purposes, including Active status, parameter name, data type, and value.

To create a new parameter, select the NEW button. The following screen will appear:

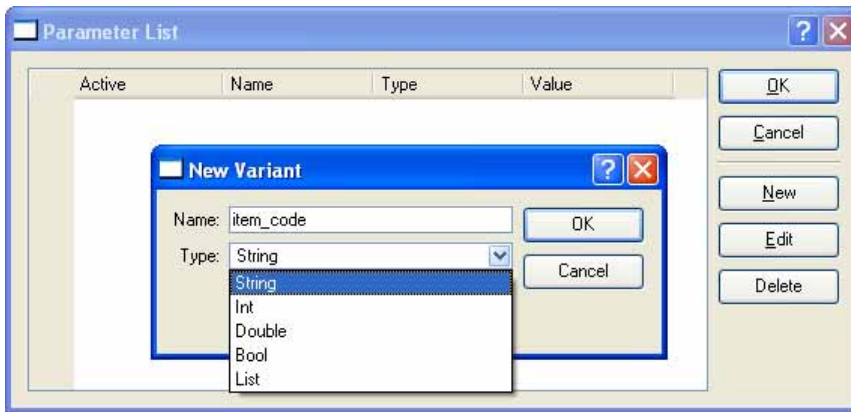


Figure 3.9: Enter New Parameter

When entering a new parameter, you are presented with the following options:

**Name:** Enter a name to identify the parameter.

- The names of parameters should correspond to parameter names referenced in your test queries.

**Type:** Select the appropriate data type from the list of available data types.

- Data types are defined on the database—and may vary from column to column. To be successful, your selection must match the data type for the target column in the database. In our example, the target column is `item_number`. The data type for this column is `text`. In the MetaSQL Editor, the `text` data type corresponds to the `String` type.

To the far right of the screen, the following buttons are available:

**OK:** Select to save the entered values.

**CANCEL:** Select to cancel the transaction and return to the parameter list.

After we have entered the appropriate values and selected the OK button, the following screen appears:

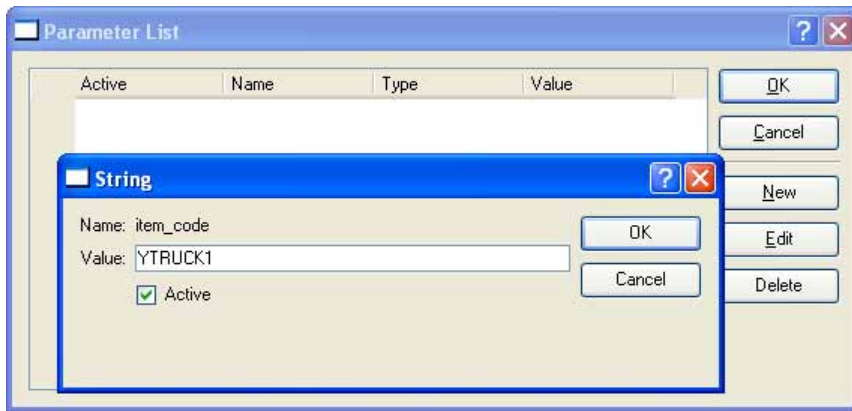


Figure 3.10: Specify Value for Parameter

As you can see in Figure 3.10, we are asked to enter a value for the parameter. In this case, we enter YTRUCK1. This is an `item_number` from our sample database. By entering that value here, we are linking the parameter `item_code` to `item_number YTRUCK1`. Selecting the OK button saves our information.

Back on the parameter list, we can verify the information has been entered correctly, as shown in the following screen:

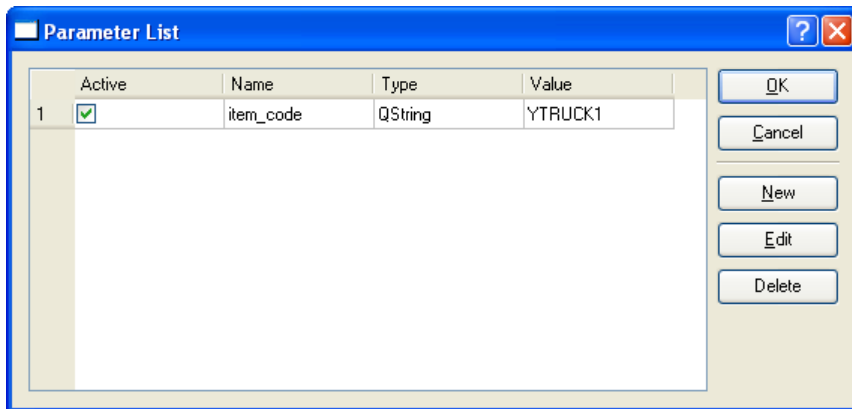


Figure 3.11: Parameter List Containing Sample Parameter

Now that we have our sample query and corresponding parameter, we are ready to begin our testing.

## Parsing and Executing a Query

Before we execute our query, we must first parse it using the MetaSQL parser. As we have discussed previously, the MetaSQL parser interprets MetaSQL statements embedded in a query, evaluates the available parameters, and then produces standard SQL. The resulting standard SQL is then sent to the database for processing.

To parse select the “Parse Query” option from the “Tools” menu. The following screen will appear:

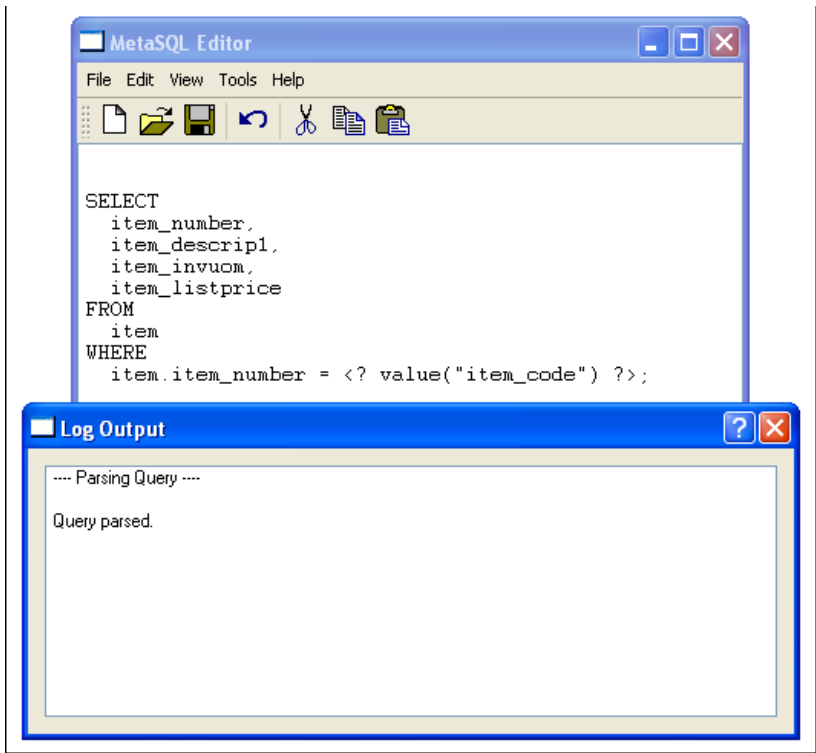


Figure 3.12: Parsed Query in MetaSQL Editor

Notice that in Figure 3.12, the MetaSQL parser creates a Log Output screen, where messages related to the parsing process will be written. In our case, we get a “Query parsed” message, which means our MetaSQL was parsed successfully.

Once a query has been parsed, we are ready to execute it. Executing a query means the standard SQL produced by the MetaSQL parser is sent to the database for processing. To execute a



query, select the “Execute Query” option from the “Tools” menu. The following screen will appear:

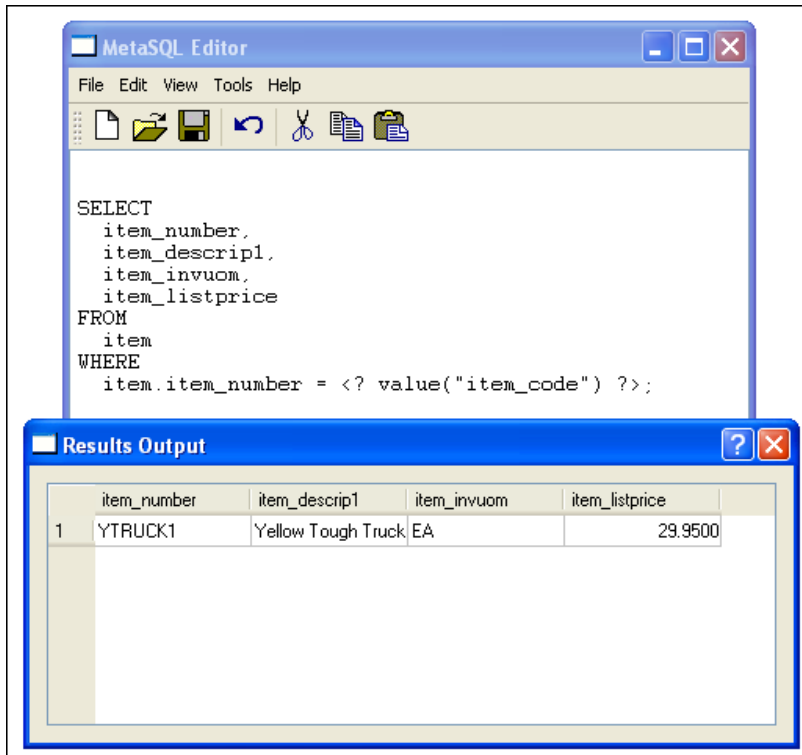


Figure 3.13: Results of Executed Query

When a query is executed successfully, the results will be displayed in a Results Output screen, as shown in Figure 3.13. As you can see in the example, the value returned in the `item_number` column equals the value assigned to the parameter `item_code`.

## Resulting Standard SQL

One of the most powerful features of the MetaSQL Editor is the ability to view the standard SQL generated by the MetaSQL parser. This is the same standard SQL the parser sends to the database for processing. This visibility is especially helpful when attempting to troubleshoot lengthy queries having complex MetaSQL statements and numerous parameters. To view the standard SQL output, select the “Executed SQL” option from the “View” menu. The following screen will appear:

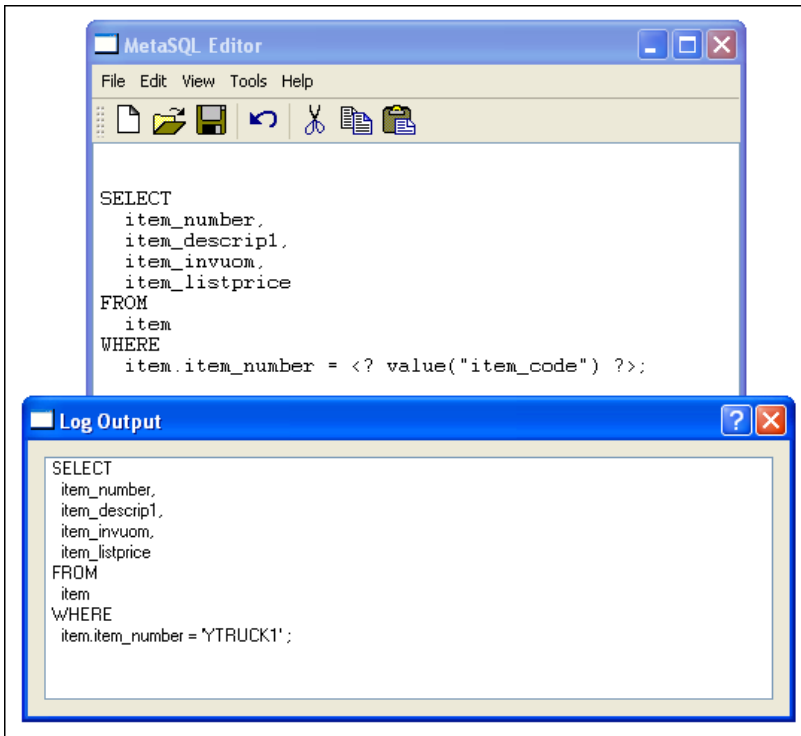


Figure 3.14: Standard SQL Output from MetaSQL Parser

As you can see in Figure 3.14, the MetaSQL parser has stripped the MetaSQL elements from the original query to produce standard SQL which can be processed by the database.

---

**Tip**

If you save your MetaSQL queries to a local file, you can load them into the MetaSQL Editor at a later time. Parameter lists may not be saved, however.

---

This concludes the section on using the MetaSQL Editor. Again, we used a very simple query to illustrate the basic mechanics of the MetaSQL Editor. We encourage you to test more complex queries and parameter lists on your own.

# OpenRPT

---

OpenRPT is the standalone version of the OpenMFG report writer. It enables you to craft report definitions and save them in XML format. Like the OpenMFG report writer, it is multi-platform supporting Windows, Mac, and Linux clients.

The OpenRPT Renderer connects to any PostgreSQL database and enables you to open an XML report definition created with OpenRPT, define parameters, assign them values, and generate the report's output. In this way it is possible to define and generate ad hoc reports.

---

### Note

The MetaSQL parser is a library which is compiled with the report renderer and also with the MetaSQL Editor.

---

In this section we will look at a simple ad hoc report definition against the OpenMFG *item* table. Keep in mind that you are not restricted to OpenMFG databases and tables when using OpenRPT in conjunction with the OpenRPT Renderer. After reviewing a few key aspects of the report definition we will look at how to generate the report's output with the OpenRPT Renderer.

## ***Ad Hoc Report Definitions***

The functionality in OpenRPT is identical to that of the OpenMFG report writer. Below we see the definition for a report that displays data contained in the *item* table:

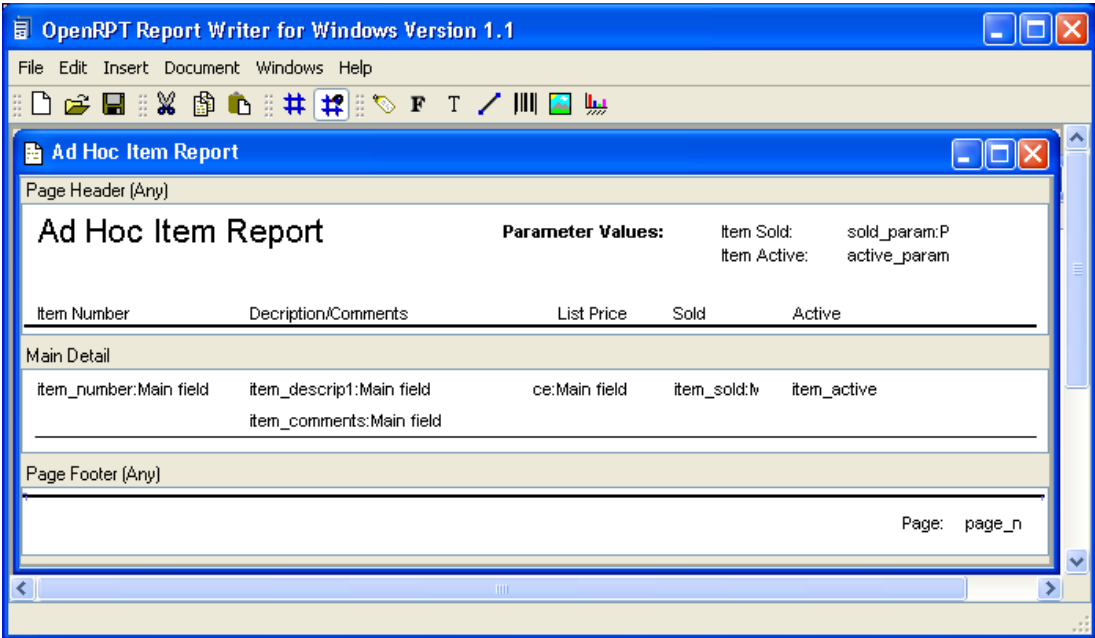


Figure 3.15: OpenRPT Report Definition For An Ad Hoc Item Report.

Note that the report displays whether or not an item is sold and whether it is active. In the next section we see the Query Source and corresponding SQL query that retrieves the data from the database. As part of the SQL we will assign parameters that, when we generate the report with the Renderer, filter data based on user provided values for these two parameters.

### *Report Query Source*

The screen below shows the SQL that retrieves the data from the PostgreSQL database:

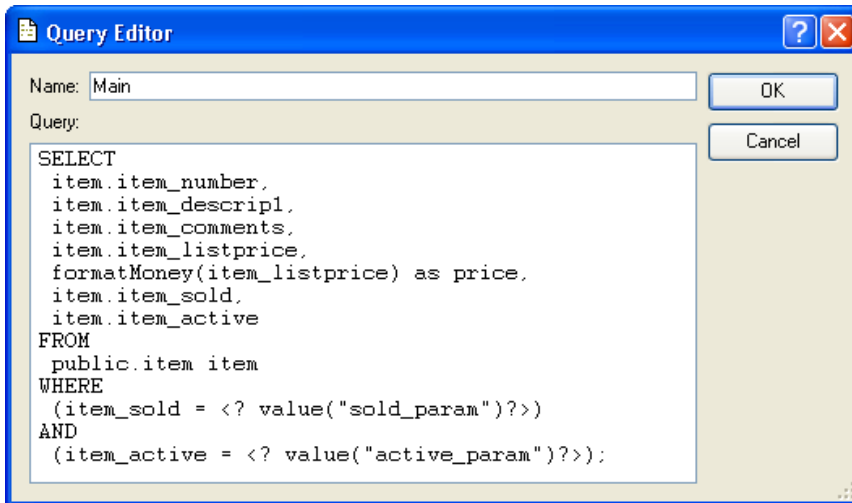


Figure 3.16: Report Definition's Query Source SQL

Please observe the following in the report's SQL:

- We may format the field *item\_listprice* by using the syntax “formatMoney(*item\_listprice*) as *price*” and then reference *price* in our report definition. This displays 2 decimals instead of the field's 4 decimal places.
- The WHERE clause contains the parameters passed to the standard SQL using OpenRPT MetaSQL syntax (remember that MetaSQL is contained inside the ‘?’ and ‘?’ tags):

```
<? value("sold_param")?>
```

```
<? value("active_param")?>
```

Later, using OpenRPT, we will pass runtime parameter values to the report definition when we generate its output and in this way control the nature of the data displayed on the resulting report.

---

**Tip:**

Earlier we learned about MetaSQL and the MetaSQL Editor. This tool enables you to craft queries that contain MetaSQL and test them with various parameter values to verify the SQL generated and the rows returned from the database. To accelerate the creation of any report definition, first verify the SQL in the MetaSQL Editor and then copy and paste it into your report definition's Query Source.

---

## ***Save XML Report Definition***

Once the report definition has been created in OpenRPT it is time to save it:

- Pull down the OpenRPT File menu
- Click on the “Save As” option
- Using your operating system's save file dialogue select a location to save the report definition and give it a name that ends with.XML
- Click the SAVE button

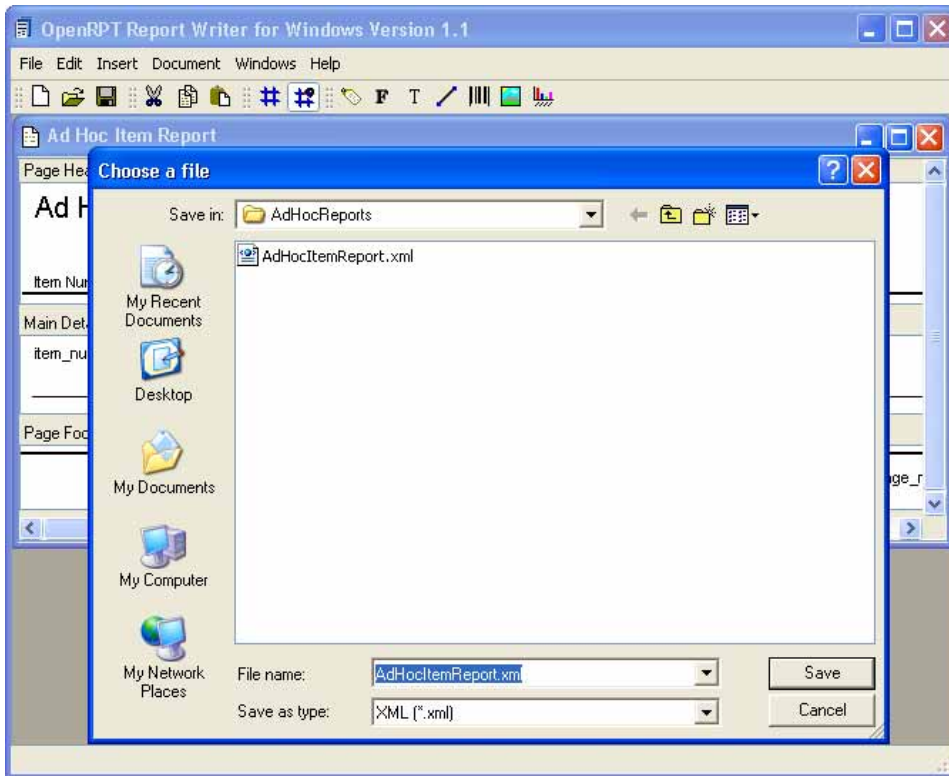
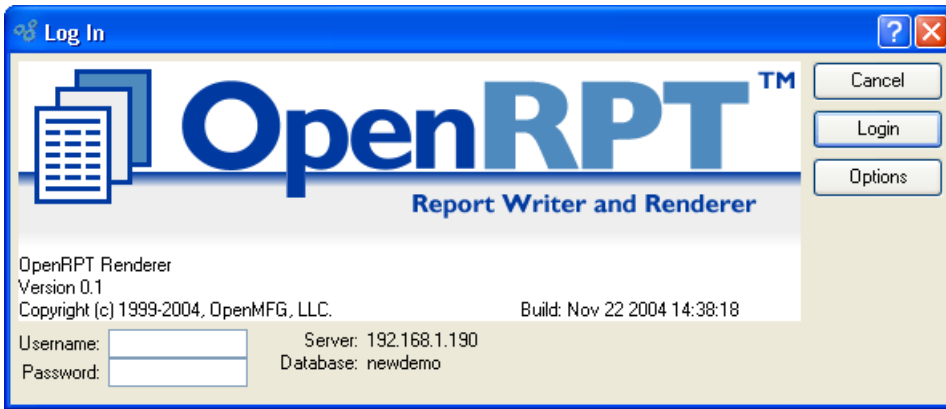


Figure 3.17: Report Definitions Are Saved In XML Format

Now that we have defined our report definition and saved it to an XML file, it is time to generate the report's output using the OpenRPT Renderer.

## *Report Renderer*

Before opening a report definition, we must first connect to the PostgreSQL database containing the table(s) from which we will query the data for our report. When you first open the OpenRPT Renderer, you will be prompted to Log In.



**Figure 3.18: The OpenRPT Renderer Must First Be Connected To A PostgreSQL Database**

You may save or change the default connection options by clicking on the **OPTIONS** button and providing:

- **Server** - the name or IP address of the PostgreSQL server
- **Database** - the name of the PostgreSQL database on the server
- **Port** - the port on which PostgreSQL communicates

The Username and Password must be for a valid database user and corresponding password.

### *Open XML Report Definition in Renderer*

This first step when using the OpenRPT Renderer is opening a report definition. Remember, these definitions are created using OpenRPT and are saved in XML format.

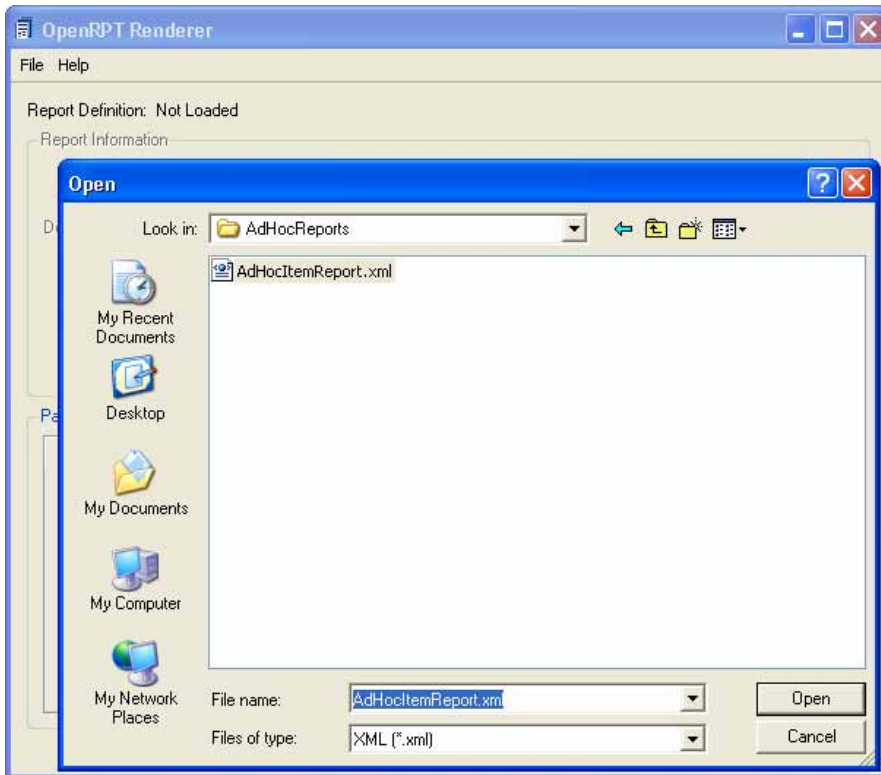
---

**Tip:**

XML report definitions may be saved to a network drive. In this way many users can have access to a collection of Ad Hoc reports.

---





To open an XML report definition file:

- Pull down the OpenRPT Renderer File menu
- Select the option Open
- In the Operating System's open file dialogue, locate the report definition's XML file and select it.

The top half of the OpenRPT Renderer contains a section called Report information. In it you will see the following information read from the report definition's XML file:

- Name
- Title
- Description

Developers of report definitions should utilize the Description section of a report definition to communicate information about what the report does to those who will use it.

## *Adding OpenRPT Renderer Runtime Parameters*

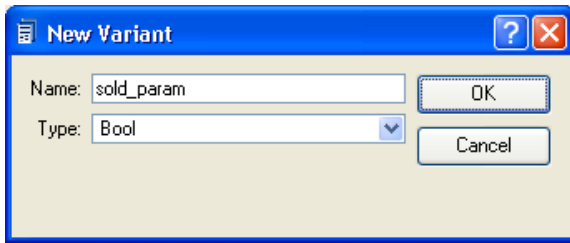
You may recall that when we created our report definition's SQL, we embedded in it (within the MetaSQL tags '<?' and '?>' parameters that will accept user defined values at run time. After we open an OpenRPT report definition, we must define these parameters and set their values before generating the report. The report definition we defined contains two parameters:

- sold\_param
- active\_param

Let's look at how a parameter is defined and a value assigned.

### Define Parameter

After opening the report definition click the ADD button. You will see the New Variant screen:

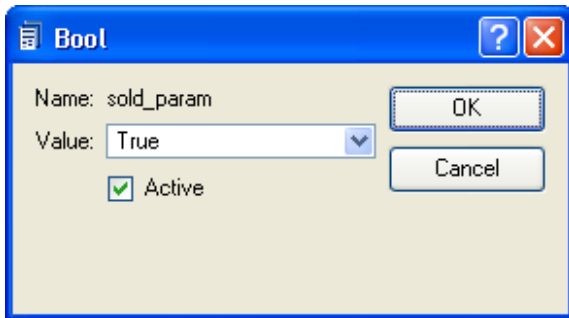


You must enter the exact Name of the parameter, as defined in the report definition, and assign it a Type. Above we see the "sold\_param" defined as a Type "Bool" (Boolean) which means it has a True/False value in the database.

After clicking the OK button, you will be prompted to enter a value for the parameter and check whether or not it is Active.

### Set Parameter Value

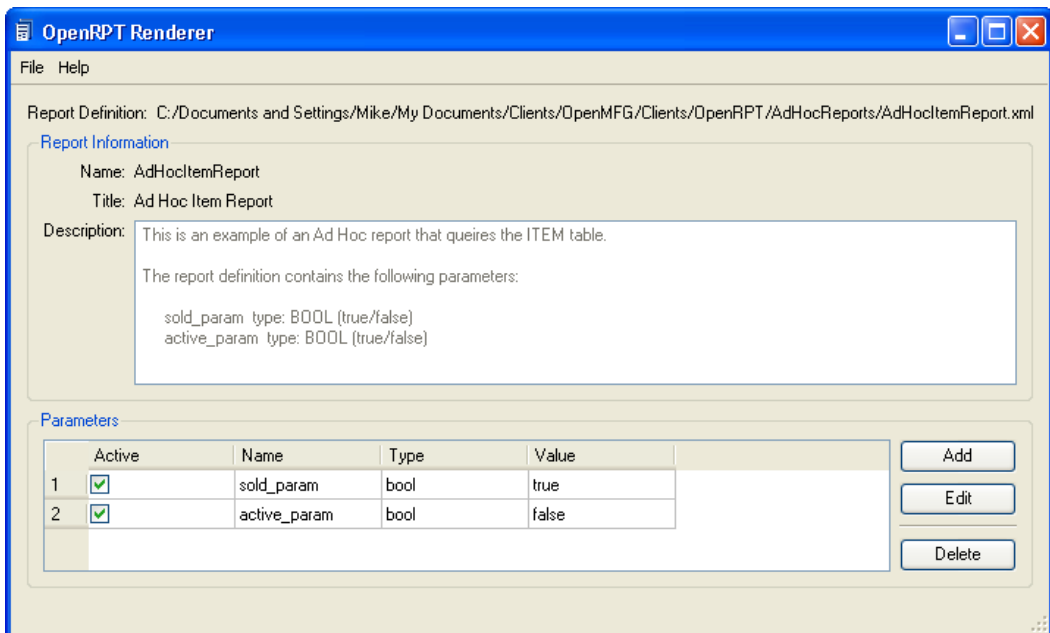
Below we see the screen that enables us to set a value for the parameter we just define. This screen displays after we click the OK button on the New Variant screen.



Note that because the parameter was defined as type Bool, we are presented only with the options True or False for the parameter's value.

It is important to set the parameter as Active if you want its value passed to the report definition at report run time.

Clicking the OK button returns you to the main screen for the OpenRPT Renderer and displays information about the parameter(s) in the Parameters section of the screen



**Figure 3.19: OpenRPT Renderer After Two Parameters Have Been Defined Along With Values That Are Passed To The Report's SQL To Control Data Selected By The Query And Displayed In The Report.**

## Changing Parameter Values

Parameters values may be changed by clicking the EDIT button found on the main OpenRPT Rendered screen. The user first selects a parameter to edit by clicking on it and then clicks the EDIT button. The OpenRPT Renderer displays the screen that enables the user to change the parameter's value or uncheck the Active option to deactivate the parameter.

## *Deleting a Parameter*

Parameters may be deleted with the DELETE button found on the main OpenRPT Renderer screen. The user first selects a parameter to delete by clicking on it and then clicks the DELETE button. The OpenRPT Renderer removes the parameter from the list of parameters displayed.

---

### **Note:**

Currently parameters are not saved. When the Renderer is closed, all parameter settings are lost and must be re-entered the next time the report definition is opened with the OpenRPT Renderer.

---

## Generating the Ad Hoc Report

Now that you have:

- Connected to the database
- Opened report definition's XML file
- Defined parameters and set their values

It is possible to render the report's output. Simply:

- Pull down the File menu on the main OpenRPT Renderer screen
- Select the Print option
- Choose a printer and start the print job

Below we see our Ad Hoc Item Report:

Ad Hoc Item Report		Parameter Values:	Item Sold:	Item Active:
Item Number	Description/Comments	List Price	Sold	Active
ZTRUCK	Special Collector's Truck This is the special 2003 collector's edition truck	59.99	true	false
XTRUCK	NASCAR Collector's Truck This is the special 2002 NASCAR X truck	74.99	true	false

Figure 3.20: Ad Hoc Report Generated Through The OpenRPT Renderer.

Above we see that the user, prior to running this report, set parameters that show only items that are sold (`sold_param = true`) and that have been set to inactive status (`active_param = false`). The user could return to the OpenRPT Renderer and change one or both of the parameter's values to generate a different report.

---

### Tip

Utilities exist on the three support client platforms that enable the generation of printed output to a PDF formatted file (as seen above) for viewing on-screen.

---

## Watermarks and Background Images

---

The OpenMFG report writer supports two advanced features that enable you to make your reports visually appealing and add a level of security that makes it easier to determine if a printed report is the original or a duplicate. These two features are watermarks and background images.

A watermark is text that is printed across the background of a report and is usually defined with an opacity factor that cause the printing to be lighter than the report's foreground content.

A background image is similar to a watermark in that it is displayed in the background of the report’s output and its opacity can be controlled. However, as its name implies, a background image is graphical, not textual, in nature.

The use of watermarks and background images is not mutually exclusive; a report may employ both. Also, both may be static or dynamic in nature. That is to say, a watermark may have a fixed value, or its value may be derived from a query source that retrieves it from the database. A static background image references a single image for the report. A dynamic background image can use a query against the *images* table to retrieve a different image (perhaps a customer’s logo) based on parameter values passed to the report at run-time.

Below is a report that employs both an static background image and a static watermark:

Modified Users Master List						
Username	Active	Proper Name / Photo	Initials	Purchasing Agent	Language	Active
jsmith	Yes	John Smith 	JS	Yes	Default	true
mfgadmin	Yes	OpenMFG Administrator 	ADMIN	Yes	Default	true
Number of Users Displayed: 2.00			Total Active Users: 2.00			

Figure 3.21: Portion of a Sample Report Showing Static Background Image and Static Watermark

Both watermarks and background images are defined in the Report Properties session. To open this session first open the report writer and then the report to which you want to add or change the watermark or background image. Next:

- Pull down the Document menu
- Click on the “Properties” option

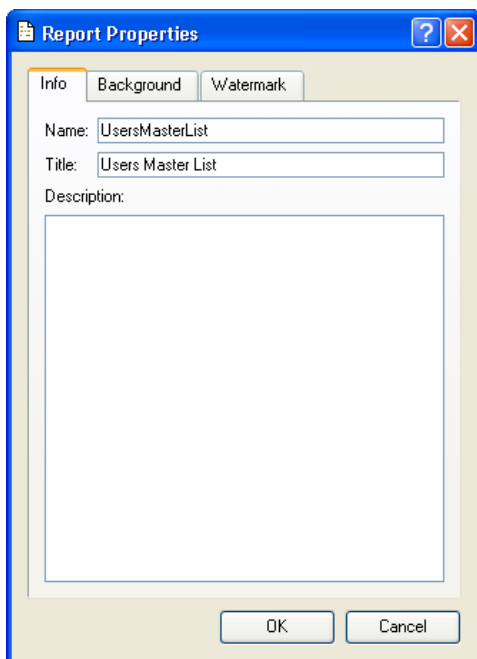


Figure 3.22: Report Properties Info Tab

The Info tab enables you to provide a descriptive title for your report and a detailed description that may, in the future, help others understand how your report works or should be used.

## ***Background Images***

Background images are defined on the Report Properties session under the Background tab:

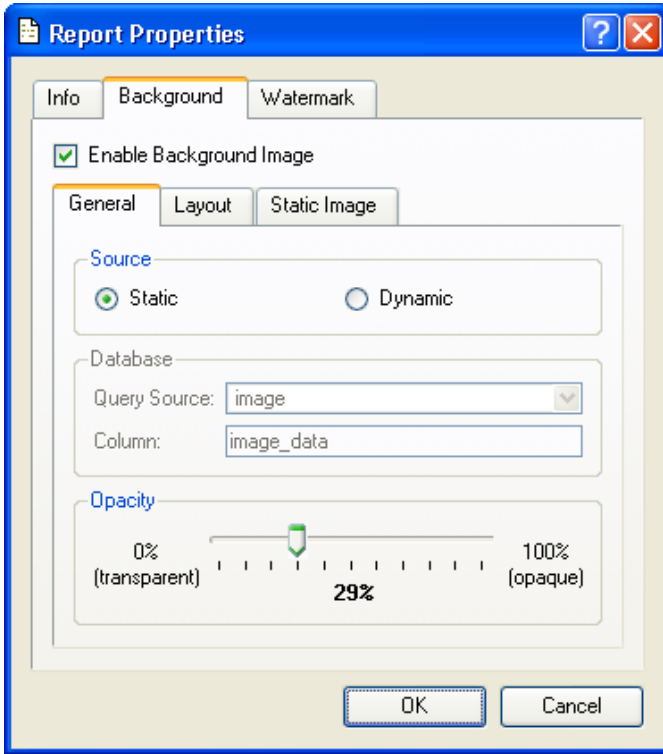


Figure 3.23: General Tab for Background Images

To enable Background images, the Enable Background image box must be checked.

There are two types of Background image: static and dynamic. Our example depicts a static background image; one where the image shown never changes.

A Dynamic background image can be displayed from the OpenMFG *images* table based on the results of a the SQL in a Query Source. The column field would then reference the *image\_data* column which contains the image data. Company logos, product images, and employee photos, just to name a few, can be stored in the *images* table and pulled dynamically into a report through the SQL in a Query Source.

Within the Background tab there are three sub-tabs: General, Layout, and Static Image.



## General

The General tab controls the Source of the image: Static or Dynamic. The Query Source and Column, if it is a dynamic background image, references the SQL query source and the column retrieved by it that contains the image data. The Opacity slider controls the level of transparency that the background image will possess when displayed.

## Layout

The Layout tab for background images controls whether the image is shown at its original size (the Clip option) or it is stretched (the Stretch option) based on the values of the fields Width and Height.

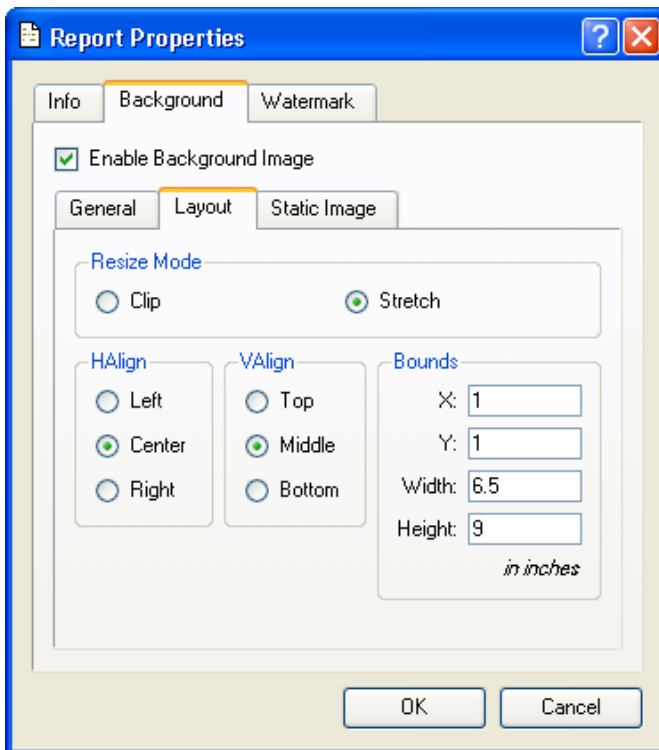
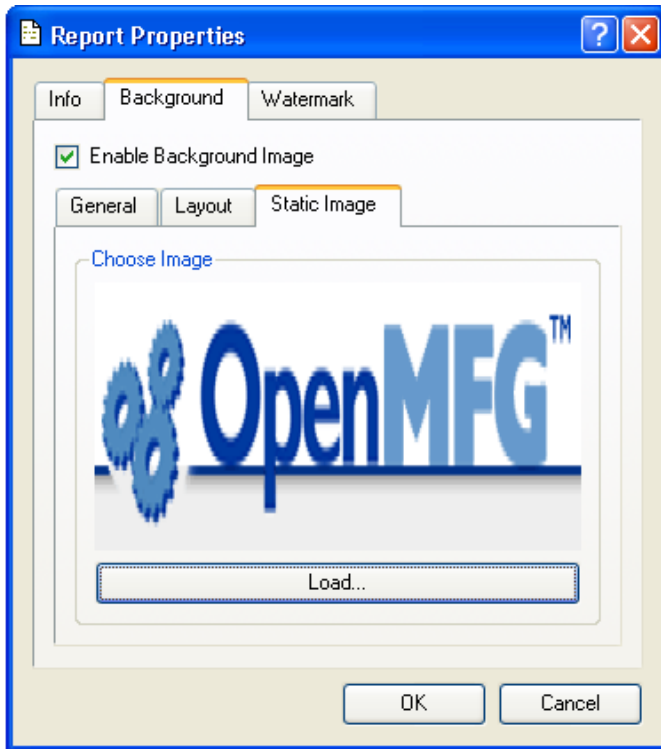


Figure 3.24: Layout Tab for Background Images

Other settings on this tab control the position of the background image in the report

## Static Image

The Static Image tab for background images only applies to static background images.



**Figure 3.25: The Static Image Tab Shows The Static Image You Have Loaded For Display in the Background of Your Report**

When you click on the LOAD button, you are presented with your operating system's locate file dialogue. Selecting the image locally and clicking OK returns you to the Static Image tab and a view of the image.

---

**Note:**

Static background images are embedded in XML that is stored in the column *report\_source* in the table *report*. As such, when you save a report definition locally in XML format, the static image is embedded in it and transported with it.

---

## Watermarks

Watermarks are defined on the Report Properties session under the Watermarks tab. Let's take a look at the screen that enable us to control watermarks:

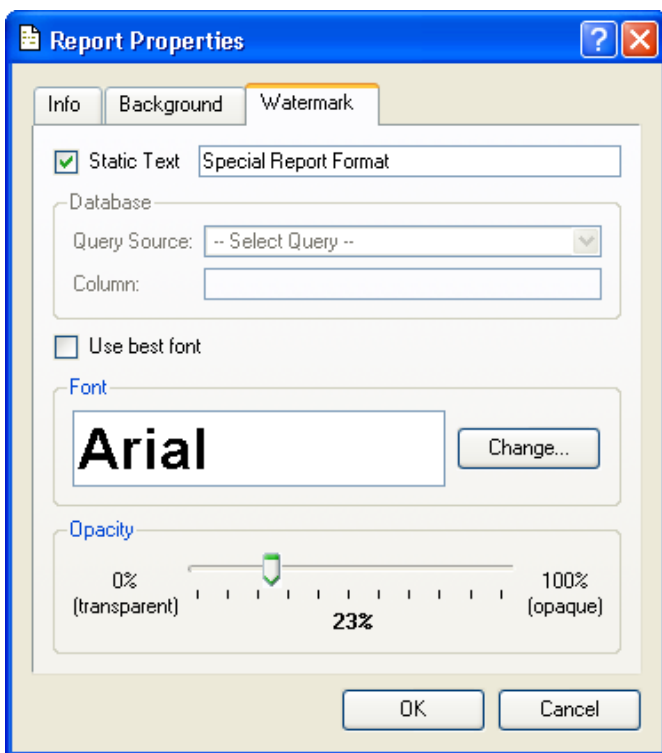


Figure 3.26: Watermark Tab on Report Properties

Like background images, watermarks can also be static or dynamic.

The value of a dynamic watermark may be provided through the results of an SQL query referenced in the fields Query Source and Columns. Likewise, the value of a parameter value passed to the report at run-time can also be displayed by selecting Parameter Query in the Query Source field and entering the name of the parameter in the Column field.

The characteristics of the watermark, its size, font, and opacity, are controlled by the other fields on the Watermark tab.

## Bar Coding

---

The two major benefits to Bar coding are accuracy and speed during data collection. The report writer makes it easy to add Bar coded information to report definitions. In this section we look at a simple but powerful example.

The photo below is of a wedge type Bar code scanner. This type of scanner is attached to a PC running the OpenMFG Client. When a Bar code is scanned, the information read by the scanner is entered on the screen wherever the cursor is currently located. Put another way, a wedge scanner is a substitute for the user's manual data entry. Today these scanners are durable, inexpensive, and easy to connect.



**Figure 3.27: Low Cost Bar Code Scanner**

Frequently Bar code scanners are used to collect information on the shop floor. Below is the OpenMFG Post Production screen:

**Post Production**

Work Order #:  ... W/O #:

Item Number: UOM:

Status:

Qty. Ordered:  Backflush Materials

Qty. Received:  Issue Items not on Pick List

Balance Due:  Backflush Operations

Qty. to Post:   Close W/O after Posting

Production Notes:

Immediate Transfer to Warehouse:

**Figure 3.28: The Post Production Screen Requires the Entry of a Work Order Number and Quantity Completed Information That Could Be Entered Via a Bar Code Scan**

Users posting production are required to enter two pieces of information: the Work Order Number and the Quantity to Post. This information is available on the Work Order's Router. But the standard Router (see below) contains this information only in human readable form.

<b>Routing</b>					
Work Order #: 1154-1		Warehouse : WH1			
Item: YTRUCK1 Yellow Tough Truck		UOM: EA			
Status: E					
Qty. Ordered: 100.00		Start Date: 11/05/2004			
Qty. Received: 0.00		Due Date: 11/05/2004			
Seq. #	Work Center Std. Oper.	Description	Tooling Reference	Setup Total Run Total	Setup Remain Run Remain
10	PAINT PAINT	Paint Operation	YTRUCK Paint Rack	30.0 100.0	30.0 100.0
	Instructions				
20	ASSEMBLY1 ASSEMBLY	Assembly	YTRUCK Assembly Jig	1.0 100.0	1.0 100.0
	Instructions				
30	SHIPPING1 SHIP1	Shipping Area 1	YTRUCK Shipping Form	1.0 100.0	1.0 100.0
	Instructions				

Figure 3.29: Output of the Standard OpenMFG Work Order Routing With Human Readable Information.

The information that we need for Posting Production is on the Routing, but in human readable form. Let’s look at how easy it is to add two addition fields that display this information in Bar code Format.

Below we see the report definition called Routing:

Page Header (First)					
Page Header (Any)					
Seq. #	Work Center Std. Oper.	Description	Tooling Reference	Setup Total Run Total	Setup Remain Run Remain
Report Header					
<b>Routing</b>					
Work Order #: <b>wonumber:Head field</b>		Warehouse: <b>warehouse_code</b>			
Item: <b>item_number:Head field</b> <b>item_descrip1:Head field</b> <b>item_descrip2:Head field</b>		UOM: <b>item_invuom:He</b>			
Status: <b>wo_status:Head field</b>					
Qty. Ordered: <b>tyord:Head field</b>		Start Date: <b>startdate:Head 1</b>			
Qty. Received: <b>tyrcv:Head field</b>		Due Date: <b>duedate:Head fi</b>			
Seq. #	Work Center Std. Oper.	Description	Tooling Reference	Setup Total Run Total	Setup Remain Run Remain
unnamed Detail					
<b>eqnumber: wrkcnt_code:Detail field</b>		<b>wooper_descrip1:Detail field</b>		<b>wooper_toolref:Detail field</b>	<b>sutime:Detail field</b>
<b>stdopn:Detail field</b>		<b>wooper_descrip2:Detail field</b>		<b>remain:Detail field</b>	<b>_runtime:Detail field</b>
Instructions: <b>wooper_instruc:Detail textarea</b>					
Page Footer (Any)					
Report Date: <b>report_date:Conte</b>					Page: <b>page_n</b>

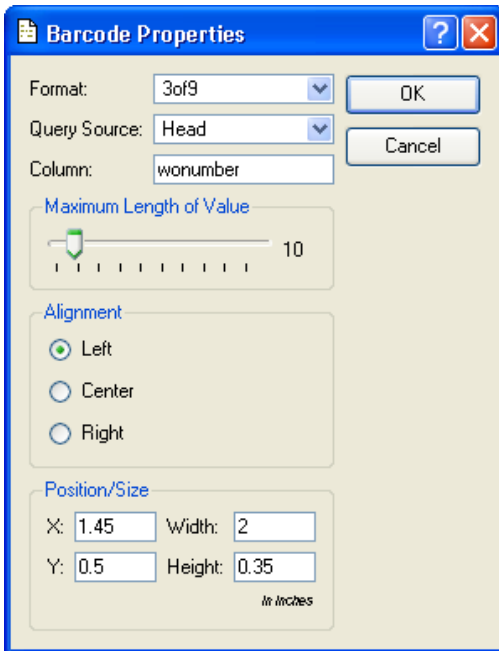
Figure 3.30: Standard Work Order Routing Report Definition Before the Addition of Bar Coded Work Order Number and Quantity Ordered.

To added the human readable fields we are interested in at referred to on the screen as “wonumber:Head field” and “qtyord:Head field”. We will leave these fields as they are, but, we will need to move the “wonumber:Head field” and its corresponding label up a little to make room for the Bar code field which we will place underneath it.

Once we have room on the report definition for the Bar code we can use the Bar code tool



to place Bar code in the report definition. Below we see the Bar code Properties screen:



**Figure 3.31: Bar Code Properties Definition For the Work Order Number Field**

There are four critical settings on this screen:

- **Format** - You should check which formats your scanner supports. Most modern scanners enable autoselection which means that the scanner can read more than one format and determine the format when the Bar code is scanned. OpenMFG provides the following standard Bar code formats:
  - 3 of 9
  - 3 of 9+
  - 128
  - ean13
  - ean8
  - upc-a
  - upc-e
- **Query Source** - we can look at this settings for the human readable “wonumber:Head field” and “qtyord: Head field” fields and use that same query for our Bar coded fields



- Column - we can look at this settings for the human readable “wonumber:Head field” and “qtyord: Head field” fields and use that same column for our Bar coded fields
- Maximum Length of Value - Here we set the number characters wide the work order number and quantity ordered could be. Ten and six respectively will work for these two Bar codes.

After the addition of our Bar code fields the new report definition will look something like this:

Page Header (First)					
Page Header (Any)					
Seq. #	Work Center Std. Oper.	Description	Tooling Reference	Setup Total Run Total	Setup Remain Run Remain
<b>Report Header</b>					
Work Order #: <b>wonumber:Head field</b> wonumber:Head barcode			<b>Routing</b>		
Item: <b>item_number:Head field</b> <b>item_desc1:Head field</b> <b>item_desc2:Head field</b>			Warehouse: <b>warehouse_code</b> UOM: <b>item_invuom:Ht</b>		
Status: <b>wo_status:Head field</b>			Start Date: <b>startdate:Head 1</b>		
Qty. Ordered: <b>lyord:Head field</b> qtyord:Head barcode		Due Date: <b>duedate:Head fi</b>			
Qty. Received: <b>tyrcv:Head field</b>					
Seq. #	Work Center Std. Oper.	Description	Tooling Reference	Setup Total Run Total	Setup Remain Run Remain
<b>unnamed Detail</b>					
<b>eqnumber: wrkcnt_code:Detail</b>		<b>wooper_desc1:Detail field</b>		<b>wooper_toolref:Detail field</b>	
<b>stdopn:Detail field</b>		<b>wooper_desc2:Detail field</b>		<b>sutime:Detail field</b>	
				<b>remain:Detail field</b>	
Instructions: <b>wooper_instruc:Detail textarea</b>					
<b>Page Footer (Any)</b>					
Report Date: <b>report_date:Conte</b>				Page: <b>page_n</b>	

Figure 3.32: Routing Report Definition After the Addition of Bar Coded Work Order Number and Quantity Ordered Fields

Remember when you Save to DB to use a grade other than 0 for your new routing report definition. To view the new routing, go to the W/O - W/O Control menu and select Print Routing. Enter a the Work Order Number for a currently released work Order and click the PRINT button. The new routing looks like this:

Work Order #: 1154-1
Routing

  
 Item: YTRUCK1  
 Yellow Tough Truck

Warehouse: WH1  
 UOM: EA

Status: E

Qty. Ordered: 100.00          Start Date: 11/05/2004

Qty. Received: 0.00     Due Date: 11/05/2004

Seq. #	Work Center Std. Oper.	Description	Tooling Reference	Setup Total Run Total	Setup Remain Run Remain
10	PAINT PAINT	Paint Operation	YTRUCK Paint Rack	30.0 100.0	30.0 100.0
	Instructions				
20	ASSEMBLY ASSEMBLY	Assembly	YTRUCK Assembly Jig	1.0 100.0	1.0 100.0
	Instructions				
30	SHIPPING SHIP1	Shipping Area 1	YTRUCK Shipping Form	1.0 100.0	1.0 100.0
	Instructions				

Figure 3.33: New Routing After The Addition of Bar Coded Fields to Enhance the Accuracy and Speed of Collection.

Now, a user recording production on the Post Production screen need only scan the Work Order Number and the Quantity to Post from the new Routing, and click the POST button.

The screenshot shows a 'Post Production' dialog box. It has a blue title bar with a question mark and a close button. The main area is light beige. At the top, there are two rows of input fields: 'Work Order #' with a dropdown arrow and a 'Whs.' field with a 'Cancel' button; and 'Item Number' with a dropdown arrow and a 'UDM' field with a 'Post Production' button. Below this is a 'Status:' section with four checkboxes: 'Backflush Materials' (checked), 'Issue Items not on Pick List' (unchecked), 'Backflush Operations' (checked), and 'Close W/O after Posting' (unchecked). There is also a 'Qty. to Post' input field. At the bottom, there is a 'Production Notes' text area and an 'Immediate Transfer to Warehouse' checkbox with a dropdown menu showing 'WH1'.

**Figure 3.34: After the Addition of Bar Codes to the Router, The User Records Production by Scanning the Work Order Number Quantity Bar Codes and Clicking the POST PRODUCTION Button.**

As you become more and more familiar with OpenMFG and the data collection screens in it that you use to run your business, pay close attention to the OpenMFG documentation that users rely on to provide that data. You will likely find many other opportunities to add Bar coded fields to report definitions and by doing so, improve the speed and accuracy of the information that is collected.

## Graphing

The report writer provides the capability to display information graphically. In this section we will examine this functionality by looking at how an existing report definition defined in the OpenMFG ERP application suite that displays inventory history can be enhanced to show the information in both numerical and graphical form.

## Graphical Report Output

The basis for our discussion is an existing report that is generated by OpenMFG in the Inventory Management module. The display is called Time-Phased Item Usage Statistics by Item and the report is generated by clicking the PRINT button.

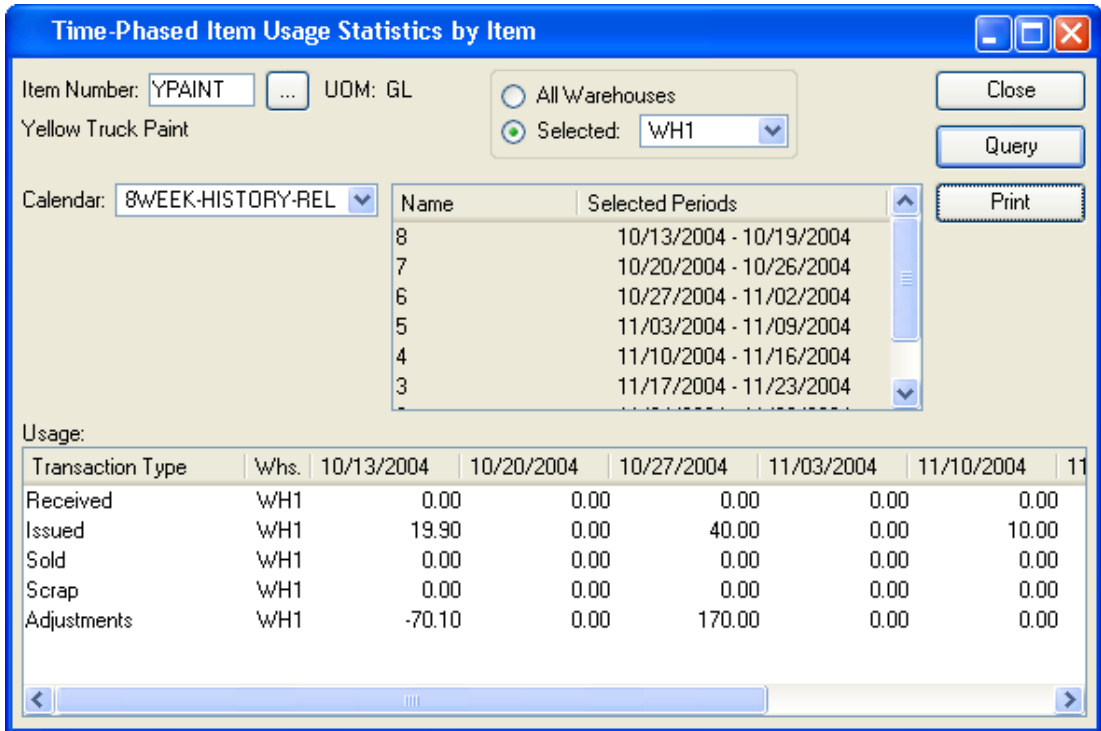


Figure 3.35: The Time-Phased Item Usage Statistics by Item Report is an Excellent Candidate for Enhancement with a Graph.

Data for the report can be viewed prior to initiating the report. Above we see 8 weeks of historical information for a specified item in a specific warehouse. The standard report definition displays this same information in a vertical format on a printed page. But, with the report writer’s graphing capability, we can display the same information visually as well.

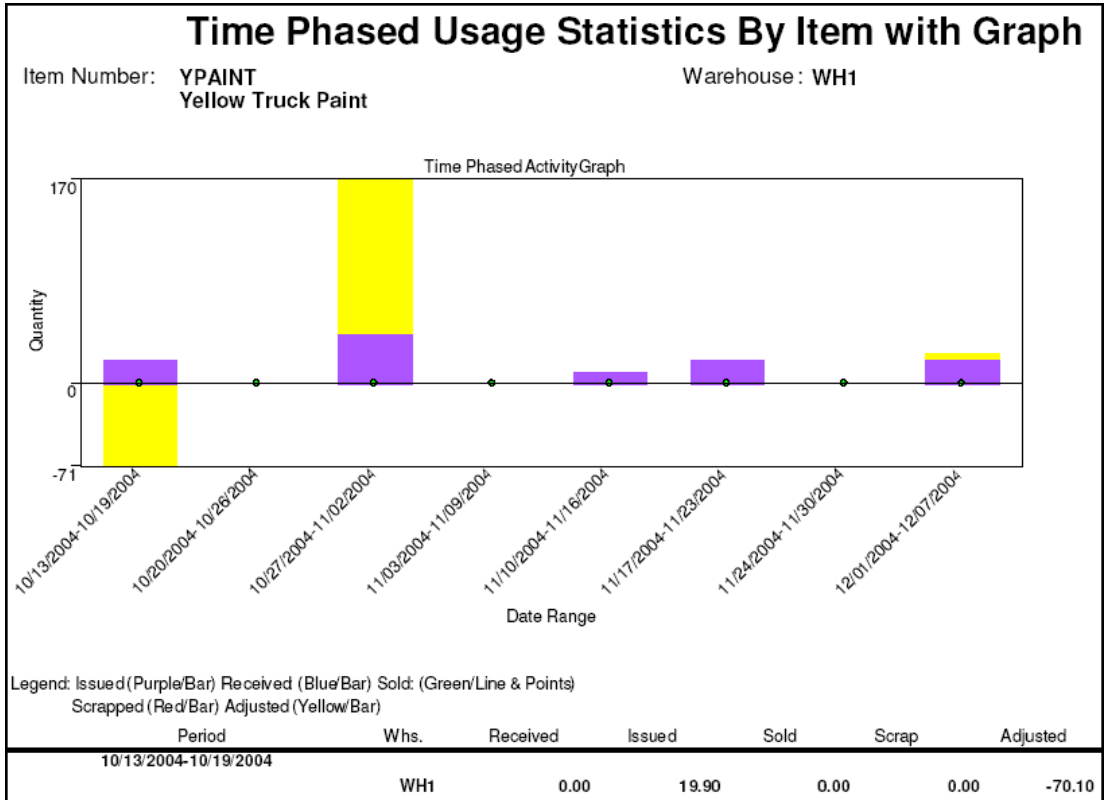


Figure 3.36: Data That Appears in the Body of the Report (Partially Seen at the Bottom) Is Displayed in Graphical Form in the Header.

To do this, the standard report definition was enhanced so that the Header area at the top was large enough to accommodate the new graph. Then, the same columns in the query definition that were used in the body of the report to display the period were used to plot the Y axis. Likewise, the columns in the query definition that were used to display the quantity information (Received, Issued, etc.) were used to define the X axis. Let's take a look under the hood and see how this was done.

## Graphical Report Definition

The nature of a report definition that displays information graphically is fundamentally the same as one that displays information textually. Indeed, a report definition that displays numerical information is often a good candidate for graphical enhancement.

Below we see the report definition for the Time Phased usage Statistics By Item after the section Report Header has been enlarged and a Graph object has been added to it:

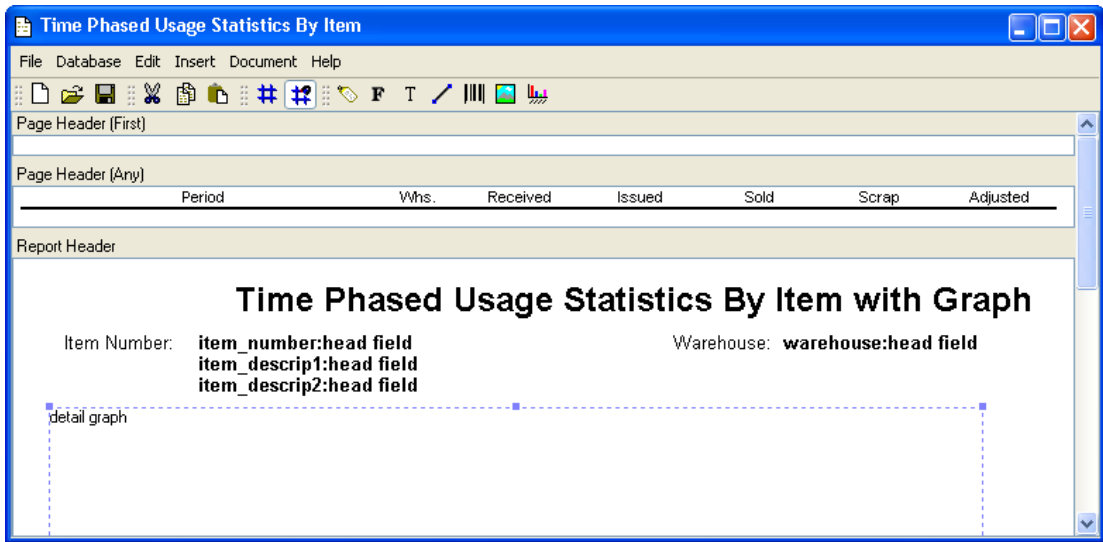



Figure 3.37: The Report Definition’s Report Header Section Has Been Enhanced With a Graph Defined in the Object Called “detail graph”.

A Graph object is added using the  graphing tool on the toolbar. Start by clicking on the graphing tool. Then, click on the area in the section of the report definition where you want the graph to display. Next, resize the resulting Graph object box with your mouse. Finally, doubleclick on the Graph object to define detailed information about its behavior.

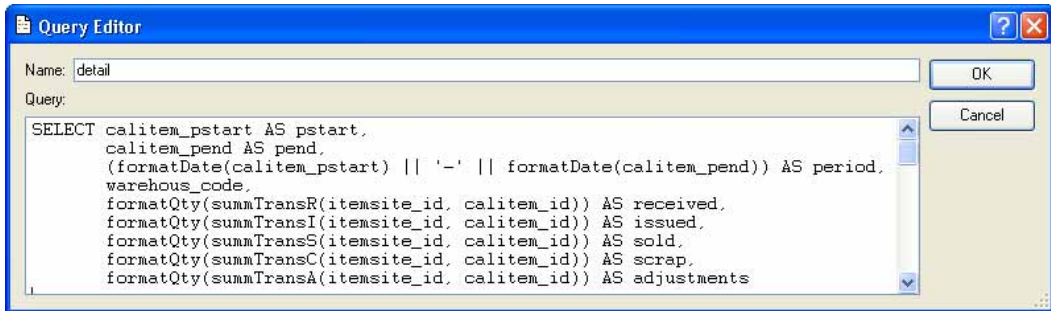
We will cover Graphing object definition shortly. First, let’s take a look at the SELECT clause in the report’s Query Definition to see the origin of the column values that will be used to define values and information for the X and Y axes.

## Query Source

The SELECT clause in the SQL statement that is used in the report’s Query Definition is shown below. It is important to note two factors in relation to this Query Source:

- The existing report definition’s Query Source was not modified in any way to accommodate the graph.

- The SQL utilizes embedded PL/pgSQL (the PostgreSQL Procedural Language) functions `summTransR()`, `summTransI()`, `summTransS()`, `summTransC()` and `summTransA()` to actually query the table *invhist*.



**Figure 3.38: The Select Clause in the Report’s SQL Statement Contained in the Query Definition “detail” Contains The Columns That Will Referenced in the Graph.**

Ultimately the query returns values for columns: received, issued, sold, scrap, adjustments, and period. These will be used in the graph’s definition to supply the dynamic data upon which the resulting graph will render the information visually.

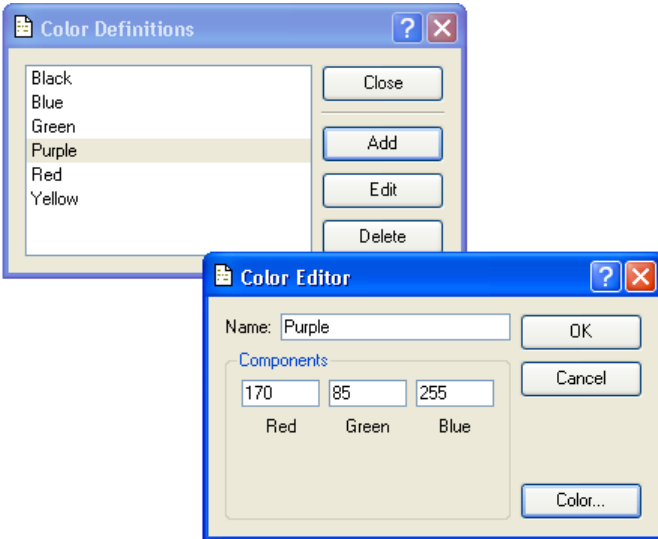
## Color Definitions

Colors must be defined for each report writer report definition. We will assign our color definitions to the bars, lines, points that define to display the graph.

To define colors:

- Pull down the report writer’s Document menu
- Click on the option “Color Definitions”

You will see the Color Definitions screen:



**Figure 3.39: Bars, Lines, and Points Are Assigned Names and Component Values Which May be Determined From a Color Wheel Using the COLOR Button.**

The color Definitions Screen enables you to add, edit, and delete a color. To add a color, click the ADD button. The report writer displays the Color Editor screen. You may define a color in two ways:

- If you know the levels of Red, Green, and Blue that define the color you want simply enter the color’s Name, fill in the values in the Components fields, and click the OK button.
- You may also have the Component values filled in for you by entering the Name for your color and clicking the COLOR button. This displays the Select color screen which provides a color palette.



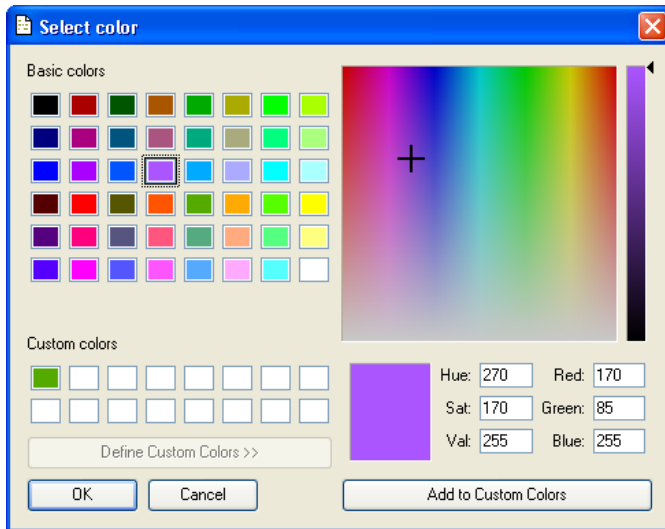


Figure 3.40: The Select Color Screen is used to Choose a Color and Automatically Assign its Component Values.

You may use the color palette to select the exact color you want to define. When you click the OK button, you are returned to the Color Editor screen. The color Component values are filled in for you based on your selection.

## *Defining the Graphing Object*

Now that we have looked at the Query Source and identified the columns that will provide the data we want to graph, and we have defined colors that we will associate with bars, lines, and points in our graph, we can define the details of our graphing object. Double-clicking on the Graph object we placed in our report definition displays a dialogue with four tabs. Let's take a look at each:

### **Graph Editor General Tab**

The most significant aspect of the General tab is that it is the place where we link our Graph object to a Query Source. We also can precisely control the size and location of the graph on the report give it a title and assign a base Font that can be used throughout the rest of the Graph object's definition or overridden by exception.

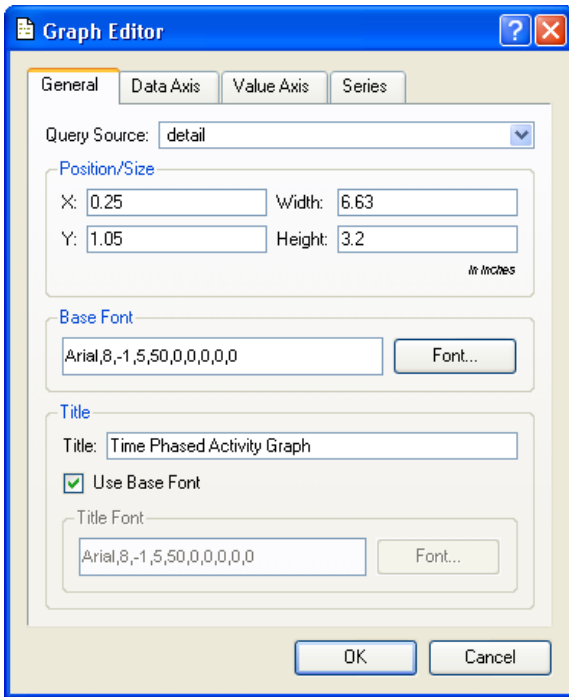


Figure 3.41: The Graph Editor General Tab is used to Assign a Query Source and Provide a Graph's Title.

The Graph Editor tab provides the following options:

**Query Source:** From the pull down list select the Query Source that provides the columns containing the values you want graphed.

**Position/Size:** It is easiest to simply drag the Graph object in the report definition and resize it with your mouse. However, for very precise control you may enter X and Y coordinates for the location and a Width and Height defined in inches.

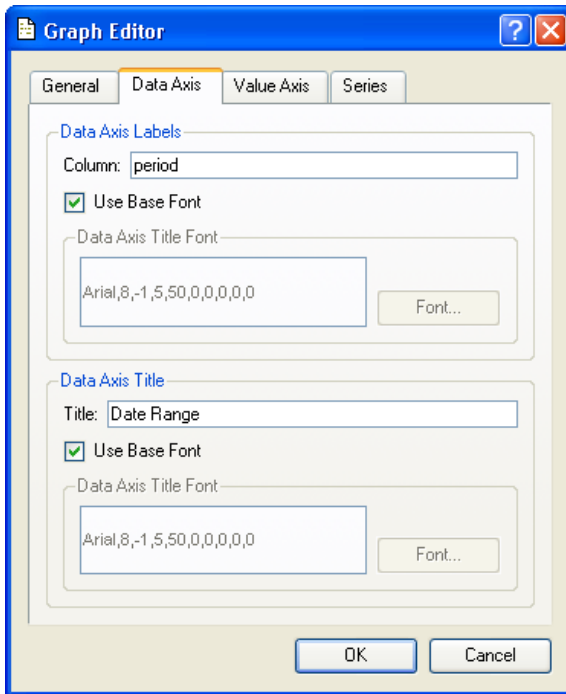
**Base Font:** You may click the FONT button to define the characteristics of a base font for your graph. Then, on other tabs in the Graph Editor, simply check “Use Base Font” to select it for use on that element of the graph.

**Title:** Enter the title you want to appear above (but within) your graph

Next we will define the Data Axis.

## Graph Editor Data Axis Tab

The Data Axis tab in the Graph Editor defines your graph's X axis.



**Figure 3.42:** The Graph Editor Data Axis Tab is used to a Column That Shows Dynamic Data Along the X Axis (in this Case a Date Range) and Assign the X Axis a Title.

You may define the following information in the Data Axis tab:

**Data Axis Labels:** The Column field in this section refers to columns that are the Query Source you referenced under the General tab. This column contains the dynamic data you want displayed along the bottom of the X axis. In our example, the column “period” contains the date for each period that will be displayed in our time-series graph of inventory activity.

**Data Axis Title:** This section enables you to provide a static description for the X axis that displays along its base.

Both sections under the Data Axis tab enable you to select the base font defined under the General tab, or, leave the option unchecked and use the FONT button to specify a different font and size.

Now that the X axis is defined, it is time to define the static information and other parameters that control the Y axis.

## Graph Editor Value Tab

The Graph Editor’s Value Axis tab enables you to define properties of a graph’s Y Axis.

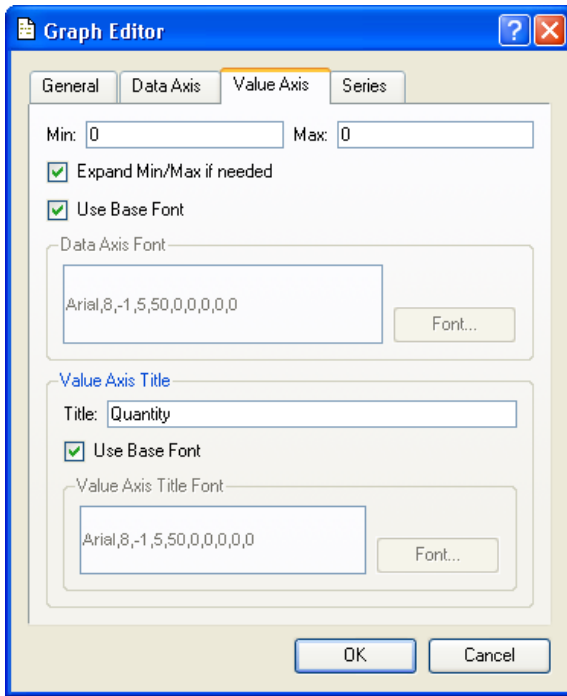


Figure 3.43: The Graph Editor Value Tab is used to Define Y Axis Behavior and Provide Title for It.

There are two main sections in the Value Axis tab:

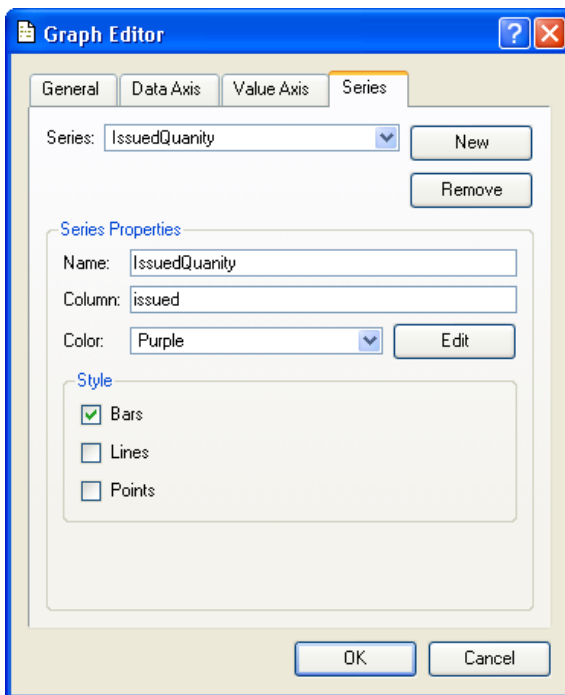
**Min/Max:** The Min/Max values control the minimum and maximum value that will for displayed for a graphed element. If the values are set to 0 and “Expand Min/Max if needed” is checked, the limits of the Y axis will equal largest and smallest graphed element.

**Value Axis Title:** The value of the field Title is static and will display vertically along the Y axis of the graph.

Both sections under the Value Axis tab enable you to select the base font defined under the General tab, or, leave the option unchecked and use the FONT button to specify a different font and size.

## Graph Editor Series Tab

The Series tab in the Graph Editor enables you to define one or more series that are plotted on your graph.



**Figure 3.44:** The Graph Editor Series Tab is used to Define the Dynamic Series Data That Is Displayed in the Graph.

To Establish a series click the NEW button and then fill in the following:

**Name:** Assign your new series a descriptive name. This name is for internal reference only and is not displayed on the graph.

**Column:** Link your series to a column in the Query Source (linked to the graph under the General tab) that contains the information you want graphed.

**Color:** Select from the drop down list a color that you defined earlier.

- You may also click the EDIT button and define one or more new colors.

**Style:** Check one or more styles to define how the data will display in the graph:

- Bars: Displays the series in bar format, or stacked bars for multiple series defined as bars.
- Lines: Displays the series in line format.
- Points: Displays the series as a point on the graph.

If you want to continue by adding another series, click the NEW button. The series you are defining is saved and all values cleared so you can define the new series' properties.

If you are done entering series information, you may click the OK button to exit the Graph Editor, or click on another tab under it.

This completes the mechanics for defining a graph in the report writer. Earlier in this section we saw the output of a report with an embedded graph. The definition process was easy and straight forward. The graphing capability enables you to quickly enhance existing reports or define new reports that improve how complex information is presented to users.

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# 4

## OpenMFG Topics

This chapter contains focuses on topics related to the report writer embedded within the OpenMFG ERP Suite. While OpenRPT users may find useful information here, this chapter is dedicated primarily to OpenMFG users.

### Labels and Forms

---

The OpenMFG report writer enables you to customize report definitions that produce standard sized **labels** for shipments and generate them from the OpenMFG client. It also enables you to define unique report definitions, called **forms**, for packing lists and bills of lading that can be linked to one or more customers. There are three steps necessary to define and generate a label or form:

**Step 1 - Report Definition**

- Define the label or form's report definition with the OpenMFG report writer

**Step 2 - Report Definition Link**

- Link the label or form to the report definition
- For forms, link the form to one or more customers

**Step 3 - Generate Labels or Forms**

- Generate labels or forms from the OpenMFG client using options on S/R - Forms menu

There are six sessions that generate labels of forms and they are accessed through S/R - Forms menu: They are:

- Print Packing List
- Print Shipping Form
- Print Shipping Forms
- Print Shipping Labels by S/O #
- Print Shipping Labels by Invoice
- Print Receiving Labels by P/O #

Though several of these forms and labels can be generated from other places within OpenMFG, the S/R, Forms menu is a single menu from which all can be generated:

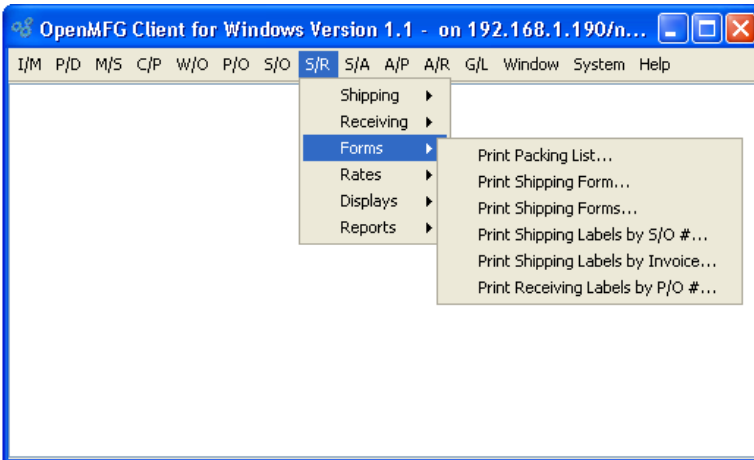


Figure 4.1: OpenMFG Forms Menu

In the next few sections we will examine the setup for producing custom labels and forms. Remember, forms are named report definitions that are linked to a customer. Labels are report definitions that are linked to a unique name but not a specific customer. However, you could create a report definition for a label and assign it a name that references a customer. This is appropriate when a customer has a unique label requirement and you want the name of the report definition to reflect this.



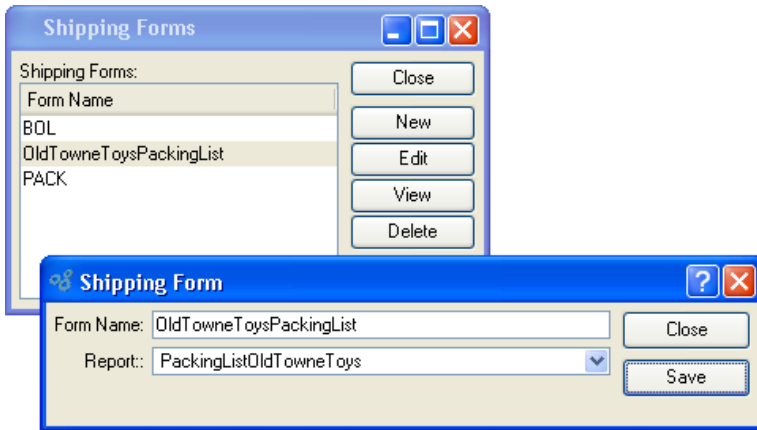
## Linking a Form Name to a Report Definition and Customer

The cross referencing capability in OpenMFG is a very powerful feature that makes it possible to, for example, to define report definitions that are unique to a customer or types of customers.

When you define a Customer (see below) you will assign the customer a Customer Type and a preferred Shipping Form:

Figure 4.2: Customer Master

The entries that display in the Shipping Form choice field are first defined using the session Shipping Forms located on the S/O - Master Information menu:

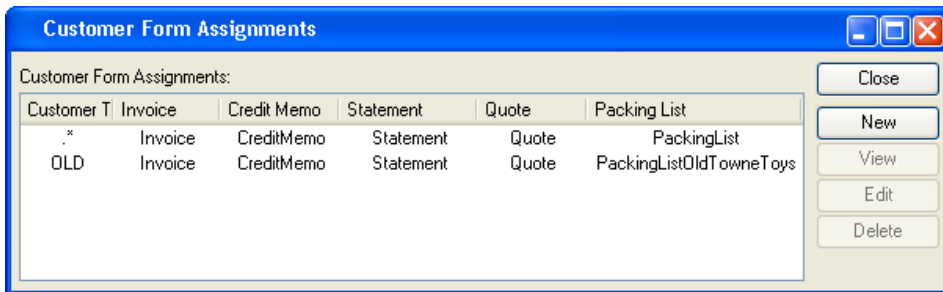


**Figure 4.3: Shipping Forms**

This session enables the creation of a unique form name that is linked to an OpenMFG report definition. Running the session Print Shipping Form from the menu S/R - Forms causes OpenMFG to display the customer’s preferred shipping form in the field Shipping Form.

This technique makes it possible to create logical form names that are tied to specific report definitions and to one or more customers.

Referring back to the Customer master you will also note the Customer Type field. This also controls the printing of forms. The following session enables you to define, by Customer Type, the report definition that is used to generate the specific documents listed:



**Figure 4.4: Customer Form Assignments**

The following diagrams recap the setup just described for Customer Form Assignments:

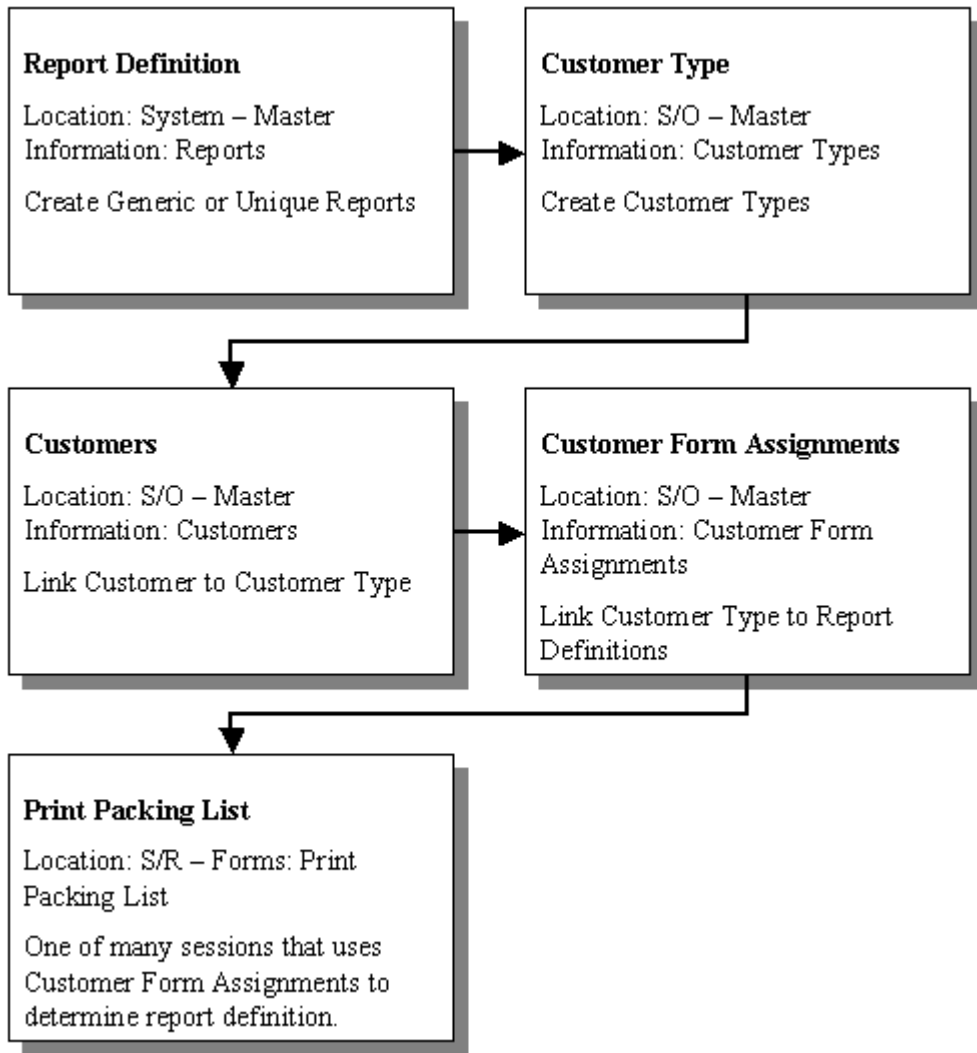


Figure 4.5: Linking Customers to Customer Form Assignments

We have also looked at the screens that link a customer to a shipping form. The following diagram recaps this setup:

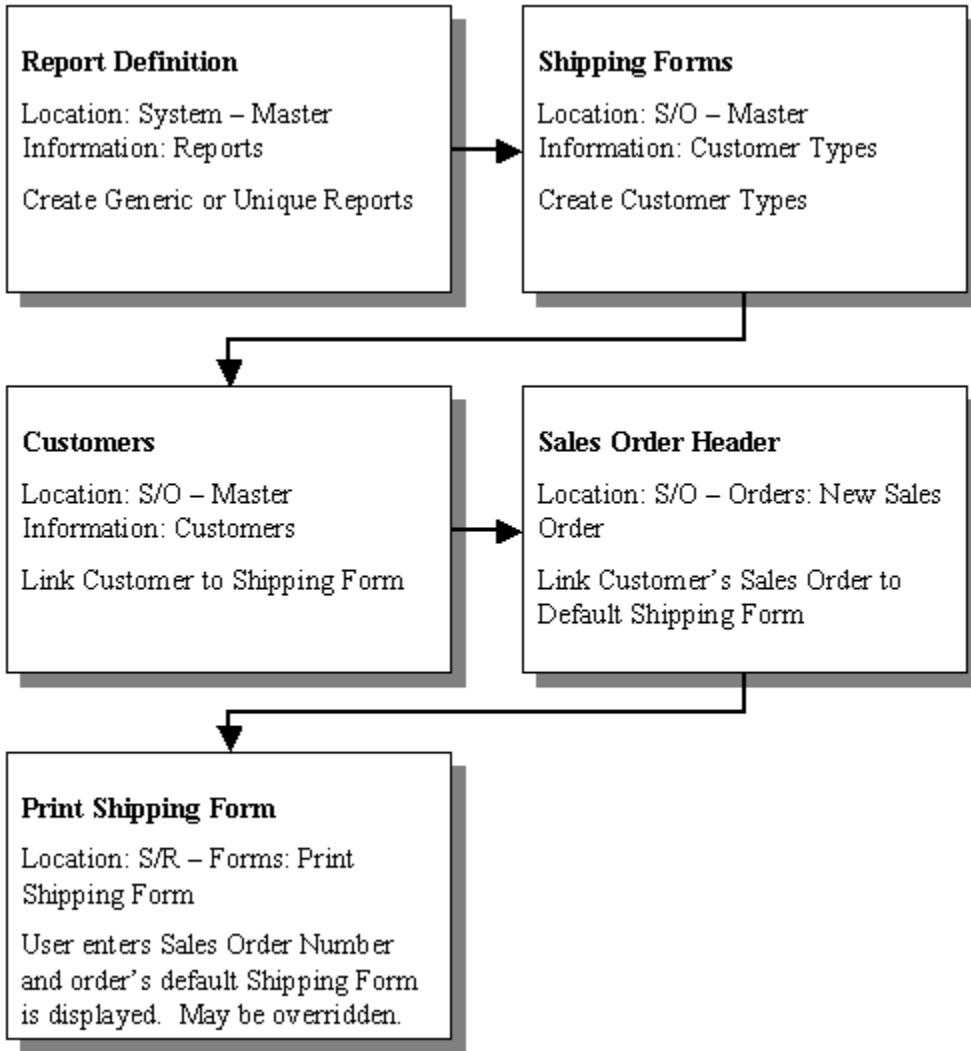


Figure 4.6: Linking Report Definitions to Sales Orders

Later in this section we will look at the parameters values that are passed to the report definition when Print Shipping Form and Print Packing List are run from the S/R Forms menu. But first, let’s look at how OpenMFG enables you to define unique label definitions.

## Linking a Label to a Name and Report Definition

The last three options on the S/R - Forms menu are:

- Print Shipping Labels by S/O #
- Print Shipping Labels by Invoice
- Print Receiving Labels by P/O #

The cross-reference to the report definition for these three is a little simpler. On the System menu's Master Information a sub-menu is the Label Forms option:

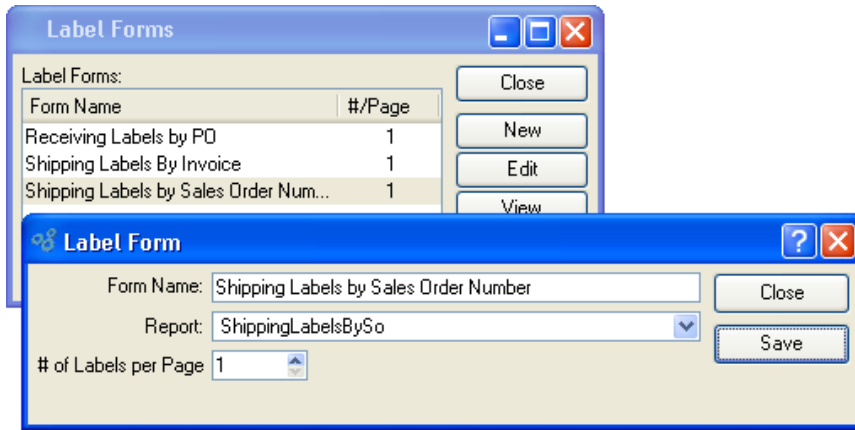


Figure 4.7: Label Forms

When one of the three options label options on the S/R - Forms menu (listed in the table below) is run, the user is presented with a drop down choice field called Report Name in which is displayed the form name linked to a report definition using the session Label Form.

<p>System - Master Information: Label Forms</p>	<p>Enables the creation of a unique form name that is linked to an OpenMFG report definition. The report name displays in the Report Name field on the following label reports:</p> <ul style="list-style-type: none"> <li>• Print Shipping Labels by S/O #</li> <li>• Print Shipping Labels by Invoice</li> <li>• Print Receiving Labels by P/O #</li> </ul>
---	---

## Label and Form Parameters

When a user runs generates a form or a label from an option on S/R, Forms menu, the Open-MFG client passes parameter values to the selected form's definition (more on this shortly) based on the user's entries. These parameter values can be used by the report's SQL to retrieve information from the database.

The tables below identify fields on the sessions that are available on the S/R Forms menu. The parameters column provides the name of the parameter that corresponds to the field if it is in fact a parameter (not all are). Also provided, in the Table Reference column is the name of a table that the author of the report may choose to query to locate information in the database based on the parameter value provided by the user.

It is important to note that some fields are not parameters and some parameters do not correspond to tables. For example the parameters *labelTo* and *labelFrom* pass parameter values that can be used in the report definition to control the number of labels that print. These parameters do not correspond to a table.

## Print Packing List

The option Print Packing List, located on the S/R - Forms menu, enables you to generate a packing list by entering a sales order number (see the section Linking a Form Name to a Report Definition and Customer to see how this is setup). At run-time, the order's internal reference number is passed to the report definition as the value for the parameter *sohead\_id*. This parameter can be employed in a query that derives information from a join on the tables *cohead* and *shipto* to retrieve information pertinent to shipping labels.

Field	Parameter	Table Reference
Sales Order #	sohead_id	cohead

## Print Shipping Form

The option Print Shipping Forms, located on the S/R - Forms menu, enables you to see a customer's default Shipping Form by entering a sales order number (see the section Linking a Form Name to a Report Definition and Customer to see how this is setup) and override it if you chose.

At run-time, the order's internal reference number is passed to the report definition in the value of the parameter *cosmisc\_id*. This parameter can be employed in a query that derives information from a join on the tables *cosmisc* and *shipto* to retrieve information pertinent to shipping labels.

The table below shows these and other parameters that are passed to the report definition and may be used to query other tables (if applicable) or display their value on the report. For example, the user's input for Watermark is passed in the parameter *watermark* and may be referenced in a report's Properties and displayed as a dynamic watermark.

Field	Parameter	Table Reference
Sales Order #	cosmisc_id	cosmisc
Shipping Form	not a parameter	n/a
Shipping Charges	shipchrg_id	shipchrg
# of Copies	not a parameter	n/a
Watermark	watermark	n/a
Show Prices	showcosts	n/a

## Print Shipping Forms

The session Print Shipping Forms prints all orders that are at shipping and have not yet had shipping forms printed or for which a shipping change has been recorded. You can see orders at shipping and the status of their shipping forms by going to the session Maintain Shipping Contents on the menu S/R - Shipping. The column "Prnt'ed" indicates the status of shipping forms.

Using Print Shipping Forms an order's shipping forms may only be printed once unless the shipment has been changed and then the field Print Shipping Forms for Changed Shipments must be checked. Note, the session Print Shipping Form (the second option on the S/R - Forms menu) will always enable you to print a specific sales order's shipping form.

The table below identifies screen literals, parameters, and a table reference to assist you in creating your report definitions for labels:

Field	Parameter	Table Reference
Print Shipping Forms for New Shipments	not a parameter	n/a
Print Shipping Forms for Changed Shipments	not a parameter	n/a
# of Copies	not a parameter	n/a
Watermark	watermark	n/a
Show Prices	showcosts	n/a

### Print Shipping Labels by S/O #

The Print Shipping Labels by SO # session is found on the S/R - Forms menu. The user is prompted to enter a Sales Order number, select a label form (remember that these were defined in the System - Master Information: Label Forms session) in the Report Name field, and enter a range in the Labels: from and to fields to control the number of labels printed. This approach enables you to pre-define a variety of label formats.

The table below identifies screen literals, parameters, and a table reference to assist you in creating your report definitions for labels. Note that address information for orders that are destined for customer ship-to addresses is contained in the table *shipto* and can be accessed with a join to information in the table *cohead* using the value passed by the parameter *sohead\_id*.

Screen Literal	Parameter	Table Reference
Sales Order #	sohead_id	cohead
Report Name	not a parameter	n/a
Label from	labelFrom	n/a
Labels to	labelTo	n/a

### Print Shipping Labels by Invoice

The Print Shipping Labels by Invoice session is found on the S/R - Forms menu. The user is prompted to enter an Invoice Number, select a label form (remember that these were defined in the System - Master Information: Label Forms session) in the Report Name field, and enter



a range in the Labels: from and to fields to control the number of labels printed. This approach enables you to pre-define a variety of label formats.

The table below identifies screen literals, parameters, and a table reference to assist you in creating your report definitions for labels:

Screen Literal	Parameter	Table Reference
Invoice #	invthead_id	invthead
Report Name	n/a	n/a
Label from	labelFrom	n/a
Labels to	labelTo	n/a

## Print Receiving Labels by PO #

The Print Receiving Labels by PO # session is found on the S/R - Forms menu. The user is prompted to enter an Purchase Order number, select a label form (remember that these were defined in the System - Master Information: Label Forms session) in the Report Name field, and enter a range in the Labels: from and to fields to control the number of labels printed. This approach enables you to pre-define a variety of label formats.

The table below identifies screen literals, parameters, and a table reference to assist you in creating your report definitions for labels. Note that receiving line item information is contained in the table *porecv* and can be accessed with a join to information in the table *pohead* using the value passed by the parameter *pohead\_id*. In this way, receiving labels that contain item, description, quantity and other information pertinent to receiving and putaway can be generated.

Screen Literal	Parameter	Table Reference
P/O #	pohead_id	pohead
Report Name	n/a	n/a
Label from	labelFrom	n/a
Labels to	labelTo	n/a

## Report Definition for Custom Labels

To begin you must define a label's report definition using the OpenMFG report writer. Previous sections of this guide have provided detailed explanations on the mechanics of creating report definitions. Below are areas of interest that are specific to a label definition in general and the sample label shown.

### Generating a Label Sheet

Before we begin, let's see how the custom label was printed and what it looks like. The customer label was printed through the Print Labels by Sales Order option found on the S/R, Forms menu:

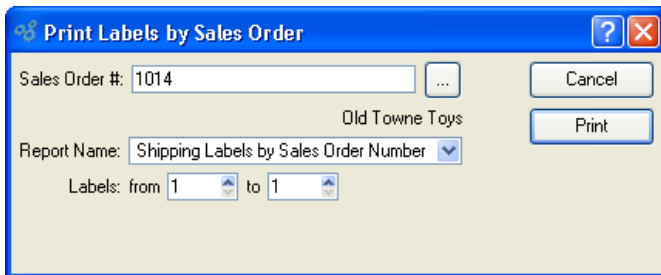


Figure 4.8: Custom Shipping Labels by Sales Order

Note that the user enters the Sales Order for which the labels are to be generated, selects a Report Name, and enters a value for Labels From and To - this controls the number of labels printed.

The Sales Order number is passed to the report definition as a parameter called *sohead\_id* which can be used in an SQL query to look up additional information about the order in the table *cohead*.

Likewise the values entered for Label From and Label To are passed as the parameters *labelFrom* and *labelTo*. These parameters do not correspond to a specific table, but later we will learn how to use them in conjunction with the *sequence* table to create multiple labels.

The Report Name choice field lists all of the Reports Names that have been linked to a report definition using the session Forms found on the System, Master Information menu. Only Report Names linked to report definitions using the Forms session will display in this choice field.

The report definition we will look at generates the following labels:

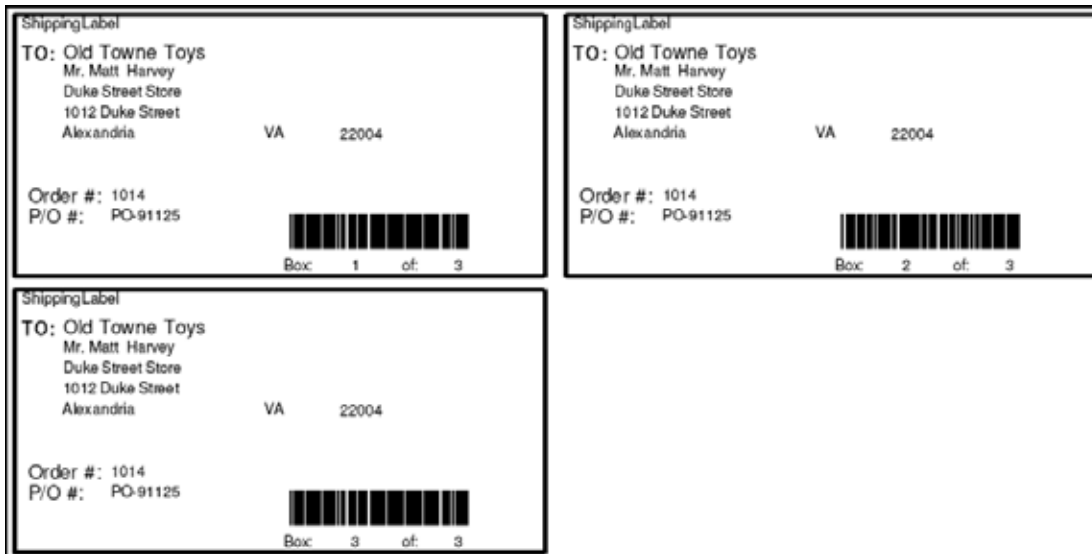


Figure 4.9: Custom Labels with Bar Codes

Note that three labels were generated based on a user entry for Label From of 1 and Label To of 3.

## Label Report Definition

Let's take a look at the report definition that generated these labels.

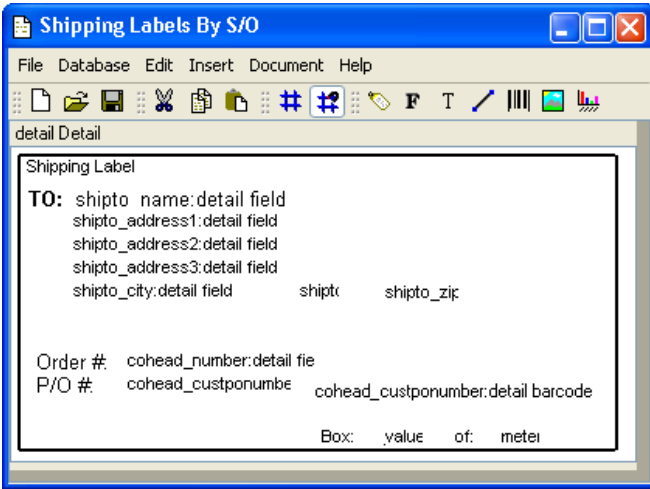


Figure 4.10: Sample Report Definition for a Shipping Label

As noted earlier, the OpenMFG report writer supports several standard label sizes. This report uses an Avery 5263 label size. The Page Setup session is used to select a label size.

---

**Note**

The report writer supports Avery Standard Labels. It also supports portrait or landscape, Letter, Legal, and A4 documents.

---

### ***Report Definition Page Setup***

To open the Page Setup session, in the report writer:

- Pull down the Document menu
- Click on the “Page Setup” option

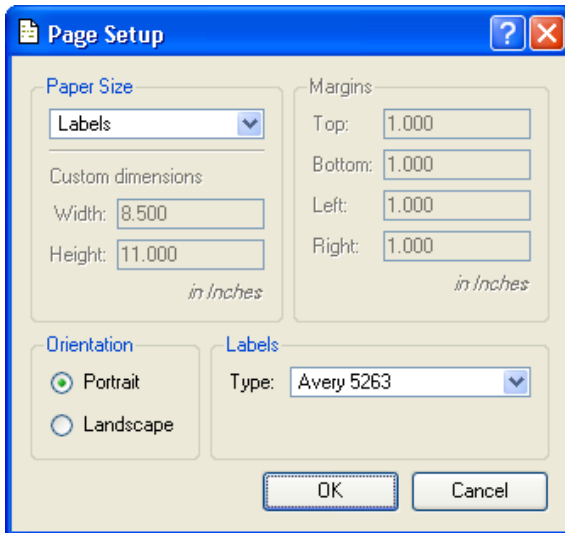


Figure 4.11: Selecting Label Type

Labels use a Paper Size type of “Labels”. Then, one of three predefined Label Types may be selected:

- Avery 5263
- Avery 5264
- Avery8460

This controls the size of the Detail section of the report which is the only portion of the report definition that should be used for a label report definition.

## Displaying a Parameter Value

We noted earlier that one of the parameters passed to the report definition at run-time was *labelTo*. You may have noticed that the labels show the value of the user’s input for this parameter in the lower right corner of each label. This was accomplished by creating a special Properties (Field) that references “Parameter Query” in the Query Source field and the name of the parameter (*labelTo*) in the Column field.

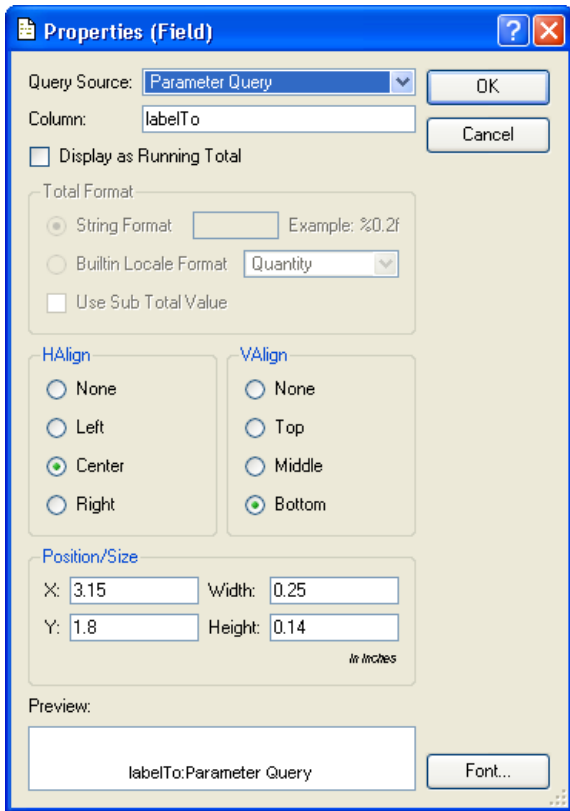


Figure 4.12: Parameter Values for Label

The other values for fields on this report definition were retrieved from the database through and SQL query.

## Label Report Query Definition

The query in the report definition is sophisticated and yet fairly straight forward. It is shown below:

```

SELECT
  sequence_value,
  cohead.cohead_number,
  cohead.cohead_shipto_id,
  cohead.cohead_custponumber,
  shipto.shipto_name,
  shipto.shipto_address1,
  shipto.shipto_address2,
  shipto.shipto_address3,
  shipto.shipto_city,
  shipto.shipto_state,
  shipto.shipto_zipcode
FROM
  public.cohead cohead,
  public.shipto shipto,
  public.sequence
WHERE cohead.cohead_shipto_id = shipto.shipto_id
  AND ((cohead.cohead_id=<? value("sohead_id") ?>)
  AND (sequence.sequence_value
  BETWEEN <? value("labelFrom") ?>
  AND <? value("labelTo") ?>));

```

Let's take a look at each section of this query:

### SELECT SECTION

This portion of the SQL retrieves column values from three tables: *sequence*, *cohead*, and *shipto*. The values retrieved are used to define the Columns in the Property (Fields) session which controls what and how dynamic information is displayed on the label. The descriptions of these fields are self explanatory.

### FROM SECTION

This portion of the SQL specifies the tables from which the query retrieves the data:

<b>cohead</b>	This table contains Header information for Sales Orders
---------------	---

<b>shipto</b>	This table contains customer shipping addresses
<b>sequence</b>	This table contains a sequence of numbers from 1 to 1000 and facilitates the execution of the SQL multiple times in order to generate multiple labels

## WHERE SECTION

The WHERE section of the SQL does the following:

- Retrieves the row in the table *cohead* where the column *cohead\_id* equals the value for the parameter passed from the user (the user enters the order number but the program passes the order’s system generated *cohead\_id*).
- Joins the tables *cohead* and *shipto* on the columns *cohead\_shipto\_id* and *shipto\_id*.
- Causes the SQL to “fire” multiple times to print multiple labels. The table *sequence* contains a sequential list of integers from 1 to 1000 and is used by the query such that it repeats for the number of times contained in the range defined by the *label-From* and *labelTo* parameters. The information returned is the same each time but by design the report writer generates one label each time the SQL returns a row of information.

The table *shipto* contains the specific the shipping address information that appears on the label. Also note that parameters are contained inside the MetaSQL tags *<? and ?>*.

---

### Note:

Finally, for the sake of simplicity, this sample label’s SQL only generates labels for orders in which the shipping address is selected from the list of Ship-To’s by customer. In this case this scenario the shipping address is contained in the table *shipto*. For orders where the ship to address is merely copied using the button COPY TO SHIP-TO -> button, the address information is contained in the table *cohead*. A more sophisticated query, leveraging MetaSQL could test for this condition (the value of column *cohead\_shipto\_id* = -1 in table *cohead*) and retrieve the shipping information directly *cohead*. If you decide to re-create this label, make certain to test it against a Sales Order that uses an address from the list of pre-defined customer ship-to’s.

---



## Linking Label Name to Report Definition

Once the report definition is created, it is time to link it to a user defined Form Name:

- Pull down the OpenMFG System menu
- Click on the Master Information menu
- Select the option “Forms”
- Click the NEW button

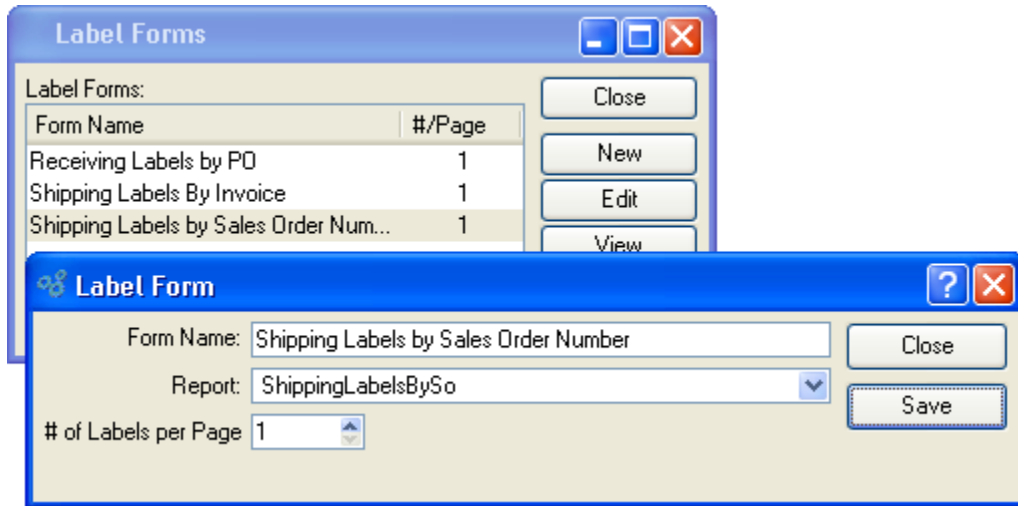


Figure 4.13: Linking Label Names to Report Definitions

The Form Name field is a user friendly description of the label displayed to the user when the user is selecting a label type to print. It could, for instance, link to a special report definition in the Report field that is unique to a specific customer. The # of Labels per Page field is not used.

To print your labels, first create a Sales Order that uses a pre-defined customer ship-to address. Then:

- Pull down the OpenMFG S/R menu
- Click on the Forms menu
- Select the option Print Shipping Labels by SO #



Figure 4.14: Generating Custom Shipping Labels

- In the field Sales Order #, enter the order number sales order you just created
- In the choice field Report Name, select the name of the label you just liked to your report definition using the Forms session
- Set the Label from field to 1 and the To field to 3
- Click the PRINT button

OpenMFG will print 3 labels, based on the unique report definition you linked to the Report Name selected, that contain information for the customer’s ship-to address tied to the order you entered.

## CSVimp

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CSVimp is a tool used for data migration.

## Report Importing Tools

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In Chapter One we learned how to save a report definition to an XML (Extensible Markup Language) file that is external to the OpenMFG database. These files may be used as a backup and as a means to share reports definitions throughout the OpenMFG community.

In this chapter we will learn about two tools that facilitate the importation of one or more report definitions using their XML definition file. We have already seen that it is possible to use the report writer itself to open a report from its XML definition file so the main benefit to

these tools is the ability to import multiple files simultaneously, or, in the case of the command line tool, write scripts that do the importation.

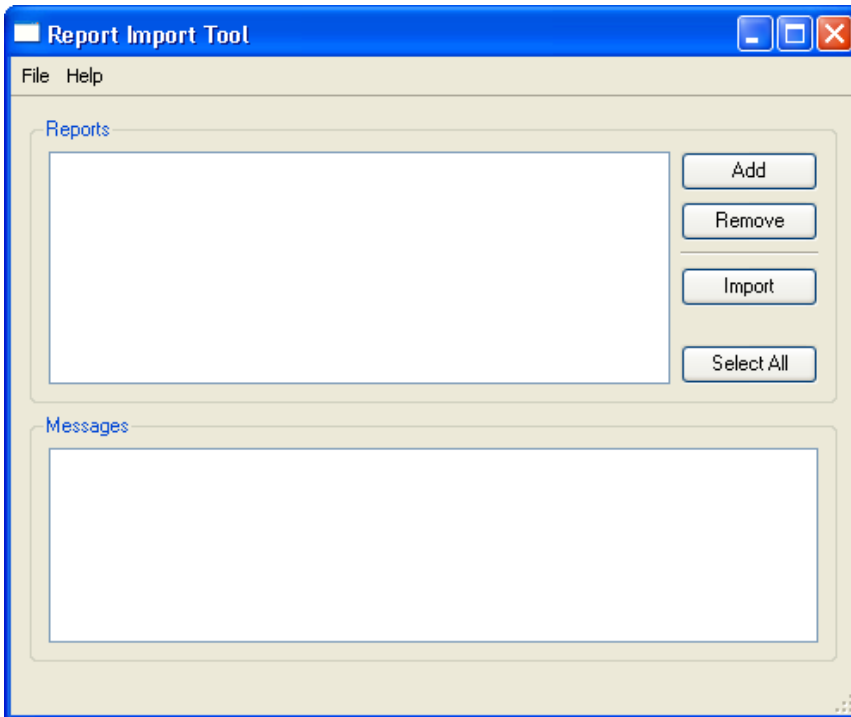
## *importrptgui*

The first tool we will look at is the Report Import Tool. This tool runs on all supported client platforms and provides a simple, easy to use graphical user interface importation capability. The name of the binary file that you execute from a command line to start the Report Import Tool is *importrptgui* (note that on the Windows platform you will include the '.exe' suffix).

The Report Import Tool is designed to simplify the process of uploading multiple reports to an OpenMFG database. For optimal performance, the *importrptgui* file should be placed in the same directory as the *OpenMFG* ('.exe' on Windows) client file.

When you open the utility, you will notice that you are brought to the standard OpenMFG log in screen. Log in to the database where you want to upload your reports. As with the OpenMFG client, you may click the OPTIONS button to change these settings.

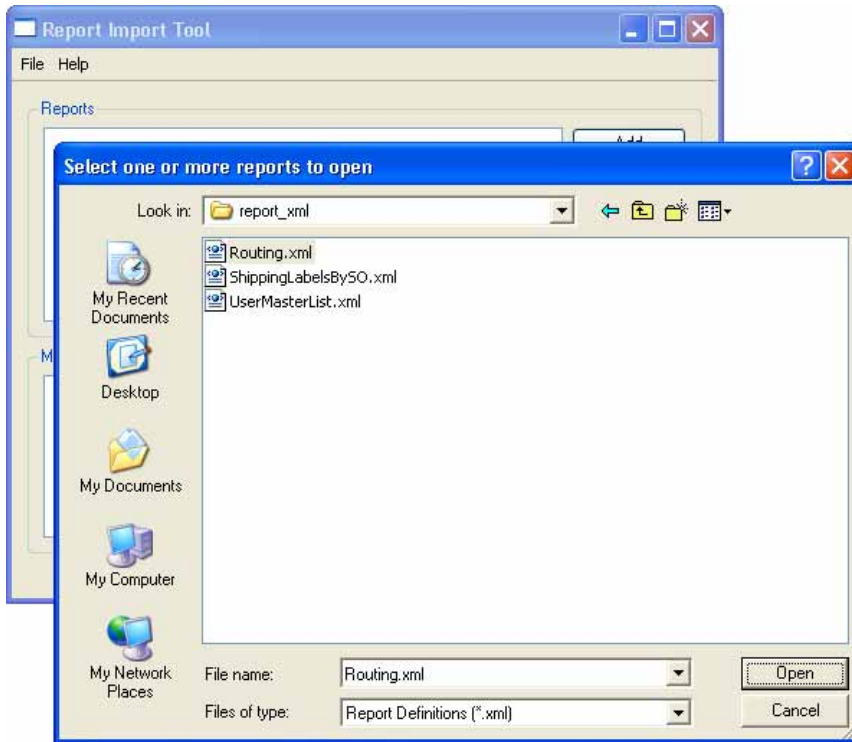
From the command line, and in the directory where the OpenMFG client files and the *importrptgui* binary files are co-located, run *importrptgui*. You will see:



**Figure 4.15: Main Screen of importrptgui Tool**

The definitions that you import with this tool may be newly created reports, or, updated versions of already existing reports.

Using the ADD button on the GUI screen, browse for the directory where you have saved your report definition .xml files. Once you have located and opened the directory where the files are stored, you may add them individually by double-clicking on them one-at-a-time. Or, you may select all or a subset of the total using your window manager.



**Figure 4.16: Importing Report Definitions in XML Format**

As you load reports into the list, you will see a number in brackets following the name of each report. This number is the grade assigned to each report. The reports will be loaded into the database using the grade you see here. By default this grade is zero. If you choose to change this value, you may double-click on any of the reports in the list to bring up a dialog that will allow you to set the value for the grade.

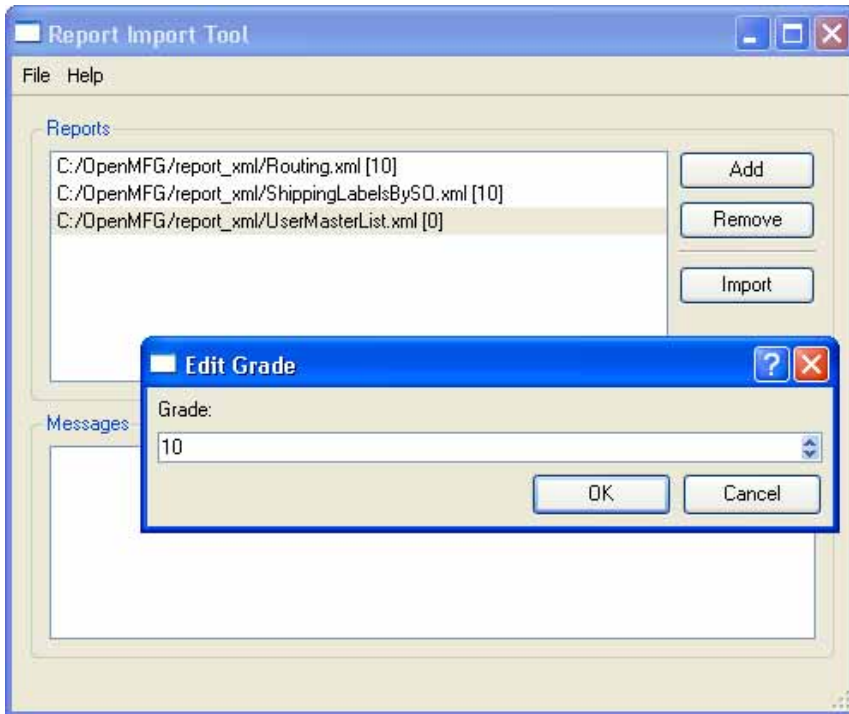


Figure 4.17: Report Grading

It is important to remember that when running a report, OpenMFG uses the report definition with the highest grade (for example, 10 runs before 9). OpenMFG recommends that you never overwrite the report definition with grade 0, reserving this for the definition provided by OpenMFG.

If after you are done adding reports to the list you find a report which you do not want to upload, simply highlight the report and select the REMOVE button. The report will be removed from the list, and it will not be uploaded.

Once you are satisfied with your list of reports and the grades you have assigned, highlight individual reports or use the SELECT ALL button to select all of the reports for importing. After the desired reports have been highlighted, select the IMPORT button. The highlighted reports will be uploaded to the database you logged into when you started your session.

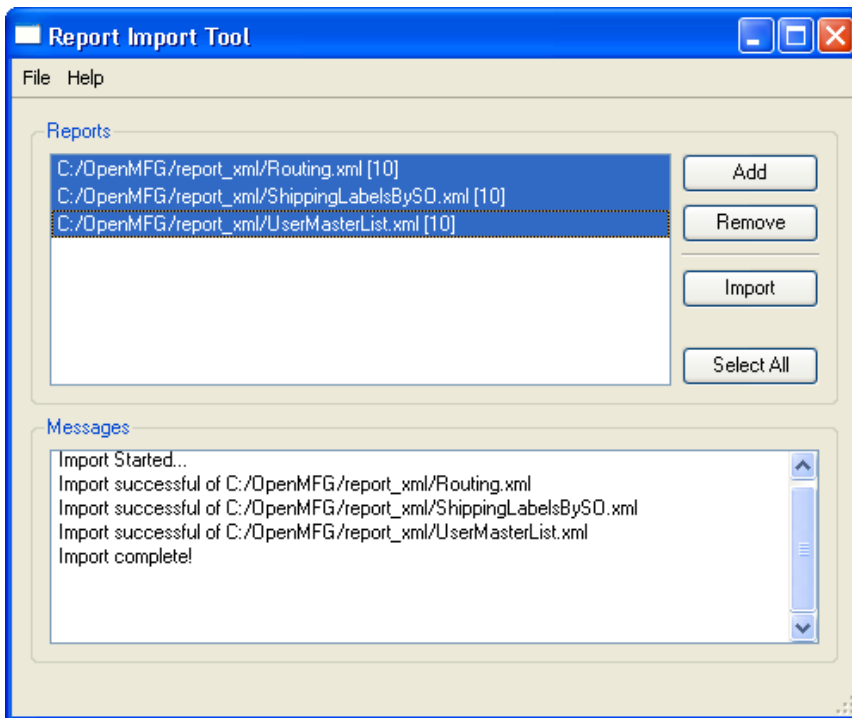


Figure 4.18: Selecting Reports To Be Imported

The Messages section of the Report import Tool shows the status of your import.

To exit, select the EXIT option from the “File” menu--or click on the “X” in the upper-right hand corner of the screen.

After importing report definitions, you may want to open the OpenMFG report writer and view the report definitions you imported.

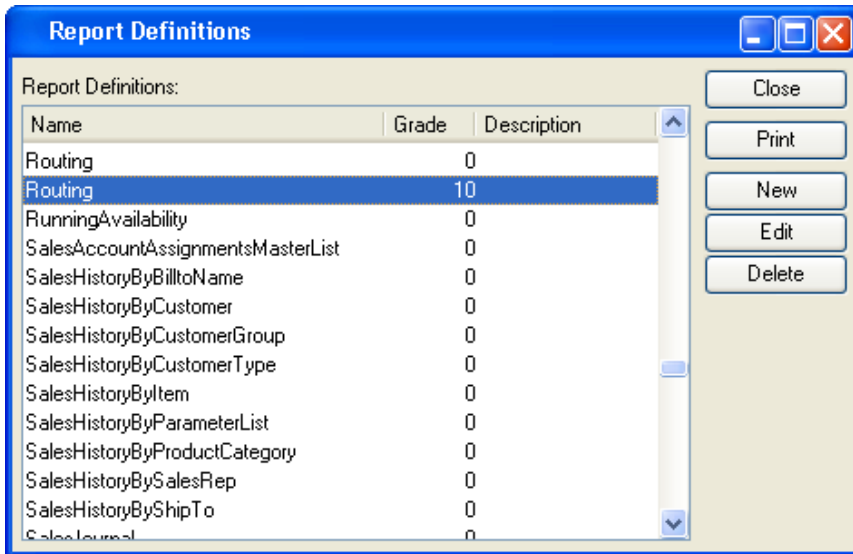


Figure 4.19: Updated Grade After Import

While report definitions can be loaded from the .xml definition file through the report writer itself, the Report Import Tool expedites this process when multiple report definitions require importation.

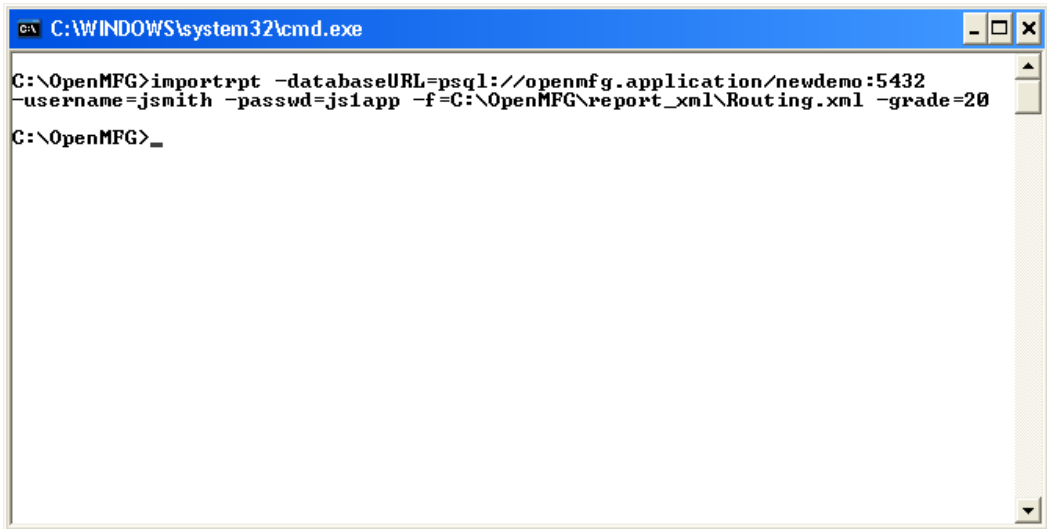
Now let's look at a tool that enables you to import from the operating system's command line on a client computer.

### *importrpt*

The command line import tool functions on all supported client environments and enables the importation of .xml report definitions over the network through a command line on a client computer. Systems administration personnel may embed the command line import tool in scripts that import multiple report definitions in a single run or use it iteratively from the command line.

The example provided in this document shows the command line report import tool being used on a Window client computer. The syntax is the same regardless of the operating system.





```
C:\WINDOWS\system32\cmd.exe
C:\OpenMFG>importrpt -databaseURL=psql://openmfg.application/newdemo:5432
-username=jsmith -passwd=jslapp -f=C:\OpenMFG\report_xml\Routing.xml -grade=20
C:\OpenMFG>_
```

Figure 4.20: Using importrpt Tool

The name of the binary is *importrpt* (with the ‘.exe’ extension on Windows) and should be collocated with the OpenMFG client application files. The table below shows the command, as executed above, in a more readable fashion:

```
importrpt
  -databaseURL=psql://openmfg.application/newdemo:5432
  -username=jsmith
  -passwd=jslapp
  -f=C:\OpenMFG\report_xml\Routing.xml
  -grade=10
```

Figure 4.21: Sample importrpt Output

Let’s take a look at all of the options available in *importrpt* to understand each a little better:

Option	Syntax
<p><b>-databaseURL=&lt;connection URL&gt;</b></p>	<p>Specify the connection information that importprt should use when loading a report definition. The connection URL is in the following format:</p> <p style="text-align: center;"><code>psql://servername/database[:port]</code></p> <p>In the connection URL, the servername is the host or IP address of the server where the database is running.</p> <p>For example: <code>somehost.openmfg.com</code></p> <p>The database is the name of the actual database you want to connect to on the specified server.</p> <p>For example: <code>mydb</code></p> <p>The last option, port, is optional. If included, it must follow a colon and be a valid port number. If the port is not specified, the default port of '5432' is used.</p> <p>For example, if you wanted to connect to the database 'mydb' on the server 'somehost.openmfg.com' using the default port, you would use the following connection URL:</p> <p style="text-align: center;"><code>psql://somehost.openmfg.com/mydb</code></p> <p>Similarly, if you wanted to connect to the database 'dbtest' on the server '192.168.128.64' using the port 2345 you would use the following connection URL:</p> <p style="text-align: center;"><code>psql://192.168.128.64/dbtest:2345</code></p>

<b>-username=&lt;user name&gt;</b>	This is user name you are using to connect to the server and database. It is the same username that the user enters when logging on through the OpenMFG client and must be setup using the OpenMFG client session Maintain Users.
<b>-passwd=&lt;password&gt;</b>	This is the password for the user name you specified in Maintain Users. This is the same password that the user enters when logging in through the OpenMFG client.
<b>-grade=&lt;number&gt;</b>	The grade used to load a report into the database. A numeric value from 0 to 99 is valid. The default value is 0 if this option is not specified. Grade 0 should generally be reserved for the baseline report definition supplied by OpenMFG.
<b>-f=&lt;report definition&gt;</b>	The name of the report definition file (as it appears on your disk) that you are loading into the database. The path may be included if the file is located in a directory that is different from the one in which <i>importprt</i> is located and the syntax for the path will vary by operating system.

You may have noticed that the report definition loaded in our example above was for the Routing report and that grade was assigned a value of 20. If, after running *importprt*, we start the OpenMFG report writer and browse the report definitions, we will find that we now have an additional report definition for the Routing:

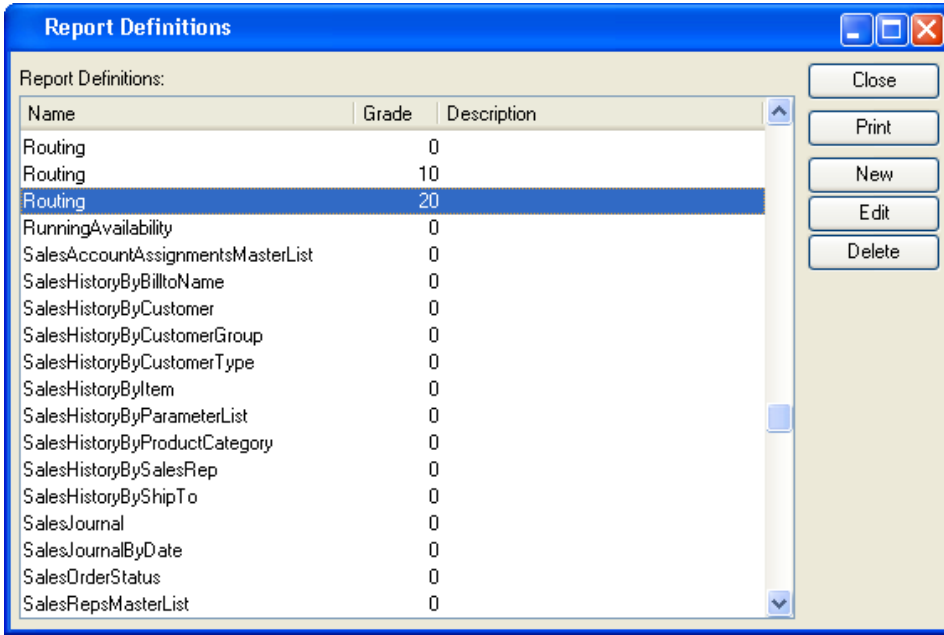


Figure 4.22: Report Grade Updated

We can see that Routing has 3 definitions: 0, 10, and 20. When a user runs the Routing report, OpenMFG will use the definition with grade 20: the definition we just imported using the *import rpt* command line tool.

---

# 5

## Tools

In this chapter we will examine several third party tools that you may find useful when creating new report definitions and in general for administering OpenMFG.

The first tool we will look at is pgAdmin III which is an open source database administration utility for PostgreSQL.

Next we will look at the ODBC driver available for PostgreSQL. We will install and configure an ODBC connection from a Windows client to a PostgreSQL database.

Finally, we will examine how a query tool can be used to generate SQL that can then be copied and pasted into an OpenMFG report definition Query Source to accelerate the development of a new report. We will use our new ODBC connection with Microsoft Query on the Windows platform to generate an SQL statement and then use it in a new OpenMFG report definition.

### pgAdmin III

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pgAdmin III describes itself as follows:

“pgAdmin III is a comprehensive PostgreSQL database design and management system for \*nix and Windows systems. It is freely available under the terms of the Artistic Licence and may be redistributed provided the terms of the licence are adhered to. The project is managed by the pgAdmin Development Team.

“This software was written as a successor to the original pgAdmin and pgAdmin II products, which though popular, had limitations in the design that prevented them being taken to the 'next level'. pgAdmin III is written in C++ and uses the excellent wxWindows cross platform toolkit. Connection to PostgreSQL is made using the native libpq library.”

You will find pgAdmin III invaluable for performing database maintenance along with simply examining database structures and data.

pgAdmin III is available through Postgres.org which is the web site for The PostgreSQL Global Development Group, a community of companies and people co-operating to drive the development of PostgreSQL, the world’s most advanced Open Source database software.

The PostgreSQL software itself had its beginnings in 1986 inside the University of California at Berkeley as a research prototype, and in the 18 years since has moved to its now globally distributed development model, with central servers based in Canada.

### *Where Can I Find pgAdmin III?*

pgAdmin III is available free in the downloads section of the Postgres.org site (<http://postgres.org>).

Though subject to change, the following site, as of this writing, went directly to a listing of the most recent versions of pgAdmin III:

**<ftp://ftp9.us.postgresql.org/pub/mirrors/postgresql/pgadmin3/release/>**

pgAdmin III is a multi-platform tool. We will work with the Windows release and it is located here:

**<ftp://ftp9.us.postgresql.org/pub/mirrors/postgresql/pgadmin3/release/win32/>**

The name of the file you will download for the Windows version is:

**pgadmin3.zip**

### *How Do I Install pgAdmin III?*

When you unzip the file you downloaded from the Postgres.org site (pgadmin3.zip) you will get the installer file: pgadmin3.msi. Place this file in a temporary directory and double click on it to start a normal Windows installation dialogue.

## *How Do I Connect to An OpenMFG Database With pgAdmin III*

Now that you have completed the installation of pgAdmin III, it is time to configure a connection to your OpenMFG server and a PostgreSQL database. The installation will create a shortcut called pgAdmin III.

Execute this shortcut and then, from the pgAdmin III File pull down menu, select the option Add Server. You will be presented with the Connect to a Server configuration screen.

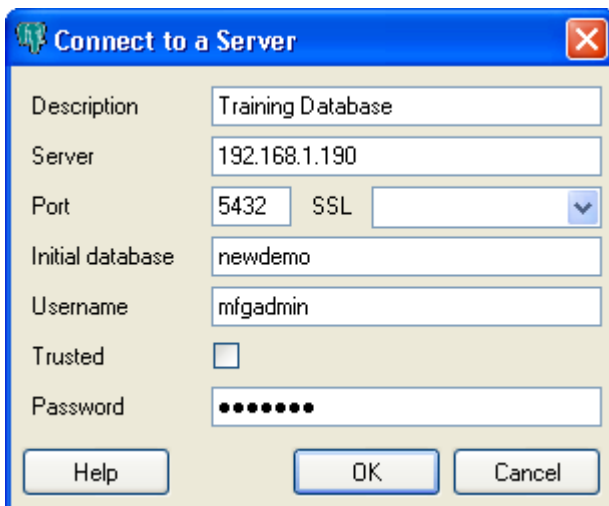


Figure 5.1: pgAdmin III Connection Definition Screen

You will need to provide the URL or IP address of your server along with the port on which PostgreSQL is listening. Then, you will identify the name of the OpenMFG database and the Username and Password for the user as whom you will establish the connection. This information corresponds to the information you provide the OpenMFG client when you configure a connection through it.

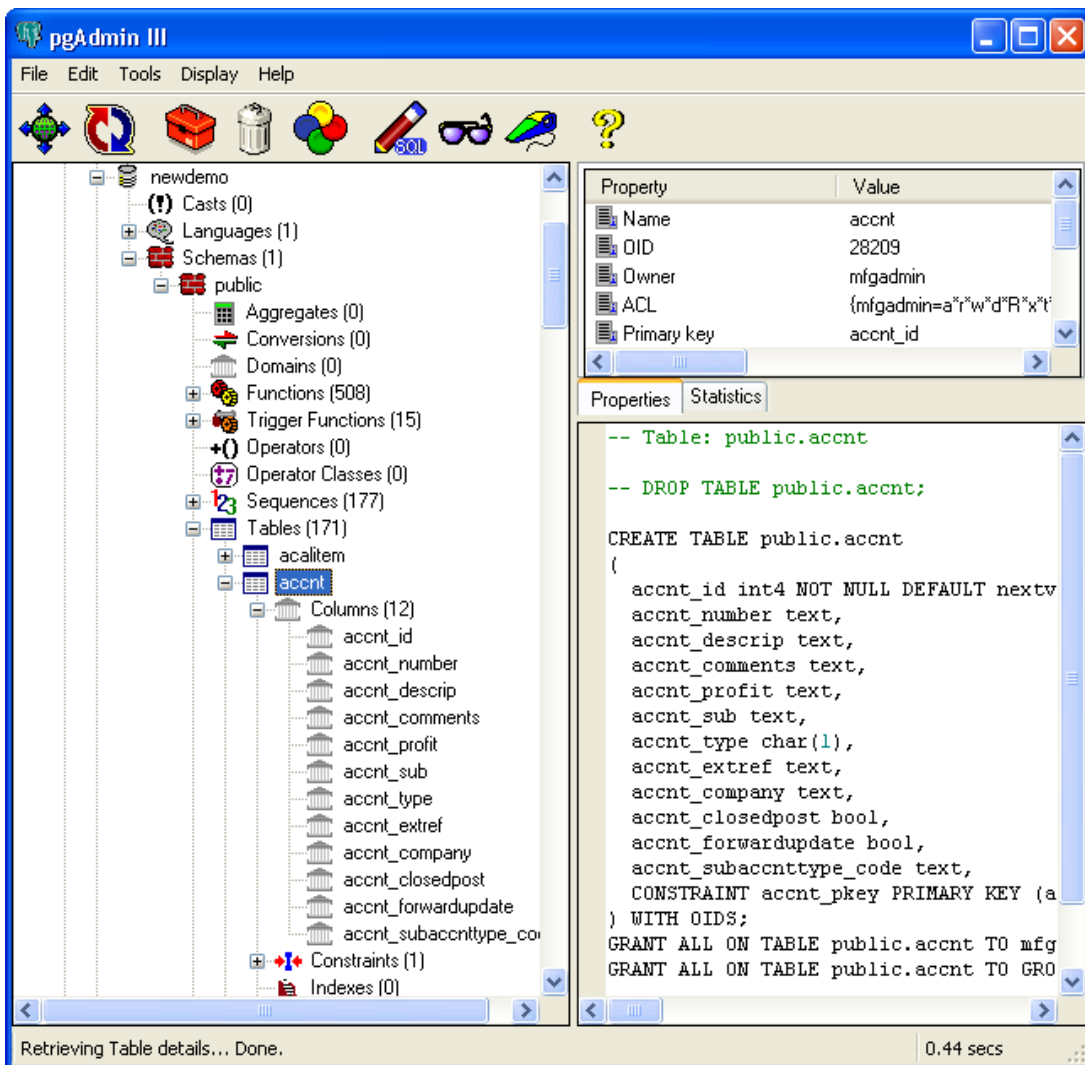


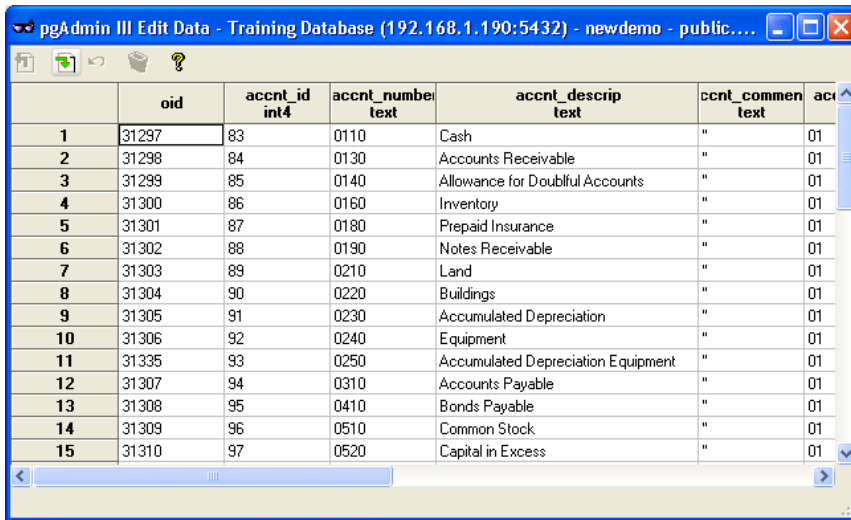
Figure 5.2: pgAdmin III Provides a Robust Graphical Management Tool for PostgreSQL Databases

pgAdmin III will add your new connection to its Servers list. In the future, after you open the tool, you can double click on a connection, provide a password, and you will be connected to the database.

Using pgAdmin III is useful when creating OpenMFG reports because it enables you to see all of a database's tables and their corresponding columns. It is also possible to see data and even



maintain data, by drilling down to a specific table, right clicking on it, and selecting View Data from the resulting menu.



The screenshot shows the pgAdmin III 'Edit Data' window for a table in a training database. The table contains 15 rows of account data. The columns are: oid, acct\_id int4, acct\_number text, acct\_desc text, acct\_commen text, and acct... (partially visible). The data is as follows:

	oid	acct_id int4	acct_number text	acct_desc text	acct_commen text	acct...
1	31297	83	0110	Cash	"	01
2	31298	84	0130	Accounts Receivable	"	01
3	31299	85	0140	Allowance for Doubtful Accounts	"	01
4	31300	86	0160	Inventory	"	01
5	31301	87	0180	Prepaid Insurance	"	01
6	31302	88	0190	Notes Receivable	"	01
7	31303	89	0210	Land	"	01
8	31304	90	0220	Buildings	"	01
9	31305	91	0230	Accumulated Depreciation	"	01
10	31306	92	0240	Equipment	"	01
11	31335	93	0250	Accumulated Depreciation Equipment	"	01
12	31307	94	0310	Accounts Payable	"	01
13	31308	95	0410	Bonds Payable	"	01
14	31309	96	0510	Common Stock	"	01
15	31310	97	0520	Capital in Excess	"	01

Figure 5.3: pgAdmin III Enables The Viewing and Maintenance of Data

The pgAdmin III utility is a very powerful tool. Take care with the View Data option as it enables the updating of data in the database.

Also worth noting is pgAdmin III's SQL Help option locate on its Help pull down menu. It provides very detailed descriptions and examples of SQL commands, syntax, and statements.

## What is ODBC?

The online technical resource Whatis.com provides the following definition for ODBC:

“Open Database Connectivity (ODBC) is an open standard application programming interface (API) for accessing a database. By using ODBC statements in a program, you can access files in a number of different databases, including Access, dBase, DB2, Excel, and Text. In addition to the ODBC software, a separate module or driver is needed for each database to be accessed. The main proponent and supplier of ODBC programming support is Microsoft.

ODBC is based on and closely aligned with The Open Group standard Structured Query Language (SQL) Call-Level Interface. It allows programs to use SQL requests that will access databases without having to know the proprietary interfaces to the databases. ODBC handles the SQL request and converts it into a request the individual database system understands.”

### *Where Can I Find the ODBC Driver For PostgreSQL?*

The ODBC driver for PostgreSQL can be downloaded from the Postgres.org web site. The current version for Windows is available at:

**<ftp://ftp3.us.postgresql.org/pub/postgresql/odbc/versions/msi/>**

The driver is periodically updated but as of this writing the most recent file on the site was:

**psqlodbc-07\_03\_0200.zip**

After you download this file to a temporary directory, you may extract its contents:

**psqlodbc.msi**

Double clicking on this install file starts a normal Windows installation.

### *How Do I Configure the ODBC Connection to OpenMFG?*

After installing the PostgreSQL ODBC driver it is time to configure it. This is a simple task performed by opening your Windows Control Panel, selecting Administrative Tools and then Data Sources (ODBC).

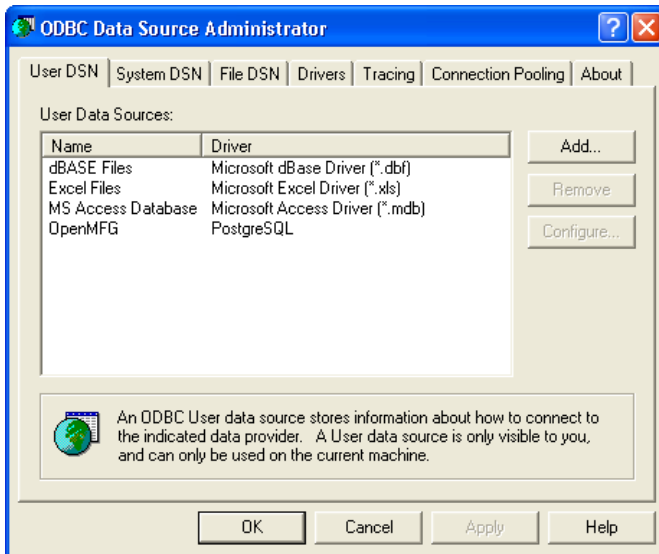


Figure 5.4: The ODBC Data Source Administrator Panel Is Used to Add and Configure New ODBC Connections

On the ODBC Data Source Administrator Panel, click the Add button to begin configuring a connection to your OpenMFG PostgreSQL database.

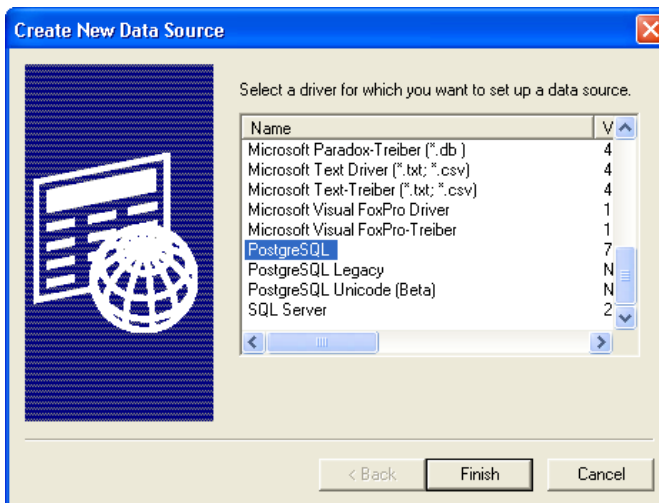
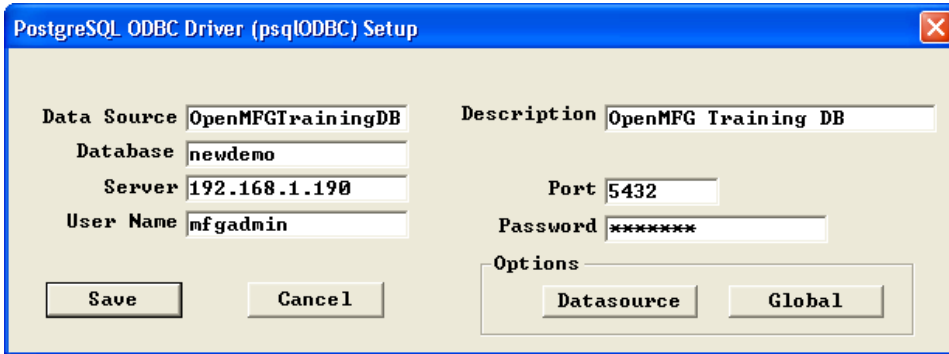


Figure 5.5: The PostgreSQL Driver Appears On The List Of Drivers After You Complete The Installation Procedure

Select the PostgreSQL driver from the list of available drivers and click the FINISH button.



The last step in the process is defining setup information:

- Data Source:** Give your connection a name (leave out spaces)
- Description:** Describe your connection
- Database:** Enter the name of the PostgreSQL database
- Server:** Provide the name or IP address of the PostgreSQL server
- Port:** Enter the port on which the PostgreSQL database is listening
- User Name:** Provide a database user's user name
- Password:** Provide the database user's password

Again, the logon credentials you used to configure the OpenMFG client and pgAdmin III should work to for the ODBC configuration. Click the SAVE button.

Now let's use the connection to access OpenMFG data.

## Capturing the SQL With Microsoft Query

---

You may know of a query tool that generates SQL statements. If so, you may want to try this against your OpenMFG database and then copy and paste the SQL it creates into a Query Source in a new or updated OpenMFG report writer report definition. This can help to accelerate the creation of a report definition.

In this section we will look at an example of how this process works using Microsoft Query.

## *What is Microsoft Query?*

Microsoft defines Query as follows:

“Microsoft Query is a program for bringing data from external sources into other Microsoft Office programs—in particular, Microsoft Excel. By using Query to retrieve data from your corporate databases.”

Remember, we are most interested in Query as a means for generating SQL statements against our OpenMFG database as a means to accelerate the process of creating new or updated Query Sources in OpenMFG report writer report definitions.

## *How Can I Use the SQL From Microsoft Query In A Report Writer Report?*

Below is the SQL generated by Microsoft Query using our ODBC connection against the OpenMFG table *usr* in our PostgreSQL database.

```
SELECT
    usr.usr_id,
    usr.usr_username,
    usr.usr_propername,
    usr.usr_passwd,
    usr.usr_locale_id,
    usr.usr_initials,
    usr.usr_agent,
    usr.usr_active,
    usr.usr_email
FROM
    public.usr usr
ORDER BY
    usr.usr_username
```

Let's see how this SQL statement was generated.

Open Microsoft Excel and then, from the Pull Down menu, select the Data option. Select the Get External Data option and under it the option New Database Query. You are presented with the Choose Data Source screen.

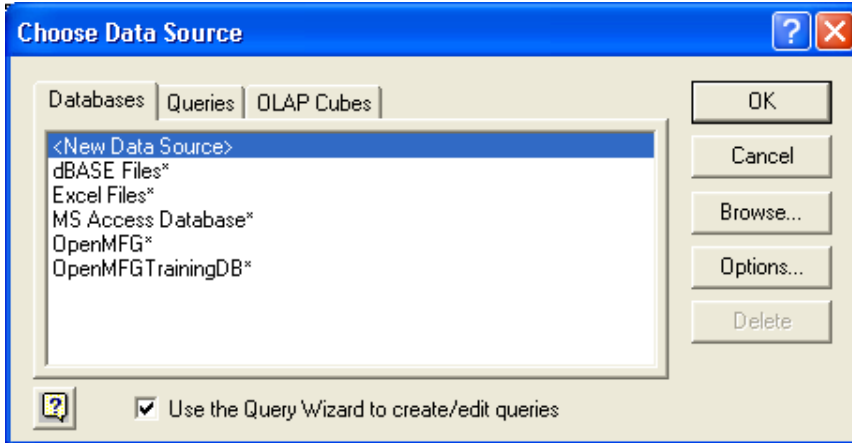


Figure 5.6: Upon Starting Query, We Are Prompted To Select an ODBC Data Source

Select the new ODBC connection that you just created against you PostgreSQL database and click the OK button.

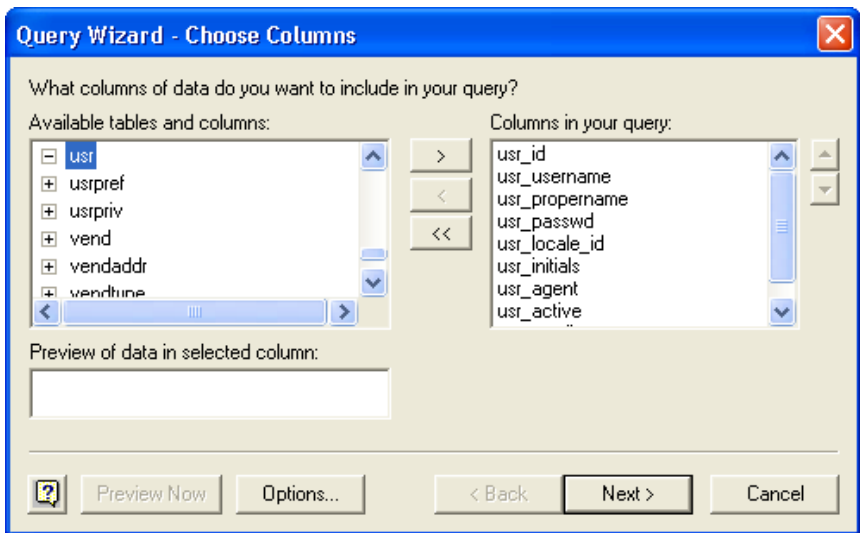


Figure 5.7: After Selecting the Data Source, Query Presents The First Screen In The Query Wizard. Tables Are Selected In The Left Column And Included Columns Display In The Left.

In the left column, scroll to the table *usr* and click on it.

Click on the '>' button to select all columns in the table and then click the NEXT button.

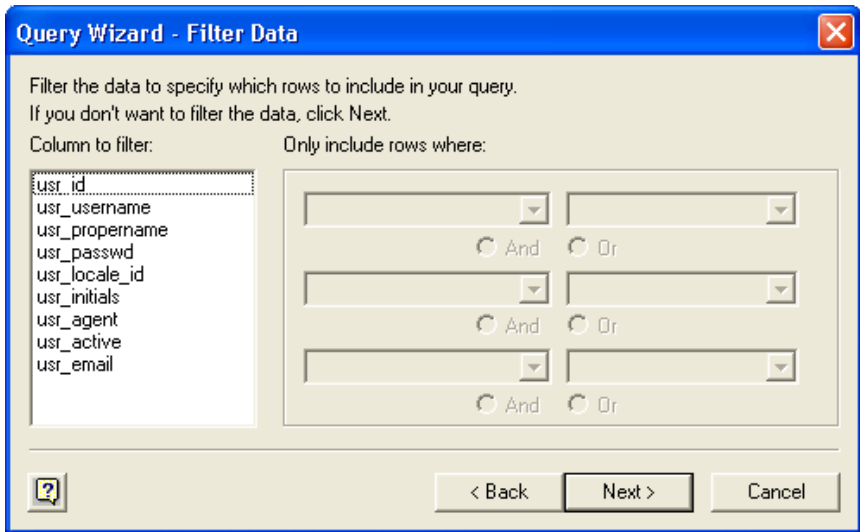


Figure 5.8: The Query Wizard Also Offers the Opportunity To Filter Data

Next, the Query Wizard provides you with the opportunity to filter the data. We will not apply a filter to the data. Click the NEXT button.

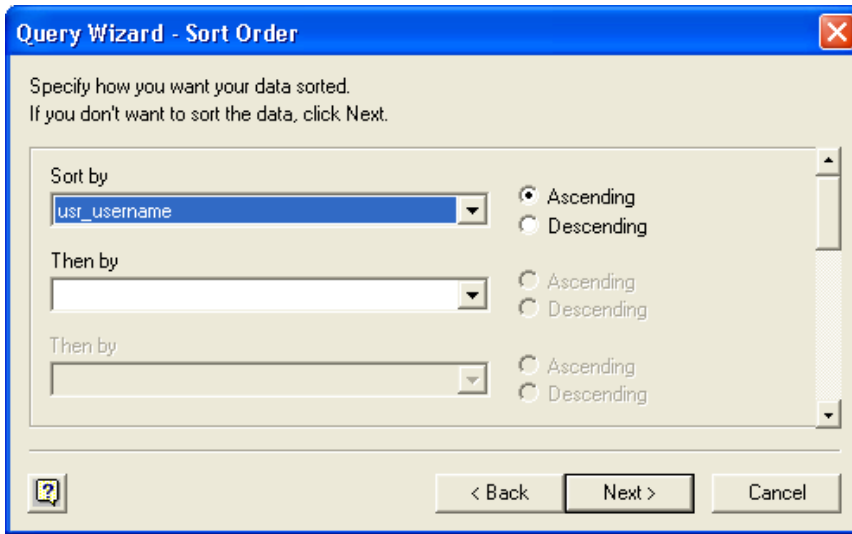


Figure 5.9: Sorting Criteria May Be Defined Through the Query Wizard

We will define one sort criteria. In the Sort by field select the column *usr\_username* and check Ascending next to it. Click the NEXT button.



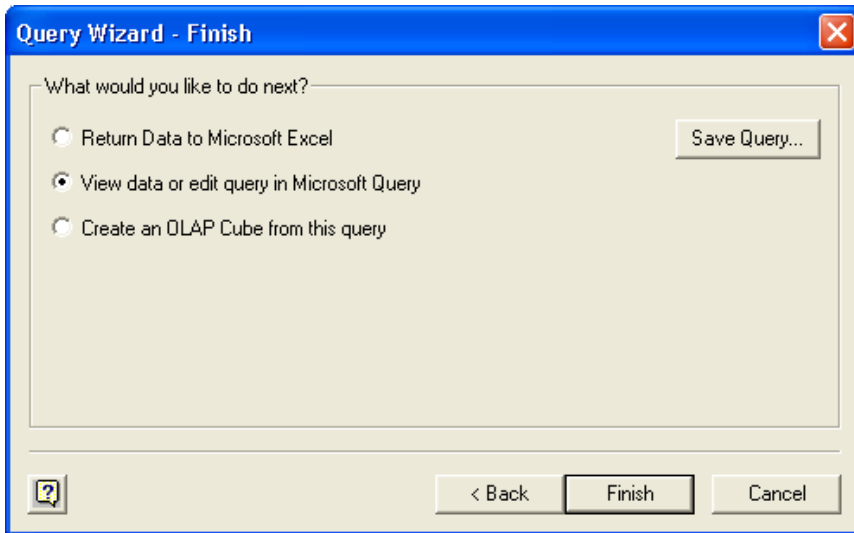


Figure 5.10: Query Offers Several Output Options

Because we are only using Query to generate an SQL statement, we check the option “View data or edit query in Microsoft Query.” Click the FINISH button.

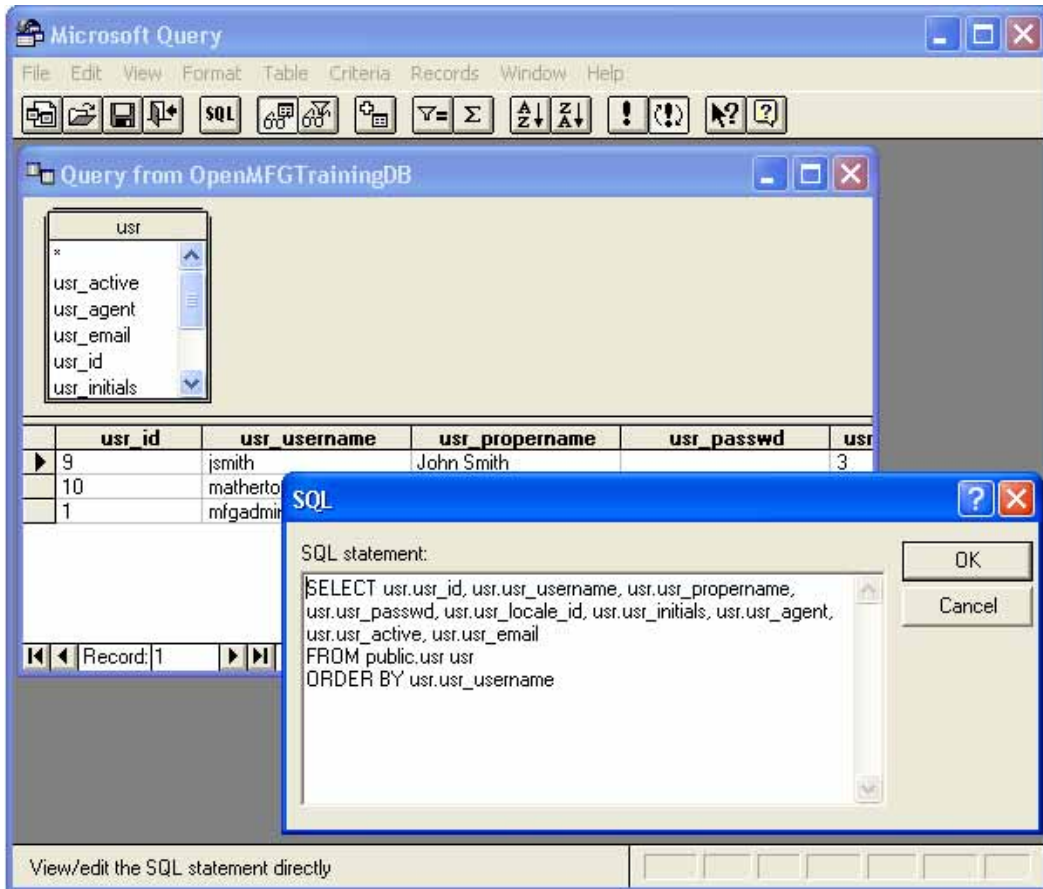


Figure 5.11: To View The SQL Statement, Click the SQL Button In The Toolbar

Initially Query displays the results of the query we just created with the Query Wizard. To see the syntax of the SQL statement, click the SQL tool in the toolbar.

To copy this SQL statement for importing into an OpenMFG report writer report definition, select the statement and then right click and use the Copy option. Later you can paste the statement into a Query Source.

Earlier chapters in this guide instructed you in the details of modifying and creating OpenMFG report writer report definitions. The next few screens show the core elements of a report definition and the resulting output.

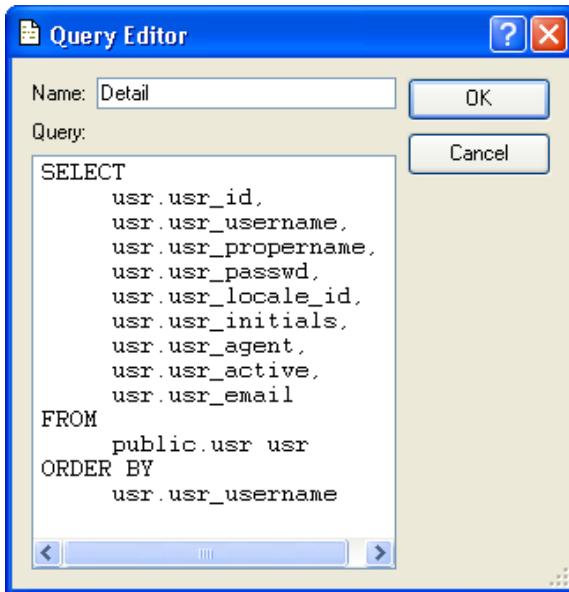


Figure 5.12: Other Than Formatting To Make Reading Easier, This Is The Exact SQL Statement As It Was Copied From Microsoft Query

Above we see the SQL statement exactly as it was copied from Microsoft Query and loaded into a Query Source for a new report definition. The report definition will be saved as Users-MasterList, Grade 20, and will print when the PRINT button is clicked on the OpenMFG Users session.

Note that above is the exact SQL statement as it was copied from Microsoft Query. MetaSQL has not been added to it. The OpenMFG session Users passes the parameters *locale\_id* and *showInactive* to the report definition at run time. These parameter values can be used to create sophisticated WHERE clauses that show data on the report based on user entries on the User screen. Remember, you can use the MetaSQL Editor to test SQL that contains MetaSQL before pasting into a report's Query Source.

Below is a the report definition that was created from scratch using the Microsoft Query SQL.

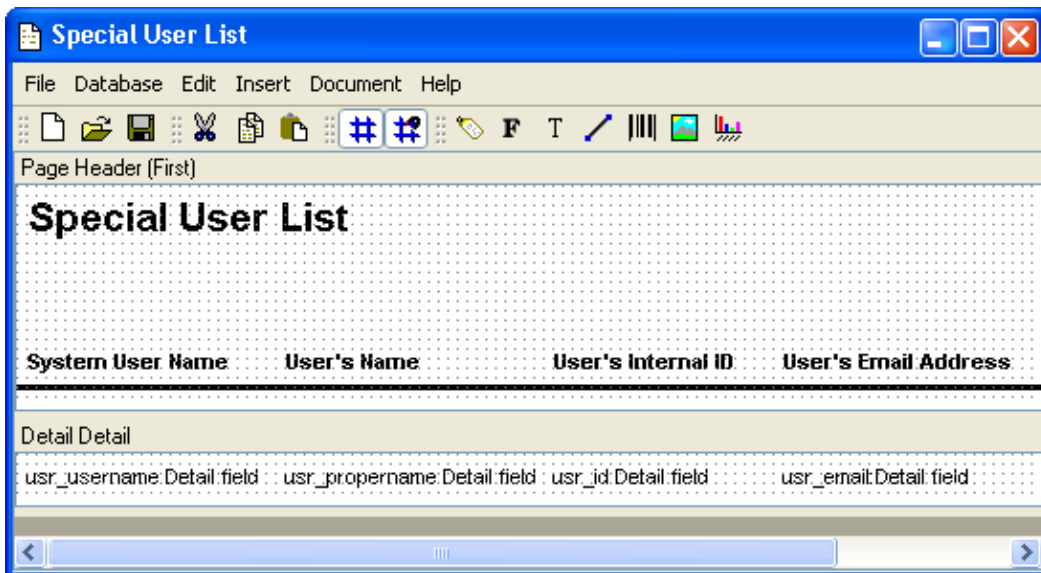


Figure 5.13: This Simple Report Definition Was Created From Scratch And Uses Microsoft Query SQL To Produce A Report Called UsersMasterList Which Is Called From The OpenMFG Client Session Users

The Special User List is a simplified version of OpenMFG report UsersMasterList. It uses the SQL generated by Microsoft Query and is called by the OpenMFG session Users.

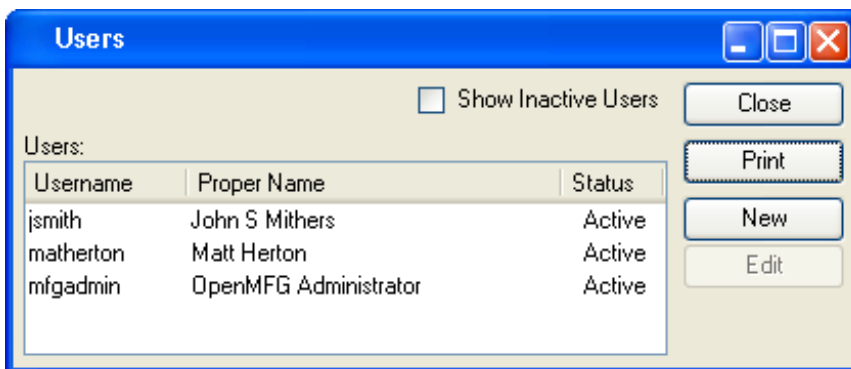


Figure 5.14: The Session Users Is Access From The OpenMFG System Menu Through The Option Maintain Users And Calls The Report Definition UsersMasterList When The Print Button Is Clicked

The OpenMFG report definition UsersMasterList is called when the PRINT button on the OpenMFG session Users is clicked.

<b>Special User List</b>			
<b>System User Name</b>	<b>User's Name</b>	<b>User's Internal ID</b>	<b>User's Email Address</b>
jsmith	John S Mithers	9	jmithers@openmfg.com
matherton	Matt Herton	10	matt@openmfg.com
mfgadmin	OpenMFG Administrator	1	admin@openmfg.com

**Figure 5.15: UsersMasterList Report Output That Uses An SQL Statement Generated By Microsoft Query**

The report shown above was generated using the SQL that we copied from Microsoft Query. It demonstrates the speed and ease with which new reports can be created and deployed with the OpenMFG report writer.

