Thermo Labsystems

KingFisher®

KingFisher® Software version 2.0

User Manual

Cat. no. 1508540

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Table of Contents

1 About the User Manual

This User Manual has been written for the users of *KingFisher* and *KingFisher mL* instruments and provides information on KingFisher Software. This manual contains the operating instructions for KingFisher Software version 2.0.

Read the manual in its entirety prior to using the software.

This User Manual can be found in PDF format on the installation CD, under the \Manuals directory. The User Manual PDF file can also be launched from the same location as the software itself: **Start → Programs → KingFisher 2.0 → User Manual**.

For more information on the KingFisher and KingFisher mL instruments, see their respective User Manuals.

Warning markings used in the documentation

Warning: Risk of electric shock.

Warning: Biohazard risk.

Warning: Risk of injury to the user(s).

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

Other markings used in the documentation

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

2 Introduction to KingFisher Software 2.0

KingFisher Software 2.0 is used to create protocols for KingFisher and KingFisher mL instruments.

Using KingFisher Software 2.0 the user can:

- Create new protocols
- Modify existing protocols
- Transfer protocols to and remove protocols from the KingFisher instrument memory
- Run a protocol directly with the KingFisher instrument without first transferring it to the instrument memory
- Export and import protocols between KingFisher databases in different PCs
- Create HTML reports for documenting protocols

The protocols are made and stored in a database on the PC using KingFisher Software 2.0. Once a protocol has been created, the user can either transfer the protocol into the KingFisher instrument memory or run the protocol directly from the software. Directly run protocols are not stored in the instrument memory.

The instrument memory can hold several protocols at the same time. The protocols stored in the instrument memory are launched from the KingFisher instrument.

The PC and the instrument only need to be connected to each other when protocols are transferred to or removed from the instrument itself, or if protocols are run directly from the software – i.e. you can create and edit protocols without a connection to the instrument.

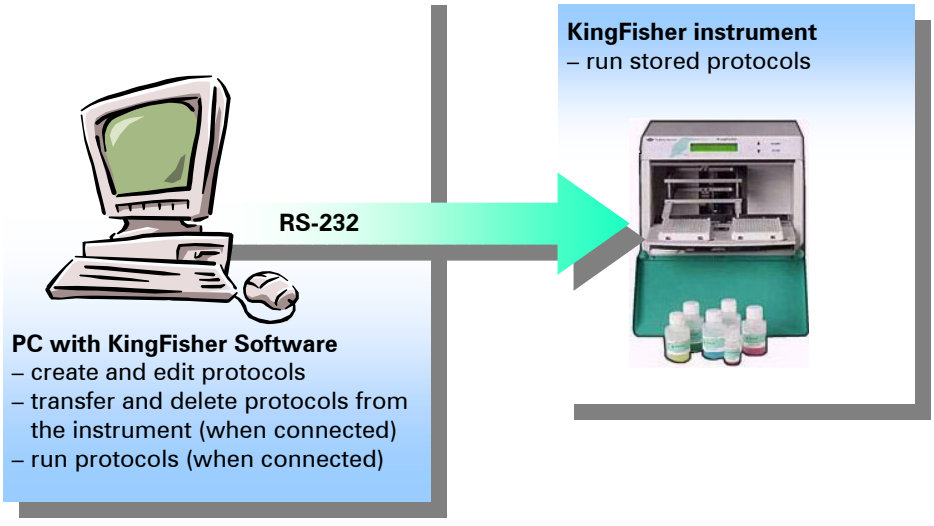


Fig. 2.1 Operation principle

3 Installing KingFisher Software 2.0

3.1 Before installation

Note: Failure to follow these instructions may lead to an unsuccessful installation of KingFisher Software 2.0!

Caution: Previously installed older versions of KingFisher Software must be removed before installing KingFisher Software version 2.0. The database for protocol storage should be removed as well. Refer to Section 3.2 Uninstalling earlier versions of KingFisher Software.

Note: Protocols made with KingFisher Software 1.0 cannot be opened with KingFisher Software 2.0. Refer to Appendix A: Printing reports of protocols made with KingFisher Software 1.0.

3.1.1 Checking the PC requirements

The table below lists the PC requirements for KingFisher Software 2.0.

PC requirements	
Interface	Serial communication port via an RS-232 full duplex interface
Supported operating systems	– Microsoft Windows NT 4.0 – Microsoft Windows 2000 – Microsoft Windows XP
Disk space	220 MB
Memory	≥ 128 MB RAM recommended
Serial ports available	1
Pointing device	Mouse or equivalent is necessary
CD-ROM drive	1
Monitor / color settings	SVGA monitor with at least 800 x 600 resolution (1024 x 768 recommended) and at least a 16-bit color environment.
Service Packs installed	– *Microsoft Windows NT 4.0*: Service Pack 6 – *Microsoft Windows 2000*: Service Pack 1 (or greater)
Browser	Microsoft Internet Explorer 4.0 (or greater) installed

If you do not have the correct Service Packs installed, you can download them from the Microsoft web pages: http://www.microsoft.com.

3.1.2 Microsoft Windows language settings

The language should be set to **English (United States)** or **English (United Kingdom)** before installation of KingFisher Software 2.0. The language settings can be checked and changed in the **Regional Settings** window (*Windows NT*), in the **Regional Options** window (*Windows 2000*), or in the **Regional and Language Options** window (*Windows XP*):

Windows NT:

Start → Settings → Control Panel → Regional Settings → English

Windows 2000:

Start → Settings → Control Panel → Regional Options → General → English

Windows XP:

Start → Settings → Control Panel → Regional and Language Options → Regional Options → English

If for some overriding reason you do not wish to set the language to English, the **Decimal symbol** must nevertheless be determined as "**.**" and the **Digit grouping symbol** preferably as "**,**" and not "**.**".

Windows NT:

Start → Settings → Control Panel → Regional Settings → Number → Decimal symbol & Digit grouping symbol

Windows 2000:

Start → Settings → Control Panel → Regional Options → Number → Decimal symbol & Digit grouping symbol

Windows XP:

Start → Settings → Control Panel → Regional and Language Options → Customize → Numbers → Decimal symbol & Digit grouping symbol

3.1.3 Letters permitted with KingFisher Software 2.0 installation

It is only allowed to use the letters a to z and A to Z with KingFisher Software 2.0. Scandinavian letters (å, ä, ö, æ, ø etc) or any other non-standard letters should not be used with KingFisher Software 2.0.

3.2 Uninstalling earlier versions of KingFisher Software

Before installing KingFisher Software version 2.0, make sure that there is no earlier version of the software installed on the PC. If there is, the earlier version must be uninstalled first.

Note: Protocols made with KingFisher Software 1.0 cannot be opened or used with KingFisher Software 2.0. Therefore, the KingFisher Software 2.0 installation CD includes a small program for printing reports of the protocols created with KingFisher Software 1.0. The printout can then be used as an aid when creating protocols with KingFisher Software 2.0. Refer to Appendix A: Printing reports of protocols made with KingFisher Software 1.0.

After saving the reports of the old protocols as described in Appendix A, proceed to uninstall KingFisher Software 1.0:

Start → Settings → Control Panel → Add/Remove Programs → select **KingFisher Software 1.0 → Remove.**

The dialog will ask you whether you want to remove the database. It is recommended to remove the database in order to free disk space. The old database will be unusable with the new version of the software.

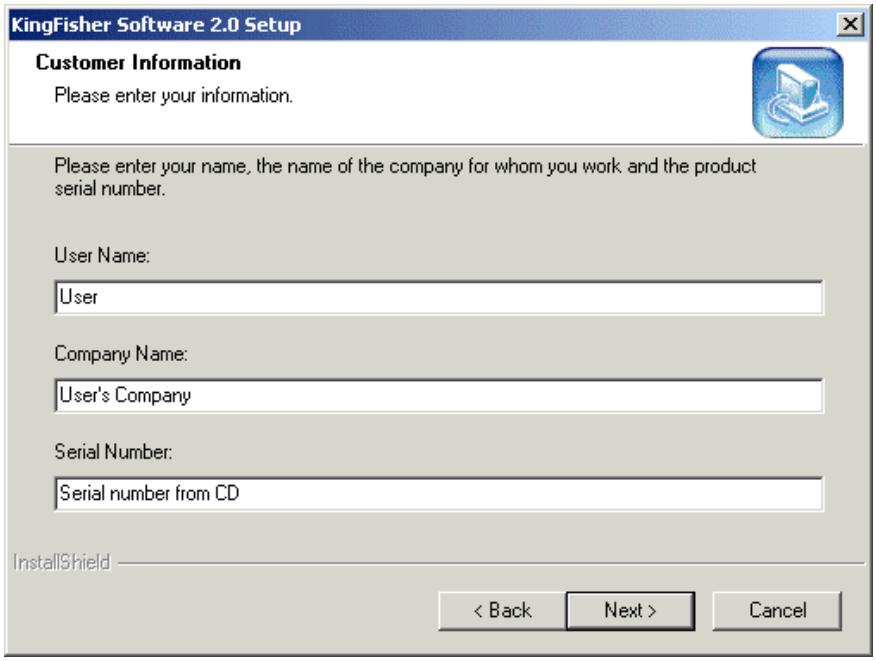
3.3 Installing

1. Check that the requirements in Section 3.1 are met.
2. Insert the KingFisher Software 2.0 installation CD into the CD-ROM drive of your PC.
3. If the **Welcome to KingFisher Software Setup** window does not appear automatically, launch the installation through the **Run…** window in the **Start** menu:

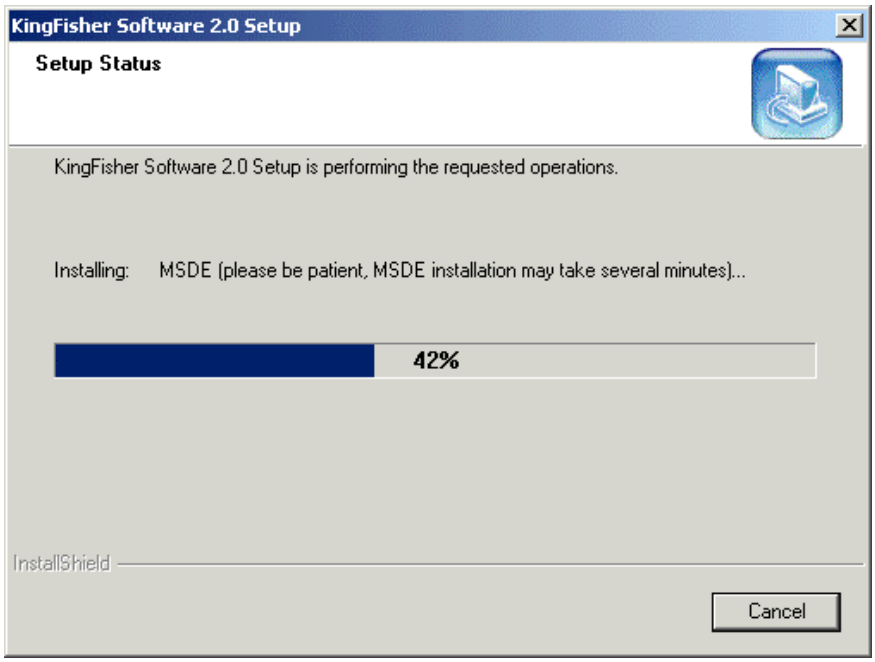
   Start → **Run…** → **Browse…** → select the **Setup.exe** file on the CD → **Open** → **OK**.
4. The InstallShield Wizard is launched. The wizard installs all the necessary components into your PC:
   - KingFisher Software 2.0, always installed
   - Microsoft Database Engine, installed if not found on your PC
   - Java Run Time Environment, installed if not found on your PC.

   The wizard automatically suggests file locations for the files to be installed. We recommend that these suggestions are used – change them only if absolutely necessary. The wizard guides you through the installation.

5. During the installation there are some key windows that need to be checked with caution:
   - When entering your information in the **Customer Information** window, type your name and company in the **User Name** and **Company Name** fields. Type the serial number in the **Serial Number** field – the serial number is found on the CD cover.



- The Microsoft Database Engine installation may take several minutes depending on your PC.



6. After the installation is complete, click **Finish**.
7. WAIT until the green **KingFisher Software Setup** window disappears.
8. Check that the Microsoft Database Engine is running correctly. Select **Start → Programs → MSDE → Service Manager** or double-click the MSDE icon on the taskbar. You will obtain the **SQL Server Service Manager** window.

9. Check that the **Start/Continue** button is inactive (the server running and the green "play" symbol displayed) and that the **Auto-start service when OS starts** check box is checked.
10. KingFisher Software 2.0 can now be launched from the **Start** menu:

    Start → Programs → KingFisher 2.0 → KingFisher Software 2.0.

    Or: double-click the KingFisher Software shortcut icon on your desktop.

4 Using KingFisher Software 2.0

This chapter describes the functions of KingFisher Software 2.0.

4.1 General operational procedure

The general operational procedure with KingFisher Software 2.0 is as follows:

1. Launch the KingFisher Software 2.0 application.
2. Open an existing protocol or create a new protocol.
3. Edit the protocol if necessary.
4. Send the protocol to the KingFisher instrument memory or run it directly from the software.

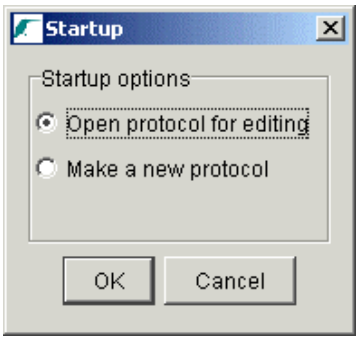
Note: You can also send protocols to the instrument memory or run protocols directly without opening them.

4.2 Launching KingFisher Software 2.0

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

   Start → Programs → KingFisher 2.0 → KingFisher Software 2.0.

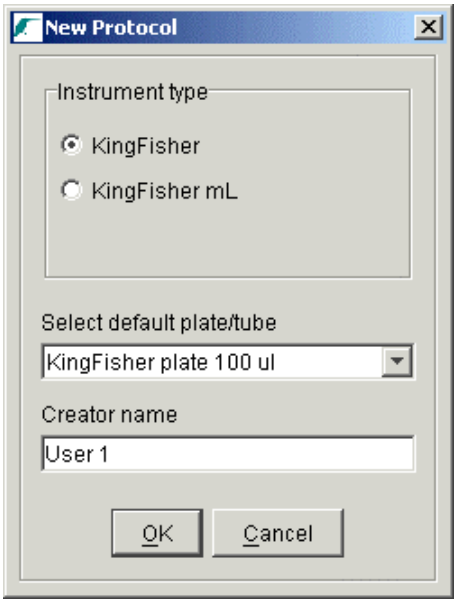
   The **Startup** window appears.



2. Select your action from the **Startup** options:
   - **Open protocol for editing** – Opens an existing protocol from the database on the PC (see Section 4.4).
   - **Make a new protocol** – Creates a new protocol that can be saved in the database (see Section 4.3).

4.3 Making a new protocol

1. From the **Startup** dialog select **Make a new protocol** or, if you are already in the protocol editor, select **Protocol → New**.



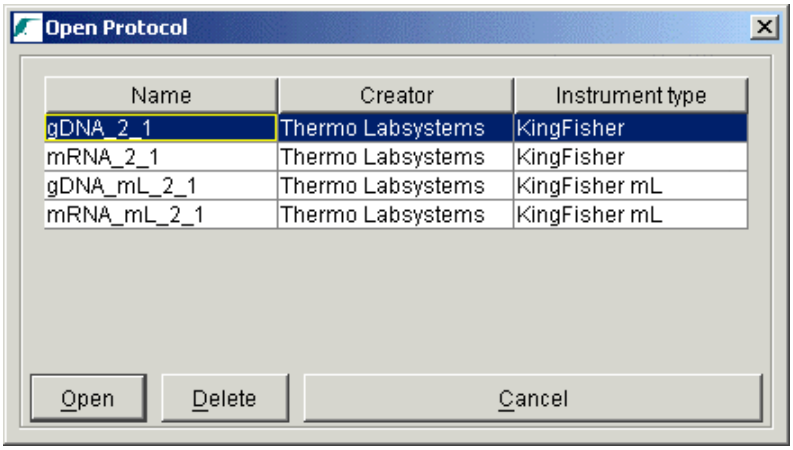
2. Fill in the protocol information:
   - **Instrument type** – Select the instrument type: **KingFisher** or **KingFisher mL**.
   - **Select default plate/tube** – Select a default plate or tube from the drop-down list. See default plate values in Table 4.1 in Section 4.5.5.
   - **Creator name** – Type in a name (max. 20 characters) – your Windows user name is suggested as default.
3. Click **OK**.

Note: You must give the new protocol a creator name, otherwise the protocol will not be created. The creator name "ThermoLabsystems" is reserved for built-in protocols that cannot be deleted from the database.

4. A new blank protocol appears with the Protocol properties as the first step. The Protocol properties step is always the first step in a protocol. For information on how to fill in the Protocol properties, see Section 6.2.1.
5. Edit the protocol as necessary (see Section 4.5).

4.4 Opening an existing protocol

After you have chosen **Open protocol for editing** from the **Startup** dialog or selected **Protocol → Open**, the **Open Protocol** dialog appears.



The **Open Protocol** dialog shows all the protocols that are currently in the database.

To open a protocol for editing:

1. Select the protocol by clicking its name.
2. Click **Open**.

The selected protocol is now opened for editing in the **Protocol Edit** window.

4.5 Editing a protocol

4.5.1 General guidelines

Here is a list of tasks that need to be carried out when editing new or existing protocols. The tasks below can be performed in any order – as long as they are all checked before you save the protocol or send it to the instrument.

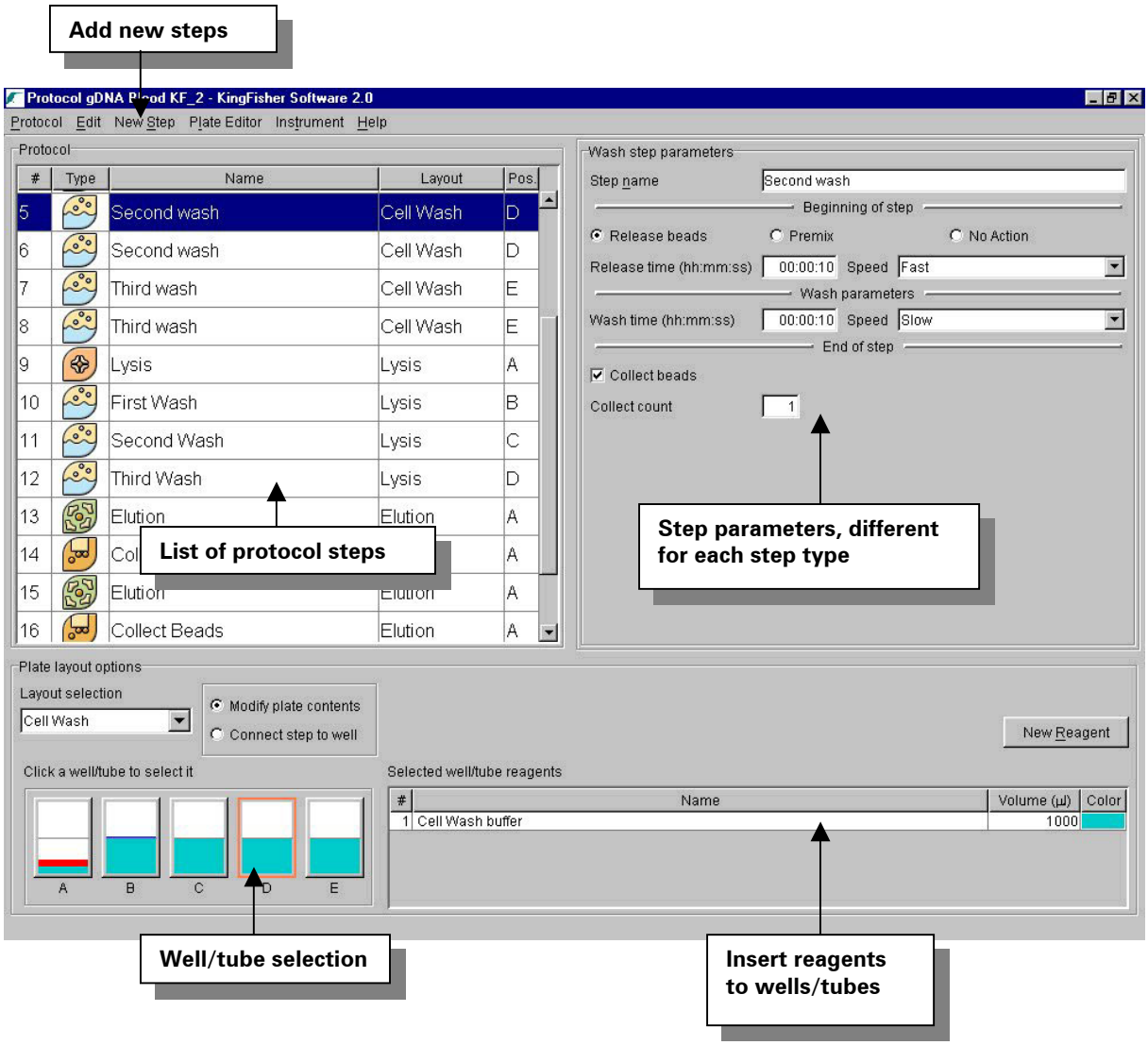
- ❑ Edit the Protocol properties data (Section 6.2.1)
- ❑ Add, delete or edit protocol steps (Sections 4.5.3, 4.5.4 and 6.2.1 through 6.2.8)
- ❑ Check that the plate layouts match the actual plates – create new plate layouts or edit the existing ones, if necessary (Section 4.5.5)
- ❑ Assign protocol steps to plate layouts (Section 4.5.5.2)
- ❑ Assign steps to wells/tubes in the plate layout(s) (Section 4.5.6)
- ❑ Add, delete or edit the reagents in the wells/tubes (Sections 4.5.7 and 4.5.8)

4.5.2 Protocol Edit window

The following figure shows an example of a protocol that has been opened in the **Protocol Edit** window.

In addition to the Main menu (see Section 6.1), the window has three sections:

- **Protocol** – Includes a table that shows all the steps included in the current protocol.
- **Step parameters** (Wash step parameters in the illustrated protocol below) – Includes the parameters for the selected step inside the current protocol. For more information, see Section 6.2.
- **Plate layout options** – Shows the reagents in the strip wells/tubes and is also used to add reagents into the wells/tubes and to connect wells/tubes in a plate layout to a specific step in the step list. For more information, see Sections 4.5.5 through 4.5.8.



4.5.3 Adding new protocol steps

Once a protocol has been created (Section 4.3) or opened (Section 4.4), new steps can be added to the protocol. New steps appear after the selected step or, if no step has been selected, after the last step.

1. Go to the **New Step** menu.
2. Select the type of step you wish to add (*Collect Beads*, *Bind*, *Wash*, *Mix*, *Dry*, *Elution*, *Pause*). For more information on the steps, see Section 6.2.

4.5.4 Deleting protocol steps

1. Select (click) the step you wish to delete.
2. Select **Edit → Delete**.

Caution: Before selecting **Edit → Delete** (or pressing CTRL+Del), always check that you have selected the item you wish to delete. The same **Delete** command can be used for deleting either protocol steps or well/tube reagents.

4.5.5 Selecting plate layout

The KingFisher instruments can handle different types of plates with a different number of wells/tubes with different volumes. A single protocol can utilize several different plate types – ultimately, every step can be assigned to a different plate layout if necessary.

Table 4.1 below shows the available plate layouts for the instruments. The volume range for the selected plate type must be observed.

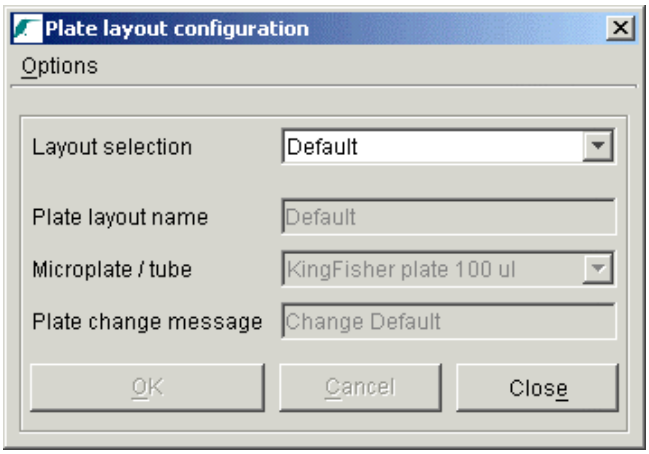
Table 4.1 Plate layouts for KingFisher instruments

Instrument	Layout	Volume range
KingFisher	KingFisher plate 100 µl *(default)*	20 – 100 µl
	KingFisher plate 200 µl	20 – 200 µl
KingFisher mL	KingFisher tubestrip 1000 µl *(default)*	50 – 1000 µl
	Microtube 1.5 ml	500 – 600 µl
	Microtube 1.9 ml	500 – 800 µl

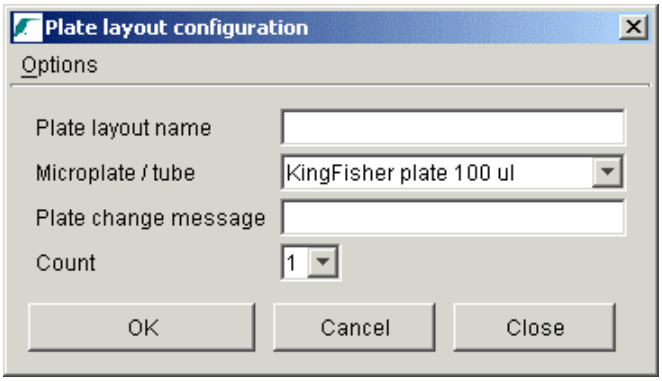
Caution: The software does not accept volumes that exceed the maximum volumes given in the table. However, the software accepts volumes smaller than the minimum volume. **DO NOT** enter smaller values though, as the magnetic rod will not reach the liquid.

4.5.5.1 Creating a new plate layout for a protocol

1. Select **Plate Editor → Plate Configuration…**.



2. Select **Options → New**.



3. Enter the information in the fields:
   - **Plate layout name** – The name that is shown in the **Selected layout** pull-down menus (max. 18 characters).
   - **Microplate / tube** – Select the volume per well of the used plate type. See available types and default values in Table 4.1.
   - **Plate change message** – This message is shown on the instrument display when this plate is to be inserted into the instrument (max. 18 characters).
   - **Count** – Select the number of Plate layouts to be created (from 1 to 8).
4. Click **OK**. The new layout name is shown in the **Layout selection** pull-down menu and, if selected, can be edited or removed using the **Options** menu.
5. Click **Close** to return to the **Protocol Edit** window.

4.5.5.2 Assigning a plate layout to a step

You can assign plate layouts to the steps in the **Protocol Edit** window (see Section 4.5.1):

1. Activate (select) the step you wish the plate layout to be assigned to.
2. Select **Connect steps to well** in the *Plate layout options* field.
3. Select the layout from the **Layout selection** pull-down menu.

4.5.6 Assigning protocol steps to a well / tube in a plate layout

A protocol step is assigned to a well/tube using the **Protocol Edit** window.

1. Activate (click) a step in the list of protocol steps.
2. Check that the Layout is correct.
3. Select **Connect steps to well** in the *Plate layout options* field.
4. Assign a well/tube by clicking a well/tube, marked as **A**, **A** to **E**, or **A** to **H** – depending on the KingFisher instrument and plate layout used.
5. Repeat for each step.
6. Select **Modify plate contents** in the *Plate layout options* field.

4.5.7 Adding reagents into a well / tube

To add reagent(s) into a well/tube:

1. Make sure that **Modify plate contents** is selected.
2. Select (click) a well/tube marked with the letters **A** to **H** (**A** to **E** with the KingFisher ml tubestrip 1000 µl, and only **A** with 1.5 ml and 1.9 ml Microtubes).
3. Click **New Reagent**. A new reagent row appears in the *Selected well/tube reagents* table.
4. Enter the reagent name in the *Name* column of the new row (max. 20 characters).
5. Enter the volume (in microliters) for the new reagent in the *Volume* column of the new row.
6. Specify a color for the new reagent from the palette that appears when you click the *Color* column of the new row.

If the well/tube contains more than one reagent, go back to step 3 in the list above and add all reagents that are in that specific well/tube. Otherwise go back to step 2 and select another well/tube.

Note: Each well/tube has a volume range that must be observed (20 – 100 µl for 100 µl plates, 20 – 200 µl for 200 µl plates, 50 – 1000 µl for 1000 µl tubestrips, 500 – 600 µl for 1.5 ml Microtubes, and 500 – 800 µl for 1.9 ml Microtubes).

4.5.8 Deleting reagents from a well / tube

To delete reagents from a well/tube:

1. Click on the row of the reagent you wish to remove.
2. Select **Edit → Delete** from the menu.

Caution: Before selecting **Edit → Delete** (or pressing CTRL+Del), always check that you have selected the item you wish to delete. The same **Delete** command can be used for deleting either protocol steps or well/tube reagents.

4.6 Saving a protocol

Select **Protocol → Save** or **Protocol → Save As…** from the menu. **Save** saves the protocol with its current name and **Save As…** asks for a new protocol name (max. 20 characters).

4.7 Deleting a protocol from the database

To delete a protocol from the database on the PC:

1. Select **Protocol → Open**.
2. In the **Open Protocol** dialog, select the protocol you wish to delete.
3. Click **Delete**.

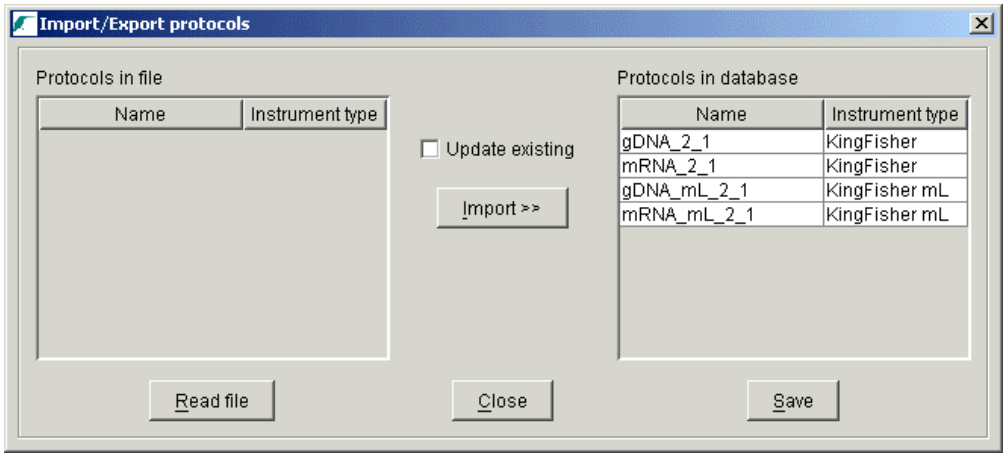
For information on how to remove a protocol from the KingFisher instrument, see Section 5.5.

4.8 Exporting and importing data

4.8.1 Exporting protocols

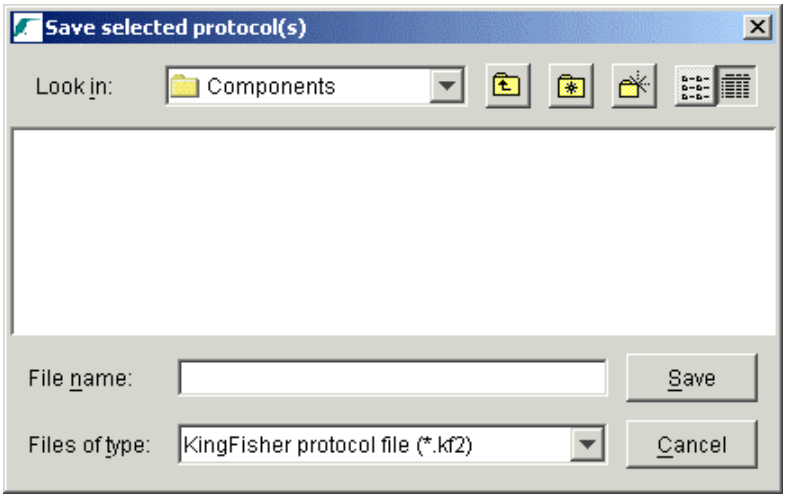
A single protocol or many protocols can be exported into a separate database that can be imported to another KingFisher protocol database on another PC.

1. Select **Protocol → Import/Export protocols**.



2. Select one or more protocols from the *Protocols in database* list. Use the SHIFT key together with the mouse button to select protocols between two clicked protocols and the CTRL key to select only the clicked protocols.

3. Click **Save**.



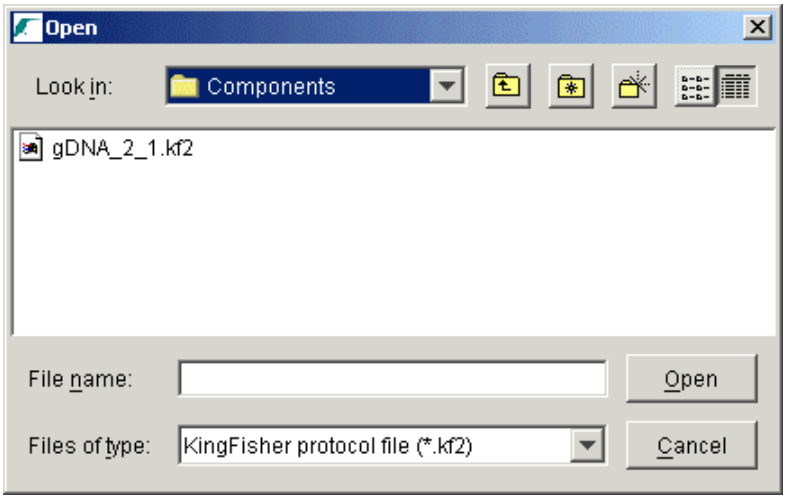
4. Select the directory where the "**.KF2**" file is saved.
5. Enter a name for the file.
6. Click **Save**.

You will receive a message stating whether the export procedure was successful or not.

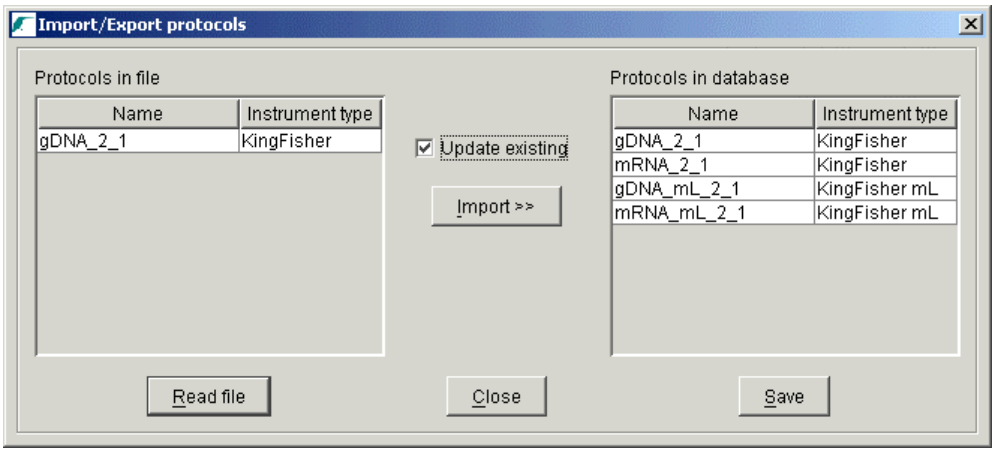
4.8.2 Importing protocols

Protocols can be imported from a database that has been exported from KingFisher Software 2.0.

1. Select **Protocol → Import/Export protocols**.
2. Click **Read file**.

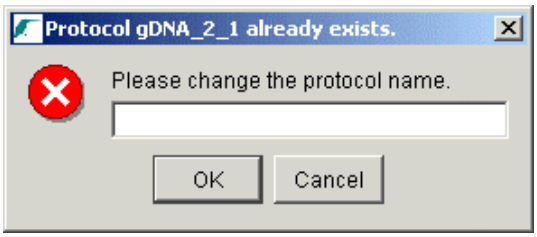


3. Select the database (***.KF2**) by browsing in the **Open** window and click **Open**.



4. Select the protocol(s) you wish to import from the *Protocols in file* list. Use the SHIFT key together with the mouse button to select protocols between two clicked protocols and the CTRL key to select only the clicked protocols.
5. Tick **Update existing** if you wish to overwrite the protocols with identical protocol name(s) in the target database.
6. Click **Import**.

   If there are protocols with identical names and you have not ticked the **Update existing** tick box, you will be asked to change the name of the protocol that is being imported:



   Type in a new name and click **OK**.

You will receive a message stating whether the import procedure was successful or not.

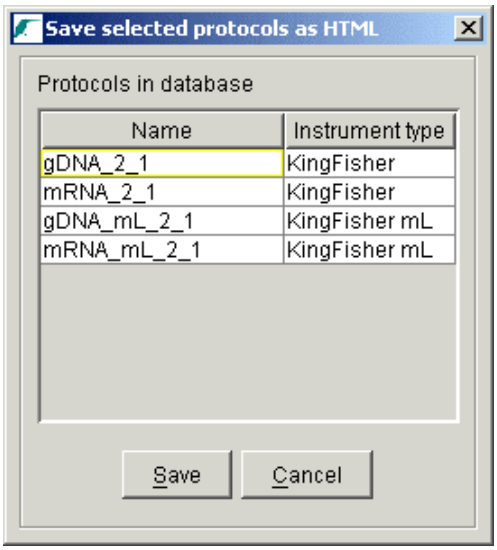
4.8.3 Exporting protocol data in HTML format

The protocol characteristics, i.e. the protocol settings that the protocol operates with, can be exported into an HTML file. This function can be used, for example, for documenting protocols.

The HTML files cannot be imported back into KingFisher Software 2.0 – they can be regarded as electronic printouts of the protocol settings.

To create an HTML file:

1. Select **Protocol → Export printout**.



2. Select the protocol(s) you wish to save from the *Protocols in database* list. Use the SHIFT key together with the mouse button to select protocols between two clicked protocols and the CTRL key to select only the clicked protocols.
3. Click **Save**.
4. Select the directory where you wish to save the HTML file(s). The filename is created automatically and is of the following format: "**KingFisher**__<*protocol name*>**.html**".
5. Click **Save**.

You will receive a message stating whether the **Save** procedure was successful or not.

You can now open the HTML file for viewing using a web browser or import it into a word processing program and add it to a report document, for example.

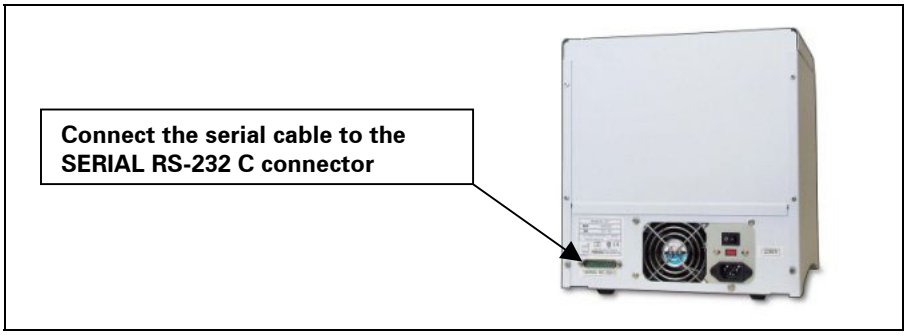
5 Communicating with KingFisher instruments

The KingFisher instruments have to be configured in the PC database in order to establish the data transfer connection between the software on the PC and the instrument. The connection has to be physically established only when protocols are sent to or removed from the instrument, or when protocols are run directly from KingFisher Software 2.0.

5.1 Connecting the PC and the KingFisher instrument

The PC and the KingFisher instrument are connected using an RS-232 serial cable.

1. Switch OFF both the PC and the KingFisher instrument.
2. Connect the serial cable to a free serial (COM) port on your PC.
3. Connect the other end of the cable to the SERIAL RS-232 C connector on the KingFisher instrument back panel.

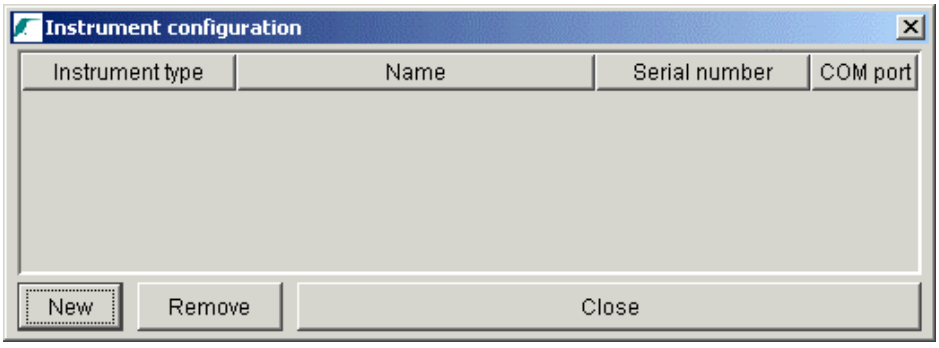


4. Switch ON the KingFisher instrument and then the PC.

5.2 Adding an instrument to the PC database

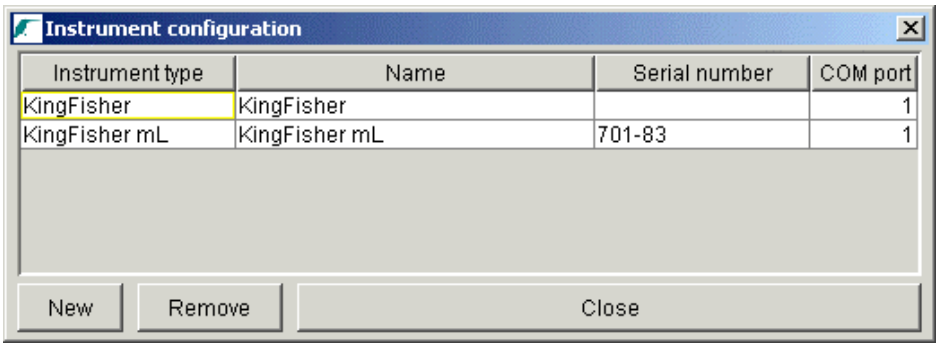
Before protocols can be sent to the instrument memory, or run directly, the instrument identification and communication data has to be added to the database.

1. Open the **Instrument configuration** dialog from the **Instrument** → **Instrument Configuration**… menu.



2. Click **New**.

3. Select your instrument type from the pull-down menu: **KingFisher** or **KingFisher mL**. Click **OK**.

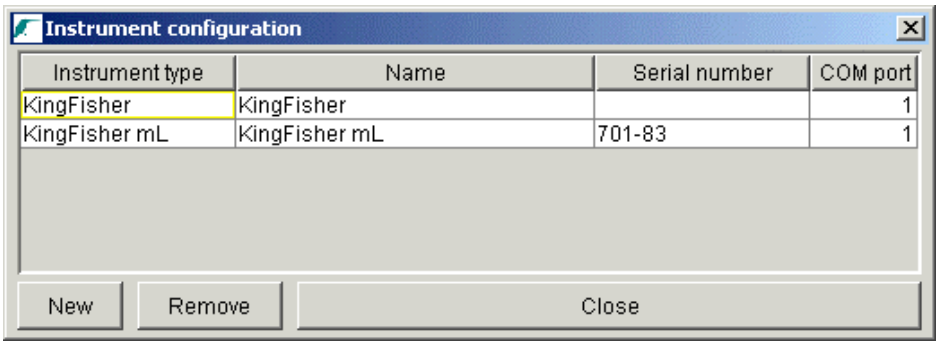


4. Enter the instrument information in the fields:
   - **Name** – Give the specific instrument a unique name (max. 20 characters).
   - **Serial number** – Check the instrument's serial number from the back of the instrument and type it here. When the field is red, the serial number is either false or not completely typed.
   - **COM port** – Select the COM port that the instrument is connected to.
5. Click **Close**.

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

5.3 Removing an instrument from the database

1. Open the **Instrument configuration** dialog from the **Instrument → Instrument Configuration…** menu.



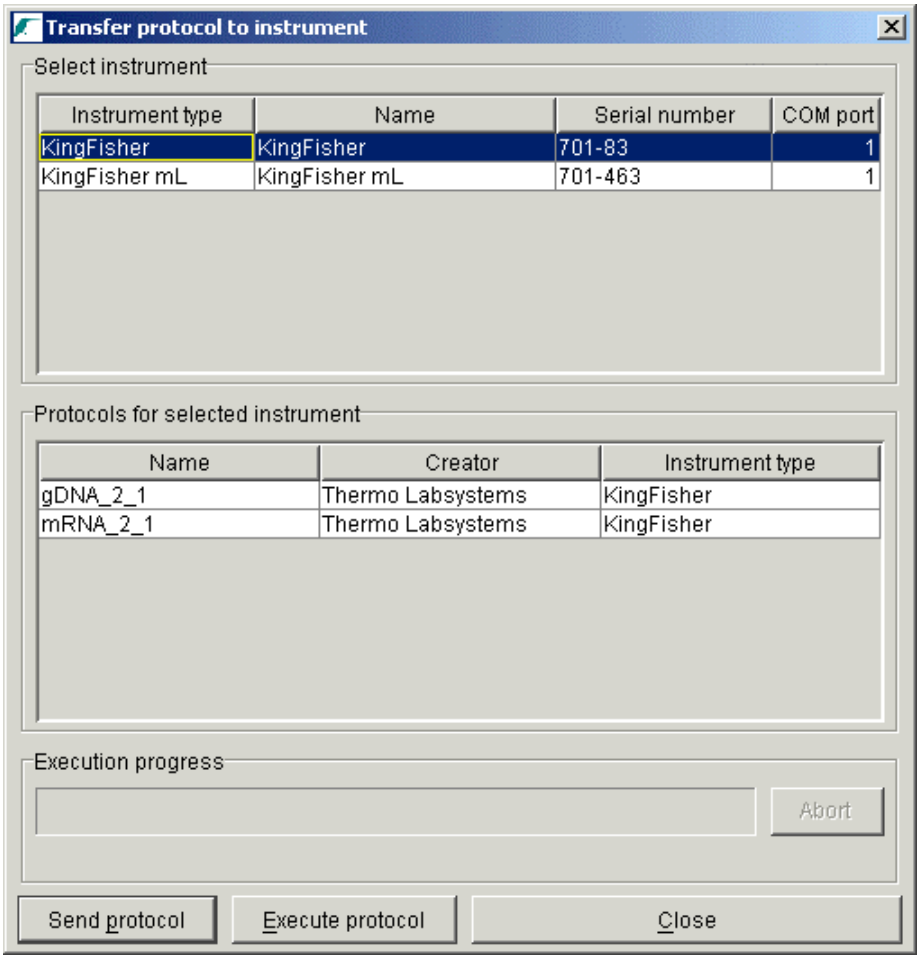
2. Select the instrument you wish to remove.

3. Click **Remove**.

5.4 Sending or running a protocol

To send a protocol to the instrument memory, or to run the protocol directly without saving it to the instrument memory:

1. Check that the instrument has been configured correctly (Section 5.2) and that the instrument and PC are connected to the correct COM port.
2. Open the **Transfer protocol to instrument** dialog from **Instrument → Send Protocol to Instrument**….



3. Select the target instrument from the *Select instrument* table.
4. Select a protocol from the *Protocols for selected instrument* table. The protocols in that table are the available protocols in the database.
5. Select either of the following:
   - Click **Send protocol** to transfer the protocols to the instrument memory.

     The *Execution progress* bar shows how the transfer is progressing while the text field below the progress bar shows textual information on the transfer. The **Abort** button will abort the operation if clicked during the transfer.
   - Click **Execute protocol** to launch the protocol directly without transferring it to the instrument memory.

Note: Use the **Abort** button only if the protocol transfer has halted for more than 5 minutes. After the transfer has been aborted, you have to turn the power OFF and back ON again from the instrument in order to continue.

For example, if you notice during the transfer that you chose the wrong protocol from the list, DO NOT click **Abort** – let the protocol be sent to the instrument and remove it separately afterwards (see Section 5.5).

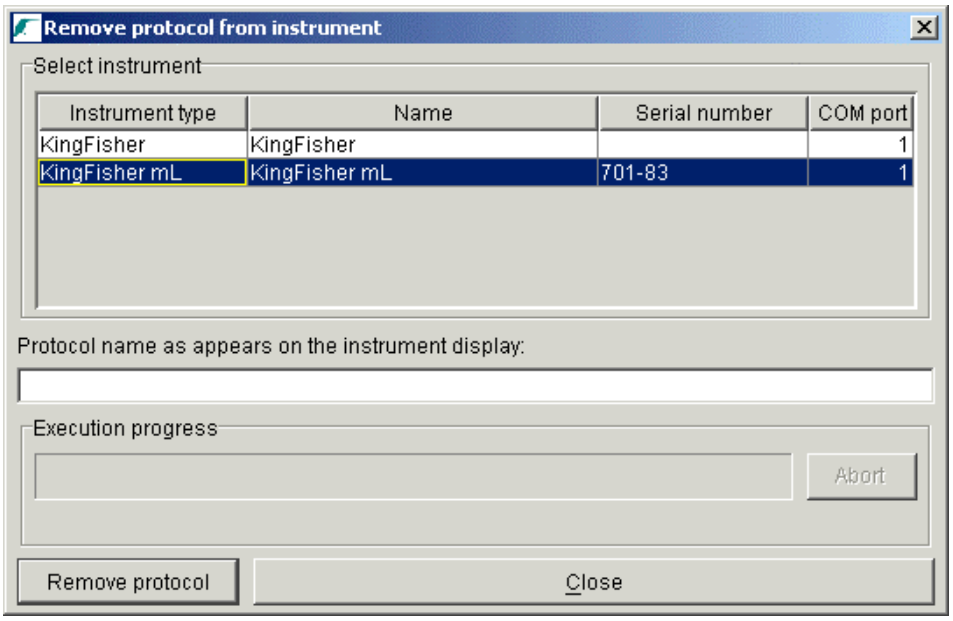
Before the protocol is sent or executed, the software checks the validity of the protocol. If there is an error in the protocol, the protocol is not sent or executed and you will be notified of the error.

After transferring the protocol, a dialog box appears and indicates whether the transfer was successful or not.

If the protocol was transferred to the instrument memory, you can launch the protocol using the instrument keypad and display. If **Execute protocol** was selected, the protocol will launch immediately after validation.

5.5 Removing a protocol from the instrument

1. Check that the instrument has been configured correctly (Section 5.2) and that the instrument and PC are interconnected through the selected COM port.
2. Check the protocol name from the instrument display.
3. Select **Instrument → Remove Protocol from Instrument…** from the KingFisher Software 2.0 main menu.



4. Select the instrument from the *Select instrument* field.
5. Type in the protocol name. The protocol name has to be typed exactly as it was shown on the instrument display.
6. Click the **Remove protocol** button.

You will receive a message stating whether the action was successful or not.

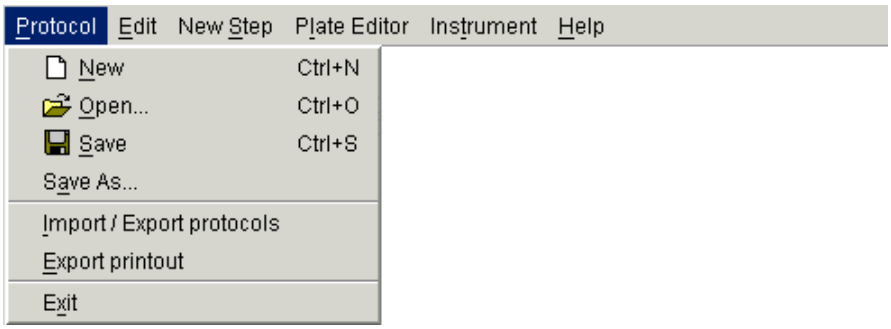
Note: Use the **Abort** button only if the operation has halted for more than 30 seconds. After the operation has been aborted, you have to turn the power OFF and back ON again from the instrument in order to continue.

6 Reference

This chapter includes descriptions of all the commands in KingFisher Software 2.0.

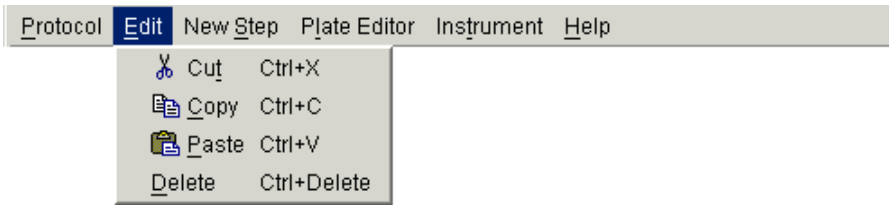
6.1 Main menu commands

6.1.1 Protocol



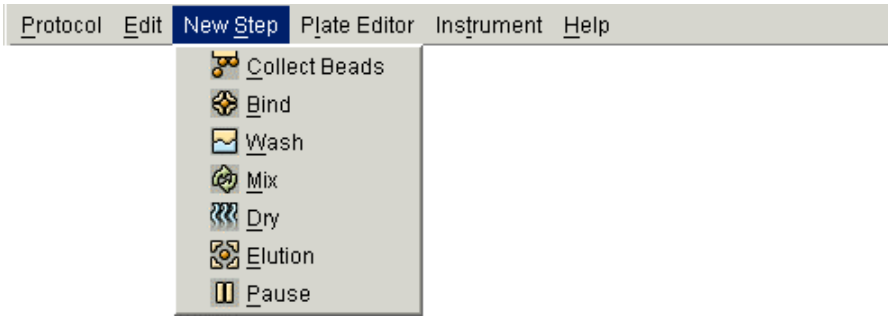
- **New** – Creates a new protocol (see Section 4.3).
- **Open…** – Launches the Open protocol dialog for opening protocols from the database (see Section 4.4).
- **Save** – Saves the current protocol in the database.
- **Save As…** – Saves the current protocol with a new name (max. 20 characters).
- **Import/Export protocols** – Saves (exports) selected protocols in separate databases that can be imported to a database of another PC with KingFisher Software 2.0 (see Section 4.8).
- **Export printout** – Exports protocol data into an HTML file that can be used for documentation purposes (see Section 4.8.3).
- **Exit** – Exits KingFisher Software 2.0.

6.1.2 Edit



- **Cut** – Cuts the selected protocol step to the clipboard.
- **Copy** – Copies the selected protocol step to the clipboard.
- **Paste** – Pastes the protocol step from the clipboard into the protocol step list.
- **Delete** – Deletes the selected item, for example, the protocol step or well/tube reagent (see Sections 4.5.4 and 4.5.8).

6.1.3 New Step

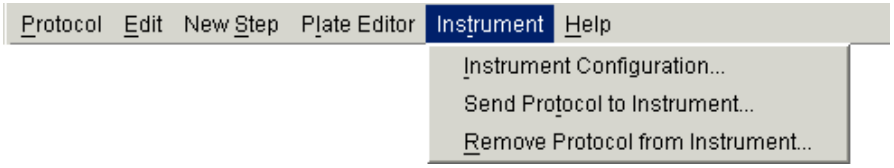


- ***<Step type>*** – Adds the chosen step type to the current protocol after the selected step. If no step is selected, the new step is added after the last step. For more information, see Sections 4.5.3 and 6.2.

6.1.4 Plate Editor

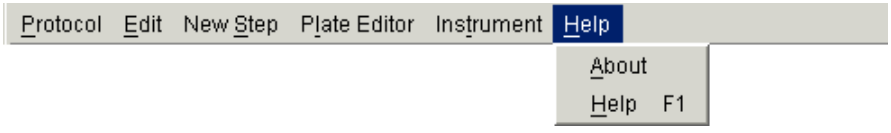
- **Plate Configuration…** – Configures plate layouts (layout names, well/tube volumes and plate change messages) for a protocol (see Section 4.5.5).

6.1.5 Instrument



- **Instrument Configuration…** – Establishes a connection to the KingFisher instrument (see Section 5.2).
- **Send Protocol to Instrument…** – Sends a protocol from the database to the instrument memory or runs a protocol directly (see Section 5.4).
- **Remove Protocol from Instrument…** – Removes a protocol from the instrument (see Section 5.5).

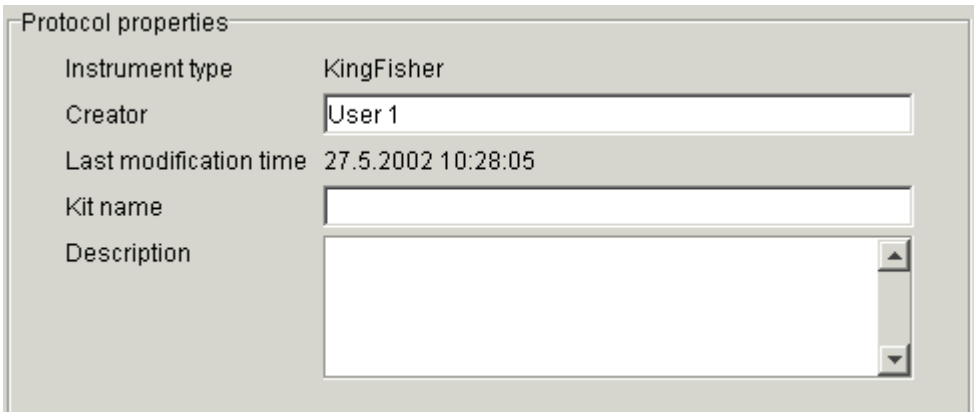
6.1.6 Help



- **About** – Contains information about KingFisher Software 2.0.
- **Help** – Launches the help application (see Chapter 7).

6.2 Step parameters

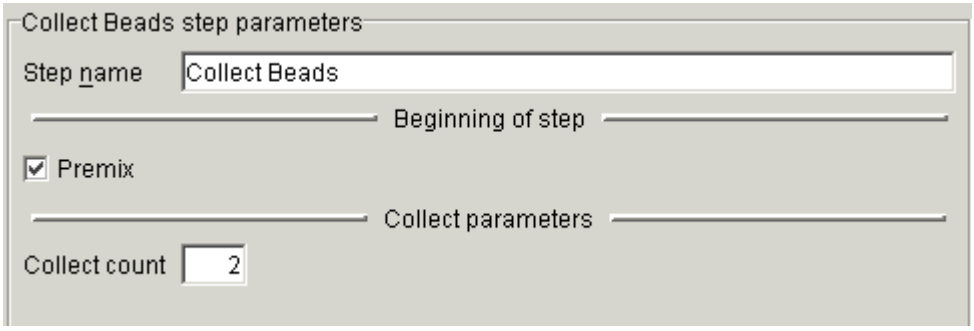
6.2.1 Protocol properties



Every protocol has Protocol properties as the first step. It contains the following information on each protocol:

- **Instrument type** – Either KingFisher or KingFisher mL. The instrument type is selected when creating a new protocol.
- **Creator** – The name of the person or agent that created this protocol must be entered when creating a protocol.
- **Last modification time** – Indicates the time the protocol was last edited.
- **Kit name** – The name of the used kit (optional – max. 20 characters).
- **Description** – Text description of the protocol (optional).

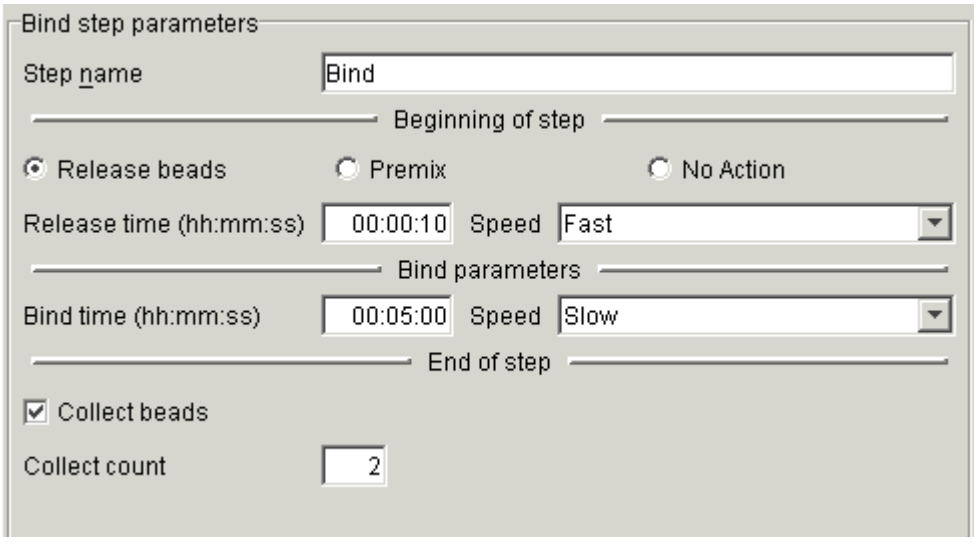
6.2.2 Collect Beads



The Collect Beads step collects the magnetic beads from the well/tube specified. This step can be repeated as many times as necessary. The step has the following parameters:

- **Step name** – The name of the step (max. 20 characters).
- **Premix** – If Premix is ticked, the tip (without the magnetic rod) mixes the reagent so that the beads are distributed evenly in the liquid (see Section 6.3.3).
- **Collect count** – The number of times the tip moves with the magnetic rod in the reagent in order to collect all the beads. A default value is given automatically.

6.2.3 Bind



The Bind step is used to collect material onto the magnetic beads from the reagent in a specific well/tube. The user can define the duration and how the beads are mixed during the binding process. The step has the following parameters:

- **Step name** – The name of the step (max. 20 characters).

Select one of the following in *Beginning of step*:

- **Release beads** – If selected, the beads are released into the reagent in the beginning, i.e. there are no beads in the reagent.
  - **Release time (hh:mm:ss)** – The time that the tip shakes in the reagent in order to release all the beads. A default value is given automatically.
  - **Speed** – The speed of the shaking action during Release time. The default speed is Fast. Available speeds are: Very slow; Slow; Medium; Fast; Very fast; Superfast (KingFisher only); Bottom very slow; Bottom slow; Bottom medium; Bottom fast; Bottom very fast; Bottom superfast (KingFisher only), and Fast dual mix.
- **Premix** – If Premix is selected, the tip (without the magnetic rod) mixes the reagent so that the beads are distributed evenly in the liquid (see Section 6.3.3).
- **No Action** – If selected, the KingFisher skips this section. The plastic tips and magnetic rods are not moved; they remain in the position that the previous step has left them.

Bind parameters:

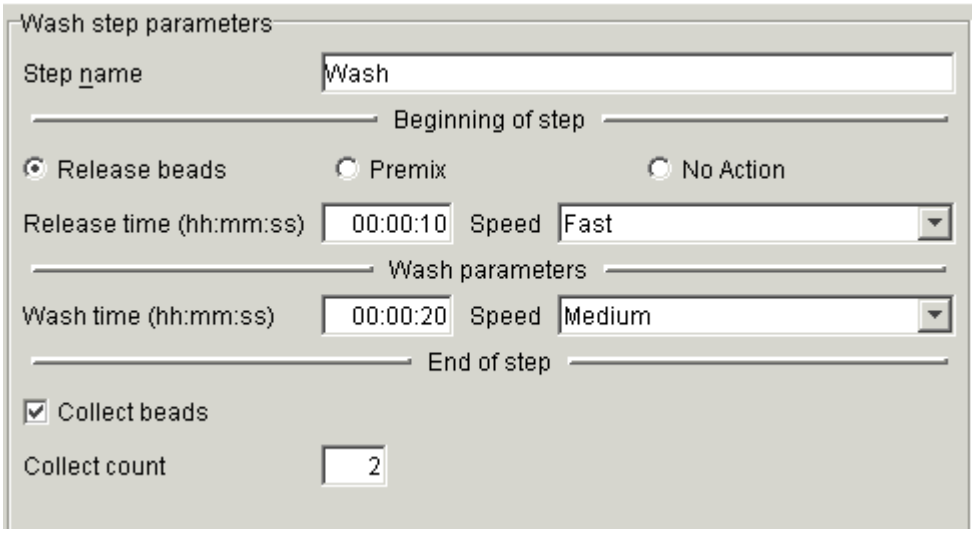
- **Bind time (hh:mm:ss)** – The time that the tip shakes in the reagent in order to collect material of interest onto the beads. A default value is given automatically.
- **Speed** – The speed of the shaking action during Bind time. The default speed for the Bind step is Slow. Available speeds are: Very slow; Slow; Medium; Fast; Very fast; Superfast (KingFisher only); Bottom very slow; Bottom slow; Bottom medium; Bottom fast; Bottom very fast; Bottom superfast (KingFisher only), and Fast dual mix.

End of step:

- **Collect beads** – Tick if you want the beads to be collected from the reagent and transferred to the next well/tube.
- **Collect count** – The number of times the tip moves with the magnetic rod in the reagent in order to collect all the beads. A default value is given automatically.

For more information on tip speeds, see Section 6.3.2.

6.2.4 Wash



The Wash step is used to wash the magnetic beads in a specific well/tube. This step can be repeated as many times as necessary. The step has the following parameters:

- **Step name** – The name of the step (max. 20 characters).

Select one of the following in *Beginning of step*:

- **Release beads** – If selected, the beads are released into the reagent in the beginning, i.e. there are no beads in the reagent.
  - **Release time (hh:mm:ss)** – The time that the tip shakes in the reagent in order to release all the beads. A default value is given automatically.
  - **Speed** – The speed of the shaking action during Release time. The default speed is Fast. Available speeds are: Very slow; Slow; Medium; Fast; Very fast; Superfast (KingFisher only); Bottom very slow; Bottom slow; Bottom medium; Bottom fast; Bottom very fast; Bottom superfast (KingFisher only), and Fast dual mix.
- **Premix** – If Premix is selected, the tip (without the magnetic rod) mixes the reagent so that the beads are distributed evenly in the liquid (see Section 6.3.3).
- **No Action** – If selected, the KingFisher skips this section. The plastic tips and magnetic rods are not moved; they remain in the position that the previous step has left them.

Wash parameters:

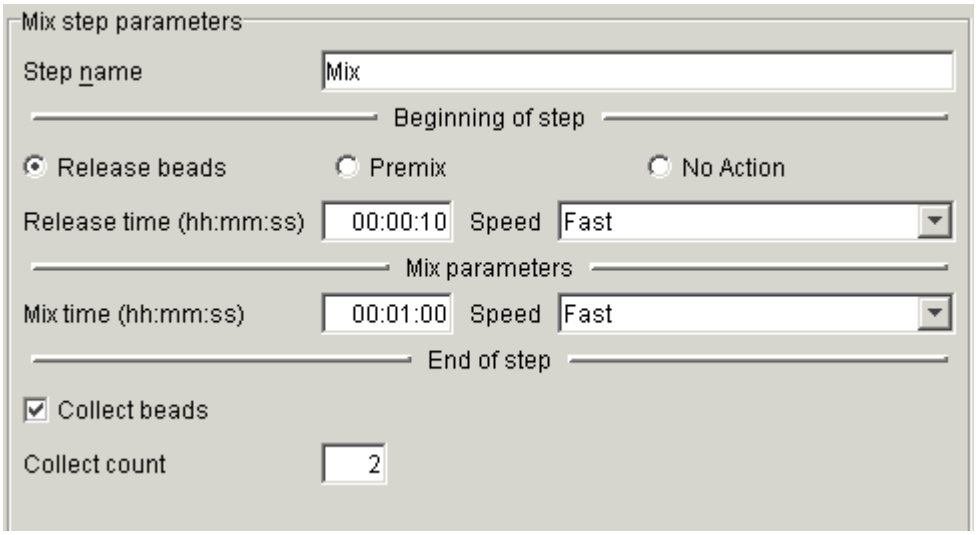
- **Wash time (hh:mm:ss)** – The time that the tip shakes the beads in a liquid in order to wash the beads. A default value is given automatically.
- **Speed** – The speed of the shaking action during Wash time. The default speed for the Wash step is Medium. Available speeds are: Very slow; Slow; Medium; Fast; Very fast; Superfast (KingFisher only); Bottom very slow; Bottom slow; Bottom medium; Bottom fast; Bottom very fast; Bottom superfast (KingFisher only), and Fast dual mix.

End of step:

- **Collect beads** – Tick if you want the beads to be collected from the reagent.
- **Collect count** – The number of times the tip moves with the magnetic rod in the reagent in order to collect all the beads. A default value is given automatically.

For more information on tip speeds, see Section 6.3.2.

6.2.5 Mix



The Mix step mixes the reagent and the beads (if inserted) with the plastic tip in a specific well/tube. This step can be repeated as many times as necessary. The step has the following parameters:

- **Step name** – The name of the step (max. 20 characters).

Select one of the following in *Beginning of step*:

- **Release beads** – If selected, the beads are released into the reagent in the beginning, i.e. there are no beads in the reagent.
  - **Release time (hh:mm:ss)** – The time that the tip shakes in the reagent in order to release all the beads. A default value is given automatically.
  - **Speed** – The speed of the shaking action during Release time. The default speed is Fast. Available speeds are: Very slow; Slow; Medium; Fast; Very fast; Superfast (KingFisher only); Bottom very slow; Bottom slow; Bottom medium; Bottom fast; Bottom very fast; Bottom superfast (KingFisher only), and Fast dual mix.

- **Premix** – If Premix is selected, the tip (without the magnetic rod) mixes the reagent so that the beads are distributed evenly in the liquid (see Section 6.3.3).
- **No Action** – If selected, the KingFisher skips this section. The plastic tips and magnetic rods are not moved; they remain in the position that the previous step has left them.

Mix parameters:

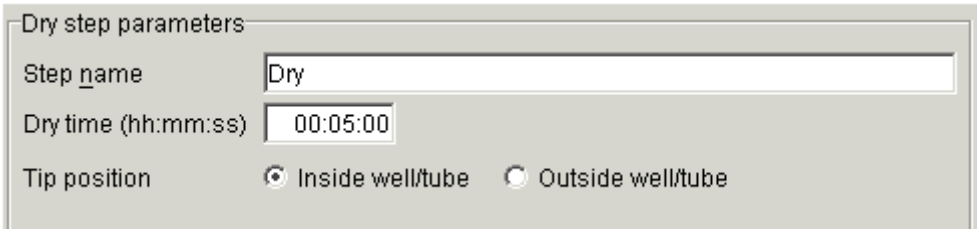
- **Mix time (hh:mm:ss)** – The time that the tip shakes in the reagent in order to mix the reagent with or without the beads. A default value is given automatically.
- **Speed** – The speed of the shaking action during Mix time. The default speed for the Mix step is Fast. Available speeds are: Very slow; Slow; Medium; Fast; Very fast; Superfast (KingFisher only); Bottom very slow; Bottom slow; Bottom medium; Bottom fast; Bottom very fast; Bottom superfast (KingFisher only), and Fast dual mix.

End of step:

- **Collect beads** – Tick if you want the beads to be collected from the reagent.
- **Collect count** – The number of times the tip moves with the magnetic rod in the reagent in order to collect all the beads. A default value is given automatically.

For more information on tip speeds, see Section 6.3.2.

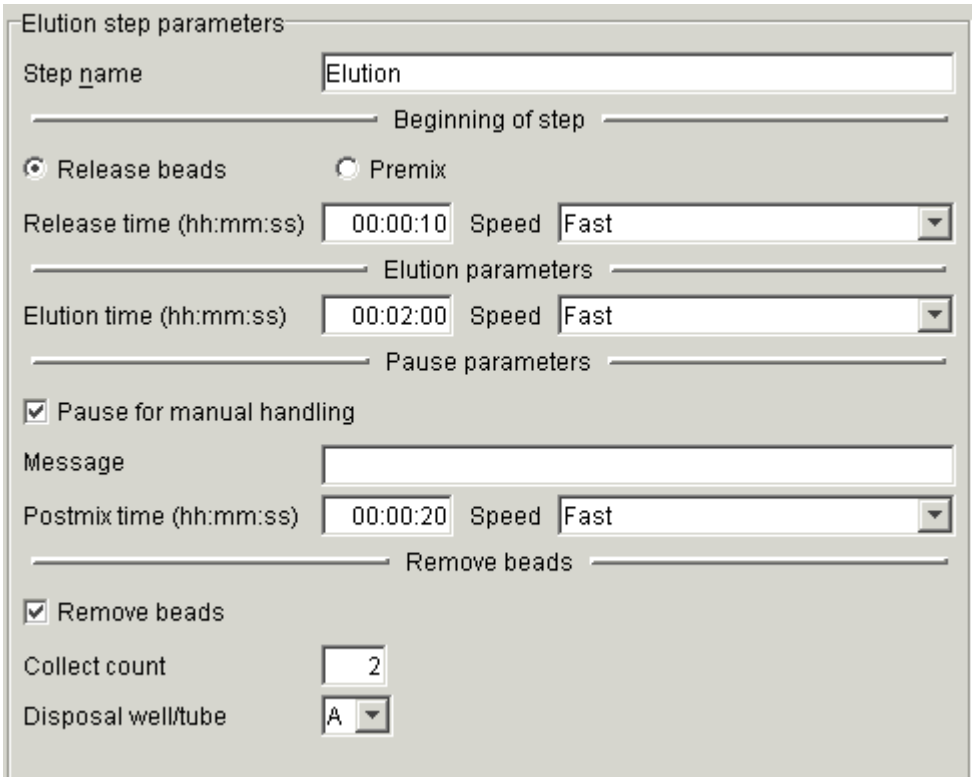
6.2.6 Dry



The Dry step removes the magnetic beads from a specific well/tube reagent. During the Dry step the beads remain attached to the tip surface – the magnetic rod remains inside the tip. The beads can be dried inside the well/tube above the liquid level or with the tip completely raised out of the well/tube. This step can be repeated as many times as necessary. The step has the following parameters:

- **Step name** – The name of the step (max. 20 characters).
- **Dry time (hh:mm:ss)** – The duration of the drying time. A default value is given automatically.
- **Tip position** – The position of the tips: **Inside well/tube** or **Outside well/tube**.

6.2.7 Elution



The Elution step is used to release the collected material from the surfaces of the magnetic beads into a specific well/tube. After the Elution step, the beads can be disposed into another specific well/tube. This step is usually carried out only once in a protocol – usually as the last step. The step has the following parameters:

- **Step name** – The name of the step (max. 20 characters).

Select one of the following in *Beginning of step*:

- **Release beads** – If selected, the beads are released into the reagent in the beginning, i.e. there are no beads in the reagent.
  - **Release time (hh:mm:ss)** – The time that the tip shakes in the reagent in order to release all the beads. A default value is given automatically.
  - **Speed** – The speed of the shaking action during Release time. The default speed is Fast. Available speeds are: Very slow; Slow; Medium; Fast; Very fast; Superfast (KingFisher only); Bottom very slow; Bottom slow; Bottom medium; Bottom fast; Bottom very fast; Bottom superfast (KingFisher only), and Fast dual mix.
- **Premix** – If Premix is selected, the tip (without the magnetic rod) mixes the reagent so that the beads are distributed evenly in the liquid (see Section 6.3.3).

Elution parameters:

- **Elution time (hh:mm:ss)** – The time that the tip shakes in the reagent in order to release the collected material from the beads. A default value is given automatically.
- **Speed** – The speed of the shaking action during Elution time. The default speed for the Elution step is Fast. Available speeds are: Very slow; Slow; Medium; Fast; Very fast; Superfast (KingFisher only); Bottom very slow;

Bottom slow; Bottom medium; Bottom fast; Bottom very fast; Bottom superfast (KingFisher only), and Fast dual mix.

Pause parameters:

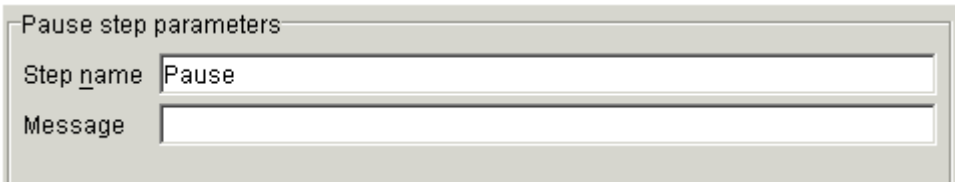
- **Pause for manual handling** – If selected, the protocol stops and the instrument displays the message stated in the Message parameter. For example, the plates can be taken out of the instrument and inserted into a heater. After the pause, the plates can be returned into the KingFisher instrument and the protocol will continue after the START button is pressed on the instrument keypad.
- **Message** – The message that appears on the instrument display when the protocol has stopped (max. 20 characters).
- **Postmix time (hh:mm:ss)** – If Postmix time is given, the tip (without the magnetic rod) mixes the reagent after the pause. A default value is given automatically.
- **Speed** – The speed of the shaking action during Postmix time. The default speed is Fast. Available speeds are: Very slow; Slow; Medium; Fast; Very fast; Superfast (KingFisher only); Bottom very slow; Bottom slow; Bottom medium; Bottom fast; Bottom very fast; Bottom superfast (KingFisher only), and Fast dual mix.

Remove beads:

- **Remove beads** – Tick if you want the beads to be removed from the well/tube after elution.
- **Collect count** – The number of times the tip moves with the magnetic rod in the reagent in order to collect all the beads. A default value is given automatically.
- **Disposal well/tube** – Select the well/tube into which the beads are inserted for disposal. Select from the drop-down list.

For more information on tip speeds, see Section 6.3.2.

6.2.8 Pause



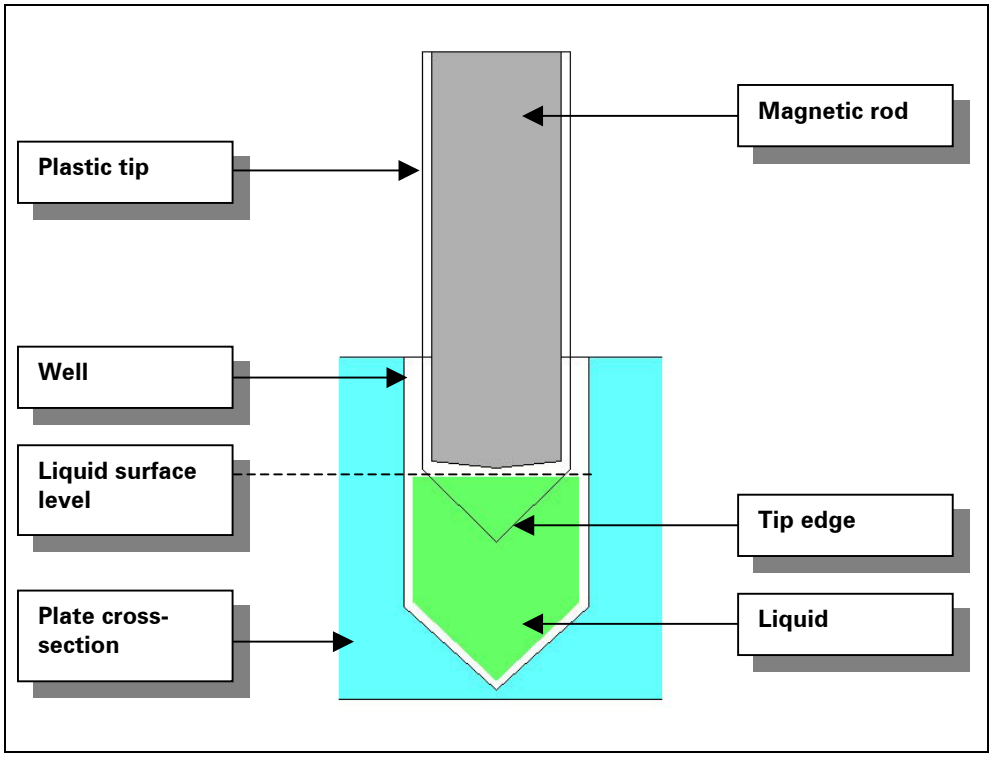
The Pause step is used for stopping the protocol. A message is displayed on the instrument display if a message has been entered in the step parameters. The plastic tips are raised into the top position with the Pause step. The KingFisher instrument continues with the protocol after the START button is pressed on the instrument keypad. This step can be repeated as many times as necessary. The step has the following parameters:

- **Step name** – The name of the step (max. 20 characters).
- **Message** – The message that appears on the instrument display when the protocol has stopped (max. 20 characters).

6.3 Technical information about the step functions

6.3.1 About the technical terms

The figure below clarifies the references to the KingFisher instruments.



6.3.2 Tip speeds

There are two different types of speeds you can specify for the plastic tip movement in the well/tube: full length speed, where the tip moves throughout the length of the well, and bottom speed, where the tip moves only at the bottom of the well. In Fast dual mix the tip moves first 10 seconds at the bottom of the well and then 10 seconds throughout the length of the well.

Table 6.1 shows the full length speed selection alternatives. Table 6.2 shows the alternatives for the bottom speed selections.

Table 6.1 Full length speeds for KingFisher instruments

Speed	KingFisher (0,1 mm/s)	KingFisher mL (0,1 mm/s)
Very slow	50	50
Slow	250	400
Medium	500	800
Fast	800	1100
Very fast	1000	1500
Superfast	1500	*Not in KingFisher mL*

Table 6.2 Bottom speed selections for KingFisher instruments

Speed	KingFisher (0,1 mm/s)	KingFisher mL (0,1 mm/s)
Bottom very slow	50	50
Bottom slow	250	400
Bottom medium	500	800
Bottom fast	800	1100
Bottom very fast	1000	1500
Bottom superfast	1500	*Not in KingFisher mL*
Fast dual mix	Bottom movement: time 10 s, speed 1000 Full length: time 10 s, speed 1000	Bottom movement: time 10 s, speed 1100 Full length: time 10 s, speed 1100

6.3.3 Premix command

The Premix command must be used if the magnetic beads have been in the well/tube for a long time and have sunk to the bottom. The Premix function mixes the liquid so that the beads float evenly in the liquid.

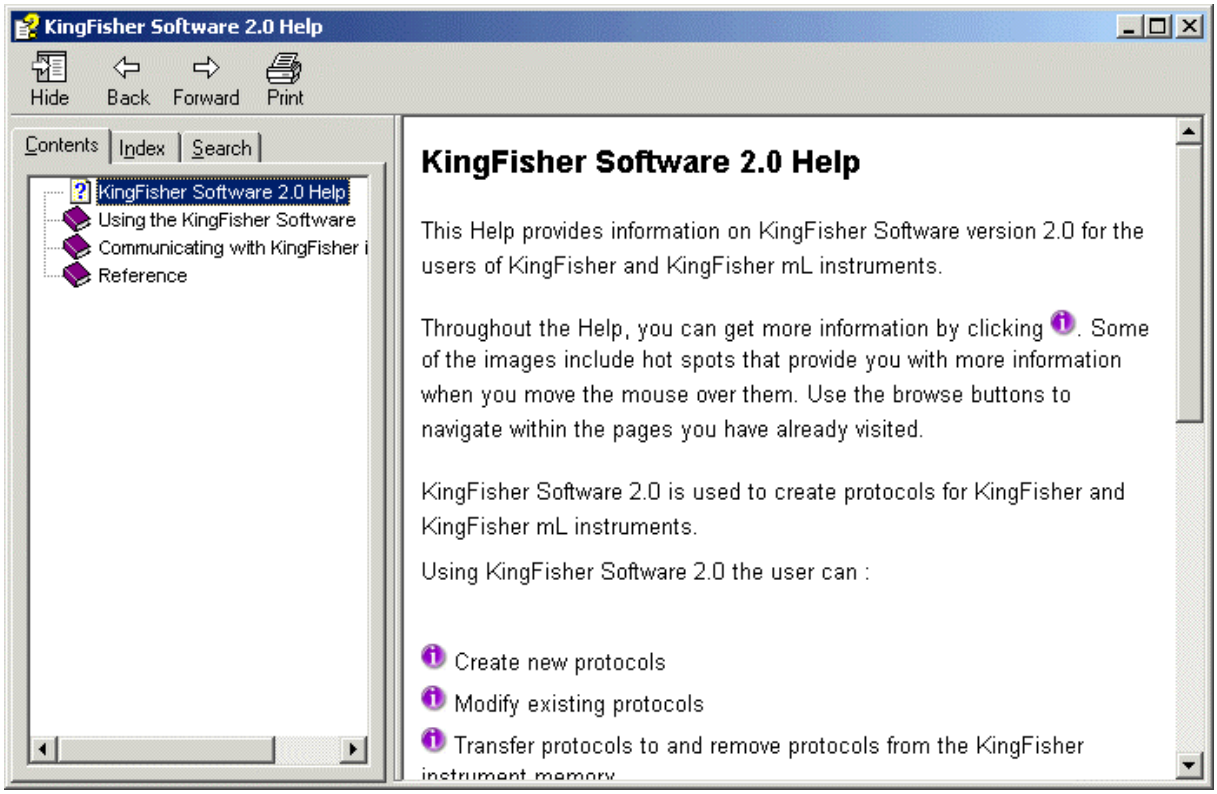
The Premix command includes the following procedures:

1. The plastic tip edges are lowered to the liquid surface level.
2. The magnetic rods are lowered into the tips.
3. Once the magnetic rods are inside the plastic tips, they are together lowered slowly (speed value 8) to the well/tube bottom limit.
4. The magnetic rods and plastic tips are raised to the liquid surface level (speed value 100).
5. The magnetic rods are lifted away from the plastic tips.
6. The Release command is executed. The plastic tips will then move up and down between the top and bottom limits for 5 seconds set at Fast.

7 Using KingFisher Software 2.0 Help

You can launch the Help application by selecting **Help → Help** from the main menu or by pressing the **F1** key on your keypad.

The following **KingFisher Software 2.0 Help** window will appear.



The KingFisher Help main menu buttons are:

- **Hide** – Hides the left-hand side navigation window. To display the navigation window 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 three different ways by selecting one of the following tabs:

- **Contents** – Browse the help topics by subject.
- **Index** – Type in 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.

Note: Many images in the help application contain links to topics. When you see an image, move the cursor across the image to find the links.

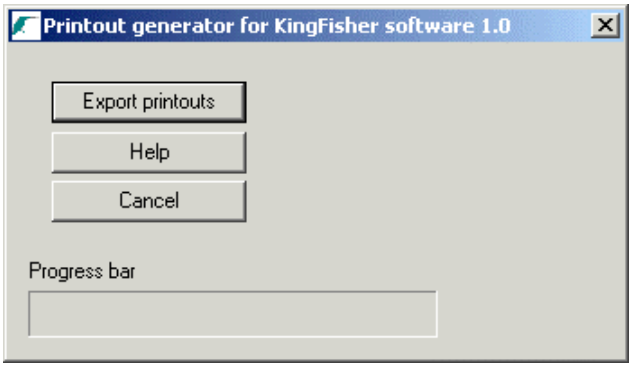
8 Glossary and Abbreviations

Beads	Paramagnetic particles that are used to bind target material from the sample. There are beads with different types of surface coating for collecting different types of material.
Collect	A command that collects the beads onto the plastic tip so that the beads can be transported to another well/tube. Also see Release.
Magnetic rod	The rods that are magnetic and collect magnetic particles. The rods do not collect the particles on their own; the magnetic rods must always be protected by a tip comb.
Plastic tip	Protects the magnetic rod. A disposable tip comb always has to be fitted into the tip comb holder slot during processing.
Plate	A plate containing microwells for pipetting.
Protocol	A sequence of steps that performs desired function(s).
Reagent	A chemical solution in a well/tube used in the KingFisher purification process to react with the material imported using the magnetic beads. In a well/tube there can be several reagent types.
Release	A command that releases the beads from the plastic tip into the solution in the well/tube that the tip is in. Also see Collect.
Step	A protocol consists of a number of steps. One step performs a specific function, such as wash, dry, mix, etc. Each step also has a number of parameters according to which the step is carried out.
Strip	A strip of wells/tubes in a row, which is used to process one sample.
Tip edge	The pointed end of the plastic tip.
Tube strip	The disposable tubes where all the reagents and samples are located and where the processing takes place.
Well/tube	The individual reaction vessel in a plate.

Appendix A: Printing reports of protocols made with KingFisher Software 1.0

Before installing KingFisher Software version 2.0, any earlier version of the software installed on the PC must be uninstalled. The protocols made with KingFisher Software 1.0 cannot be opened or used with KingFisher Software 2.0. Therefore, the KingFisher Software 2.0 installation CD includes a small program for printing reports of the protocols created with KingFisher Software 1.0. The printouts can then be used as an aid when creating protocols with KingFisher Software 2.0.

1. When you insert the KingFisher Software 2.0 installation CD, the first dialog prompts you to add or remove programs. Cancel the dialog.
2. Copy the program **LOY_Printout.exe** from the CD to a folder of your choice on your hard disk.
3. Double-click the program to start it and select **Export printouts**.



   The program creates protocol reports from the database into a subfolder named **Printouts**. Each protocol report is saved as an HTML file, which can be read and printed with any HTML browser.

   Check that reports of all the protocols made with KingFisher Software 1.0 are now saved.
4. Proceed to uninstall the KingFisher Software 1.0 as described in Section 3.2.

You can use the printouts as help when you start creating protocols for KingFisher Software 2.0 (Section 4.3).

Please send to Thermo Labsystems
Fax +358-9-32910415
Internet: http://www.thermolabsystems.fi

Appendix B: KingFisher Software 2.0 Feedback Form

Cat. no.	Serial no.
PURCHASED BY	**PURCHASED FROM**
Company/Institute	Distributor
Department	
Address	Address
Tel.	Tel.
Fax	Date of delivery
Internet home page	
Date of purchase	
Your research area	
Dr. ☐ Mr. ☐ Mrs. ☐ Ms. ☐ Job title/Position	
Surname (block capitals)	First name (block capitals)
Internet e-mail address	

	Excellent	Above expectations	As expected	Below expectations	Comments
Software installation	☐	☐	☐	☐	
Ease of use	☐	☐	☐	☐	
Flexibility	☐	☐	☐	☐	
Design	☐	☐	☐	☐	
User manual	☐	☐	☐	☐	
Customer support	☐	☐	☐	☐	
Overall	☐	☐	☐	☐	

Additional software features desired:

Did you encounter any problems?

Where did you first learn about the product?

Would you like to receive information about other Thermo Labsystems products?

Appendix C: Addresses

Thermo Labsystems on the Internet

For the latest information on products and services, visit our worldwide web sites on the Internet at:

http://www.thermolabsystems.fi

http://www.thermo.com

Manufactured by:

Thermo Labsystems
P.O.Box 100, FIN-01621 Vantaa, Finland
Tel. +358-9-329 100, Fax +358-9-3291 0415
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