USER
MANUAL

For Microsoft® Windows

MasterPlex®
EX

Expression Analysis Module

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For Research Use Only

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MiraiBio

MasterPlex® EX

Analysis software for multiplex data from the Luminex® 100/200, BioPlex system.

CONTENTS

CHAPTER 1

Welcome to the MiraiBio MasterPlex® EX User Manual. MasterPlex® EX software analyzes results files (.csv, *xls, *.lxd or *.mlx*) from the Luminex® 100/200 or BioPlex system.*

1.1

About This Manual

This manual explains how to use the MasterPlex® EX software to:

- Import results files (*.csv, *.xls, *.lxd or *.mlx*) from the Luminex system
- Designate control, treatment and background wells
- Set housekeeping gene
- Normalization and compute fold change
- Generate data charts and reports

What's New in MasterPlex® EX

MasterPlex® EX offers new features, including the ability to:

- Merge plates using virtual plate feature so that it can analyzes beyond 100 panels at one time
- Make a sample marking and groups easily and quickly using Auto-grouping feature or dragging grouping feature
- Calculate a fold change for being used relative gene analysis
- Normalize the data so that it can analyze between different plates
- Generate a custom reports using style sheet

Conventions Used in This Manual

This manual describes the steps required to perform the various tasks associated with the MasterPlex® EX software. The manual uses a step format to explain the various tasks associated with MasterPlex® EX. A symbol may follow a step instruction. It indicates the software response to the action performed by the user.

Screen Captures

Screen captures may accompany the step instructions for further illustration. The screen captures in this manual may not exactly match those displayed on your screen.

1.2

Technical Support

You can contact MiraiBio Technical support at:

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E-mail: support@miraibio.com
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CHAPTER 2 Installing MasterPlex®

This chapter explains the minimum hardware and software requirements needed to install and use MasterPlex® EX. It provides installation instructions for a computer connected to the Luminex® 100/200 or BioPlex system.

2.1 Requirements

For optimum performance, MasterPlex® EX requires hardware and software that meet or exceed the following specifications. It is also strongly recommended that you use the Luminex XY platform.

Minimum Hardware Requirements

Platform	PC
CPU	Intel Pentium 4 2 GHz or equivalent, Intel Pentium 4 2 GHz or better (recommended)
Memory (RAM)	512MB or higher for Windows XP/Vista/7
Storage space (HDD)	120 MB available hard drive space for the installation
Input devices	Keyboard and mouse or other pointing device
Video RAM	32MB or higher
Monitor resolution	XGA (1024x768 pixels or higher; 1280 x1024 recommended)
Monitor color	16-bit color (high color) or higher
CD-ROM drive	Required for CD media version. Not applicable for download version.

Software Requirements

Operating system	Microsoft Windows XP/Vista/7, Microsoft .NET3.5 framework and Windows Media Player 10 or higher required.

2.2

Installing MasterPlex®

1. Insert the MasterPlex® CD-ROM in the workstation computer
   ⇨ The installation guide begins automatically and the InstallShield Wizard appears (Figure 2.1).

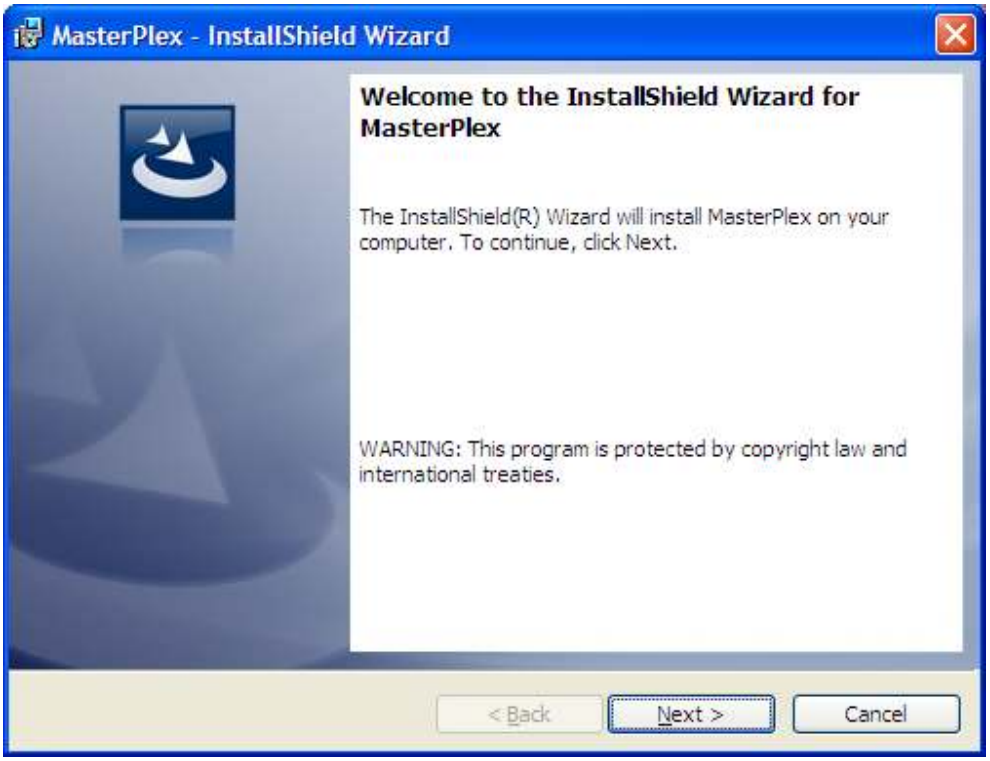


Figure 2.1 InstallShield Wizard, Welcome screen

2. To continue the installation, click **Next**.
   ⇨ The destination folder confirmation window appears (Figure 2.2).

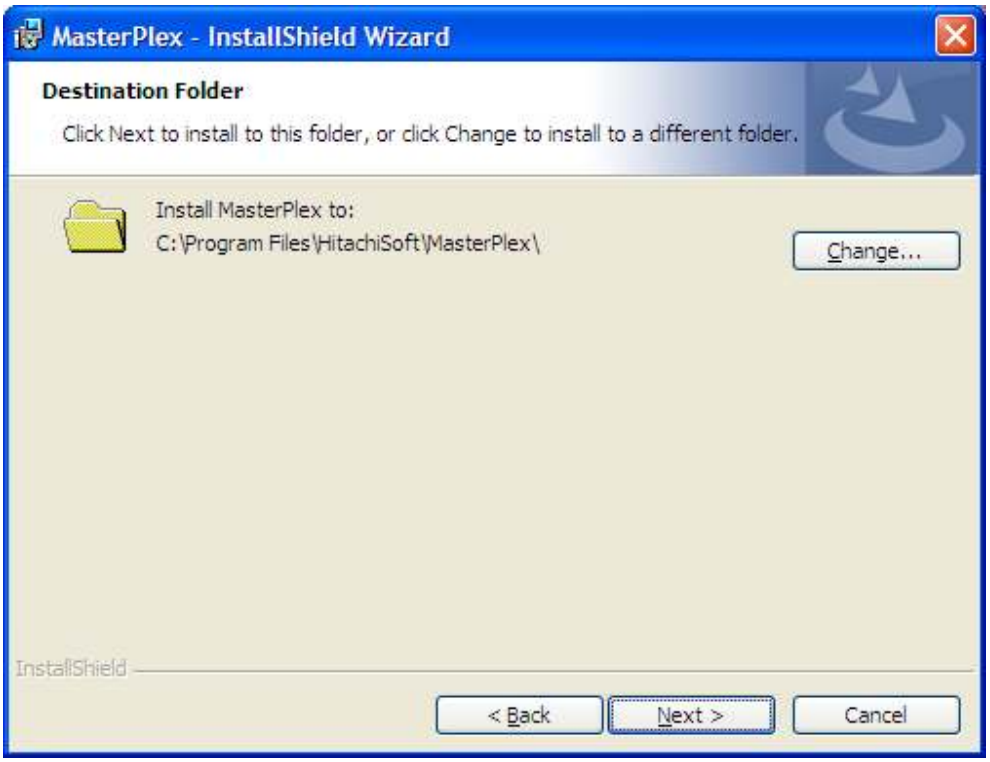


Figure 2.2 Destination Folder screen

To specify a different destination folder, click **Change**, choose the folder, and click **Next** (Figure 2.2).

3. To continue, click **Next**.
   ⇨ Custom module setup window appears (Figure 2.3).

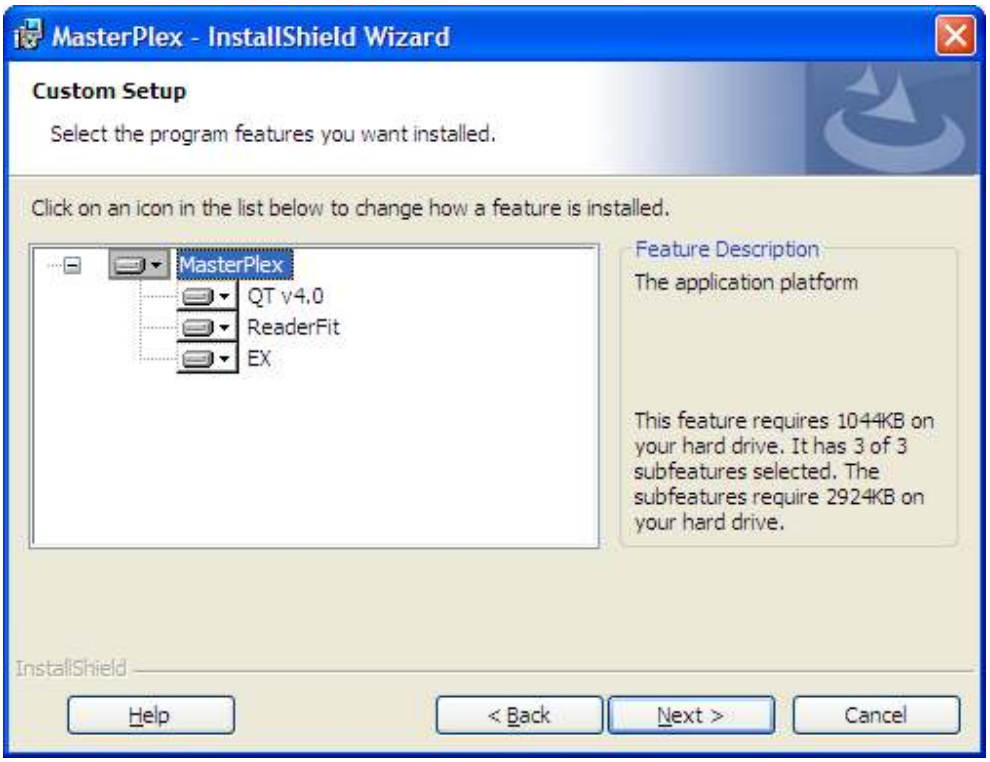


Figure 2.3 Module selection window

4. Make sure the module name you purchased and click  icon you don't want to install.

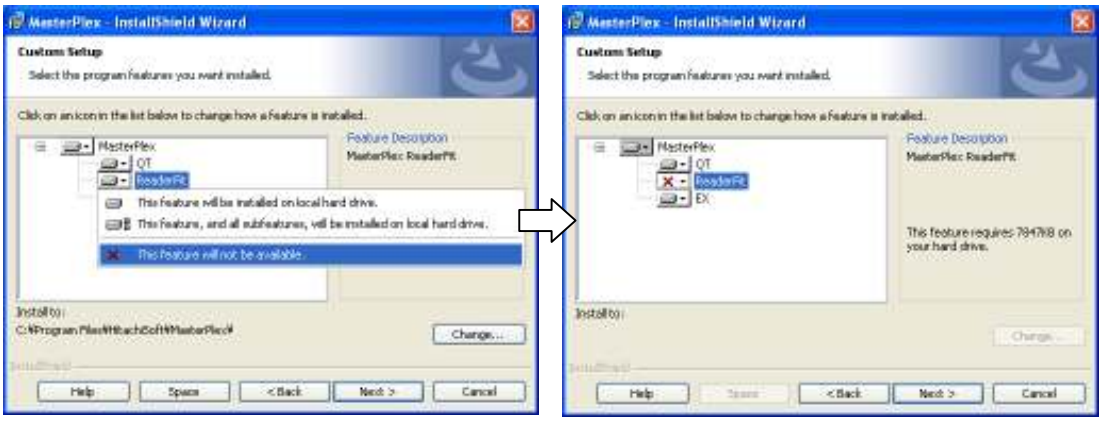


Figure 2.4 Install module selection window

5. To continue, click **Next**.
   ⇨ The Ready to Install the Program window appears (Figure 2.5).

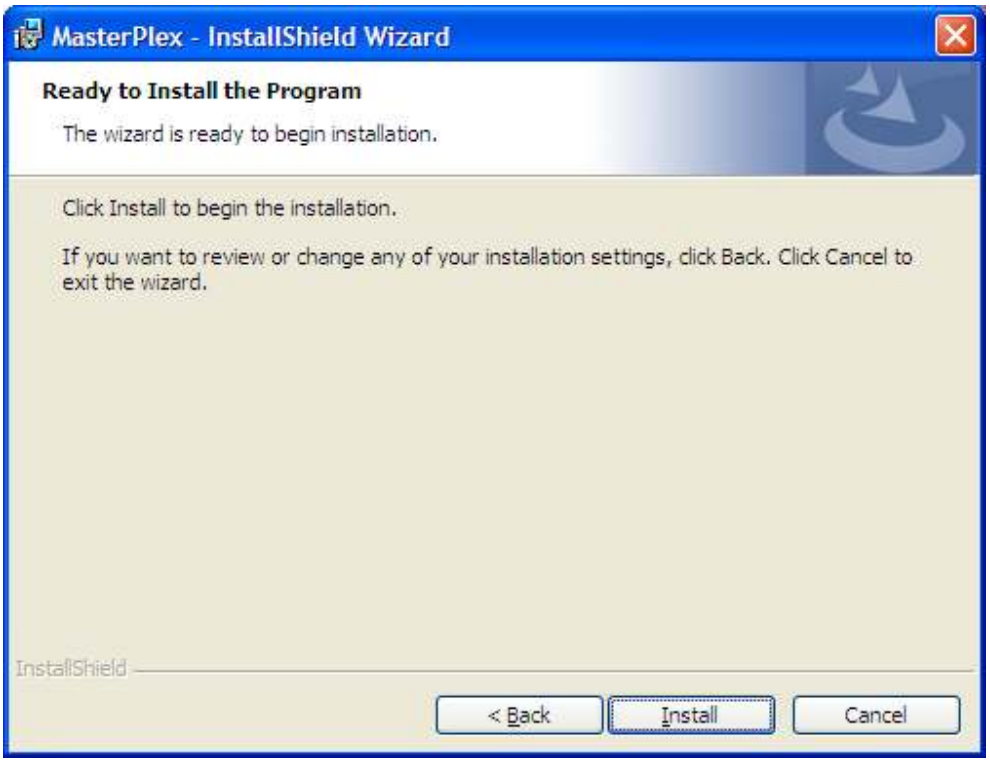


Figure 2.5 Ready to Install the Program window

6. Click **Install**.
   ⇨ The Start Copying Files window appears (Figure 2.6).

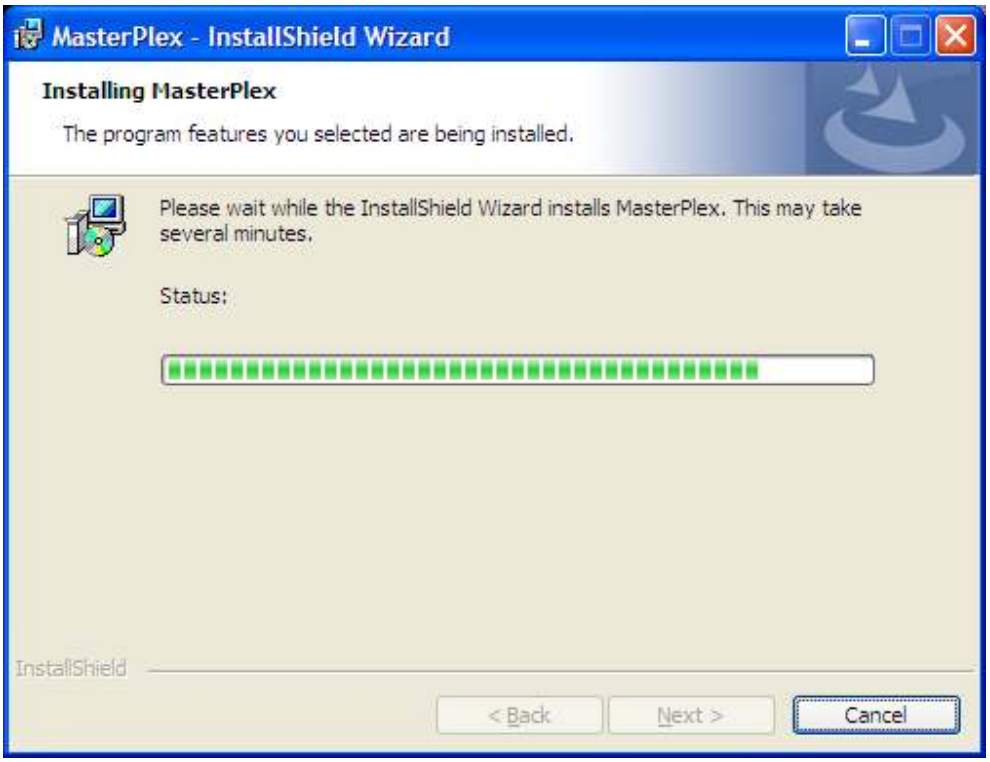


Figure 2.6 InstallShield Wizard, Start Copying Files window

7. After the installation is completed, the InstallShield Wizard Complete window appears (Figure 2.7).

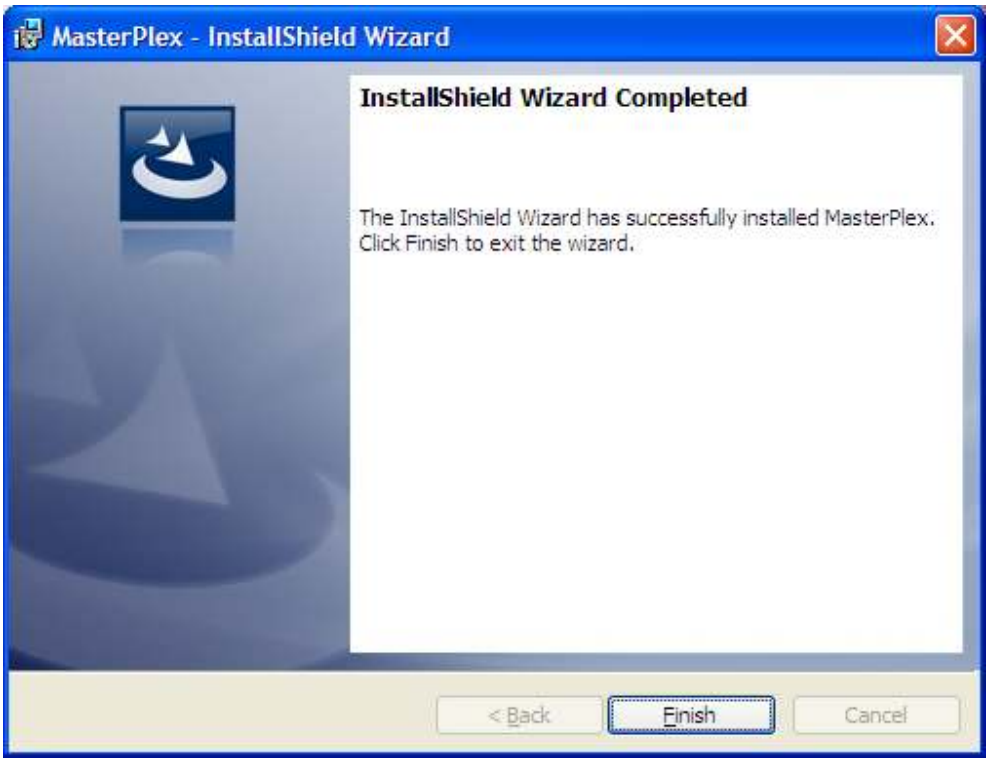


Figure 2.7 InstallShield Wizard Complete window

8. Click **Finish** to finish the installation and close the window.

2.3

Installing a License

1. Double-click the MasterPlex® icon  on the workstation desktop.
   ⇨ The License Information dialog box appears (Figure 2.5).

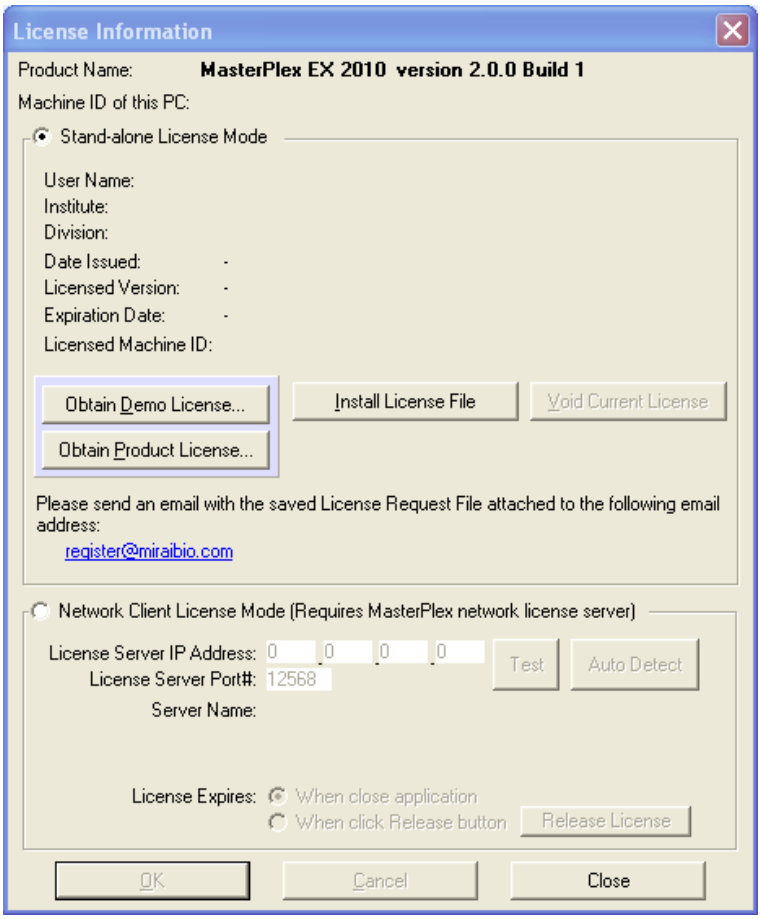


Figure 2.5 License Information dialog box

2. To view instructions on how to obtain a license (*.lic), click **Obtain Product Licenses**.
3. After you have obtained a license, click **Install New License**.
   ⇨ The Open dialog box appears.
4. Use the Open dialog box to locate the license (*.lic) and double-click the file.
   ⇨ The license is installed.

CHAPTER 3 Getting Started

This chapter provides a brief overview of data analysis using MasterPlex® EX. It also explains how to start the software, import a Luminex® 100/200 or BioPlex results file (.csv, .xls or .lxd), and the user interface components.

3.1 Overview of MasterPlex® EX Analysis

MasterPlex® EX software analyzes results files (.csv, .xls or .lxd) from the Luminex 100/200 or BioPlex system. The analysis steps include:

- Import a Luminex results file (.csv, .xls or .lxd)
- Designate well types (control, treatment or background) and well groups
- Attach housekeeping gene status to the analytes
- Associate or *link* a control group set to an treatment group(s)
- Normalization and compute fold change
- Save the Luminex results file in MasterPlex® EX file format (.mlxe). The .mlxe file includes information associated with the file (for example, well definitions and calculated results)

After the fold changes are calculated, you can:

- View the results in graphs or several different report formats
- Create a *virtual plate* (a simulated microtiter plate) that contains data from user-selected actual plates (.csv, .xls, .lxd or .mlx)

3.2

Starting MasterPlex® EX

• On the desk top, double-click the MasterPlex® icon . Alternatively, you can click the Windows start menu button and select **Programs > MasterPlex 2010 > MasterPlex 2010**.

➪ The MasterPlex® user interface appears and lists up all detected modules in the application pane (Figure 3.1).

You can import a Luminex® or BioPlex results file (.csv, .xls or .lxd) or create a virtual plate from this interface. For more information on virtual plates, see Chapter 4 Section 4.7 *Creating a Virtual Plate*.

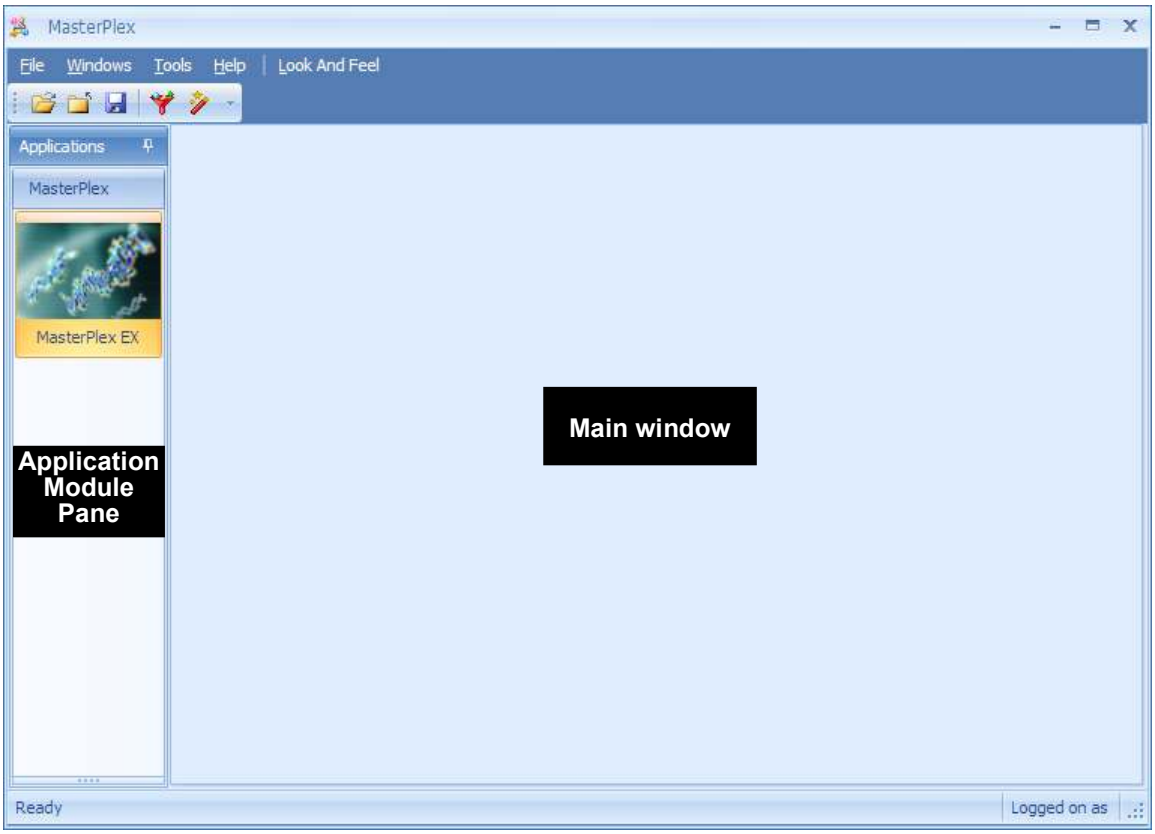


Figure 3.1 MasterPlex® user interface

3.3

Importing Luminex® Results

To begin a MasterPlex® EX analysis, import a .csv, .xls or .lxd file from the Luminex 100/200 or BioPlex system using toolbar, menu bar or application icon.

NOTE: The Luminex default directory is named Output.

Importing Luminex Results Using the File Open Menu, File Open Icon or Application Icon

1. Choose **File** > **Open**, click the **File Open** icon or click the application icon .

   ⇨ The Open dialog box appears (Figure 3.2).

2. Enter the file path for the .csv, .xls or .lxd that you want to import.

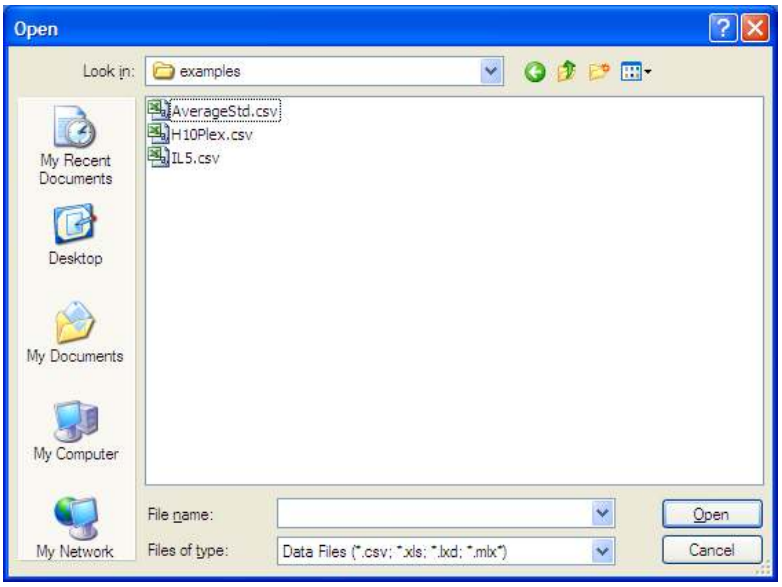


Figure 3.2 Open dialog box

3. Navigate to the directory of the .csv, .xls or .lxd that you want to import.
4. Select one or more .csv, .xls or .lxd files and click **Open**.
   To select adjacent files, press and hold the **Shift** key while you click the first and last file in the selection. To select nonadjacent files, press and hold the **Ctrl** key while you click the files of interest.

   ⇨ The EX module window opens and displays the results data (Figure 3.3).

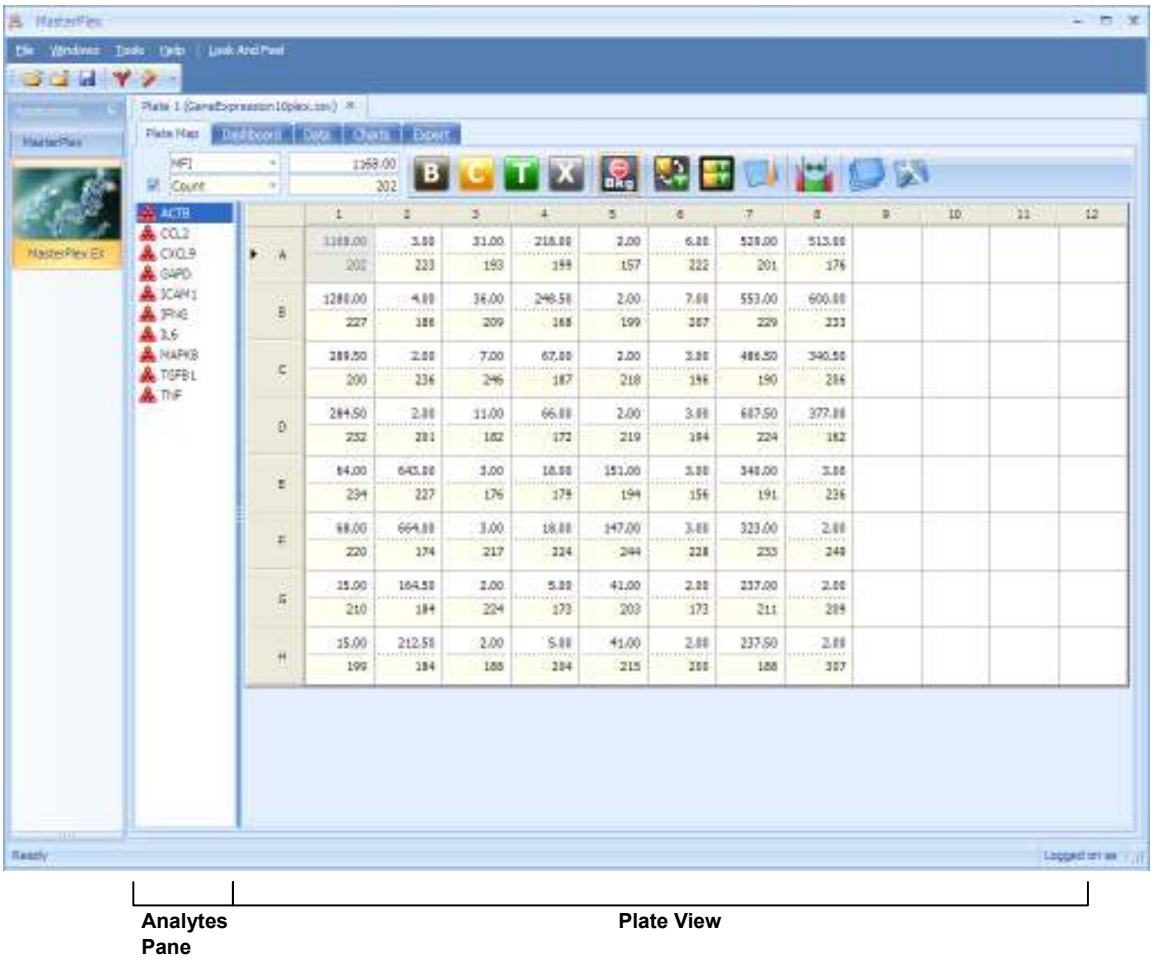


Figure 3.3 Plate tab displaying results data

3.4
Import .csv, .xls or Open .lxd, .mlx* Files by drag and drop

1. Open Windows Explorer and adjust the window size so that you can view both the MasterPlex® EX and Windows® Explorer application windows.
2. Use Windows Explorer to navigate to the .csv, .xls, .lxd or .mlx file(s) that you want to open.
3. Select the file(s) of interest, then click and hold the mouse button while you drag the selected file(s) to the MasterPlex® application menu bar area (Figure 3.4).
   To select adjacent files, press and hold the **Shift** key while you click the first and last file in the selection. To select nonadjacent files, press and hold the **Ctrl** key while you click the files of interest.
4. Release the mouse button.
   ⇨ The file(s) open in MasterPlex® EX.

Figure 3.4 MasterPlex® EX and Windows® Explorer application windows
Use a drag-and-drop operation to open a .csv, .xls, .lxd or .mlx file(s) in the MasterPlex® application menu bar area

3.5

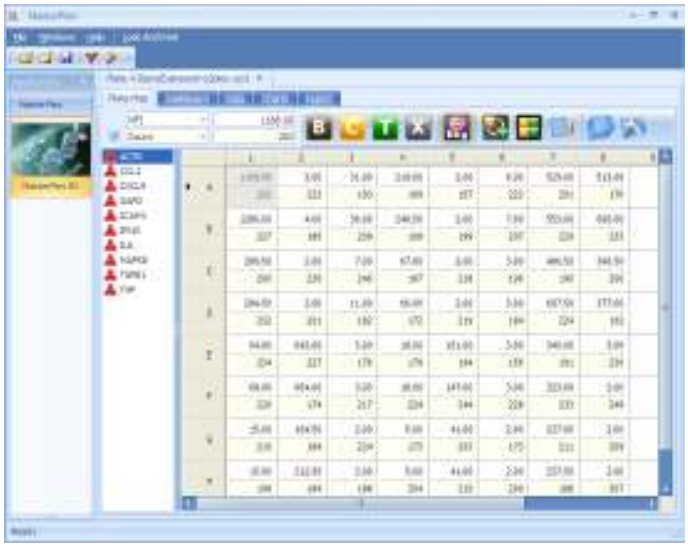
Tab categorized work flow

EX application module consists of five tab pages, **Plate Map**, **Dashboard**, **Data**, **Charts** and **Export** (Figure 3.5), designed to match the work flow in a typical multiplex data analysis session.

Figure 3.5 EX application module tabs

Define a Plate

- Mark sample as Background, Treatment or Control
- Fill out sample amount
- Define Housekeeping genes

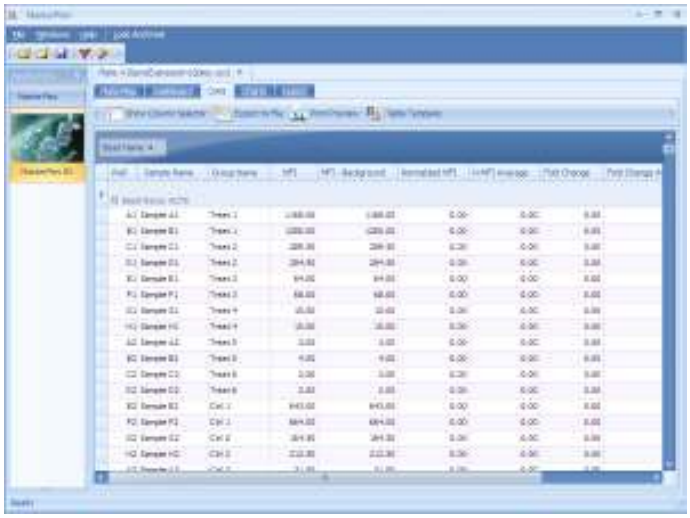


Check data distributions and calculate fold change

- Plot data on the chats and review the data distributions
- Normalization
- Calculate fold change

Review Data

- Review all data
- Print or export the data

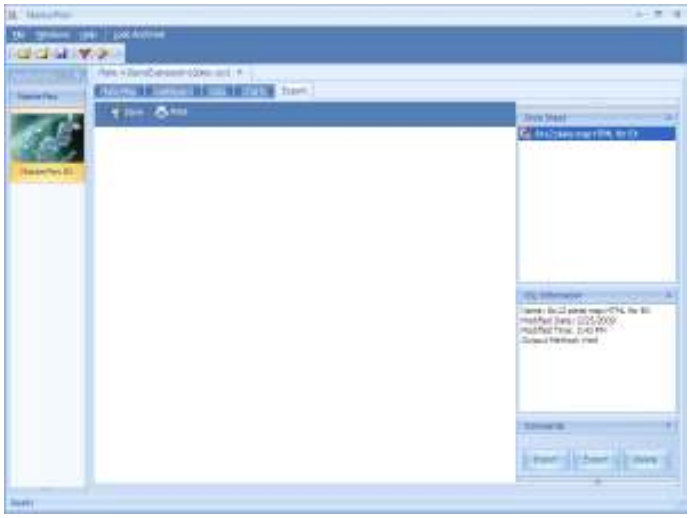


Review Data by Chart

- Review all data on the chart
- Customize chart properties
- Print or export the chart

Export Customized Data

- Transform the MasterPlex®QT xml data to original data format
- Import or export the style sheet data



3.6

Viewing Data in the Plate Tab

The EX application module starts in the Plate Map tab. If any other tab page is displayed, click the **Plate Map** tab to display the Plate Map tab as shown below(Figure 3.6).

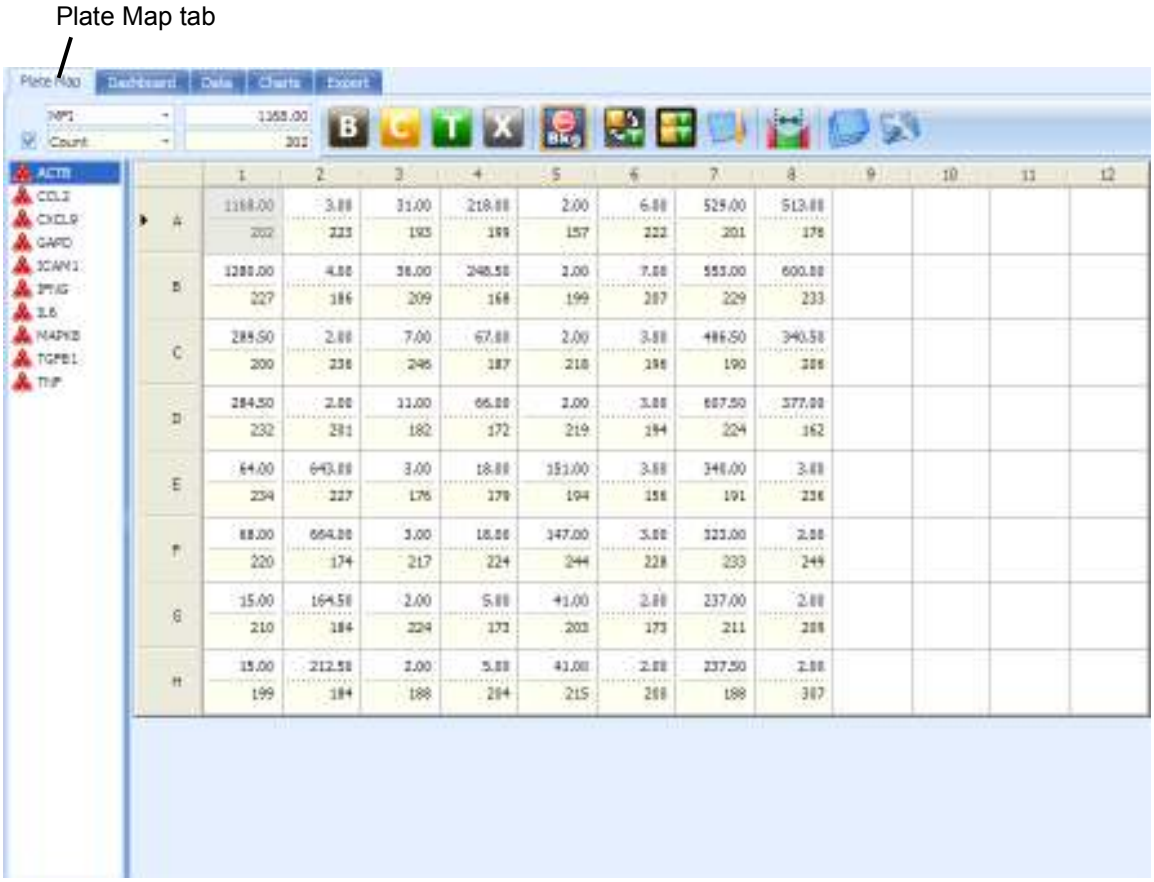


Figure 3.6 Plate tab page

1. If more than one application window is open, select the **Cascade**, **Tile Horizontal** , or **Tile Vertical** menu from the window menu bar to arrange the application windows for easier viewing.
2. To change the data displayed in the well grid:
   a. Click an analyte in the Analyte pane.
   b. Make a selection from the data type upper drop-down list.
      ⇨ The well grid displays the data for the selected analyte.

Figure 3.7 shows the components of the Plate tab. Table 3.1 lists the types of data available for display in the plate view.

3. To view background-subtracted data, click the **Subtract background** button 

   ⇨ The Plate tab displays background-subtracted data.
   For more information on background calculation options, see *Background Type* on section 4.6.

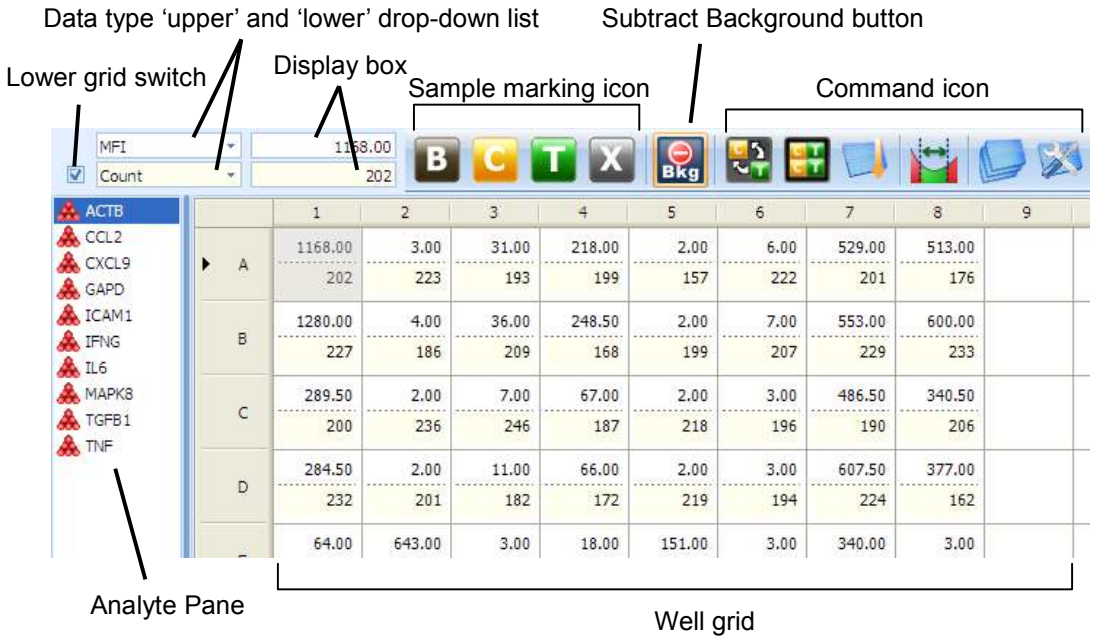


Figure 3.7 Plate tab and Analyte pane

Plate View Components

Well Grid	A representation of a microtiter plate that displays the well contents for the analyte selected from the Bead Set panel and data type selected from the data drop-down list. Some data types can be edited (see Table 3.1). Select one of the wells (The wells turn gray), then click the same well once again to edit mode.
Data type 'upper' and 'lower' drop-down list	Shows the types of data available for display in the well grid. Make a selection from this drop-down list to choose the data type displayed in the well grid. Click the drop-down arrow to view the list and select a data type. (See Table 3.1 for a description of the data types.) The well grid can be separated into upper and lower grids by clicking lower grid switch. (See Figure 3.8 for more further details)
Lower grid switch	Enables the lower grid data selection and display.
Display box	Displays the selected data type value for the active (selected) well.
Analyte pane	Displays a list of the analytes (bead sets) in an assay.
Sample marking icon	Icons for sample marking.
Subtract background	Displays the background-subtracted value.
Command icon	Icons for operating plate tab.

Table 3.1 Data Types in the well grid

Data Type	Description	Edit Data
MFI (Median Fluorescence Intensity)	The median fluorescence intensity measured by the Luminex® 100/200 or BioPlex system for a bead set count.	No
Count	The number of beads (per bead set) detected by the Luminex® 100/200 or BioPlex system (specified by the user in the Luminex software).	No
Sample Amount	The sample's amount.	Yes
Outlier	A check mark indicates the well is outlier and the well data are not included in the calculation of concentrations.	Yes
Normalized MFI	Shows calculated normalization value	No
Fold Change	Shows calculated fold change value	No
Sample Name	User-specified name for the well.	Yes
Group Name	The group number of the well. Wells that belong to the same group have the same group number.	Yes
Link Group	Shows the control group number that is linked to each well or well group.	Yes
MFI Average	Shows the MFI average within the group.	No
MFI Stdev	Shows the MFI standard deviation within the group.	No
MFI %CV	Shows the MFI %CV within the group.	No
N-MFI Average	Shows the Normalized MFI average within the group.	No
N-MFI Stdev	Shows the Normalized MFI standard deviation within the group.	No
Fold Change Average	Shows the Fold Change average within the group.	No
Fold Change Stdev	Shows the Fold Change standard deviation within the group.	No
Intensity	Shows the Normalized data within the group. (This data type is available in the lower drop-down list only.)	No

Display Double Data Information in one Cell

MasterPlex® EX has an unique feature for data viewing on the well grid. You can select two data type from various kind of data, and it is displayed in the one cell separated into upper and lower. Figure 3.8 shows how to display the double data in one cell.

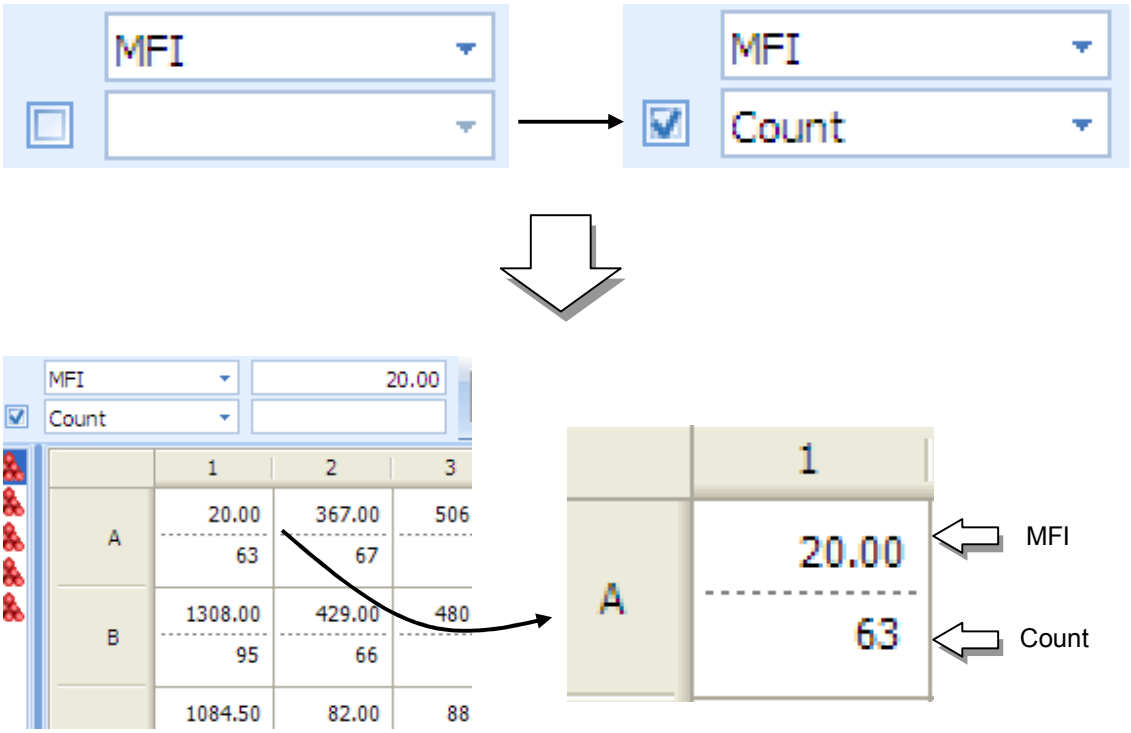


Figure 3.8 Upper and lower grid display

Well grid can be separated into upper and lower grid. Each grid displays separate data type.

3.7

Saving Plate Data

After you import a Luminex results file (.csv, .xls or .lxd), the data can be saved to a MasterPlex® EX file format (.mlxe). The .mlxq file includes all data associated with a plate such as well definitions and computed (interpolated or extrapolated) concentrations.

To save results data (.csv, .xls or .lxd) to a MasterPlex® file (.mlxq):

1. Click the **Save** button . Alternatively, select **File > Save** from the main menu.
   ⇨ The Save As dialog box appears (Figure 3.9).

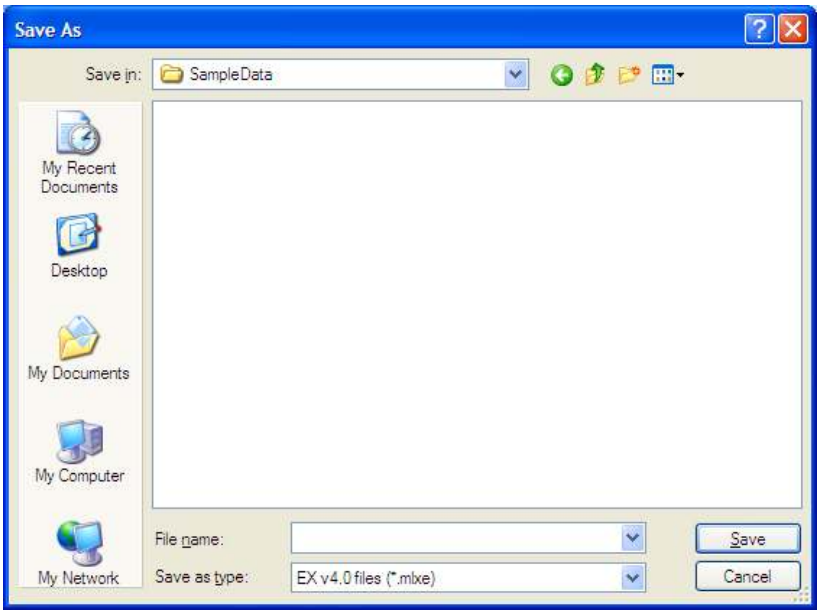


Figure 3.9 Save As dialog box

2. Confirm the default directory where the file will be saved or choose another directory.
3. Enter a file name and click **Save**.

Opening a MasterPlex® File (.mlxe)

1. Click the **Open** button . Alternatively, select **File > Open** from the main menu.
   ⇨ The Open dialog box appears (Figure 3.10).

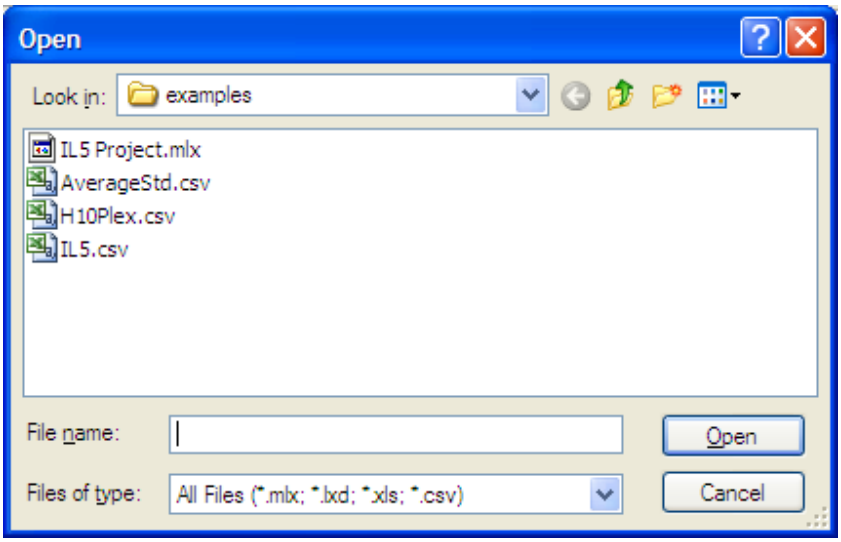


Figure 3.10 Open dialog box

2. Confirm the default directory or choose another directory.
3. Select a file name (.mlxq) and click **Open**.

⇨ An application module window opens and displays the results data (Figure 3.11).

Figure 3.11 Plate Map tab

CHAPTER 4 Defining a Plate – *Plate tab*

After you import a Luminex results file (.csv, .xls, .lxd), your analysis begins by defining a plate. This chapter explains how to define and save a plate. The steps to define a plate include:

- **Designate well type** to identify the standard, unknown, background, and control wells.
- **Attach Housekeeping gene status** by right clicking on the analyte pane. A plate can have more than one housekeeping genes.
- **Link each well group to a control group** to specify the control that is used to compute the analyte fold changes.

The plate definition can be saved as a template that can be applied to other plates. The Template Manager helps you manage your templates. For more information on templates, see *Working With Templates* (on section 4.5).

4.1

Designating Well Type and Group

Selecting Wells

To select a well in the Plate tab, click the well in the well grid. There are three ways to select multiple wells:

- To select adjacent wells (Figure 4.1), press and hold the mouse button while you drag the pointer over the wells that you want to select. Click and release the mouse button to select the highlighted wells.
- To select adjacent wells, press and hold the **Shift** key while you click the first and last well in the selection.
- To select nonadjacent wells (Figure 4.2), press and hold the **Ctrl** while you click the wells.

	1	2	3	4
A	20.00 63	367.00 67	506.50 76	341.00 80
B	1308.00 95	429.00 66	480.50 78	392.00 79
C	1084.50 72	82.00 79	88.00 75	78.00 70
D	525.00 79	88.50 66	82.00 76	96.50 74
E	201.00 81	37.50 82	38.00 85	37.00 96
F	66.50 80	32.00 79	32.00 66	34.00 74
G	39.00 78	18.00 81	18.00 68	23.00 69

Figure 4.1 Well grid

*To select adjacent wells, press and hold the **Shift** key while you click the first and last well in the selection. Alternatively, press and hold the mouse button while you drag the mouse over the wells of interest.*

	1	2	3	4
A	20.00 63	367.00 67	506.50 76	341.00 80
B	1308.00 95	429.00 66	480.50 78	392.00 79
C	1084.50 72	82.00 79	88.00 75	78.00 70
D	525.00 79	88.50 66	82.00 76	96.50 74
E	201.00 81	37.50 82	38.00 85	37.00 96
F	66.50 80	32.00 79	32.00 66	34.00 74
G	39.00	18.00	18.00	23.00

Figure 4.2 Well grid

*To select nonadjacent wells, press and hold the **Ctrl** key while you click the wells of interest.*

Designating Well Type

Table 4.1 shows the types of wells that are available.

1. Select the well(s) that you want to define.
2. To define (or *mark*) the well(s), click one of the icons located on the upper well grid (Figure 4.3). You can also right-click the selection and choose a well type from the pop-up menu that appears Figure 4.4. (Table 4.1).
   ⇨ The well type is applied to the selected well(s).

Figure 4.3 Sample mark icons

Figure 4.4 Well grid pop-up menu

Right click a well to display the pop-up menu

Table 4.1 Sample mark icon and context menu to define wells

Well Type	Button	Context menu on the well grid
Background Wells that contain no analytes.		**Background**
Control Wells that contain analytes that function as controls for a particular assay design.		**Control**
Treatment Wells that contains analytes of unknown concentration.		**Treatment**
Unmark Clear the current marking.		**Unmark**

If a well belongs to a group, unmarking the well also removes the well from the group.

3. Repeat step 1 and step 2 to mark and group other well(s).

Designating Well Groups

After you have defined the wells, the wells are organized into *groups* automatically so that the software can identify:

- Replicate unknowns

MasterPlex® EX automatically places all background wells into one group. You can define one or more groups of control wells per plate.

NOTE: A group can include nonadjacent wells. A plate can have more than one group of controls or unknowns.

Grouping Wells by Pattern

The purpose of pattern grouping is to provide users another way to easily and quickly make replicate groups. Pattern here means two things: the group type (e.g., control, unknown…) and the dimensions of the group (i.e., rows and columns). This function acts similarly to the Resizing feature of Microsoft Excel. It is especially useful when the plate has many groups/replicates that follow similar group patterns.

1. Define the group pattern by selecting a group of wells, and marking and grouping them together. We will group other wells into this pattern.
2. Select all wells of the pattern group(Figure 4.5).

	1	2	3	4	5	6	7
A	20.00 63	367.00 67	506.50 76	341.00 80			
B	1308.00 95	429.00 66	480.50 78	392.00 79			
C	1084.50 72	82.00 79	88.00 75	78.00 70			
D	525.00 79	88.50 66	82.00 76	96.50 74			
E	201.00 81	37.50 82	38.00 85	37.00 96			
F	66.50 80	32.00 79	32.00 66	34.00 74			
G	39.00 78	18.00 81	18.00 68	23.00 69			
H	26.50 68	19.00 69	17.50 80	27.00 42			

Figure 4.5 Well groups

3. Move the pointer to the bottom-right corner of the selection. When you see the pointer turn into a black cross, hold down the left mouse button and drag the pointer over the selection. During dragging, you will see in real-time that new wells are selected and grouped into the pattern, as indicated by a red-line border (Figure 4.6).

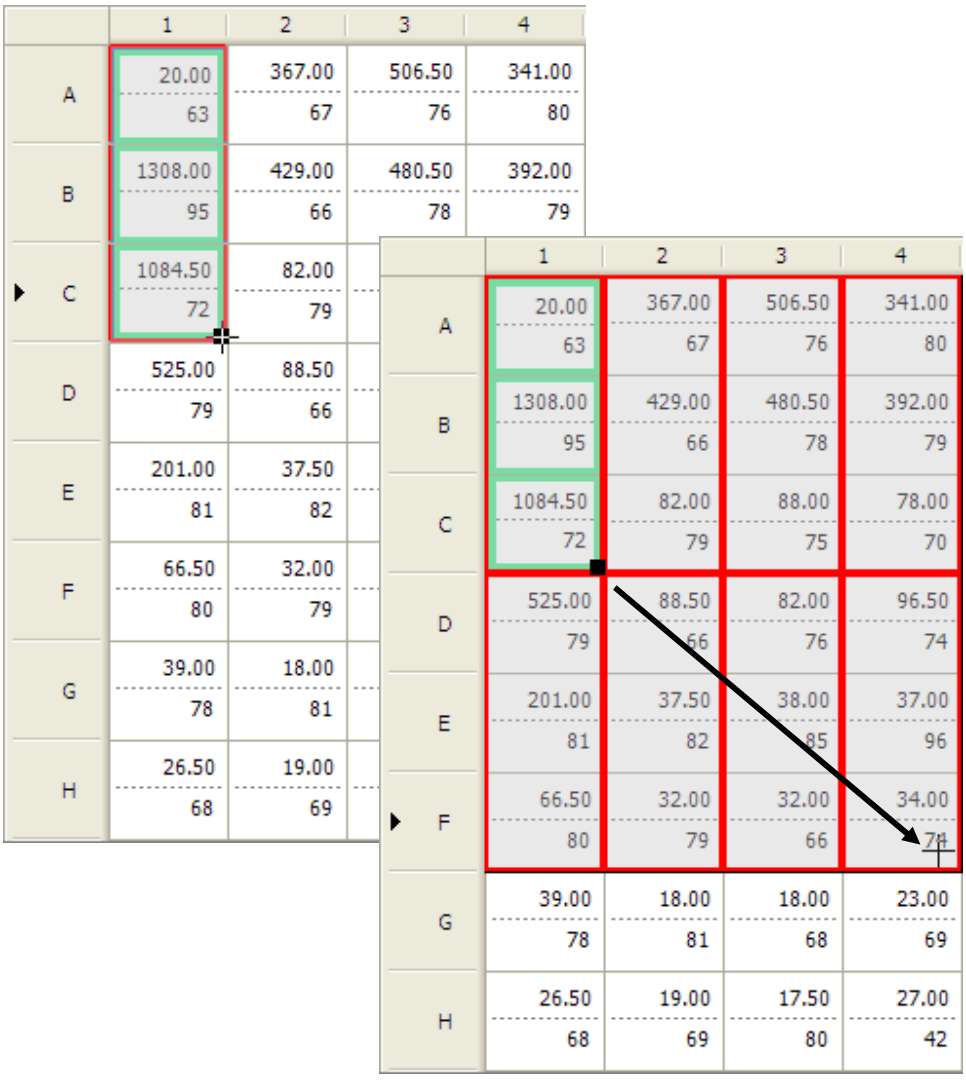


Figure 4.6 Well groups

4. Once you are satisfied with the selection, just release the mouse button. The software will automatically finish the grouping(Figure 4.7).

	1	2	3	4
A	20.00 63	367.00 67	506.50 76	341.00 80
B	1308.00 95	429.00 66	480.50 78	392.00 79
C	1084.50 72	82.00 79	88.00 75	78.00 70
D	525.00 79	88.50 66	82.00 76	96.50 74
E	201.00 81	37.50 82	38.00 85	37.00 96
F	66.50 80	32.00 79	32.00 66	34.00 74
G	39.00 78	18.00 81	18.00 68	23.00 69
H	26.50 68	19.00 69	17.50 80	27.00 42

Figure 4.7 Well groups

NOTE: When starting drag, you can move the pointer, you can move it either downwards or rightwards, which results in different ways to select wells. To switch between the two modes, just drag the pointer back into the pattern group, and then drag it out in either direction. So, it is determined by your first move direction when you are dragging the pointer out of the pattern group.

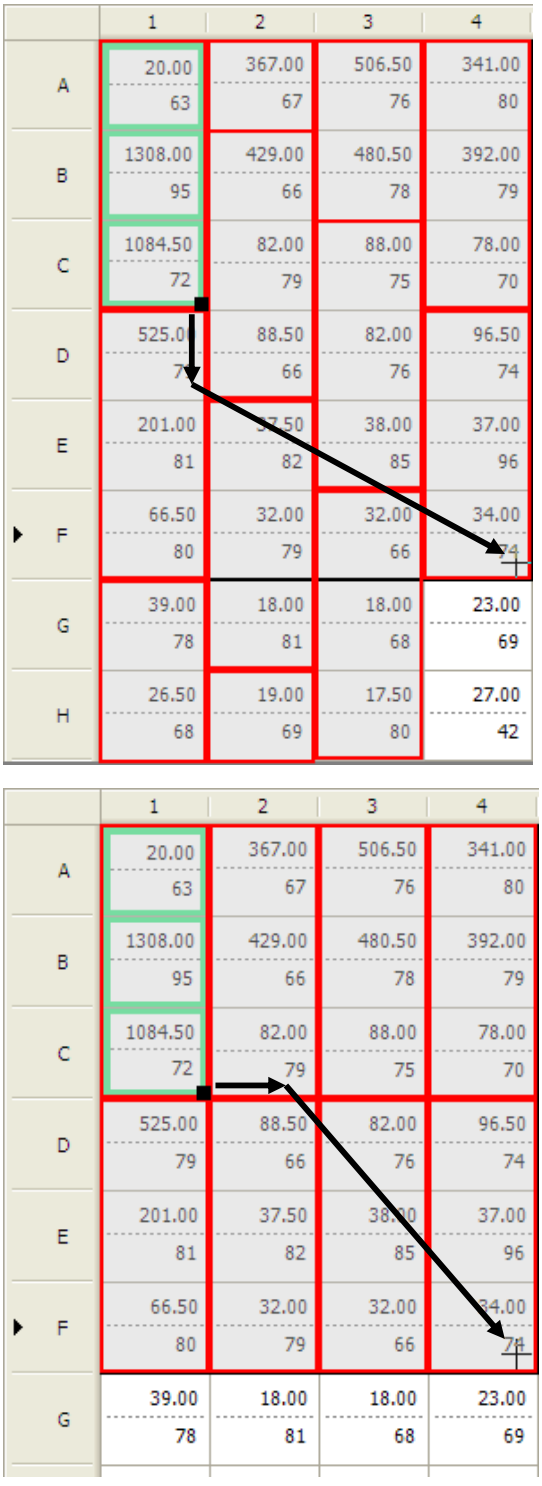


Figure 4.8 Well groups

Dragging downwards as the first move (above) vs. dragging rightwards as the first move (below)

Select all wells within the group at one time

1. While hovering over a replicate group border, the mouse pointer changes to a ‘hand’ icon (Figure 4.9).

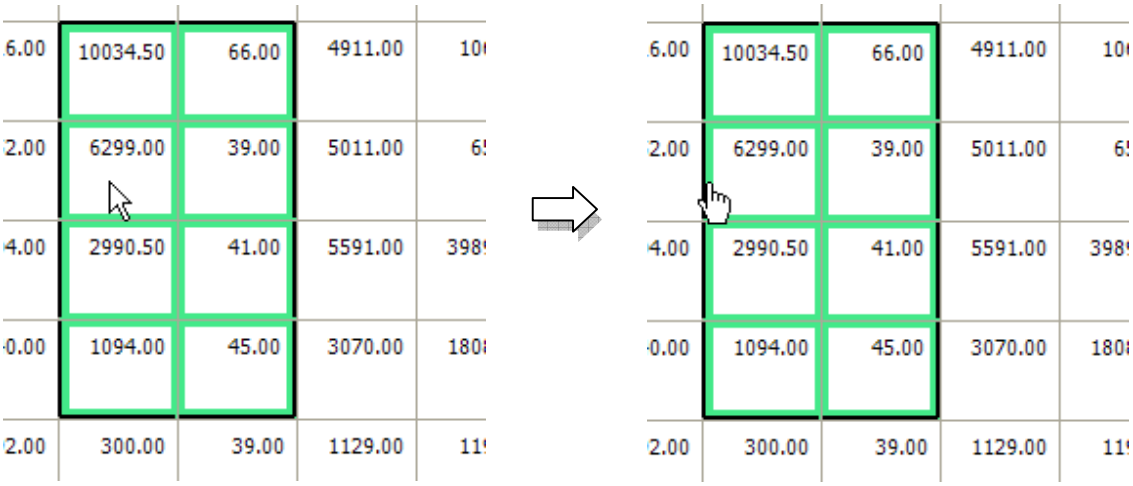


Figure 4.9 Mouse pointer changes to ‘hand’ icon

2. Click the border while mouse pointer is hand icon.
   ⇨ Entire wells within the group are selected (Figure 4.10).

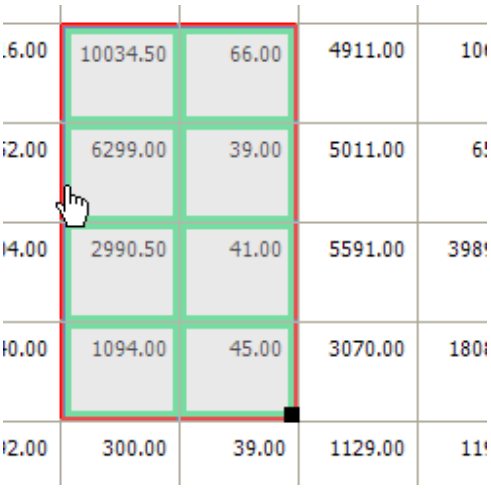


Figure 4.10 Selected wells

4.2

Setting Sample Amount

If you want to use sample amount index to confirm your MFI values are correctly gathered, use the auto fill feature to help you automatically enter the sample amount.

1. Click the **Auto-Fill** button  located above the well grid.
   ⇨ The Auto Fill dialog box appears (Figure 4.11).

Figure 4.11 Auto Fill dialog box

2. Make a selection from the Analyte drop-down list.
3. Enter the starting value for the sample amount.
4. Enter the dilution factor.
5. Make a selection from the sample amount unit drop-down list or input the unit from the keyboard.
6. To select a dilution direction for the selected wells, click a dilution direction arrow.
   ⇨ The gradient map shows the location and direction of the dilution gradient(s) (Figure 4.12).

Click an arrow to choose a dilution direction.

This gradient map specifies a separate dilution gradient in each column of the selected wells. The starting value is at the top of a column.

This gradient map specifies selected wells. The starting value is at the upper left well and the end concentration is at the lower right well. Click an arrow to choose a dilution direction.

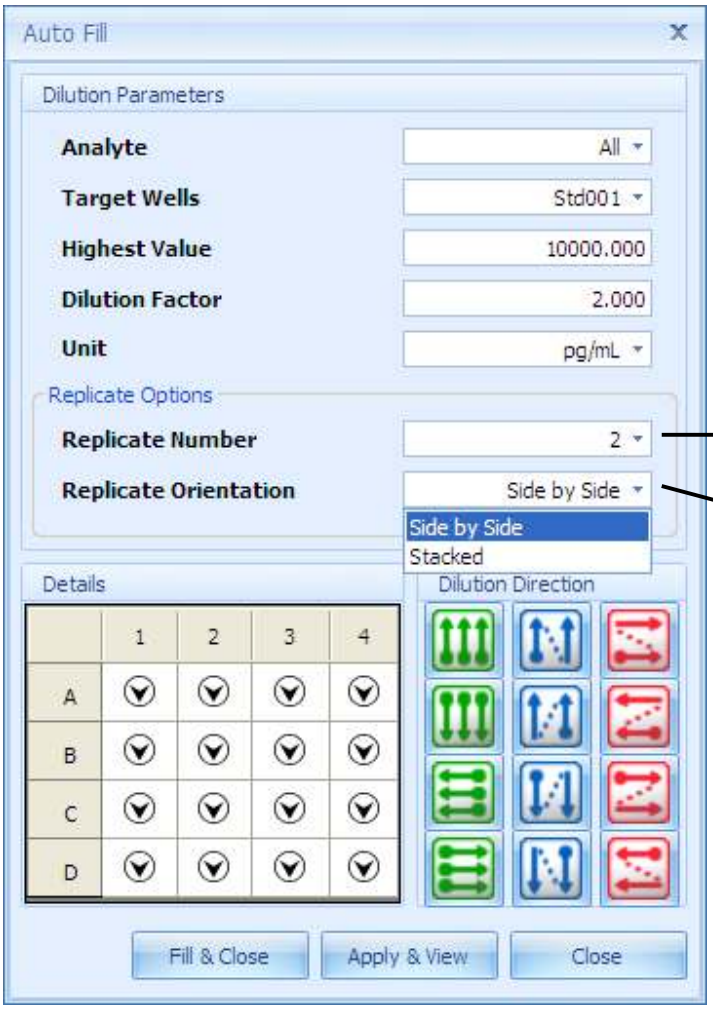
Figure 4.12 Example dilution gradient maps

Click a dilution direction arrow to choose the dilution gradient configuration for the selected wells.

7. To specify the same starting value, dilution factor, and units for all analytes in the standard data set, choose the **Fill for all analytes** option. To specify a different starting value, dilution factor, or unit for a different analyte, repeat step 2 through step 4.
8. Click **Apply** button when finished entering the sample amount value, the dilution, and the dilution direction for all analytes in the selected wells. If you want to close the dialog box at the same time, click **Fill & Close** button.

Fill in for replicate samples

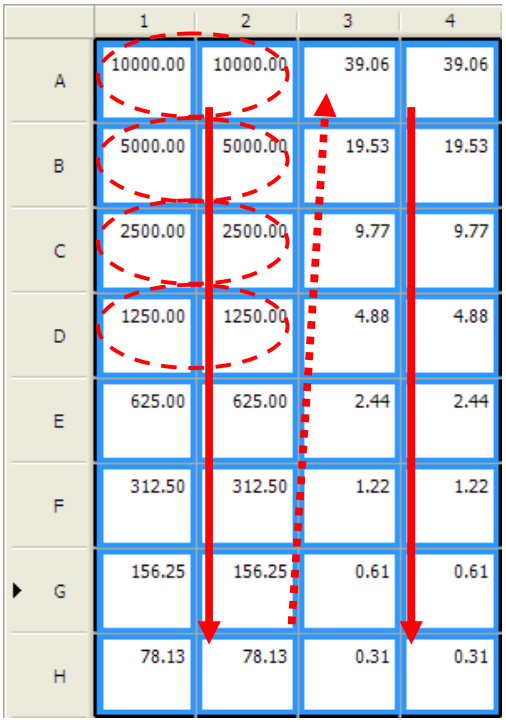
If you have replicate samples in your plate, and if you want to fill the same diluted sample amoount value for each replicates, use replicate filling option (Figure 4.13). Figure 4.14 and 4.15 shows each 'Side by Side' and 'Stacked' replicate example.



Choose Replicate Number from 2 to 5

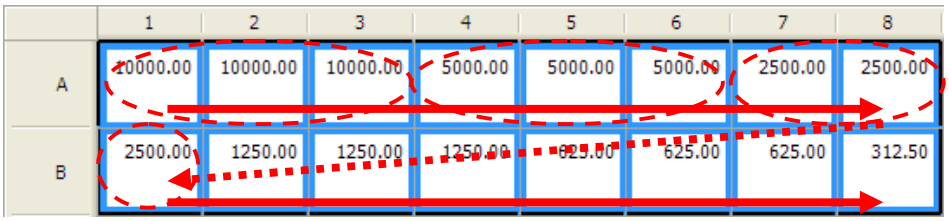
If replicate number is selected (other than 'None'), 'Side by Side' and 'Stacked' are selectable..

Figure 4.13 Replicate Options



Replicate Number : 2
Replicate Orientation: Side by Side
Dilution Direction:

Figure 4.14 Side by Side Replicate Options



Replicate Number : 3
Replicate Orientation: Stacked
Dilution Direction:

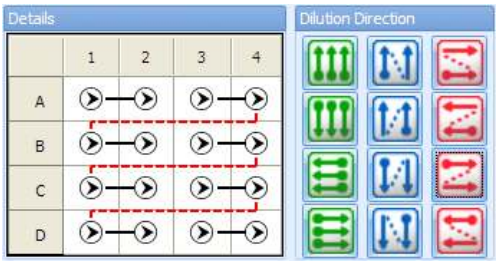
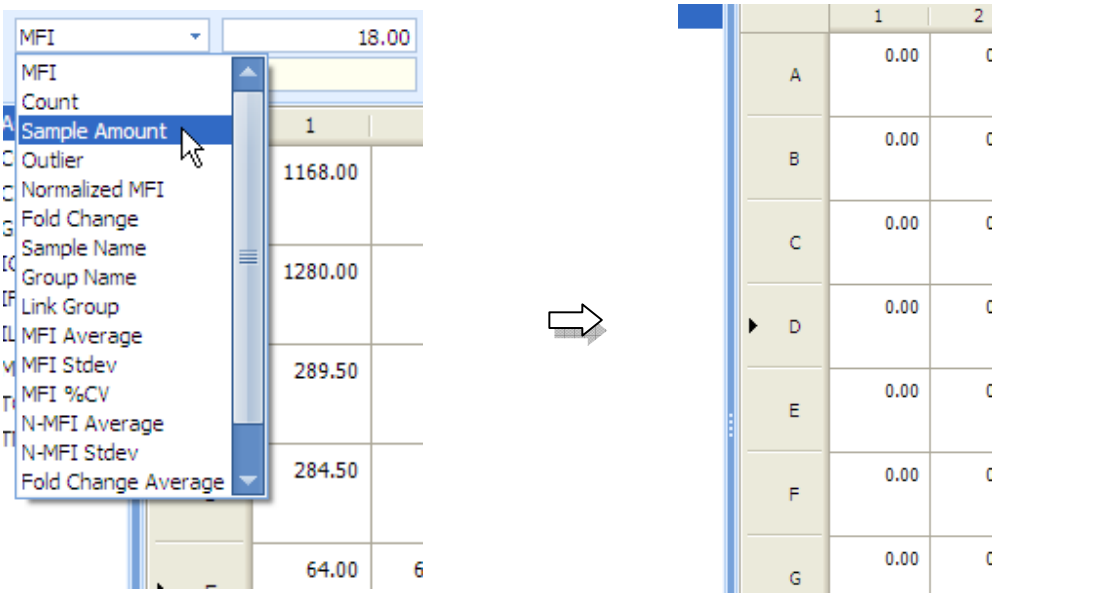


Figure 4.15 Stacked Replicate Options

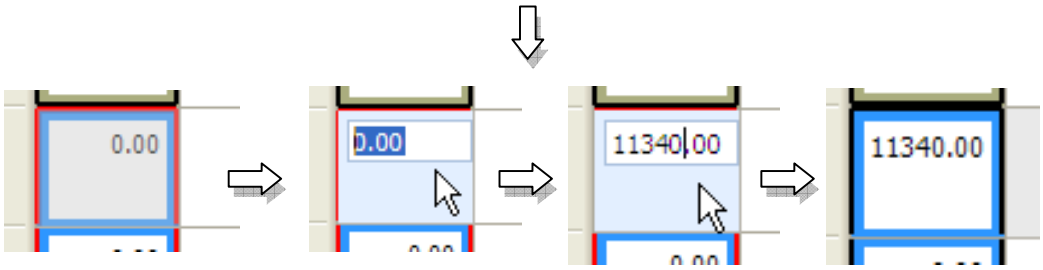
Input Sample Amount value Manually

If your sample amount series does not have sequential diluted values, use direct edit mode on the well grid(Figure 4.16) .



Set data type as sample amount in the upper or lower dropdown list.

Sample amount is shown in the well grid.



Click one of the well you want to input the value.

Click same well again, press character key or press F2 to enter the edit mode.

Input the value.

Click other well, enter key or ESC key to exit the edit mode.

Figure 4.16 Input manually using edit mode

4.3

Linking a Control Group

Treatment wells must be associated with or *linked* to the control group that will be used to calculate fold changes. By default, the first control group that you define will be linked to the treatment well groups.
If there is more than one control group on the plate, you can link a user-selected control to a user-selected well group(s).
1. To link a well group to a control group, press and hold the **Ctrl** key while you click the group and the control group that you want to link.

NOTE: A control group can be linked to multiple groups of the same well type, but each group can have only one control group.

2. Click the **Link One vs. Multi** button .
3. To check the status, select Link Group data type from upper or lower drop-down(Figure 4.17).

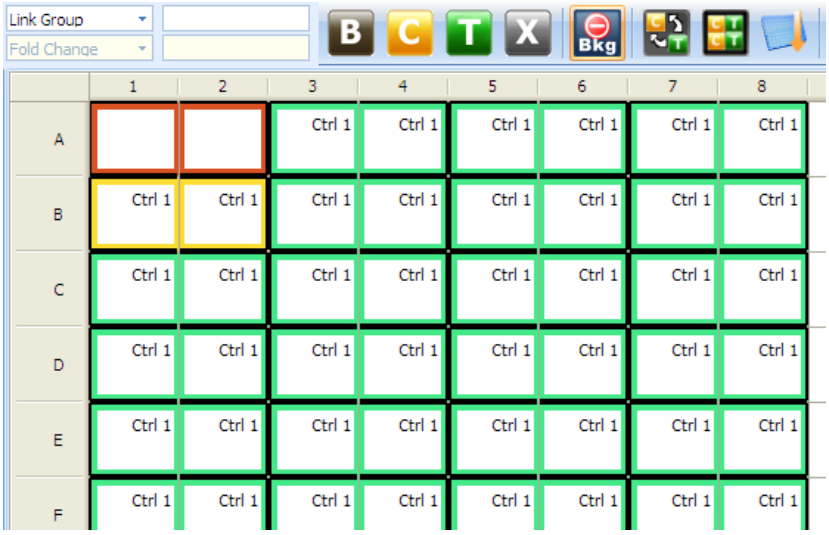


Figure 4.17 Display linking status

4.4

Attach Housekeeping Gene Status

If you need to set housekeeping gene status to some analyte for normalization, you can attach the housekeeping gene status to the analyte.

1. Right click on the analyte name you want to add 'housekeeping gene' status in the analyte pane.
   ⇨ Context menu appears (Figure 4.18).

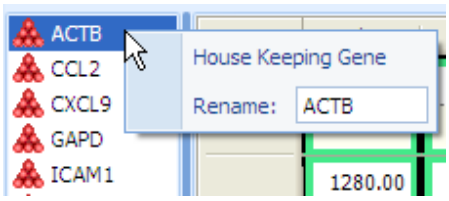


Figure 4.18 Context menu for analyte pane

2. Select 'House Keeping Gene' menu from the context menu.
   ⇨ Analyte icon in front of the analyte name turns red to green (Figure 4.19).

Figure 4.19 Attach housekeeping gene status

3. Repeat step 1 and 2 until all house keeping genes have housekeeping gene status.

4.5

Flagging the data

If you need to set outlier flag due to our of range results, you can flag the data as outlier.

Set outlier flag manually

1. Select '**Outlier**' data type from upper drop-down list or lower drop-down list (Figure 4.20).
   ⇨ Current outlier status are shown in the plate well grid.

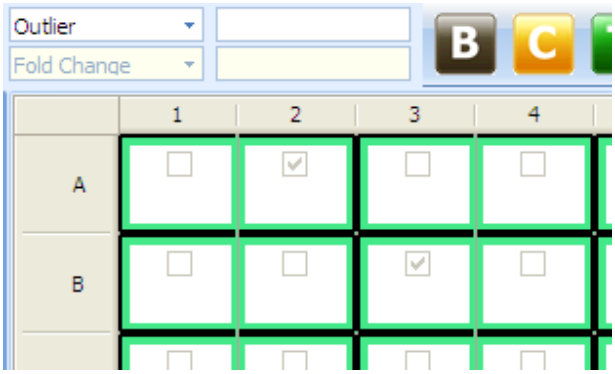


Figure 4.20 Display outlier status

2. Select a well you want to flag → click same well to enter the edit mode → click once again to make a check → select other wells to exit the edit mode (Figure 4.21).

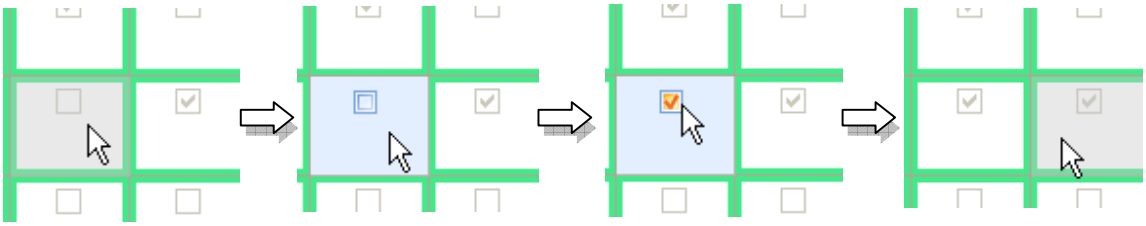


Figure 4.21 Flag the data manually

Set multiple outlier flag using batch flagging feature

2. Select multiple wells you want to set the dilution at one time(Figure 4.22).

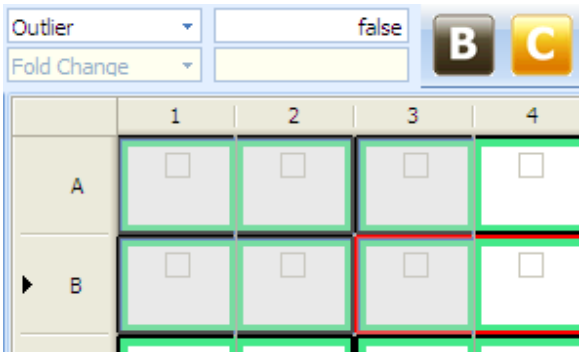


Figure 4.22 Flagging outlier

2. Right click on the well grid.
   ⇨ Context menu appears (Figure 4.23).

Figure 4.23 Batch outlier flagging menus

3. Select **Plate Outlier** menu. Sub-menu appears (Figure 4.23).
4. Select one of the sub-menu to flag the data.
   ⇨ Check box status is changed by the selected menu (Figure 4.24).

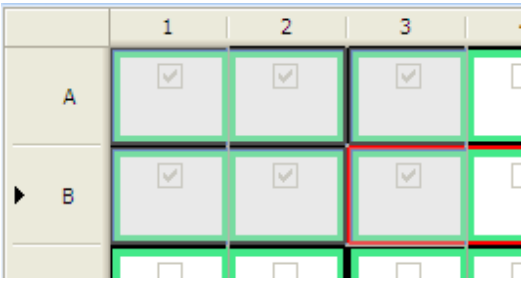


Figure 4.24 Flagged out data

4.6

Working With Templates

A plate definition includes:

- Well types and well groups
- Housekeeping gene status
- Links between the control(s) and well groups
- Data calculated for the plate (for example, normalization MFI or fold changes)
- Data manually entered in the plate (for example, sample names or sample amount)

You can save the plate definition as a template. You can apply a template to an active plate. Templates may also be exported, imported, or deleted.

Opening the Template Manager

The Template Manager is a tool that helps you manage your templates.

1. Click the **Template Manager** button  .
   ⇨ The Template Manager appears (Figure 4.25).
2. Click a template in the Available Templates list to view information about the template.

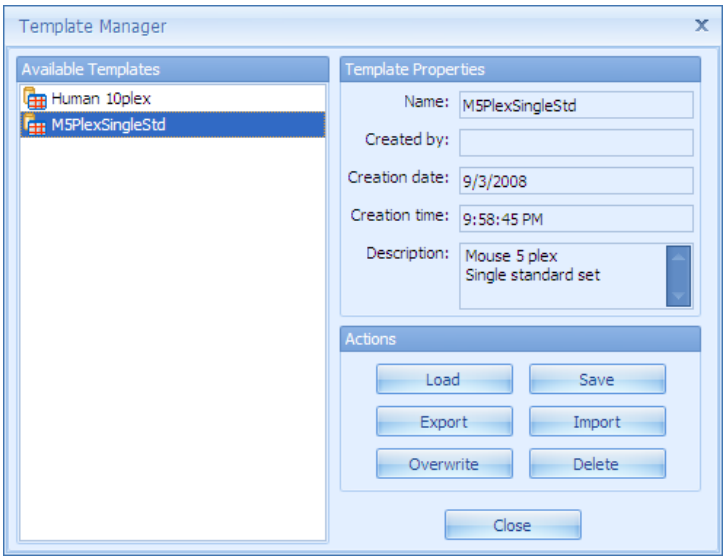


Figure 4.25 Template Manager shows available templates

Click a template to view information about the template.

Saving a Template

You can save the current plate definition to a template.

1. After you have finished defining a plate, open the Template Manager and click the **Save** button.

⇨ The Template Name and Description box appears (Figure 4.26).

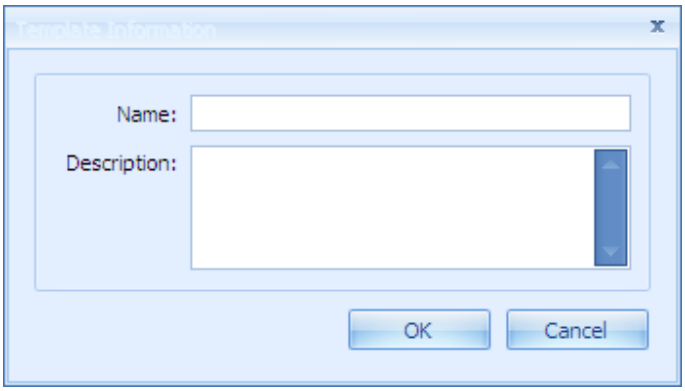


Figure 4.26 Template Name and Description box

2. Enter a name and descriptions for the template and click **OK**.
   ⇨ The new template is added to the Available Template list.

Loading a Template

You can apply or *load* a saved template to the current plate.

1. In the Template Manager, select the template that you want to apply to the plate.
2. Click the **Load** button.
   ⇨ The template is applied and the well grid shows the new well attributes (well type, well group, and links to standard data sets).

Overwriting a Template

You can overwrite an existing template with the current plate definition.

1. In the Template Manager, select the template that you want to overwrite
2. Click the **Overwrite** button.
   ⇨ A confirmation box appears (Figure 4.27).

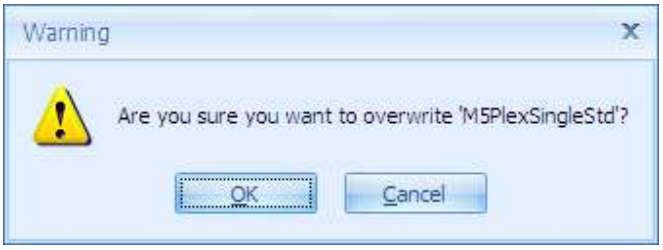


Figure 4.27 Confirmation box

1. Click **OK** to overwrite the selected template with the current plate definition.

Exporting a Template

You can export a template to a user-specified location.

1. In the Template Manager, click the template you want to export.
2. Click the **Export** button.
   ⇨ The Save As dialog box appears (Figure 4.28).

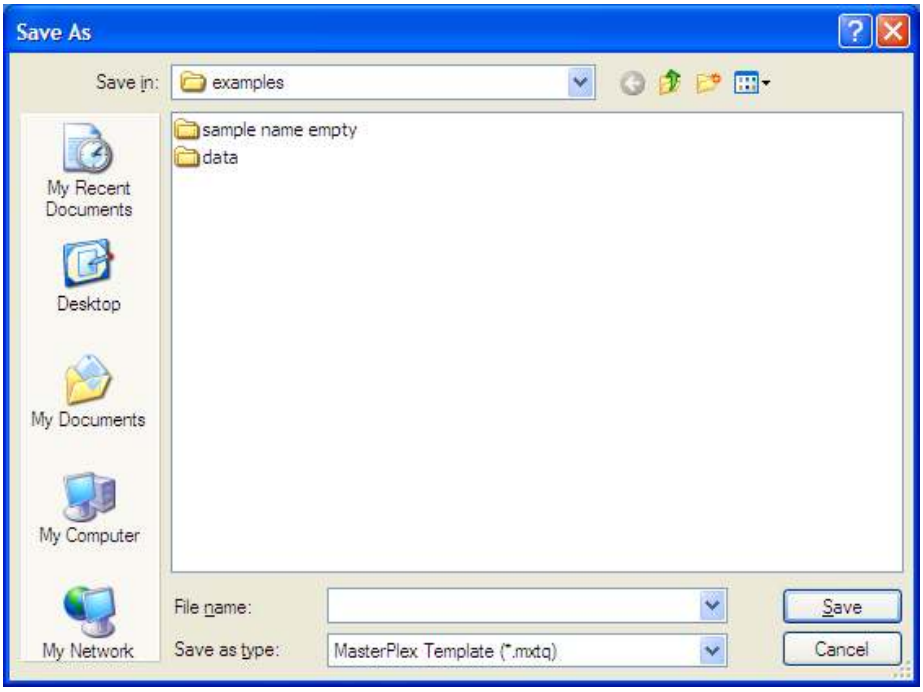


Figure 4.28 Save As dialog box

3. Choose the directory for the template that you want to export.

4. Enter a name for the template (*.mxte).

NOTE: A template must have a .mxte file extension. Changing the extension will render the exported template unusable.

Importing a Template

You can import a template (.mxte) from a user-specified location.

1. In the Template Manager, click **Import** button.
   ⇨ The Open dialog box appears (Figure 4.29).

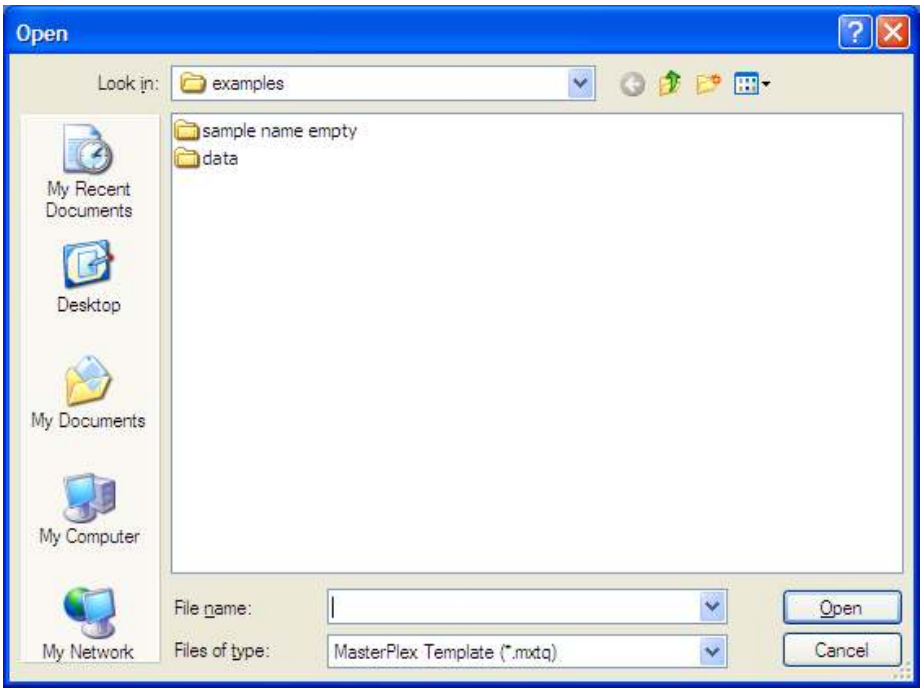


Figure 4.29 Open dialog box

2. Choose the directory with the template that you want to import.
3. Select the template and click **Open**.
   ⇨ The template name is added to the Template Manager.

Deleting a Template

You can delete a template (.mxte) from the system.

1. In the Template Manager, click the template that you want to delete.
2. Click **Delete** button.

⇨ A confirmation box appears (Figure 4.30).

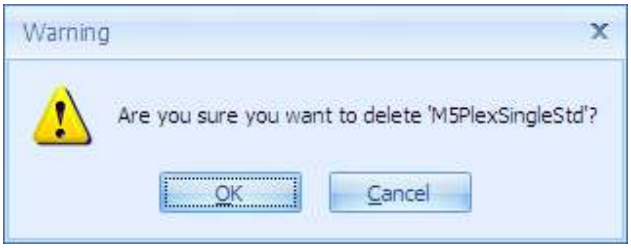


Figure 4.30 Confirmation box

3. Click **OK** to delete the template.
   ⇨ The template is removed from the Template Manager.

WARNING: This permanently removes the template from the system.

4.7

Preferences

Preferences are user-modifiable software settings. They are displayed in the Preferences dialog box.

• To open the Preferences dialog box (Figure 4.31), click the **Preferences** button  .

There are two preference tabs

Application	Application specific preferences. Preferences in this tab are applied to all files being opened on the EX module.
Plate	Plate specific preferences. Preferences in this tab are applied to current being opened file.

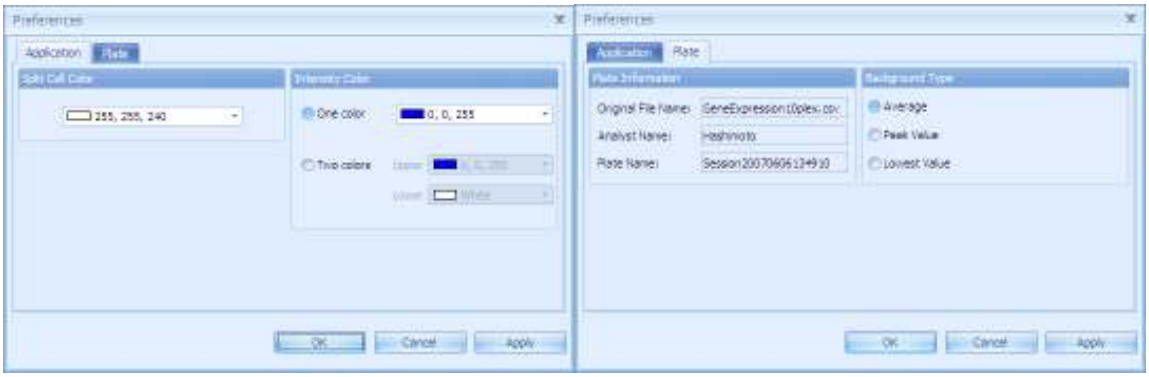


Figure 4.31 Preferences dialog box

Application preferences

Split Cell Color

Color lower grid by specified color (Figure 4.32).

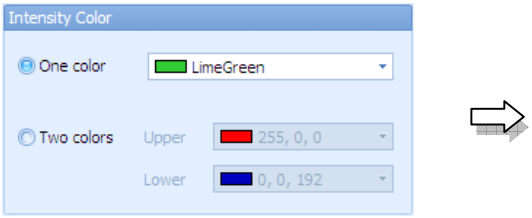
	1	2	3	4
A	41.00 189	39.00 194	37.00 193	112.00 226
B	10516.00 208	10034.50 152	66.00 199	4911.00 203
C	6152.00 225	6299.00 246	39.00 247	5011.00 220

Figure 4.32 Colored lower well grid

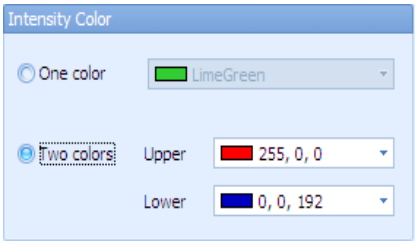
Intensity Color

One Color Use Bead Count value for threshold conditions.

Two Color Use Error Range for threshold conditions.



Click 'one color' and select desired color for the maximum value. The color density decreases directly with the value.



Click 'two colors' and select desired color for the maximum and minimum value. The color shifts upper to lower directly with the value.

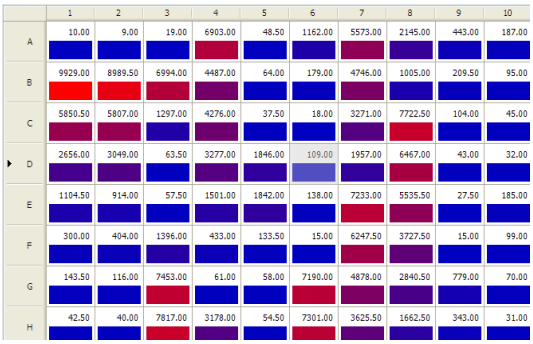


Figure 4.33 Example of Intensity color

Plate Preferences

Plate Information

Original File Name Displays the name assigned to the result file in the Luminex® 100/200 or BioPlex software. To edit the plate name, enter a new name.

Analyst Name Displays the analyst name entered in the Luminex® 100/200 or BioPlex software. To edit the analyst name, enter a new name.

Plate Name Shows plate name of this file.

Background type

Average	Calculate average value in the background group. Background (Bkg) MFI = (Bkg MFI_1 + Bkg MFI_2 +... Bkg MFI_n)/n where n = the number of background wells in the plate
Peak Value	Take highest value in the background group.
Lowest Value	Take lowest value in the background group.

Outlier Options

You can select one of the criteria for threshold marker from MFI, Concentration, Bead count and Error range. Select one of them and enter an MFI, count, concentration or error range threshold for a plate. The software automatically marks wells that contain data less than the user specified threshold with a red border (Figure 4.34).

To set a threshold(s):

1. Check '**Show threshold marker**' box
2. Check one of the radio button in front of the data type you want to use as a threshold marker.
3. Select equity equal symbol and input the value in the box.
4. Click **Apply** to reflect current setting to the plate, or click **OK** to reflect and close the dialog box.
   ⇨ A red border marks wells that contain data less than or greater than threshold for all analyte (Figure 4.25).

	1	2	3	4	5	6	7	8	9	10
A	28.00	29.00	40.50	1022.00	126.00	1932.50	1964.00	787.00	271.00	105.0(
B	11083.00	10831.00	587.00	5457.00	133.50	621.50	1465.00	472.50	128.00	66.0(
C	9072.00	8899.00	58.00	5459.00	201.00	62.00	866.50	5011.50	80.00	48.0(
D	7044.00	7087.00	63.00	4589.50	481.00	50.00	511.00	3186.00	47.00	38.0(
E	4987.00	4440.00	95.50	575.00	2722.00	415.00	4701.00	2289.50	41.00	154.0(
F	2824.00	2861.00	280.00	218.50	72.00	49.00	3372.00	1472.00	30.00	89.0(
	1484.00	1451.00	2190.00	157.50	63.00	4727.00	2160.50	831.00	310.50	59.0(

Figure 4.34 Well grid

Outlier Options

Show threshold Marker	Show red rectangle indicator inside the grid if the threshold conditions meet the criteria.
MFI	Use MFI value for threshold conditions.
Count	Use Bead Count value for threshold conditions.
Normalized MFI	Use Normalized MFI value for threshold conditions.
Fold Change	Use Fold change value for threshold conditions.
Error Range	Use Error Range for threshold conditions.
Automatic outliers	Automatically check on/off the outlier check box for the wells. To check on, click **Set** button. To check off, click **Clear** button.

4.8

Creating a Virtual Plate

1. Open the Luminex results files (.csv, .xls or .lxd) or MasterPlex® EX files (.mlx*) that are the data sources for the virtual plate.
2. Click the **Virtual Plate** button 
   ⇨ The Virtual Plate dialog appears (Figure 4.35).

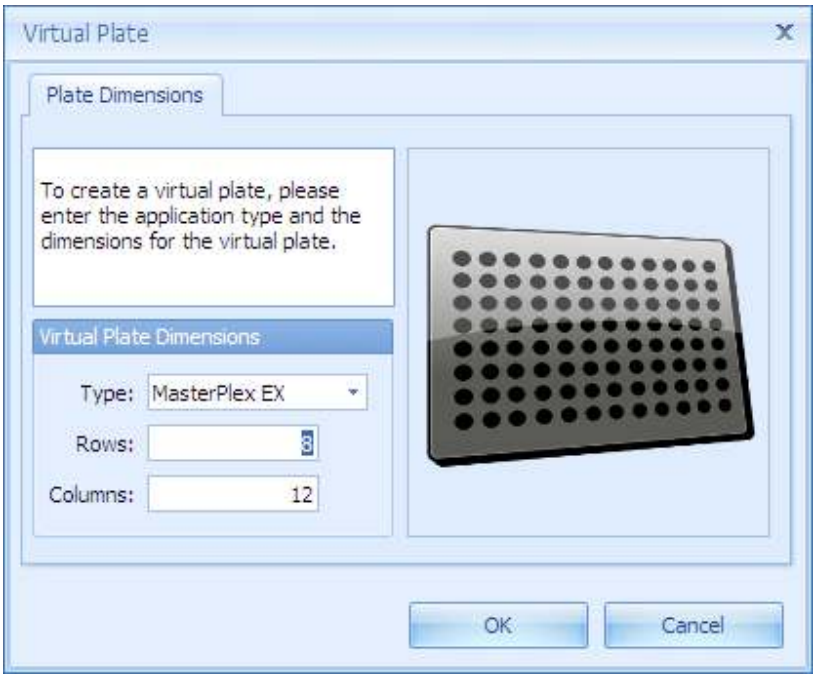


Figure 4.35 Plate Wizard, Plate Dimensions tab

3. Select an application module, then enter the number of rows and columns for the virtual plate. Click **OK**.
   ⇨ A module window opens and displays the empty well grid of the virtual plate (Figure 4.36).

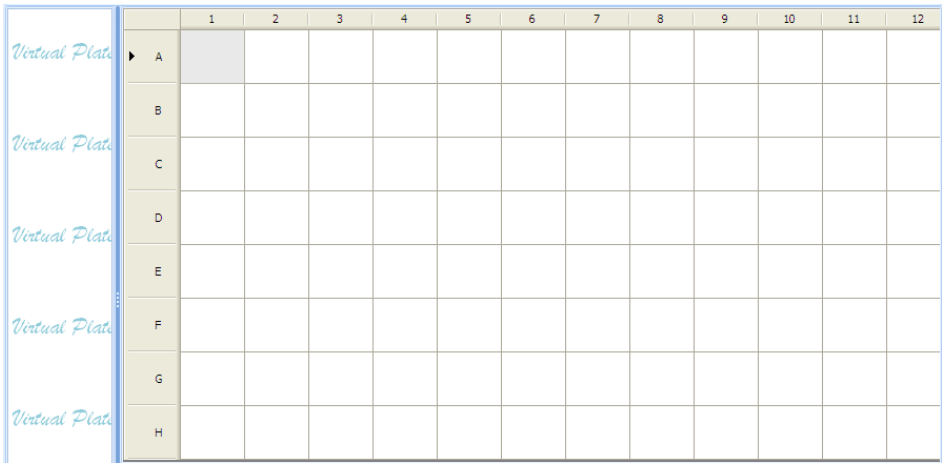


Figure 4.36 Virtual plate

Selecting Data from a Source Plate

The virtual pipette copies (*aspirates*) data from user-selected wells in a source plate and pastes (*dispenses*) the data into a virtual plate. The virtual pipette copies all of the analyte data in a well, including the computed analyte concentrations. It remains loaded until you dispense or clear the pipette.

NOTE: The data source plates must contain the same type and number of analytes, otherwise concentrations cannot be calculated. If the source plates contain the same number of analytes, but they are named differently, use the virtual analyte filter to rename analytes so that the nomenclature is consistent. (See *Working with the Virtual Analyte Filter* on section 4.8.)

1. In the source plate, select the wells of interest.
   To select adjacent wells, press and hold the mouse button while you drag the mouse pointer to select the wells of interest.

NOTE: Selecting non-adjacent wells is not recommended.

2. Right-click the selected wells and select **Aspirate** from the pop-up menu that appears (Figure 4.40).
   ⇨ The data for the analytes in the selected wells are added to the virtual pipette and is ready to dispense into a virtual plate.

NOTE: If the background is subtracted in the source plate, the virtual pipette aspirates and transfers background-subtracted values. If you do not want to aspirate background-subtracted values, make sure the background subtraction is turned off before you aspirate data into the virtual pipette. (Click the Bkg button to turn background subtraction on or off.)

Figure 4.37 Well grid

Right-click selected wells to display the pop-up menu.

3. To clear the data from the virtual pipette, right-click and select **Clear** from the pop-up menu (Figure 4.40).

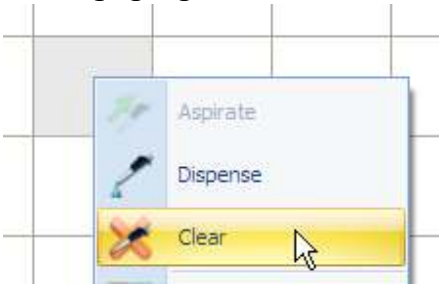


Figure 4.40 Clear Aspirated Data

Adding Data to a Virtual Plate

After the virtual pipette aspirates data from the source plate, it is ready to dispense the data into the virtual plate.

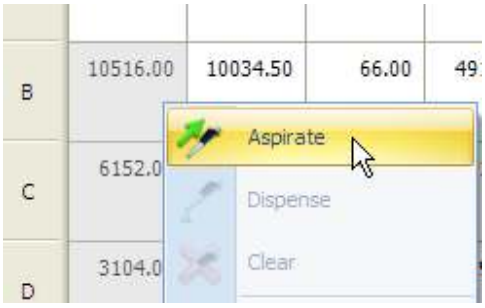
1. Position the mouse pointer over the virtual plate.
2. Click the first well to which the data will be added.
3. Right-click the well and select **Dispense** from the pop-up menu that appears.
   ⇨ The data are added to the virtual plate (in the same configuration as in the source plate) (Figure 4.41).

NOTE: If the number or names of the analytes in the virtual pipette is different from that in the virtual plate, the virtual analyte filter automatically appears. For more information on using the filter, see *Working With the Virtual Analyte Filter* on section 4.9.

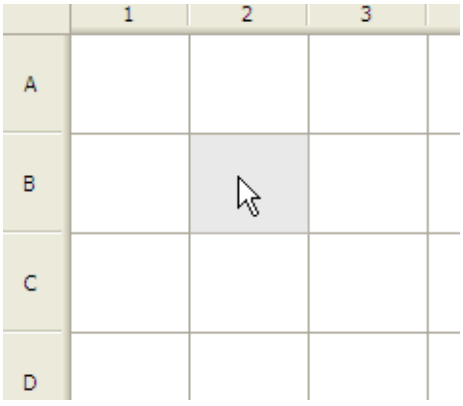
NOTE: Data in a virtual plate cannot be removed, but can be overwritten.

1. Open a .mlx or .csv.

2. Select the wells of interest in the source plate (.csv or .mlx). Right-click the selected wells and choose aspirate from the pop-up menu.



3. In the virtual plate, select the first well where you want to dispense the data.



4. Right-click the well and select **Dispense** from the pop-up menu.

5. The data are added to the virtual plate (starting at the selected well) in the same configuration as in the source plate.

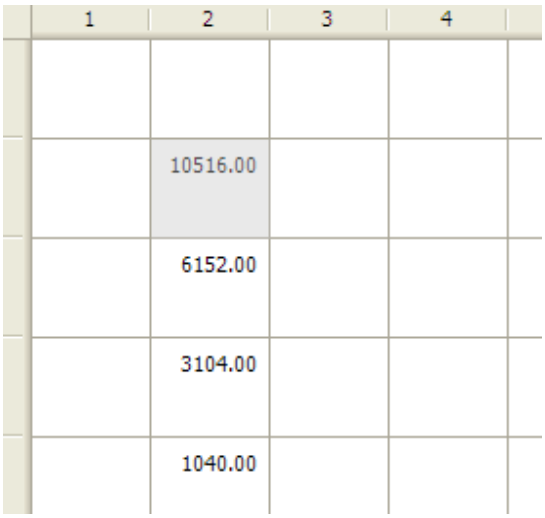


Figure 4.41 Adding data to a virtual plate

Open a source plate (.mlx or .csv, .xls or .lxd) and create a virtual plate (click the button to generate the blank virtual plate).

4. 9

Working With the Virtual Analyte Filter

In a multiplex assay, all of the plate wells must contain:

- The same types of analytes (bead sets) with the same nomenclature
- The same number of analytes

This is true for virtual plates as well. When you add data to a virtual plate, MasterPlex® EX compares the name and number of the analytes in the virtual pipette to those in the virtual plate. The virtual pipette will not dispense if there are discrepancies between the number or names of analytes in the pipette and the virtual plate. If the number of analytes in the pipette is greater than that of the destination plate, the virtual analyte filter automatically appears (Figure 4.42).

The virtual analyte filter displays a list of the analytes that are present in the virtual pipette. It enables you to choose the analytes that you want to add to the virtual plate and, if necessary, rename them to be consistent with the number and name of analytes in the virtual plate.
If you add data to a virtual plate from source wells that contain different analyte names or a different number of analytes, data holes are created. As a result, a well in the virtual plate appears blank if the analyte selected in the analyte panel is not present in the well. If a plate file (.csv, .xls, lxd, .mlx, or virtual) contains data holes, the concentrations cannot be calculated.

NOTE: In order to prevent data holes, if the number of analytes in the virtual pipette is less than the number of analytes in the destination plate, the data cannot be added to the virtual plate.

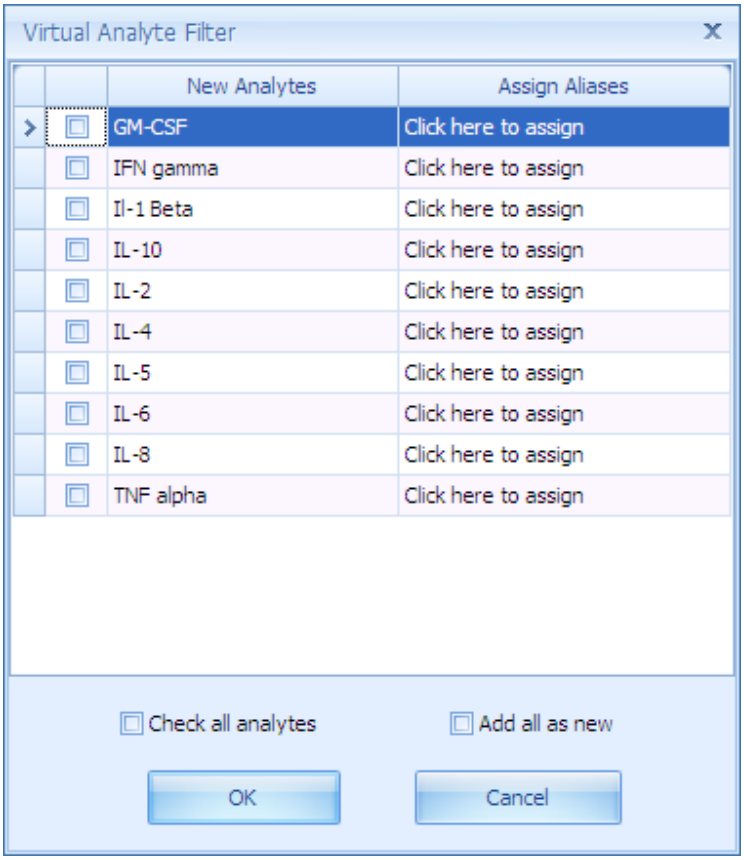


Figure 4.42 Virtual analyte filter shows the analytes in the virtual pipette

Selecting and Renaming Analytes

If the virtual analyte filter appears, you must select and, if necessary, rename the analytes to match the number and names of the analytes in the virtual plate.

1. In the virtual analyte filter (Figure 4.44), place a check mark next to each analyte that you want to add to the virtual plate. To select all analytes for the virtual plate, click **Check All**.
2. To rename an analyte so that it is consistent with the nomenclature in the virtual plate:
   a. Click **here to assign** next to the analyte that you want to rename.
      ⇨ A drop-down list shows the names of the analytes in the virtual plate (Figure 4.43).
   b. Select a name from the drop-down list.
      ⇨ The virtual analyte filter displays the new name for the analyte.

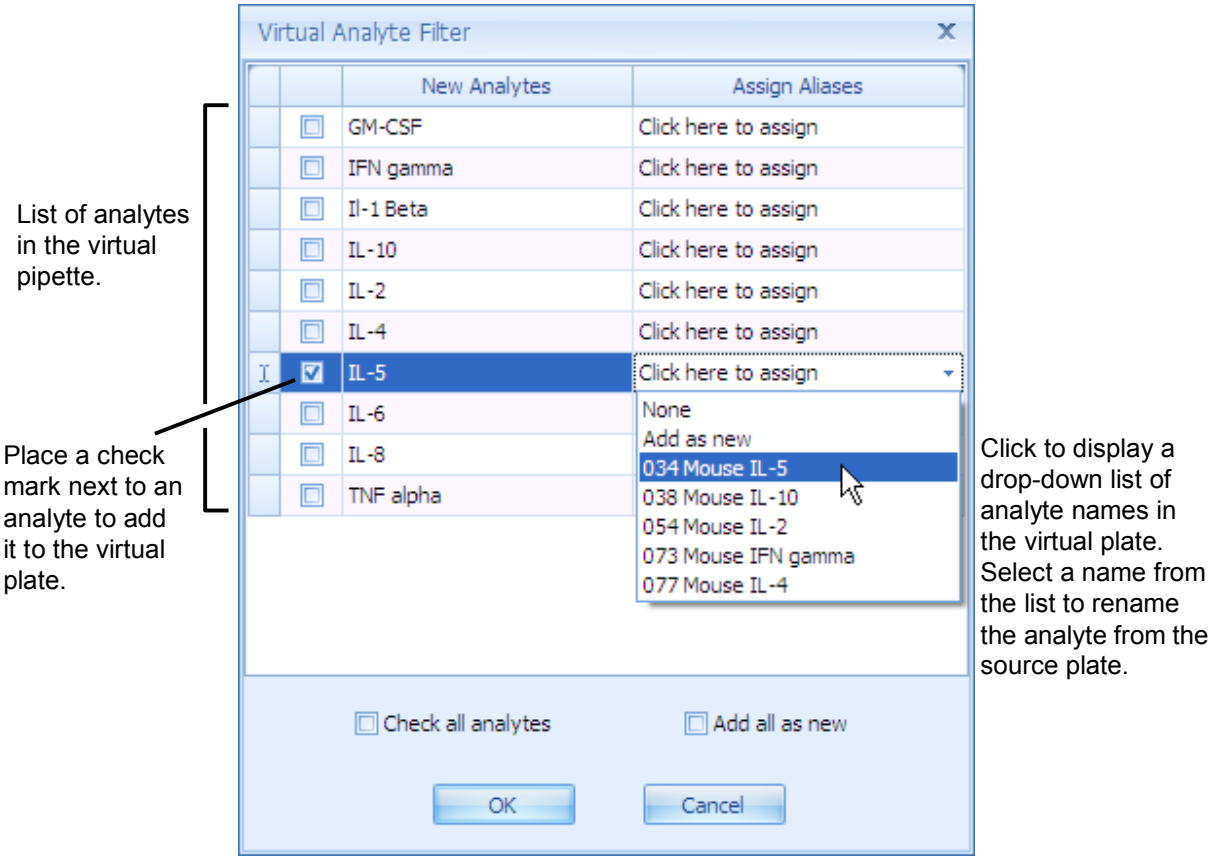


Figure 4.43 Virtual analyte filter

3. To save the renaming assignments for use again with the same source plate (.csv, .xls or .lxd or .mlx) during the current session, choose the **Save this assignment** option.
   If you want to aspirate other data from the same source plate, choose the **Use last saved assignments** option in the virtual analyte filter to automatically rename all of the analytes in the filter.
4. Click **OK**.
   ⇨ The data are added to the virtual plate and the virtual analyte filter closes.

4. 10

Changing the Analyte Name

You can change the analyte names on plate map tab's analyte pane (Figure 4.44).

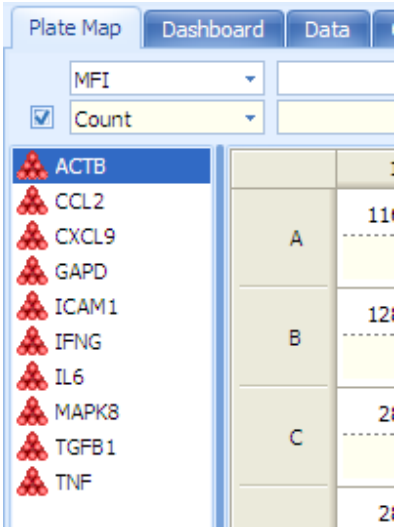


Figure 4.44 Analyte pane

1. Right click on the analyte name you want to rename.
   ⇨ Renaming box appears (Figure 4.45).

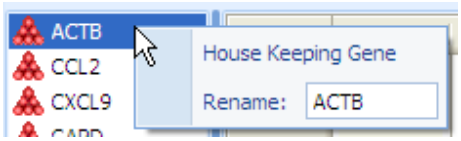


Figure 4.45 Renaming box

2. Input new name and click out side of the box or enter return key.
   ⇨ Renaming is performed (Figure 4.46).

Figure 4.46 Renaming the analyte name

4. 11

Quality Control Manager (optional module)

Quality Control Manager helps you flag and optionally set as an outlier any wells whose value is outside of the range defined by the thresholds. Thresholds can be assigned using the manual method for

- A single selected analyte
- Multiple selected analytes
- All analytes

• To open the Quality Control Manager (Figure 4.47), click the **Quality Control Manager** button  .

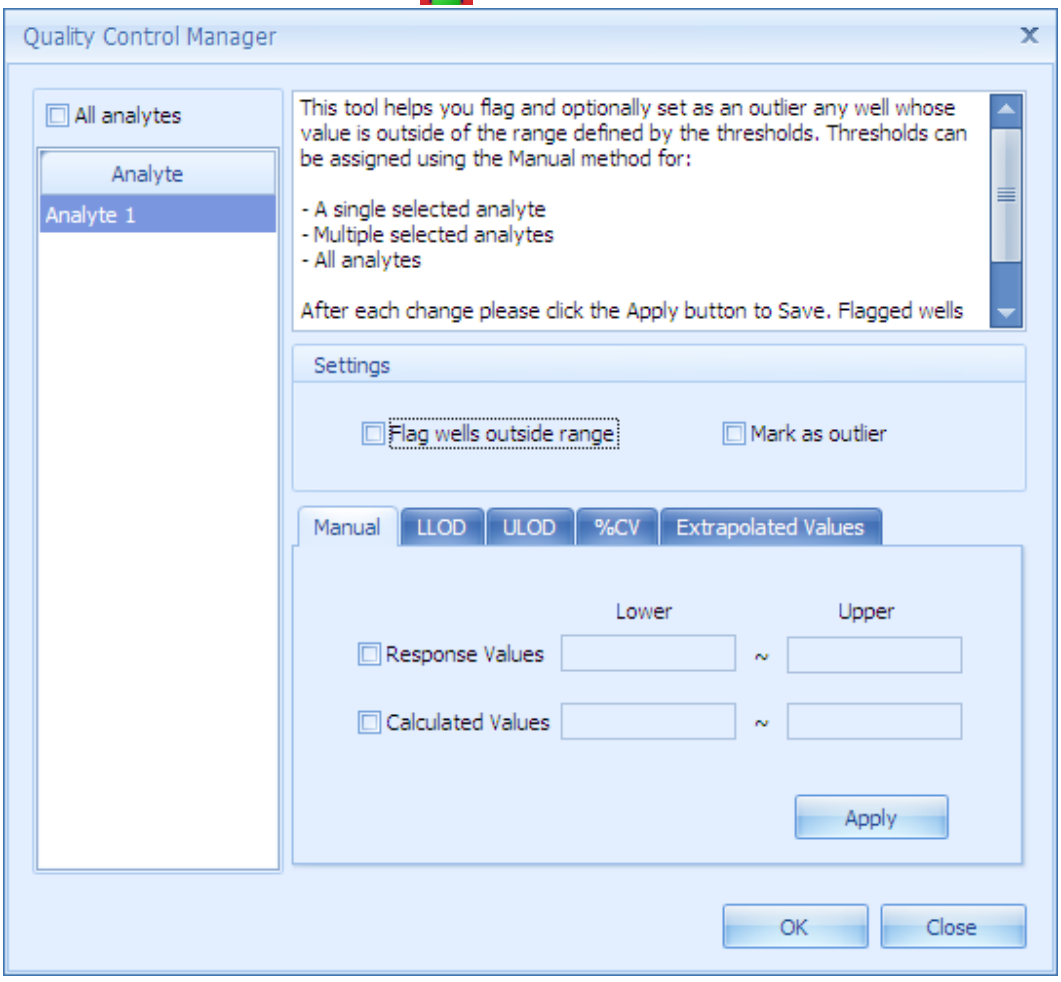


Figure 4.47 Quality Control Manager dialog

The software automatically marks wells that contain data less than the user

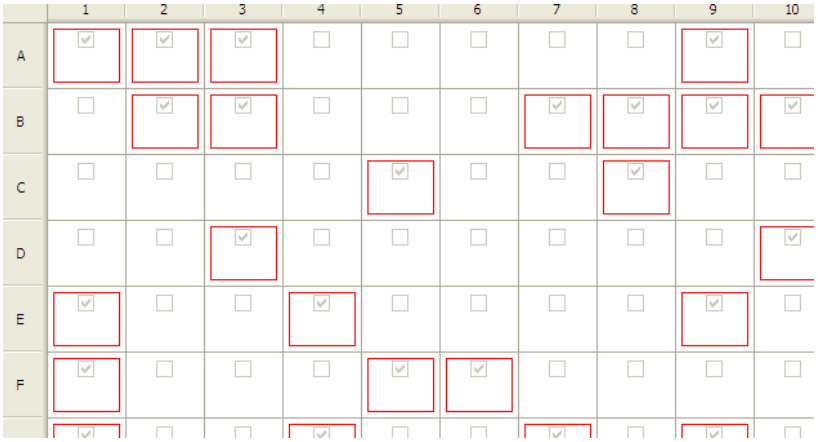
specified threshold with a red border (Figure 4.48).

To set a threshold(s):

1. Select analytes you want to attach the threshold criteria from the analyte pane.
   ⇨ Use All analytes check box or Ctrl key for multiple selection.
2. Check '**Show threshold marker**' box and/or '**Mark as outlier**' box.
3. Select the threshold criterion from the threshold tab.
4. Set threshold conditions and click apply button. Close the dialog box.
   ⇨ A red border marks wells that contain data meet the threshold criteria.
   ⇨ If you choose '**Mark as outlier**' at the same time, the data are marked as outlier and outlier check boxes are checked (Figure 4.49).

	1	2	3	4	5	6	7	8	9	10
A	41.00	39.00	37.00	112.00	92.00	2426.50	43.00	36.00	48.00	80.00
B	10516.00	10034.50	66.00	4911.00	106.50	186.00	41.00	38.00	45.50	55.00
C	6152.00	6299.00	39.00	5011.00	65.00	43.00	38.00	52.00	40.00	45.00
D	3104.00	2990.50	41.00	5591.00	3989.50	113.00	38.00	44.00	40.00	42.00
E	1040.00	1094.00	45.00	3070.00	1808.00	270.00	49.00	40.00	36.00	47.00
F	292.00	300.00	39.00	1129.00	119.00	41.00	42.00	40.00	37.00	49.00

Figure 4.48 Well grid



	1	2	3	4	5	6	7	8	9	10
A	☑	☑	☑	☐	☐	☐	☐	☐	☑	☐
B	☐	☑	☑	☐	☐	☐	☑	☑	☑	☑
C	☐	☐	☐	☐	☑	☐	☐	☑	☐	☐
D	☐	☐	☑	☐	☐	☐	☐	☐	☐	☑
E	☑	☐	☐	☑	☐	☐	☐	☐	☑	☐
F	☑	☐	☐	☐	☑	☑	☐	☐	☐	☐

Figure 4.49 Outlier check boxes

Settings

Flag wells outside range	Show red rectangle indicator inside the grid if the threshold conditions meet the criteria.
Mark as outlier	Mark flagged data as outlier

Threshold Options

Manual

Use Raw MFI, count, Normalized MFI or Fold Change value for threshold conditions (Figure 4.50).

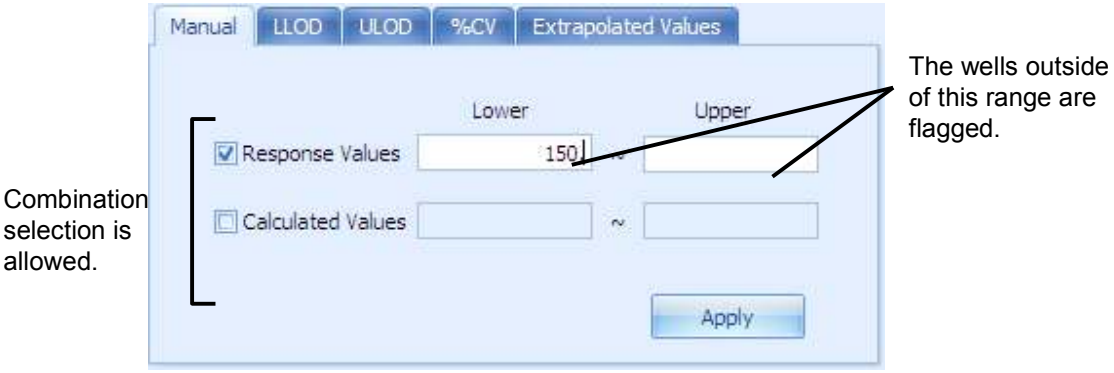


Figure 4.50 Outlier check boxes

LLOD (Lower Limit of Detection)

Flag the lower values than the LLOD calculation value (Figure 4.51). LLOD is based on the MFI mean value of the selected wells plus the standard deviation multiplied by the user selected number.

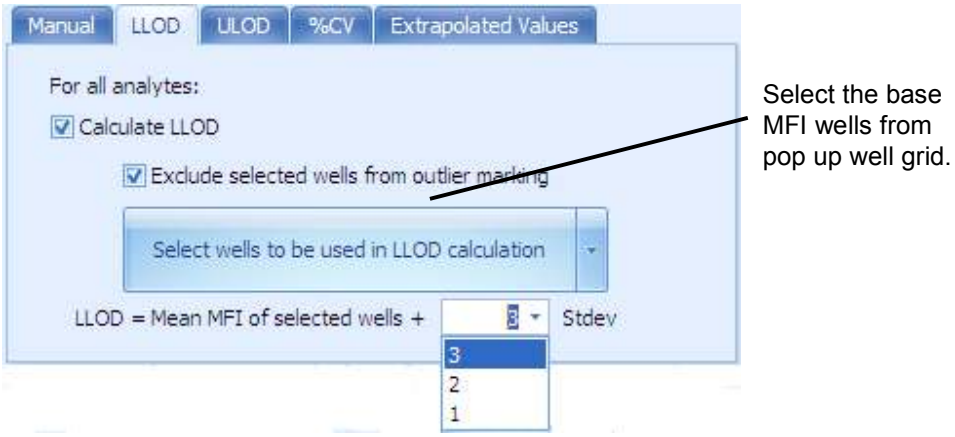


Figure 4.51 Outlier check boxes

ULOD(Upper Limit of Detection)

Flag the upper values than the ULOD calculation value (Figure 4.45). ULOD is based on the MFI mean value of the selected wells plus the standard deviation multiplied by the user selected number.

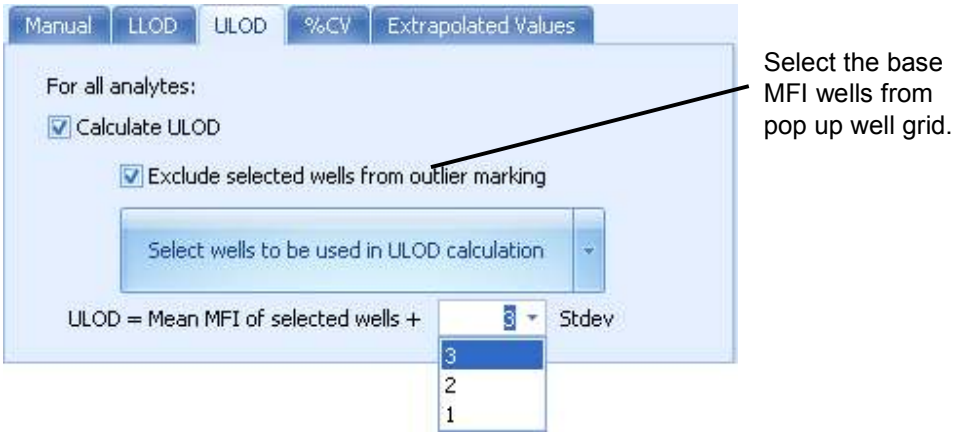


Figure 4.45 ULOD tab

%CV

Use %CV value of the group (Figure 4.52). Flag the values greater than the specified %CV value.

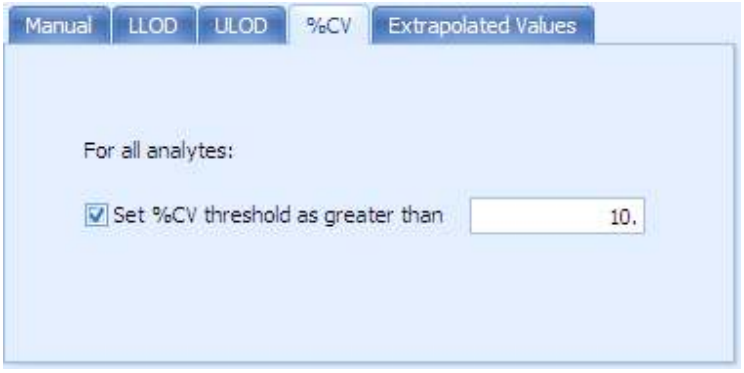


Figure 4.52 Outlier check boxes

CHAPTER 5 Normalization & Fold Change - *Dashboard tab*

This chapter explains how to evaluate each analyte and calculate normalized MFI and fold change.

5.1 Go to Dashboard Tab

Click **Dashboard** tab then application window displays the dashboard tab page (Figure 5.1).

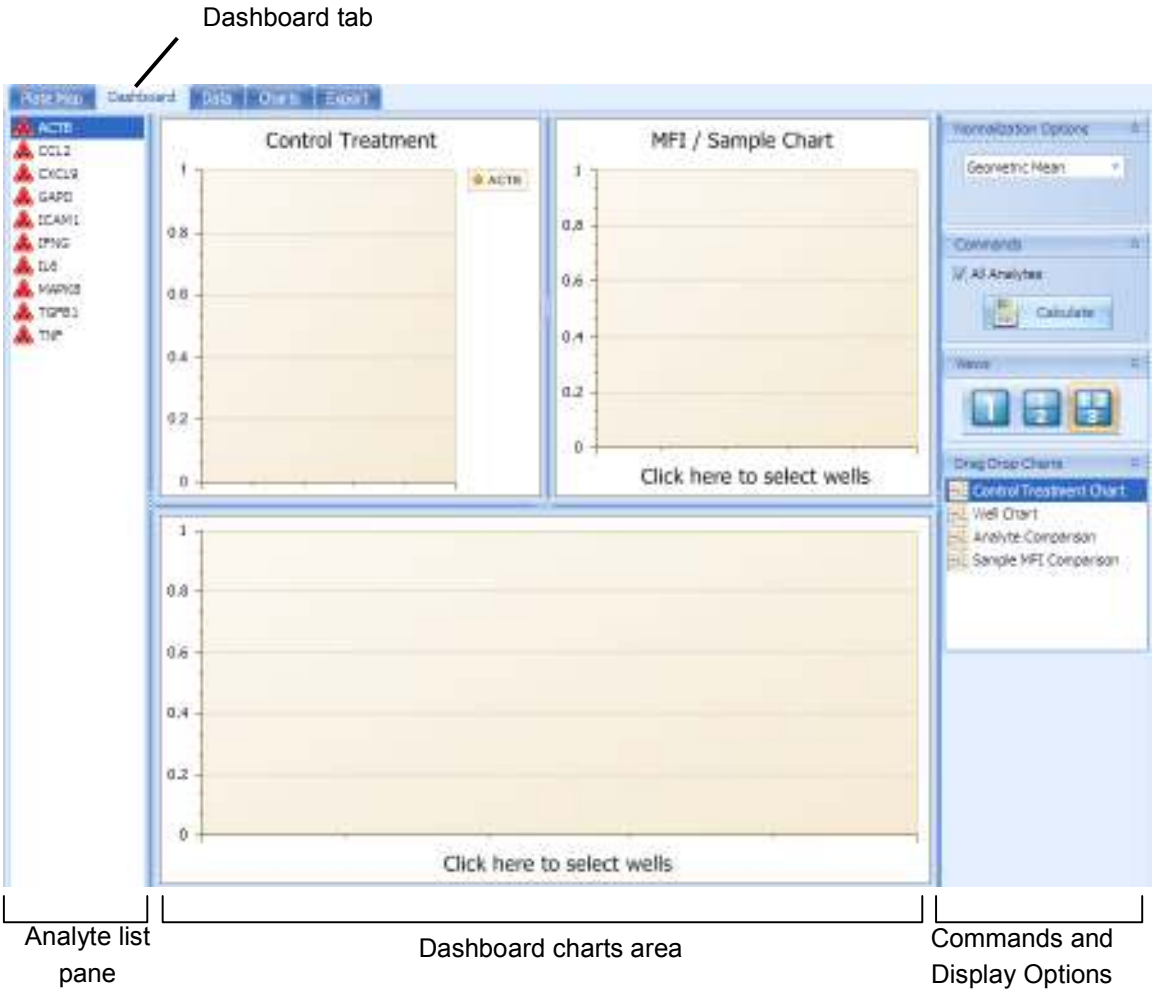


Figure 5.1 Dashboard

5.2

Checking the Data Distributions Using Multi Charts

There are three blank charts in the charts area by default and you can use these charts for checking your data. Dashboard has four type of charts (Figure 5.1).

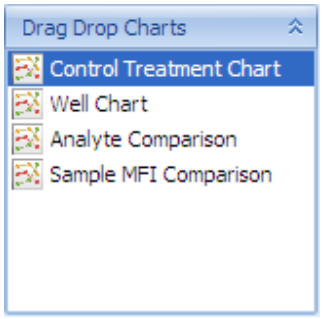


Figure 5.2 Four chart types

Table 5.1 Charts

Chart Name	Description
Control Treatment Chart	Display all treatments distributions which belong one control group (Figure 5.1).
Well Chart	Plot MFI and normalized MFI simultaneously (Figure 5.1).
Analyte Comparison	Plot all data points between two analytes (Figure 5.1).
Sample MFI Comparison	Correlation plot between sample amount and MFI (Figure 5.1)..

Control Treatment Chart

Control Treatment Chart plots all treatments data belong one control group with an error bar (Figure 5.3). All control groups and treatments are plotted on the chart at the same time. Chart can be copied or exported from context menu, and display data type can be chosen from context menu as well (Figure 5.4).

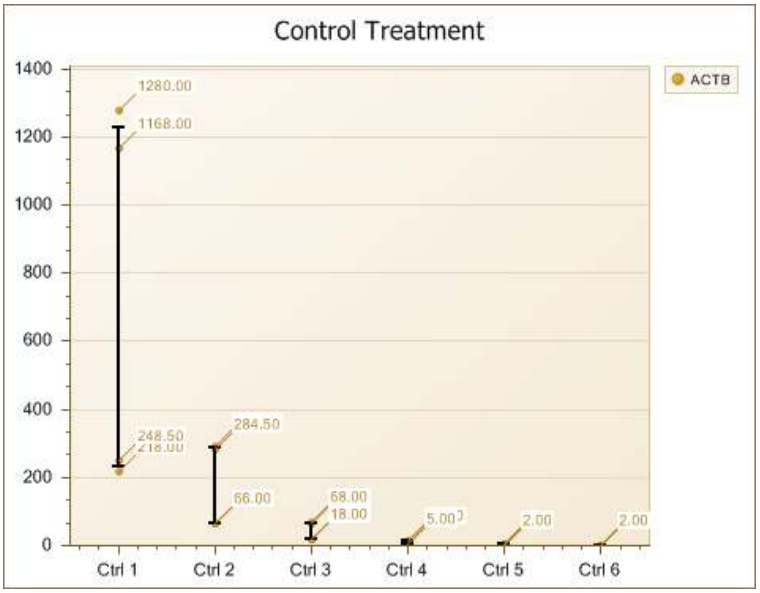


Figure 5.3 Control Treatment Chart

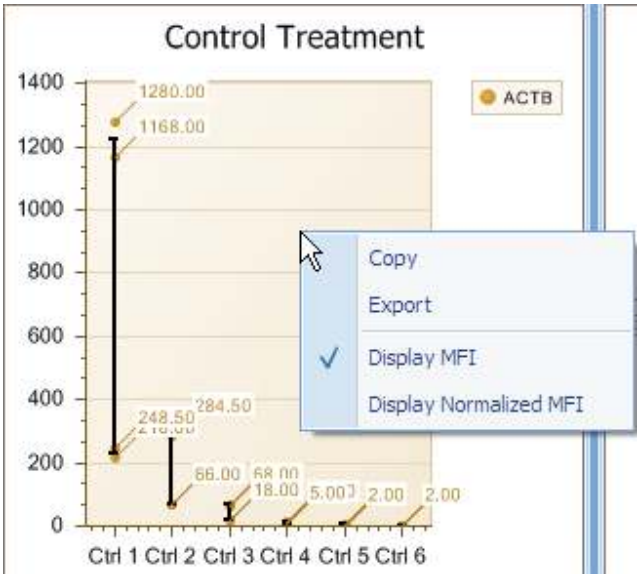


Figure 5.4 Context menu for Control Treatment Chart

Well Chart

Well chart plots MFI and normalized MFI data selected by the mini plate selection tool (Figure 5.5). Chart can be copied or exported from context menu, and MFI and normalized MFI data can be tuned off from context menu as well (Figure 5.6).

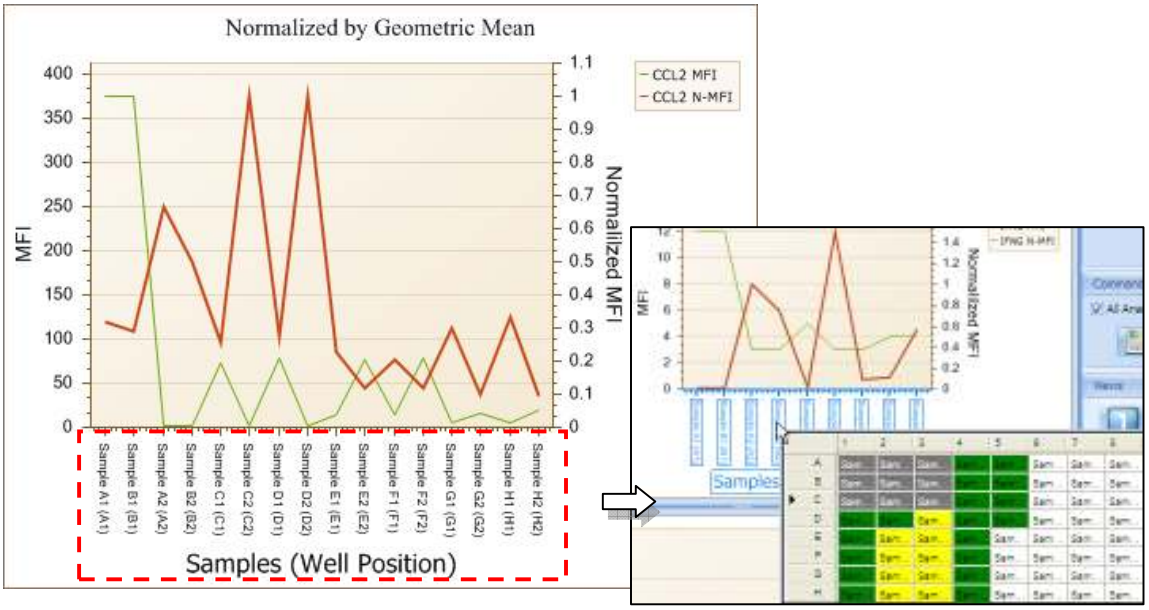


Figure 5.5 Well Chart

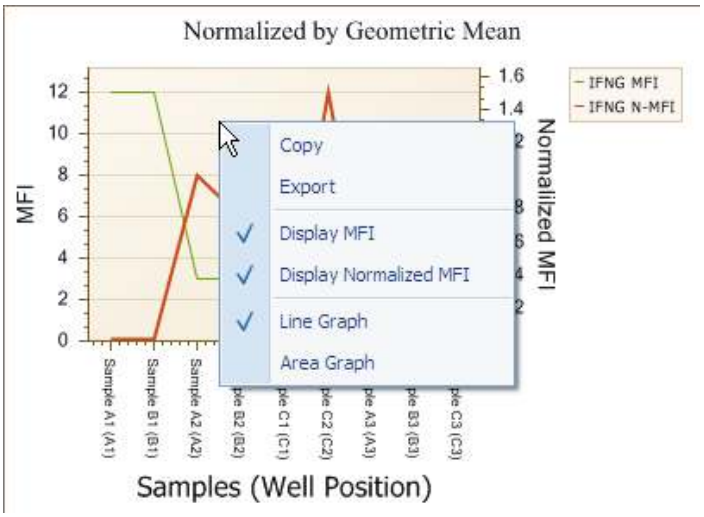


Figure 5.6 Context menu for Well Chart

Analyte Comparison Chart

Analyte comparison chart plots all MFI or normalized MFI data between two analytes with correlation line (Figure 5.7). Chart can be copied or exported from context menu, and display data type can be chosen from context menu as well (Figure 5.4).

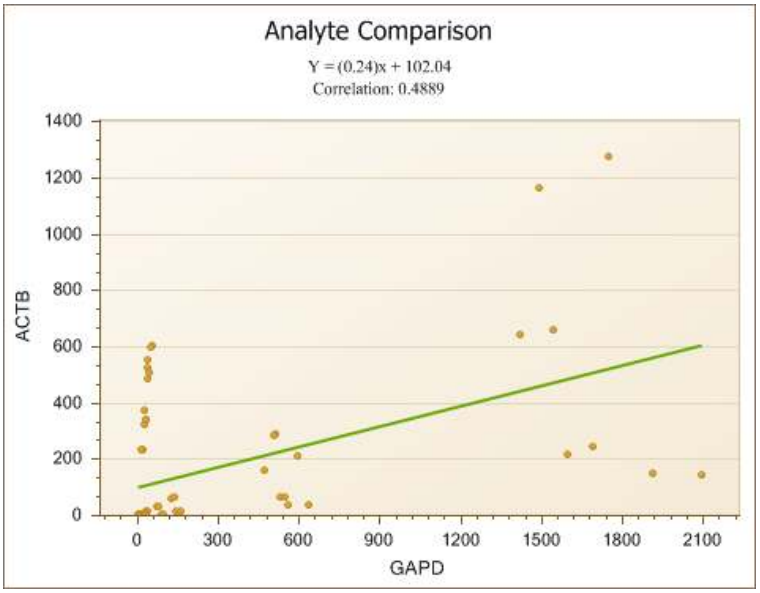


Figure 5.7 Analyte Comparison Chart

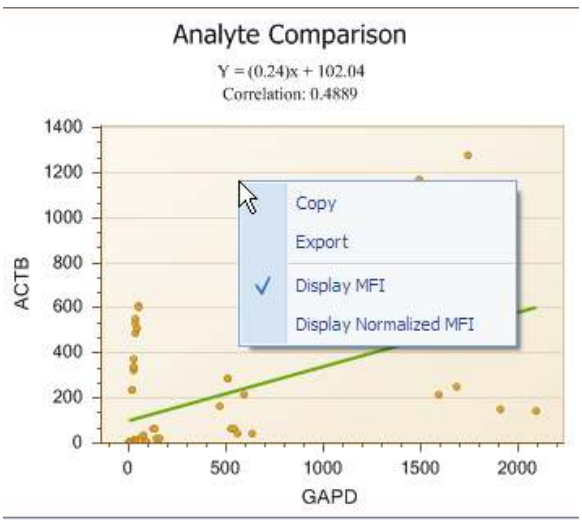


Figure 5.8 Context menu for Analyte Comparison Chart

Sample MFI Comparison Chart

Sample MFI comparison chart plots MFI and normalized MFI data selected by the mini plate selection tool (Figure 5.9). Chart can be copied or exported from context menu, and MFI and normalized MFI data can be tuned off from context menu as well (Figure 5.10).

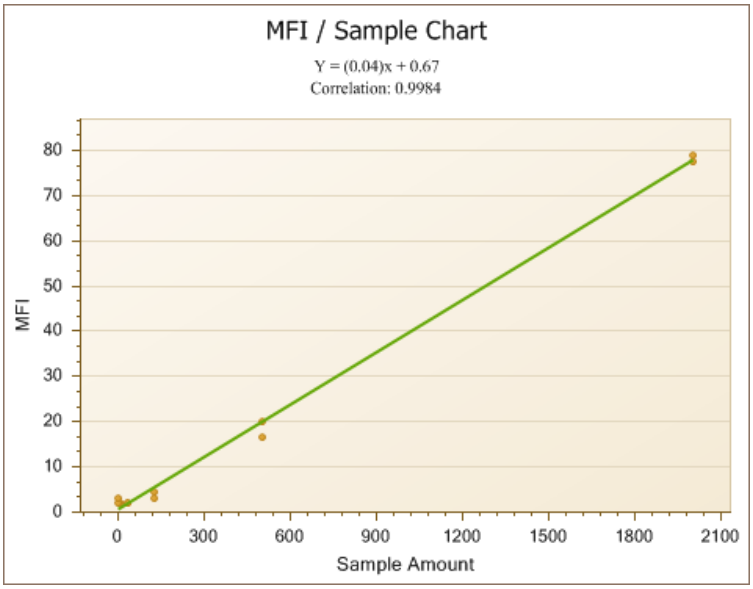


Figure 5.9 Sample MFI Comparison Chart

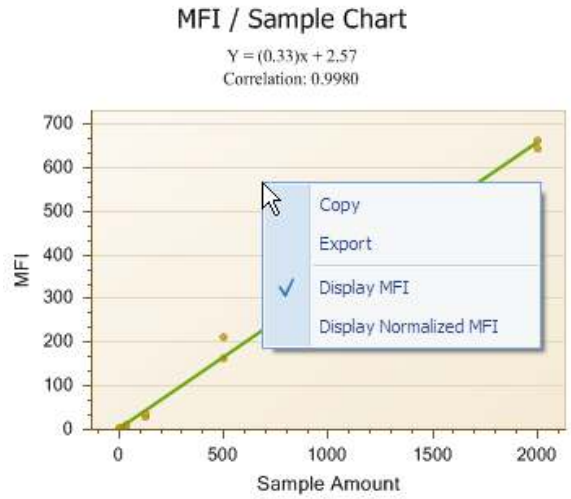


Figure 5.10 Context menu for Sample MFI Comparison Chart

Replacing the chart by drag & drop

Charts in the chart area can be easily replaced by drag & drop operation.

1. Select one of the chart you want to use from the drag drop charts pane (Figure 5.11).

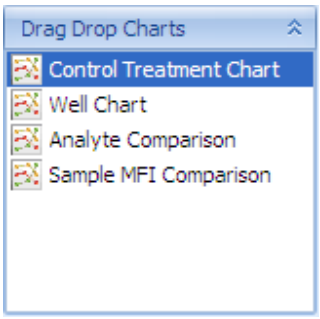


Figure 5.11 Replace the chart by drag & drop

2. Drag & drop selected chart into the chart area you want to replace (Figure 5.12).
   ⇨ The chart is replaced.

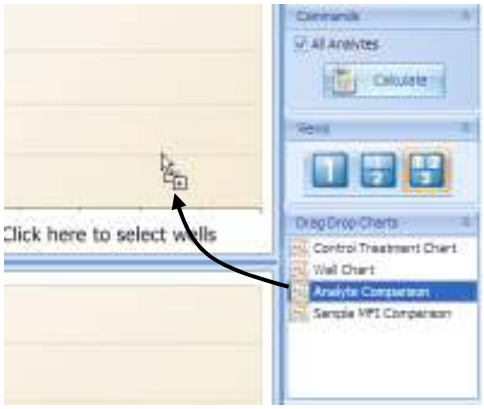


Figure 5.12 Replace the chart by drag & drop

5.3

Normalization and Fold Change

Selecting a Normalization Method

1. Select an analyte from the left analyte pane.
2. In the normalization option pane, select one normalization method from the drop-down list (Figure 5.13).
   ⇨ Some methods needs to specify the normalization baseline item.

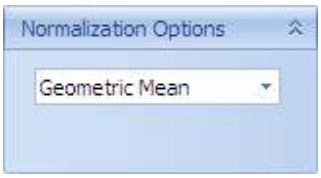


Figure 5.13 Model Equations drop-down list

Table 5.2 Normalization methods

Method	Description
None	Nothing normalization is done.
Geometric Mean	Use geometric mean method as a normalization baseline.
HK Gene	Choose one particular housekeeping gene as a normalization baseline.
HK With Least <CV%	Automatically select a housekeeping gene which has least CV% value as a normalization baseline.
Constant	Use user inputted value as a normalization baseline.
Inter-Sample Factor	Use inter sample factor method as a normalization baseline.

Calculate normalization and fold change

1. Click Calculate button in the commands pane (Figure 5.14).
   ⇨ If you want to calculate for all analytes at the same time, check 'All Analytes' check box.

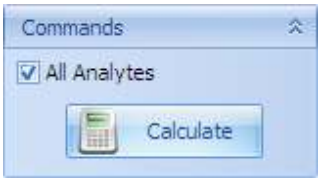


Figure 5.14 Model Equations drop-down list

2. Fold changes are calculated after normalization calculation. (Figure 5.15).

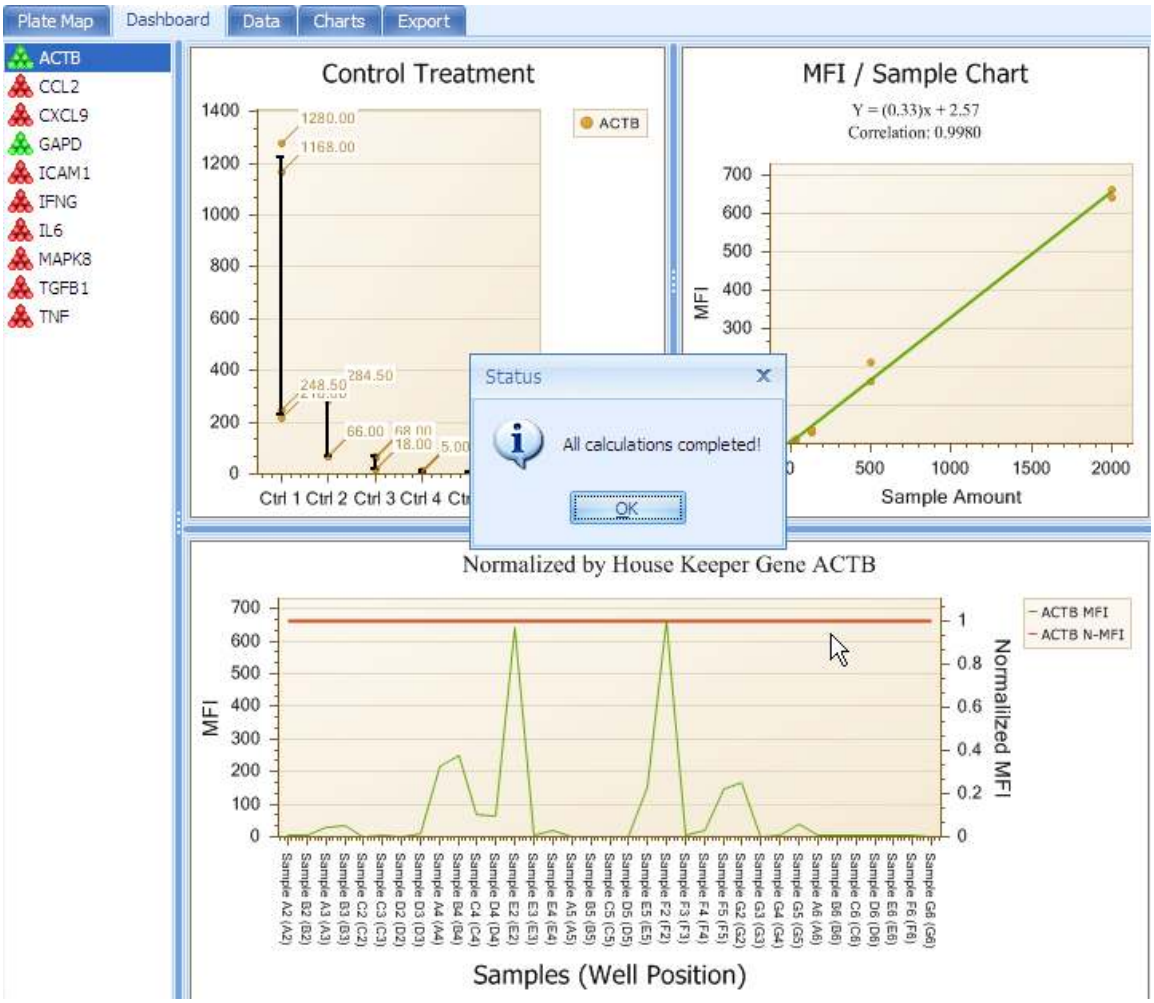


Figure 5.15 Fold Change Calculation

CHAPTER 6 Reviewing Data – *Data tab*

Data tab is to review the data across all analytes. In this tab, you can:

- Add or delete the data column via column selector box
- Sort or filter the column data
- Change the column layout
- Make groups to categorize the data
- Print or export the data

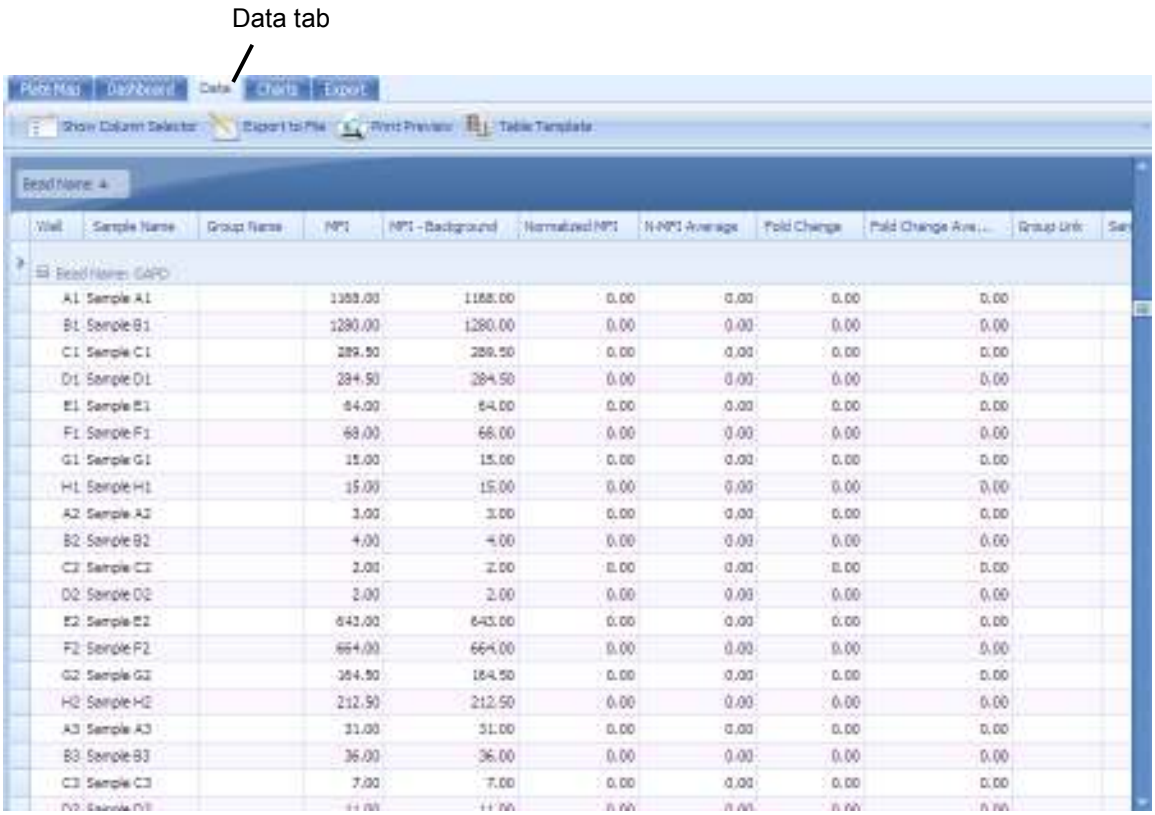


Figure 6.1 Data Tab

6.1

Add or Delete a column

1. Click **Show Columns Selector** 

button.
   ⇨ Column selector appears(Figure 6.2).

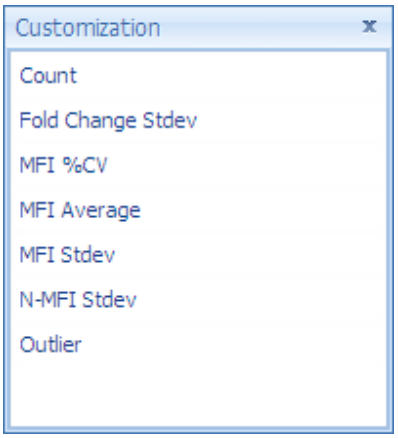


Figure 6.2 Column Selector box

2. To add a data column, select one of the data types and drag & drop it onto the data grid (Figure 6.3)

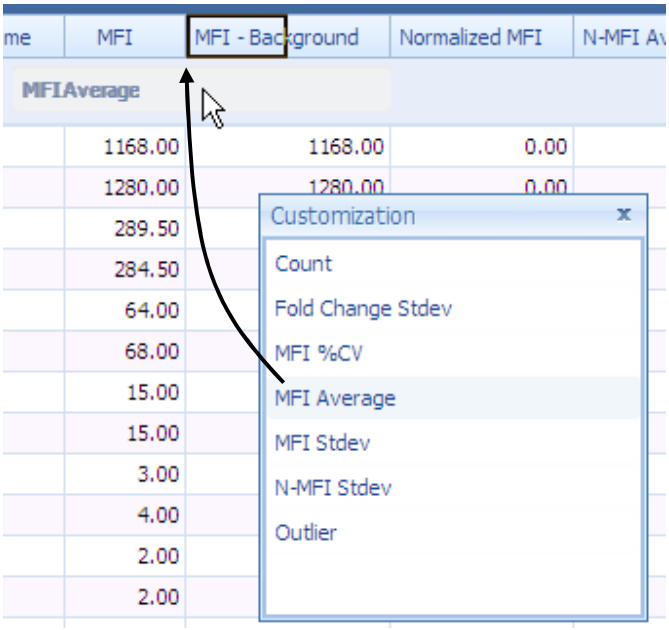


Figure 6.3 Add data type to the data grid

3. To delete the column from the data grid, select desired column and drag & drop it away from the column (Figure 6.4).

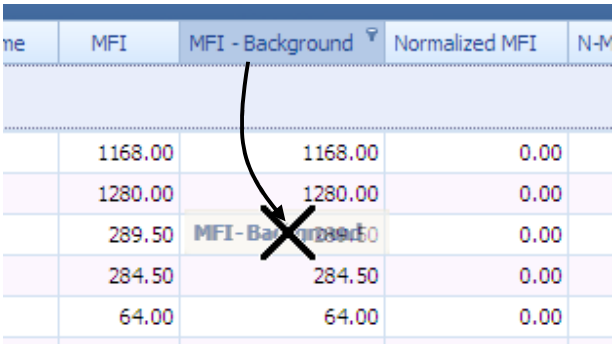


Figure 6.4 Delete data type from the data grid

Table 6.1 Data Types in the Data Table

Data Type	Description
Well	Well name
Bead Name	Bead name
Sample Name	User-specified name for the well.
Group Name	The group number of the well. Wells that belong to the same group have the same group number.
Outlier	Outlier status
MFI (Median Fluorescence Intensity)	The median fluorescence intensity measured by the Luminex® 100/200 or BioPlex system for a bead set count.
Normalized MFI	Shows calculated Normalized MFI value
Fold Change	Shows calculated Fold Change value
MFI - Background	Background subtracted value from MFI.
MFI Average	Shows the MFI average within the group.
MFI Stdev	Shows the MFI standard deviation within the group.
MFI %CV	Shows the MFI %CV within the group.
Count	The number of beads (per bead set) detected by the Luminex® 100/200 or BioPlex system.
N-MFI Average	Shows the Normalized MFI average within the group.
N-MFI Stdev	Shows the Normalized MFI standard deviation within the group.
Fold Change	Shows the Fold Change average within the group.

Average	
Fold Change Stdev	Shows the Fold Change standard deviation within the group.
Group Link	Control group associated with this well

6.2

Sort or Filter the Column Data

To sort by specific column, click the column title. Ascending and descending are changed alternatively (Figure 6.5).

Figure 6.5 Sort Column Data

To clear the sort, right click on the column you want to clear the sort, select '**Clear Sorting**' from the menu (Figure 6.6).

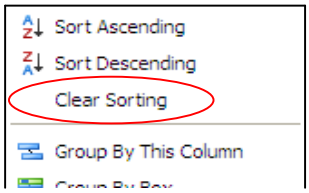


Figure 6.6 Clear Sorting

To filter by specific data in the column, click upper right side of the column you want to use it as filter base (Figure 6.7).

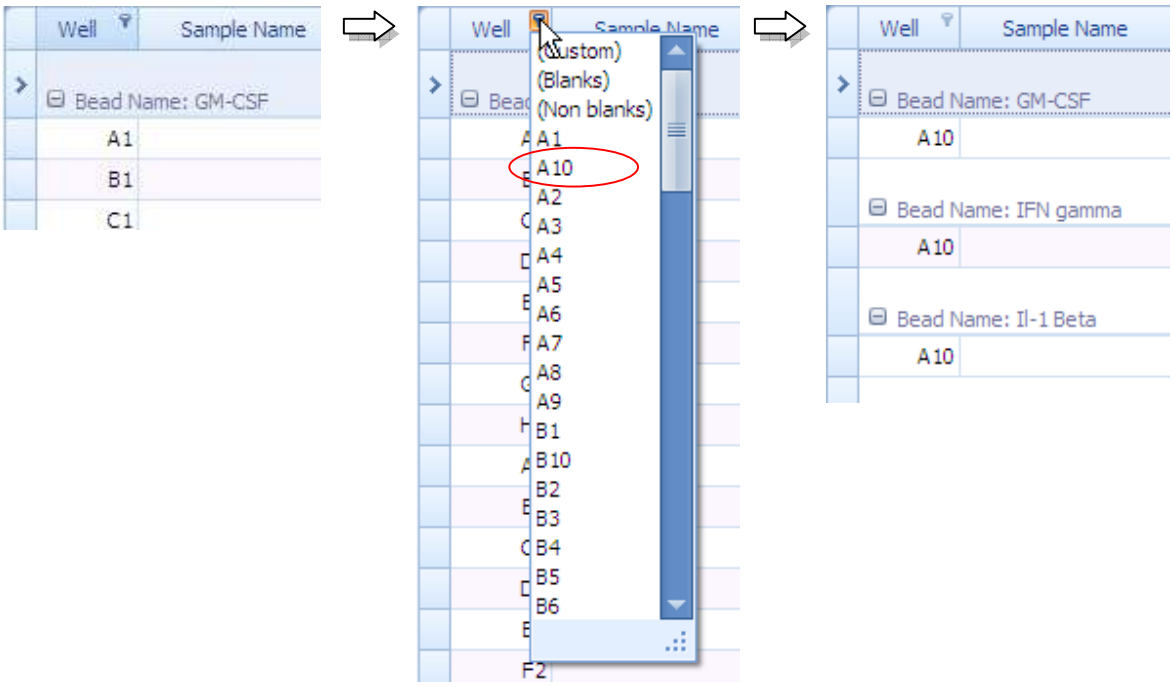


Figure 6.7 Filter by the data in the column

NOTE: There is a way to construct more complex filter conditions using **Filter Builder**. See appendix A section A.1 *'Create Complex Filter Criteria'* paragraph.

6.3

Exporting a Data

You can export your data table data from **Export to File** button  .

1. Click Export to File drop-down button.
2. Select the file format you want to export
   ⇨ There are five file formats available: Excel, CSV, PDF, HTML and Text (Figure 6.8).

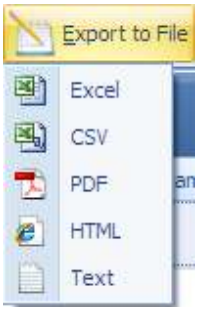


Figure 6.8 Export to File menu

3. File save dialog appears. Set file path and input file name, then click OK (Figure 6.9).

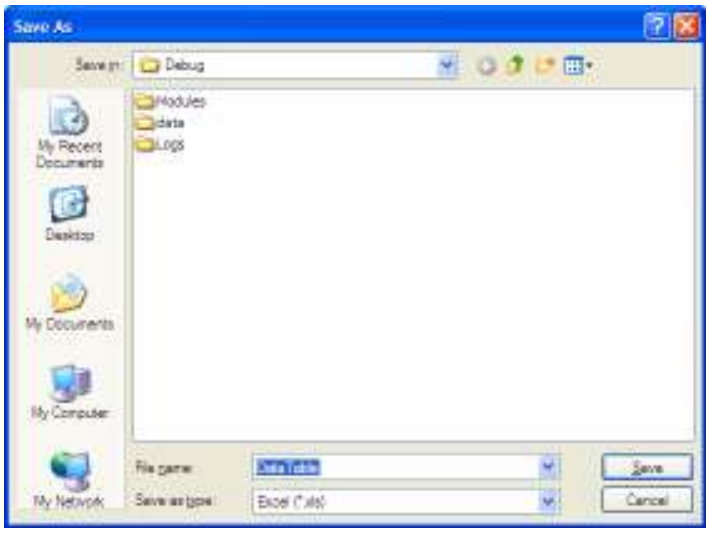


Figure 6.9 File save dialog

4. After saving the file, an Open file prompt appears (Figure 6.10). If you want to open the saved file immediately using the program the files extension is associated with, click Yes.

⇨ The saved file is opened on the program. (Figure 6.11).

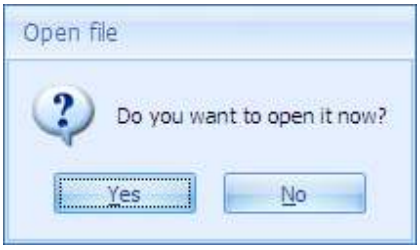


Figure 6.10 File save dialog

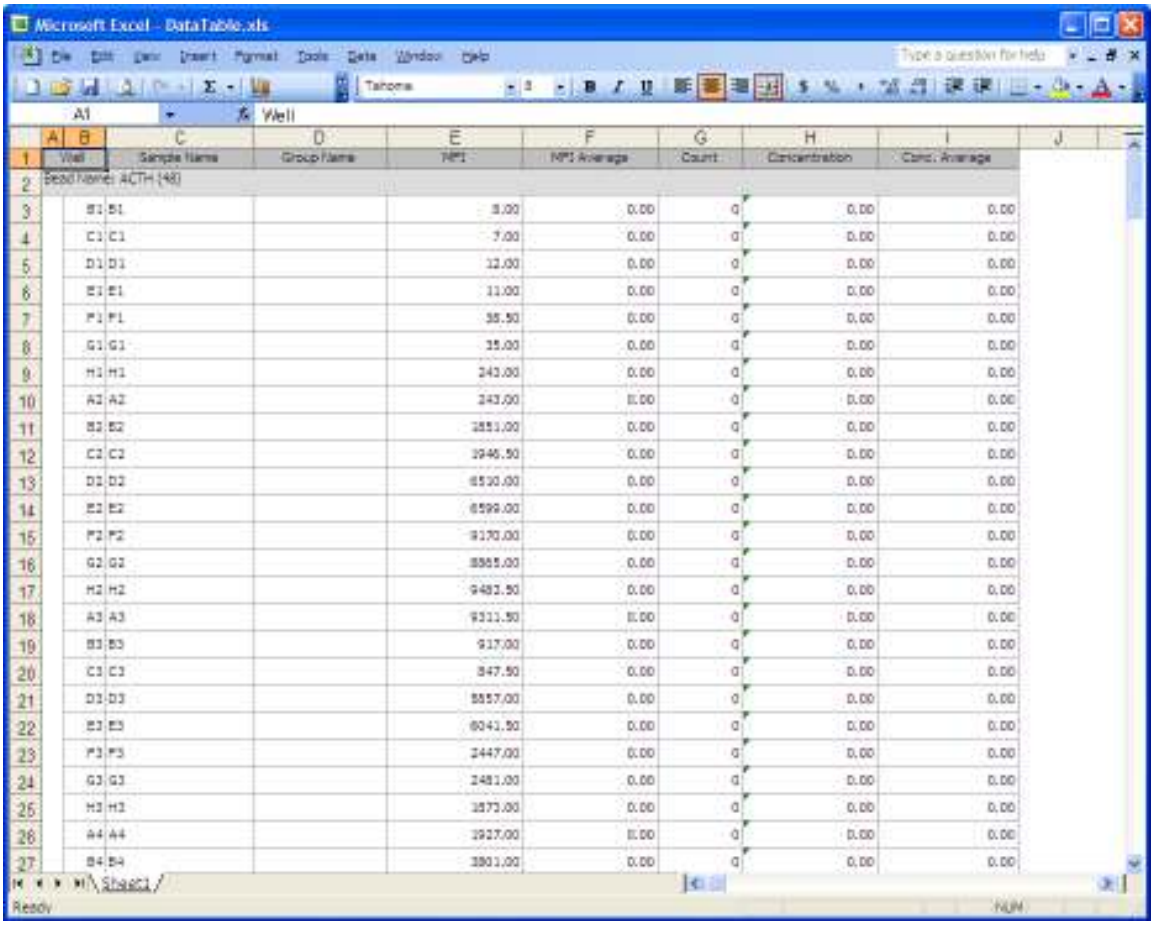


Figure 6.11 Opening in Excel

6.4

Printing a Data

You can preview your data with the **Print Preview** button  .

1. Click the **Print Preview** button.
   ⇨ Print preview window appears (Figure 6.12).

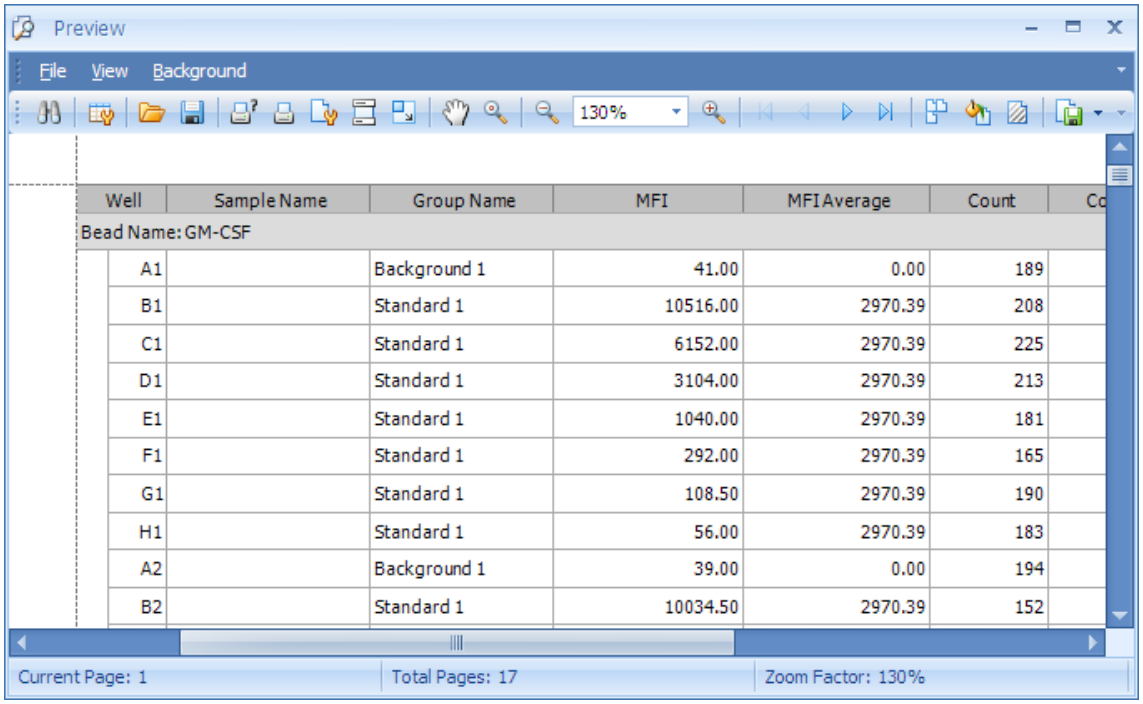


Figure 6.12 Print Preview

2. To print, click the **Print**  icon from the menu bar.
   ⇨ Print setting dialog appears.

NOTE: For more printing options, see appendix A section A.2 '*Print Preview*' menu.

CHAPTER 7 Data Charts – *Charts tab*

MasterPlex® EX can display MFI, count, or concentration data in many graph formats in the charts tab.

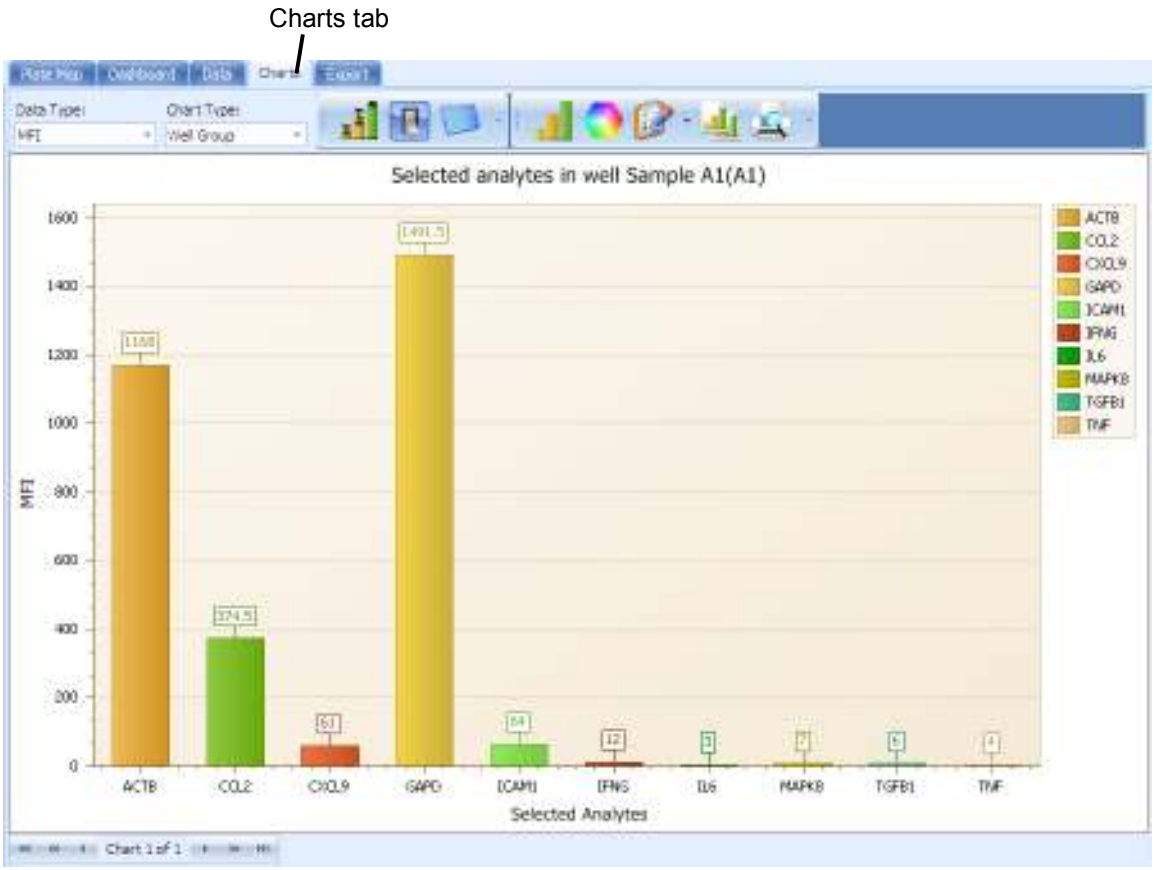


Figure 7.1 Chart tab

7.1 Viewing a Data Chart

1. Click the Well Selector button.
   ⇨ A mini sized well plate is displayed under the button (Figure 7.2).

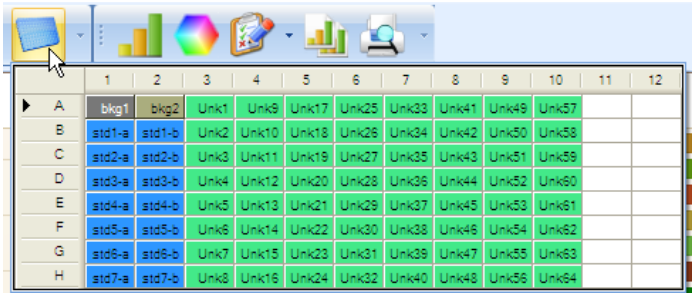


Figure 7.2 Well Selector

2. Select the wells you want to display on the chart. You can select multiple wells by pressing [CTRL] key (Figure 7.3).

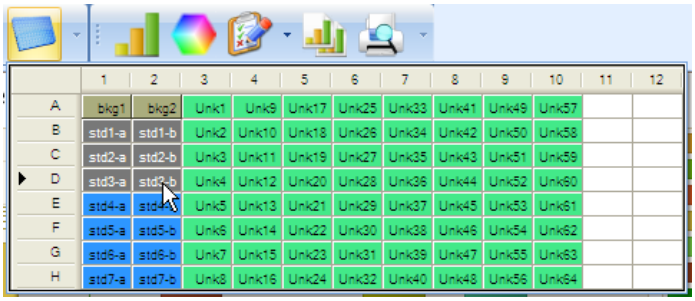


Figure 7.3 Multiple Well Selection

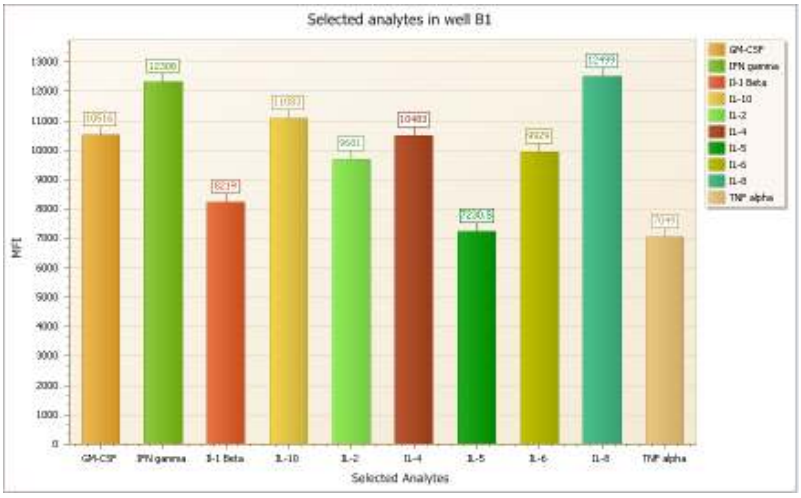


Figure 7.4 Multiple Well Selection

3. To display another data type for the selected wells, click the **Data Type** drop-down list and select one of the data type.

Table 7.1 Data Types

Data Type	Displays...
MFI	MFI (Median Fluorescence Intensity).
Count	Bead count
Normalized MFI	Calculated Normalized MFI
Fold Change	Calculated Fold Change

4. To change the data type, click the Chart Type drop-down list and select one of two chart types.

Table 7.2 Chart Types

Chart Type	Displays...
Well Group	Analyte data for each user selected well.
Single Analyte	Single analyte across all user selected wells.
Group by Analyte	Wells grouped by same analyte name.
Group by Sample name	Wells grouped by same sample name.

Replicate View

Plotting group values is available by clicking the **Replicate View** button  . Replicate View is available only on Bar style charts. If you are on another type of chart when you click the Replicate View button, it automatically re-selects the Bar chart and displays the data with error bars. Figure 7.5 shows an example of the replicate view chart.

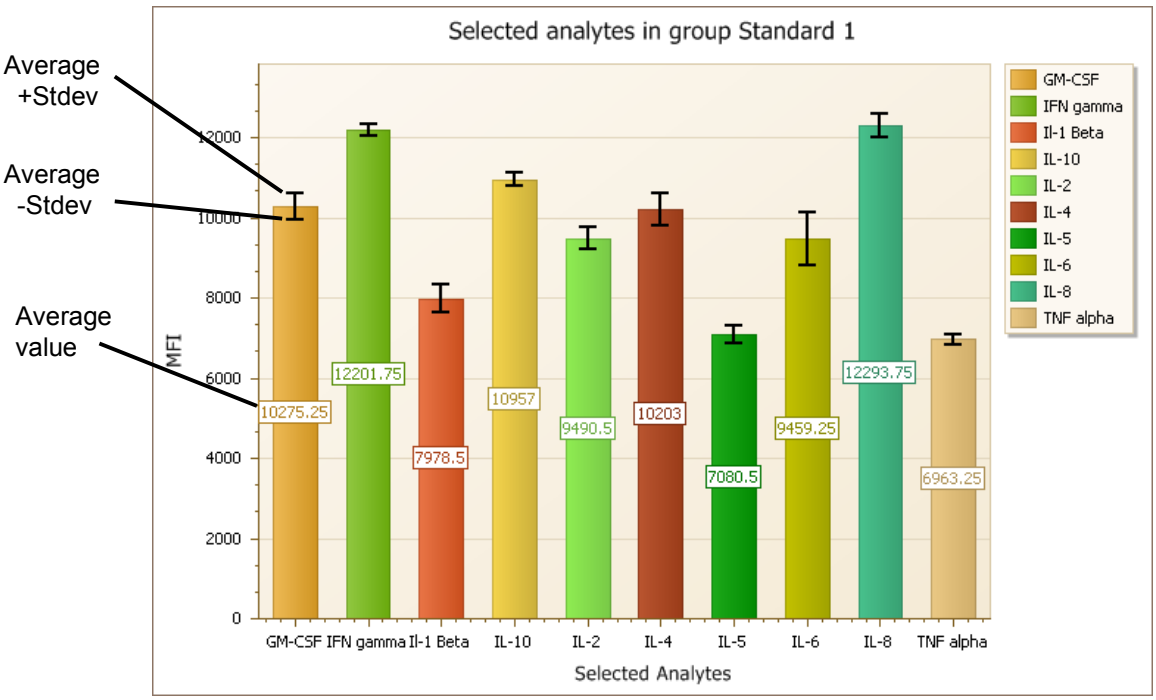


Figure 7.5 Replicate View chart

7.2

Chart Format

MasterPlex® EX provides various chart formats (Table 7.3). To change a chart format for the selected well data, click the **Chart Gallery** button , and make a selection from the drop-down list of **Chart Gallery**.

Table 7.3 Available chart format

Icon	Chart Name	Features
	Bar	Bar style x-y chart
	Bar 3D	3D bar style x-y chart
	Manhattan Bar	3D bar style x-y-z chart
	Point	Point style x-y chart
	Line	Line interpolated style x-y chart
	Step Line	Step line interpolated style x-y chart
	Spline	Spline interpolated style x-y chart
	Line 3D	3D line interpolated style x-y chart
	Step Line 3D	3D step line interpolated style x-y chart
	Spline 3D	3D spline interpolated style x-y chart
	Area	Are painted style x-y chart
	Spline Area	Spline area painted style x-y chart
	Area 3D	3D area painted style x-y chart
	Spline Area 3D	3D spline area style x-y chart
	Pie	Pie style circular chart
	Pie 3D	3D pie style circular chart
	Doughnut	Doughnut style circular chart
	Doughnut 3D	3D doughnut style circular chart
	Radar Line	Line interpolated style radar chart
	Radar Point	Point plotted style radar chart

7.3

Analyte Selector

In the Well Group chart, **Analyte Selector** allows you to change the analytes position in the chart and allows you to display on/off setting for each analyte. To move the analyte position,

1. Click **Analyte Selector** icon  .
   ⇨ Analyte selector drop-down list appears (Figure 7.6).
2. Select the analyte you want to move.
3. To move the analyte to the left, click **Up** button. To move the analyte to right, click **Down** button.
   ⇨ The analyte moves one position to the left (or right) from its current position (Figure 7.7).

In the Single Analyte chart, the Analyte Selector allows you to select the analyte you want to display in the chart (Figure 7.8).

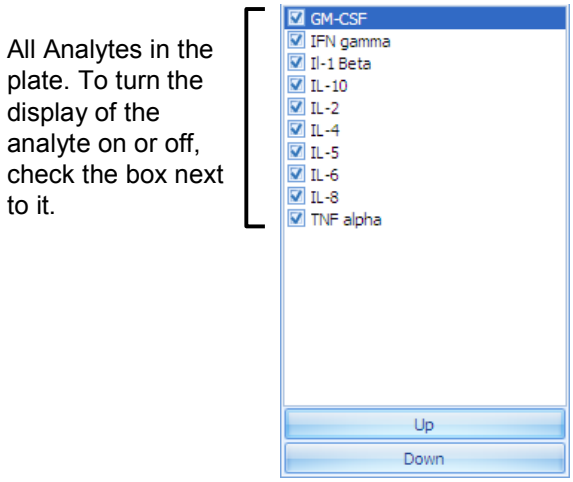


Figure 7.6 Analyte Selector drop-down list

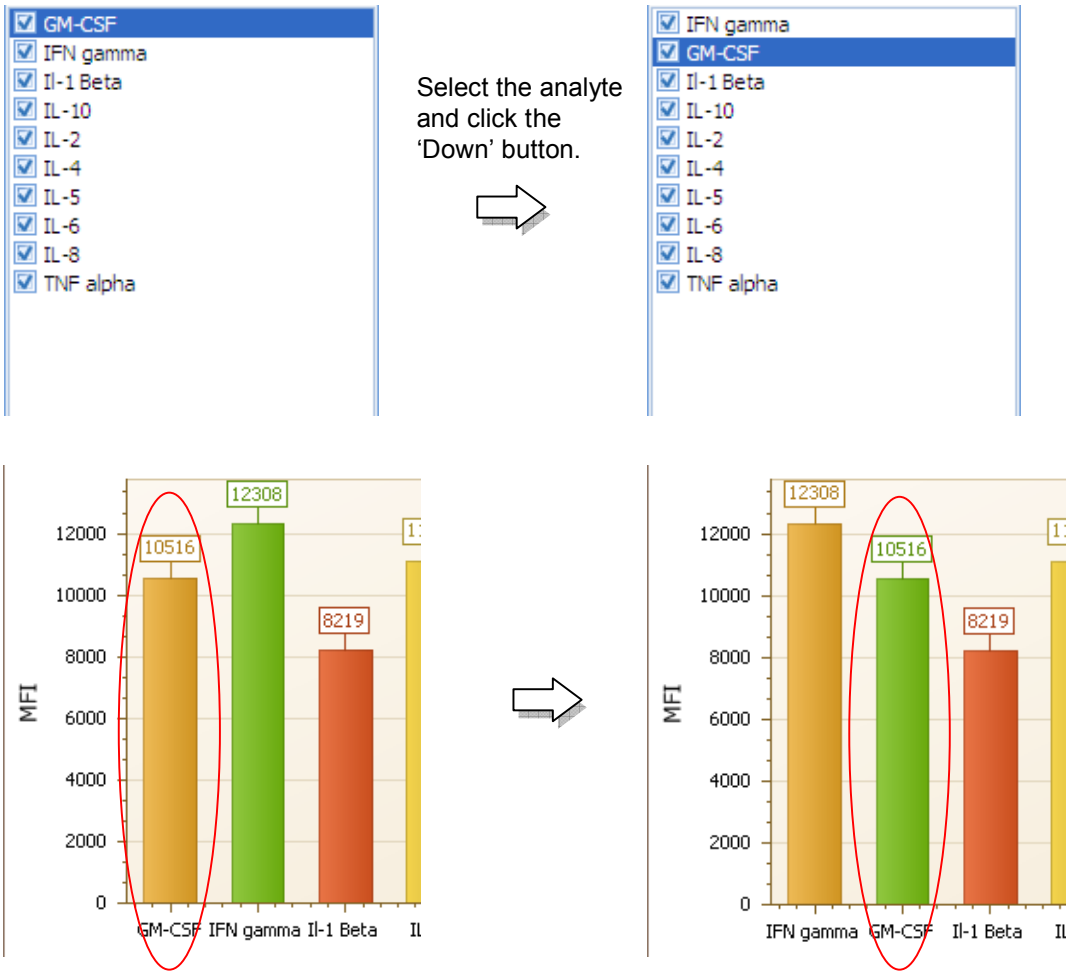


Figure 7.7 Change the analyte position

All Analytes in the plate. To select the analyte, click the radio button next to the analyte name.

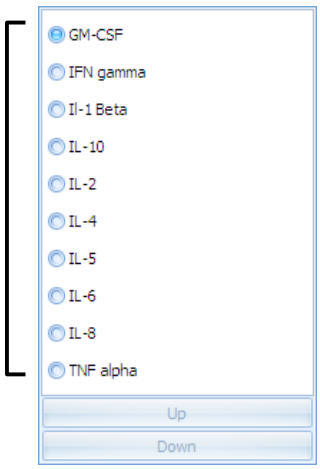


Figure 7.8 Analyte Selector drop-down list

7.4

Changing the Color Palette

There are 30 color palettes available from **Color Palette** button . Figure 7.9 shows the palette names and their corresponding color patterns.

Figure 7.9 Color Palettes

7.5

Changing Chart Properties

The Chart tab has great flexibility in customizing the chart. To enter the chart properties dialog, click **Chart Properties** button . You can choose to change the entire chart's properties or just one of them. To change the entire chart's properties, click body of the button. To change one of the chart's properties, click small drop-down arrow right side of the button (Figure 7.10) . Figure 7.11 shows Chart Properties dialog, and Table 7.4 explains the property categories.

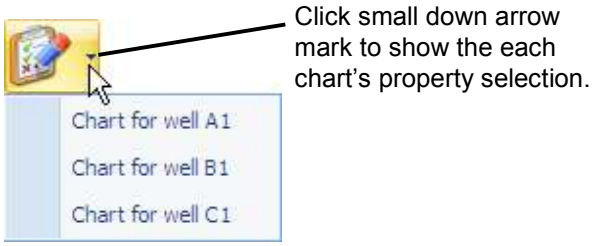


Figure 7.10 Chart Property for Individual Chart

Figure 7.11 Multiple Well Selection

Table 7.4 Chart Properties

Properties	Icon	Features
Legends		Customize the legend's properties.
Diagram		Customize the diagram's properties.
Axes		Customize X and Y axes of the diagram. Note that you may select an axis to be modified on the chart preview.
Chart Titles		Add chart titles to be displayed within a chart.
Point Labels		Customize point label properties of the selected series. Note that you may select a series to be modified on the chart preview.
Series Views		Customize series view properties of the selected series. Note that you may select a series to be modified no the chart preview.
Appearance		Choose a palette to color series or their data points. Also choose the style, which specifies the chart's appearance depending on the current palette.

7.6

Chart Template

You can save the chart properties as a template. You can apply a template to an active chart. Templates may also be exported, imported, or deleted.

Opening the Chart Template Manager

1. Click the **Chart Template Manager** button  .
   ⇨ The Chart Template Manager appears (Figure 7.12).
2. Click a chart template in the Available Templates list to view information about the template.

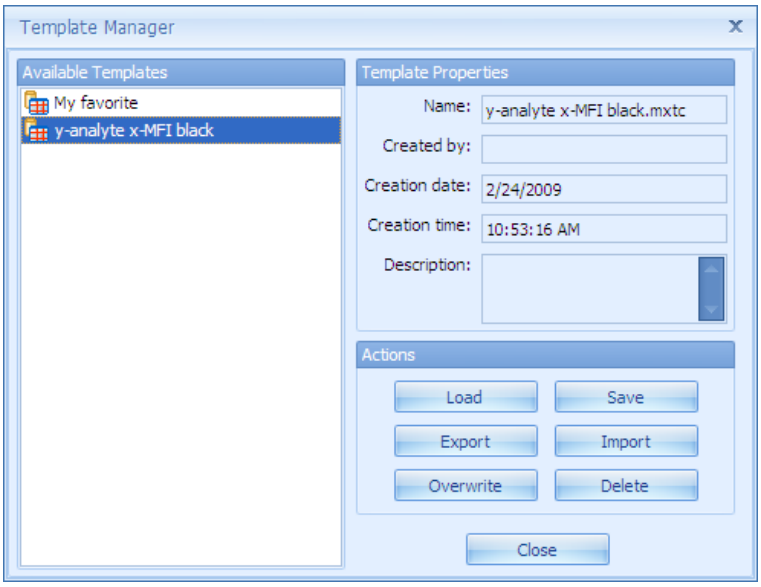


Figure 7.12 Chart Template Manager shows available templates
Click a template to view information about the template.

Saving a Chart Template

You can save the current chart properties to a template.

1. After you have finished modifying the properties, open the Chart Template Manager and click the **Save** button.
   ⇨ The Template Name box appears (Figure 7.13).

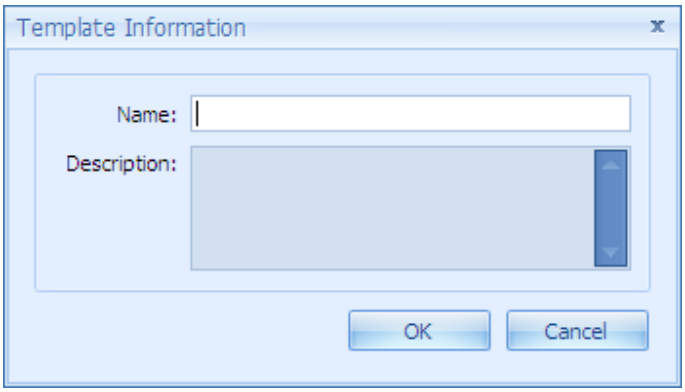


Figure 7.13 Template Name and Description box

2. Enter a name for the template and click **OK**.
   ⇨ The new template is added to the Available Template list.

Loading a Template

You can apply or *load* a saved template to the current chart.

1. In the Template Manager, select the template that you want to apply to the chart.
2. Click the **Load** button.
   ⇨ The template is applied and the properties are set to the current chart.

Overwriting a Template

You can overwrite an existing template with the current chart properties.

1. In the Chart Template Manager, select the template that you want to overwrite
2. Click the **Overwrite** button.
   ⇨ A confirmation box appears (Figure 7.14).

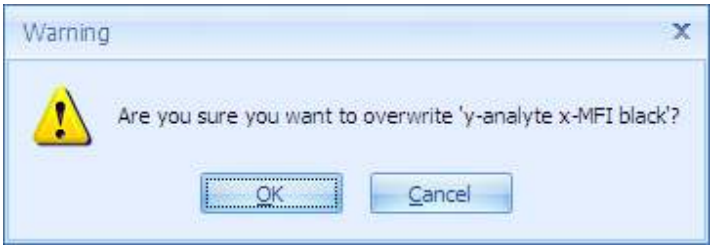


Figure 7.14 Confirmation box

1. Click **OK** to overwrite the selected template with the current chart properties.

Exporting a Chart Template

You can export a template to a user-specified location.

1. In the Chart Template Manager, click the template you want to export.
2. Click the **Export** button.
   ⇨ The Save As dialog box appears (Figure 7.15).

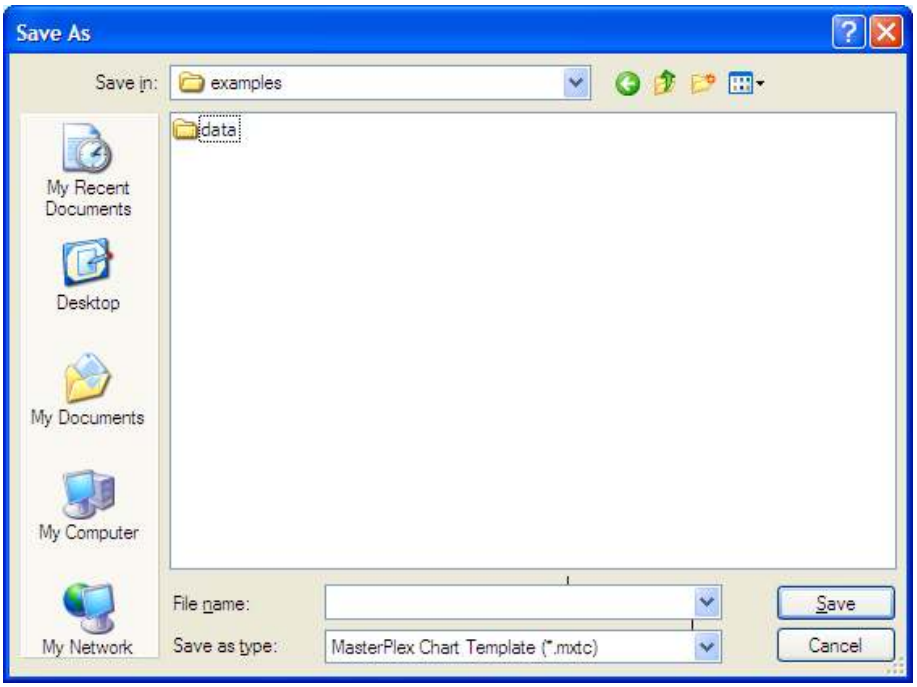


Figure 7.15 Save As dialog box

3. Choose the directory for the template that you want to export.
4. Enter a name for the template (*.mxtc).

NOTE: A template must have a .mxtc file extension. Changing the extension will render the exported template unusable.

Importing a Chart Template

You can import a chart template (.mxtc) from a user-specified location.

1. In the Chart Template Manager, click **Import** button.
   ⇨ The Open dialog box appears (Figure 7.16).

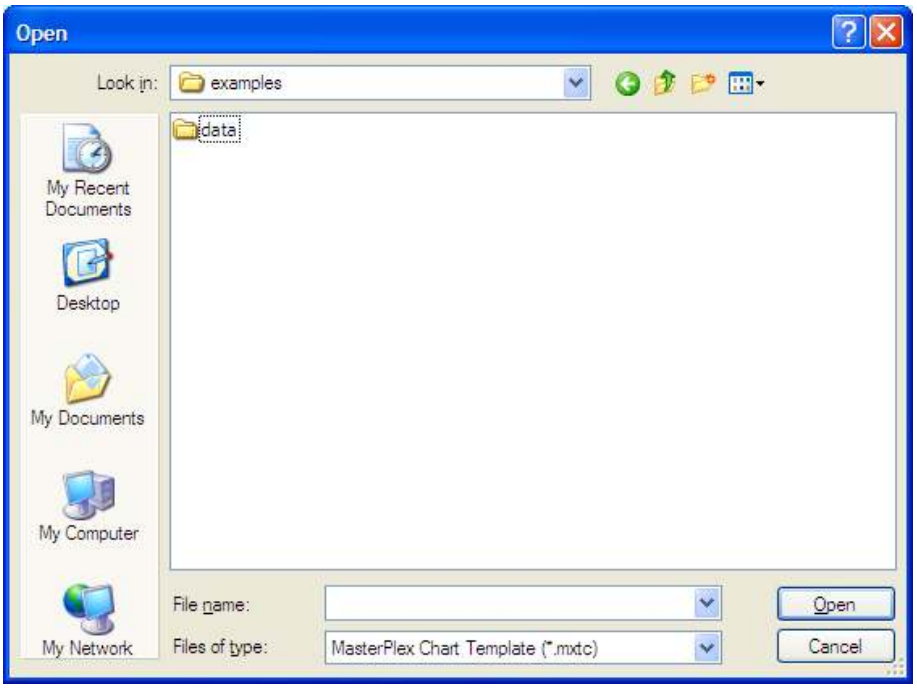


Figure 7.16 Open dialog box

2. Choose the directory with the template that you want to import.
3. Select the template and click **Open**.
   ⇨ The template name is added to the Chart Template Manager.

Deleting a Template

You can delete a template (.mxtc) from the system.

1. In the Chart Template Manager, click the template that you want to delete.
2. Click **Delete** button.
   ⇨ A confirmation box appears (Figure 7.17).

Figure 7.17 Confirmation box

3. Click **OK** to delete the template.
   ⇨ The template is removed from the Chart Template Manager.

WARNING: This permanently removes the template from the system.

7.7

Printing a Chart

You can print your data with the **Print** button .

1. Click the **Print Preview** button.
   ⇨ Print preview window appears (Figure 7.18).

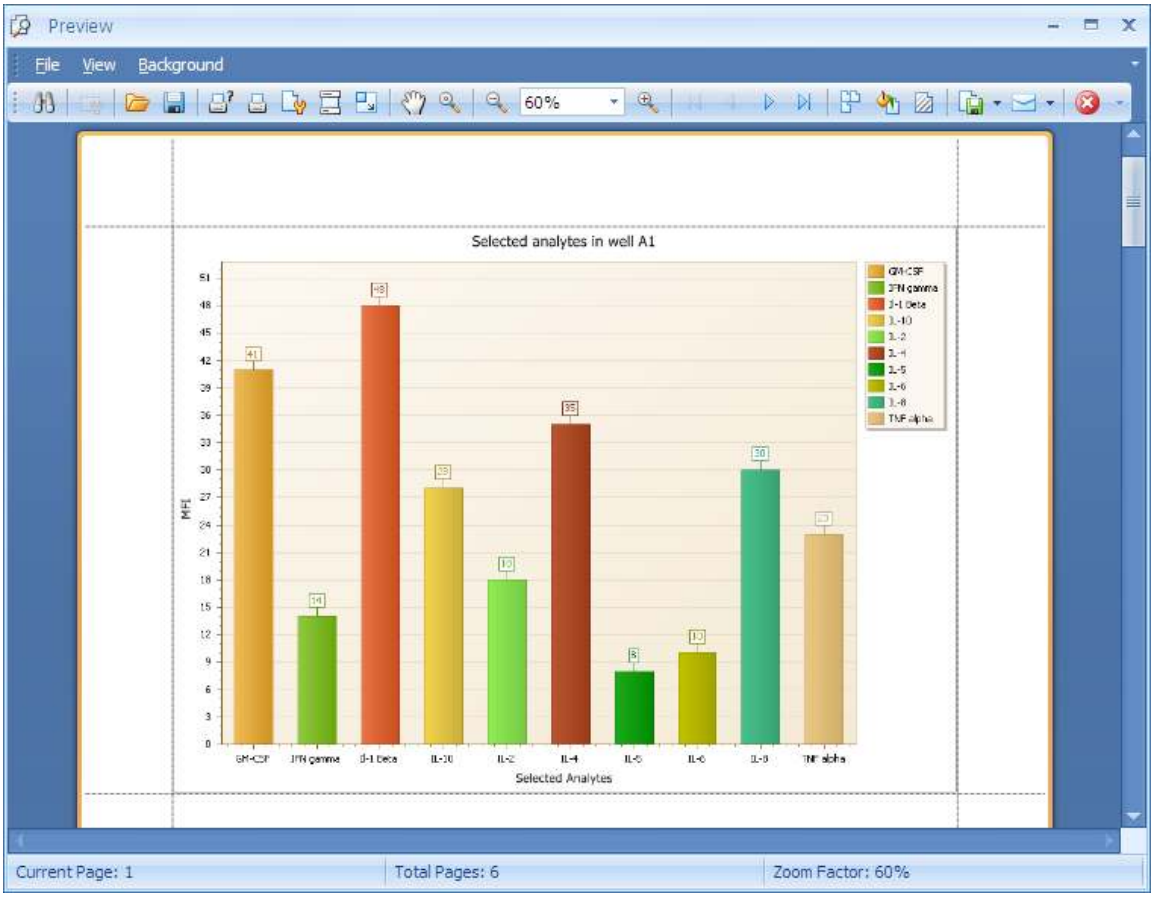


Figure 7.18 Save As dialog box

2. To print, click the **Print** icon from the menu bar.
   ⇨ Print setting dialog appears.

NOTE: For more print options, see appendix A section A.2 '*Print Preview*' menu.

7.8

Copying or Saving Chart Image

The software can export the chart image to other applications. The data may be copied to the system clipboard or saved in different file formats.

1. Right click on the chart you want to copy or save.
2. To copy the chart image in bitmap format, click '**Copy**'.
   ⇨ The image is sent to the clipboard and you can paste the image data on other applications.
3. To save the chart image in other formats, click '**Export Image**'.
   ⇨ The File Save dialog is opened (Figure 7.19).
4. Input the file name and select one of the file formats from the 'Save as type' drop-down list. There are five formats available: bitmap, png, html, pdf and Excel.

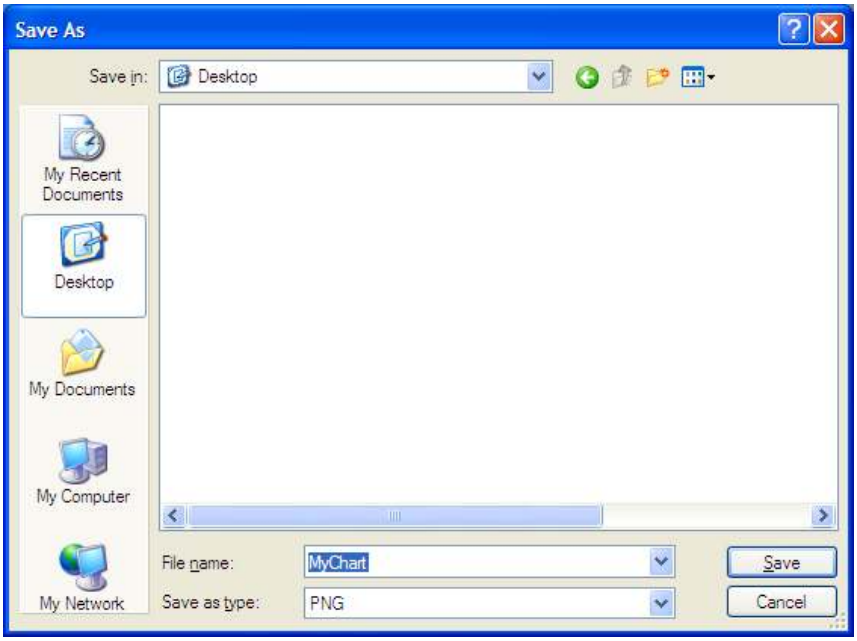


Figure 7.19 Chart Image Export dialog

CHAPTER 8 Export Data – *Export tab*

This chapter explains how to export MasterPlex® EX data transformed by the user. Custom report is a powerful and flexible tool for presenting and exporting your data. Compared to regular report, Custom report has greater flexibility on what and how to present data. While EX stores its analysis results in an XML format document, it is possible for users to present their data in whatever format they want. The only thing users need to do is to define their presenting formats in XSL files (Extensive Stylesheet Language).

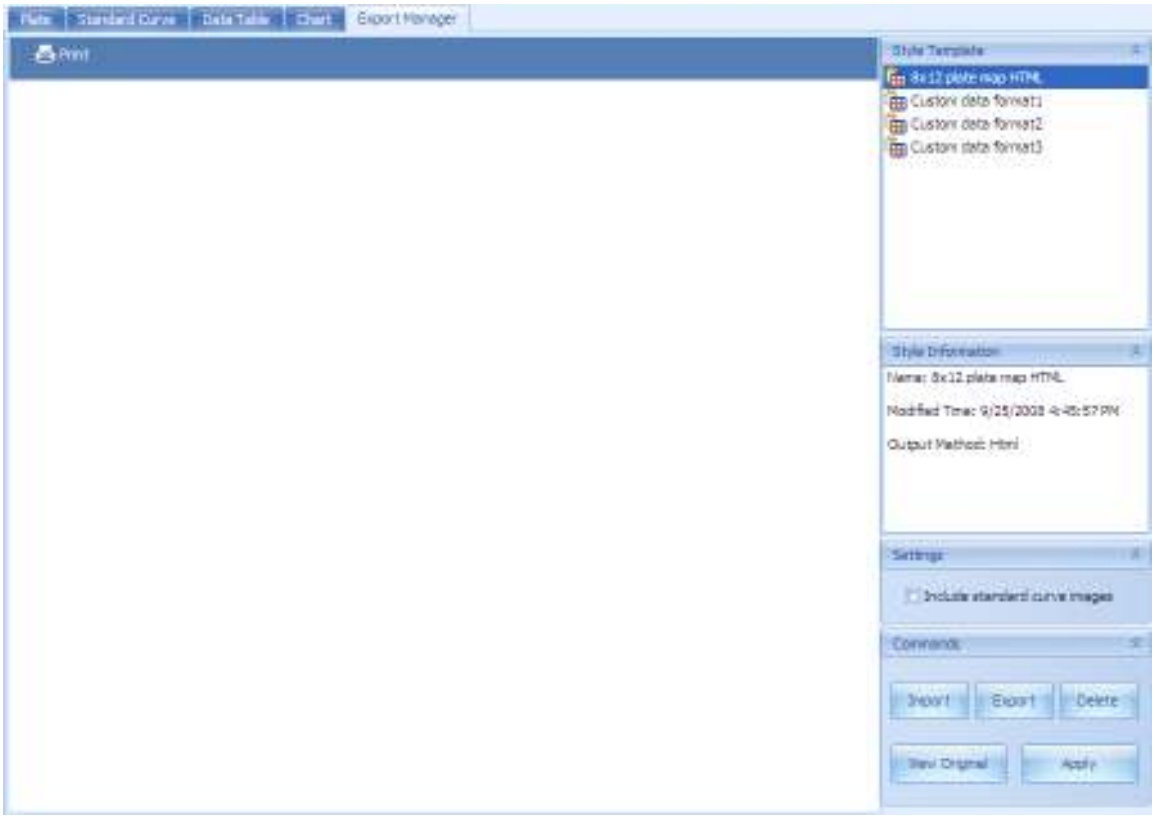


Figure 8.1 Export Manager tab

8.1

Importing a User Defined Stylesheet

1. Click **Import** button 

.
   ⇨ The file open dialog appears (Figure 8.2).

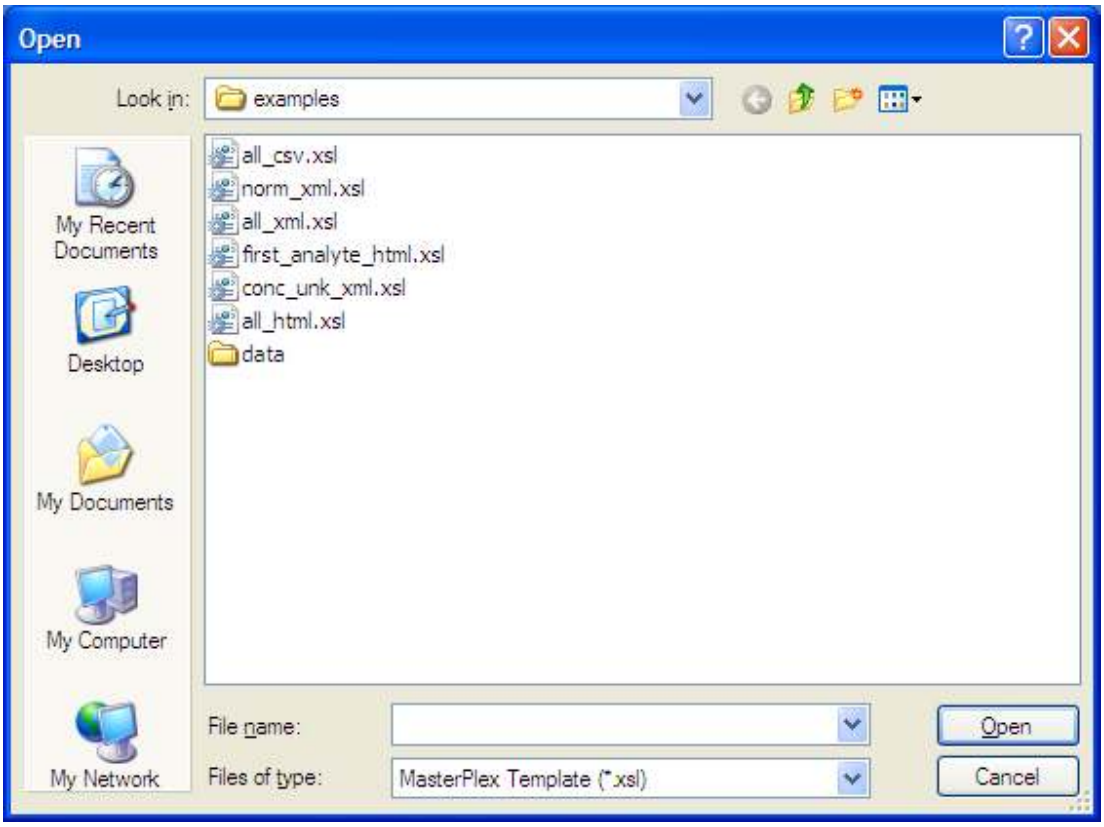


Figure 8.2 Open File Dialog

2. Select the file you want to import to the export manager.
   ⇨ Style sheet's name is displayed in the Style Sheet list, and XSL Information window shows style sheet's information (Figure 8.3).

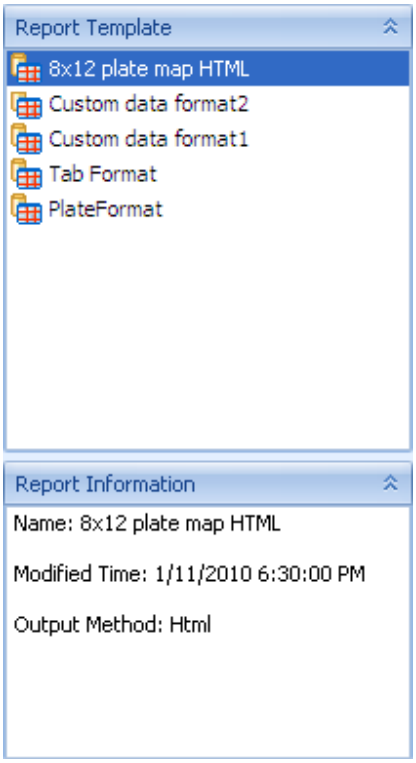
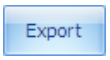


Figure 8.3 Open File Dialog

8.2

Exporting a User Defined Stylesheet

1. Click **Export** button 

.
   ⇨ The file save dialog appears (Figure 8.4).

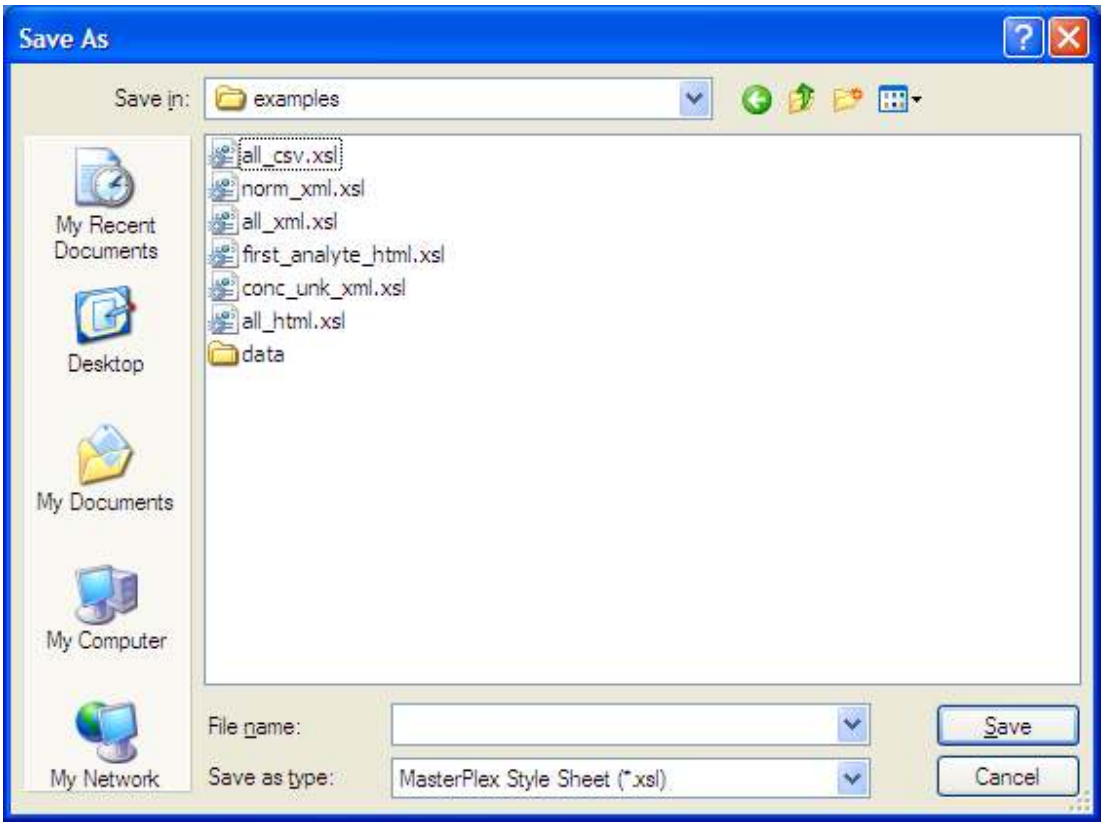
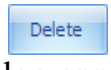


Figure 8.4 Open File Dialog

2. Set the destination and input file name, then click the Save button.
   ⇨ Style sheet's name is displayed in the Style Sheet window, and XSL Information window shows style sheet's information (Figure 8.3).

8.3
Delete Style Sheet File from Style Sheet List

1. Select the style sheet you want to delete from the style sheet list.
2. Click the **Delete** button 

.
   ⇨ The confirmation dialog appears (Figure 8.5).
3. Click OK to delete.

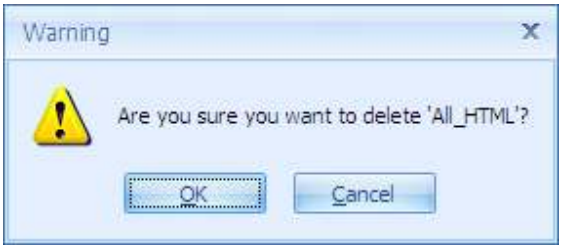


Figure 8.5 Confirmation Dialog

8.4

Viewing Original Data

1. Click **View Original** button 

.

⇨ Original data by xml format is displayed in the preview window (Figure 8.6).

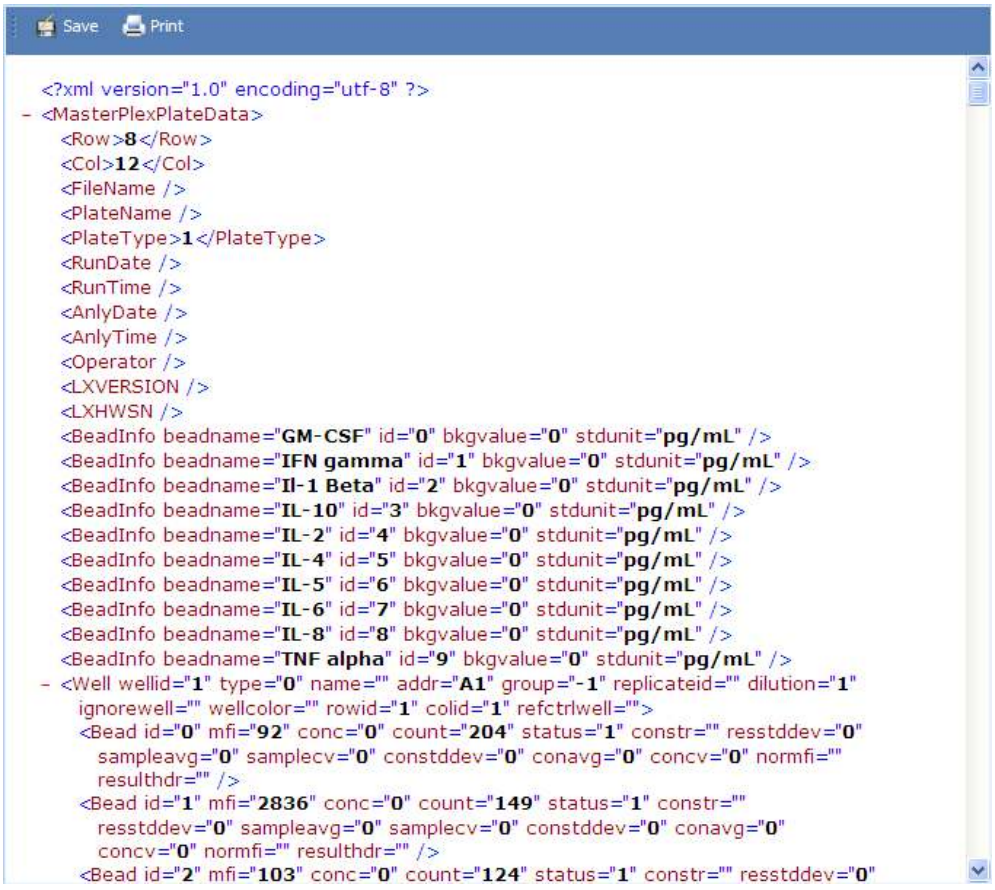


Figure 8.6 Confirmation Dialog

2. To save this data, click the Save button Save .
3. To print this data, click the Print button Print .

8.5

Transform Original Data into Your Customized Data

1. Select the style sheet you want to apply from the style sheet list.
2. Click the Apply button Apply .
   ⇨ The transformed data is shown in the preview window (Figure 8.7).

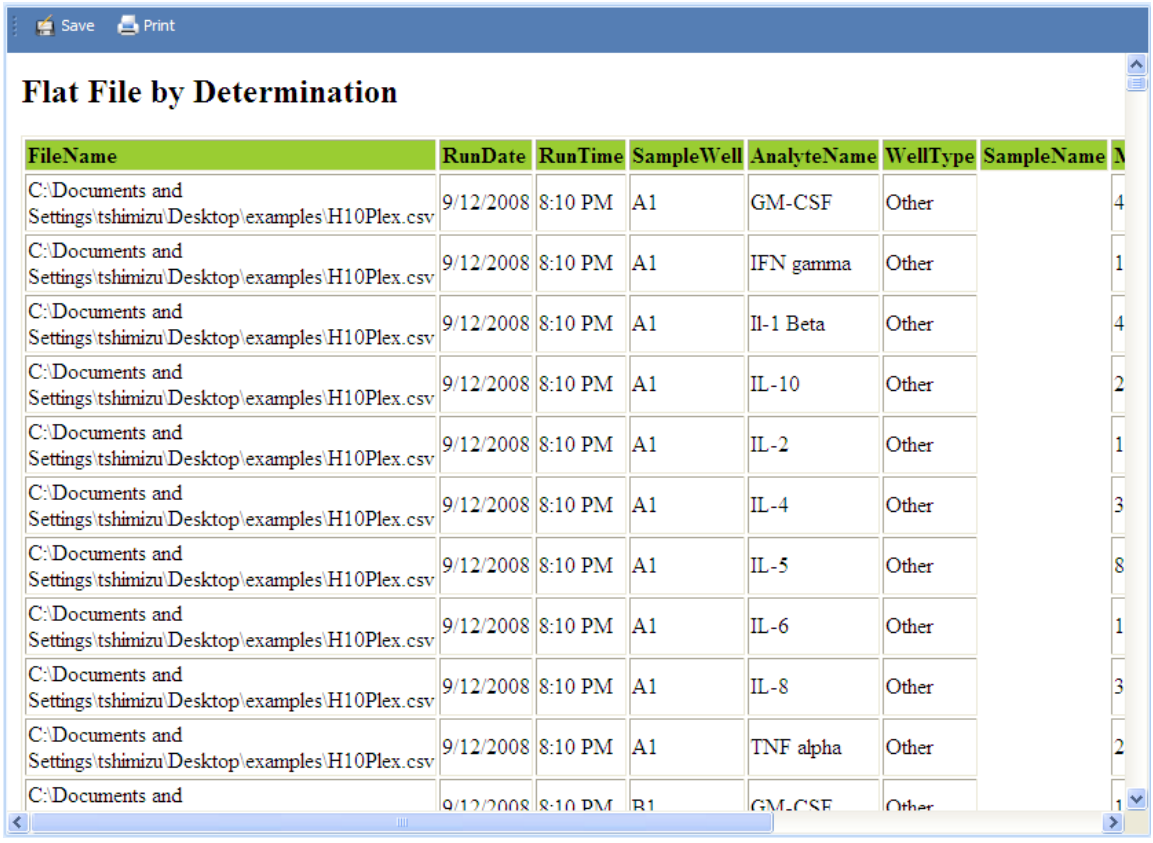


Figure 8.7 Transformed Data (HTML format)

3. Save to file or print from the menu button.

APPENDIX **A**

This appendix explains more details about Data Grid (for Standard curve tab and Data Table tab) and Print Preview.

A.1

Grid Customize Menu

Grid customize menu allows you to customize your grid data viewing more flexibly and efficiently. Grid Customize Menu is invoked by right clicking on the both grid column, standard curve data grid and data table grid (Figure A.1).

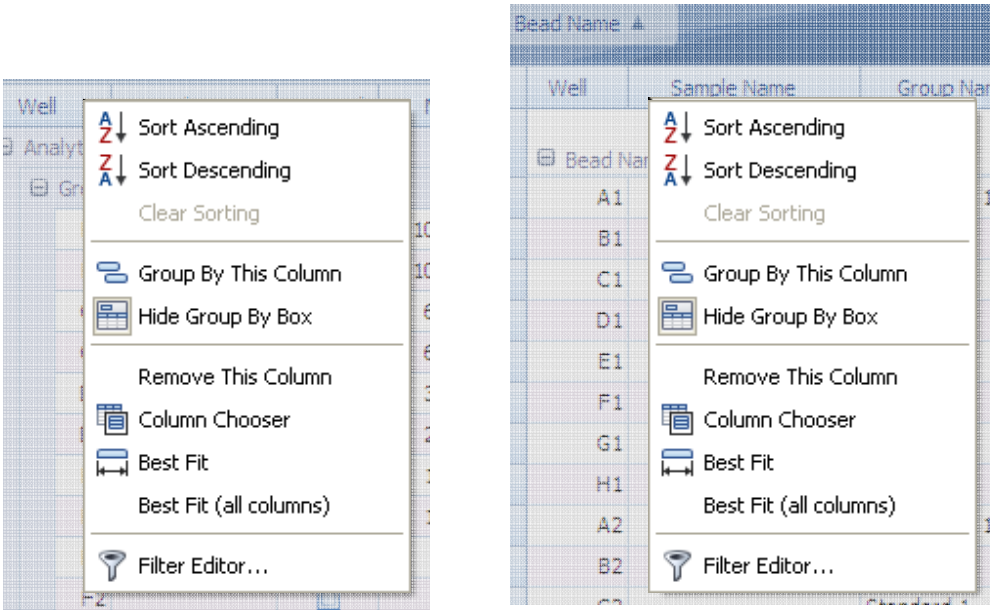


Figure A.1 Grid Menu in the Standard Curve tab and Data Table tab

Table A.1 Main toolbar buttons and functions

Icon	Command	Function
	Sort Ascending	Sort right clicked column by ascending.
	Sort Descending	Sort right clicked column by descending.
	Clear Sorting	Clear sorting of right clicked column (if the

		columns is sorted).
	**Group By This Column**	Make a group by right clicked column. The group is located under the last position of current group hierarchy.
	**Hide Group By Box**	Display/Hide **Group Box** (Figure A.2) on the upper side of the columns. It enables you to make group(s) by drag and drop operation.
	Remove This Column	Remove right clicked column.
	**Column Chooser**	Show Column Chooser box.
	**Best Fit**	Adjust the width of right clicked column.
	**Clear Filter**	Clear filter condition of right clicked column (if column is filtered).
	**Filter Editor**	Open **Filter Builder** window (Figure A.6).
	Best Fit (all columns)	Adjust the width of all columns.

Group Box

The Group Box appears on the upper side of the column (Figure A.2) by choosing the **Group By Box** menu from the right click menu on the grid column. You can drag one of the column you want to group to this box (Figure A.3). Also you can multi-group by repeating same way (Figure A.4).

Figure A.2 Group Box

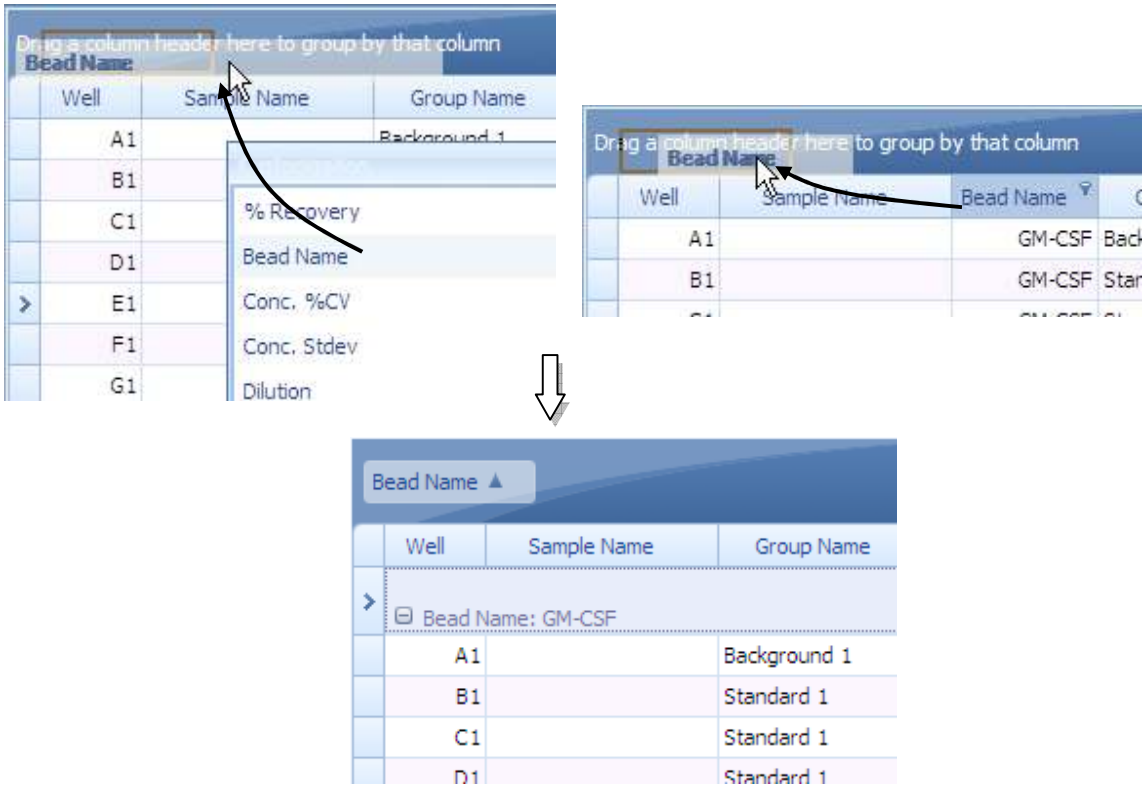


Figure A.3 Group by Drag & Drop

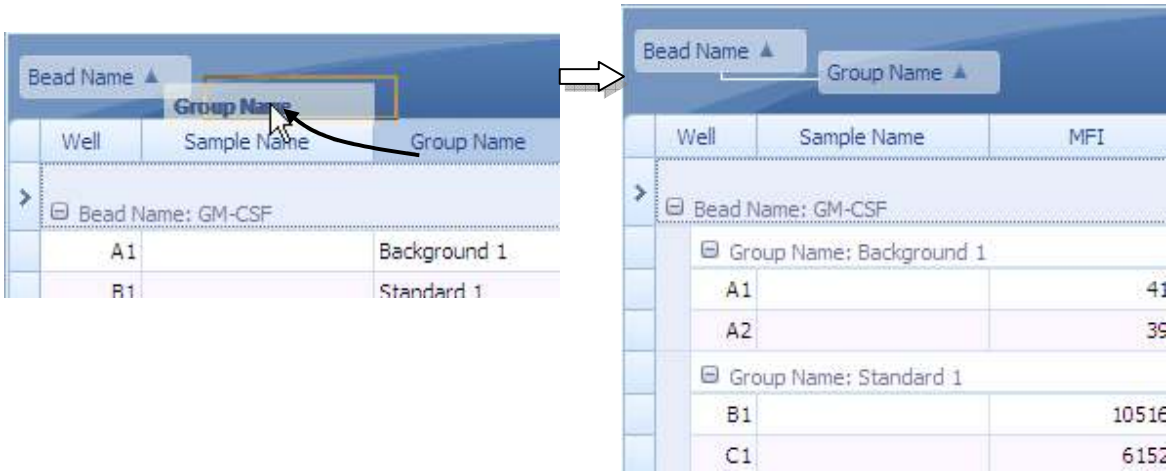


Figure A.4 Multi-Group by Drag & Drop

Group Box Menu

Group Box has context menu. Table A.2 shows the menus.

Table A.2 Main toolbar buttons and functions

Icon	Command	Function
	Full Expand	Expand all group trees.
	Full Collapse	Collapse all group trees.
	Clear Grouping	Clear group and return the group columns to the grid column..

Working with Column Filter

There are two ways to set a filter. The first way is by using the filter drop-down menu from the column (Figure A.5). You can filter the column by selecting the specific data in the column. The second way is by using the **Filter Builder** window (Figure A.6).

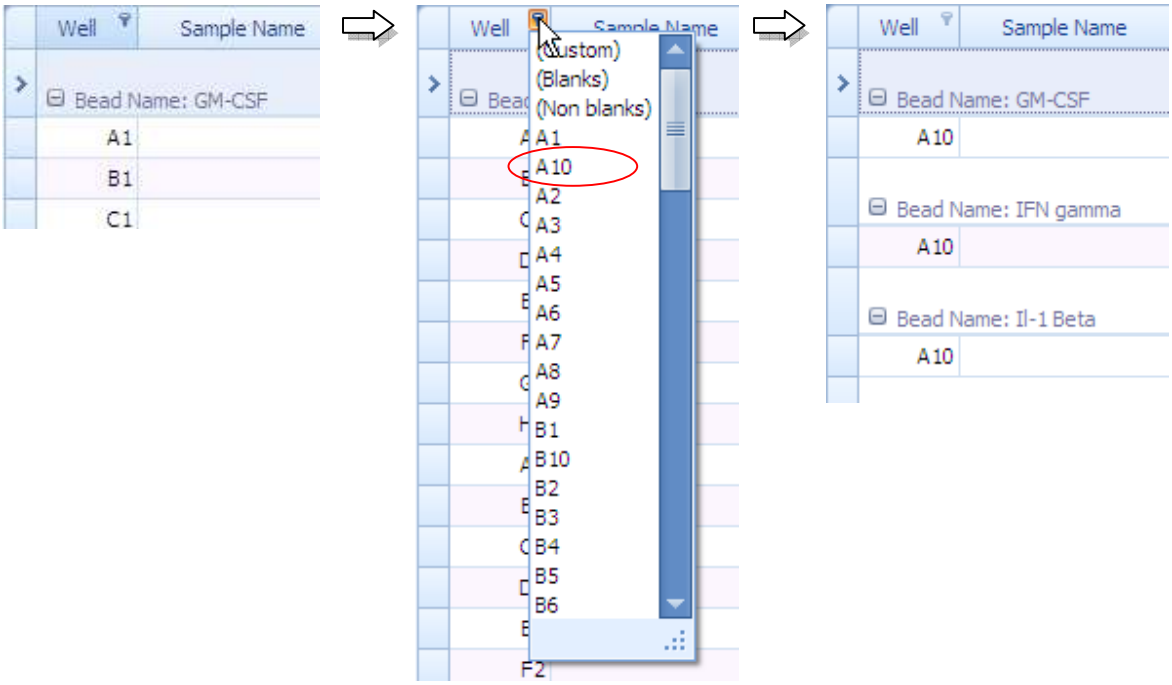


Figure A.5 Direct Filtering from the column

Create Complex Filter Criteria

To construct filter criteria involving multiple columns and various comparison operators, use the filter drop-down list and click **Custom**. This invokes the **Custom AutoFilter** dialog (Figure A.6) which allows you to compare a column with one or two values. To construct using more various operators and multiple conditions, use the filter builder. See '**Basic step for constructing Filter Criteria by using Filter Builder**' paragraph in this section.

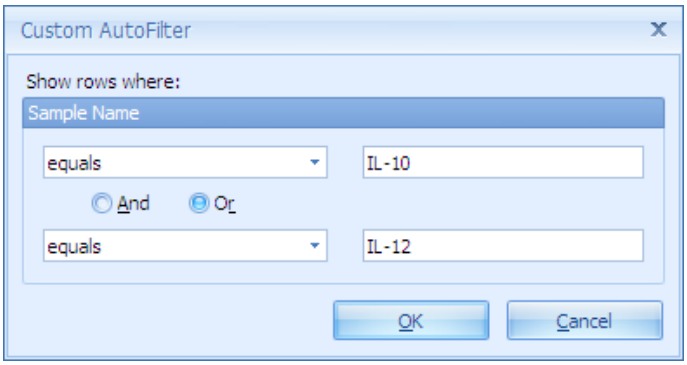


Figure A.6 Custom AutoFilter dialog

Filter Builder Window

By using the filter builder, you can filter the data more specifically. To open the filter builder window, choose **Filter Editor** from the right click menu on the column or click **Edit Filter** button on the bottom of the data grid (Figure A.7).

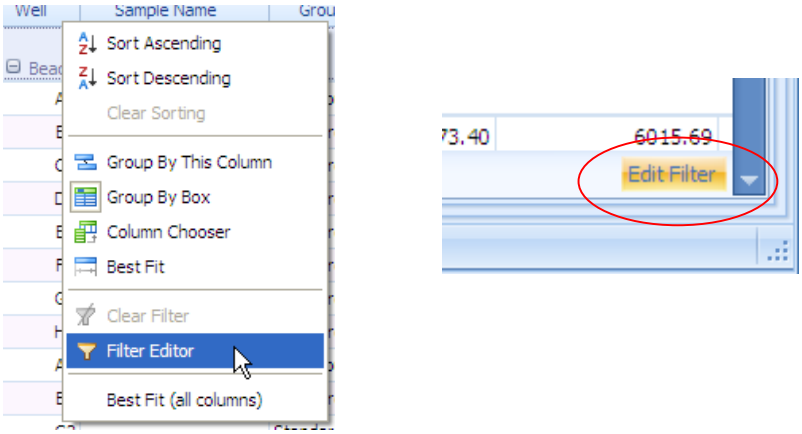


Figure A.7 Opening the Filter Builder

Basic steps for constructing filter criteria with the Filter Builder

1. Right click on the grid column.
2. Choose Filter Editor.
   ⇨ Filter Builder window appears (Figure A.8).

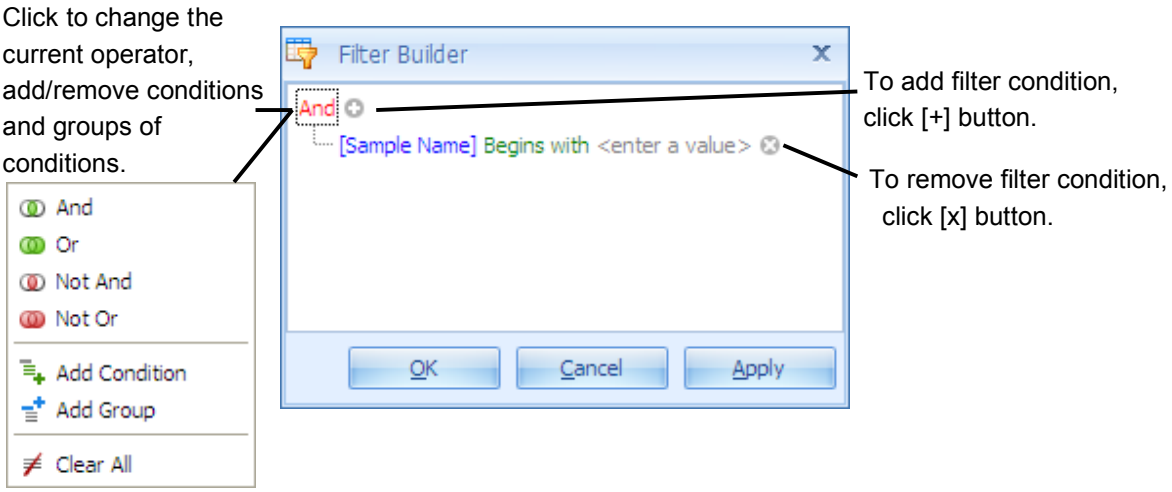


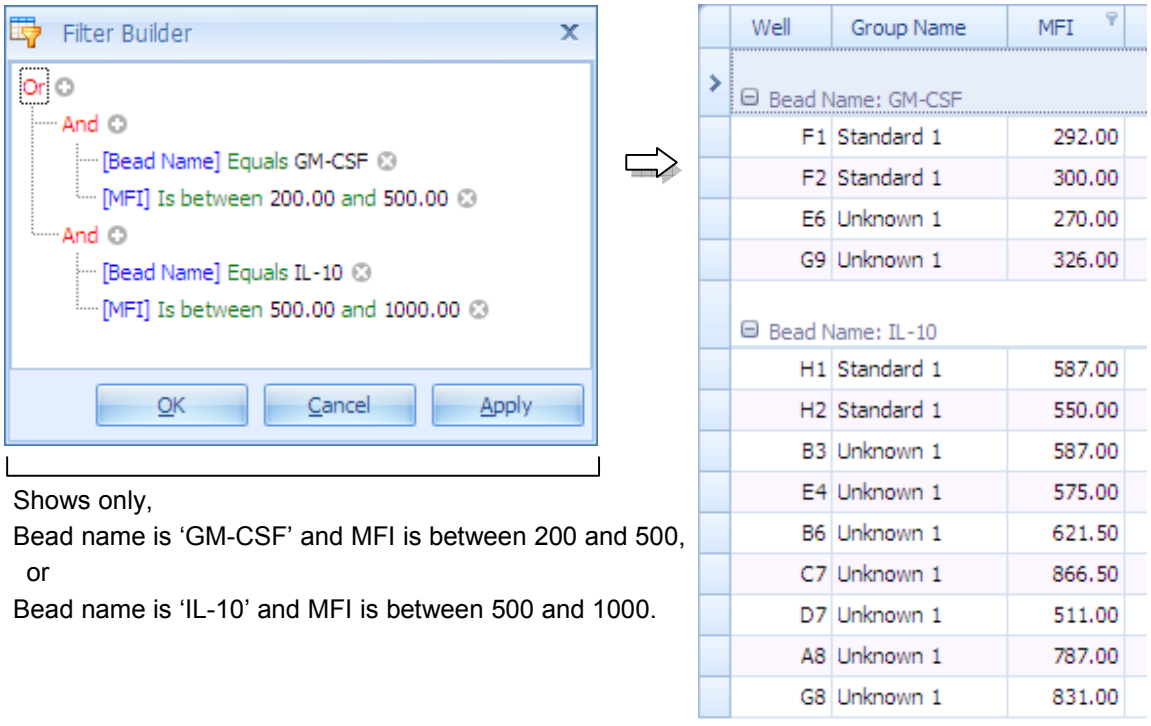
Figure A.8 Filter Builder Window

3. Click **[Sample Name]** and choose one of the column item.
4. Click **Equals** and choose one of the operator. Table A.3 shows the conditions you can choose from.
5. Click **<Enter a value>** and enter the operand value.
6. Click the **Apply** button to apply the filter setting to the grid. If you want to apply and close the Filter Builder window, click the **OK** button.

Table A.3 Available Commands for Filter

Icon	Operator	Function
=	**Equals**	Shows only [Sample Name] = <value>.
≠	**Does not equal**	Shows only [Sample Name] ≠ <value>
>	**Is greater than**	Shows only [Sample Name] > <value>.
≥	**Is greater than or equal**	Shows [Sample Name] = <value> and [Sample Name] > <value>
<	**Is less than**	Shows only [Sample Name] < <value>
≤	**Is less than or equal**	Shows [Sample Name] = <value> and [Sample Name] < <value>

	Is between	Shows only the value which has between first <value> and second <value>
	Is not between	Shows only the outside value which has between first <value> and second <value>
abc	**Contains**	Shows only the value contains <value>
acb	**Does not contain**	Shows only the value does not contains <value>
[a]b	**Begins with**	Shows only the value starts with <value>
b[c]	**Ends with**	Shows only the value ends with <value>
a%c	**Is like**	Shows only [Sample Name] > <value>
a%c	**Is not like**	Shows only [Sample Name] > <value>
	Is blank	Shows only value are blank.
	Is not blank	Shows only value are not blank.
	Is any of	Shows only value which has <value>s.
	Is none of	Shows only value does not have <value>s.



Shows only,
Bead name is 'GM-CSF' and MFI is between 200 and 500,
or
Bead name is 'IL-10' and MFI is between 500 and 1000.

Figure A.9 Example of the complex filter criteria

A.2

Print Preview Menu

Print preview allows you to zoom, navigate, print out, set printing options, export and other useful tasks (Figure A.10).

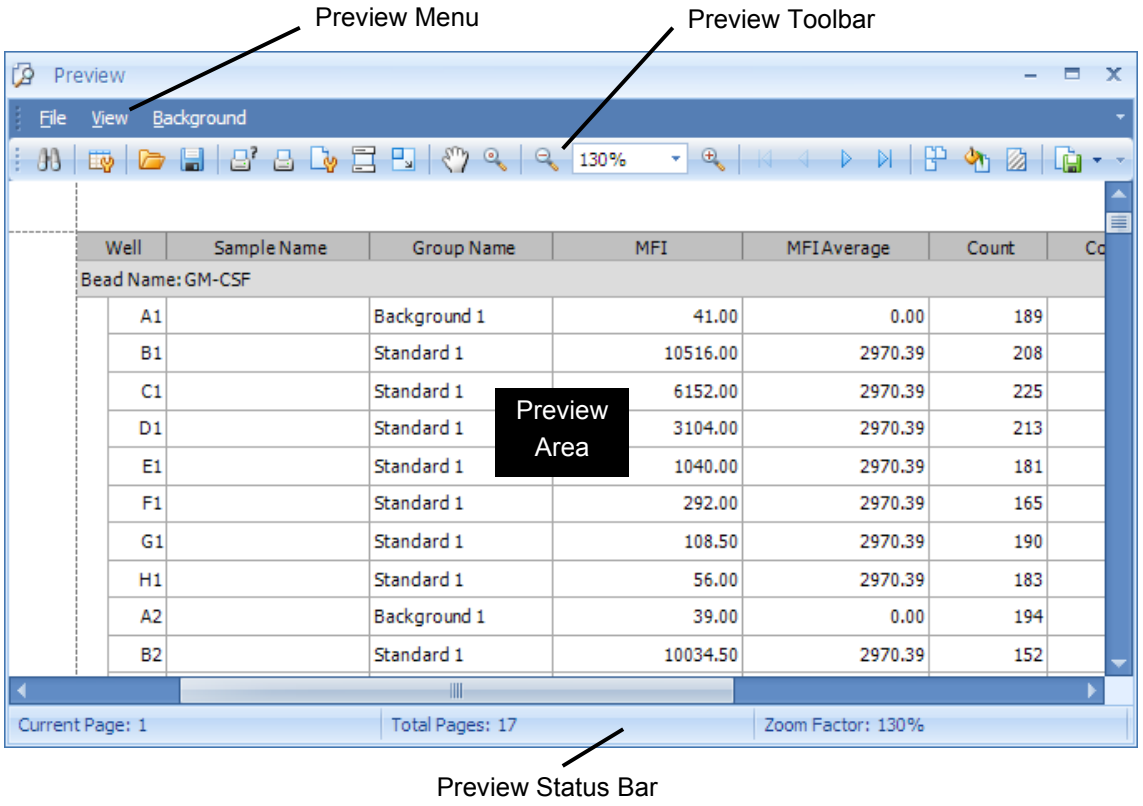
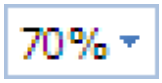


Figure A.10 Print Preview Window

Table A.4 Preview Toolbar buttons and functions

Icon	Command	Function
	**Search**	Search specific word or value from the preview document.
	**Customize**	Customize the printing items.
	**Open**	Open preview document files(*.prnx).

	**Save**	Save preview document by *.prnx format.
	**Print…**	Open print dialog.
	**Print**	Print the preview document.
	**Print Setup…**	Open print setup dialog.
	**Header and Footer**	Set up header and footer options (Figure A.10).
	**Scale**	Set page scale.
	**Hand Tool**	User hand icon
	**Magnifier**	User magnifier
	**Zoom Out**	Zoom out the preview document.
	**Zoom**	Set zoom size from the drop-down list.
	**Zoom In**	Zoom in the preview document.
	**First Page**	Show first page.
	**Previous Page**	Show previous page.
	**Next Page**	Show next page
	**Last Page**	Show last page.
	**Multiple Pages**	Select multi pages to preview.
	**Color…**	Open color picker and set the document background color.

	Water Mark…	Open water mark setting dialog (Figure A.10).
	Export Document…	Export the document by selected format. PDF, HTML, MHT, RTF, Excel, CSV, Text, Image
	Send via E-Mail…	Export the document by selected format, and send it via e-mail. PDF, MHT, RTF, Excel, CSV, Text, Image
	Exit	Close preview window.

Insert Header/Footer

To insert header/footer into your printing document, open **Header and Footer** dialog (Figure A.11). Select header or footer radio button, then input text or items from the header/footer toolbar (Table A.5) in the left, center or right text box.

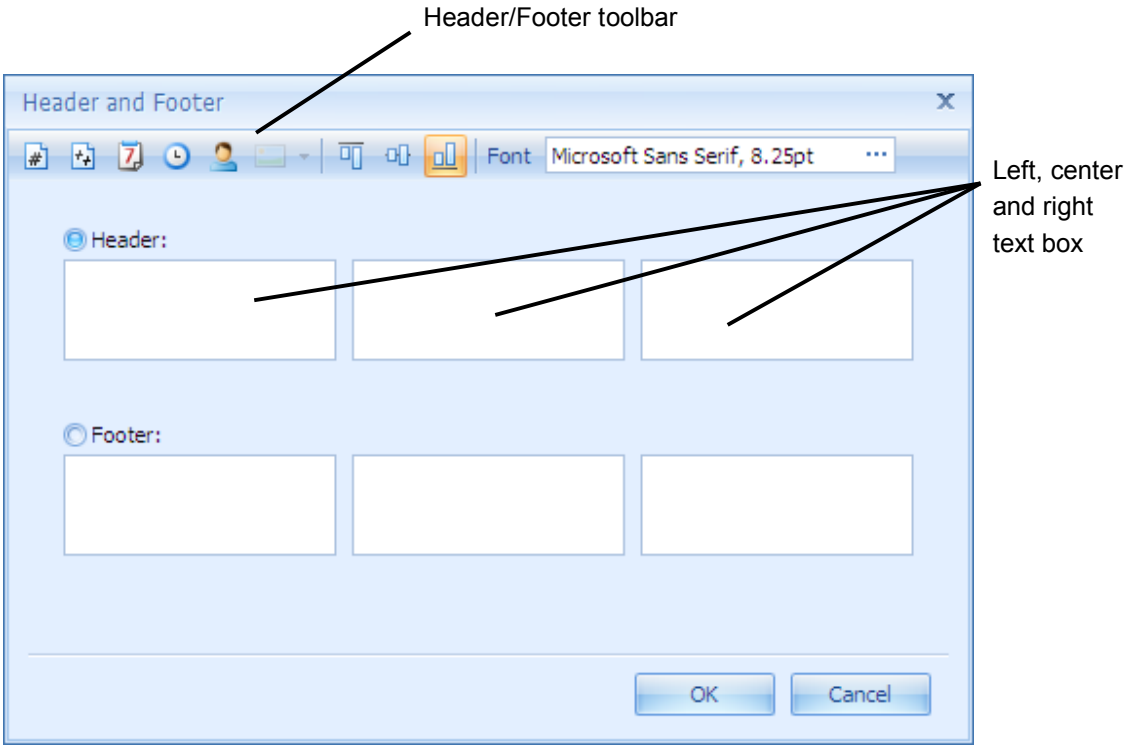


Figure A.11 Header and Footer dialog

Table A.5 Header and Footer Toolbar buttons and functions

Icon	Command	Function
	**Page Number**	Insert page number.
	**Page # of Pages #**	Insert '(current page) of (total pages)' type page number.
	**Date Printed**	Insert date printed.
	**Time Printed**	Insert time printed.
	**User Name**	Insert user name who login the windows.
	Image	Insert the image.
	**Align to Top**	Align all headers/footers to the top level.
	**Align to Center**	Align all headers/footers to the center level.
	**Align to Bottom**	Align all headers/footers to the bottom level.
	Font	Open font dialog for the header and footer font.

Insert Water Mark

To insert water marks into your printing document, open **Water Mark** dialog (Figure A.12). There are two types of watermarks you can insert in your document, one is 'Text' and another is 'Picture'. They are separated into two tabs. To insert a text watermark, use 'Text Watermark' tab. To insert a picture watermark, use the 'Picture Watermark' tab.

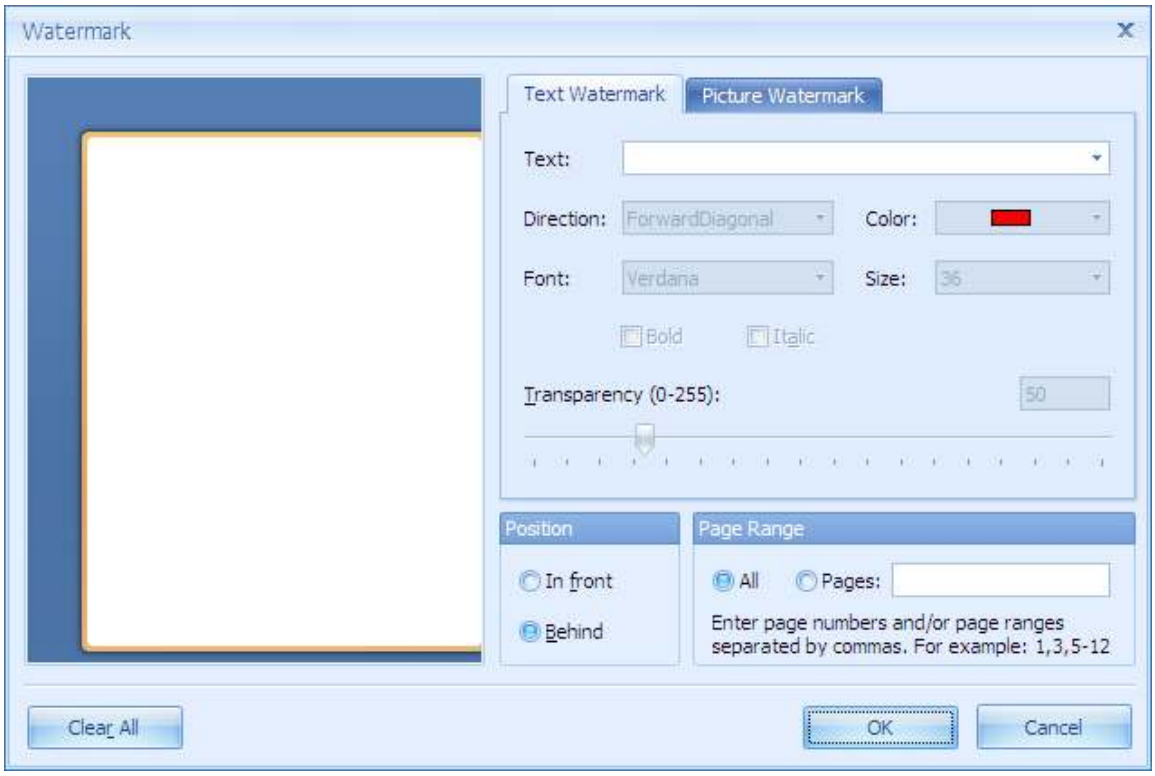


Figure A.12 Watermark dialog

Table A.6 Text Watermark properties

Property	Function
Text	Input text word in the text box or select predefined words from the drop-down list Predefined words: ASAP, CONFIDENTIAL, COPY, DO NOT COPY, DRAFT, EVALUATION, ORIGINAL, PERSONAL, SAMPLE, TOP SECRET, URGENT
Direction	Select text direction from one of the followings: Horizontal, Vertical, BackwardDiagonal, ForwardDiagonal
Color	Open color picker and choose text font color.
Font	Open font dialog and choose text font.
Size	Specify text font size.
Transparency	Set transparency for the insert text.
Position	Select text position, In front or Behind.
Page Range	Set page range for the text water mark.

Table A.7 Picture Watermark properties

Property	Function
Load image…	Open file open dialog and specify the image file to be inserted.
Size mode	Select one of the size mode from followings. Clip: Insert the image as same size as original image. Stretch: Stretch the image to horizontal direction. Zoom: Zoom the image to the page.
Horizontal alignment	Set horizontal alignment, left, center or right.
Vertical alignment	Set vertical alignment, left, center or right.
Tiling	Fill up the page by the image.
Transparency	Set transparency for the insert image.
Position	Select image position, In front or Behind.
Page Range	Set page range for the image water mark.

Bead Name: GM-CSF						
A1	Background 1	41.00	0.00	189	103.94	84.27
B1	Standard 1	10516.00	2970.39	208	10429.40	2843.14
C1	Standard 1	6152.00	2970.39	225	4908.06	2843.14
D1	Standard 1	3104.00	2970.39	213	2567.05	2843.14
E1	Standard 1	1040.00	2970.39	181	1211.88	2843.14
F1	Standard 1	292.00	2970.39	165	600.61	2843.14
G1	Standard 1	108.50	2970.39	190	345.86	2843.14
H1	Standard 1	56.00	2970.39	183	203.36	2843.14
A2	Background 1	39.00	0.00	194	64.60	84.27
B2	Standard 1	10034.50	2970.39	152	9609.67	2843.14
C2	Standard 1	6299.00	2970.39	246	5042.17	2843.14
D2	Standard 1	2990.50	2970.39	252	2491.46	2843.14
E2	Standard 1	1094.00	2970.39	223	1249.38	2843.14
F2	Standard 1	300.00	2970.39	217	609.27	2843.14
G2	Standard 1	104.00	2970.39	259	336.75	2843.14
H2	Standard 1	55.00	2970.39	202	199.04	2843.14
A3	Unknown 1	37.00	540.89	193	<64.60	671.22
B3	Unknown 1	66.00	540.89	199	240.47	671.22
C3	Unknown 1	39.00	540.89	247	64.60	671.22
D3	Unknown 1	41.00	540.89	183	103.94	671.22
E3	Unknown 1	45.00	540.89	201	143.07	671.22
F3	Unknown 1	39.00	540.89	213	64.60	671.22
G3	Unknown 1	45.00	540.89	207	143.07	671.22
H3	Unknown 1	51.00	540.89	177	180.04	671.22
A4	Unknown 1	112.00	540.89	226	352.75	671.22
B4	Unknown 1	4911.00	540.89	203	3865.87	671.22
C4	Unknown 1	5011.00	540.89	220	3944.48	671.22
D4	Unknown 1	5591.00	540.89	262	4418.11	671.22
E4	Unknown 1	3070.00	540.89	165	2544.35	671.22
F4	Unknown 1	1129.00	540.89	238	1273.49	671.22
G4	Unknown 1	107.50	540.89	182	343.86	671.22
H4	Unknown 1	5578.00	540.89	241	4407.15	671.22
A5	Unknown 1	92.00	540.89	204	310.71	671.22
B5	Unknown 1	106.50	540.89	200	341.85	671.22
C5	Unknown 1	65.00	540.89	172	237.15	671.22
D5	Unknown 1	3989.50	540.89	232	3177.84	671.22
E5	Unknown 1	1808.00	540.89	218	1722.64	671.22
F5	Unknown 1	119.00	540.89	179	366.03	671.22
G5	Unknown 1	111.00	540.89	211	350.80	671.22
H5	Unknown 1	59.00	540.89	201	215.54	671.22
A6	Unknown 1	2426.50	540.89	218	2122.04	671.22
B6	Unknown 1	186.00	540.89	219	471.89	671.22
C6	Unknown 1	43.00	540.89	202	126.21	671.22
D6	Unknown 1	113.00	540.89	218	354.68	671.22

Figure A.13 Example of the text and image watermark

APPENDIX **B**

The toolbars that are available depend on the types of windows that are open in the main display area.

B.1

Main File Menu and Toolbar

Table B.1 Main File menu and toolbar

Menu Bar Command	Main Toolbar Button	Function
File → Open		Displays the Open dialog box so that a Luminex results file (.csv, .lxd), BioPlex file (.xls) or MasterPlex® EX file (.mlxe) may be opened.
File → Close		Close currently opened plate data file.
File → Save		Save currently opened plate data.
File → Save as	-	Save currently opened plate data as different file name.
File → Recent Files	-	List up the files recently opened.
File → Exit	-	Close MasterPlex® application.
Analyte Filter		Valid analyte filter feature.
Virtual Plate		Generate virtual plate. It opens plate dimension input dialog.
Windows → Show Tab style	-	Set tab style window display
Windows → Cascade	-	Arrange the window by cascade style.
Windows → Tile Horizontal	-	Arrange the window by horizontal style.
Windows → Tile	-	Arrange the window by vertical style.

Vertical		
Tools → Applications	-	Open application license information dialog.
Tools → Plugins	-	Open plugin license information dialog.
Tools → User Management	-	Open user management dialog. (For 21 CFR Part 11 module only)
Tools → Log Viewer	-	Open log viewer. (For 21 CFR Part 11 module only)
Tools → Verify files	-	Open verification checker dialog. (For 21 CFR Part 11 module only)
Help → Tutorial	-	Open video tutorial.
Help → Online Support	-	Open support URL by the default browser.
Help → About	-	Display splash screen with application version information.
Look and Feel	-	Change application skins.

B.2
Plate Tab Toolbar

The Plate tab toolbar is available on the top of the well grid in the plate tab.

Figure B.2 Plate toolbar

Table B.2 Plate toolbar buttons and functions

Menu Bar Command	Toolbar Icon	Function
Background		Mark selected wells as Background.
Control		Mark selected wells as Control.

Treatment		Mark selected wells as Treatment.
Unmark		Unmark selected wells.
Subtract Background		Toggle subtract background function.
Link One vs. Multi		Link between one control group and multiple treatment group.
Link adjacent multiples		Link adjacent control groups and treatment groups.
Auto Fill		Open Auto Fill dialog.
Quality Control Manager		Open Quality Control Manager. (Optional module)
Template Manager		Open template manager.
Plate Preferences		Open plate preference dialog.

B.3

Data Table Tab Toolbar

The Data Table toolbar is available on the top of the data grid in the Data Table tab.

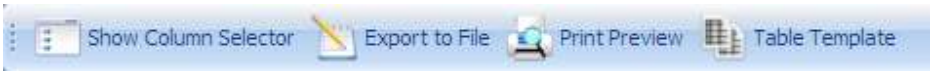


Figure B.4 Calculation toolbar

Table B.4 Calculation toolbar buttons and functions

Menu Bar Command	Toolbar Button	Function
Show/Hide Columns Selector		Show or hide columns selector.
Export to File		Export data table by selected format. Format: Excel, CSV, PDF, HTML, Text
Print Preview		Open print preview window
Table Template		Open table template dialog

B.4

Chart Tab Toolbar

The chart toolbar is available on the top of the chart view area in the chart tab.

Figure B.5 Chart toolbar

Table B.5 Chart toolbar buttons and functions

Menu Bar Command	Toolbar Button	Function
Replicate View		Toggle replicate view mode.
Analyte Selector		Shows drop-down list for all analytes.
Well Selector		Shows mini-sized plate view.
Chart Gallery		Shows drop-down list of available chart format.
Color Palette		Shows drop-down list of available palette.
Chart Properties		Open chart properties dialog.
Chart Template		Open chart template manager.
Print Preview		Open print preview.

B.5

Export Manager Tab Toolbar

The Export Manager toolbar is available on the top of the preview area in the export manager tab.

Figure B.5 Chart toolbar

Table B.6 Chart toolbar buttons and functions

Menu Bar Command	Toolbar Button	Function
Print		Print current displayed document.