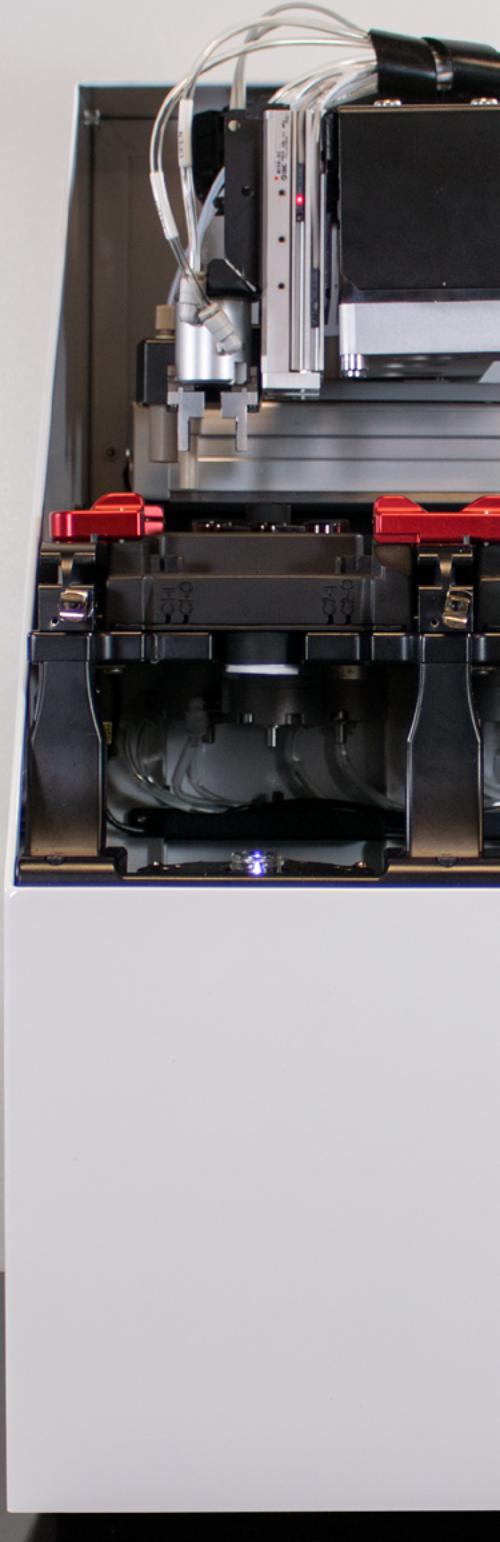
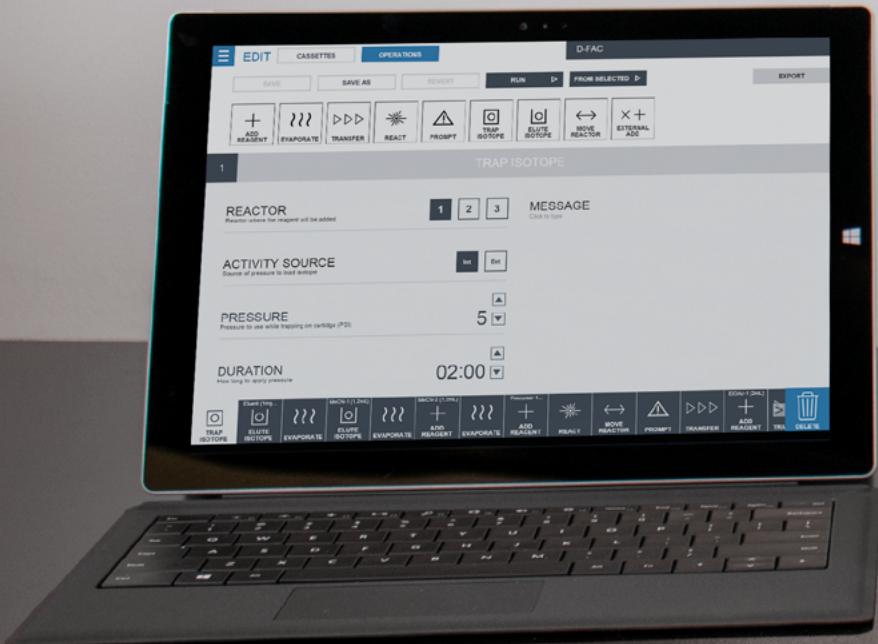


ELIXYS

Software User Manual



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Section 1: Overview, login, and main navigation

1.1 ELIXYS software overview

Most of the functionality of Elixys is controlled by a touch software interface. The software is installed on a touch screen tablet which will usually paired with a bluetooth keyboard. This manual will give a section-by-section overview of the software.

1.2 Login

The login page is a simple “splash” page with a “Sign In” button. Clicking the Sign In button will take the user to the Sequences page.



1.3 Main Menu

At the top left of the screen is a button that toggles the appearance of the main menu:  When clicked, the main menu will slide out from the left. The main menu is available on every screen except for the login screen. A blue title to the right of the icon shows which section of the software is currently visible.

1.4 Main Menu Icons

1.4.1 Sequences

1.4.2 Logs

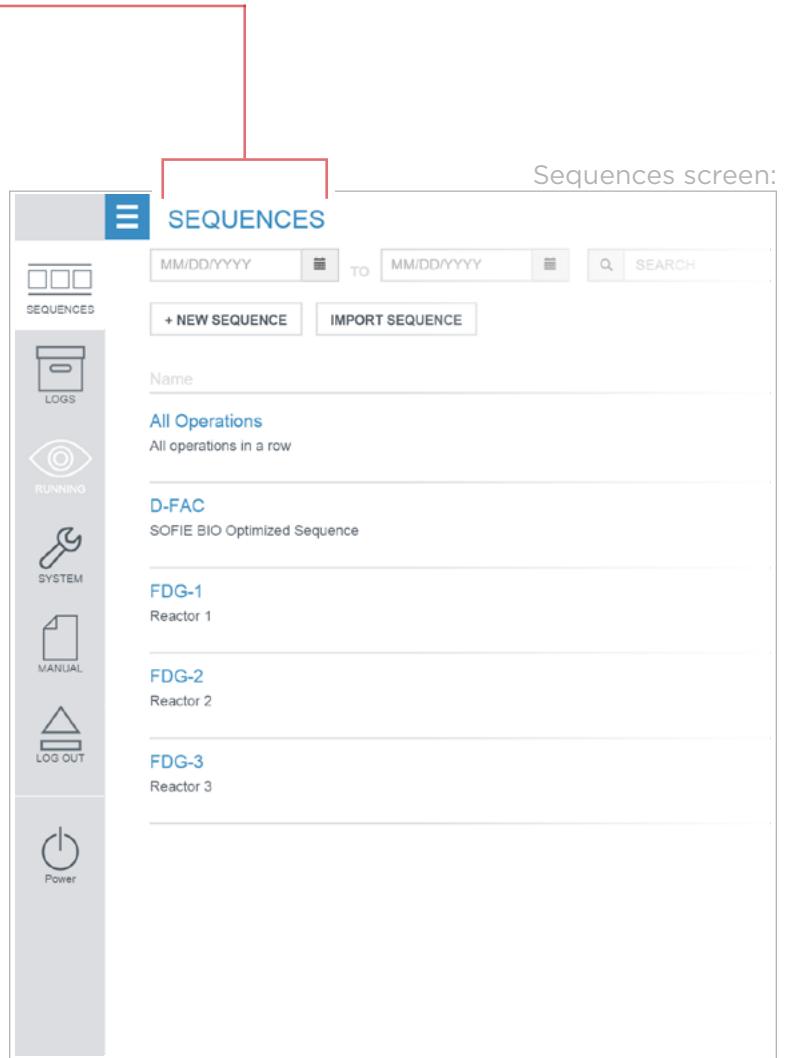
1.4.3 Running

1.4.4 System

1.4.5 Manual

1.4.6 Log Out

1.4.7 Power



1.5 Confirm on close

Quitting the application at any time will cause a dialog to appear asking "Are you sure you want to quit?" Confirming will close the software interface regardless of whether a Sequence is running, but will not affect a running Sequence. If an edit operation was in progress, any unsaved changes would be lost.

Section 2: Creating and managing Sequences

2.1 Sequence List (“Sequences” screen)

The Elixys software’s primary use is to create, edit, and run sequences on the hardware. The Sequences screen is where all of the sequences are created, managed, and run. When first clicking Sequences from the main menu, or when first logging in, the list of all sequences is displayed. Sequences are ordered alphabetically by name.

For each Sequence, under the “Name” column these Sequence attributes are shown:

- Name
- Description

For each Sequence, under the Date Created column these Sequence attributes are shown:

- The creation date of Sequence in the format MM/DD/YY

SEQUENCES			
SEQUENCE		SEQUENCE	
NAME		DATE CREATED	
D-FAC	SOFIE BIO Optimized Sequence	02/27/15	COPY DELETE EXPORT
FDG-1	Reactor 1	02/27/15	COPY DELETE EXPORT
FDG-2	Reactor 2	02/27/15	COPY DELETE EXPORT
FDG-3	Reactor 3	02/27/15	COPY DELETE EXPORT

2.1.1 Copy | Delete | Export

For each Sequence, under the third unlabeled column these links are available:

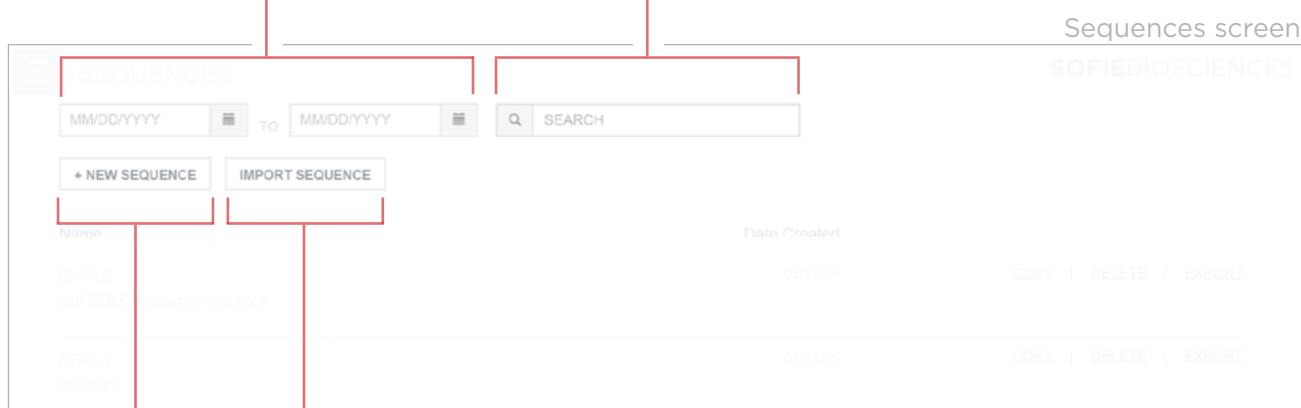
- “Copy”: Will create a copy of the Sequence.
- “Delete”: Will delete the Sequence.
- “Export”: Clicking the Export link will save the sequence as a file that can be imported into other ELIXYS systems.

2.1.2 Date Range Filters

By default, the sequences screen shows all available sequences in alphabetical order. Date range filters are provided to aid in finding a specific sequence. When dates are set in the “from” and/or “to” date fields, only sequences will be shown that fall within that date range. If a date field has a value, an “X” button is enabled. Clicking this button will clear the field.

2.1.3 Text Search

Text entered in the search field is matched against the title and descriptions of Sequences. It will filter the list according to text entered. When the search field has a value, an “X” button is enabled in the field. Clicking this button will clear the field.



2.1.5 Import Sequence Button

Clicking on import sequence will open a file navigator for selecting and importing sequences saved on a thumb drive.

2.1.4 New Sequence Button

Below the filters there is a “new sequence” button, which will open a popup box. This box is used to define a name and description for a new blank sequence.

Creating a new sequence is the starting point for developing a new probe protocol.

2.2 New Sequence Popup

By default, the sequences screen shows all available sequences in alphabetical order. Date range filters are provided to aid in finding a specific sequence. When dates are set in the “from” and/or “to” date fields, only sequences will be shown that fall within that date range. If a date field has a value, an “X” button is enabled. Clicking this button will clear the field.

Sequences screen (New Sequence Popup):



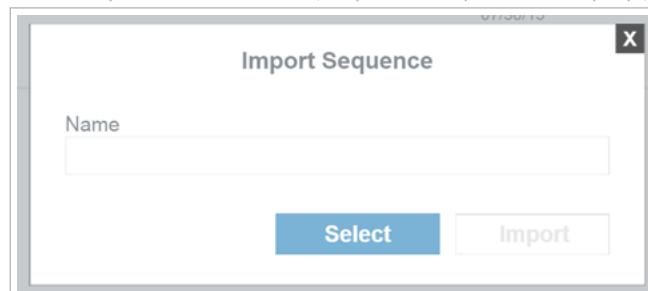
2.3 Copy Sequence

Clicking “Copy” button (2.1.4) on a Sequence will open a popup similar to the New Sequence box. The dialog will have text fields for Name and Description, and a “Copy” button. The “Copy” button is disabled until the fields are filled out. Copying a sequence creates an identical duplicate of the original with a different name and description. Once a copy has been made, it can be modified and run without effecting the original sequence.

2.4 Import Sequence

Clicking “Copy” button (2.1.4) on a Sequence will open a popup similar to the New Sequence box. The dialog will have text fields for Name and Description, and a “Copy” button.

Sequences screen (Import Sequence Popup):



Section 3: Editing and running sequences

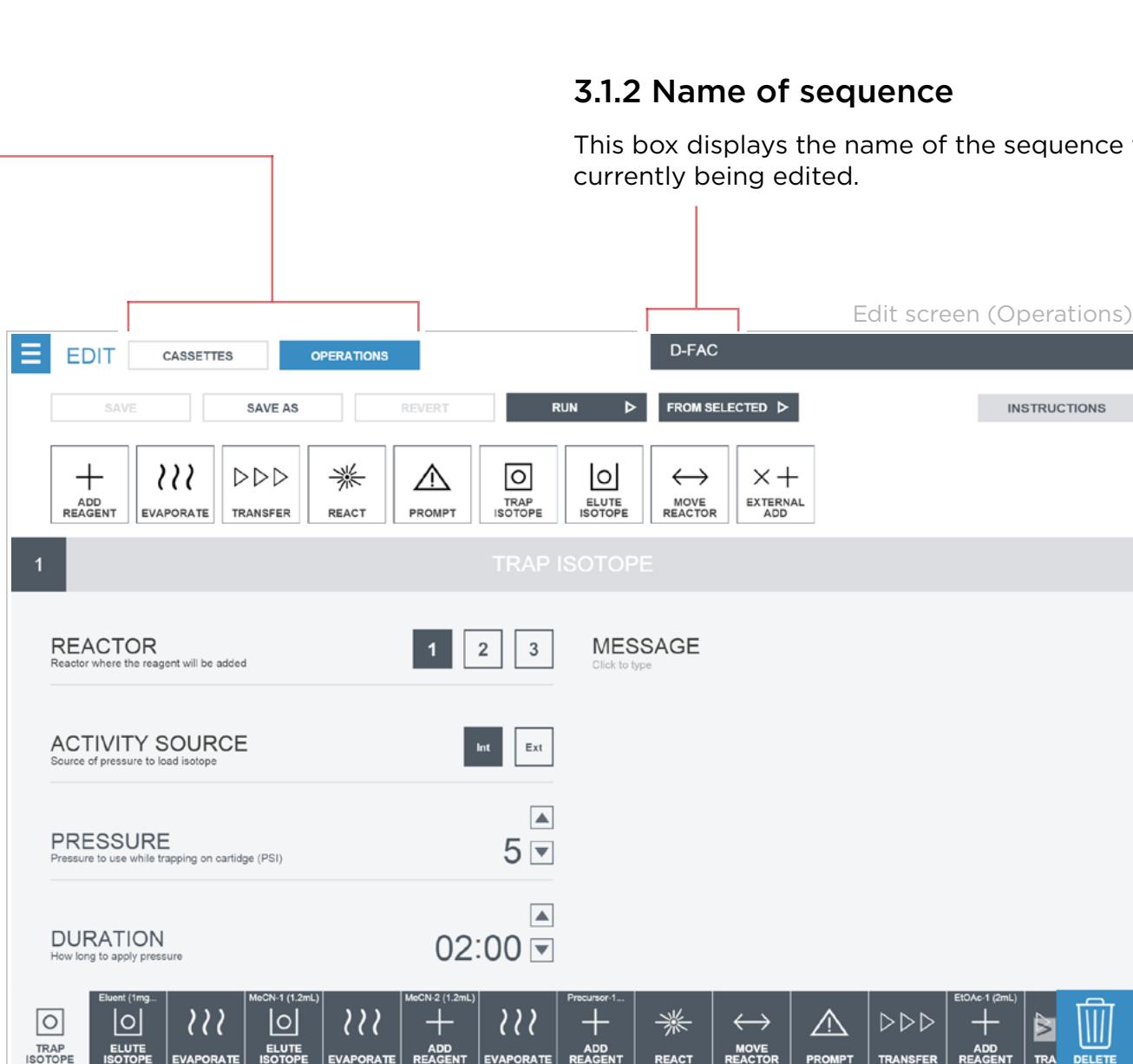
The edit section is where sequences can be built and modified. It is divided into two main sections; “Operations” and “Cassettes”. These two sections offer all options for developing sequences to control the Elixys hardware.

3.1 Header

The edit section has some common elements that remain available even when scrolling through various portions of the edit section.

3.1.1 Cassettes/operations buttons

The edit portion of the ELIXYS software is divided into two sections: Cassettes and Operations. Operations (displayed below) is the section where operations are sequenced and parameters are determined for a sequence. Cassettes is the section where reagent vials are assigned to cassette positions. The Cassettes/Operations are used to toggle between the two sections.



3.1.2 Name of sequence

This box displays the name of the sequence that is currently being edited.

3.1.3 Save Button/warn on leave

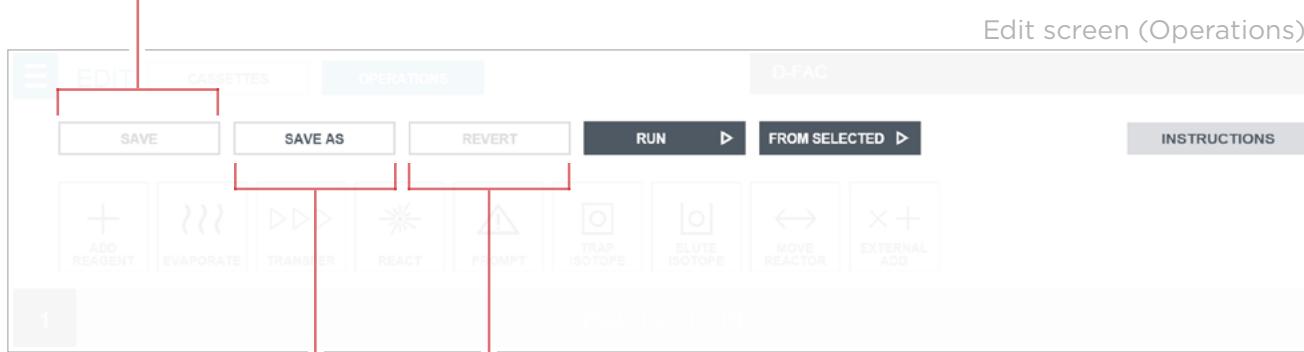
Pressing this button will save any changes made to the settings in the currently open sequence.

When first opening a Sequence in Edit mode, the Save button is visible but disabled because no changes have been made that need to be saved. Once any changes are made, this button becomes enabled to indicate there are un-saved changes.

If there are un-saved changes, clicking on a main menu link to leave the Sequence Edit Screen will cause a box to pop up warning that un-saved changes will be lost.

3.1.6 Export Button

Clicking the Export button will save the sequence as a file that can be imported into other ELIXYS systems.



3.1.5 Revert Button

Like the Save button, when first opening a Sequence in Edit mode this button is visible but disabled because no changes have been made that could be reverted. Once any changes are made, this button becomes enabled to indicate there are un-saved changes that can be reverted.

Clicking Revert will bring up a confirmation dialog and, if confirmed, discarding any un-saved changes, reverting the sequence to the condition it was in when last saved.

3.1.4 Save as Button

This button is always available. It behaves exactly the same as the Copy button (section 2.3), using the currently open Sequence as the source of the copy.

3.2 Operations screen

When the “OPERATIONS” button in the header is selected, the operations toolbox and details are displayed.

3.2.1 Toolbox

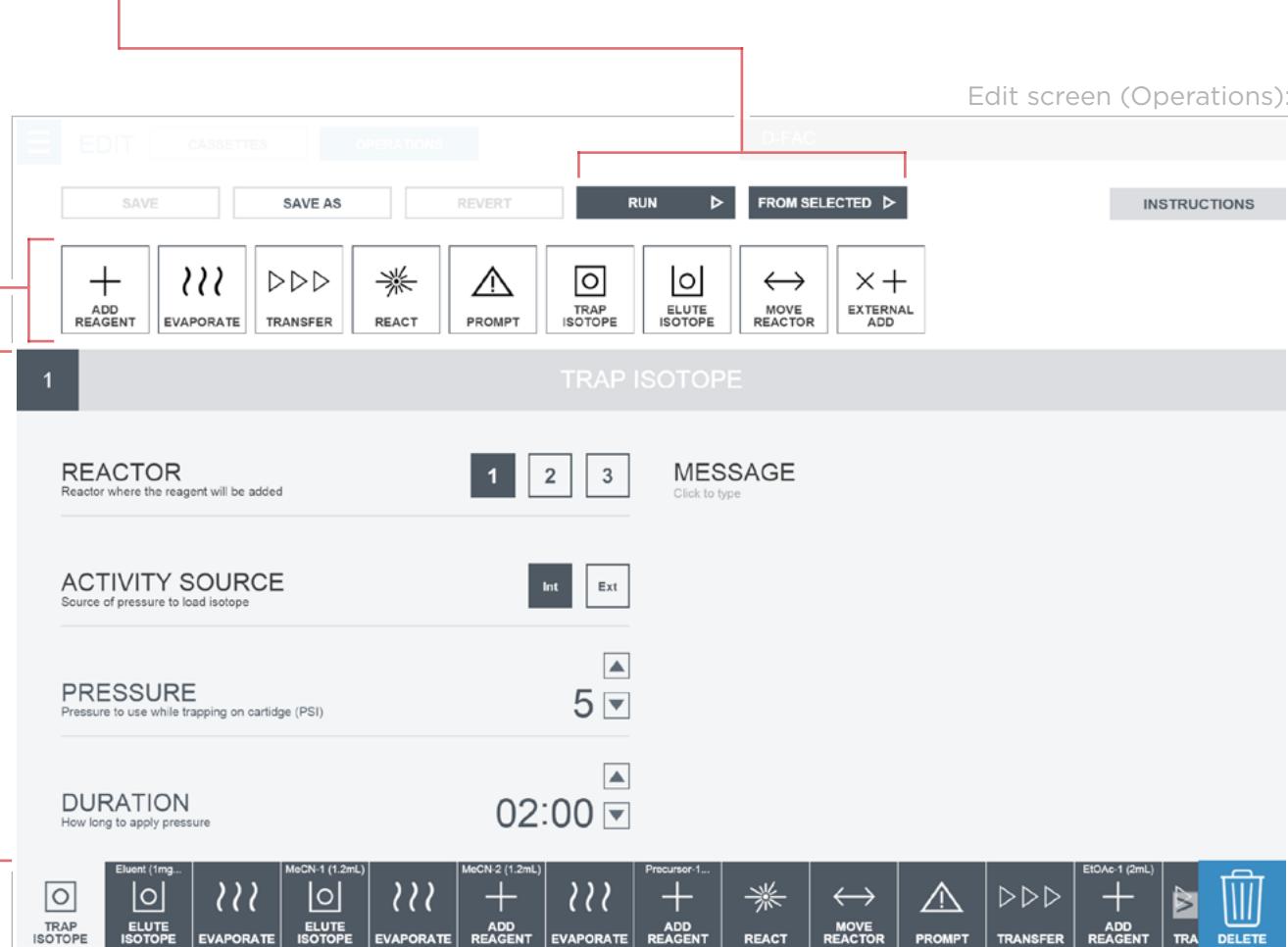
When the Operations screen is displayed, there is a “toolbox” of operations available to add to the timeline. These are described in detail below. Clicking and dragging an Operation from the Toolbox to the timeline will add it to the timeline at the position where the drag is released.

3.2.2 Run/from selected

To the right of the Toolbox are buttons for Run and From Selected.

Run will display the Pre-Run Checklist to prepare a Sequence Run starting at the beginning of the Timeline.

From Selected will display the Pre-Run Checklist to prepares a Sequence Run starting at the currently selected Operation in the Timeline.



3.2.3 Operation detail pane

The middle part of the screen shows the details of the selected Operation in the Timeline. In the upper left corner of the pane there is a number which represents the order number of the currently selected operation in the timeline.

3.3 Timeline

The Timeline is the series of Operations that comprise the Sequence and is always present when opening a Sequence in Edit mode.

The order of the Operations in the Timeline reflects the order they will be executed during a Sequence Run, with the first Operation at the left and the last one at the right. Multiple instances of any operation may be dragged to the timeline as-needed.

3.3.1 Selecting operations in timeline

Clicking on an Operation in the Timeline (and not dragging) will select it. It will have a light gray background and its parameters will be displayed in the parameters pane.

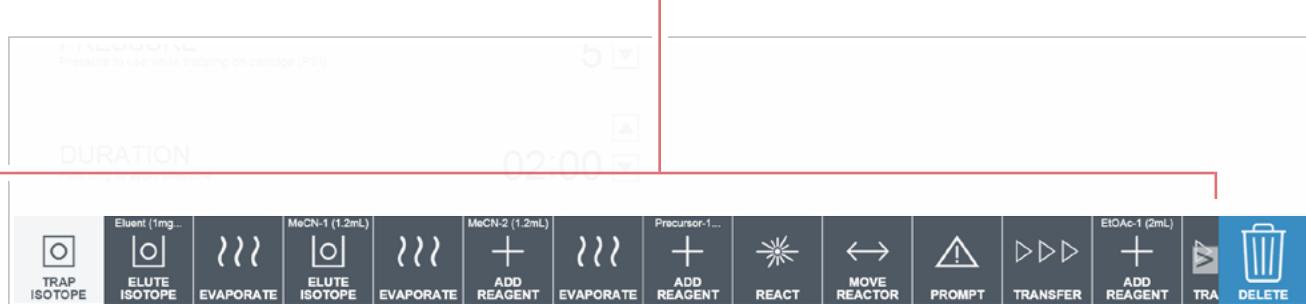
3.3.2 Scrolling operations in timeline

If there are few enough Operations in the Timeline such that they all fit on the screen at once, there is no scrolling functionality.

If there are more Operations than fit in the screen at once, arrows appear at the left or right of the Timeline as appropriate to indicate there are more operations in that direction. Dragging an Operation will scroll the list in the direction of drag

3.3.3 Reorder operations in timeline

When an Operation in the Timeline is selected (as described above), clicking and dragging it will change its order in the Timeline..



3.3.4 Delete operations from timeline

At the right edge of the Timeline is the Delete button. Any operation in the timeline can be selected then dragged to the delete button in order to remove it from the timeline. Clicking on the delete button will delete whichever operation is currently selected.

3.4 Cassettes Screen

When the Cassettes button in the header is selected, the contents of the Cassettes are displayed. This area is used to manually enter reagent names into the software to correspond with vial locations on the hardware.

3.4.1 Cassette selection

There are three buttons at the top. They correspond to the 3 cassettes on the Elixys hardware.

The screenshot shows the 'Edit screen (Cassettes)' interface. At the top, there are three tabs: 'EDIT' (selected), 'CASSETTES' (highlighted in blue), and 'OPERATIONS'. Below these are three buttons: 'CASSETTE 1' (selected), 'CASSETTE 2', and 'CASSETTE 3'. The main area displays three rows of 12 numbered slots each, corresponding to the 12 positions in a cassette. Each slot is associated with a reagent name:

Slot	Reagent Name
1	Eluent (1mg K ₂ CO ₃ , 0.3mL H ₂ O, 0.5mL I)
2	MeCN-1 (1.2mL)
3	Precursor-1 (10mg in 1.0mL of MeCN)
4	MeCN-2 (1.2mL)
5	EtOAc-1 (2mL)
6	EtOAc-2 (2mL)
7	(empty)
8	(empty)
9	(empty)
10	(empty)
11	(empty)
12	(empty)

At the bottom, there is a toolbar with various icons:

- TRAP ISOTOPE
- ELUENT ISOTOPE
- EVAPORATE
- ELUENT ISOTOPE
- EVAPORATE
- +
- ADD REAGENT
- EVAPORATE
- + ADD REAGENT
- TRANSFER
- TRA DELETE

3.4.2 Reagents

For each Cassette there are 12 text input fields for providing the names of the Reagents. Once reagent names are entered into these fields, they become available within operations that are dragged to the timeline.

3.5 Operation types

Each type of Operation has it's own unique set of properties.

When an Operation is first added to the timeline, if it has any required fields then it will initially be marked as invalid with a red exclamation point and red asterisks on the properties in the detail pane.

All properties are required to be set unless there is a default value or it is noted to be optional.

Edit screen (Operations):

The screenshot shows the 'Edit screen (Operations)' with the 'OPERATIONS' tab selected. The top bar includes buttons for 'SAVE', 'SAVE AS', 'REVERT', 'RUN', 'FROM SELECTED', and 'INSTRUCTIONS'. Below the toolbar are nine operation icons: ADD REAGENT, EVAPORATE, TRANSFER, REACT, PROMPT, TRAP ISOTOPE, ELUTE ISOTOPE, MOVE REACTOR, and EXTERNAL ADD. The sequence is labeled '1' and the operation is 'ADD REAGENT'. The parameters are as follows:

- REAGENT ***: Reagent to add to reactor
- PRESSURE**: Pressure to use when delivering reagent (PSI)
- REACTOR ***: Reactor where reagent will be added (options 1, 2, 3)
- STIR ***: Stir while adding (checkbox, checked)
- REAGENT PATH**: Needle where reagent will be added (options 1, 2)
- MESSAGE**: Click to type
- DURATION**: Duration of delivery (00:15)

At the bottom, a row of operation icons is shown again, each with a red exclamation point and asterisk, indicating they are invalid. A 'DELETE' button is also present.

The screenshot above shows a sequence with all 9 available operations arranged in the timeline. Red exclamation points and asterisks invalid operations and parameters. The following sections (3.5.1 - 3.5.9) describe the parameters for each operation.

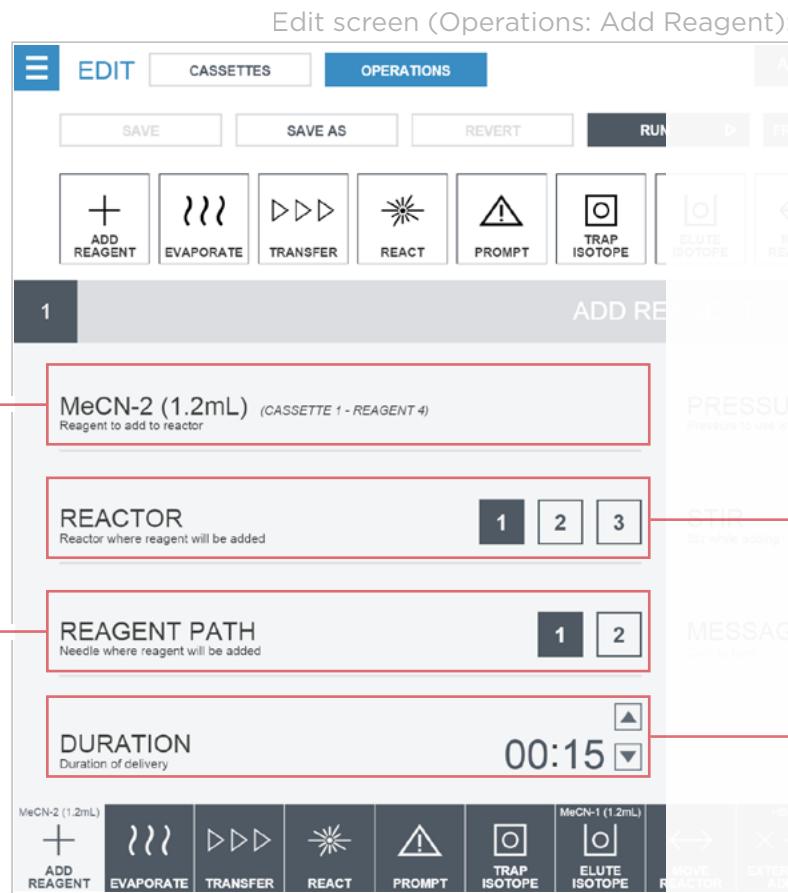
3.5.1 Add reagent

3.5.1.1 Reagent (Add Operation)

Clicking on the word “reagent” will bring up popup box that looks exactly like the “cassettes” screen. A reagent can be selected from this list to be used in the add operation.

3.5.1.2 Reactor (Add Operation)

Three buttons represent three reactors on the ELIXYS hardware. Selecting a number will determine which reactor will receive the reagent. Non-selected numbers will be gray. The selected number will be dark. Only one reactor can be selected at a time.



3.5.1.3 Reagent path (Add Operation)

Two buttons represent two needles on the ELIXYS hardware. Selecting a number will determine which needle will be used as the reagent path. Non-selected numbers will be gray. The selected number will be dark. Only one reactor can be selected at a time.

3.5.1.4 Duration (Add Operation)

Represents the duration of the operation in minutes and seconds. Text can be entered manually, or up/down arrows can be clicked to increment/decrement the seconds by 1 second per click.

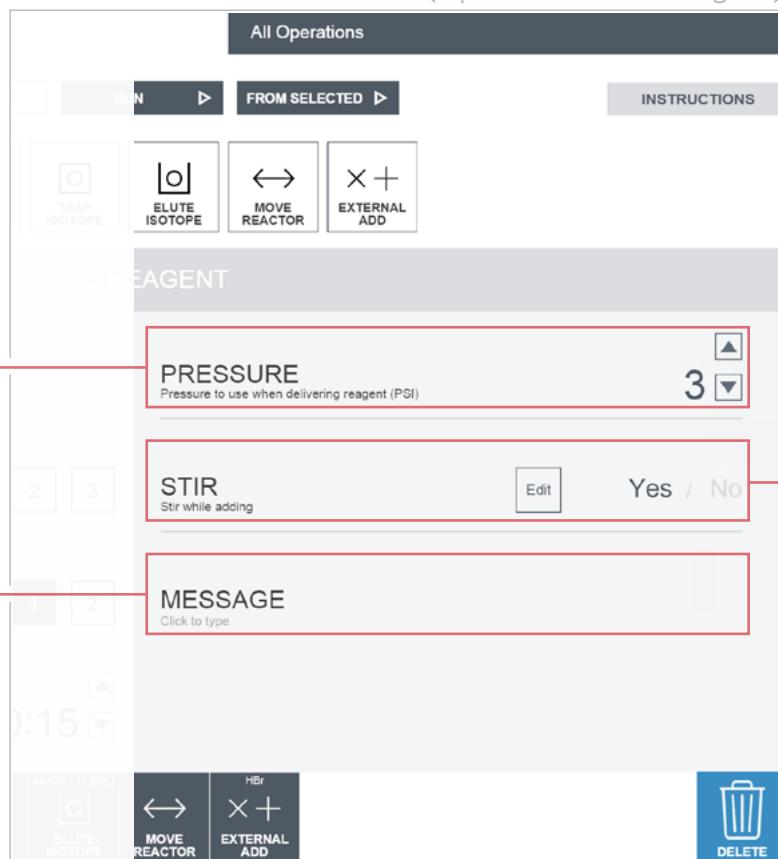
3.5.1.5 Pressure (Add Operation)

Sets the target pressure for the operation in psi. Text can be entered manually, or up/down arrows can be clicked to increment/decrement the seconds by 1psi per click.

3.5.1.6 Stir (Add Operation)

Determines whether or not the contents of the reactor will be stirred during operation. “Yes” and “No” labels are available, the darker label shows current state. An “Edit” button is present, which will popup a box with additional parameters for stirring. Even though Yes is selected by default, the property is invalid until Edit is clicked to set properties.

Edit screen (Operations: Add Reagent):

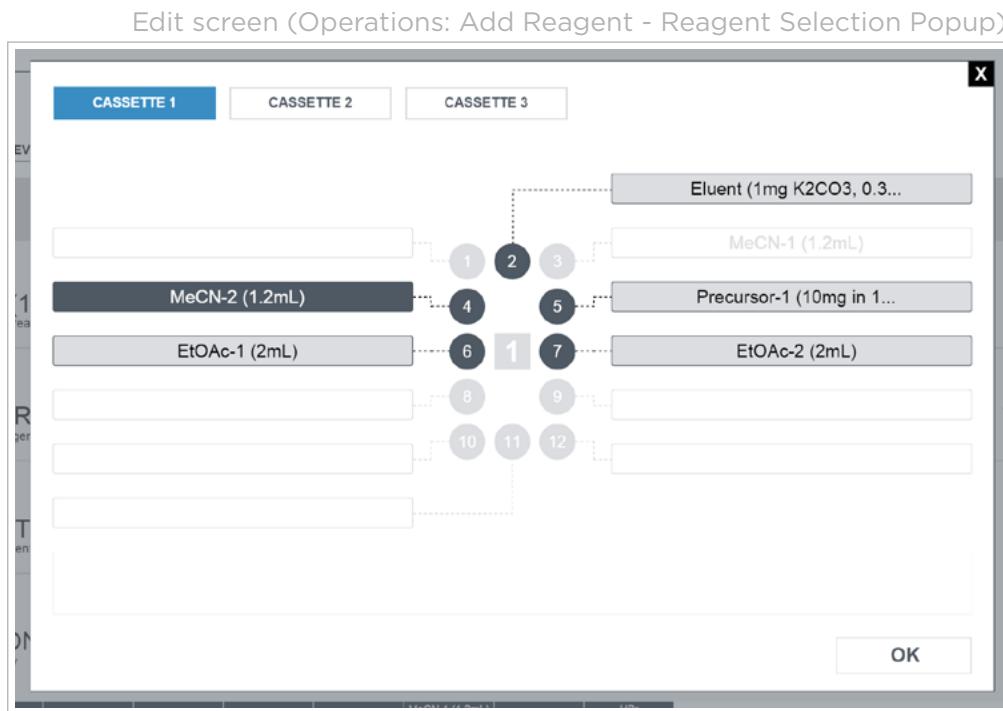


3.5.1.7 Message (Add Operation)

Optional text field. Notes entered here will be displayed on screen while the sequence is running. Clicking on the placeholder label “Click to type” will make the text editable.

3.5.1.8 Reagent Selection popup (Add Operation)

Clicking on the word “reagent” will bring up popup box that looks exactly like “cassettes” screen, complete with buttons to switch between Cassettes 1, 2, and 3. The reagent values match those set on the Cassettes Screen. When a reagent is selected, the dialog is dismissed and that reagent name will replace the word “REAGENT” in the edit properties section.

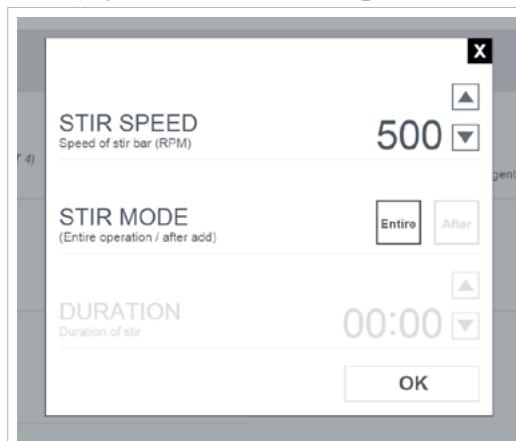


3.5.1.9 Stir Parameters popup (Add Operation)

When stir “Edit” is clicked, a popup box will appear with the following stir options:

- Stir speed: Speed of stir. (0-1000)
- Stir Mode: Clicking “after” will enable the “duration” field. Clicking “entire” will disable the “duration” field and reset it to the default value of 0.
- Duration: Disabled unless “after” is set for Stir Mode. Determines amount of time that reactor contents will be stirred after add operation has completed. (shown in its disabled state in the screenshot below)

Edit screen (Operations: Add Reagent - Stir Popup):



3.5.2 Evaporate

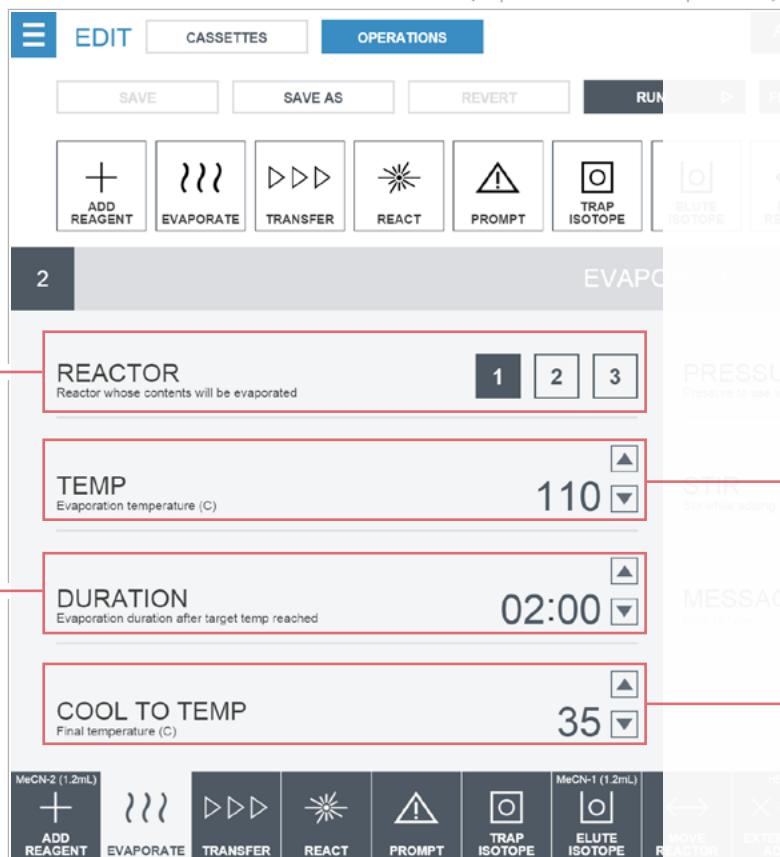
3.5.2.1 Reactor (Evaporate Operation)

Three buttons represent three reactors on the ELIXYS hardware. Selecting a number will determine in which reactor the evaporation will take place. Non-selected numbers will be gray. The selected number will be dark. Only one reactor can be selected at a time.

3.5.2.2 Temperature (Evaporate Operation)

Sets the target temperature for the evaporation. Digits represent seconds and minutes. Alternatively, the up/down arrows can be clicked to increment/decrement the seconds by 1 second per click.

Edit screen (Operations: Evaporate):



3.5.2.3 Duration (Evaporate Operation)

Represents the duration of the operation in minutes and seconds. Text can be entered manually, or up/down arrows can be clicked to increment/decrement the seconds by 1 second per click.

3.5.2.4 Cool to temp (Evaporate Operation)

Sets the final temperature to be reached after the evaporation has completed. Digits represent seconds and minutes. Alternatively, the up/down arrows can be clicked to increment/decrement the seconds by 1 second per click.

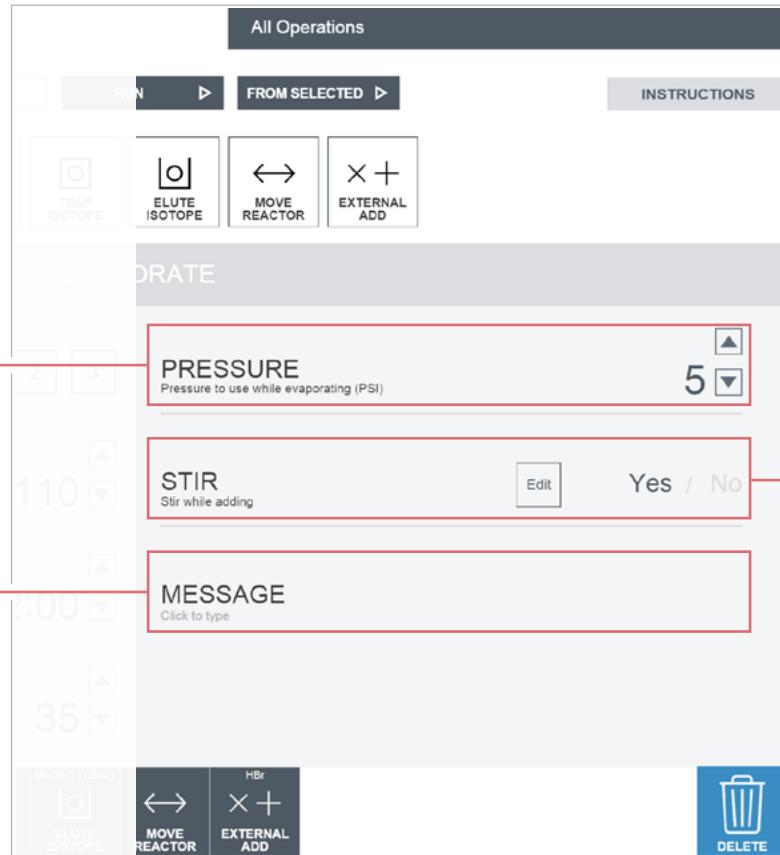
3.5.2.5 Pressure (Evaporate Operation)

Sets the target pressure for the operation in psi. Text can be entered manually, or up/down arrows can be clicked to increment/decrement the seconds by 1psi per click.

3.5.2.6 Stir (Evaporate Operation)

Determines whether or not the contents of the reactor will be stirred during operation. “Yes” and “No” labels are available, the darker label shows current state. An “Edit” button is present, which will popup a box with additional parameters for stirring. Even though Yes is selected by default, the property is invalid until Edit is clicked to set properties.

Edit screen (Operations: Evaporate):



3.5.2.7 Message (Evaporate Operation)

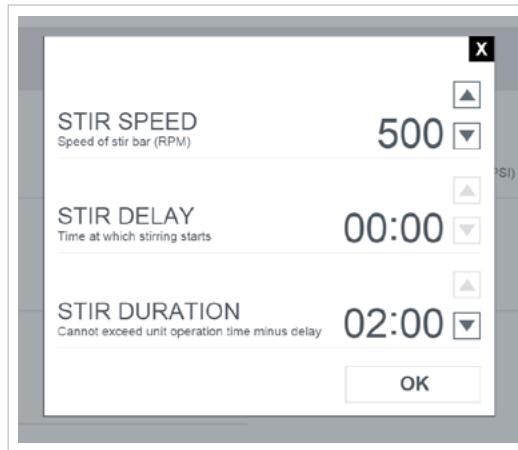
Optional text field. Notes entered here will be displayed on screen while the sequence is running. Clicking on the placeholder label “Click to type” will make the text editable.

3.5.2.8 Stir parameters popup (Evaporate Operation)

When stir “Edit” is clicked, a popup box will appear with the following stir options:

- Stir speed: Speed of stir. (0-1000)
- Stir Delay: Amount of operation time that will pass before stirring begins.
- Duration: Determines amount of time that reactor contents will be stirred.

Edit screen (Operations: Evaporate - Stir Popup):



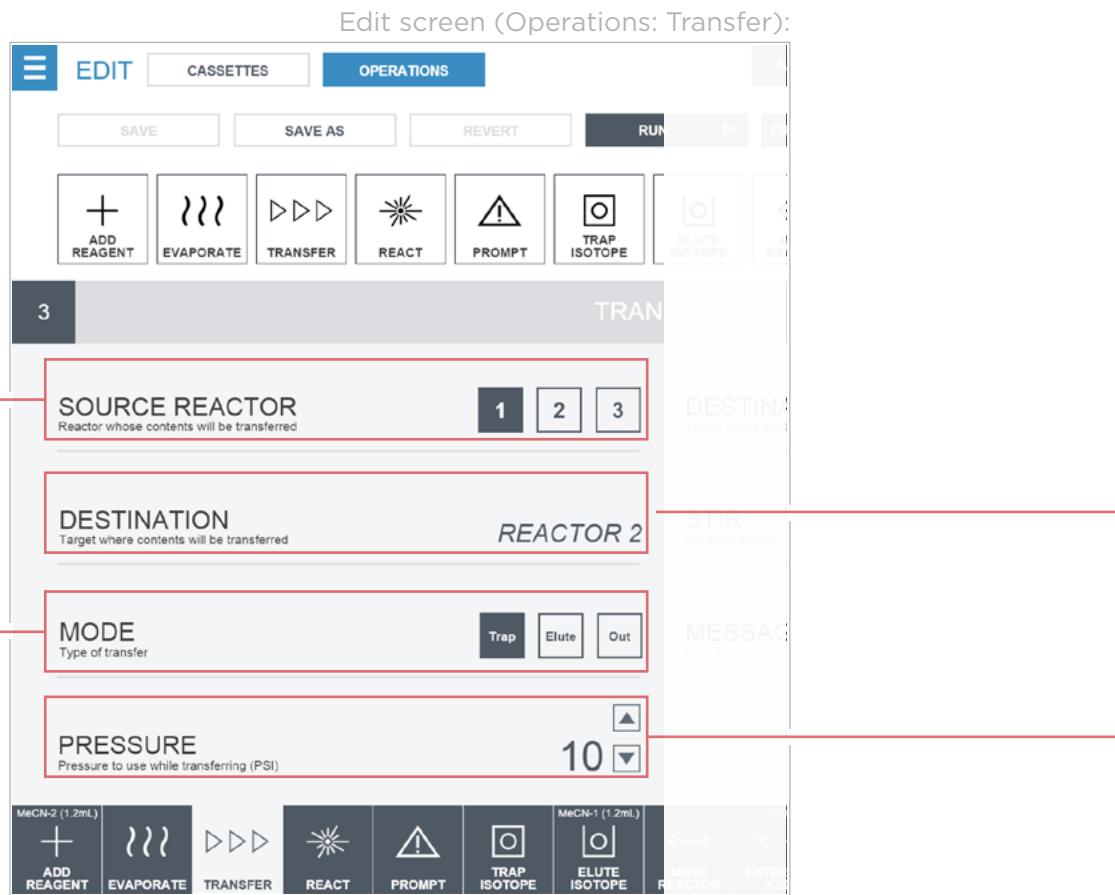
3.5.3 Transfer

3.5.3.1 Source Reactor (Transfer Operation)

Three buttons represent three reactors on the ELIXYS hardware. Selecting a number will determine which reactor will be the source of the transfer. Non-selected numbers will be grey. The selected number will be dark. Only one reactor can be selected at a time.

3.5.3.2 Destination (Transfer Operation)

Clicking on the word “select” will bring up popup box that looks for selecting the destination of the transfer. (Screenshot note: The word “Select” has been replaced by “Reactor 2”. In this representation a selection of Reactor 2 has already been made)



3.5.3.3 Mode (Transfer Operation)

Buttons for choosing between “Trap”, “Elute”, and “Out” modes. The selected mode will be dark. Only one mode can be selected at a time

3.5.3.4 Pressure (Evaporate Operation)

Sets the target pressure for the operation in psi. Text can be entered manually, or up/down arrows can be clicked to increment/decrement the seconds by 1psi per click.

3.5.1.5 Duration (Add Operation)

Represents the duration of the operation in minutes and seconds. Text can be entered manually, or up/down arrows can be clicked to increment/decrement the seconds by 1 second per click.

3.5.3.6 Stir (Transfer Operation)

Determines whether or not the contents of the reactor(s) will be stirred during operation. “Yes” and “No” labels are available, the darker label shows current state. An “Edit” button is present, which will popup a box with additional parameters for stirring. Even though Yes is selected by default, the property is invalid until Edit is clicked to set properties.

Edit screen (Operations: Transfer):

The screenshot displays the 'Edit screen (Operations: Transfer)' interface. At the top, there's a toolbar with 'All Operations' (highlighted in grey), 'RUN' (disabled), 'FROM SELECTED' (disabled), and 'INSTRUCTIONS'. Below the toolbar are four operation buttons: 'TRAP ISOTOPE', 'ELUTE ISOTOPE' (selected), 'MOVE REACTOR', and 'EXTERNAL ADD'. The main area contains three input fields: 'DURATION' (set to '01:00'), 'STIR' (set to 'Yes / No'), and 'MESSAGE' (placeholder 'Click to type'). The 'DURATION' field is highlighted with a red border. At the bottom, there are more operation buttons: 'ELUTE ISOTOPE', 'MOVE REACTOR', 'EXTERNAL ADD', and a 'DELETE' button. On the left side, there are vertical scroll bars and some small buttons.

3.5.3.7 Message (Transfer Operation)

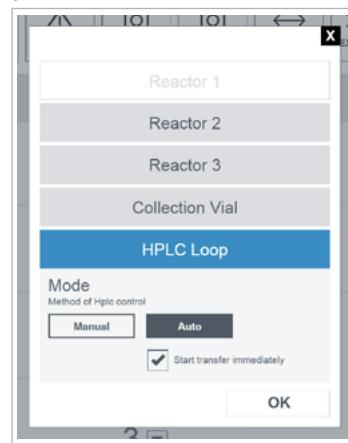
Optional text field. Notes entered here will be displayed on screen while the sequence is running. Clicking on the placeholder label “Click to type” will make the text editable.

3.5.3.8 Destination popup (Transfer Operation)

Clicking on “select” will popup a box with the following options for a transfer destination. Whatever was chosen for Source Reactor is disabled:

- Reactor 1
- Reactor 2
- Reactor 3
- Collection Vial
- Hplc Loop - clicking “Hplc Loop” will enable the hplc mode fields:
 - Manual - Hplc will be injected manually
 - Auto - system will handle hplc
 - Start transfer immediately: by default Auto Hplc mode will pause and wait for user to hit the continue button before proceeding with operation. Checking this box will start the operation immediately without pausing.

Edit screen (Operations: Transfer - Destination Popup):

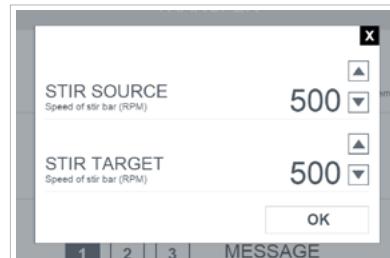


3.5.3.9 Stir parameters popup (Transfer Operation)

When stir “Edit” is clicked, a popup box will appear with the following stir options:

- Stir source: Speed of stir for source reactor
- Stir target: Speed of stir for target reactor (grayed out if target is not a reactor)

Edit screen (Operations: Transfer - Stir Popup):



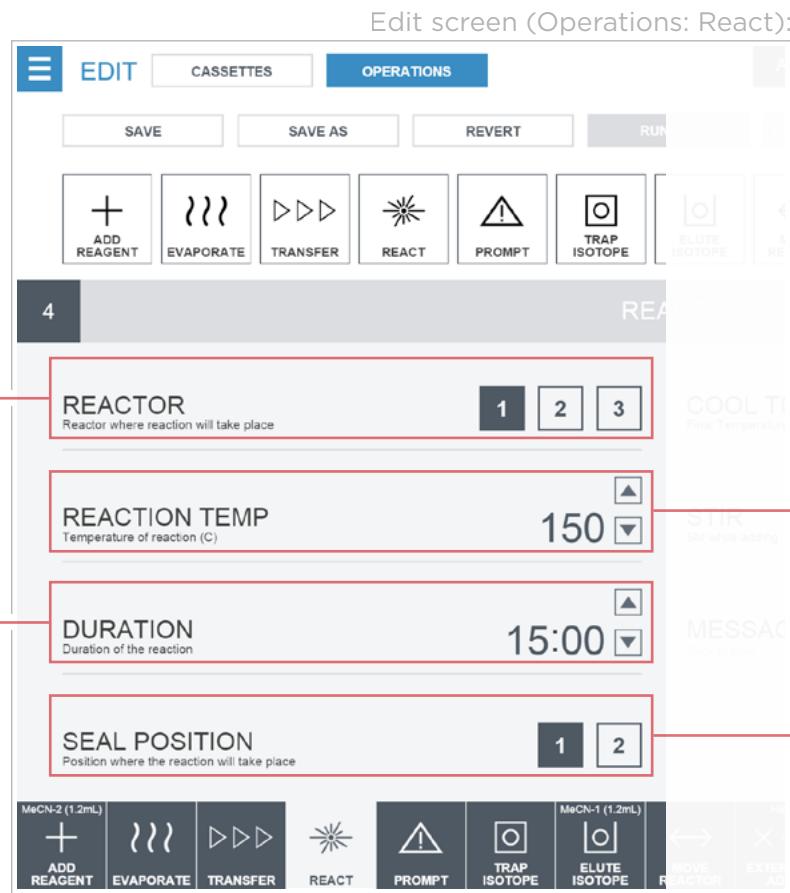
3.5.4 React

3.5.4.1 Reactor (React Operation)

Three buttons represent three reactors on the ELIXYS hardware. Selecting a number will determine in which reactor the reaction will take place. Non-selected numbers will be grey. The selected number will be dark. Only one reactor can be selected at a time.

3.5.4.2 Reaction Temp (React Operation)

Sets the target temperature for the reaction. Digits represent seconds and minutes. Alternatively, the up/down arrows can be clicked to increment/decrement the seconds by 1 second per click.



3.5.4.3 Duration (React Operation)

Represents the duration of the operation in minutes and seconds. Text can be entered manually, or up/down arrows can be clicked to increment/decrement the seconds by 1 second per click.

3.5.4.4 Seal position (React Operation)

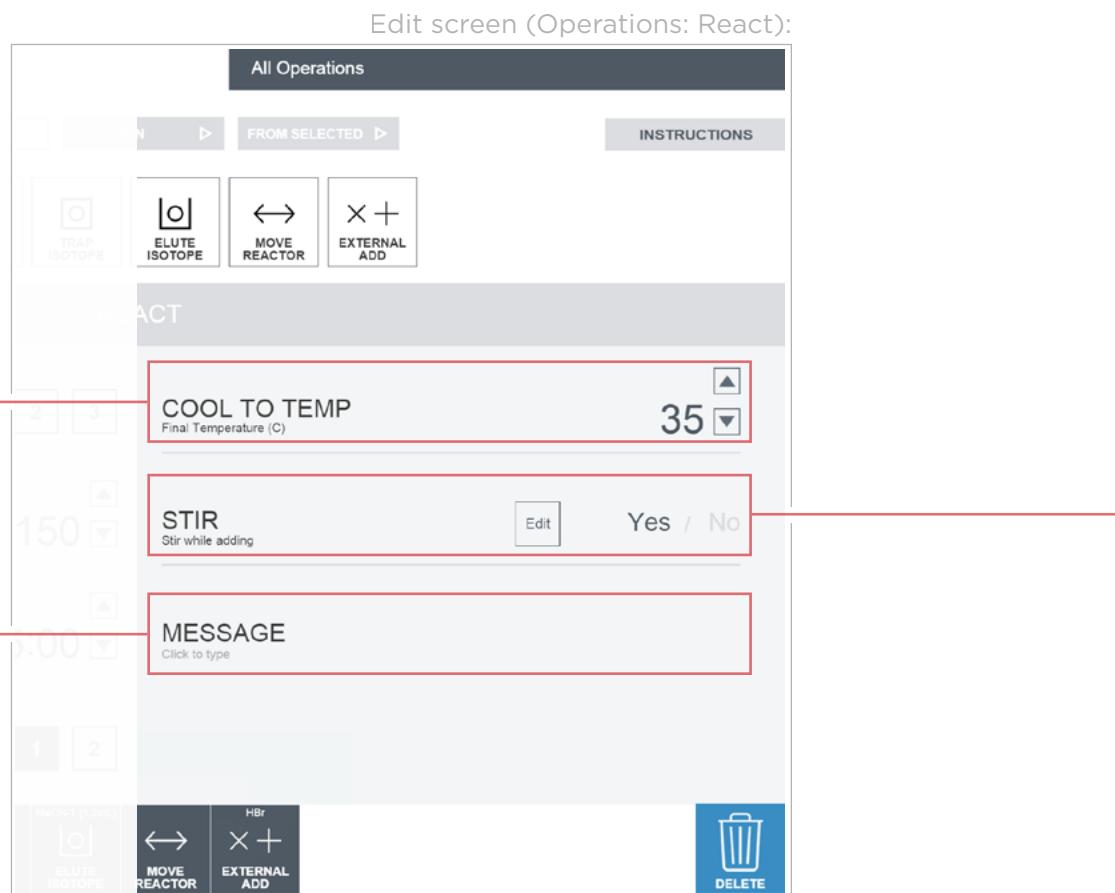
Two buttons represent seal positions on the ELIXYS hardware. Selecting a number will determine where the reactor is positioned during the reaction. Non-selected numbers will be gray. The selected number will be dark. Only one reactor can be selected at a time.

3.5.4.5 Cool to temp (React Operation)

Sets the final temperature to be reached after the reaction has completed. Digits represent seconds and minutes. Alternatively, the up/down arrows can be clicked to increment/decrement the seconds by 1 second per click.

3.5.4.6 Stir (React Operation)

Determines whether or not the contents of the reactor(s) will be stirred during operation. “Yes” and “No” labels are available, the darker label shows current state. An “Edit” button is present, which will popup a box with additional parameters for stirring. Even though Yes is selected by default, the property is invalid until Edit is clicked to set properties.



3.5.4.7 Message (React Operation)

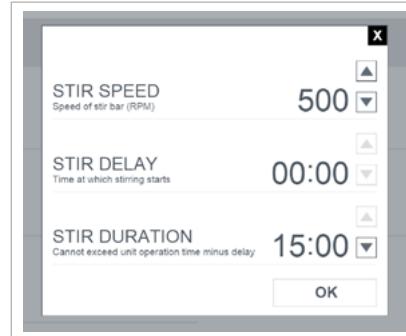
Optional text field. Notes entered here will be displayed on screen while the sequence is running. Clicking on the placeholder label “Click to type” will make the text editable.

3.5.4.8 Stir parameters popup (React Operation)

When stir “Edit” is clicked, a popup box will appear with the following stir options:

- Stir speed: Speed of stir. (0-1000)
- Stir Delay: Amount of operation time that will pass before stirring begins.
- Duration: Determines amount of time that reactor contents will be stirred.

Edit screen (Operations: React - Stir Popup):

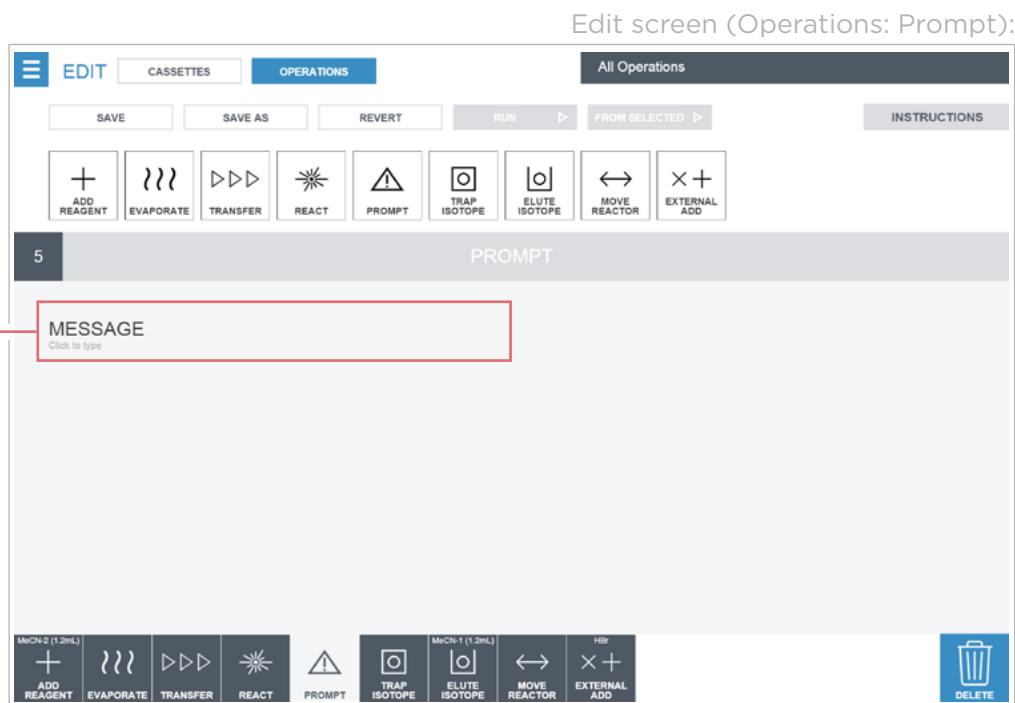


3.5.5 Prompt

3.5.5.1 Message (Prompt Operation)

Optional text field. Notes entered here will be displayed on screen while the sequence is running. Clicking on the placeholder label “Click to type” will make the text editable.

Placing the prompt operation into a sequence will pause the sequence until continue is clicked on the run screen.



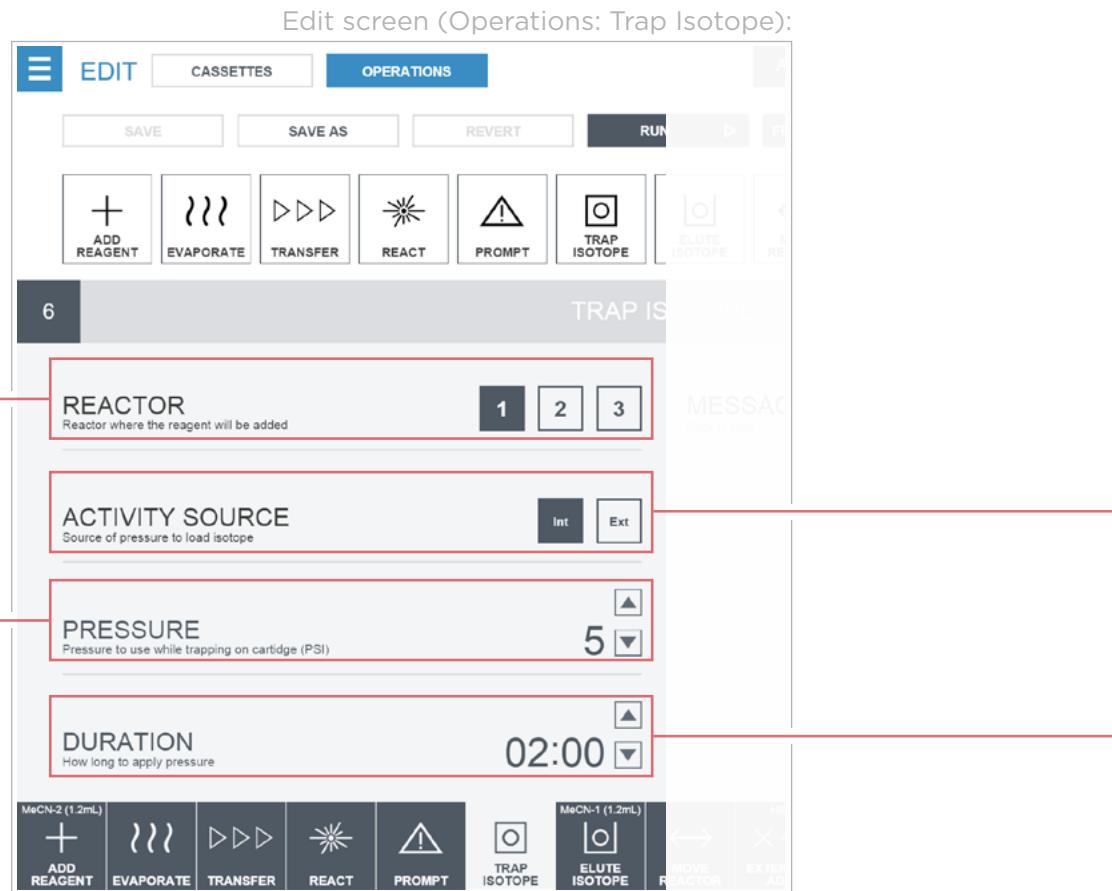
3.5.6 Trap Isotope

3.5.6.1 Reactor (Trap Operation)

Three buttons represent three reactors on the ELIXYS hardware. Selecting a number will determine which reactor will receive activity. Non-selected numbers will be grey. The selected number will be dark. Only one reactor can be selected at a time.

3.5.6.2 Activity source (Trap Operation)

Determines whether activity will come from an internal or external source.



3.5.6.3 Pressure (Trap Operation)

This parameter will not be available if external is chosen as the activity source.

Sets the target pressure for the operation in psi. Text can be entered manually, or up/down arrows can be clicked to increment/decrement the seconds by 1psi per click.

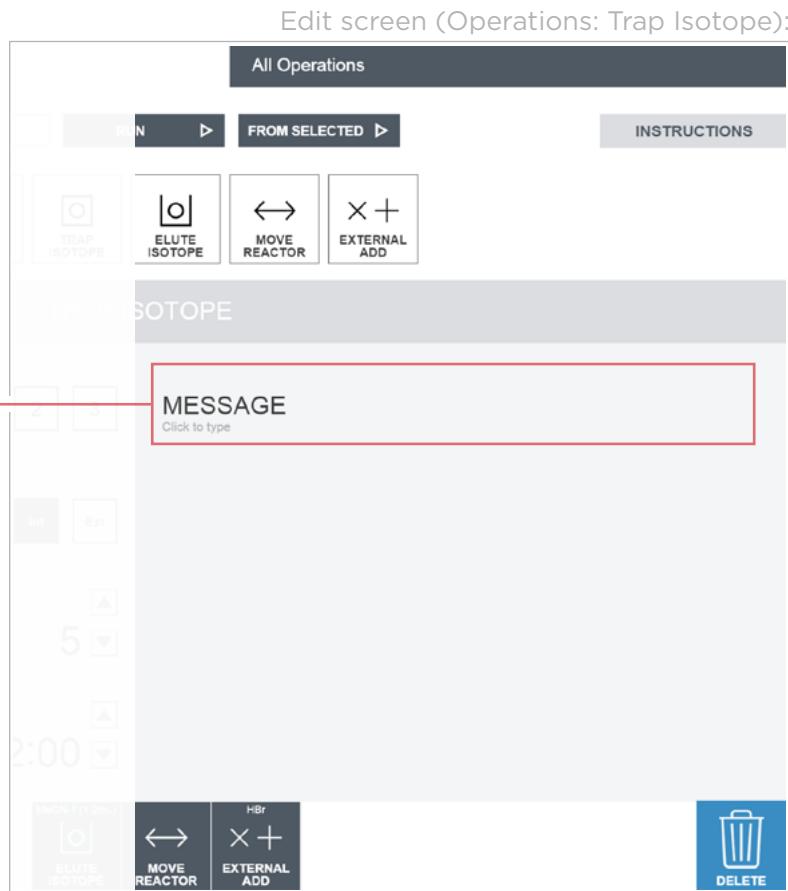
3.5.6.4 Duration (Trap Operation)

This parameter will not be available if external is chosen as the activity source.

Represents the duration of the operation in minutes and seconds. Text can be entered manually, or up/down arrows can be clicked to increment/decrement the seconds by 1 second per click.

3.5.6.5 Message (Trap Operation)

Optional text field. Notes entered here will be displayed on screen while the sequence is running. Clicking on the placeholder label “Click to type” will make the text editable.



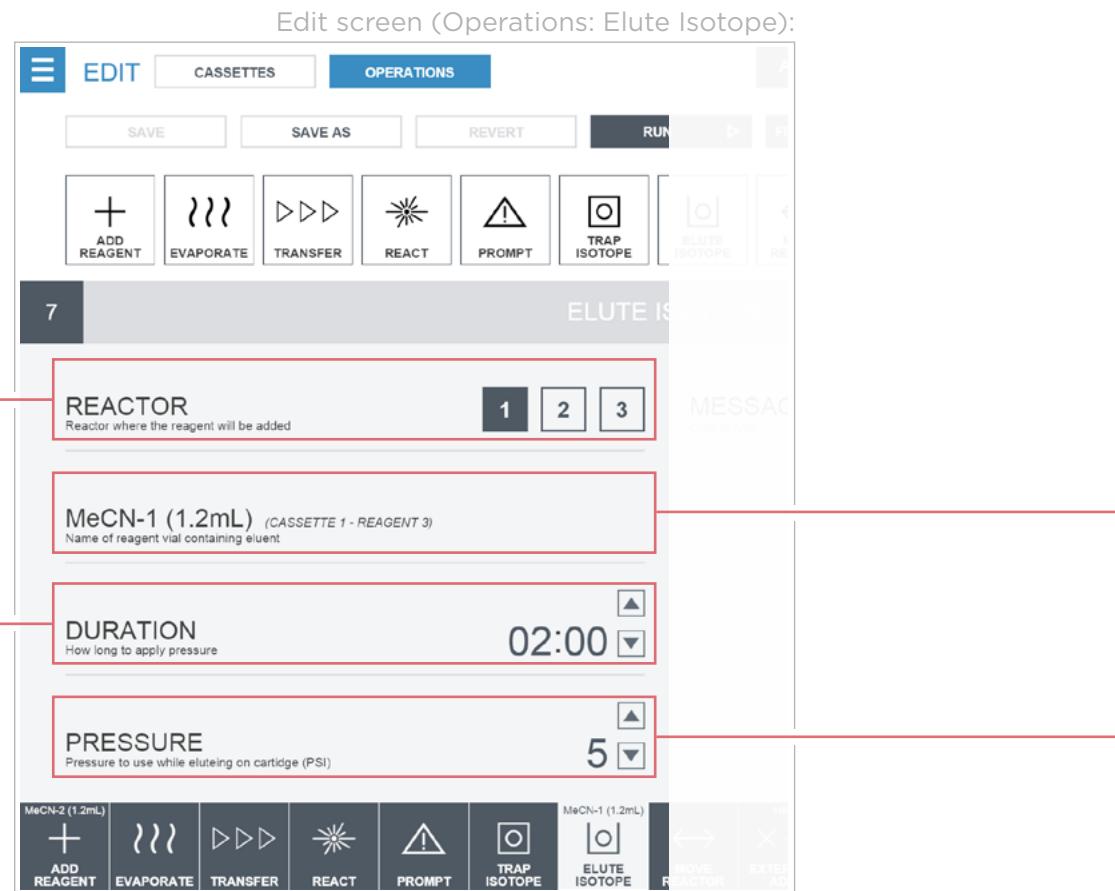
3.5.7 Elute Isotope

3.5.7.1 Reactor (Elute Operation)

Three buttons represent three reactors on the ELIXYS hardware. Selecting a number will determine which reactor will receive the reagent. Non-selected numbers will be gray. The selected number will be dark. Only one reactor can be selected at a time.

3.5.7.2 Reagent (Elute Operation)

Clicking on the word “reagent” will bring up popup box that looks exactly like the “cassettes” screen. A reagent can be selected from this list to be used in the add operation.



3.5.7.3 Duration (Elute Operation)

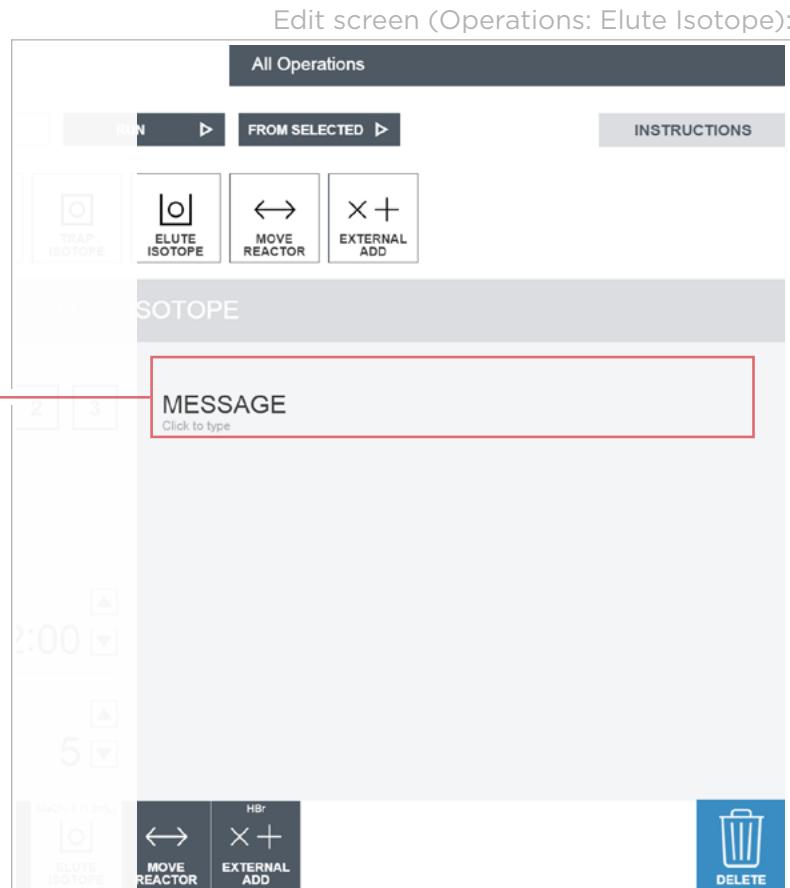
Represents the duration of the operation in minutes and seconds. Text can be entered manually, or up/down arrows can be clicked to increment/decrement the seconds by 1 second per click.

3.5.7.4 Pressure (Elute Operation)

Sets the target pressure for the operation in psi. Text can be entered manually, or up/down arrows can be clicked to increment/decrement the seconds by 1psi per click.

3.5.7.5 Message (Elute Operation)

Optional text field. Notes entered here will be displayed on screen while the sequence is running. Clicking on the placeholder label “Click to type” will make the text editable.



3.5.7.6 Reagent selection popup (Elute Operation)

Clicking on the word “reagent” will bring up a popup box that looks exactly like “cassettes” screen, complete with buttons to switch between Cassettes 1, 2, and 3. The reagent values match those set on the Cassettes Screen. When a reagent is selected, the dialog is dismissed and that reagent name will replace the word “REAGENT” in the edit properties section.

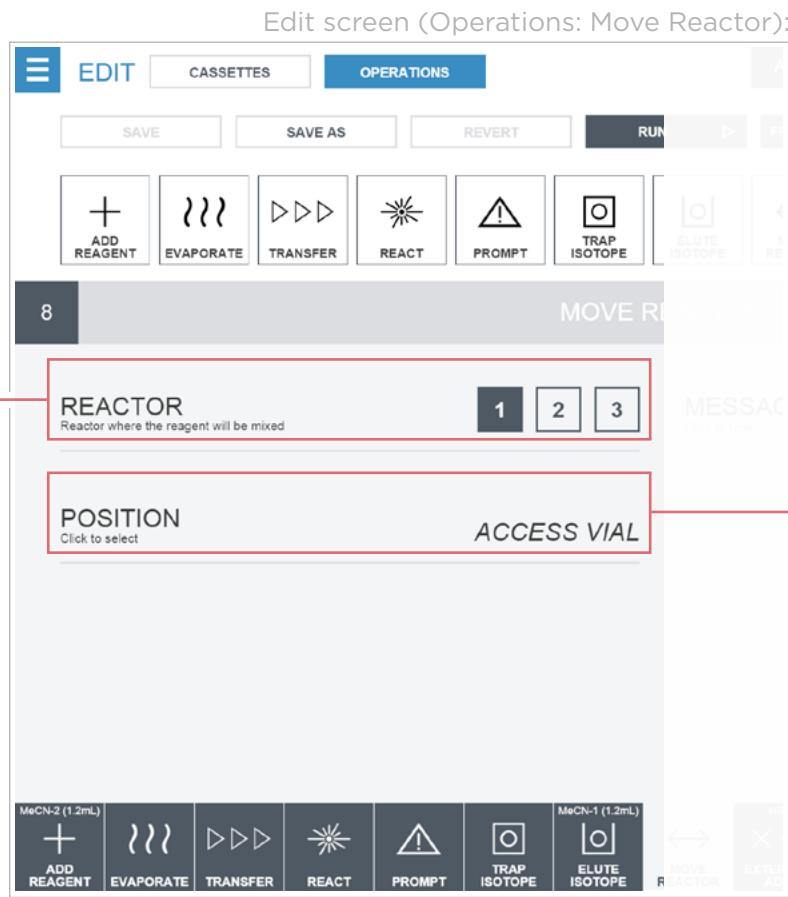
3.5.8 Move Reactor

3.5.8.1 Reactor (Move Operation)

Three buttons represent three reactors on the ELIXYS hardware. Selecting a number will determine which reactor will be moving. Non-selected numbers will be gray. The selected number will be dark. Only one reactor can be selected at a time.

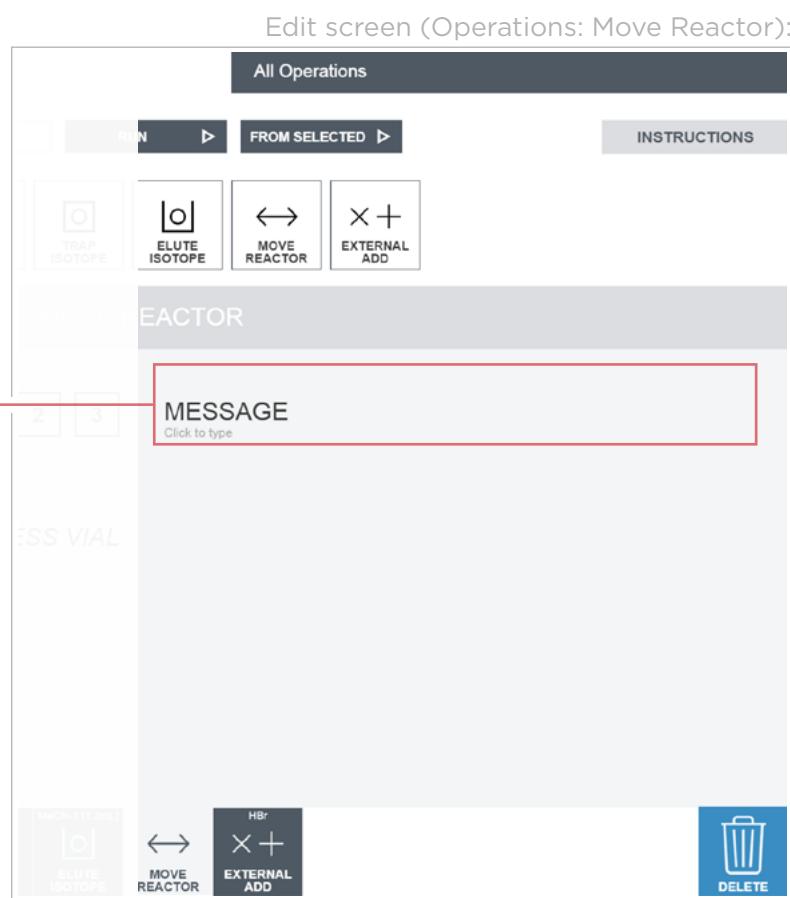
3.5.8.2 Position (Move Operation)

Determines position to which the reactor will be moving. (currently Access Vial is the only available option)



3.5.8.3 Message (Move Operation)

Optional text field. Notes entered here will be displayed on screen while the sequence is running. Clicking on the placeholder label “Click to type” will make the text editable.



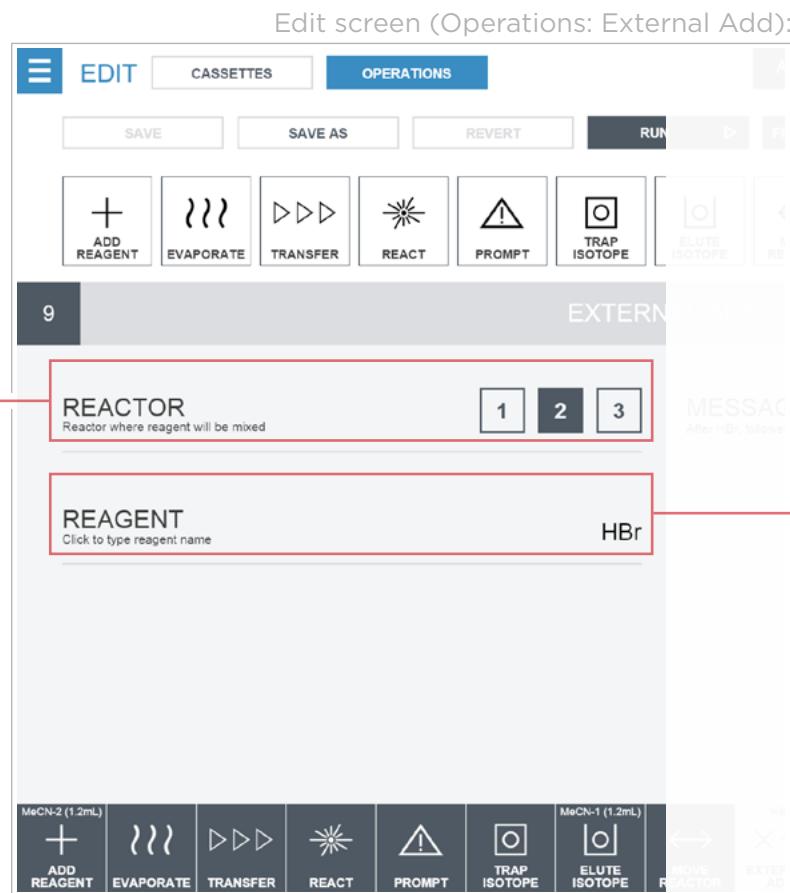
3.5.9 External Add

3.5.9.1 Reactor (External Add Operation)

Three buttons represent three reactors on the ELIXYS hardware. Selecting a number will determine which reactor will receive the reagent. Non-selected numbers will be gray. The selected number will be dark. Only one reactor can be selected at a time.

3.5.9.2 Reagent (External Add Operation)

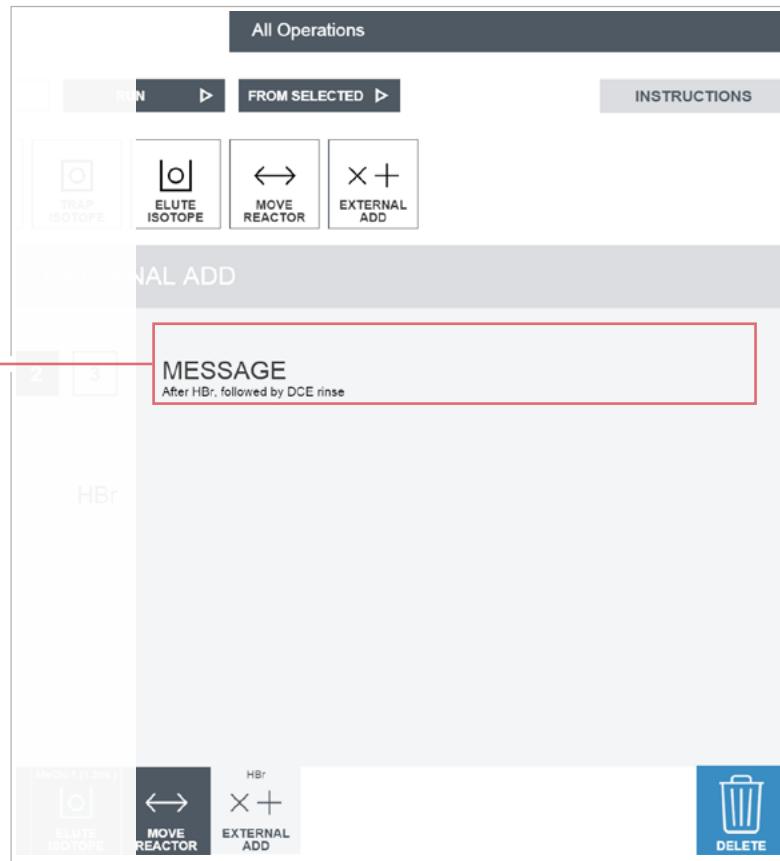
This field is used to manually enter the name off the reagent that will be externally added.



3.5.9.3 Message (External Add Operation)

Optional text field. Notes entered here will be displayed on screen while the sequence is running. Clicking on the placeholder label “Click to type” will make the text editable.

Edit screen (Operations: External Add):



Section 4: Pre-run Checklist

Before a Sequence is actually run, a Pre-Run Checklist must be completed to confirm that everything is ready. The checklist will appear automatically after hitting the run button in the edit sequence section.

4.1 Record run name

A name for the run is entered here. This field is required and must be unique. The same run name can never be used twice.

Pre-run Checklist:

The screenshot shows a software interface titled "PRE-RUN CHECKLIST". At the top, there is a dark bar with the text "D-FAC". Below it, a large dark box contains the instruction "1. Record run name:". To the right of this box are two input fields: "Run name or number" and "Run description", both of which are currently empty and highlighted with red boxes. Below this, another box contains the instruction "2. Insert the following reagent vials into the correct locations on the proper cassettes." followed by a detailed list of reagents and their positions.

4.1.1 Record run description

A description for the run is entered here. This field is not required and does not need to be unique.

4.2 Reagent verification

For each Reagent on each Cassette, there will be a checkbox. The check box must be clicked in order for a sequence to run. This feature serves as a reminder to make sure that every reagent vial has been loaded into the correct position on the correct cassette. To the right of each checkbox the corresponding reagent name and position are displayed.

Pre-run Checklist:

The screenshot shows the continuation of the "Pre-run Checklist" interface. It starts with the "Record run name" section from the previous screenshot. Below it, the "2. Insert the following reagent vials into the correct locations on the proper cassettes." section is shown. This section lists seven reagents with their descriptions and positions on "Cassette 1":

Reagent	Position	Lot number	Description
Eluent (1mg K ₂ CO ₃ , 0.3mL H ₂ O, 0.5mL EtOAc)	Cassette 1 - Position 2		
MeCN-1 (1.2mL)	Cassette 1 - Position 3		
MeCN-2 (1.2mL)	Cassette 1 - Position 4		
Precursor-1 (10mg in 1.0mL of MeCN)	Cassette 1 - Position 5		
EtOAc-1 (2mL)	Cassette 1 - Position 6		
EtOAc-2 (2mL)	Cassette 1 - Position 7		

4.2.1 Reagent lot number

This is an optional field allowing the lot number of each reagent vial to be recorded and stored in the system's database.

Pre-run Checklist:

1. Record run name:

2. Insert the following reagent vials into the correct locations on the proper cassettes. Record lot numbers in the fields to the right:

Eluent (1mg K₂CO₃, 0.3mL H₂O, 0.5... Cassette 1 - Position 2

Lot number
 Description

4.2.2 Reagent description

This is an optional field allowing the description of each reagent vial to be recorded and stored in the system's database.

4.3 Cassette verification

For each cassette on ELIXYS, there will be a checkbox. The check box must be clicked in order for a sequence to run. This feature serves as a reminder to make sure that ever reagent vial has been loaded into the correct position on the correct cassette. To the right of each checkbox the corresponding cassette number displayed.

Pre-run Checklist:

3. Insert cassettes into Elixys, lock down with clips, and record lot numbers in the fields to the right:

Cassette 1 Lot number
 Cassette 2 Lot number
 Cassette 3 Lot number

4.3.1 Cassette lot number

This is an optional field allowing the lot number of each cassette to be recorded and stored in the system's database.

4.4 Step verification

This section displays a list of steps that must be completed in order for a run to start. To the left of each step a checkbox is displayed. Every check box must be clicked in order for a sequence to run.

Pre-run Checklist:

4. Complete the following steps:

<input type="checkbox"/> Ensure sufficient nitrogen supply is connected (>60psig)	<input type="checkbox"/> Connect tubing from cassettes to each other and/or HPLC injector valve as applicable
<input type="checkbox"/> Prepare cold trap	<input type="checkbox"/> Ensure all HPLC components are initialized and ready for use
<input type="checkbox"/> Insert reactor vials with stir bar	<input type="checkbox"/> Prepare source activity (or connect to beam line)

Select All Clear All

4.5 Select/clear buttons

The select all button checks all checkboxes on the page.

The clear all button unchecks all checkboxes and clears all fields on the page.

4.6 Video feed verification

This section displays three video feeds. One for each camera on the three reactors. Verify that all feeds are working correctly. If a video feed is not displaying, or appears to be frozen, the “RESET FEED” button under that video can be pushed to reboot the feed.

Pre-run Checklist:

5. Verify video feeds:

<input type="button" value="RESET FEED 1"/>	<input type="button" value="RESET FEED 2"/>	<input type="button" value="RESET FEED 3"/>

Back Continue

4.7 Back/continue buttons

- The back button will exit out of the pre-run checklist, clearing out all of the entered data and return to the sequence edit section.
- When the continue button is clicked, there are two possible options for what may happen:
 - If all checkboxes are checked and required values are provided, a popup box is shown with two buttons: Run, which will start the run, and Cancel, which will dismiss the popup box.
 - If there are any validation problems such as un-checked checkboxes or missing values, the invalid fields will be marked with a red asterisk.

Section 5: Monitoring running sequences

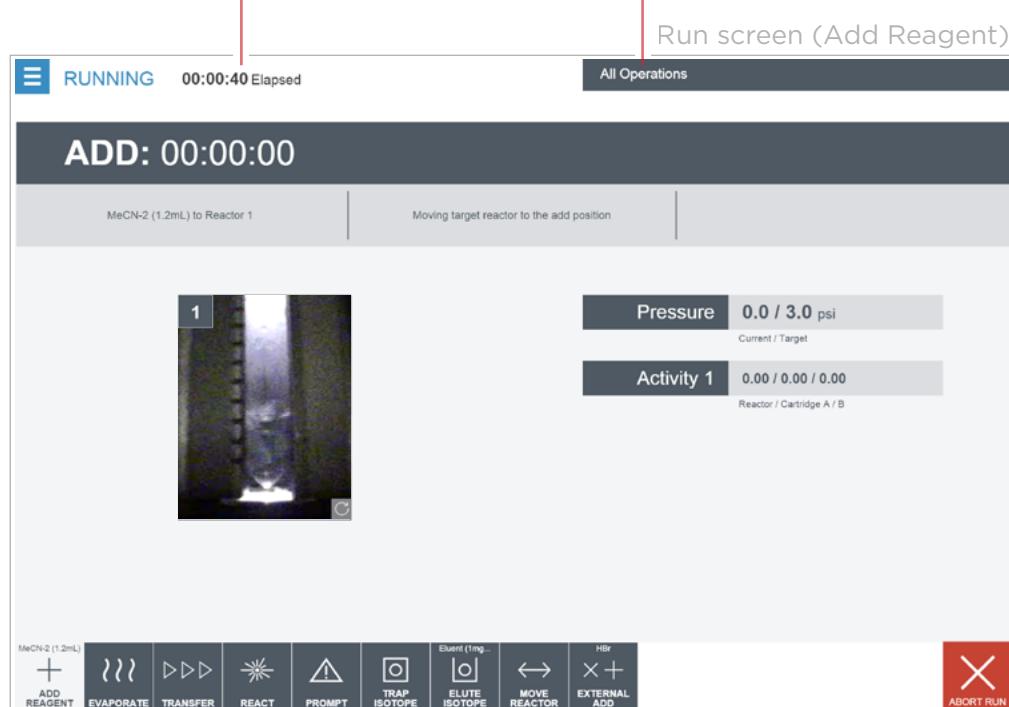
The “Running” section is available when a sequence is running. It is the way to monitor a sequence as it is executed by the system, and optionally make changes to some attributes while it runs.

5.1 General Running screen features

While some information displayed in the software during the process of running a sequence is operation specific, there are several common elements displayed in the ELIXYS software throughout the duration of a sequence.

5.1.1 Elapsed Time

The total elapsed time of the running sequence is displayed as hours, minutes, and seconds. The value represents a running total for the entire run.



5.1.2 Name of sequence

This box displays the name of the sequence that is currently being run.

5.1.3 Timeline (Run screens)

The Timeline is the series of Operations that comprise the Sequence and is always present on the sequence run screens.

The order of the Operations in the Timeline reflects the order they will be executed during a Sequence Run, with the first Operation at the left and the last one at the right.

The color of each operation in the timeline indicates it's status as follows:

- The currently running operation is indicated with a light gray background color
- Completed Operations get a white background and light gray text
- Yet-to-be-run Operations get a dark gray background with light text



5.1.3.1 Abort Button

Clicking on the Abort Run button will pop up a box with options to confirm or cancel the abort action. If the abort is confirmed, the Run is stopped, and the Save a Copy dialog is shown.

5.2 General Running screen features

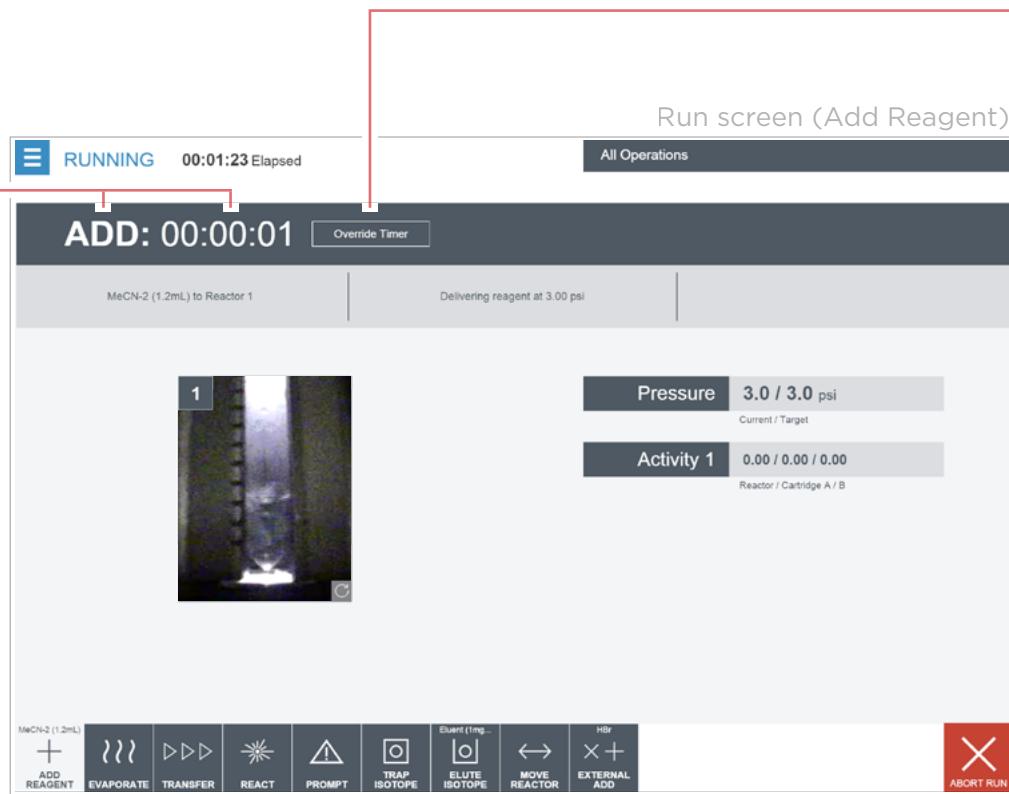
Some information on the run screens is shown as-needed.

5.2.1 Running Operation name

The name of the operation currently running is displayed here.

5.2.2 Countdown timer

The operation countdown is displayed as hours, minutes, and seconds. This readout appears and begins counting down after any preliminary operation setup has completed (i.e. reactors heating to target temp). The value counting down is determined by the duration time entered for the specific operation when the sequence was created.



5.2.3 Override Timer button

When the countdown timer appears, there will be an “Override Timer” button to its right. When this button is clicked, the Operation Countdown timer will be reset to 0 and start counting up (instead of down). The Override Timer button text will change to “Continue”. When Continue is clicked, the Sequence will move to the next Operation in the Timeline. It will stay on the current Operation until Continue is clicked—there is no time limit.

5.2.4 Messages

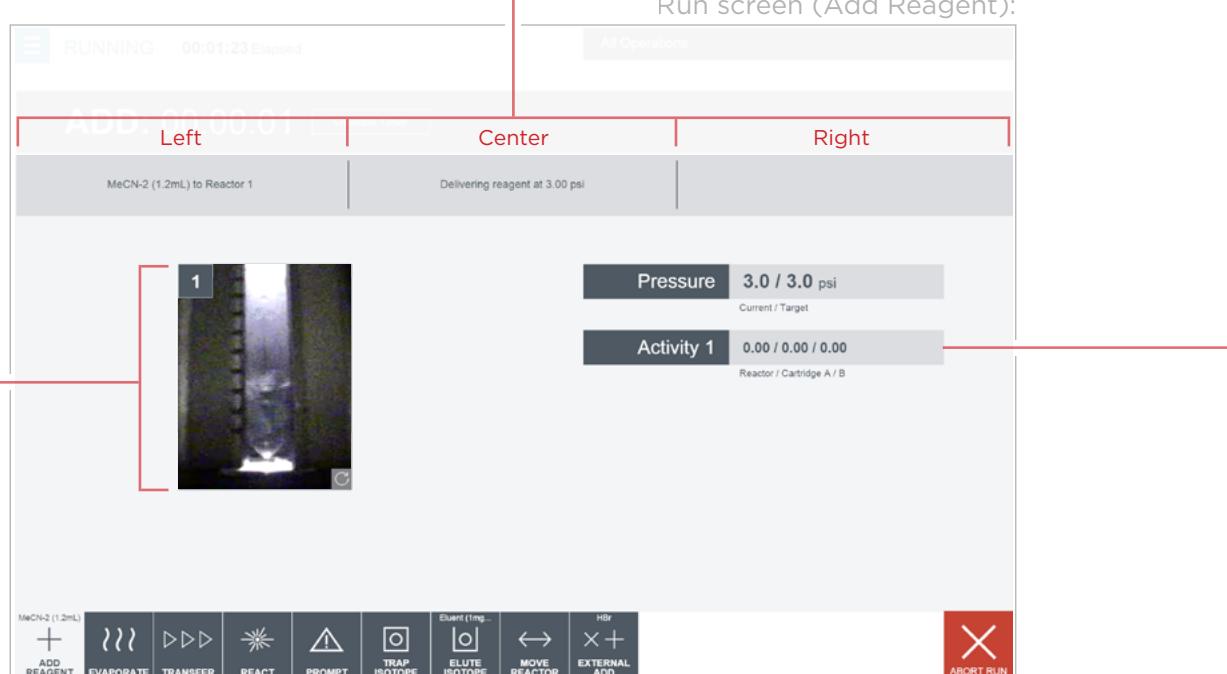
All Operations have an area that displays a message related to the Operation in progress.

The light gray message bar is divided into 3 sections. From left to right, the following message types will be displayed if appropriate for the currently running operation:

Left - Simple basic information to the operation such as which reagent is going to which reactor

Center - System status messages are displayed here. These will update frequently.

Right - Any message entered into the software interface by the user who created the sequence will display here.



5.2.5 Video feeds

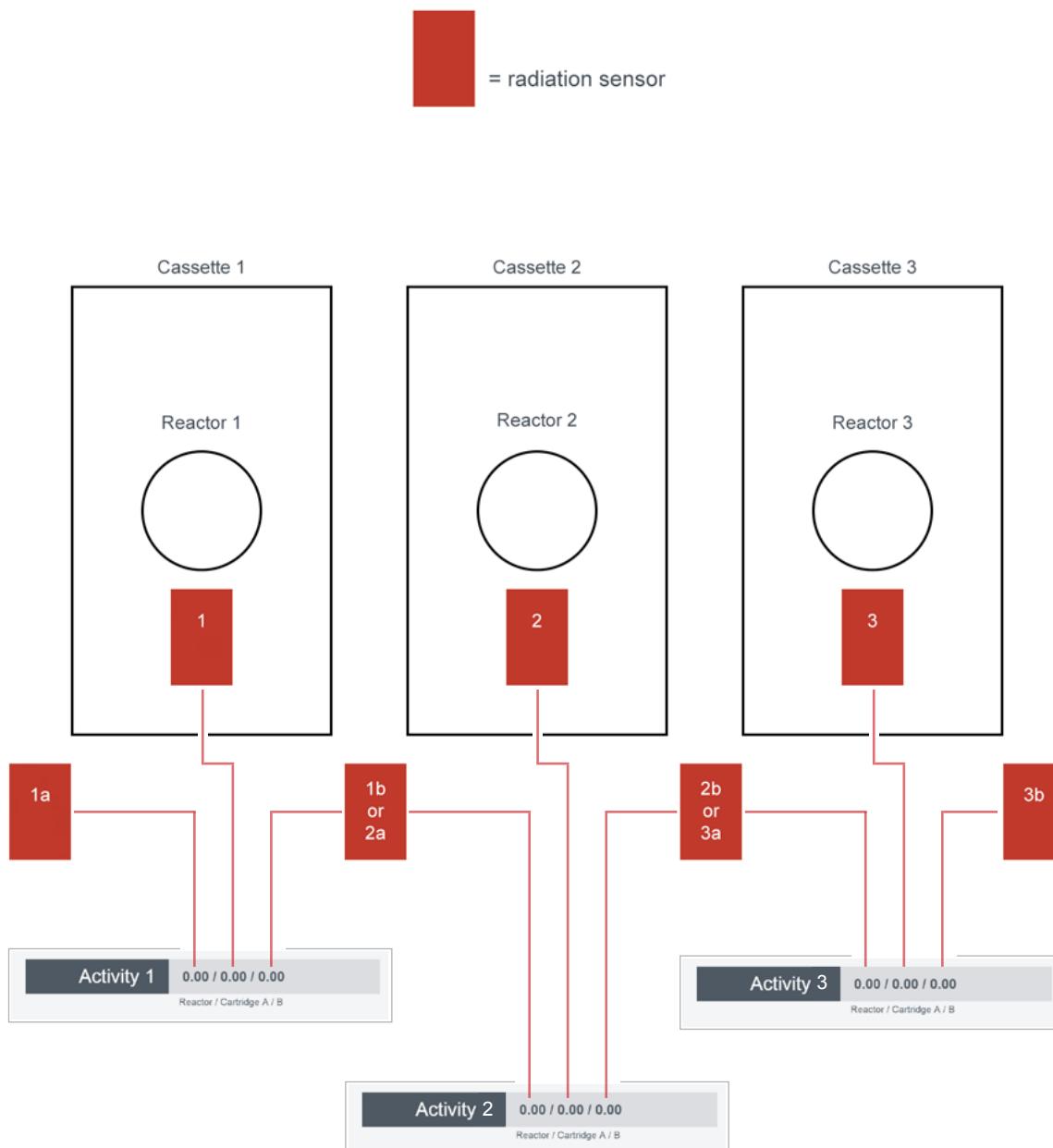
Some Operations show a video feeds while running (depending on the target and source of a transfer operation, it may display two videos). The video is a closeup live-stream of the reactor where the operation is taking place.

5.2.6 Radiation sensors

During a Run, each Operation will show 3 Activity values, one from each relevant sensor. Transfer will show Activity values from both the source and destination. There will be some overlap here because certain sensors are relevant for more than one reactor. See next page for more info.

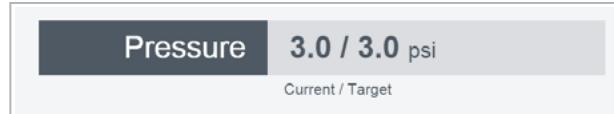
5.2.6 Radiation sensors (continued)

There are 7 total radiation sensors on the unit. Some of them are directly on the reactor, others are staggered so they can detect activity from more than one reactor. The diagram below shows how each activity readout relates to the hardware.



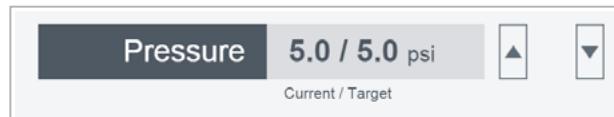
5.2.7 Pressure readings

There is a pressure readout on the ELIXYS software that is receiving its value from the inert gas pressure regulator on the ELIXYS system. It displays the actual current pressure in the system as well as the target pressure that was defined for the operation when the sequence was created.



5.2.8 Pressure adjustment (timer override)

When the countdown timer is overridden, if there is a Pressure property it will become editable with up and down buttons to increase or decrease the value in real time. Pressure values are adjusted in increments of 0.5 psi.



5.2.9 Stir toggle (timer override)

When the countdown timer is overridden, if there is a Stir property it will become editable with on and off buttons to toggle stirring in real time.

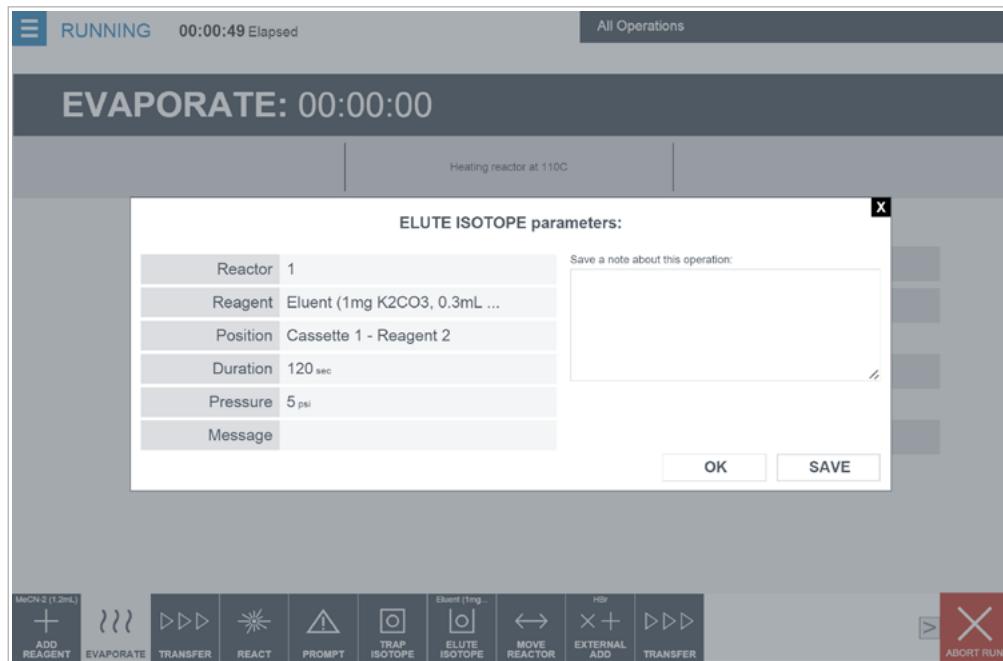


5.2.10 Operation parameters popup

Double-clicking on an operation in the timeline will show a popup box with these elements:

- Read-only descriptions of all the parameters/properties set for this operation.
- Note: Any notes can be entered into the field and saved to the ELIXYS database associated with the run.
- Ok button: Will close parameters popup without saving any text typed into the note box
- Save button: When clicked, will save to the Run Log any changes to the Note field and dismiss the dialog.

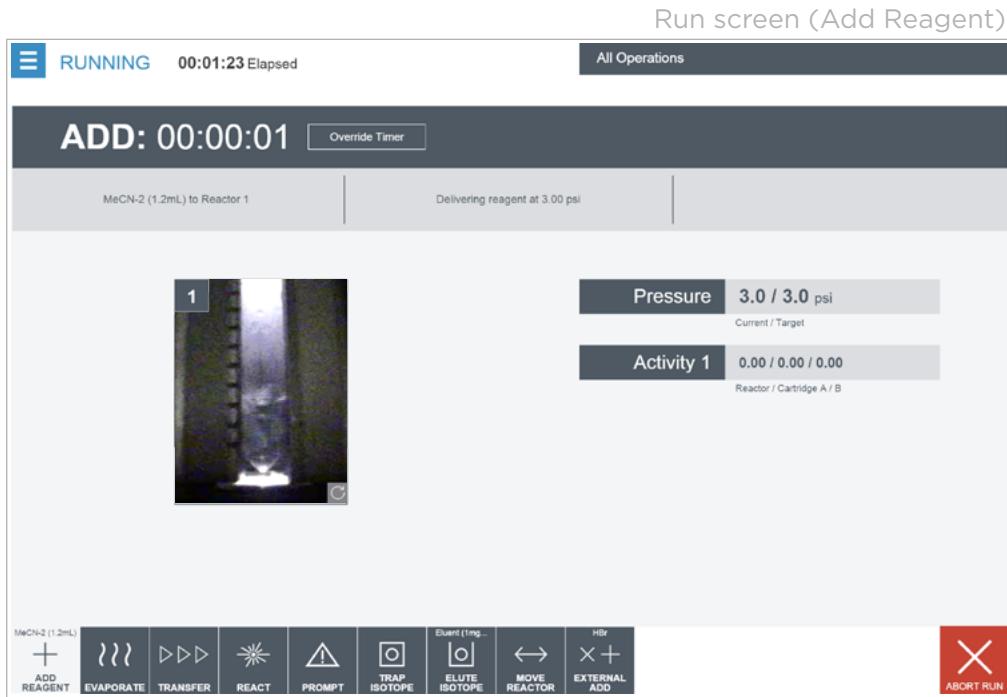
Run screen (Elute Isotope - Parameters Popup):



5.3 Operation-type specific details

Each Operation will display different, but similar, status values for pressure, temp, vacuum, and activity. They will be displayed as “current value/target value.”

5.3.1 Add



5.3.1.1 Video feed of relevant Reactor

Automatically displays a video feed from reactor 1, 2, or 3, depending on which is relevant for the operation.

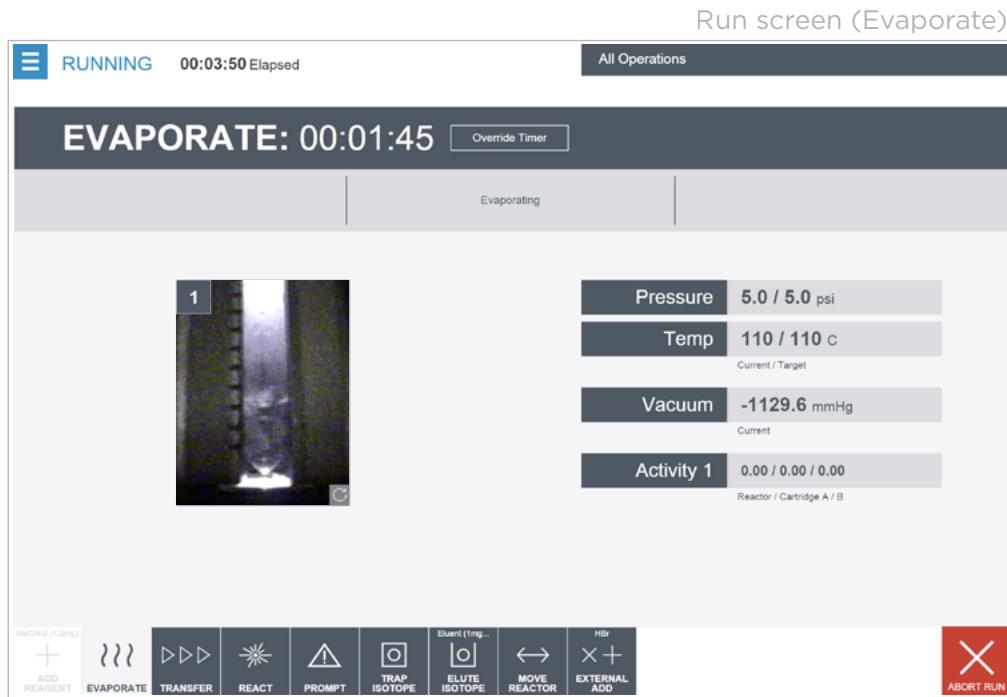
5.3.1.2 Pressure readout

Displays system pressure in psi and becomes editable when timer is overridden.

5.3.1.3 Activity level of target reactor

See 5.2.6.

5.3.2 Evaporate



5.3.2.1 Video feed of relevant Reactor

Automatically displays a video feed from reactor 1, 2, or 3, depending on which is relevant for the operation.

5.3.2.2 Pressure readout

Displays system pressure in psi and becomes editable when timer is overridden.

5.3.2.3 Temperature of relevant Reactor

Automatically displays the temperature of reactor 1, 2, or 3, depending on which is relevant for the operation. Values in degrees Celsius.

5.3.2.4 Vacuum readout

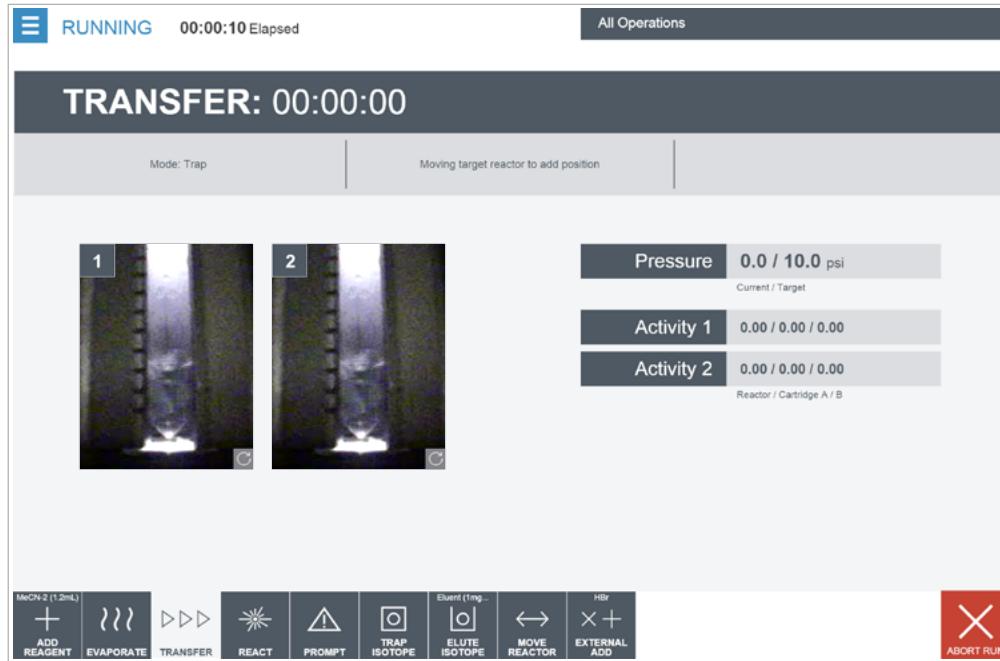
Displays system vacuum in mmHg.

5.3.2.5 Activity level of target reactor

See 5.2.6.

5.3.3 Transfer

Run screen (Transfer):



5.3.3.1 Video feed of source Reactor and target Reactor (if target is reactor)

Automatically displays a video feed from reactor 1, 2, or 3, depending on which is relevant for the operation.

5.3.3.2 Pressure readout

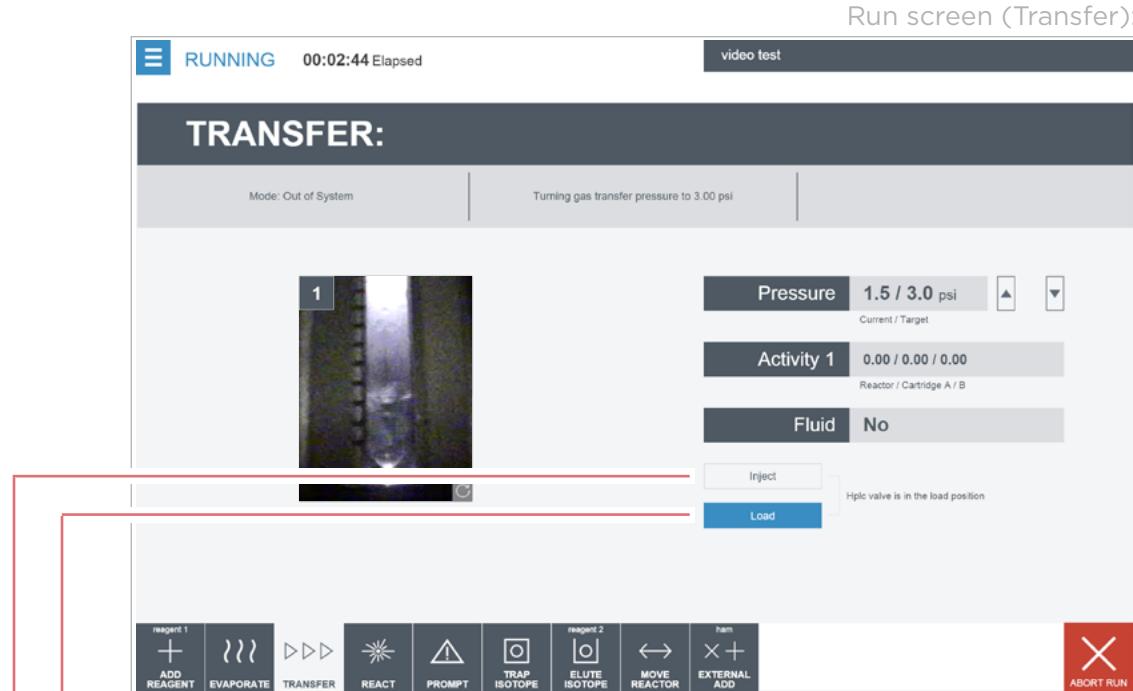
Displays system pressure in psi and becomes editable when timer is overridden.

5.3.3.3 Activity level of source and target reactor (if target is reactor)

See 5.2.6.

5.3.3.4 Transfer (Hplc)

The transfer run screen will behave differently when hplc auto or manual is chosen as the destination. When the operation is hplc auto, the hplc valve will automatically switch positions when fluid is detected in the system. In manual mode, the transfer screen will display inject and load buttons to manually toggle the hplc valve position.



5.3.3.5 Load

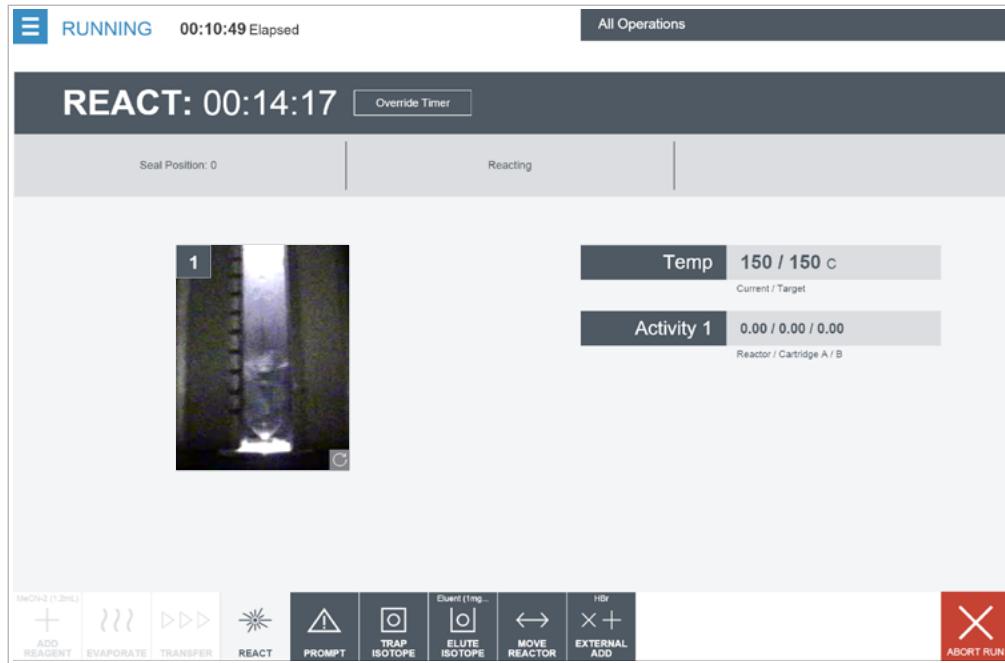
Clicking the load button will switch the hplc valve into load position for moving fluid out of the ractor and into the hplc valve.

5.3.3.6 Inject

Clicking the inject button will switch the hplc valve into inject position for moving fluid out of the valve and out of the system.

5.3.4 React

Run screen (React):



5.3.4.1 Video feed of relevant Reactor

Automatically displays a video feed from reactor 1, 2, or 3, depending on which is relevant for the operation.

5.3.4.2 Temperature of relevant Reactor

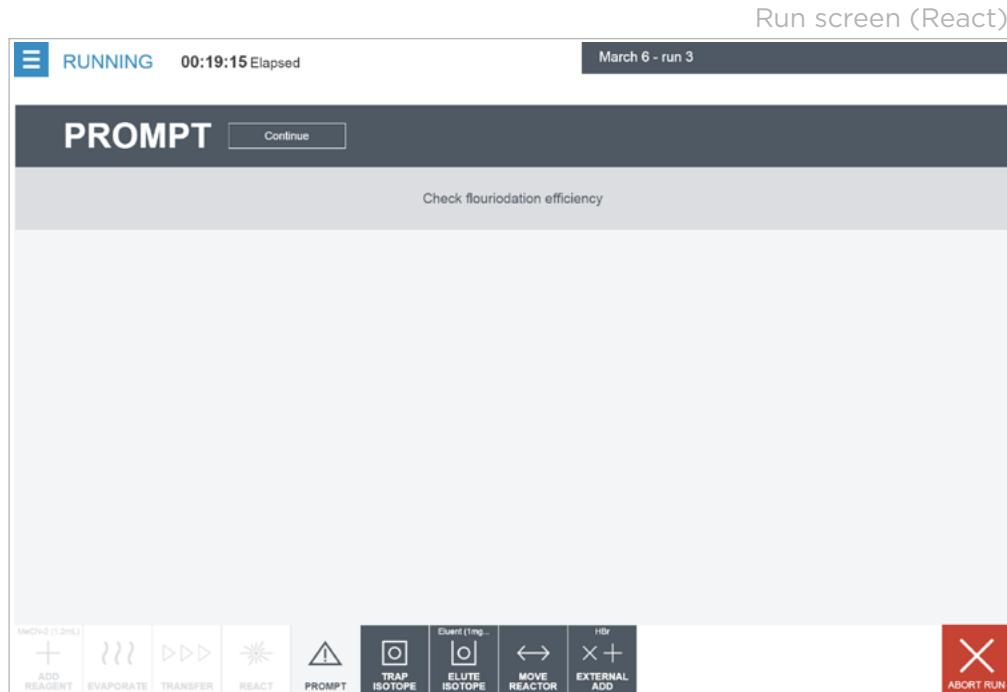
Automatically displays the temperature of reactor 1, 2, or 3, depending on which is relevant for the operation. Values in degrees celcius.

5.3.4.3 Activity level of relevant reactor

See 5.2.6.

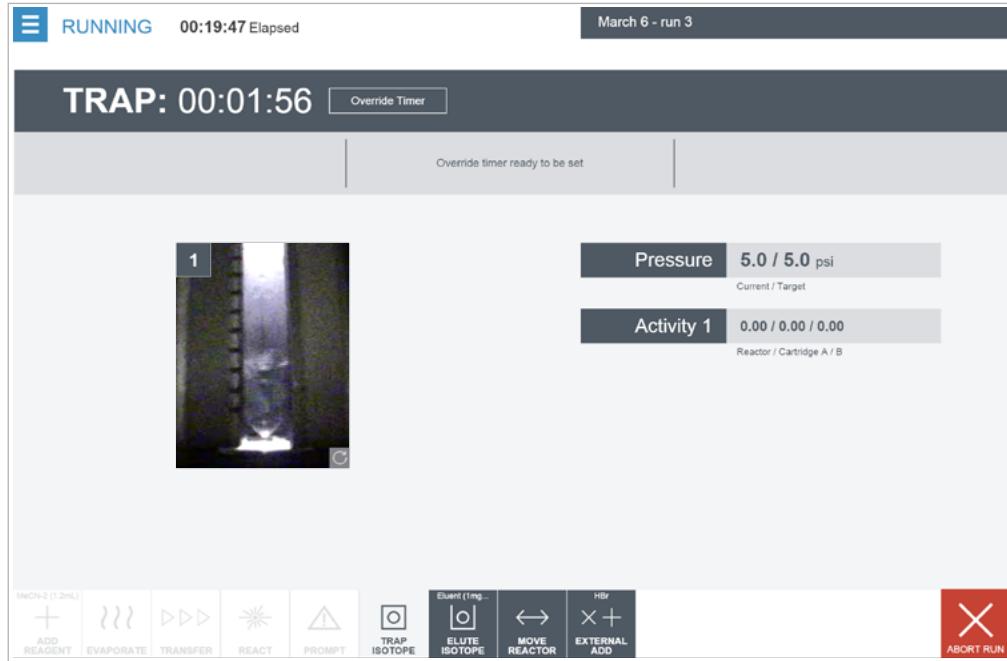
5.3.5 Prompt

This window pauses the operation for a pre-determined amount of time or until the continue button is pressed.



5.3.6 Trap

Run screen (Trap Isotope):



5.3.6.1 Video feed of relevant Reactor

Automatically displays a video feed from reactor 1, 2, or 3, depending on which is relevant for the operation.

5.3.6.2 Pressure readings

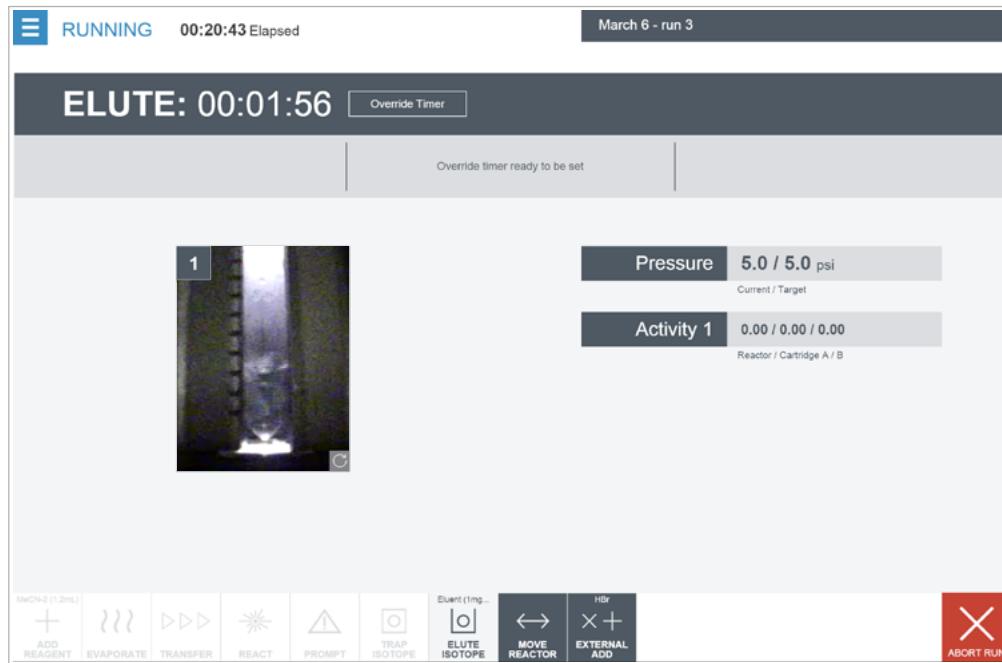
Displays system pressure in psi and becomes editable when timer is overridden.

5.3.6.3 Activity level of relevant reactor

See 5.2.6.

5.3.7 Elute

Run screen (Elute Isotope):



5.3.7.1 Video feed of relevant Reactor

Automatically displays a video feed from reactor 1, 2, or 3, depending on which is relevant for the operation.

5.3.7.2 Pressure readings

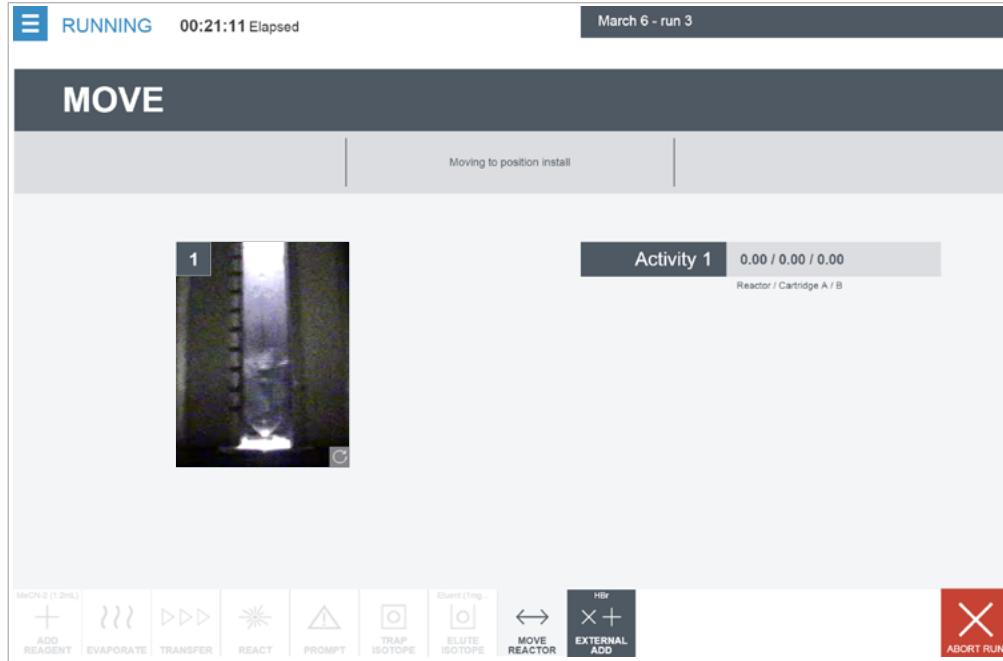
Displays system pressure in psi and becomes editable when timer is overridden.

5.3.7.3 Activity level of relevant reactor

See 5.2.6.

5.3.8 Move

Run screen (Move):



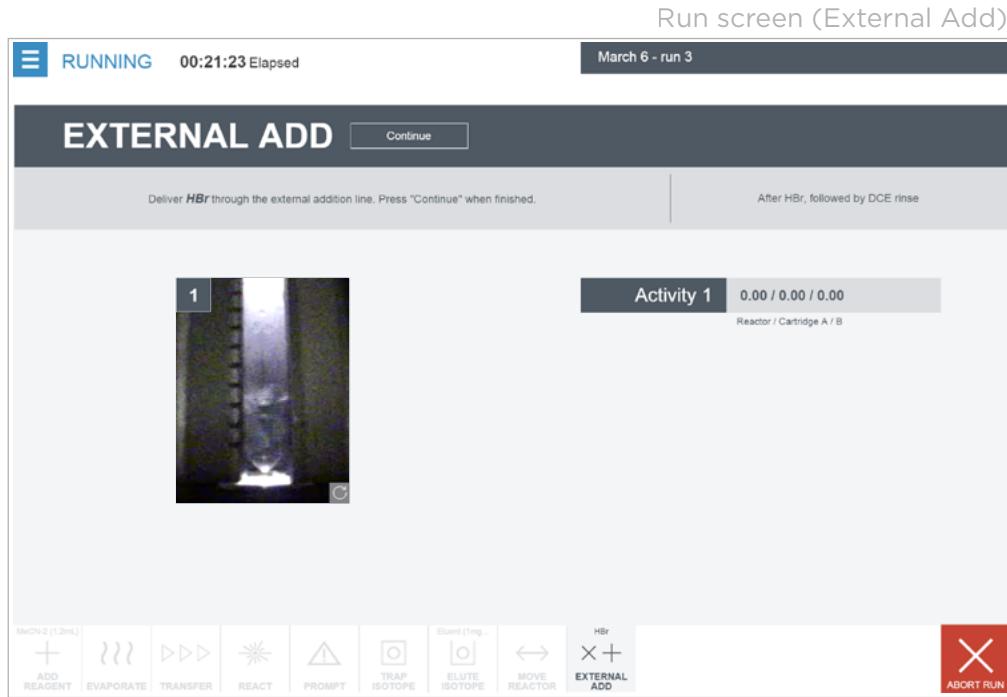
5.3.8.1 Video feed of relevant Reactor

Automatically displays a video feed from reactor 1, 2, or 3, depending on which is relevant for the operation.

5.3.8.2 Activity level of relevant reactor

See 5.2.6.

5.3.9 External Add



5.3.9.1 Video feed of relevant Reactor

Automatically displays a video feed from reactor 1, 2, or 3, depending on which is relevant for the operation.

5.3.9.2 Activity level of relevant reactor

See 5.2.6.

5.3.9.3 Instructions for External Add

Instructions will be displayed in the message section. See 5.2.4.

5.4 End of run

There are three possible ways for a Run to end.

- Abort: If the Abort button is clicked and confirmed, the run is aborted and the “Save a Copy” dialog is presented. Upon completion, the Logs screen will be displayed.
- Override Timer: If the Override Timer button was clicked on any Operation, then when the Sequence completes the “Save a Copy” dialog is presented. Upon completion, the Logs screen will be displayed.
- Completes Normally: Upon normal completion of a run, the Logs screen will be displayed.



Section 6: Logs

Past Sequence runs are listed in the Logs section. The software interface for this is the same as the Sequence List with these differences:

- The name column shows the sequence name followed by the name provided for that particular run.
- There is a new Date column that shows the date and time when the run was started.
- There are no links on rows. Each row has a “View” button which will open the corresponding Sequence, in the state it was when this Run occurred, in a read-only manner.
- The buttons for New Sequence and Copy are removed.

Logs screen:

LOGS		SOFIEBIOSCIENCES	
MM/DD/YYYY	TO	MM/DD/YYYY	<input type="button" value="SEARCH"/>
<input type="button" value="EXPORT LOGS"/>			
<input type="checkbox"/>	Name	Date	
<input type="checkbox"/>	D-FAC run 7 SOFIE BIO Optimized Sequence	02/27/15 1:41pm	<input type="button" value="VIEW"/>
<input type="checkbox"/>	D-FAC run 6 SOFIE BIO Optimized Sequence	02/27/15 1:40pm	<input type="button" value="VIEW"/>
<input type="checkbox"/>	D-FAC run 5 SOFIE BIO Optimized Sequence	02/27/15 1:39pm	<input type="button" value="VIEW"/>
<input type="checkbox"/>	D-FAC run 4 SOFIE BIO Optimized Sequence	02/27/15 1:38pm	<input type="button" value="VIEW"/>
<input type="checkbox"/>	D-FAC run 3 SOFIE BIO Optimized Sequence	02/27/15 1:37pm	<input type="button" value="VIEW"/>
<input type="checkbox"/>	D-FAC run 2 SOFIE BIO Optimized Sequence	02/27/15 1:36pm	<input type="button" value="VIEW"/>
<input type="checkbox"/>	D-FAC run 1 SOFIE BIO Optimized Sequence	02/27/15 1:35pm	<input type="button" value="VIEW"/>

6.1 List

For each Sequence, under the “Name” column these Sequence attributes are shown:

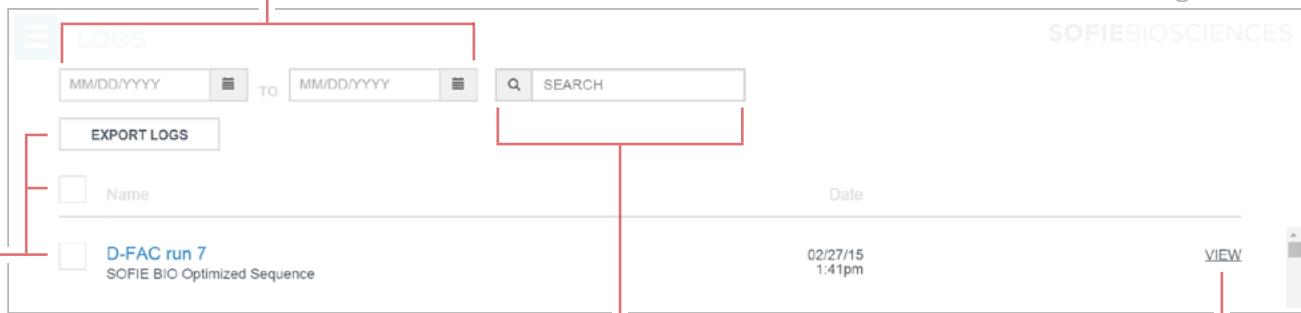
- Name of specific run
- Description

For each Sequence, under the Date Created column these Sequence attributes are shown:

- The date of Sequence run in the format MM/DD/YY
- Time run began in the format hh:mm (am or pm)
- Each row has a “View” button which will open the corresponding Sequence, in the state it was when this Run occurred, in a read-only manner

6.1.1 Date Range Filters

By default, the Logs shows all available run logins alphabetical order. Date range filters are provided to aid in finding a specific sequence. When dates are set in the “from” and/or “to” date fields, only logs will be shown that fall within that date range. If a date field has a value, an “X” button is enabled. Clicking this button will clear the field.



6.1.2 Text Search

Text entered in the search field is matched against the title and descriptions of logs. It will filter the list according to text entered. When the search field has a value, an “X” button is enabled in the field. Clicking this button will clear the field.

6.1.3 Export Logs

Every run log in the list has a square checkbox to its left. If one or multiple runs are selected, selected batch records for the selected logs will be exported when the Export Logs button is pushed.

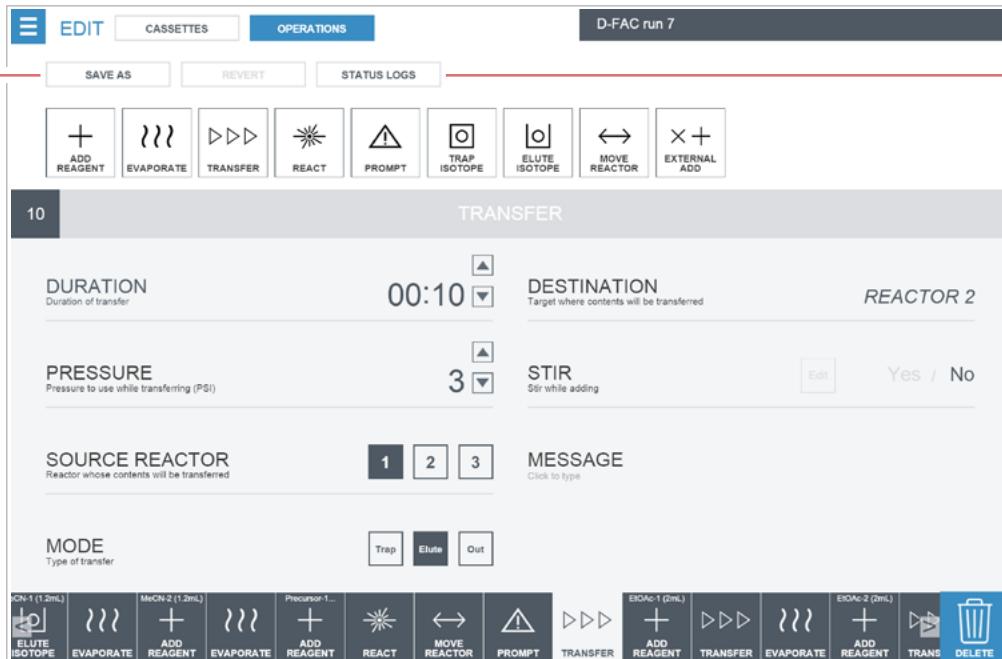
6.1.4 View Button (Read-only sequence log)

Each row has a “View” button which will open the corresponding Sequence, in the state it was when this Run occurred, in a read-only manner.

6.2 Read-only sequence log

Clicking the “View” button for a Log instance will open the corresponding Sequence, in the state it was when this Run occurred, in a read-only manner. The sequence can be edited and a copy can be saved, but the changes cannot be saved to over write the original sequence.

Read only sequence screen:



6.2.1 Save as button

This button is always available. It behaves exactly the same as the Copy button, using the currently open Sequence as the source of the copy. Save is not available for logs because they are read-only. However, save as can be used to make a new sequence from the log instance, copying all of its operations and properties in an editable state.

6.2.2 Status logs

Clicking the Status Logs button will open an complete chronological list of status message created while the sequence was running.

6.2.2 Status logs (Continued)

Read only sequence screen (Status Logs Tab):

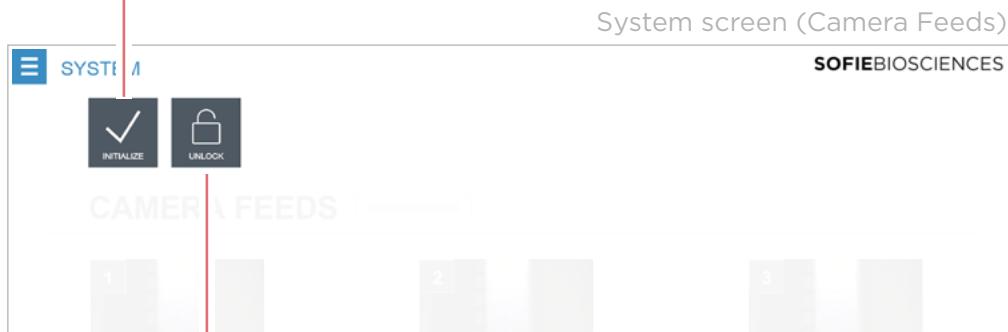
EDIT	CASSETTES	OPERATIONS	D-FAC run 7		
Status Message				Operation	Time
			Starting the Evaporate run	evaporate	1:41:24pm
			Turn off gas transfer	evaporate	1:41:24pm
			Setting gas transfer pressure to 0 psi	evaporate	1:41:24pm
			Gas transfer pressure reached 0.00 psi	evaporate	1:41:25pm
			Moving reactor to evaporation position	evaporate	1:41:26pm
			Lifting reactor	evaporate	1:41:30pm
			Moving reagent robot to reactor evaporation position	evaporate	1:41:33pm
			Lowering reagent robot gas transfer	evaporate	1:41:37pm
			Turning the vacuum pump system on	evaporate	1:41:39pm
			Turning on gas transfer	evaporate	1:41:39pm
			Setting gas transfer pressure to 0.00 psi	evaporate	1:41:40pm
			Gas transfer pressure reached 0.00 psi	evaporate	1:41:40pm
					

Section 7: System

7.1 Hardware controls

7.1.1 Initialize

This button triggers a routine which homes the reagent robot, lowers the reactors, clears the gas transfer pressure, and turns off heaters and other auxiliary devices.



7.1.2 Unlock

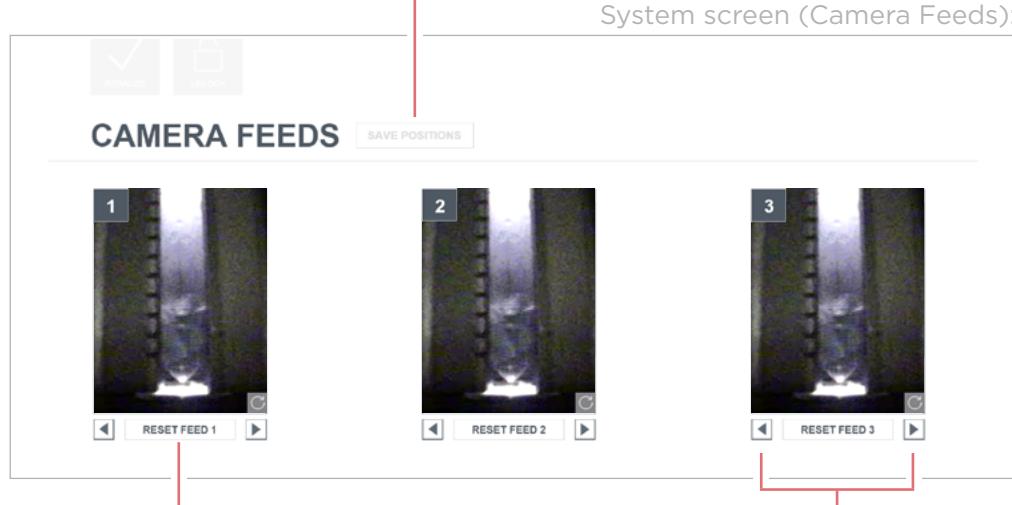
This button unlocks reagent and reactor robots, so they can be positioned by hand.

7.2 Camera Feeds

The camera feeds section is used to calibrate horizontal positioning of videos and to reset the feeds if a video crashes or gets stuck. It simultaneously displays feeds from all 3 cameras on the ELIXYS system.

7.2.1 Save positions

This button is grayed out unless changes have been made to the horizontal position of any of the video feeds. Clicking on “Save Positions” will save the position for all 3 videos. Saved changes to the positioning of video feeds on this screen will be represented throughout the software interface, including all running screens.



7.2.2 Reset feed button

Clicking the reset feed button will reset the video stream for the corresponding video. This feature should be used in case of a stuck video feed or video dropout.

7.2.3 Left/right adjustments

Tapping the left/right adjustment buttons will move the corresponding video feed left or right. These changes are not saved when navigating away from the system screen, until “Save Positions” is clicked.

7.3 Liquid Sensor

This is used to calibrate the liquid sensor used in the hplc transfer mode.

7.3.1 Detected value

Live analog value coming directly from liquid sensor. Should see a change when liquid is present.



7.3.2 Calibrate button

Clicking this button display prompts to follow for sensor calibration. Should initially be clicked when no fluid is present in tube.