Thermo Scientific

FILLit™ Software for Multidrop™ Combi

User Manual

Software version 2.0

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Thermo SCIENTIFIC

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About the User Manual

Intended users

The user manual has been written for the users of the Thermo Scientific Multidrop Combi reagent dispenser and provides information on Thermo Scientific FILLit Software for Multidrop Combi. The manual contains the operating instructions for version 2.0 of the software.

Read the manual in its entirety before using the software.

For more information

For instrument-related issues, refer to the *Thermo Scientific Multidrop Combi User Manual* (Cat. no. N05616). The software user manual can be found in PDF format on the software installation USB stick.

Please refer to the printed user manual for the latest information.

For the latest information on products and services, visit our website at:

http://www.thermofisher.com

http://www.thermofisher.com/multidrop

In an effort to produce useful and appropriate documentation, we appreciate your comments on this user manual to your local Thermo Fisher Scientific representative.

Warning and other markings used in the documentation

The following symbols and markings appear in this user manual.

Caution Risk of damage to the instrument, other equipment or loss of performance or function in a specific application.

Note Marks a tip, important information that is useful in the optimum operation of the system, or an item of interest.

Tip Gives a helpful hint for getting the most out of the software functionality.

Chapter 1
Introduction

Thermo Scientific FILLit Software

FILLit Software is used to control the Multidrop Combi reagent dispenser.

The software provides features needed to create, open and run dispensing protocols, control the instrument, and to transfer protocols between the workstation (PC) and the instrument. The plate templates cover the most common plate formats. The software also lets you edit existing protocols.

Creating a protocol is effortless. The protocol steps are simply added to a step tree while their parameters can be viewed and defined in one window.

With the software you can:

- Open, create and edit dispensing protocols
- Run a protocol directly from the software with the instrument
- Use dispense, shake, prime, empty and pause protocol steps
- Control the instrument, for example, to prime and empty the dispensing system
- Transfer protocols between the workstation and instrument
- Create and print reports

The dispensing protocols are created and then stored in the file system on the workstation using the software. Once you have created a protocol, you can run it directly from the software or transfer it to the instrument. The workstation and the instrument only have to be connected to each other when protocols are run directly from the software or when protocols are transferred. This lets you create and edit protocols independently without a connection to the instrument.

Figure 1-1. Operation principle

Thermo Scientific Multidrop Combi

The Multidrop Combi (Figure 1-2) is an automatic, programmable, eight-channel bulk reagent dispenser for microvolume dispensing. It has a peristaltic pump for rapid and continuous dispensing of liquids into various microplates. It can dispense 1 to 8 different reagents from external liquid reservoirs into different rows and can be used in several applications, for example, in high-throughput screening, and genomic, proteomic and cell-based assays and ELISA.

Figure 1-2. Multidrop Combi microplate dispenser

The instrument is available in the following configurations:

- Multidrop Combi, 100–240 V 50/60 Hz (Cat. no. 5840300)
- Multidrop Combi with SMART 2, 100–240 V 50/60 Hz (Cat. no. 5840320)

For more information, see the *Thermo Scientific Multidrop Combi User Manual* (Cat. no. N05616).

Chapter 2
Installing FILLit Software

This chapter contains information on installing FILLit Software.

Before installation

Read these instructions before you attempt to install FILLit Software.

Note Failure to follow these instructions may lead to an unsuccessful installation of FILLit Software.

Checking the PC requirements

The table below lists the minimum PC requirements for FILLit Software.

Table 2-1. Minimum PC requirements

Minimum PC requirements	
Supported operating systems	Microsoft Windows 7 with Service Pack 1 or later, Microsoft Windows 8.1 and Microsoft Windows 10
Disk space	0.5 GB free disk space
Processor	Intel Pentium (or equivalent), 1 GHz or
faster Memory	1 GB RAM
Serial or USB ports available	1
Pointing device	Mouse or equivalent is necessary
Monitor / color settings	XVGA monitor with 1024 x 768 resolution

If you do not have the correct Service Packs installed, you can download them from the Microsoft website at:

http://www.microsoft.com

Checking Microsoft Windows regional settings

The Microsoft Windows regional format should be set to *English (United States)* or *English (United Kingdom)* before installing FILLit Software. The regional settings can be accessed in the Windows Control Panel:

Windows 7:

Start > Control Panel > Region and Language > Formats > Format > **English**

Windows 8.1:

Charms bar > Settings > Change PC Settings > Time and Language > Region and language > Country or region > **United Kingdom** or **United States**

Windows 10:

Settings menu > Time and Language > Region and language > Country or region > **United Kingdom** or **United States**

Installing

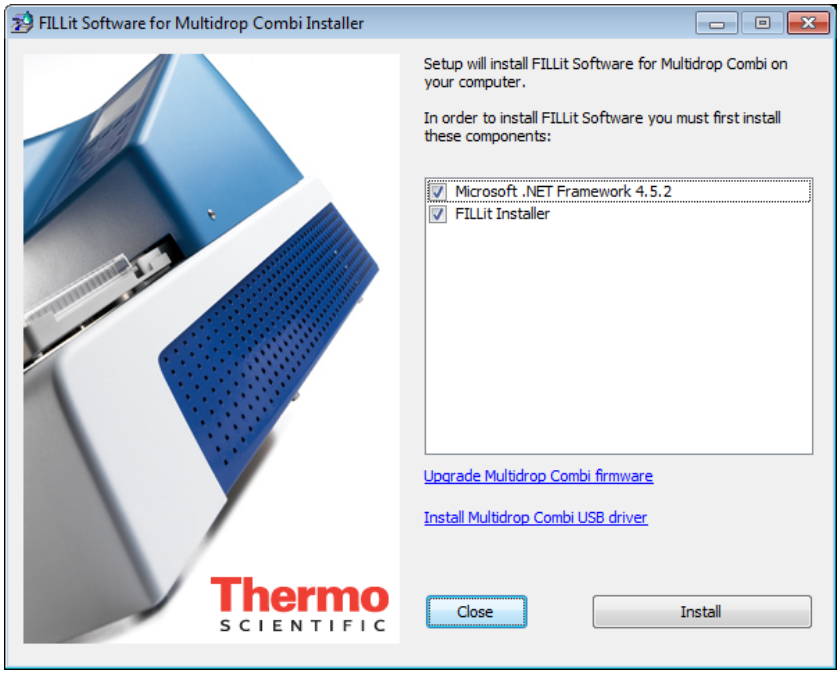
This section guides you through the software installation procedure.

Note FILLit Software cannot be installed on a network drive.

Note You must be logged on to your computer with Windows administrator rights to install FILLit Software.

Note You can stop the installation procedure at any stage by clicking **Cancel**. The setup will roll back your system to the initial state.

1. Check that the PC requirements in Table 2-1 are met.
2. Insert the FILLit Software installation USB stick into a USB port on your PC.
3. The **FILLit Software Installer** window appears automatically. If it does not appear, launch the installation from the USB stick by double-clicking the *Setup.exe* file.



4. FILLit Software Installer checks that all the software and system requirements are met and installs the required components:

   - Thermo Scientific FILLit Software, always installed.
   - Microsoft .NET Framework 4.5.2, installed if not found on your PC.

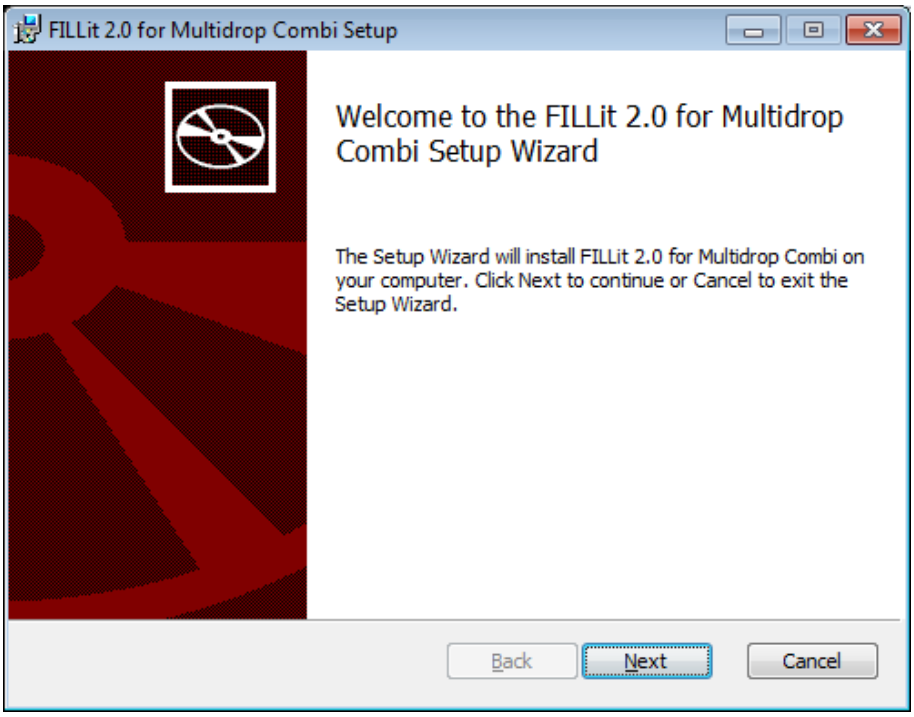
   Close all other programs from your computer and click **Next**.

5. The installation steps are shown.

   You may have to restart your computer after the prerequisites have been installed. However, the setup will inform you about it and the setup will continue after the restart.

Installing the software

When the prerequisites have been installed, the FILLit for Multidrop Combi Setup proceeds with the actual FILLit Software installation.

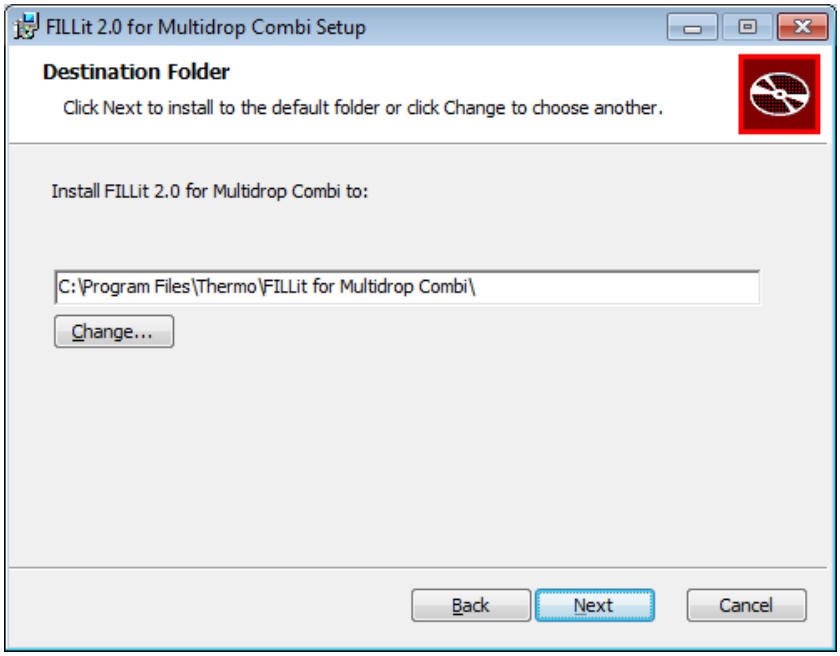


1. The Setup Wizard is launched automatically. The wizard guides you through the entire installation procedure. Click **Next**.

2. Read the End-User License Agreement and agree with it to proceed with the installation. Click **Next**.

3. The wizard automatically suggests file locations for the files to be installed. It is recommended to use these suggestions. Change them

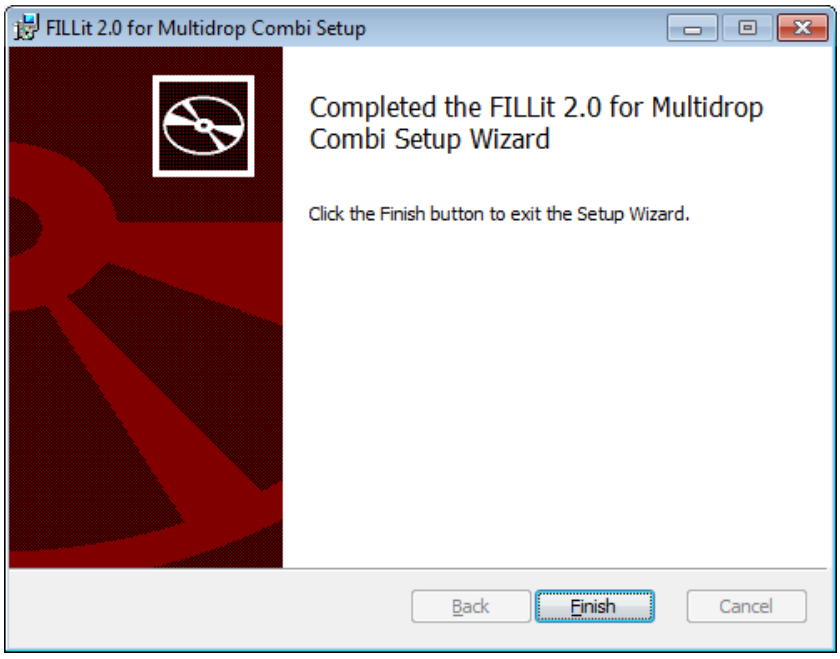
only if absolutely necessary. The recommended free disk space is minimum 0.5 GB.



Click **Change...** to select another folder or drive. Click **Next**.

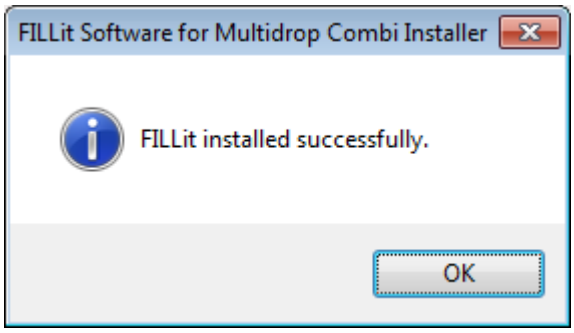
4. The wizard is now ready for the actual installation. Click **Install** to proceed. The installation files are copied to the selected folder.

5. When the installation is complete, you will receive a notification of it.



Click **Finish**.

6.



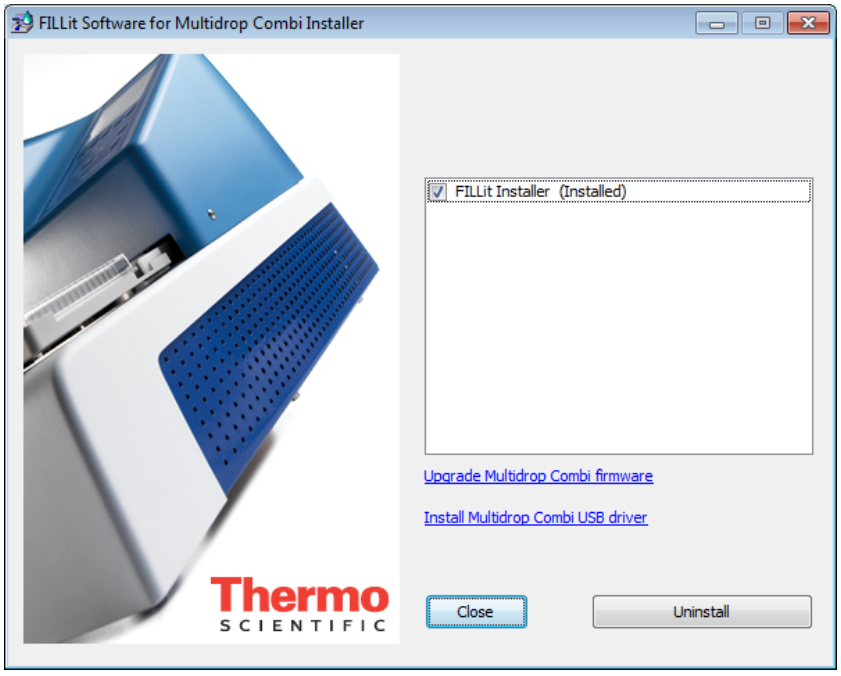
Exit the setup by clicking **OK**.

7. You can now open FILLit Software from the **Start** menu. For more information, see "Starting the software" on page 34.

Installing Multidrop Combi USB driver

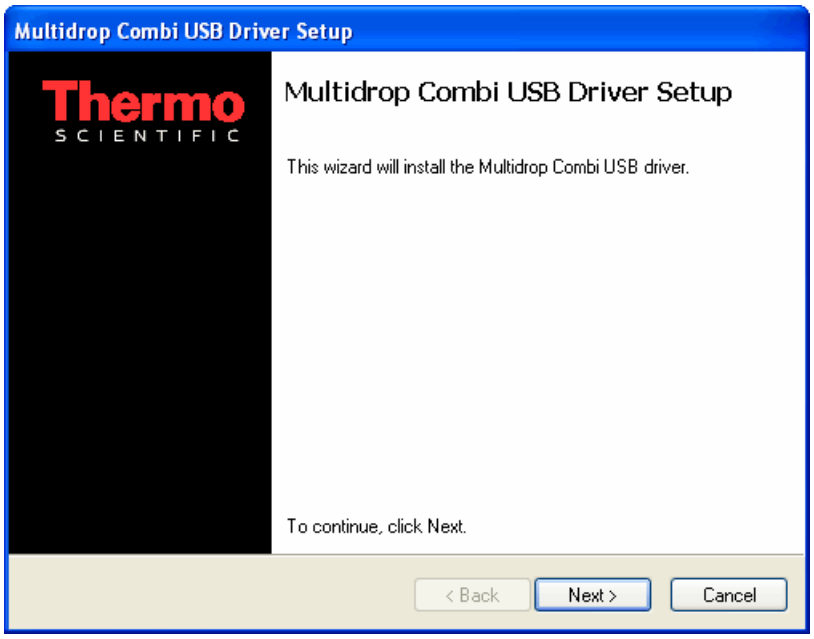
If you are going to connect your instrument to the PC through a USB port, the USB driver must be installed.

1. If you are already in the process of installing the USB driver, proceed with Step 3. Otherwise, insert the installation USB stick of FILLit Software into a USB port on your workstation. The **FILLit Software Installer** dialog opens.



2. Click **Install Multidrop Combi USB driver**.

3. The Multidrop Combi USB Driver Setup is launched.



Click **Next**.

4. You have to first accept the End User License Agreement. Select **I accept this EULA** and click **Next**.

5. The USB Driver is installed. Click **Finish**.

Updating the embedded software

FILLit Software requires that the Multidrop Combi instrument has an embedded software version 2.00.28 or newer. If the Multidrop Combi instrument that you use has an embedded software version older than 2.00.28, you must update its embedded software.

You can check the embedded software version currently installed in the instrument. When you start the instrument, the info text bar on the display shows the current version number. The installation of the embedded software also shows the version number and tells if it is up-to-date or not.

Before you start, check that:

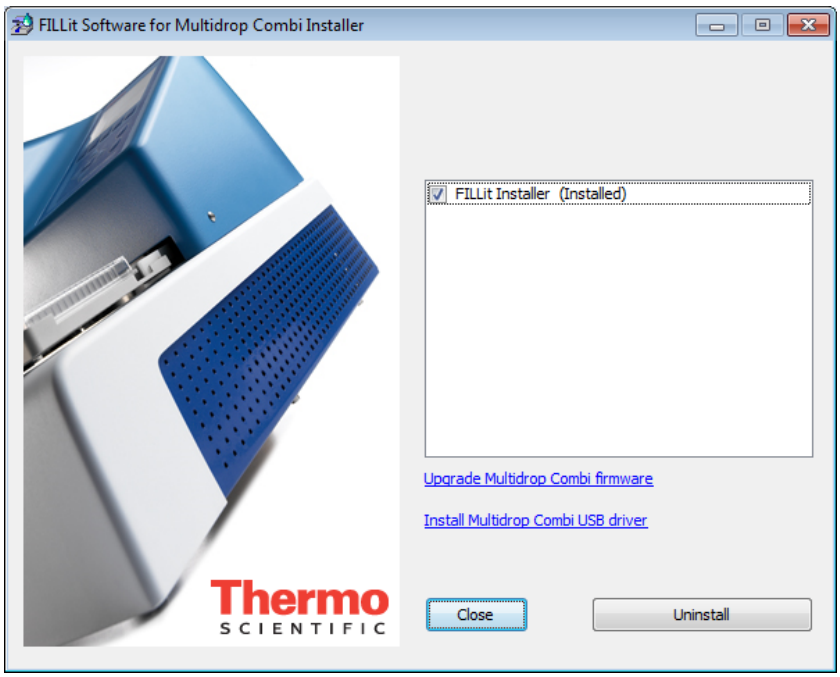
- the workstation is connected to the instrument through a COM (1–9) port or USB port.
- the instrument is switched on.

Caution Do not disconnect the cable or power off the instrument during the embedded software update. Failure to comply may render the instrument unworkable and require contacting the Thermo Fisher Scientific service representative.

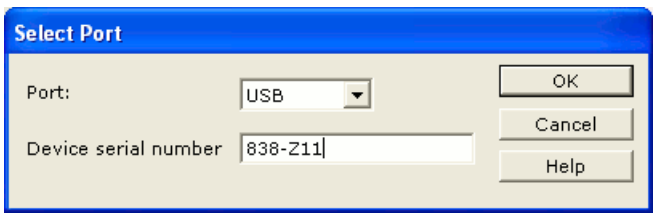
Note FILLit Software for Multidrop Combi version 2.0 works only with the updated embedded software version.

Note After the update you cannot downgrade back to the previous version of the embedded software.

1. If you are already in the process of installing the embedded software, proceed with Step 3. Otherwise, insert the installation USB of FILLit Software into a USB port on your workstation. The **FILLit Software Installer** dialog opens.



2. Click **Upgrade Multidrop Combi firmware**.



3. Select the serial communications port (COM 1–9) or USB port that the instrument is connected to from the **Port** list. When USB is selected, the *Device serial number* field can be left empty. Click **OK**.

Caution Do not switch off or disconnect the instrument during the installation. Otherwise a major service will be required.

Note Upgrading the embedded software may take several minutes.

4. When the update has finished, you are notified of it. Click **OK**.

5. The FILLit Software installation is now completed. Click **OK**.

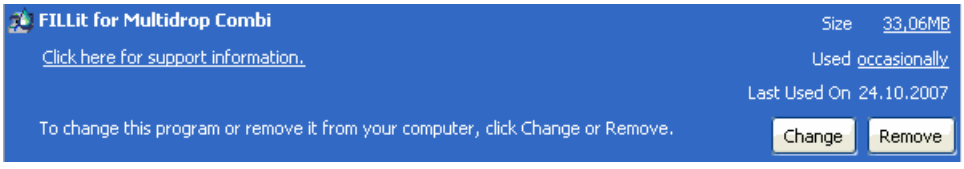
The setup is now completed. The embedded software version is now 2.00.21 or higher. Click **OK**. The FILLit installation is now finished. Click **Exit**.

Installing the software for different instrument models

FILLit Software is published separately for different instrument types. If the same workstation is used to operate different instrument types, such as Multidrop Combi and Multidrop Combi nL, each instrument type requires the installation of the FILLit Software version intended for the instrument type. Multidrop Combi and Multidrop Combi with SMART option can be operated with FILLit Software for Multidrop Combi. The installation procedure is similar for all versions.

Uninstalling the software

You can uninstall FILLit Software by using the “Add-Remove Programs” application in the Windows Control Panel.



Click **Remove**. You are asked to confirm the removal of the program. Click **Yes**. FILLit Software is uninstalled.

Communicating with instruments

The instrument has to be configured in FILLit Software before a connection can be established between the instrument and FILLit Software on the workstation.

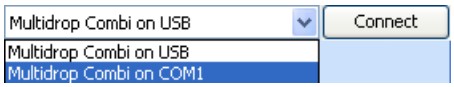
When the instrument and FILLit Software are connected, the software checks the serial number of the instrument and compares it to the configured

instruments. The following sections describe the instrument and software settings. Also see Chapter 8: "*Settings*".

Defining a new instrument automatically

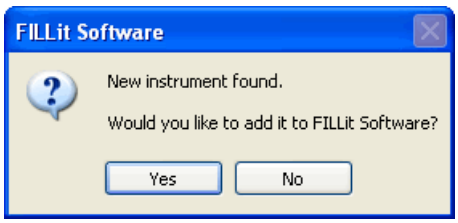
When you connect the workstation and a new instrument for the first time with FILLit Software, the software detects the new instrument automatically. Make sure that the corresponding computer interface, either USB or RS-232 (COM), is selected in the **Options** menu of the instrument. You can then add the instrument to FILLit Software.

1. Connect to the instrument with FILLit Software. Select the instrument from the list based on the communication mode, either USB or COM. For more information, see "Connecting the instrument to the workstation through a COM port" on page 26 or "Connecting the instrument to the workstation through a USB port" on page 27.



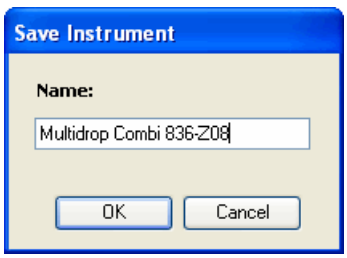
   Click **Connect**.

2. When the software finds the instrument, you are asked if you want to add it to FILLit Software.



   Click **Yes**.

3. Enter a name for the instrument. The default name has the instrument serial number.

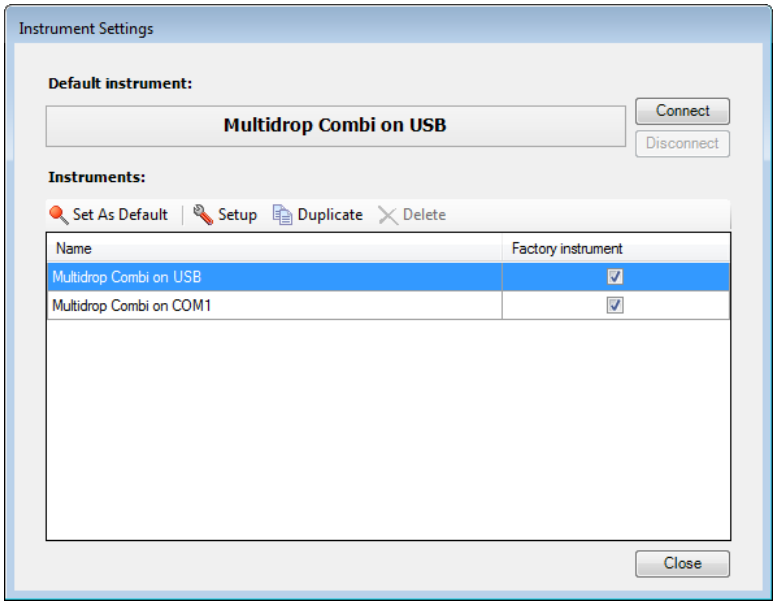


   Click **OK**.

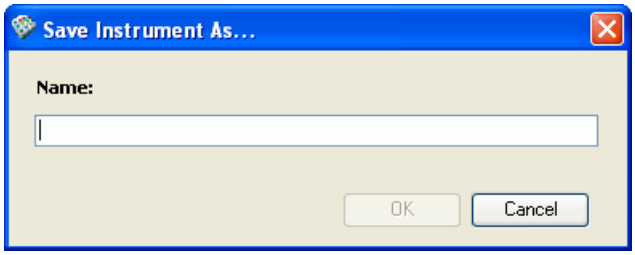
The instrument is added to FILLit Software as the default instrument and the workstation is connected to the instrument.

Defining a new instrument manually

1. Open the **Instrument Settings** dialog by selecting Settings > **Instrument...**. For more information about the dialog, see "Instrument" on page 67.

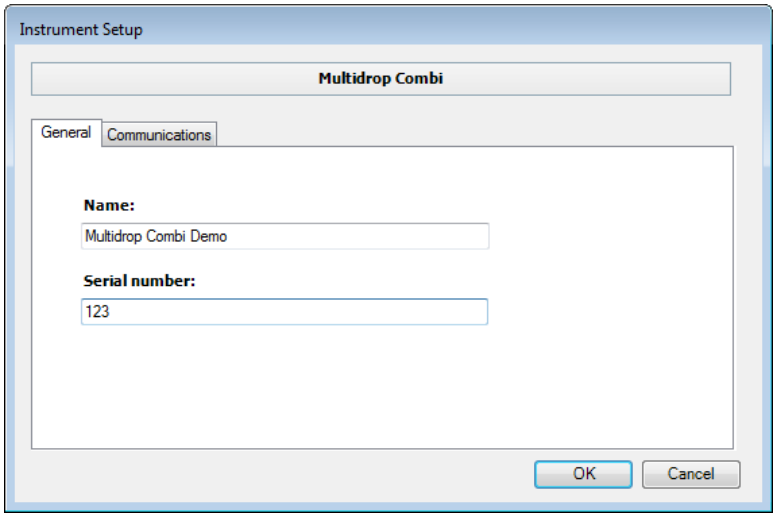


2. If your instrument is not included in the list, add the instrument to FILLit Software: select *Multidrop Combi on USB* or *Multidrop Combi on COM1* and click **Duplicate**. The **Save Instrument As...** dialog opens.



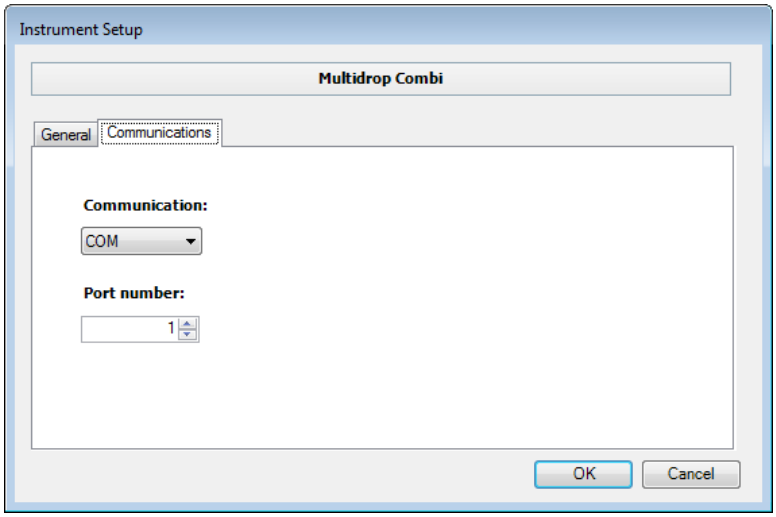
Type the name of your instrument in the field and click **OK**.

3. A duplicate of the selected instrument is added to the Instruments list with the new name and you can now modify it. Select the instrument from the Instruments list and click **Setup...**. The **Instrument Setup** dialog opens.



4. Change the instrument information in the fields (see “General” on page 69).

5. Select the **Communications** tab.

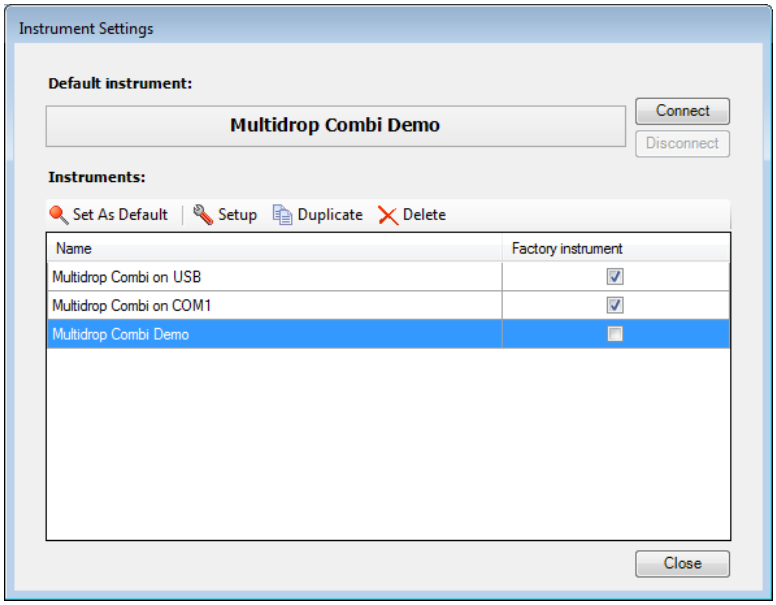


6. Select the data communication options in the fields (see “Communications” on page 69).

7. Click **OK**.

8. You can now change the default instrument to be the newly added instrument. Select the new instrument from the *Instruments* list and click **Set As Default**.

Note You must disconnect from the current default instrument first.



9. Click **Close** to exit the **Instrument Settings** dialog.

Note You can add several new instruments before clicking **Close**.

Connecting the instrument to the workstation through a COM port

The workstation and the instrument can be connected by using an RS-232 C serial cable.

1. Close FILLit Software and shut down the workstation. Switch off the instrument from its mains switch.

2. Connect the serial cable to a free serial (COM) port on your workstation.

Note Check that the port corresponds to the port that is defined for the instrument in the Instruments list. The port is defined in the **Instrument Setup** dialog, under the **Communications** tab.

Note Check that *RS-232* is selected as the computer interface in the **Options** menu of the instrument.

3. Connect the other end of the cable to the SERIAL RS-232 C connector (Figure 2-1) on the back panel of the instrument.

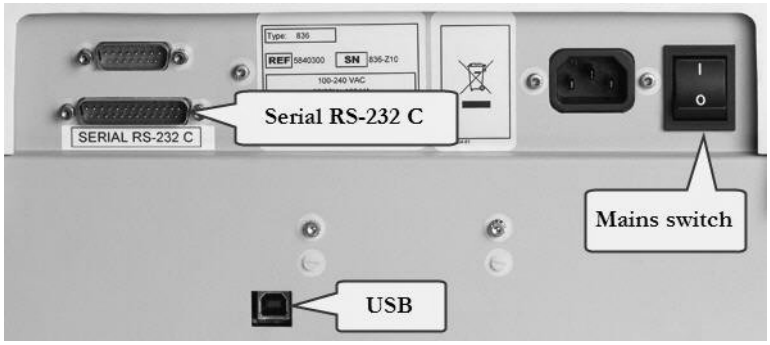


Figure 2-1. Computer and mains power supply connectors in the instrument

4. Switch ON the instrument and then the workstation.
5. Start FILLit Software as described in "Starting the software" on page 34.
6. After startup the instrument is ready for operation.

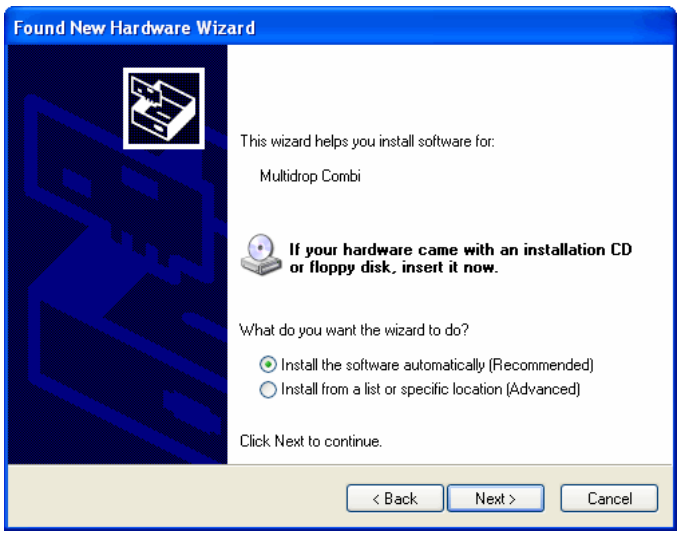
Connecting the instrument to the workstation through a USB port

The workstation and the instrument can also be connected by using a USB cable. You must have the USB driver installed (see Step 1). You should also have the FILLit Software Setup USB stick available.

Note Check that *USB* is selected as the computer interface in the **Options** menu of the instrument control panel.

1. Turn off the instrument.
2. Connect the instrument to the workstation using a USB cable (see Figure 2-1).
3. Turn on the instrument. The computer recognizes the new USB device.

4. Select *No, not this time* and click **Next**.



5. Select *Install the software automatically* and click **Next**. The driver is installed.

Note In case the USB driver does not install automatically, insert the software installation USB stick into a USB port on your workstation and select *Install from a list or specific location*. The driver is located in the *Drivers\USB\x86* folder on the installation USB stick. Select the folder and click **Next**.

6. Click **Finish**. The instrument is now ready for operation.

Chapter 3
User Interface

Navigating in the software

When a dispensing protocol is open, the main window of the software is divided into the following areas (see Figure 3-1):

- The **Protocol** action panel (**1**) has buttons for creating, opening and saving protocols, and for viewing the Help.
- The **Steps** action panel (**2**) has buttons for adding steps to protocols. The adjacent step tree shows the structure of a protocol. The step order corresponds to the order in which the steps are run on the instrument. When you select a step in the step tree, the view on the right-hand panel changes accordingly and you can modify the step parameters. The plate type is the root item in the tree; all the steps are added to it.
- The **Instrument** action panel (**3**) tells whether the instrument is primed and whether the priming vessel and the protective cover are in place. The action panel has instrument control functions to connect or disconnect the selected instrument, prime or empty the dispensing system, and run protocols.
- The right-hand panel (**4**) shows step parameters according to the selection in the step tree. You can view and edit step parameters, plate type properties and plate type settings of a dispensing protocol.
- The menu bar (**5**) has menu commands for software functions and settings as well as for instrument functions and settings (see Chapter 9: "*Menus and Action Panels*").
- The status bar (**6**) shows which instrument the workstation is connected to, the logged-on Windows user, and the current date and time. When the workstation is connected to an instrument, the background color is green, and when not connected, the background color is red.

See "Protocol editing window" on page 30 for an example of the protocol editing window.

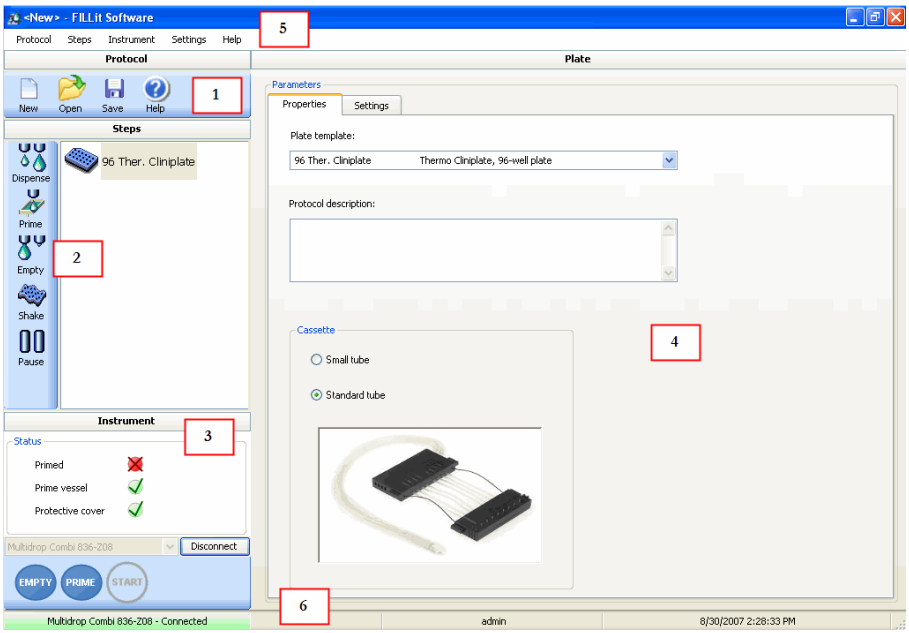


Figure 3-1. Different parts of the main window

Protocol editing window

The following figure shows an example of a dispensing protocol that has been opened in the main window. Plate type is the first item in the step tree. The desired step is added to or selected from the tree. The parameters of the plate or selected step can now be viewed or edited in the main panel.

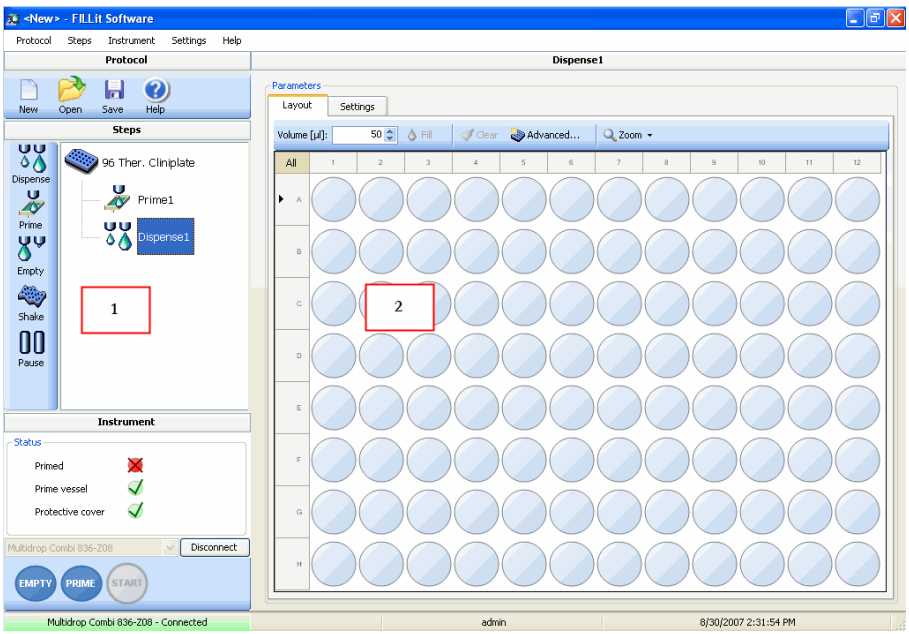


Figure 3-2. Main window for protocol editing

- **1** – Step tree. You can drag-and-drop the steps. To rename or delete a step, right-click on the step.
- **2** – The main panel shows the parameters of the plate or the selected protocol step.

For more information on editing a protocol, see "Editing a protocol" on page 36 and Chapter 5: "*Step Parameters*".

Effective use of the software features

You can speed up your use of the software by using the following features.

Right-click menus

In many cases when using the software, you can open an additional menu by right-clicking the mouse. The menus allow quick access to functions that are relevant to the item you are clicking. For example, you can right-click:

- the *step tree* to add, rename or delete steps
- the *plate map* in the *Dispense* step to add volumes to target wells, to copy and paste volumes , or to clear volumes from the wells
- *text fields* to select, cut, copy and delete text

Entering information without using the mouse

The software requires the use of a mouse, but you can do without one in certain cases. When you are entering information in fields (parameters, text fields, check boxes, and so on), you can use the tabulator on your keyboard instead of the mouse to move from one field to the next.

You can use the arrow keys to select radio buttons or steps in the step tree, change the available values in fields or open the main menus and select menu commands. You can open a menu command by pressing the **Enter** key. You can also use the arrow keys to toggle between tabs in a dialog.

In the *Dispense* step, you can move on the plate map using the arrow keys. You can paint an area by keeping the **Shift** key down while moving with the arrow keys.

Shortcuts

You can select menus by pressing **Alt** and the underlined letter. For example, **Steps** is selected by pressing **Alt+t**.

Some operations have keyboard shortcuts. These are presented in Table 3-1.

Table 3-1. Keyboard shortcuts

Operation	Keyboard shortcut
Open an existing protocol	**Ctrl+O**
Create a new protocol	**Ctrl+N**
Save a protocol	**Ctrl+S**
Close an open dialog	**Esc**
Accept and save changes made through a dialog	**Enter**

Some operations have function key shortcuts. These are presented in Table 3-2.

Table 3-2. Function key shortcuts

Operation	Function key shortcut
Open the Help	**F1**
Rename a protocol step	**F2**
Run a protocol *	**F5**
Prime the dispensing system *	**F6**
Empty the dispensing system *	**F7**
Connect to the default instrument *	**F11**
Disconnect from the default instrument *	**F12**

* Only when connected to the instrument

Drag-and-drop

You can drag-and-drop protocol steps in the step tree under the **Steps** panel. Click on the desired step and while holding your left or right mouse button down, pull the step to a new position in the step tree, and release the button.

Tooltips

Tooltips appear when you move the cursor over a button in a toolbar or an action panel.

When the information icon appears next to a field or a button in a dialog, it means that a precondition related to the task must be fulfilled first. Move the cursor over the icon to view instructions.

Chapter 4
Protocols

A protocol contains all the information required by the instrument to dispense a plate. The information includes a plate template, plate settings, steps and their parameters. The instrument uses the information to determine the actual movements of the plate carrier and pump body, and the dispensing functions. The protocol steps tell the instrument which functions are required (for example, priming, dispensing and shaking) and in which order they should be performed.

A protocol you create can be either an instrument protocol or a multistep protocol. The instrument protocol can only contain one dispense step. Instrument protocols can be downloaded to the instrument and then run on the instrument directly without a remote connection. The instrument protocols can also be uploaded back to the workstation for modification or backup.

The multistep protocol can contain any of the available steps with no limitations. Multistep protocols are stored only on the workstation and cannot be downloaded to the instrument. The protocol itself is run on the workstation while FILLit Software controls the instrument and the steps run on the instrument.

General operational procedure

The general operational procedure with FILLit Software is as follows:

- Start the FILLit Software application.
- Open an existing protocol or create a new one. A new protocol is opened by default at startup.
- Edit the protocol (plate properties, plate settings, and protocol steps) if necessary and save it.
- Transfer protocols if the protocols are needed for the standalone use of the instrument.
- Prime the instrument.
- Run the protocol.

Starting the software

1. Start the software from the **Start** menu:

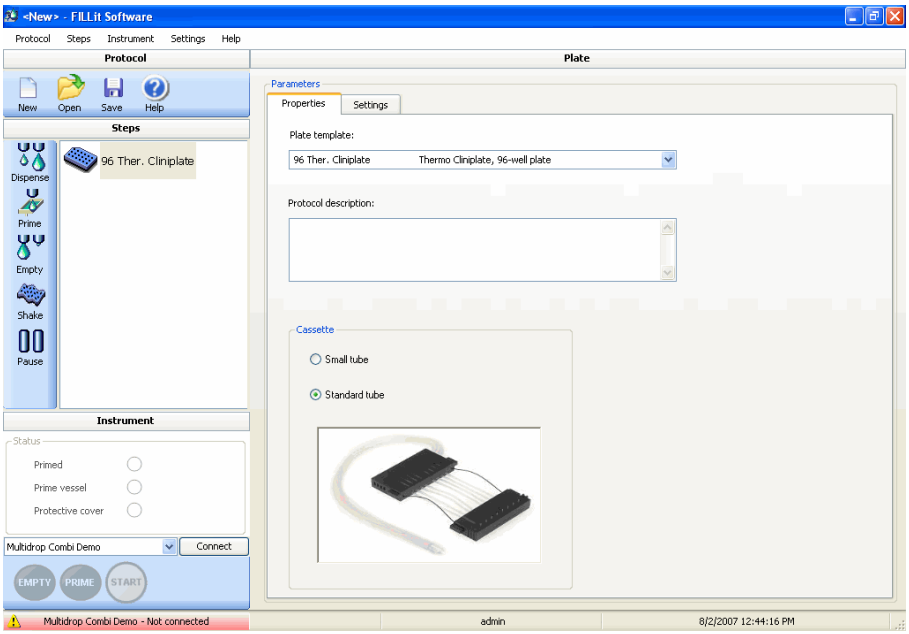
   Start > All Programs > Thermo FILLit Software > **FILLit 2.0 for Multidrop Combi**.

   Or: double-click the FILLit for Multidrop Combi shortcut icon on your desktop.

2. The software starts to load and a splash screen appears.

   The software connects to the default instrument if the **Connect to default instrument at startup** setting is selected from the Settings > **Options...** menu.

When the software is ready for use, the main window opens. You can now create a new protocol (see “Creating a new protocol” on page 35) or open an existing protocol (see “Opening an existing protocol” on page 36).



Creating a new protocol

1. Create a new protocol in one of the following ways:

   - Select Protocol > **New...**.
   - Click the button on the **Protocol** action panel.
   - Press **Ctrl+N**.

   A new empty protocol opens in the main window. The window also opens when you start the software for the first time (see "Protocol editing window" on page 30).

2. Select a plate template (see "Editing plate and protocol properties" on page 36).

3. Give a description for the protocol (see "Editing plate and protocol properties" on page 36).

4. Select the appropriate dispensing cassette type. The available dispensing cassettes depend on the selected plate template. With a 1536–well plate only the small dispensing cassette is available.

5. Define the plate settings, such as dispensing height and offset (see "Editing plate settings" on page 38).

6. Add steps to the protocol (see "Adding new protocol steps" on page 41) and define their parameters (see Chapter 5: "*Step Parameters*").

7. Save the protocol (see “Saving a protocol” on page 43).

Opening an existing protocol

1. Open an existing protocol in one of the following ways:
   - Select Protocol > **Open...**.
   - Click the button on the **Protocol** action panel.
   - Press **Ctrl+O**.

   Windows **File Open** dialog box opens.
2. Select the protocol file (*.pcombi) from the workstation file system.
3. Click **Open**.

The selected protocol opens in the main window.

Editing a protocol

Here is a list of tasks that can be done when editing new or existing protocols. After editing the protocol, save your changes.

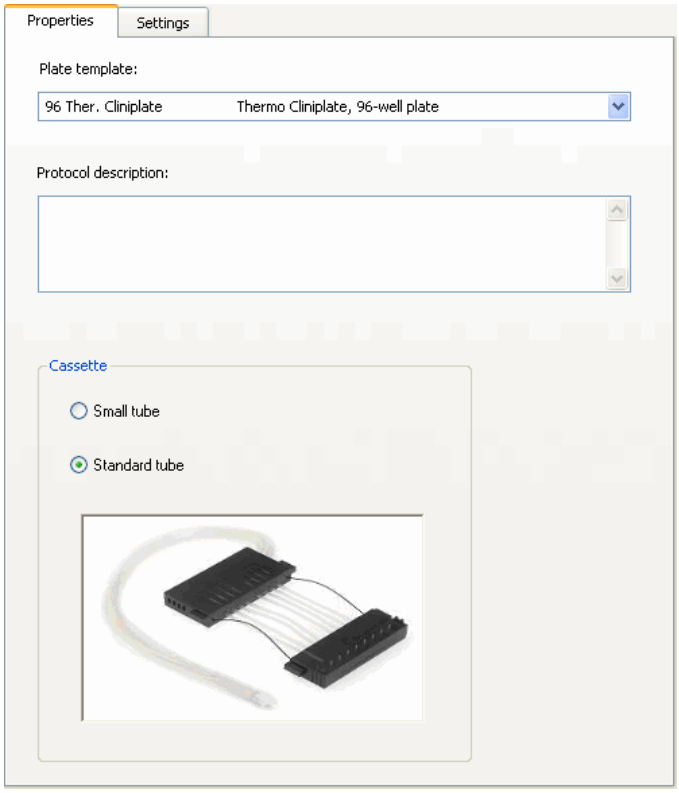
- Check that your dispensing cassette matches the selected plate template.
- Check that the plate template in the protocol matches the actual plates used on the instrument. Create a new plate template or edit the existing one, if necessary (see “Plate template settings” on page 70).
- Edit the plate properties (see “Editing plate and protocol properties” on page 36).
- Edit the plate settings (see “Editing plate settings” on page 38).
- Add, delete or edit protocol steps (see “Adding new protocol steps” on page 41, “Deleting protocol steps” on page 42 and Chapter 5: “*Step Parameters*”).

Editing plate and protocol properties

You can select the plate template used in the protocol and give the protocol a description.

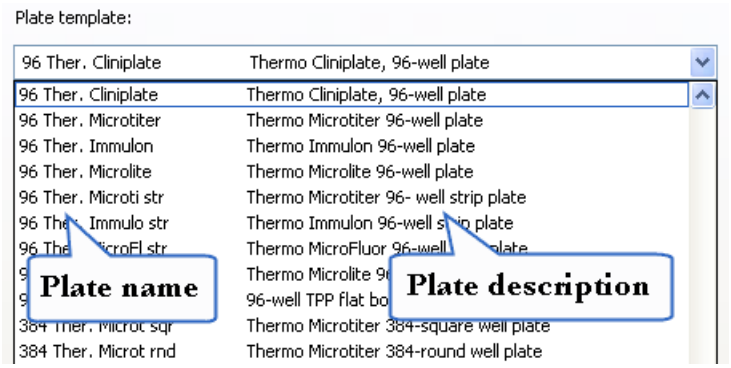
1. Create a new protocol or open an existing protocol (see “Creating a new protocol” on page 35 and “Opening an existing protocol” on page 36).
2. Click the plate in the step tree. The default plate template is shown.

3. Select the **Properties** tab.



4. Select a plate template used in the protocol. You can change the plate template which is selected by default in the list (see “Plate template settings” on page 70).

   The list shows the plate name in the first column and the plate description in the second column. The plate name is transferred with a protocol to the instrument. It is shown in the instrument display when you select the plate type using the instrument control panel.



   After saving the protocol, you can only change to a plate template within the same category, that is, plates with the same number of wells.

The acceptable plates are shown on the green background. The change does not affect other step parameters nor the target well selection of the plate.

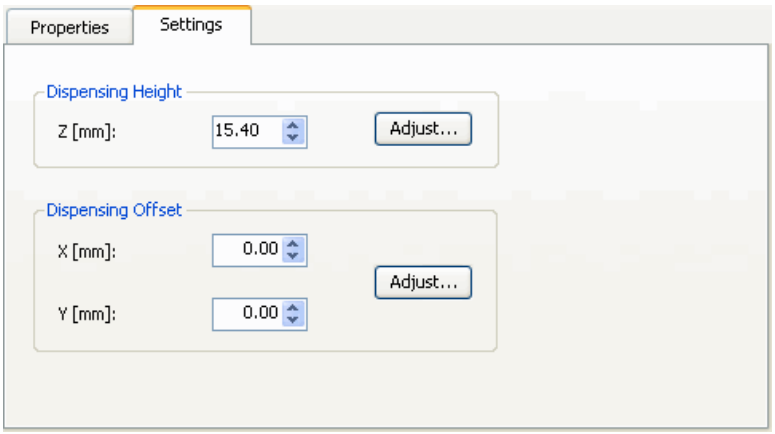
If you change the plate template category, a new protocol is automatically created and the target well selection is cleared. However, the original protocol remains unchanged.

5. Enter a description for the protocol.

6. Select the cassette type which is used for dispensing and installed in the instrument when the protocol is run. You can select either the small tube or standard tube dispensing cassette. *Small tube* is the only option with 1536-well plates.

Editing plate settings

You can set and adjust the dispensing height or the dispensing offset of the plate in the **Settings** tab.



The tab has the following parameters:

- *Dispensing Height*:
  - **Z [mm]** – The default dispensing height of the plate in millimeters.
  - **Adjust...** – Opens the **Dispensing height and offset** dialog when you are connected to the instrument. You can adjust the dispensing height by moving the dispensing pump body (see “Adjusting the dispensing height and offset” on page 39).
- *Dispensing Offset*:
  - **X [mm]** – The default dispensing X offset of the plate in millimeters.

- **Y [mm]** – The default dispensing Y offset of the plate in millimeters.
- **Adjust...** – Opens the **Dispensing height and offset** dialog when you are connected to the instrument. You can adjust the dispensing X/Y offset by moving the dispensing pump body or the plate carrier (see "Adjusting the dispensing height and offset" on page 39).

Adjusting the dispensing height and offset

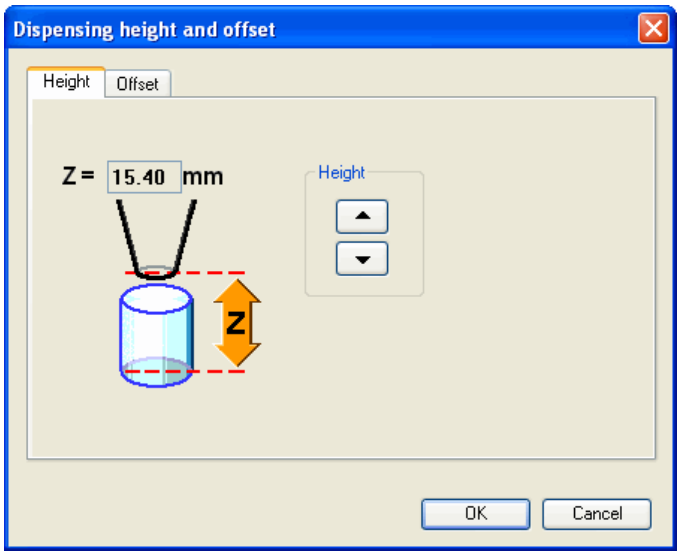
You can adjust the dispensing height and the dispensing offset by moving the lifting mechanism of the dispensing pump body and the plate carrier.

The default dispensing height depends on the plate type. You can change the dispensing height if the plate used is not the standard one defined in the plate template list. The default dispensing X/Y offset is 0.00/0.00 mm. You can change the x- and y-axis offset values if the plate used is not the standard one defined in the plate template list.

Before you start, check that:

- the workstation is connected to the instrument.
- the plate that you want to adjust is in the plate carrier.

1. Open a dispensing protocol or create a new one (see "Opening an existing protocol" on page 36 and "Creating a new protocol" on page 35).
2. Click the plate in the step tree.
3. Select the **Settings** tab and click on **Adjust...**. The **Dispensing height and offset** dialog opens.
4. To adjust the dispensing height, select the **Height** tab.

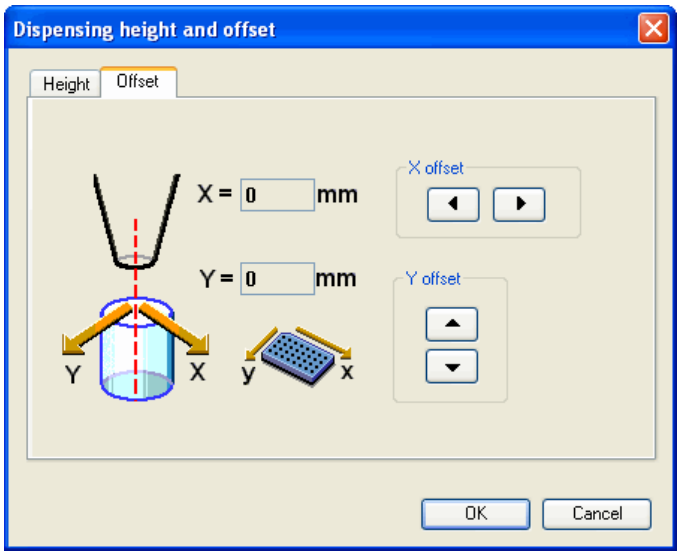


Set the dispensing height in increments of 0.05 mm. The height is the distance from the plate bottom to the dispensing tips when dispensing. The available range varies between 5 and 55 mm depending on the selected plate type. The default dispensing height is 1 mm above the selected plate.

For example, when the plate height is 15 mm and you set the value to 17 mm, it leaves a gap of 2 mm between the dispensing tips and the top of the plate.

Use the *Height* buttons to move the dispensing pump body accordingly. You can also use the up and down arrow keys on your keyboard.

5. To adjust the dispensing offset, select the **Offset** tab.



Set the dispensing offset in increments of 0.05 mm. The offset is the dispensing position distance in the x- and y-axis directions from the well center point.

Use the *X offset* buttons to move the plate carrier accordingly. You can also use the left and right arrow keys on your keyboard.

Use the *Y offset* buttons to move the dispensing pump body accordingly. You can also use the up and down arrow keys on your keyboard.

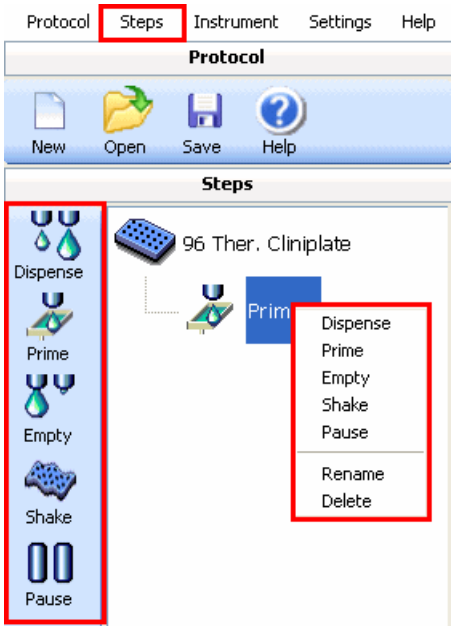
Adding new protocol steps

You can add steps to a new or an existing protocol.

1. Create a new protocol or open an existing protocol (see "Creating a new protocol" on page 35 and "Opening an existing protocol" on page 36).

2. Add steps to the step tree in the order in which you want them to be run. Use one of the following ways:

   - Go to the **Steps** menu and select the step you want to add.
   - Click on the desired step button in the **Steps** action panel.
   - Right-click on the step tree and select the step from the menu.



New steps appear after the last step in the step tree. You can move steps up and down in the step tree structure by dragging and dropping. You can rename steps by right-clicking on a step or by pressing **F2** and by entering a longer and more descriptive name for the step. Also see "Deleting protocol steps" on page 42.

3. Modify step parameters as necessary (see Chapter 5: "*Step Parameters*").

4. Save the protocol (see "Saving a protocol" on page 43).

Deleting protocol steps

You can delete steps from the step tree when the protocol is open.

1. Open the protocol from which you want to delete steps (see "Opening an existing protocol" on page 36).

2. Select the protocol step you wish to delete from the step tree.

3. Right-click on the step and select **Delete**.

Caution Before deleting, always check that you have selected the item you wish to delete.

4. Confirm the step deletion by clicking **Yes**.

Saving a protocol

You can save a protocol in one of the following ways:

- Click on the **Protocol** action panel.
- Select Protocol > **Save**.
- Press **Ctrl+S**.

The protocol is saved with its current name. If you are saving a protocol for the first time, you are prompted to give the protocol a name. Save the protocol before you run it.

You can use letters a to z or A to Z, numbers 0 to 9, and special characters "_" and "-" in the name. The maximum length of the name is 20 characters.

To save a protocol with another name, for example, after modification:

- Select Protocol > **Save As…** and give a new name to the protocol.

The protocols are saved as files in the file system of the workstation (see "Opening an existing protocol" on page 36). The protocol files for Multidrop Combi have the extension .pcombi.

Managing protocols

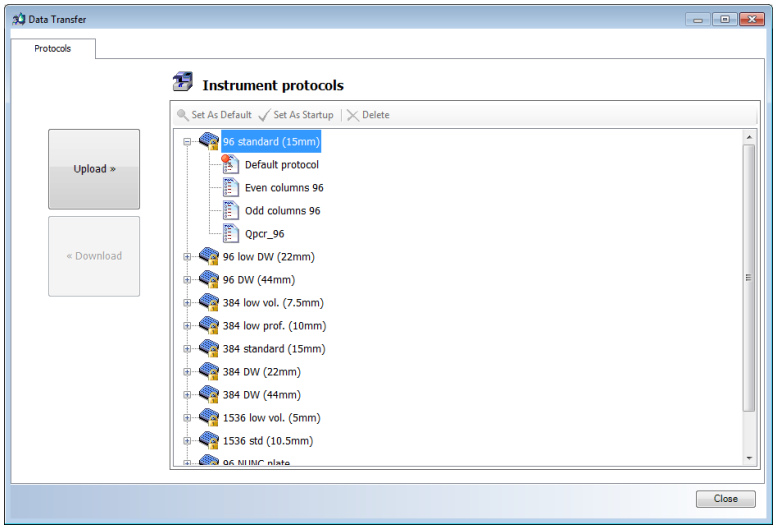
Instrument protocols stored in the workstation can be transferred to the instrument. It is also possible to transfer protocols stored in the instrument to the workstation for modification or backup. Instrument protocol types, such as default and startup protocols, can also be set.

Transferring protocols

You can download instrument protocols, which contain only a dispense step, to the instrument. You can upload protocols stored in the instrument to the workstation.

Before you start, check that the workstation is connected to the instrument.

1. Select Protocol > **Data Transfer...**. The **Data Transfer** dialog opens.



2. The instrument protocols list shows the protocols currently stored in the instrument. The protocols are grouped by plate type. You can expand the protocols stored under the plate type by clicking the plus ⊞ icon.

– Instrument protocol can be downloaded from the instrument.

3. a. Click **Upload** to transfer a protocol from the workstation to the instrument. Windows **File Open** dialog box opens.

   Select the protocol file (*.pcombi) from the workstation file system. Click **Open**.

   The protocol is transferred and stored under the appropriate plate type in the list.

   b. Under the Instrument protocols list select the protocol you want to transfer to the workstation and click **Download**. Windows **File Save** dialog box opens.

   Choose the folder where you want to save the protocol file and give the protocol a name. Click **Save**.

   The protocol is transferred and stored as a file in the workstation file system. The protocol files for Multidrop Combi have the extension .pcombi.

Note If you upload a read-only instrument protocol and modify it on the workstation, it cannot be downloaded back to the instrument. You can run it on the workstation instead. You must save it with a different name (Protocol > **Save As...**) if you want to download it to the instrument.

About instrument protocol types

Instrument protocols, which are stored in the instrument, can have any or all of the following type attributes:

- *Default protocol* – The default protocol of each plate type. The default protocol is loaded when you change the plate type in the instrument control panel. Each plate type must have a default protocol defined.
- *Startup protocol* – A protocol which is loaded at instrument startup. Only one protocol can be set as the startup protocol at a time.
- *Read-only protocol* – Protocols which are stored in the instrument memory at the factory. Protocols transferred from the instrument cannot be set as read-only.
- *Currently loaded to the instrument editor* – A protocol which is currently loaded and open in the instrument control panel.

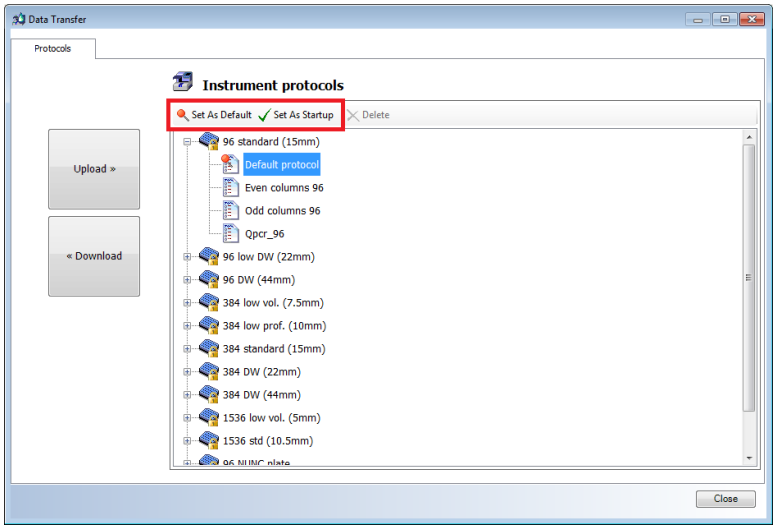
Setting default or startup instrument protocols

You can set protocols stored in the instrument as default or startup protocols. For more information, see "About instrument protocol types" on page 45.

Before you start, check that:

- the workstation is connected to the instrument.

1. Select Protocol > **Data Transfer...**. The **Data Transfer** dialog opens.



2. Under the instrument protocols, select the protocol whose type you want to set.

3. Click either the **Set As Default** or **Set As Startup** button.

   The protocol type is set. To clear the type, select another protocol and set the type to it.

Deleting protocols stored in the instrument

You can delete protocols stored in the instrument. The following types of protocols can be deleted:

- Protocols transferred from the workstation. If the protocol is loaded and opened in the instrument control panel, it cannot be deleted until another protocol is opened in the instrument control panel.
- Startup protocols. You must first change another protocol as the startup protocol before deleting.
- A protocol currently loaded to the instrument editor. You must close it first and open another protocol in the instrument control panel before deleting.

Note Read-only protocols cannot be deleted from the instrument memory.

Before you start, check that:

- the workstation is connected to the instrument.

1. Select Protocol > **Data Transfer...**. The **Data Transfer** dialog opens.
2. In the list of instrument protocols, select the protocol you want to delete. Click the **Delete** button in the header of the list.

Chapter 5
Step Parameters

This chapter describes the contents and the usage of the available step parameters in Fillit Software for Multidrop Combi.

Dispense

The *Dispense* step is used for instructing the instrument to dispense liquid into the selected wells in a microplate.

Note If you create an instrument protocol for downloading to the instrument, the protocol can only have one dispense step.

Select Steps > **Dispense**, click on the **Steps** action panel or right-click on the step tree and select **Dispense**.

The dispense step has two tabs:

- **Layout** – You can select target columns and fill them with different volumes. With the **Advanced Fill** function you can fill a series or to fill the plate with the same volume. A plate map shows the plate layout, the target wells and their dispensing volumes. For more information, refer to “Layout” on page 49.

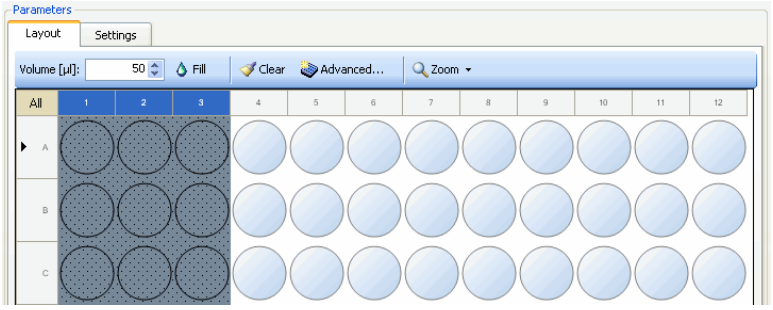
  Settings – You can select the dispensing speed and adjust predispensing volume. You can also select the delay between dispensing actions and select the dispensing direction. For more information, refer to “Settings” on page 54.

Layout

The Steps > Dispense > **Layout** tab is used for selecting the dispensing volume and the target columns to be dispensed. With the **Advanced Fill** function you can fill a series of target columns with different volumes.

A plate map shows the plate layout for the plate template and the selected target wells. You can select:

- a whole column by clicking the column header.
- the whole plate by clicking on **All**.
- several columns at once. Hold the **Ctrl** key down while selecting. This way you can select areas, columns or rows that are not next to each other.



The **Layout** tab has the following parameters:

- **Volume [µl]** – Type or select the volume you want to dispense into the target wells. The range is from 5 µl to 2,500 µl in increments of 5 µl with the standard tube cassette and from 0.5 µl to 50 µl in increments of 0.5 µl with the small tube cassette.

Note Every well, column or separately selected area can have a different volume.

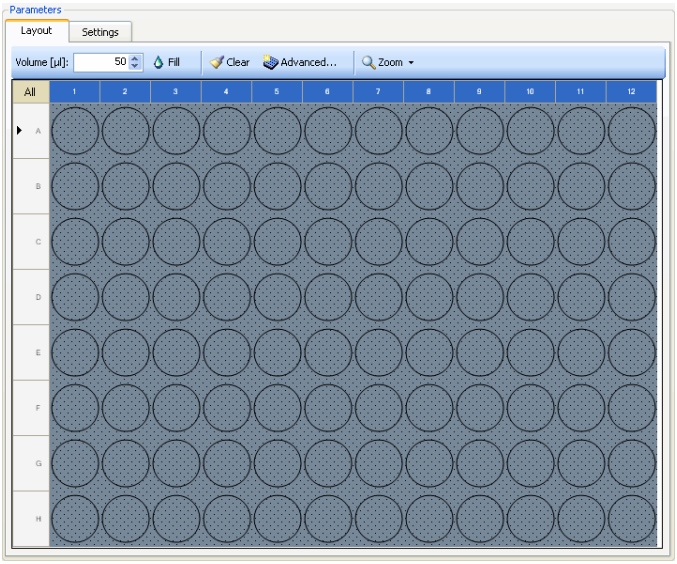
- **Fill** – Fills the target wells with the selected volume. Select the target wells first before clicking the button. You can also right-click on the selected target wells to fill them.
- **Clear** – Clears the volume from the selected wells. You can also right-click on the selection to clear the volume.
- **Advanced** – Opens the **Advanced Fill** dialog for adding a fill series or for filling the plate with the same volume. For more information, see “Filling a plate using Advanced Fill” on page 53.
- **Zoom [%]** – Zoom in on the plate map by increasing the percentage. Zoom out by decreasing the percentage.

Tip You can zoom in on a 1536–well plate to make sure that you have the intended volume in the wells.

Examples of filling a plate

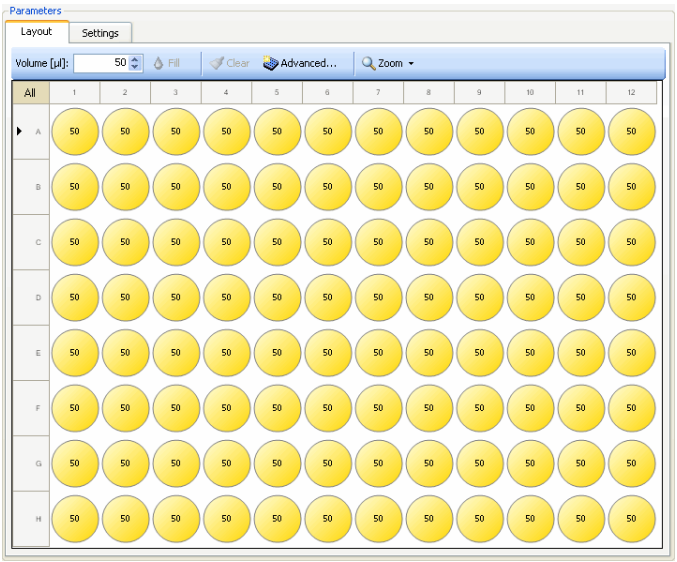
The following examples illustrate how you can select the target wells in a microplate to be filled and add a dispensing volume to the wells. The target wells are selected in the dispense step.

Example 5-1 Filling the whole 96-well plate



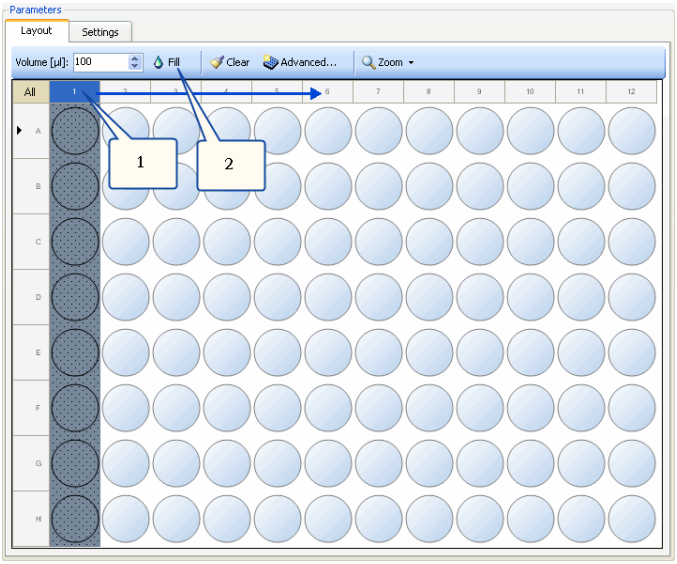
1. Select all the wells by clicking **All** on the upper left corner of the plate map.

2. Add the dispensing volume to the wells by selecting the volume and clicking **Fill**.



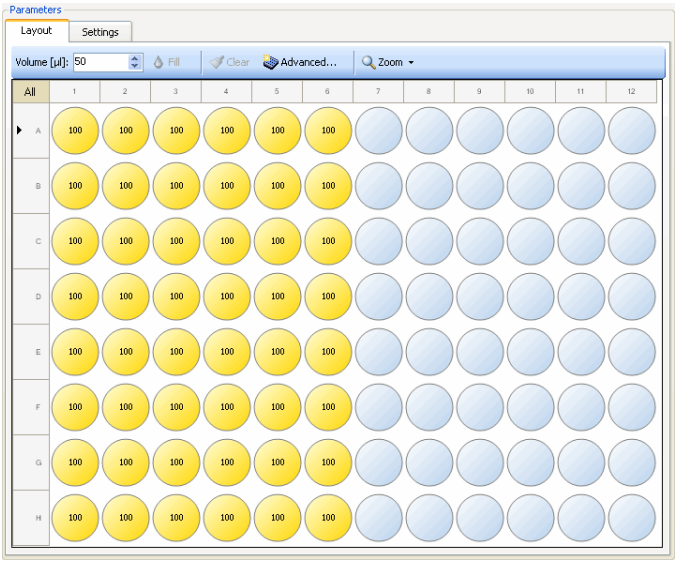
To change the dispensing volume, select all the wells again, then select the correct dispensing volume and click **Fill**. The volumes are changed.

Example 5-2 Filling six columns of a 96-well plate



1. Place the cursor on the header row of column 1, press the left mouse button down and drag the cursor over to column 6. The columns are selected as the cursor moves to the right.

2. Add the dispensing volume to the wells by selecting the volume and clicking **Fill**.

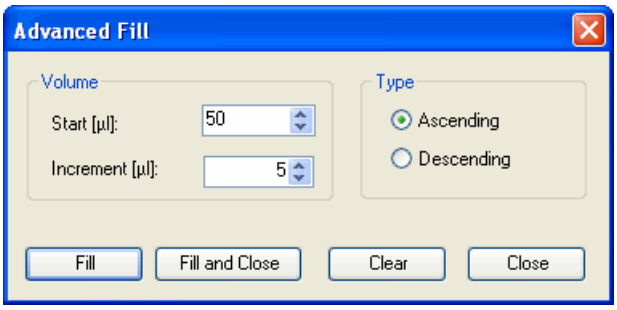


Note The selected volume is shown only in the wells while the **Volume** field has the default fill volume. You can zoom in on a 1536–well plate to make sure that the correct volume is selected.

Filling a plate using Advanced Fill

You can add a fill series. When you add a fill series, the plate is filled with a different volume column by column. You can also fill the whole plate with the same volume.

Select Steps > Dispense > Volume > **Advanced**. The **Advanced Fill** dialog opens. You can select the target wells when the dialog is open because it floats on top of the plate map.



The **Advanced Fill** dialog has the following parameters:

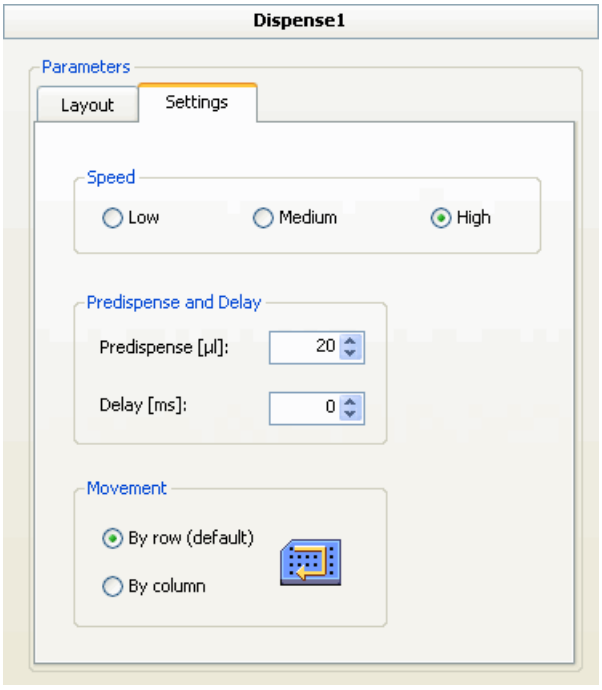
- *Volume*:
  - **Start [µl]** – Select the dispensing volume which is filled first in the fill series. The range is from 5 µl to 2,500 µl in increments of 5 µl with the standard tube cassette and from 0.5 µl to 50 µl in increments of 0.5 µl with the small tube cassette.
  - **Increment [µl]/Decrement [µl]** – Select the increment or decrement volume by which each subsequent dispensing volume in the fill series is increased or decreased. When you select 0, all the target wells are filled with the volume defined in the **Start [µl]** field. The default value is 5 µl with the standard tube cassette and 0.5 µl with the small tube cassette.
- *Type* – Select the fill series type:
  - **Ascending** – The increment volume is added to the next dispensing volume in the fill series.

  - **Descending** – The decrement volume is subtracted from the next dispensing volume in the fill series.

- **Fill** – Fills the target wells with the set volumes according to the settings. Select the wells first before clicking the button.
- **Fill and Close** – Fills the target wells with the set volumes according to the settings and closes the dialog. Select the wells first before clicking the button.
- **Clear** – Removes the set volumes from the target wells. Select the wells first before clicking the button.

Settings

The Steps > Dispense > **Settings** tab is used for setting the predispensing volume, dispensing direction, delay, and the calibration curve correction factor.



The **Settings** tab has the following parameters:

- **Speed** – Select the dispensing speed. The available options are *Low*, *Medium* or *High*. The default speed is *High*. You can change the speed, for example, to reduce foaming.

Speed	Small tube cassette (rpm)	Standard tube cassette (rpm)
Low	567	225
Medium	733	255
High	900	285

- **Predispense [µl]** – Select the volume that is dispensed into the priming vessel before starting to dispense into the plate. Some denser solutions may sometimes require extra predispensing. The range is from 1 µl with the small tube cassette and from 10 µl with the standard tube cassette to 10,000 µl in increments of 1 µl. The default volume is 2 µl with the small tube cassette and 20 µl with the standard tube cassette.

Note If you select another dispensing cassette, the predispensing volume is reset to the default volume. Check that the volume is correct after changing the dispensing cassette.

- *Movement:*

  - **By row** – The plate is filled row wise. The pump carrier moves from left to right and then from right to left using all the eight channels until all the rows are filled. With a 96-well plate the whole plate becomes filled at once. With 384 or 1536-well plates changes of direction are needed. For more information, refer to the instrument user manual.

  - **By column** – The plate is filled column wise. The pump carrier moves first from top to bottom in phases using all the eight channels until the column is filled. The pump carrier then moves right to the next column filling it from bottom to top and continues in this way until all the columns are filled. The option is available only for 384 or 1536-well plates. For more information, refer to the instrument user manual.

  - **Delay [ms]** – Select the delay time between two dispensing actions. The range is from 0 to 100 ms in increments of 10 ms. The default delay time is 0 ms.

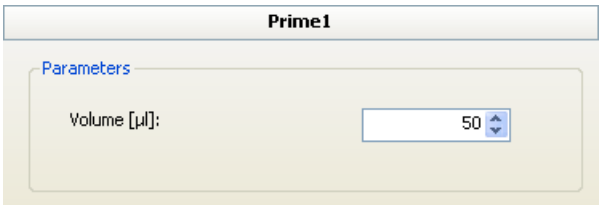
Prime

The *Prime* step is used for filling up the tubings of the cassette with a liquid to be dispensed.

Note The *Prime* step is not needed in a routine protocol unless a longer prime is needed in particular.

Note Even if you use the *Prime* step in a protocol, you must always prime the dispensing system first using the PRIME button in the **Instrument** action panel.

Select Steps > **Prime** or click on the **Steps** action panel or right-click on the step tree and select **Prime**.



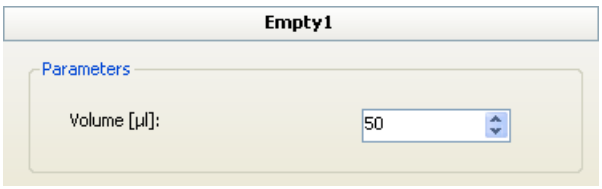
The prime step has the following parameters:

- **Volume [µl]** – Select the priming volume. The range is from 10 µl to 10,000 µl in increments of 5 µl with the standard tube cassette and from 1 µl to 10,000 µl in increments of 0.5 µl with the small tube cassette. The default priming volume is 50 µl with the standard tube cassette and 5 µl with the small tube cassette.

Empty

The *Empty* step is used for emptying the remaining liquid from the cassette into the liquid reservoir.

Select Steps > **Empty**, click on the **Steps** action panel or right-click on the step tree and select **Empty**.



The empty step has the following parameters:

- **Volume [µl]** – Select the volume to be emptied. The range is from 10 µl to 10,000 µl in increments of 5 µl with the standard tube cassette and from 1 µl to 10,000 µl in increments of 0.5 µl with the small tube

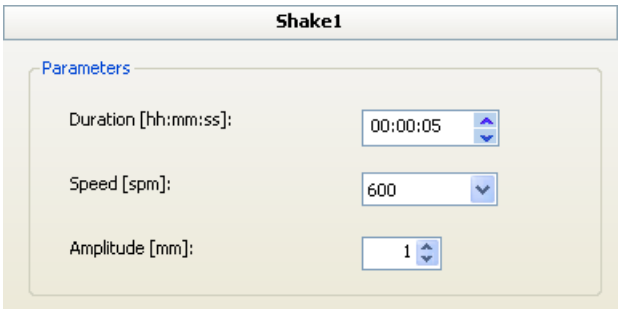
cassette. The default volume is 50 µl with the standard tube cassette and 5 µl with the small tube cassette.

Shake

The *Shake* step is used for shaking the microplate linearly to mix the liquid in the wells after dispensing.

If you create an instrument protocol for downloading to the instrument, no other step than only one dispense step is allowed in the protocol.

Select Steps > **Shake** or click on the **Steps** action panel or right-click on the step tree and select **Shake**.



The shake step has the following parameters:

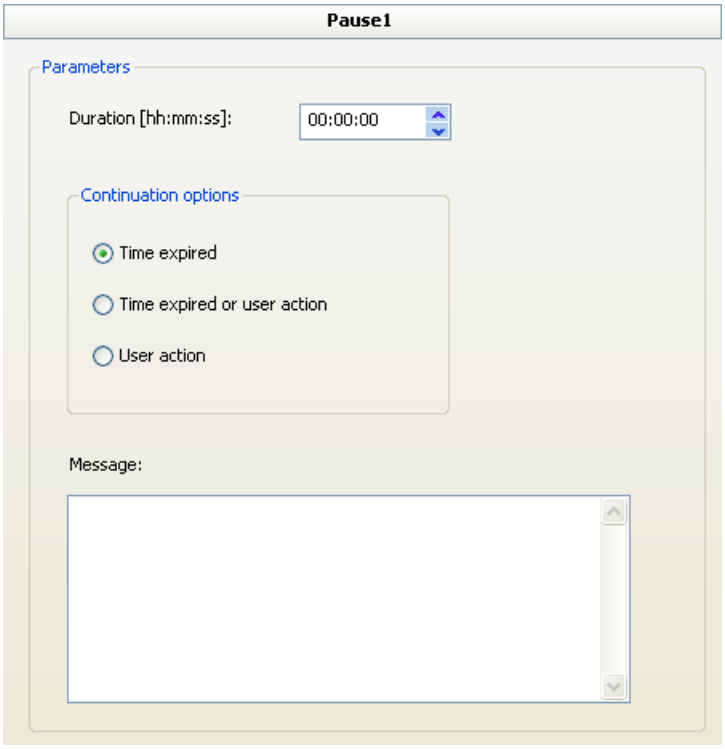
- **Duration [hh:mm:ss]** – Enter the total shaking time (step duration). The range is from one second to 23:59:59 hours in increments of 1 s.
- **Speed [spm]** – Select a shaking speed.The range is from 60 to 1200 spm (shakes per minute) in increments of 60 spm.
- **Amplitude [mm]** – Enter the linear shaking amplitude (width). The available shaking amplitude is 1 to 5 mm in increments of 1 mm.

  Only certain combinations of speed and amplitude are allowed by the software. The software automatically prevents all those combinations that would cause too strong mechanical stress to the instrument and would definitely cause spilling over of the liquid from the wells. This is based on the limitation that angular acceleration of the performed shaking may not be over 1.0 G.

Pause

The *Pause* step is used for stopping the run of a dispensing protocol for a moment. A message is displayed during the pause if a message has been entered in the step parameters. The instrument continues to run the protocol after the condition set in **Continuation options** is met.

Select Steps > **Pause** or click on the **Steps** action panel or right-click on the step tree and select **Pause**.



The pause step has the following parameters:

- **Duration [hh:mm:ss]** – Enter the pause time. The maximum pause time is 23:59:59 hours in increments of 1 s.
- **Continuation options** – Select the condition for continuing the protocol execution.
  - *Time expired* – The protocol continues after the set pause time expires.
  - *Time expired or user action* – The protocol continues after the set pause time expires or when you click **Skip Pause** in the **Execution Progress** dialog.
  - *User action* – The protocol continues when you click **Skip Pause** in the **Execution Progress** dialog. No pause time can be set when this option is selected.
- **Message** – Type in the message that is shown in the **Execution Progress** dialog during the *Pause* step.

Chapter 6
Controlling the Instrument

Running a dispensing protocol

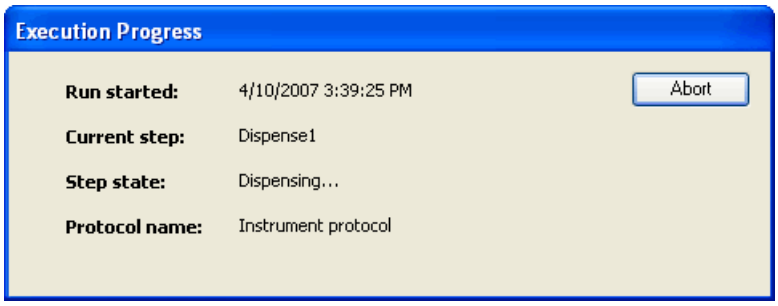
You can run both instrument and multistep protocols stored in the workstation when you are connected to the instrument. For more information about protocols, see Chapter 4: "*Protocols*".

1. Make sure that the instrument is connected correctly to the workstation (see "Connecting the instrument to the workstation through a COM port" on page 26 or "Connecting the instrument to the workstation through a USB port" on page 27).
2. Turn on the instrument.
3. Start up the software (see "Starting the software" on page 34).
4. Connect the software to the instrument (see "Connecting to the instrument" on page 63).
5. Open the protocol (see "Opening an existing protocol" on page 36). If the protocol is already open, make sure that the protocol has been saved.
6. Insert the plate into the plate carrier.

Caution Ensure that a correct microplate has been inserted.

7. Check that the rotor cover is over the rotor.
8. Prime the dispensing system (see "Priming the instrument" on page 61).
9. Click

on the **Instrument** action panel, select Instrument > **Start**, or press **F5** on your keyboard.
10. You are prompted to give the run a name. The run is saved in the file system as a file called <name>.mdrun.
11. The **Execution Progress** dialog opens and dispensing starts.

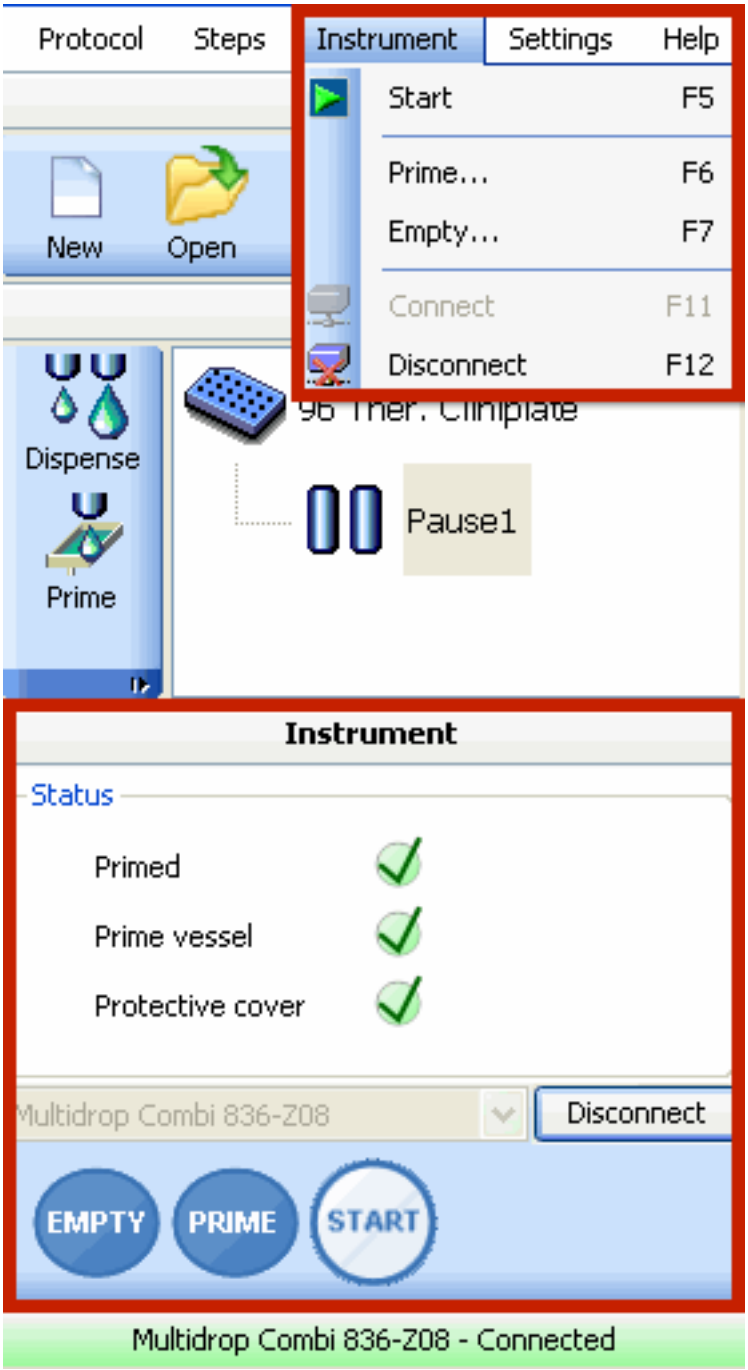


- **Run started** – Shows when the dispensing was started (the date and time). The information is also used for selecting and viewing run reports (see "Viewing run reports" on page 65).
- **Current step** – Shows the step being run.
- **Step state** – Shows the state of the step being run.
- **Protocol name** – Shows the name of the protocol being run.
- **Abort** – Interrupts the run. You can start the run again if needed.

12. Empty the tubings after dispensing if needed (see "Emptying the tubings" on page 62).

Using the instrument controls

The following sections describe how you can control the instrument using either the **Instrument** menu, the function key shortcuts, or the **Instrument** action panel.



Priming the instrument

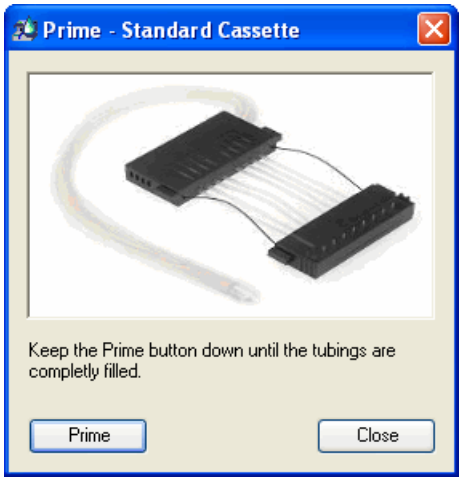
You must fill the tubings of the cassette with a liquid before dispensing. The tubings should be completely filled. Make sure that you see liquid coming through the tips before starting to dispense.

Before you start, check that:

- the workstation is connected to the instrument.
- the reagent reservoir is filled with a liquid.
- the priming vessel and rotor cover are in place.

1. Select Instrument > **Prime...**, click the PRIME button on the **Instrument** action panel, or press **F6** on your keyboard.

   The **Prime** dialog opens.



2. Click **Prime** and keep the button pressed down until the tubings are filled. The instrument primes the dispensing system.

   The lifting mechanism is lowered and the pump rotates as long as you press the button.

3. Close the dialog, click **Close**.

Emptying the tubings

You can empty the remaining liquid from the dispensing cassette into the reagent reservoir.

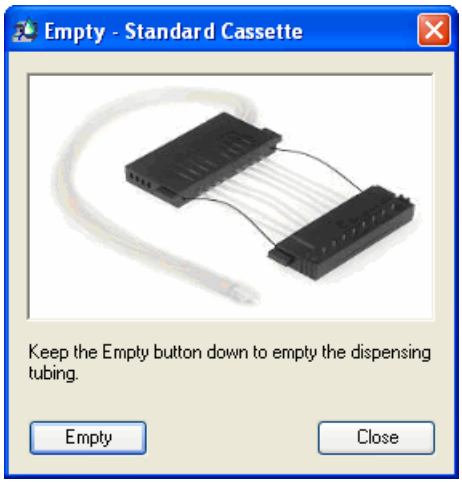
Before you start, check that:

- the workstation is connected to the instrument.
- the reagent reservoir is in place.
- the priming vessel and rotor cover are in place.

1. Select Instrument > **Empty...**, click the

button on the **Instrument** action panel, or press **F7** on your keyboard.

   The **Empty** dialog opens.



2. Click **Empty**. Keep the button pressed down until the tubings are completely empty. The instrument empties the liquid into the reagent reservoir.

3. Close the dialog, click **Close**.

Connecting to the instrument

To control the instrument with FILLit Software, connect the software to the instrument after starting the software.

Before you start, check that:

- the instrument is configured in FILLit Software (see "Defining a new instrument manually" on page 24, "Defining a new instrument automatically" on page 23, and "Instrument" on page 67).
- the instrument is connected to the workstation by a serial or a USB cable. For more information, see the instrument user manual.

You can connect the software to the instrument in one of the following ways:

- In the **Instrument** action panel, select the instrument from the list and click **Connect**.
- Select Instrument > **Connect** to connect to the default instrument (see "Instrument" on page 67).

- Press **F11** on your keyboard to connect to the default instrument.
- Connect to the default instrument automatically when the software starts (see Chapter 8: "*Settings*").

Disconnecting from the instrument

You can disconnect the software from the instrument in one of the following ways:

- Select Instrument > **Disconnect**.
- Press **F12** on your keyboard.
- In the **Instrument** action panel, click **Disconnect**.

Chapter 7
Reports

With FILLit Software you can view run, software and instrument reports, and print or save them.

Viewing run reports

A run file is created each time a protocol is run. The file includes general run information, run report, instrument information, protocol settings, software parameters, and step parameters of each step in the protocol.

When the protocol run has been started, Windows **File Save** dialog opens. Choose the folder where you want to save the run file and give the run file a name. Click **Save**.

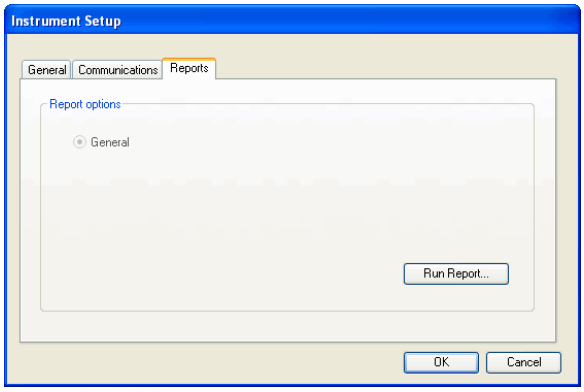
The run file is stored in the workstation file system. The run files for Multidrop Combi have the extension .combirun.

Viewing instrument reports

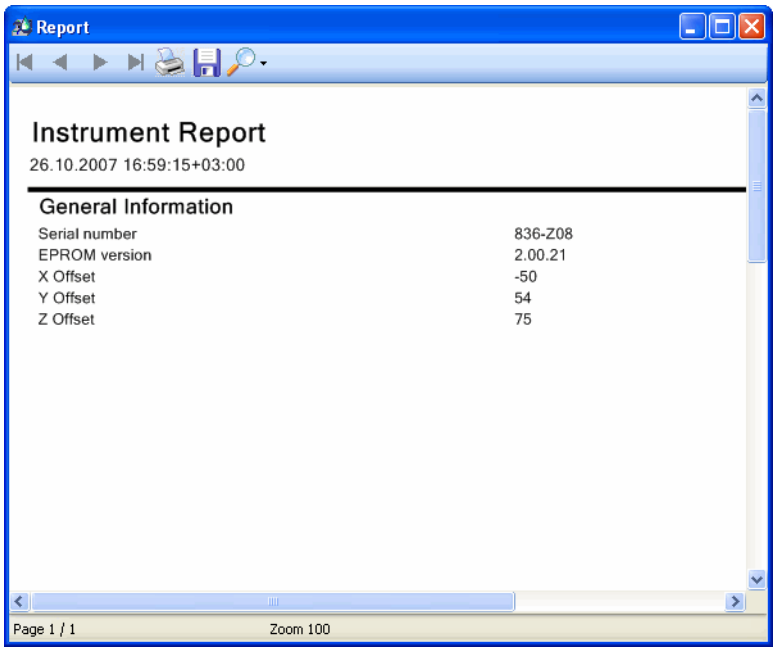
When you are connected to the instrument, you can view instrument reports. The report has information about the serial number, embedded software version, dispensing height and offset values, and the number of cycles (open and close) of each dispensing tip.

1. Select Settings > **Instrument...**. Select the instrument from the list and click **Setup...**.

2. Select the **Reports** tab in the **Instrument Setup** dialog.



3. Click **Run Report...**. The report is created and it opens.



For information about printing and saving, see “Printing and saving reports” on page 66.

Printing and saving reports

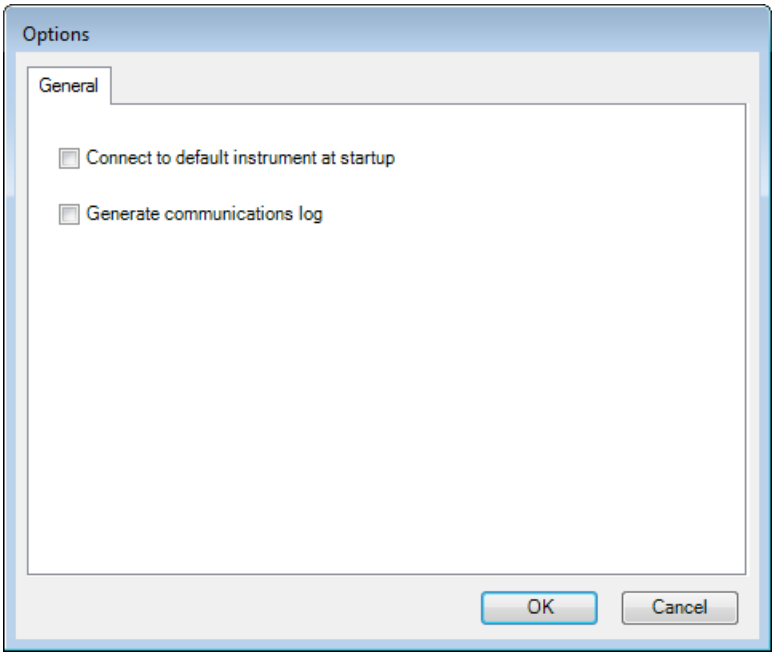
You can save a created report in an Adobe Portable Document Format file (.pdf), a Microsoft Excel file (.xls), or a text file (.txt). Click the button in the report toolbar. The **Save As** dialog is launched. Give a name to the report, select the file type and the folder, and click **Save**.

You can also print the report by clicking the button in the report toolbar.

Chapter 8
Settings

Options

Select Settings > **Options...** to open the **Options** dialog.

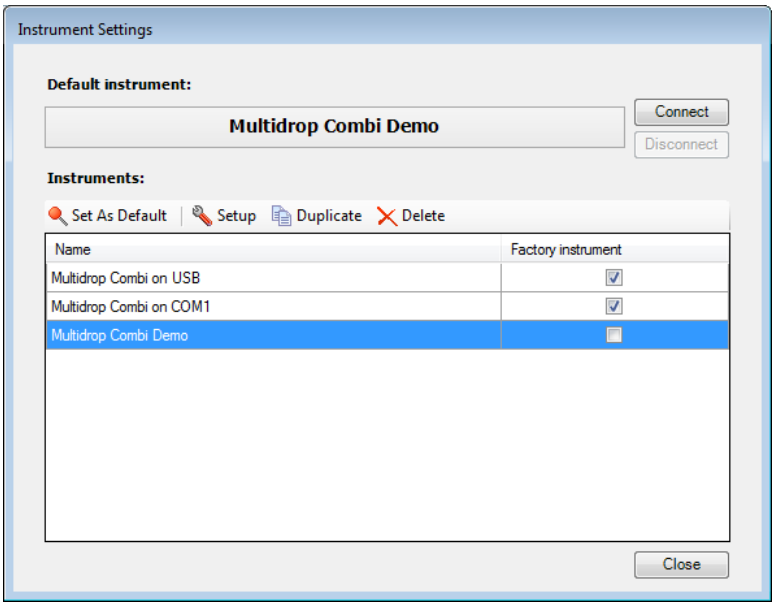


The dialog has the following parameters:

- **Connect to default instrument at startup** – When selected, the software connects to the default instrument (see "Instrument" on page 67) at startup. When you create the default instrument for the first time, the option is enabled. Otherwise, the instrument is not connected. You can establish the connection later by selecting Instrument > **Connect**.
- **Generate communications log** – As the communication log may generate a lot of data, turn this setting on only to investigate communication problems. The log file is saved in the Log folder under the software installation folder.

Instrument

Select Settings > **Instrument...** to open the **Instrument Settings** dialog.



The **Instrument Settings** dialog has the following parameters:

- **Connect** – Opens a connection to the default instrument.
- **Disconnect** – Closes the connection to the default instrument. You must close the connection before setting another instrument as the default.
- **Set As Default** – Click the button to set the selected instrument as the default. The software tries to connect to the default instrument when it is started (see "Starting the software" on page 34), if the **Connect to default instrument at startup** setting is selected (see Chapter 8: "*Settings*").
- **Setup** – Edit the setup parameters of an existing instrument.
- **Duplicate** – If you want to add a new instrument that does not exist in the list, first make a duplicate of an existing instrument and save it with a new name. Then you can modify the setup information.
- **Delete** – Remove the selected instrument from the list.
- **Close** – Close the dialog.

To edit instrument-related settings, select the instrument from the list and click **Setup...**. The **Instrument Setup** dialog opens. Also see "Options" on page 67.

The **Instrument Setup** dialog has the following tabs:

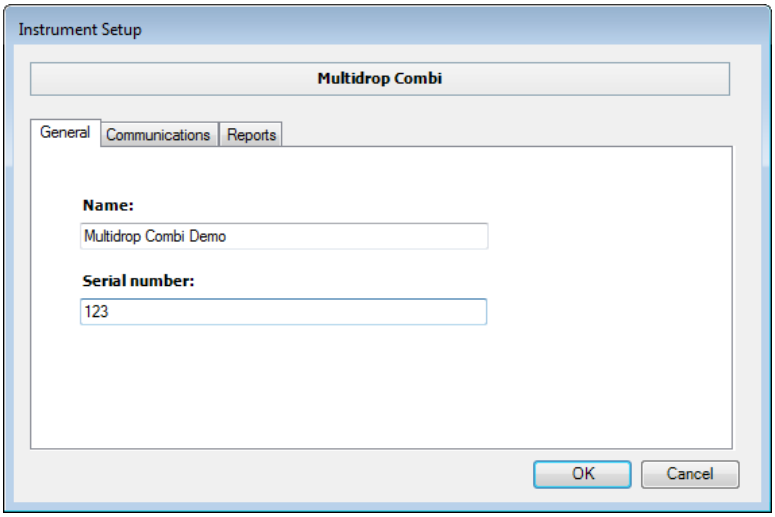
- "General" on page 69

- "Communications" on page 69
- "Reports" on page 70 (when connected to the instrument)

To add a new instrument to FILLit Software, see "Defining a new instrument manually" on page 24 and "Defining a new instrument automatically" on page 23.

General

Check the general information related to the instrument on the **General** tab.

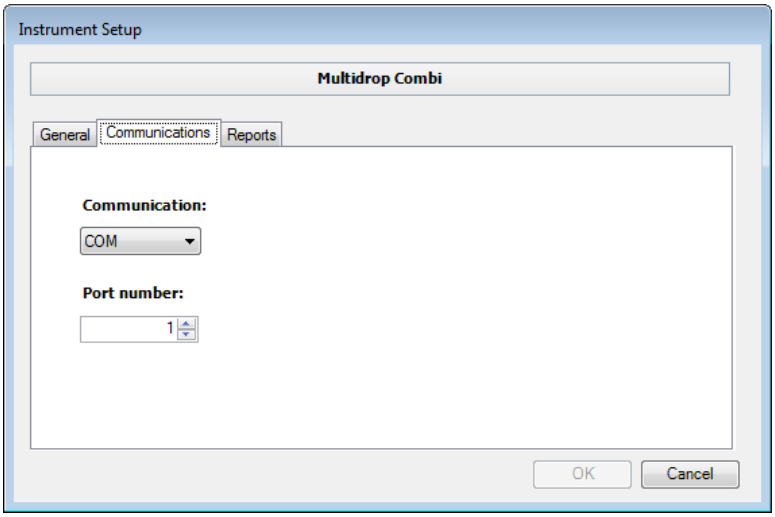


The **General** tab has the following parameters.

- **Name** – The unique name of the specific instrument.
- **Serial number** – Check the serial number of the instrument from the type label on the instrument and enter it here.

Communications

Define the communication settings between the instrument and the PC on the **Communications** tab.



The **Communications** tab has the following parameters:

- **Communication** – Select the type of data communication port. The options are COM and USB.
- **Port number** – Select the COM port that the instrument is connected to. Allowed port numbers are 1 to 100. The option is only for the COM port.

Reports

You can view instrument reports on the **Reports** tab when you are connected to the instrument. For more information, see "Viewing instrument reports" on page 65.

Plate template settings

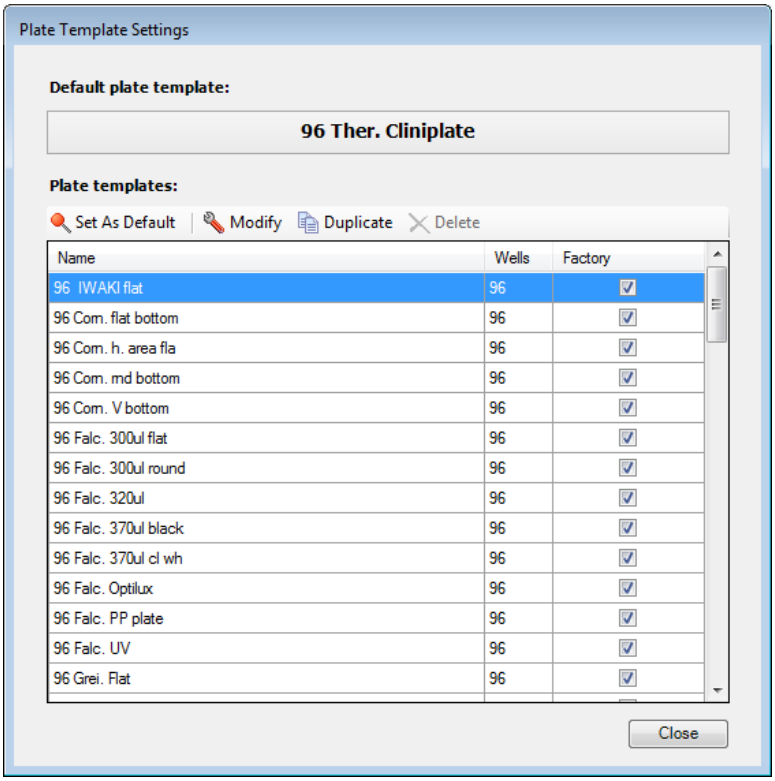
Select Settings > **Plate Template...** to open the **Plate Template Settings** dialog. The plate templates contain the most common plate types. You can change the default plate template, create new templates, modify existing plate templates, and delete plate templates.

Plate type is a microplate definition which has enough information about the plate so that the instrument can correctly dispense into the plate. The information includes, among others, the plate name, well coordinates, maximum well volume, and the plate height.

Caution Verify the plate template settings each time you start using a new batch of plates. The dimensions of the plate may have changed slightly and thus the instrument performance may be jeopardized. This may even cause damage to the instrument. Thermo Fisher Scientific takes no responsibility for any damage

to the instrument if caused by using incorrect plate template settings.

Note You cannot modify or delete factory-created plate templates. You can only view the settings. If you want to modify an existing plate template, make a duplicate of it and save it with a new name.

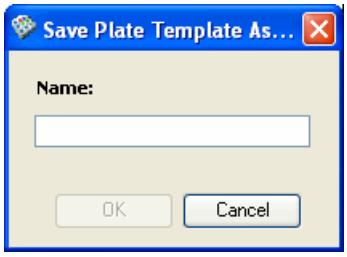


- **Set As Default** – Click the button to set the selected plate type as the default. The default plate type is used when creating a new protocol (see "Creating a new protocol" on page 35 and "Editing a protocol" on page 36).
- **Modify** – You can view the settings of an existing plate template and edit them. See "Modifying plate templates" on page 72.
- **Duplicate** – You can create a new plate template by making a duplicate of an existing plate template. See "Creating plate templates" on page 71.
- **Delete** – Remove the selected plate template from the list. The software requires you to confirm the deletion.
- **Close** – Close the dialog.

Creating plate templates

You can create new plate templates by duplicating existing plate templates.

1. Select Settings > **Plate Template...**. The **Plate Template Settings** dialog opens.
2. Select a plate template from the list. Select a plate template that is as similar as possible to the one you want to create.
3. Click **Duplicate**.



4. Give a name to the new plate template. You can use letters a to z, numbers 0 to 9, an underscore (_), and a hyphen (-) in the name. Click **OK** to save the duplicate plate template.
5. Select the new plate template from the list of plate templates and click **Modify...**. **Plate template editor** opens.
6. Modify the dimensions of the plate template as necessary (see “Modifying plate templates” on page 72).
7. Click **Save**.

Modifying plate templates

You can modify the dimensions of a plate template, for example, after creating the plate template by duplicating an existing plate template.

1. Select Settings > **Plate Template...**. The **Plate Template Settings** dialog opens.
2. Select the plate template from the list and click **Modify...**. **Plate template editor** opens.

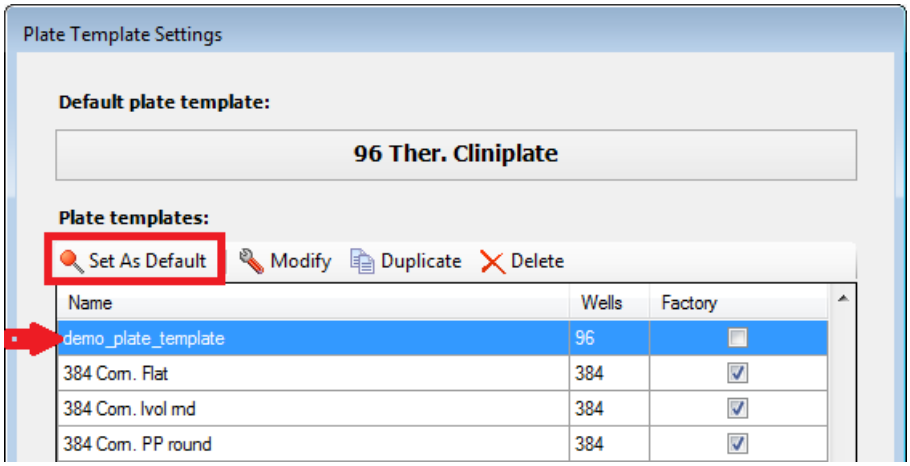


Plate Preview shows a model of the plate.

Helper View is a visual aid showing the selected distance on a 6-well plate.

The plate template definition has the following parameters. The unit of the distances is given in mm at a precision of 0.1 mm.

General:

- **Name** – The name of the plate.
- **Plate description** – The description of the plate, including information such as the well number and the shape of the well bottom.
- **Well count X** – The number of wells in the X-direction.
- **Well count Y** – The number of wells in the Y-direction.

Plate size:

- **Height [mm]** – The height of the plate.
- **Length [mm]** – The length of the plate (vertical).
- **Width [mm]** – The width of the plate (horizontal).

Well location:

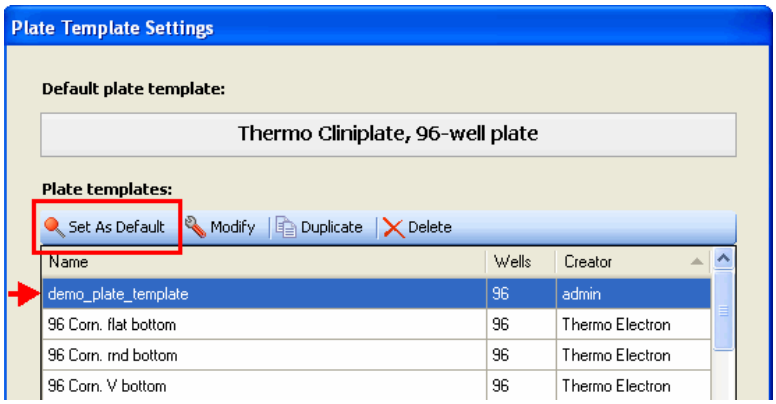
- **First column position [mm]** – The position of the first column as indicated by the visual aid.

- **First row position [mm]** – The position of the first row as indicated by the visual aid.
- **Last column position [mm]** – The position of the last column as indicated by the visual aid.
- **Last row position [mm]** – The position of the last row as indicated by the visual aid.

Well parameters:

- **Well shape** – The shape of the well is usually a circle or a square.
- **Well volume [µl]** – The maximum filling volume of the well in µl.

3. Click on appropriate fields and enter the new dimensions in them.
4. Save your changes by clicking **Save**.
5. Close the editor by clicking **Close**. If you have modified the plate template, you can save or ignore the modifications at this point.
6. If needed, set the plate template as the default plate template:
    1. Select the plate template from the list.



    2. Click **Set As Default**.

Chapter 9
Menus and Action Panels

Figure 9-1 shows the location of the menu bar and action panels in the main window of FILLit Software.

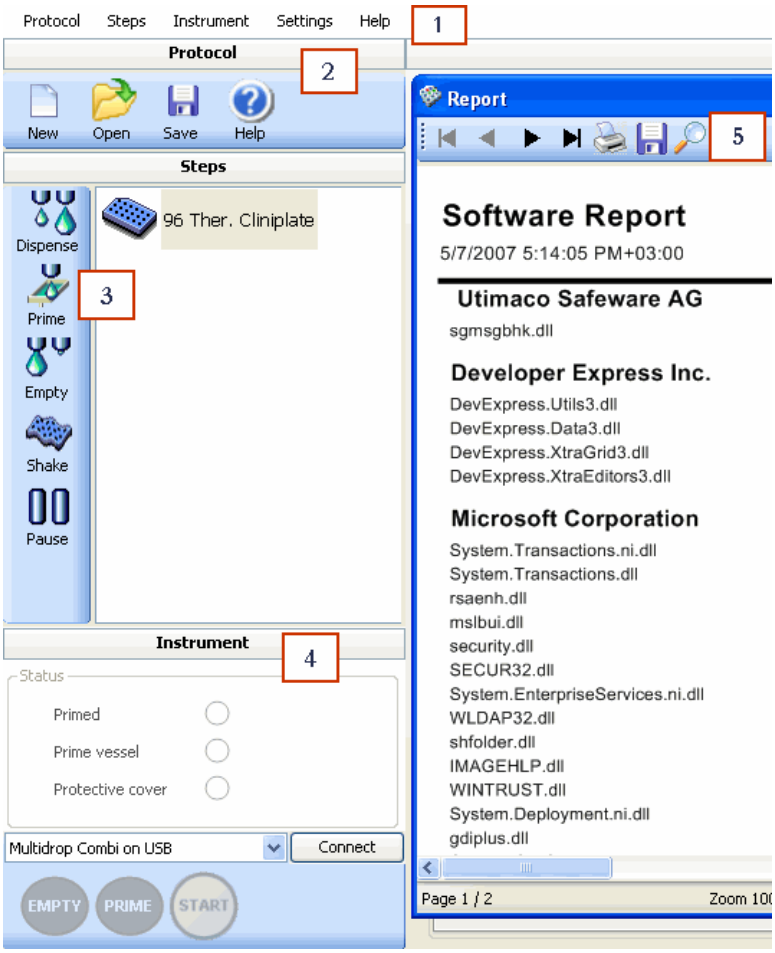


Figure 9-1. Menus and action panels of FILLit Software

- **1** – Menu bar. For more information about the menu items, see "Menu commands" on page 76.
- **2** – Protocol action panel. For more information about the buttons, see "Protocol action panel" on page 77.
- **3** – Steps action panel and step tree for editing protocols. For more information about the buttons, see "Steps action panel" on page 77.
- **4** – Instrument action panel. For more information about the buttons, see "Instrument action panel" on page 78.

- **5** – Report toolbar. It is available when a report has been created. For more information about the buttons, see "Report toolbar" on page 78.

Menu commands

This section includes descriptions of all the menu items in FILLit Software.

Protocol

- **New...** – Opens a new protocol editing window (see "Creating a new protocol" on page 35).
- **Open...** – Opens the **Open Existing Protocol** dialog for opening protocols from the file system (see "Opening an existing protocol" on page 36).
- **Save** – Saves the current protocol in the file system (see "Saving a protocol" on page 43).
- **Save As...** – Opens the **Save Protocol** dialog for saving the current protocol with a new name.
- **Data Transfer...** – Transfers stored protocols between a workstation and the instrument (see "Managing protocols" on page 43).
- **Exit** – Exits the software.

Steps

- **<Step type>** – Adds the chosen step type to the current protocol after the last step. For more information, see "Adding new protocol steps" on page 41 and Chapter 5: "*Step Parameters*".

Instrument

- **Start** – Runs the protocol on the instrument (see "Running a dispensing protocol" on page 59).
- **Prime** – Opens the **Prime** dialog for priming the dispensing system (see "Priming the instrument" on page 61).
- **Empty** – Opens the **Empty** dialog for emptying the dispensing system after use (see "Emptying the tubings" on page 62).
- **Connect** – Connects the workstation to the default instrument.
- **Disconnect** – Disconnects the workstation from the default instrument.

Settings

- **Options...** – Opens the **Options** dialog. You can set general default parameters (see "Options" on page 67).

- **Instrument...** – Opens the **Instrument Settings** dialog. You can configure the instrument connected to FILLit Software and set the default instrument. You can also define a new instrument (see "Instrument" on page 67).
- **Plate Template...** – Opens the **Plate Template Settings** dialog. You can set a plate template as default, modify plate template dimensions (such as well sizes and positions), create new plate templates by making plate duplicates and modifying the data, and delete plate templates (see "Plate template settings" on page 70).

Help

- **Contents...** – Opens the Help application (see Chapter 10: "*Using Help*").
- **About...** – Shows information about FILLit Software.

Action panels and toolbars

This section includes descriptions of all the action panel and toolbar buttons in FILLit Software.

Protocol action panel

The **Protocol** action panel has the following buttons:

New protocol ("Creating a new protocol" on page 35)

Open protocol ("Opening an existing protocol" on page 36)

Save protocol ("Saving a protocol" on page 43)

Open the Help (Chapter 10: "*Using Help*")

Steps action panel

The **Steps** action panel has the following buttons:

Dispense ("Dispense" on page 49)

Prime ("Prime" on page 55)

Empty ("Empty" on page 56)

Shake (“Shake” on page 57)

Pause (“Pause” on page 57)

Instrument action panel

The **Instrument** action panel has the following buttons:

Connect to the instrument selected from the list

Disconnect from the instrument

Empty the dispensing system (“Emptying the tubings” on page 62)

Prime the dispensing system (“Priming the instrument” on page 61)

Run the protocol on the instrument (“Running a dispensing protocol” on page 59)

Report toolbar

The report toolbar has the following buttons:

Go to the first page of the report

Go to the previous page

Go to the next page

Go to the last page of the report

Print the report

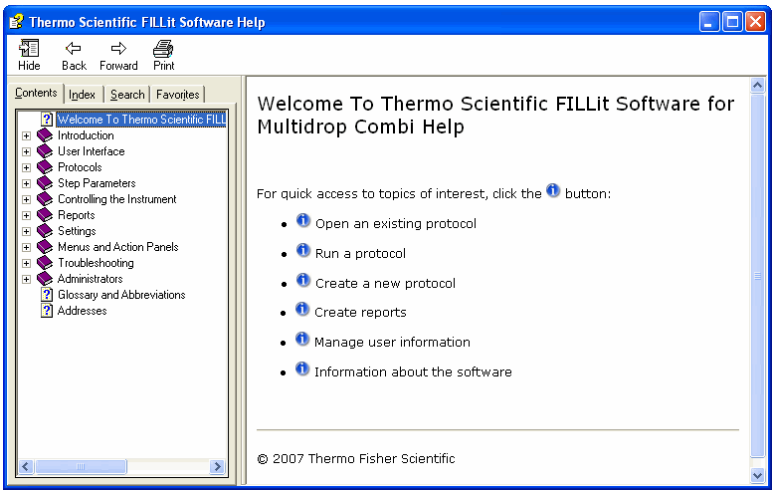
Save the report

Zoom the report view

Chapter 10
Using Help

You can open the Help by selecting Help > **Contents...** from the menu bar, pressing the **F1** key on your keyboard, or clicking the button on the **Protocol** action panel.

The following **Thermo Scientific FILLit Software Help** viewer opens.



The Help toolbar buttons are:

- **Hide** – Hides the left-hand side navigation pane. To display the navigation pane again, click the **Show** button that appears instead of the **Hide** button.
- **Back** – Takes you back to the previous view in your view history.
- **Forward** – Takes you to the next view in your view history.
- **Print** – Prints a single topic or multiple topics.

You can access the help content in different ways by selecting one of the following tabs:

- **Contents** – Browse the help topics by subject.
- **Index** – Type a keyword or browse all keywords to find a specific topic.
- **Search** – Find a specific help topic by entering words to search in the help content.

- **Favorites** – Add shortcuts to help topics of your choice.

Chapter 11
Troubleshooting Guide

Note Do not use the instrument if it appears that it does not function properly.

Note that the instrument does not verify the logic flow of the received commands.

When an error is detected, the current operation is terminated. After an error, it is best to abort the current run and restart from the beginning after the problem is fixed.

The Multidrop Combi embedded software has the following error messages (see Table 11-1).

Table 11-1. Embedded software error messages reported

Error	Cause	Action
Pump position error.	Peristaltic pump cannot rotate	Power off/on (or contact service).
Plate X position error.	Plate carrier cannot move	Power off/on (or contact service).
Plate Y position error.	Plate carrier cannot move	Power off/on (or contact service).
Z position error.	Pump lifting mechanism cannot move	Power off/on (or contact service).
No more memory for storing user data.	Too many protocols saved	Delete protocols that are not used.
Cannot dispense when pump not primed.	Predispensing undone	Press the PRIME button.
Missing prime vessel.	Priming vessel missing	Insert the priming vessel.
Rotor shield not in place.	Rotor cover not in place	Pull the rotor cover over the pump.

The run report in FILLit Software shows the error and warning messages that occur during dispensing.

Cannot connect to the instrument

If you receive an error message when trying to connect to the instrument, make sure that the correct communication port is selected in both the instrument and the software.

Problem A

After you click **Connect**, the connection fails. You receive the following error message:

Connection failed. Instrument not connected.

Problem B

After you click **Connect**, the connection fails. You receive the following error message:

Connection failed.

Solution A

Do the following:

1. Check the **Options** menu in the instrument control panel.
2. Make sure that the selected computer interface (USB or RS-232) matches the communication port in use.

Solution B

Do the following:

1. Check the **Instrument Setup** dialog in FILLit Software.
2. Make sure that the selected communication settings (USB or COM) match the communication port in use.

Also check that the serial connector or USB cable is securely connected to the computer and instrument and that the instrument is defined in FILLit Software (see “Communicating with instruments” on page 22).

You can also try switching the instrument OFF and ON again.

Glossary

backflush The operation of discharging the contents of the tubing of fluid.
See Also empty.

COM port Serial RS-232 port.

dispense To distribute liquid into the wells of the preselected strips or microplate.

dispensing height The tip position on top of the microplate. The distance between the bottom surface of the plate carrier to the tip of the dispensing tip.

dispensing cassette The dispensing cassette contains eight individual tubes. The dispensing cassette is detachable and disposable.

empty To draw back to the liquid bottle all the liquid in the dispensing cassette (i.e., the dead volume).

error message Indication that an error has been detected.

instrument protocol A dispensing protocol which can only contain one dispense step. The protocol can be downloaded to the instrument or run on the workstation when connected to the instrument.

multistep protocol A dispensing protocol which can contain any of the available steps with no limitations. Multistep protocols are only stored in the workstation and run from there when connected to the instrument.

plate A plate containing microwells.

predispense The volume that is automatically dispensed before filling each plate.

prime Completely filling the dispenser tubing with bubble-free fluid to allow sustained, reproducible dispensing action. The air in an unpredispensed line acts as a spring, adversely affecting accuracy and precision.

priming vessel An external waste container of propylene for excess priming liquid. The vessel can also be equipped with a tube drain or a cap.

remote control Running mode allowing a remote computer to operate the dispenser.

protocol A sequence of steps that performs desired function(s). A protocol contains all the information required by the instrument to dispense a plate, such as plate type, plate settings, steps and their parameters.
See Also instrument protocol, multistep protocol.

step A protocol consists of a number of steps. One step performs a specific function, such as priming, dispensing or shaking. Each step also has a set of parameters according to which the step is carried out.

strip A strip of wells in a row.

target well A well which is selected to be dispensed on a plate.

USB Universal serial bus.

well An individual reaction vessel in a plate.

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