



Evolution 4300 Dissolution Sampler

Operation Manual



LAB Online Exhibition



Distek Model Evolution 4300 Dissolution Sampler

Operation Manual

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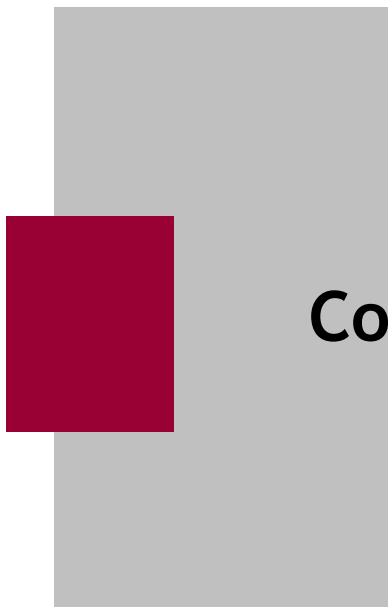
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Document Revision History

<i>Rev</i>	<i>Date</i>	<i>Notes</i>
A	5/06/2004	Initial Release of Evolution 4300. See CN #0431.
B	6/28/2005	Updated Appendix A: Spare Parts & Accessories. See CN #0509.
C	7/22/2014	<ul style="list-style-type: none">• Added WEEE statement.• Removed references to 2100B control.• Added statement that 5100 firmware revision 3.00 control is no longer supported.• Added setup configuration and operation for symphony 7100 and Model 2500.• Removed reference of “slave” to “remote” mode.• Corrected the labels for RS-485 and RS-232 in Fig. 2-6• New feature added for operator to enter the Lot and Batch number at the end of the test• Change maximum volume specification and sampling to 10mL.• Update Fig. 3-8 to reflect new values for Line 1 and 2.• Maximum number of reports was changed.• Added note regarding the importance of the “Cool Chip”.• Added notes to appendix printout reports for 2500, 6100, 6300 and 7100.• Added Appendix E for User Interface Flow Chart



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About this Manual

About This Manual includes information about what is contained in this manual and the conventions used.

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Purpose

This manual covers the installation, routine operation, maintenance and repair of your Distek Evolution 4300 Dissolution Sampler. It has information regarding the commands, menus, indicators and controls. Chapter 1 provides an overview of the Evolution 4300. Chapter 2 covers the steps to unpacking and installation of the system. Chapter 3 includes operation and programming information. Chapters 4 and 5 cover maintenance and troubleshooting. Please read Chapters 1, 2 and 3 before proceeding.

Audience

This manual is written for any person responsible for maintaining, operating or troubleshooting the Distek Evolution 4300 Dissolution Sampler.

Contents

This manual is divided into chapters. The pages of the manual are numbered providing easy navigation to assist in finding information quickly. The following list describes the material covered in each chapter:

Chapter 1 - Introduction	Provides a general overview and warnings about the instrument.
Chapter 2 - Installation	Describes how to unpack and properly install the unit.
Chapter 3 - Operation	Describes the functionalities of the system and how to run the unit.
Chapter 4 - Maintenance	Explains the steps necessary to maintain the unit.
Chapter 5 - Troubleshooting	Provides a troubleshooting chart and description of error messages to assist the user if a problem arises.
Appendix A - Spare Parts and Accessories	Provides a table of recommended and optional spare parts.
Appendix B - Pre-Installation Considerations: Electrical Power Supply	Recommendation information pertaining to electrical power supply.

Appendix C - CE Declaration of Conformity	CE Declaration of Conformity certificate.
Appendix D - Sample Printouts from Parallel Printer	Sample printouts for a parallel printer.
Appendix E - User Interface Flow Chart	Flow chart diagraming the various screens found on the user interface.

Prerequisites

This manual assumes that you understand the principles of dissolution testing.

Documentation

This manual contains important information regarding the safe operation, maintenance and repair of your Distek Evolution 4300 Dissolution Sampler.

Conventions



WARNING

Warning statements are used in this manual to prevent injury to personnel.

CAUTION

Caution statements are used to prevent damage to equipment.



High voltage warning.

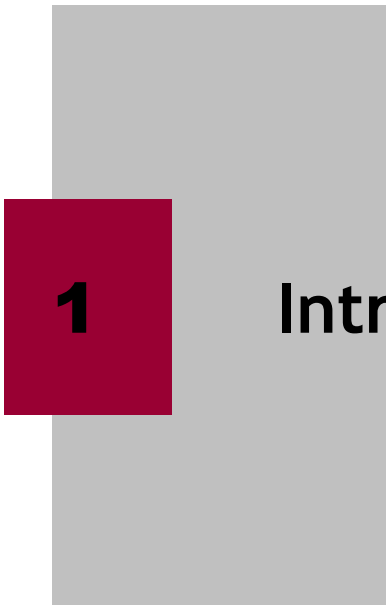


NOTES

Notes contain helpful information.

REQUIRED ACTION

Required Action is used where necessary to distinguish the action needed from the Warnings, Cautions and Notes.



1 Introduction

This chapter provides an overview of the Evolution 4300 and system specific specifications.

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Overview

The Distek Evolution 4300 Dissolution Sampler is a media sampling instrument capable of sampling into test tubes or directly injecting into HPLC vials. The system can be configured as a single or dual bath capable unit via one or two eight channel syringe pump(s).

This manual contains important information regarding the safe operation, maintenance and repair of your Evolution 4300.

Evolution 4300 Site Requirements

The site requirements to install the Evolution 4300 are as follows:

Table 1: Site Requirements

Requirements	Description
Power	See Table 2 below.
Bench Space	38"W x 24"D x 18"H (Dual Pump System)
Clearance	Sampler drive head must be free of obstructions

Specification

Table 2: System Specifications

System Collector	
Tube/Vial/Rack Capacity:	8 x 16 per bath, HPLC Vials or 10mL Test Tubes (13 x 100mm)
Maximum Number of Sample Sets:	32
Internal Method Storage	16 methods
Operator Privileges:	User and Manager Accounts
Interface Ports:	RS-232 and RS-485 (2)

Power Requirements:	100-240VAC 50/60 Hz 2.5A
Syringe Pump	
Volume:	0.1mL to 20ml, Programmable
Accuracy:	± 0.1ml
Flow Rate:	Up to 25ml/min.
Tubing Type:	1/16" OD Teflon Tubing
Interface Ports:	RS-232 and RS-485 (2)
Power Requirements:	100-120/200-240 VAC 50/60 Hz 3.0A
Dimensions	
System Collector:	16.5" W x 24" D x 16.5" H
Syringe Pump:	8.5" W x 13" D x 17" H
Weight	
Sample Collector:	43 lbs.
Syringe Pump:	29 lbs.

Physical Site Requirements

The dimensional requirements specified below are adequate for the installation of a dual pump Evolution 4300 system:

1. The minimum bench depth (front edge of bench to the back splash or wall) needed is 24" (0.61m). However, the minimum recommended bench depth is 25" (0.64m).
2. The minimum linear bench space requirement is 38" (0.97m). Distek recommends that at least 39" (.99m) be allocated to allow for adequate clearance to power off the syringe pumps.
3. There must be no obstruction (cabinet, shelf, or outlet) that intrudes into the minimum footprint of the unit up to a height of 18" (.46m) above the bench surface where the unit is to be installed.
4. The bench must be capable of sustaining the weight of the unit and all of its accessory parts without significant bending. Because the entire mass of the

collector and syringe pump(s) are transferred to the bench surface through four (4) circular feet on each unit, the bench surface should be strong enough to withstand the entire load of the unit.

5. Because of the limitation in travel of the leveling feet, the bench slope should be less than 0.75" (1.9cm) from front to back or from side to side over the unit's foot print.

Environmental Considerations

Ambient Laboratory Temperatures



Distek recommends that the laboratory temperature control system fans be kept on at all times.

Maximum Conditions:

1. The Evolution 4300 is designed to be installed and operated in laboratories where the maximum operating temperature does not exceed 25°C.
2. The maximum allowable ambient operation temperature is 30°C.

Minimum Conditions:

To assure controlled operation within specified tolerances, the Evolution 4300 is designed to be operated in laboratories where minimum operating temperatures do not drop below 15°C.

Variability or Short Term Fluctuations:

To assure controlled operation within specified tolerances, the system used to control the temperature of the laboratory where the Evolution 4300 is installed must be able to maintain the ambient air temperature within $\pm 2.5^\circ\text{C}$ of set point (worst case).

Ambient Laboratory Humidity

Maximum:

Water vapor and/or hydrogen chloride vapor, from dissolution media, can cause serious effects when condensed on electrical components and contacts. The lab's environmental controls should maintain humidity well below the dew point, to minimize corrosion and the risk of condensation.

Minimum:

It is important that the humidity level be kept at or above 30% relative humidity, to minimize the risk of damage to control circuits caused by static discharge.

Air Quality Considerations

Distek autosampling systems are designed to be operated in a lab environment that has no visible dust problem, and with organic solvent vapor levels as low as possible. Operation is not recommended in dusty lab environments, or in labs with significant chlorinated or reactive solvent vapor levels. These dust or vapor levels may have serious effects on system components. Absorption of vapors into dissolution media may bias test results. Some dissolution tests may require dissolution and drug release media prepared from USP quality water. Absorbed vapors may cause difficulty in complying with USP requirements.

Distek & WEEE Directive (Waste Electrical and Electronic Equipment)

Distek, Inc. is committed to protecting the environment and understands the importance of proper recycling. The “crossed out wheeled bin” symbol on the product or on its packaging indicates that this product must not be disposed of with domestic household waste. Instead, it is the user’s responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of electrical and electronic equipment waste. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your local distributor or Distek, Inc.



Operation Warnings and Notes



For your safety, the information in this manual must be followed to minimize the risk of fire or explosion, electrical shock, or to prevent property damage, personal injury or loss of life.

Use this equipment only for its intended purpose as described in this Operation Manual.



Never attempt to operate this instrument if it is damaged, malfunctioning, partially disassembled, or has missing or broken parts, including a damaged cord or plug.

Improper servicing or adjustment practice can cause equipment failure or serious physical injury. This equipment must be adjusted and serviced by qualified electrical maintenance personnel who are familiar with the construction and operation of the equipment and the hazards involved. Take diligent care during adjustment. All exposed points on the control circuit boards are electrically hot with respect to earth ground.



HIGH VOLTAGE IS EXPOSED WHEN THE REAR COVER IS OPENED ON THE COLLECTOR AND SYRINGE PUMP. Dangerous voltages exist on the circuit boards when powered. Disconnect AC power from the units while troubleshooting. Be alert. High voltage can cause serious or fatal injury.



External cables (excluding power cable) are limited to less than 3 meters length in order to maintain electromagnetic compliance.



Some forms of electromagnetic interference may cause unexpected operation. If this occurs, the unit will return to normal operation once the interference is removed.



2**Installation**

This chapter will describe the steps necessary to properly unpack and install the instrument.

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Unpacking

Please take a few moments when unpacking unit to check for all items indicated on packing list. Notify DISTEK or your shipper immediately with any discrepancies or damage to cartons or contents in transit.

The Evolution 4300 will arrive in 1 box containing the collector and either one or two pumps depending on the purchased configuration.



To avoid injury, two people should remove Evolution 4300 from the shipping carton.

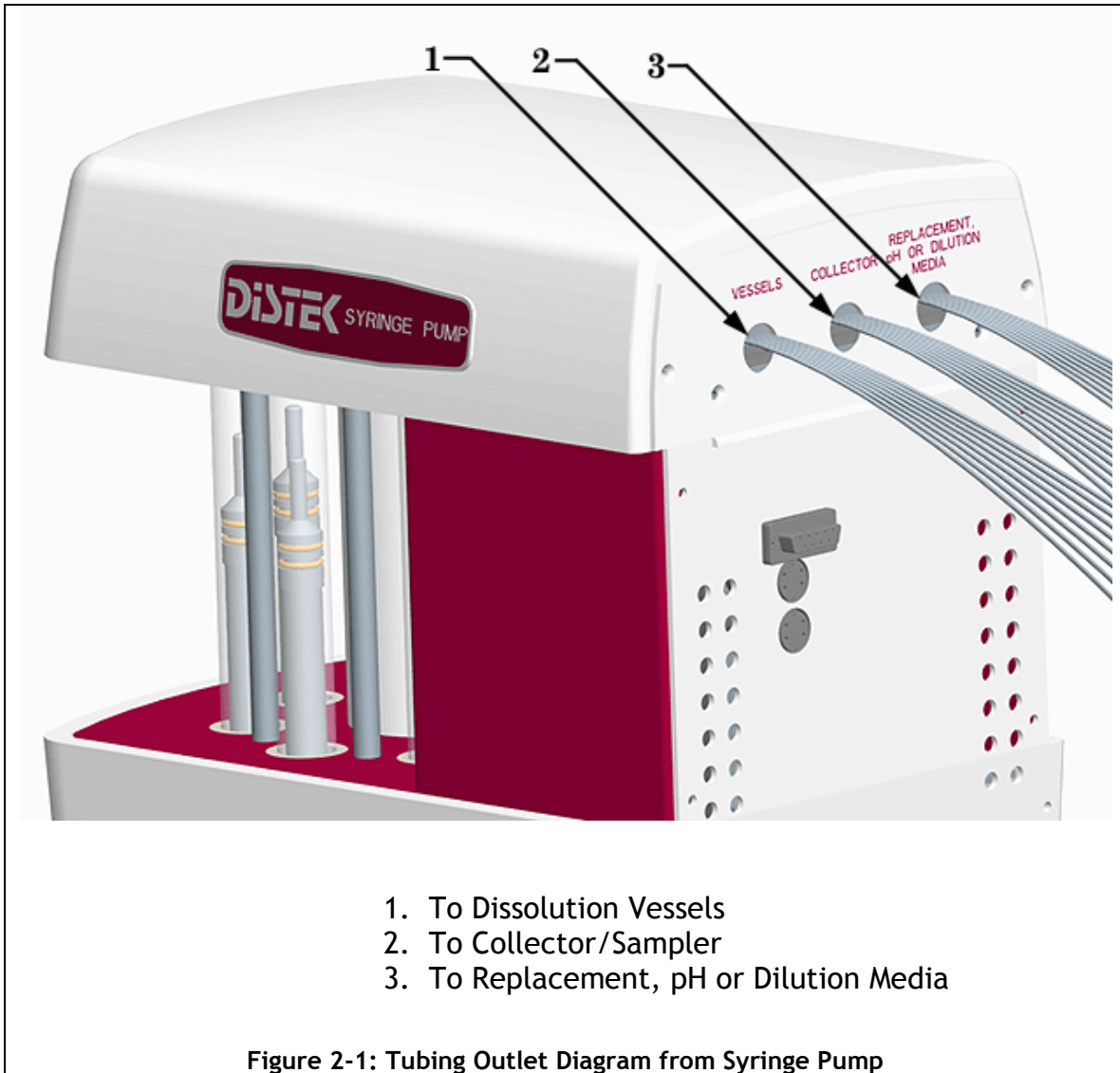
1. Cut through the tape at the top of carton. Open the four top flaps.
2. Carefully remove the packing inserts and lift the instrument from the shipping carton. See warning above.
3. If applicable, identify and remove all tie-wraps from the various locations on the unit.

Leveling: Evolution 4300

1. Trained personnel should lift the unit onto the bench and slide it into position.
2. Loosen locking nuts on front leveling feet of the system collector using the appropriate wrench.
3. Level the unit from front to back and side to side by adjusting the leveling feet under the instrument.
4. Tighten locking nuts on each foot.
5. Mark the location of leveling feet on bench to prevent changes in level due to moving the instrument.
6. Check the level after completing installation or after moving the Evolution 4300 to a new location. Verify the level using a carpenter's level. Check from front to back and side to side.

Installing the Fluid Connections

The syringe pump comes equipped with 3 sets of outlet tubes each containing 8 separate lines. The tubes go to the dissolution vessels, collector/sampler and replacement media. See Figure 2-1 for specific locations on the rear of the syringe pump. The end of each line contains a ferrule and fitting.



Follow these steps for installation:

1. Attach the sampling probes to the fittings at the end of each tubing line exiting the syringe pump (quantity 6 or 8) from the set labeled VESSELS. If the Syringe Filter Adapter was purchased see Installing the Syringe Filter Adapter (If Applicable) on page 2-4.
2. If media replacement will be used, place the replacement media lines into a reservoir of replacement media.
3. Connect the collector lines (green ¼-28 fittings) to the manifold in the rear of the collector/sampler (See Figure 2-2). The lines exiting the syringe pump will be labeled 1 through 8 and should be screwed into the corresponding number on the manifold in the rear of the sampler.

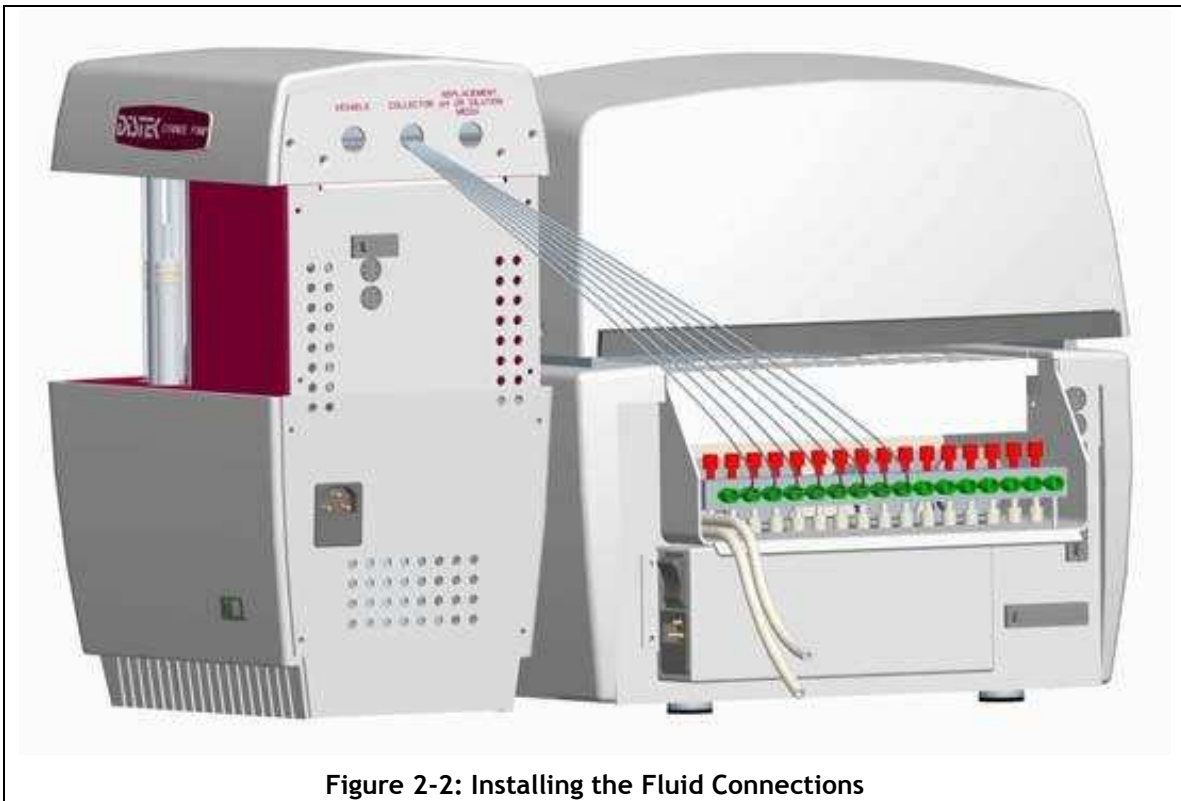


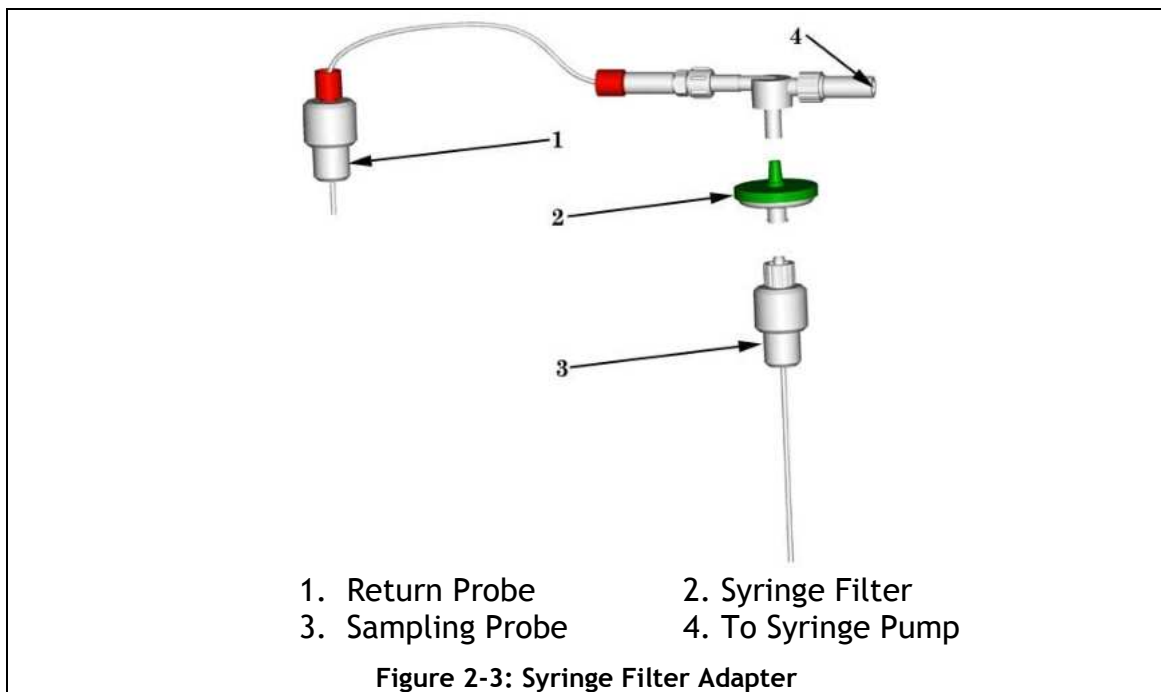
Figure 2-2: Installing the Fluid Connections

Installing the Syringe Filter Adapter (If Applicable)

One of the option accessories for the Evolution 4300 is a syringe filter adapter. The adapter enhances the unit's performance when a syringe filter will be utilized. For more information contact Distek and ask about Part Number 2800-0110.

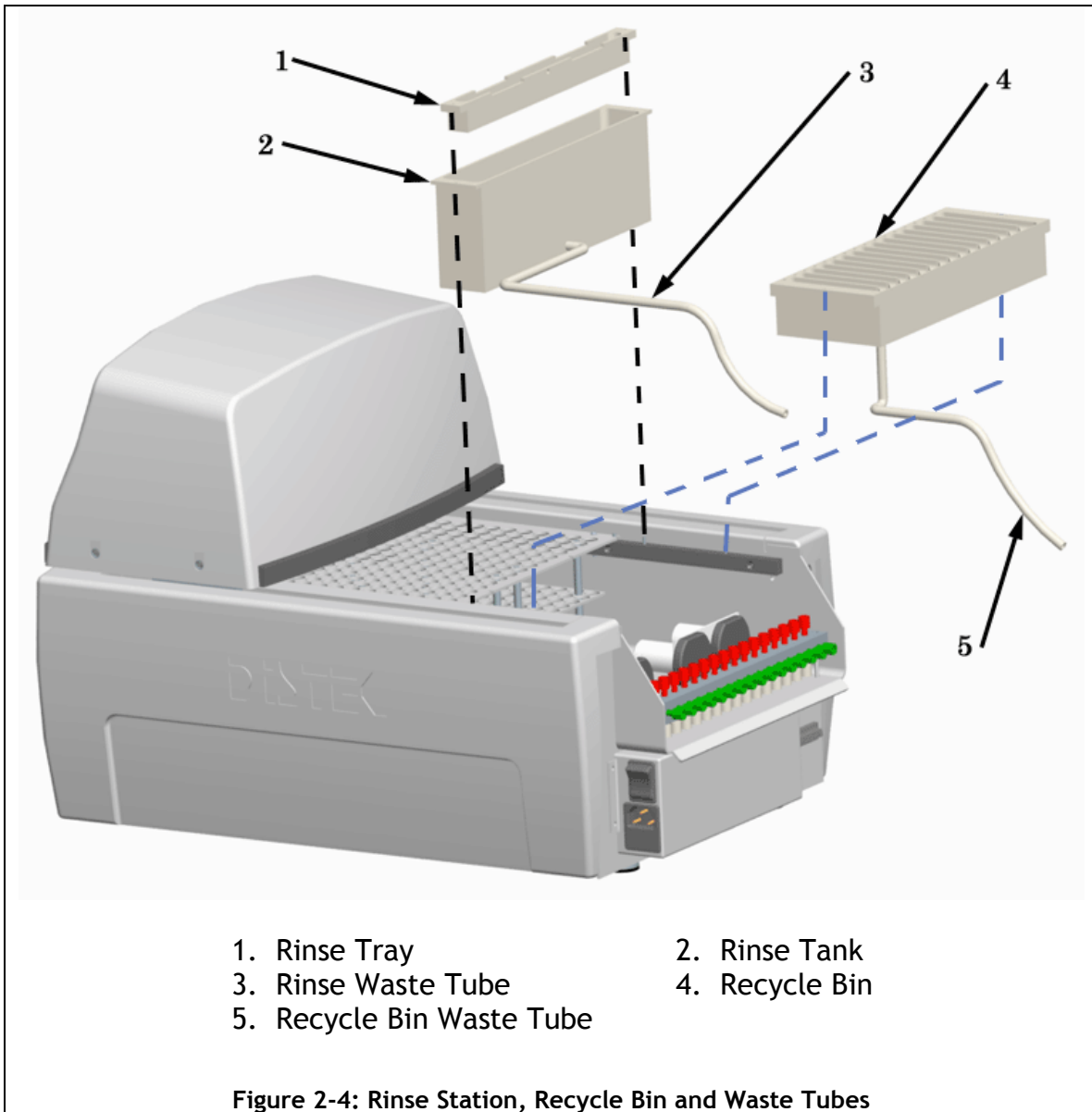
The following steps describe the installation:

1. Attach the Syringe Filter Adapter to the fittings at the end of each tubing line exiting the syringe pump (quantity 8) from the set labeled VESSELS. See item number 4 in Figure 2-3.
2. When ready for use, simply unattached the sampler probe and nut (attached to the top of the probe), screw the syringe filter (luer adapter fitting) on the nut and slip the other end into the valve. See Figure 2-3.



Routing the Waste Tubes

Exiting the rear of the collector are 2 fluid lines: the recycle bin/needle rinse station overflow and the needle rinse station pump media. The larger diameter clear tube (5/16" O.D.) is a waste line and should be placed into a waste container (See Figure 2-4). The waste tube empties the rinse tank and recycle bin by the use of gravity, therefore it is critical that the waste tube is positioned well below the collector!



Setting Up the Rinse Station

The Evolution 4300 is equipped with a needle rinse station. The rinse station is used to clean the outside sleeve of the collector needles between methods or sampling intervals. The majority of the rinse station is configured prior to shipment. The only step required to complete the rinse station setup is to place the section of peristaltic tubing (0.170" OD) into a bin containing media to be used for the needle rinse.

Installing the Rack Assembly

The Evolution 4300 comes configured with a split rack that can be configured for both test tubes and HPLC vials. Depending on what was purchased the unit will be equipped with two test tube racks or two vial racks, or a combination of the two. Please see Appendix A for information on ordering additional racks.

1. Slide the rack assembly into the waste tray located on the sampler/collector. The top plate of the racks contains a screw on each side. Be sure this screw engages the sensor block located on the sidewall of the sampler. See Figure 2-5.

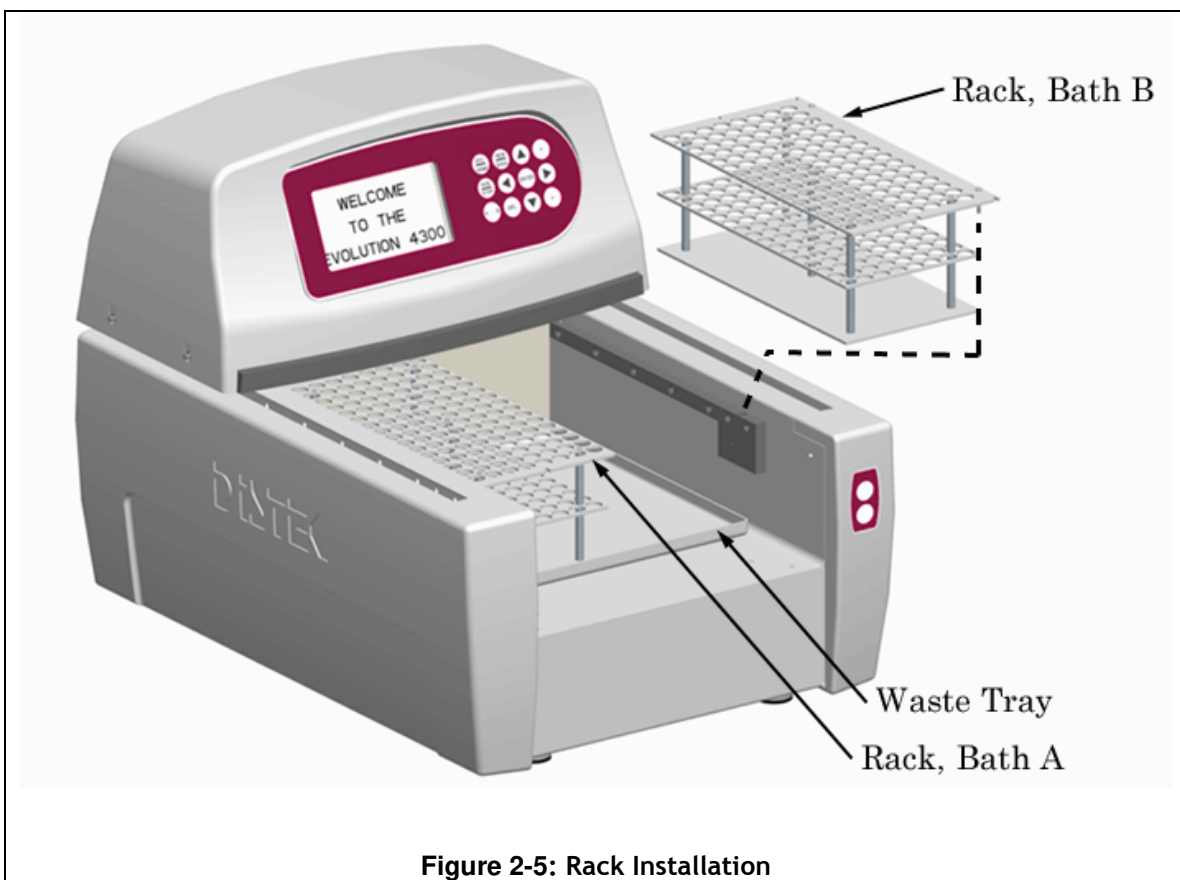


Figure 2-5: Rack Installation

Setting Up the Power and Communication Connections

1. Connect the power cord from the rear of the syringe pump to a power outlet. Repeat for additional pump in a dual bath configuration. See Appendix B for power requirements.
2. Connect the power cord from the rear of the sampler unit to a power outlet.
3. Connect the RS-485 cable from the rear of the syringe pump (either RS-485) to the rear of the sampler. The communications will work using either port (each unit contains two RS-485 connections). Repeat the connection for an additional pump in a dual bath configuration.
4. If the Evolution 4300 will be connected to a Distek dissolution instrument an additional RS-485 connection is necessary. Connect an open RS-485 port on the rear of the syringe pump to the RS-485 on the rear of the dissolution system or the TCS.



Setting Up Communication with Distek Model 2100C



- If the Evolution 4300 will be controlling two dissolution systems, all addresses must be unique.
- The firmware revision for a Model 2100C must be 2.30 or higher.
- The firmware revision for the TCS must be 1.30 or higher.

The Evolution 4300 is capable of controlling a Distek Model 2100C Dissolution system. Follow these steps to configure the connection:

1. The Model 2100C must be configured to run in Remote mode in order to accept commands from the Evolution 4300. When the bath is powered on the LED display should indicate “L 16” where L designates the unit is set for Remote mode. If an A is displayed the unit is set to Master mode and must be changed. The DIP switch settings control this option and are located on the Motor Control Module (MCM) on the Model 2100. The following steps can be used to change the unit to Remote mode:
 - a. Disconnect the power cord and all other cords from the rear of the Motor Control Module (MCM).
 - b. Carefully support and remove the MCM by unscrewing the two knobs and two Phillips flat head screws that attach it to the 2100C frame.
 - c. Remove the four screws from the bottom panel of the MCM.
 - d. Remove four more screws at the rear of the MCM (at four corners of back panel).
 - e. Check the DIP switch settings and change switch 6 to enable Remote mode. See chart below.

Model 2100 DIP Switch Functions

	1	2	3	4	5	6	7	8
ON	+1	+2	+4	+8	+16*	MASTER*	24 HR TIME	ZYMARK
OFF	ADDRESS					Remote*	AM/PM	

* Denotes default setting.

- f. Put the top cover back on and replace the four screws on the rear panel.
- g. Replace the four screws at the bottom of the MCM.
- h. Re-install the MCM on the frame.
- i. Connect all external cables to connectors on the rear of the unit. Connect the power cord. Ensure all cables are firmly in place, including the black four-pin DIN cable for RS-485.
- j. Turn on unit and check for proper functioning. Upon powering on the unit it should now display “L XX”.

2. Connect an RS-485 from the rear of the Syringe Pump to an open RS-485 on the Model 2100.
3. The Evolution 4300 now needs to be configured with the address of the 2100 and the TCS. These addresses can be obtained by turning the power off and then on. The unit's display will flash "L XX" where the XX represents the unit's address.
4. **The TCS address must be 27 or greater** (not required for TCS firmware 1.4 or higher). Follow the steps below to reset the TCS address:
 - a. Connect the RS-485 port of the 2100 to the TCS using the RS-485 cable.
 - b. Hook up a PC which has a terminal program (such as HyperTerminal) to the RS-232 port of the 2100.
 - c. Turn on the PC, the 2100C and then the TCS.
 - d. Open the PC's terminal program.
 - e. The factory default address of the TCS is 10.
 - f. Type the following command, including brackets and spaces: [10 Z:N aa] where 10 is the current address and aa is the new address of the TCS. You should get an exclamation point [!] response from the TCS.
 - g. Save the new address in the TCS memory by typing [aa M] where aa is the new address. You should get an exclamation point [!] response from the TCS.
5. On the Evolution 4300's Main screen highlight ADMIN and press **ENTER**.
6. From the Admin screen highlight CONFIG and press **ENTER** (see Figure 3-7).
7. Highlight the bath type field, using the + and - keys change the value to 2100C.
8. Highlight the Bath A or Bath B field, using the + and - keys change the value to the address of the 2100 determined in step 5.
9. Highlight the TCS field, using the + and - keys change the value to the address of the TCS determined in step 5.

Setting Up Communication with Distek Premiere 5100



- If the Evolution 4300 will be controlling two dissolution systems, all addresses must be unique.
 - The Premiere 5100 can only be controlled with firmware earlier than Version 3.00.
-

The Evolution 4300 is capable of controlling a Distek Premiere 5100 Dissolution system. Follow these steps to configure the connection:

1. Connect a **reverse** RS-485 cable from the rear of the Syringe Pump to an open RS-485 on side of the 5100 (any available port will work). Contact Distek to obtain the necessary reverse RS-485 cable.
2. Determine the address of the 5100 unit through a PC HyperTerminal connection or by viewing the DIP switch position located on the motor control board for the 5100:
 - a. HyperTerminal: Use a terminal program and send the command [SYST:ADDR?] from the PC. The unit will respond [XX], where XX represents the unit address between 00 and 31.
 - b. DIP Switch Position: The board containing the DIP switches is located behind the hinged panel at the lower rear of the unit. See chart below.



Turn off unit and disconnect power before opening panel. Improper servicing or adjustment can cause equipment failure or serious physical injury. All exposed points on the control circuit board are electrically hot with respect to earth ground.

Premiere 5100 DIP Switch Functions

	1	2	3	4	5	6	7	8
ON	+1	+2	+4	+8	+16*	BEEP ON*		
OFF	ADDRESS					BEEP OFF		

* Denotes default setting.

3. On the Evolution 4300's Main screen highlight ADMIN and press **ENTER**.
4. From the Admin screen highlight CONFIG and press **ENTER** (see Figure 3-7).
5. Highlight the bath type field, using the + and - keys change the value to 5100.

6. Highlight the Bath A or Bath B field, using the + and - keys change the value to the address of the 5100 determined in step 2.

Setting Up Communication with Distek Evolution 6100/6300 Dissolution System



- If the Evolution 4300 will be controlling two dissolution systems, all addresses must be unique.
 - The firmware revision for the 6100/6300 must be 2.10 or higher.
-

The Evolution 4300 is capable of controlling a Distek Evolution 6100 and/or 6300 Dissolution system. Follow these steps to configure the connection:

1. Connect an RS-485 cable from the rear of the Syringe Pump to an open RS-485 on the side of the Evolution Dissolution System (any available port). Contact Distek to obtain an RS-485 cable.
2. Determine the address of the dissolution unit and TCS (6300 only) through the dissolution unit's interface. From the main screen select 'SYSTEM CONFIG', then 'SYSTEM SETUP'. From the system setup screen the 'Address' is the main unit's address and 'TCS' (6300 only) is the TCS's address.
3. On the Evolution 4300's Main screen highlight ADMIN and press **ENTER**.
4. From the Admin screen highlight CONFIG and press **ENTER** (see Figure 3-7).
5. Highlight the bath type field, using the + and - keys change the value to 6100 or 6300.
6. Highlight the Bath A or Bath B field, using the + and - keys change the value to the address of the 6100 or 6300 determined in step 2.
7. For a 6300 only, highlight the TCS field, using the + and - keys change the value to the address of the TCS determined in step 2.

Setting Up Communication with Model 2500 and symphony 7100 Dissolution Systems



- EVO 4300 firmware must have Rev. 3.02 or later.
- If the Evolution 4300 will be controlling two dissolution systems, all addresses must be unique. Refer to the dissolution baths operation manual if address needs to be changed.
- If configuring two dissolution baths, typically instrument address for Bath A will be 03 and Bath B will be 04.

The Evolution 4300 is capable of controlling a Distek Model 2500 and/or symphony 7100 Dissolution system. Follow these steps to configure the connection:

1. Connect the dissolution bath RS-485 I/O port (using Distek cable part number 2700-0162A) in to the second RS-485 port of the syringe pump.
2. Log in to the 4300 as part of the Manager group.
3. On the main menu, select “ADMIN” then “CONFIG”. The “CONFIGURATION SETTINGS” screen will be displayed.
4. Scroll thru the screen so you can change the address for BATH A to 03. Do the same if you have a second bath (BATH B set to 04).
5. Change the bath TYPE to reflect the dissolution bath model (2500 or 7100) that is connected to the 4300.

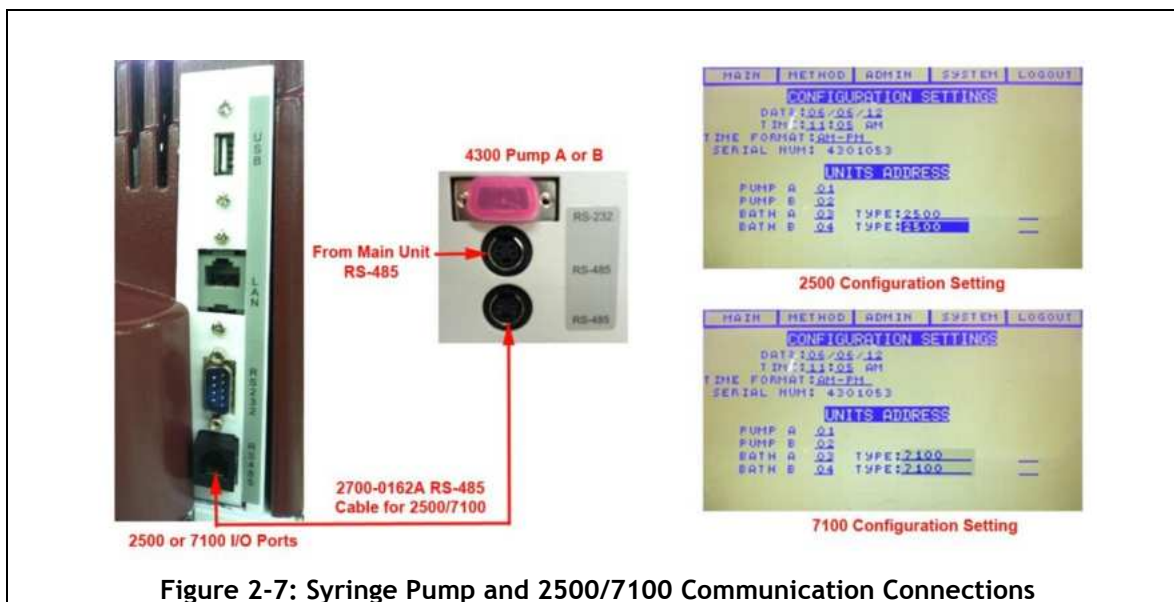


Figure 2-7: Syringe Pump and 2500/7100 Communication Connections

Configuring the Syringe Pump Address (Single Bath System)

If the Evolution 4300 is configured as a single bath system the address of Pump B must be set to N/A. Setting the address to N/A will disable certain functions that can only be used in a dual bath system.

1. Turn off Pump A. **This step is critical!**
2. From the Main screen highlight ADMIN and press **ENTER**.
3. From the Admin screen highlight CONFIG and press **ENTER** (see Figure 3-7).
4. Highlight Pump B's address field, using the + and - keys change the address to N/A and press **ENTER**.
5. A warning message will appear: "ABOUT TO CHANGE ADDRESS OF PUMP B. ACCEPT NEW ADDRESS XX?" where XX represents the new address. Select YES.
6. Press the **ESC/HOME** button twice. The first click will return to the Main screen and the second click will home the system.
7. Turn Pump A on.
8. From the MAIN screen press the ESC/HOME button to home the system.

Configuring the Syringe Pump Address (Dual Bath System)

Upon arrival from the factory the syringe pumps should be configured with the correct address to properly communicate with the collector. In the event that communication to the pump is not working this procedure should be followed:

1. Turn off the Pump B. **This step is critical!** This procedure will only work for one pump and will be repeated for the additional pump.
2. From the Main screen highlight ADMIN and press **ENTER**.
3. From the Admin screen highlight CONFIG and press **ENTER** (see Figure 3-7).
4. Highlight Pump A's address field, using the + and - keys change the address to XX where XX represents the desired address (do not use 00) and press **ENTER**.
5. A warning message will appear: "ABOUT TO CHANGE ADDRESS OF PUMP A. ACCEPT NEW ADDRESS XX?" where XX represents the new address. Select YES.
6. Press the **ESC/HOME** button twice. The first click will return to the Main screen and the second click will home the system.
7. On the Main screen run a FLUSH action (See Using Quick Action Commands on page 3-12). The purpose of this action is to verify the communication. Once the pump is responding (visually inspect the movement of syringes) this action can be aborted.

8. Turn Pump A off. **This step is critical!**
9. Turn Pump B on.
10. Now follow steps 2 through 7 substituting the desired pump address in step 4 in Pump B's address field. Be sure to use an address other than the one used for Pump A.
11. Turn on Pump A.
12. From the MAIN screen press the ESC/HOME button to home the system.



The pump address should never be permanently set to 00.

Changing the Syringe Pump Address

This procedure should be used to change the pump address when pump communications are already configured and working.

1. In a dual bath configuration, turn one of the pumps off. **This step is critical!** This procedure will only work for one pump and will be repeated for the additional pump.
2. From the Main screen highlight ADMIN and press **ENTER**.
3. From the Admin screen highlight CONFIG and press **ENTER** (see Figure 3-7).
4. Highlight the pump's address field, using the + and - keys change the address to the new value and press **ENTER**.
5. A warning message will appear: "ABOUT TO CHANGE ADDRESS OF PUMP B. ACCEPT NEW ADDRESS XX?" where XX represents the new address. Select YES.
6. On the Main screen run a FLUSH action (See Using Quick Action Commands on page 3-12). The purpose of this action is to verify the communication. Once the pump is responding (visually inspect the movement of syringes) this action can be aborted.
7. Turn on the other pump.
8. From the MAIN screen press the ESC/HOME button to home the system.



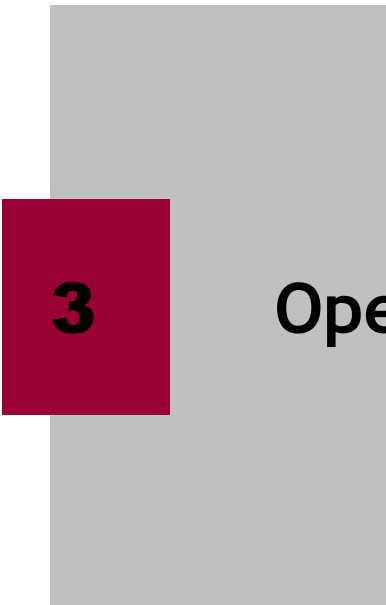
The pump address should never be permanently set to 00.

Logging on to the System for the First Time (Factory Setting)

1. Turn on the power for the sampler and the pump(s). The system will go through a self-test. If all functions are satisfactory, the Login screen will appear.
2. Highlight the “Distek” user in the user list and press **ENTER** on the keypad.
3. The virtual keyboard will be displayed. Enter the password DISTEK using the keyboard. Use the **arrow** keys to navigate through the keyboard and press **ENTER** to accept the alphanumeric value.
4. Once logged in to the system, use the **arrow** keys highlight the ADMIN menu on the top menu bar and press **ENTER** (See Figure 3-6).
5. Create a new manager. Press the **arrow** key until the “NEW USER” field is active, then press **ENTER**.
6. The virtual keyboard screen will be displayed. Enter the new username using the keyboard (maximum of 8 characters).
7. Once the username is entered navigate to the OK button and press **ENTER**.
8. The “GROUP” field will now be active. Use the + to toggle the setting to “MANAGER”.
9. Press the **ENTER** button. The new user will now be added to the user list. A default password will be set. This password will be the same as the username.
10. To change the default password highlight the PASSWORD field and press **ENTER** to activate the virtual keypad.
11. Enter the password using the keyboard (maximum of 8 characters).
12. Once the password is entered navigate to the OK button and press **ENTER**.
13. Highlight the Logout menu and press **ENTER**.
14. Log on to the system using the new username and password.
15. Highlight the System menu and press **ENTER**.
16. Highlight the Distek user from the list and press the **DEL** key from the keypad.

Installation Checkout

Your instrument has been tested thoroughly prior to shipment. To detect any problems caused by shipping and handling, Distek recommends a careful check of all crucial operating parameters after completing the installation of the sampling system. This check should include, at a minimum, performing a system wash as described in the “Using Quick Action Commands” section on page 3-12 to ensure all fittings are properly sealed.



3 Operation

This chapter will describe the user interface screens and all the parameters that can be configured in the system. It will also provide step-by-step instructions to perform many of the common tasks.

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Control Keypad

The control keypad is shown below:

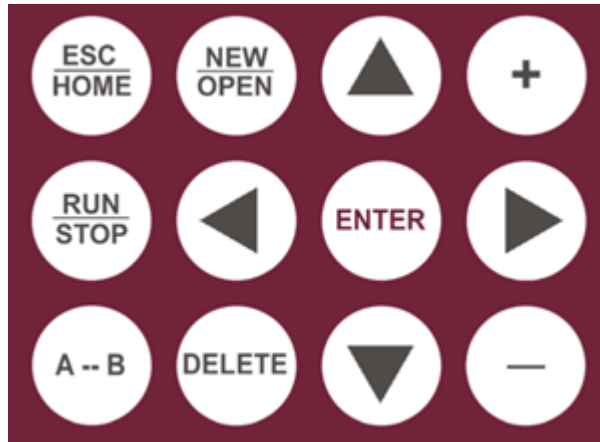


Figure 3-1: Evolution 4300 Keypad

The functions of the buttons are as follows:

ESC/HOME Button

The *ESC/HOME* button will allow the operator to navigate back to the higher level menu screen within the interface. If this button is selected while in the main screen with the system IDLE, both the sampler and syringe pumps will reset to their home positions.

RUN/STOP Button

The *RUN/STOP* button is used to start a method running while in the main screen. If a method is already running, this button can be used to abort a method.

A↔B Button

The *A↔B* is used to toggle between Bath A and Bath B when selecting a method to run or configuring a bath and system parameters.

NEW/OPEN Button

The *NEW/OPEN* button allows opening of a selected (highlighted) method while in the Method screen, or will create a new method (operator must have manager privileges) if no method is highlighted in the list. This button also will insert a new step while modifying or creating a new method.

Arrow Keys

The **ARROW** keys are used to navigate through the menus and displays.

DEL Button

The **DEL** button is used to delete a method from the Method screen, remove a user from the System screen or delete a step from the New or Open screen within the method section.

ENTER Button

The **ENTER** button locks in menu selections and settings made with the ARROW, + and - keys.

+ Button

The + button will toggle through available options depending on what field is selected. For example, when modifying the sample volume in a saved method these buttons will scroll through numeric values. This button is also used to scroll through “A”, “B” and “A B” when setting a method to run via the Method screen.

- Button

The - button works in conjunction with the + button to scroll in the opposite direction.

Display Screens

The following will appear on the front LCD when turning the unit on:



Figure 3-2: Welcome Screen

The firmware revision is displayed along with a message: “SELF TEST. PLEASE WAIT...” The system will go through an automatic initialization process and then proceed to the login screen (see Login Procedures on page 3-6).

After logging into the system, the Main menu screen will appear:



Figure 3-3: Main Screen

The menu bar at the top of the screen contains 5 buttons used to navigate through the system. This format is consistent throughout the interface.

System Administration

System administration incorporates three screens that can be found under the ADMIN, CONFIG and SYSTEM menu picks. The table below described the basic functions within each section.

ADMIN	The ADMIN screen allows access to USER/MANAGER administration. See Administration Settings on page 3-6.
CONFIG	The CONFIG screen controls setting up the data, time serial number (viewing only) and the appropriate unit addresses (pumps and dissolution baths). See Configuration Settings on page 3-9.
SYSTEM	The SYSTEM screen contains system parameters such as line 1, line 2, additional recycle and auto action operations. See System Parameter Settings on page 3-10.

Administration Settings

The Evolution 4300 is equipped with login access to allow for USER and MANAGER group settings. A USER can view and select a method to run on a particular bath. The MANAGER is able to create/modify methods, change configuration settings, modify parameters and has user administration control.

Login Procedures

After the system performs a self test or after an operator logs out, the Login screen will be displayed:



Figure 3-4: Login Screen

1. Move through the user list using the *arrow* buttons on the keypad.
2. Once the desired user is selected press the **ENTER** button.
3. The virtual keyboard screen will be displayed (see Figure 3-5). Enter the password using the keyboard. Use the *arrow* keys to navigate through the keyboard and press **ENTER** to select an alphanumeric value.
4. Once the password is entered navigate to the OK button and press **ENTER**.
5. If the password is correct the unit will produce an audible beep and proceed to the main menu (see Figure 3-3).



Figure 3-5: Virtual Keyboard

Creating a New Account



- The operator logged in to the system must be part of the Manager group to create a new user.
- A maximum of 16 accounts can be created.

1. Highlight the ADMIN menu from the Main screen and press **ENTER** (see Figure 3-3).
2. Press **NEW/OPEN** from the keypad or press the **arrow** button until the “NEW USER” field is active, then press **ENTER**.
3. The virtual keyboard screen will be displayed. Enter the username using the keyboard. Use the **arrow** keys to navigate through the keyboard and press **ENTER** to select an alphanumeric value (maximum of 8 characters).
4. Once the username is entered navigate to the OK button and press **ENTER**.
5. The “GROUP” field will now be active. Set the desired group privilege for the user by using the + and - buttons to toggle between “USER” and “MANAGER”.
6. Press the **ENTER** button. The new user will now be added to the user list. A default password will be set. This password will be the same as the username.
7. To change the default password highlight the PASSWORD field and press **ENTER** to activate the virtual keypad.
8. Enter the password using the keyboard. Use the **arrow** keys to navigate through the keyboard and press **ENTER** to select an alphanumeric value (maximum of 8 characters).
9. Once the password is entered navigate to the OK button and press **ENTER**.

MAIN	METHOD	CONFIG	SYSTEM	LOGOUT
CURRENT USER: MANAGER1		GROUP: MANAGER		
NEW USER: _____		PASSWORD: _____		
GROUP: MANAGER				
ID	USERS	GROUP		
00	MANAGER1	MANAGER		
01	USER1	USER		
		NEW: NEW USER DEL: DELETE ESC: QUIT		

Figure 3-6: Admin Screen

Changing the Privileges of an Existing Account



The operator logged in to the system must be part of the Manager group to modify an existing account.

1. Highlight the user from the user list and press the **ENTER** button.
2. Using the **arrow** keys scroll through the fields until the “GROUP” field is highlighted. Select USER or MANAGER using the + or - buttons.
3. Press the **ENTER** button to accept the modification.

Changing a Password



The operator logged in to the system must be part of the Manager group to change a password.

1. Highlight a user from the user list and press **ENTER**.
2. The PASSWORD field will now be active. Press **ENTER**.
3. The virtual keyboard screen will be displayed. Enter the new password using the keyboard. Use the **arrow** keys to navigate through the keyboard and press **ENTER** to select an alphanumeric value (maximum of 8 characters).
4. Once the new password is entered navigate to the OK button and press **ENTER**.

Deleting an Account



The operator logged in to the system must be part of the Manager group to delete an account.

1. Highlight a user from the user list.
2. Press the **DEL** key from the keypad.
3. The system will display a message box: “Are you sure you want to delete this user?” Select YES to confirm the deletion.

Configuration Settings

1. Highlight the ADMIN menu and press **ENTER**.
2. Highlight the CONFIG menu and press **ENTER**.
3. Modify the settings to the appropriate value. See below for a description of settings.

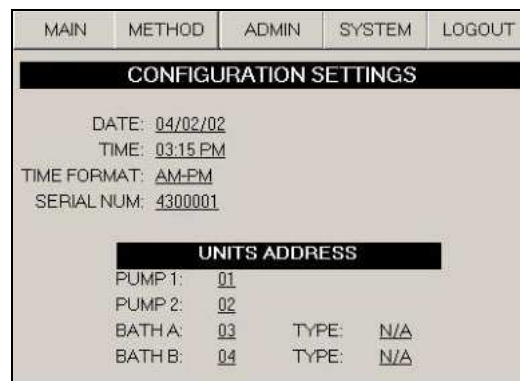


Figure 3-7: Configuration Settings Screen

Definitions of Configuration Settings:

- **DATE:** Sets the current date. This will be stored with previously run methods.
- **TIME:** Sets the current time. This will be stored with previously run methods.
- **TIME FORMAT:** Use the + and - to toggle between AM-PM and 24 HRS.
- **MEDIA REPLACE:** This turns media replacement ON or OFF. Media replacement replenishes lost media with fresh media. The valid settings are ON or OFF.
- **PUMP 1:** Sets the address of Pump 1 (see Configuring the Syringe Pump Address (Dual Bath System) on page 2-12 for more information).

- PUMP 2: Sets the address of Pump 2 (see Configuring the Syringe Pump Address (Dual Bath System) on page 2-12 for more information).
- BATH A: Sets the address of Bath 1 (see Setting Up the Power and Communication Connections on page 2-8 for more information).
- BATH B: Sets the address of Bath 2 (see Setting Up the Power and Communication Connections on page 2-8 for more information).
- TYPE: The Evolution 4300 is equipped to control a Distek Model 2100C or a Premiere 5100 Dissolution Test System. This field will set the type of bath that is connected to the Evolution 4300. Select N/A if the Evolution 4300 will be running independently of a dissolution bath (not controlling the bath parameters).

System Parameter Settings

1. Highlight the ADMIN menu and press **ENTER**.
2. Highlight the SYSTEM menu and press **ENTER**.
3. Modify the settings to the appropriate value. See below for a description of settings.

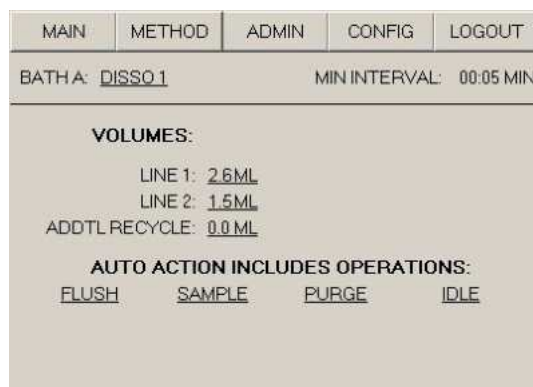


Figure 3-8: System Settings

Definitions of System Settings:

Volumes

- Line 1: Sets the volume of one tubing line between the sampler and syringe pump.
- Line 2: Sets the volume of one tubing line between the syringe pump and the bath vessels.
- Addtl Recycle: Volume is used to adjust the calculated purge volume.
(real purge volume = calculated purge volume + purge adj. volume)

Auto Actions

- Flush:** Flushes the lines with sample media. This action occurs immediately before each sample in order to minimize contamination from previous samples.
- Sample:** The sample is removed from the vessel and dispensed into the tube or vial.
- Purge:** Empties the tubing and pumps, returning the media to each test vessel. If media recycle is on, the purge action will return flush and offset medium to each test vessel from the recycle bin.
- Idle:** No action occurs.
- Rinse:** Rinses needles with fresh water from the rinse station.
- Wet Filter:** Pulls fresh medium through the filters to initially flush and wet the filters. The media is then discarded through the replacement lines.

Printing a Report



- A printer must be connected to the Evolution 4300 via the parallel port in order to produce a printout.
- A maximum of 12 reports can be stored.

1. Highlight the REPORT menu and press **ENTER**.
2. The report screen (see Figure 3-9) will display the stored tests that have been run on the instrument (maximum of 12 stored tests). Highlight the desired method from the list using the **arrows** keys and press **ENTER**.
3. Highlight the PRINT menu and press **ENTER**.

MAIN	METHOD	PRINT	ADMIN	LOGOUT
PRESS ENTER TO SELECT A REPORT				
USER	METHOD	BATH	DATE	TIME
MANAGER1	SAL ACID	A	03/14/02	04:15:12 PM
USER1	PREDNISONE	B	03/14/02	04:15:12 PM
USER1	PREDNISONE	B	03/10/02	02:25:30 PM

Figure 3-9: Report Screen

Using Quick Action Commands

The Evolution 4300 is capable of running one-time quick action commands. These actions are accessed from the Main screen (See Figure 3-3). Simply highlight the ACTION field, use the + and - buttons to toggle through the available options and press **ENTER** to run a one-time action. The following sections describe in detail the behavior of the instrument when an action is run.

Flush Action

This action will remove media from the vessels and distribute it out through the collector needles and into the recycle bin. The volume used is based on the FLUSH volume set on the parameters screen (See Figure 3-12). The media will remain in the recycle bin.

Sample Action

A sample action will remove the default volume from the sampling probes and dispense the volume into the desired row. The rows and volume can be set on the Main screen by highlighting the field and using the + and - buttons.

Purge Action

A purge will empty all fluid lines and syringe cylinders, returning the media to the vessels. If Media Recycling is ON, the media in the recycle bin will be emptied and returned to the vessels. The volume used in a purge cycle is determined by the system (it keeps track of the amount of media in the recycle bin).

Rinse Action

This action will automatically turn on the wash pump for a predetermined time in order to fill the wash station with fresh media. After this time has expired, the carriage will position the needles above the rinse station and cycle the needle in and out of the rinse bin, cleaning the outside of the needles.

Wet Filter Action

This action pulls fresh medium through the filters to initially flush and wet the filters. The media is then discarded through the replacement lines.

Empty Action

An empty action will empty all fluid lines, pump cylinders and recycle bin, returning the media to the vessels. This action differs from a PURGE action because a set volume is utilized (about 20mL).

System Wash Action

This action uses fresh medium to wash the pump, all lines, inside of needles and the recycle bin. The wash volume is set at 20mL and the media is discarded via the replacement lines.

AUTO Action

An Auto action will run a sequence of actions that are set up via the parameters screen in the section entitled: "AUTO ACTION INCLUDES OPERATIONS:" (See Figure 3-12). The row and volume can be set on the Main screen by highlighting the row field and using the + and - buttons.

Working with Methods

Setting a Method to Run

1. Select the **METHOD** menu from the **Main** screen.
2. Using the up or down **arrow** key highlight a method from the method list (see Figure 3-10).
3. Using the right **arrow** key highlight the **RUN** column field for that method.
4. Press the + or - key to toggle between the available options:
 - A
 - B
 - A B
 - OFF
5. Once the desired value is set press the **ENTER** key.
6. The method name at the top of the screen located under the bath name should now reflect the change.

MAIN	NEW	OPEN	PRINT	REPORT
BATH A: DISSO 1		BATH B: DISSO 2		
PREDNISONE		SAL ACID		
#	METHOD	DATE	RUN	
00	PRENISONE	03/14/02	A:	
01	SAL ACID	03/14/02	B:	
02	METHOD 1	03/14/02	OFF	
03	METHOD 2	03/14/02	OFF	

Figure 3-10: Method Screen

Programming a New Method



- The operator logged into the system must be part of the Manager group to create a new method.
 - A maximum of 16 methods can be created.
-

1. Select NEW from the method screen or if no method is highlighted in the method list press the **NEW/OPEN** button.
2. Enter the method name using the virtual keyboard. Use the **arrow** keys to navigate through the keyboard and press **ENTER** to select an alphanumeric value (maximum of 16 characters).
3. Once the method name is entered navigate to the OK button and press **ENTER**.
4. Using the **arrow** keys highlight the RACK field. Press the + or - button to toggle between TUBE and VIAL.
5. Using the **arrow** keys highlight the REPORT field. Press the + or - button to toggle between ON and OFF.
6. Using the **arrow** keys highlight the SAMPLE VOL field. Press the + or - button to set the sample volume. Press **ENTER**.
7. Using the **arrow** keys highlight the STEPS field. Press the + or - button to set the desired number of steps. Press **ENTER**.
8. To append a step to the list (add a step to the end of the list): Make sure the active (highlighted) field is not in the sample time point list. Press **NEW/OPEN** button from the keypad. (If the highlighted field is in the method list, the **NEW/OPEN** button will insert a step).
9. To insert a step: Highlight a row in the sample time point list and press the **NEW/OPEN** button. This will insert a step below the highlighted row.
10. To delete a step: Highlight a row in the sample time point list and press the **DEL** key.
11. The time, row #, action and setup fields can be modified by highlighting the field and selecting the + or - button to toggle through the available options. Customize the sampling list as needed.
12. Use the **arrow** key to highlight the SAVE menu and press **ENTER**.
13. Highlight the PARA menu and press **ENTER**.
14. Configure to desired parameter setting. See Setting up Method Parameters on page 3-15 for more information on parameters.

MAIN	METHOD	SAVE	PARA	BATH
METHOD: PREDNISONE		FOR A: DISSO1		
RACK: VIAL		STEPS: 02		
REPORT: ON		SAMPLE VOL: 00.5 ML		
NEW: NEW STEP		DEL: DELETE STEP		
STEP	TIME	ROW#	ACTION	VOL (ML)
01	0000.05	15	AUTO	00.5
02	0000.05	16	AUTO	00.5

Figure 3-11: New Method Screen

A method has the following settings:

- **RACK:** This configures the system to collect in a test tube or vial. The valid options are TUBE or VIAL.
- **REPORT:** If this field is set to ON, a report file will be stored. This allows the operator to print results of previously run methods. If set to OFF, a report will not be stored. The valid options are ON or OFF. See Printing a Report on 3-11 for more information.
- **STEPS:** This sets the number of steps (sampling time points) in a method.
- **SAMPLE VOL:** This sets the default sample volume for new steps added to the step list. This value can be manually changed in the step list.

Setting up Method Parameters



All method parameters described in this section are tied to the method. This is only valid for Firmware Rev. 2.0 or higher. For Firmware 1.6 and lower the parameters are tied to the pumps.

The parameter screen (see Figure 3-12) allows the operator to set up parameters for pump flow rate, volumes and media volume options.

Definitions of Parameter settings:

Pump Flow Rates

Collection: Flow rate at which the sample volume will be delivered to the tubes/vials.

Sampling: Flow rate at which the medium is pulled through the filters.

NOTE: When filters are utilized this value should not be set near the maximum flow rate! It is difficult to give a standard value for this parameter because of the large variety of filters used in the industry. A typical flow rate would be 9.0-10.0 mL/min but this can vary greatly depending on the filter.

Other Rates: Flow rates for other actions.

Volumes

Flush: Medium volume which is used to flush the syringe pump, lines and needles.

Offset: The discarded medium volume before sample collection. Both volumes are collected during a single pumping cycle.

Options

Media Replace: Turns the media replacement feature on or off.

Recycle: Turns the media recycle feature on or off.

Flush Times: Flushing of the lines occurs with sample media in order to minimize the contamination of the lines from residue in the pumps or tubing. This will set the number of flushes that will occur between sampling time points.

Continuous Wash: This option controls how the system wash cycle is performed at the end of a test. Valid settings are OFF, ON, 1, 2, 3, 4, or 5. If set to ON the washing will run continuously until the operator aborts the action. If set to OFF only one wash cycle will occur. Setting 1-5 allows the user to set a specific number of wash cycles.

- Rack Warning:** This option controls the instrument function when the sampling intervals exceed 16 (rack change required). The available options are NONE, RACK and TUBES.
- NONE: No warning messages appear once the rack is full (16 sampling time points). This is the default setting.
 - RACK: This option should be selected when the method requires collection of more than 16 sets of samples. After collection of the 16th set a prompt will appear on the display alerting the user to change racks.
- IMPORTANT:** In order to prevent double filling and/or sampling time inconsistencies the user must select OK.
- TUBES: This option should be selected when changing racks or replacing tubes prior to collection of 16 sets of samples. A prompt will be displayed to alert the operator to take action. The method will not be affected if the prompt is not acknowledged.

MAIN	METHOD	SAVE		
METHOD: <u>PREDNISONE</u>		MIN INTERVAL: 00:10		
PUMP FLOW RATES:		VOLUMES:		
COLLECTION: <u>20.0 ML/MIN</u>		FLUSH: <u>3.0 ML</u>		
SAMPLING: <u>20.0 ML/MIN</u>		OFFSET: <u>2.0 ML</u>		
OTHER RATES: <u>20.0 ML/MIN</u>				
OPTIONS:				
MEDIA REPLACE: <u>OFF</u>		# FLUSH TIMES: <u>1</u>		
RECYCLE: <u>OFF</u>		CONTINUOUS WASH: <u>ON</u>		
		RACK WARNING: <u>TUBES</u>		

Figure 3-12: Method Parameter Screen

To modify parameters:

1. Highlight METHOD menu from the main screen using the **arrow** keys and press **ENTER**.
2. Highlight the method name from the list and press **NEW/OPEN**.
3. Highlight PARA from the menu and press **ENTER**.
4. Using the **arrow** keys scroll through the pump flow rates, volumes and options adjusting the values using the + and - keys.

Media Replacement

During some dissolution studies, the amount of medium taken from the vessel at each time point must be replaced. Turning media replacement on will replace, with fresh media, an amount equal to the sample volume back to the test vessels.

Follow this procedure to turn media replacement on or off:

1. Highlight METHOD menu from the main screen using the **arrow** keys and press **ENTER**.
2. Highlight the method name from the list and press **NEW/OPEN**.
3. Highlight PARA from the menu and press **ENTER**.
4. Using the arrow keys highlight the ON/OFF field listed next to MEDIA REPLACE.
5. Using the + and - keys toggle to the desired setting (ON or OFF).

Media Recycle

With some dissolution sampling equipment there is volume loss during sample collection. The loss is due to the fact that some equipment is incapable of returning the unused portion of the sample medium to the vessel from which it was withdrawn. Utilizing the media recycle option with the Evolution 4300 will allow this media to be recycled back to the respective test vessels. When media recycle is set to on, the flush and offset volume will be returned to each vessel.

Follow this procedure to turn media recycle on or off:

1. Highlight METHOD menu from the main screen using the **arrow** keys and press **ENTER**.
2. Highlight the method name from the list and press **NEW/OPEN**.
3. Highlight PARA from the menu and press **ENTER**.
4. Using the arrow keys highlight the ON/OFF field listed next to MEDIA RECYCLE.
5. Using the + and - keys toggle to the desired setting (ON or OFF).

Programming Dissolution Bath Parameters

The Evolution 4300 is capable of controlling a Distek Model 2100C, Premiere 5100, Evolution 6100 or Evolution 6300, Model 2500 and symphony 7100 Dissolution Test Systems. The system is capable of setting bath parameters for test temperature, test RPM, infinity RPM, infinity duration, stirrer type, volume and vessels enabled (for a 5100, 6100, 6300, 2500 and 7100 only).



The Evolution 4300 is only configured to run a Distek 5100 in manual mode. It cannot create a new stored method on the 5100 system.

The bath parameters are saved with a method file. Follow these steps to view and modify bath settings:

1. From the Main screen select METHOD.
2. Use the **arrow** keys and highlight the corresponding method.
3. Press the **NEW/OPEN** button from the keypad.
4. Select the **BATH** menu button. Figure 3-13 and Figure 3-14 show sample screen for a 2100C and 5100 dissolution system.
5. Make the necessary changes to the bath parameters.
6. Select SAVE.

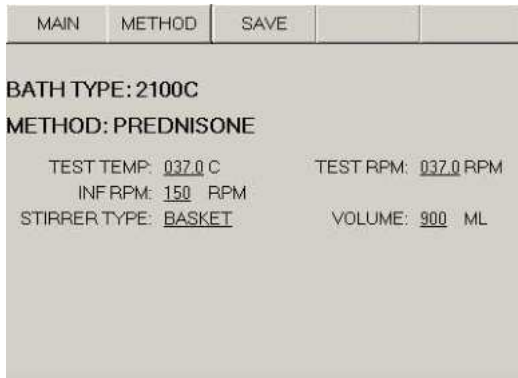


Figure 3-13: Model 2100C Settings

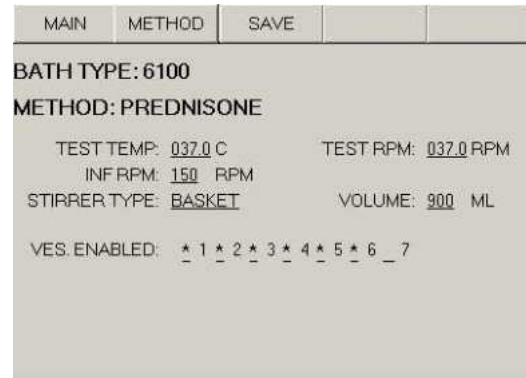


Figure 3-14: Model 6100 Settings

Programming a Method using the Dilution Functionality



- A dilution step in a method can only be added at the end of the method list.
 - Media replacement and pH Change cannot be used in conjunction with Dilutions. This is due to the fact that all three actions pull media from the same set of tubing.
-

The dilution capability of the unit allows additional media to be added to the samples collected. Dilution media is taken from the lines labeled in the rear of the Syringe Pump as 'Dilution, pH or Replacement Media' (older unit will be labeled 'Replacement Media' only).

Because dilution media is pulled from the same set of tubing lines as a pH or replacement action, it is important to turn media replacement off. (See Setting up Method Parameters on page 3-15 for more information.)

There are 2 methods possible for dilution, constant volume and varying volume.

Constant Volume Dilution

Constant volume should be used when all samples will be diluted with the same volume. With this method all samples collected (all rows) will be diluted. For example, a method with 5 sample time points would have .5mls (user defined volume) add to all 5 rows.

The following procedure describes programming a dilution action:

1. Create a method as described in Programming a New Method on page 3-14.
2. After all sample time points have been added, add an additional step and set the 'ACTION' to 'DILUTION'.
3. Change the 'ROW #' to 'ALL'.
4. Set the 'VOLUME' field to the desired volume.



It is not possible to program in the time because the system will automatically begin the dilution step after all samples have been acquired.

Varying Volume Dilution

Varying volume dilution allows for different volumes to be applied to each sample row. For example, a method with 5 sample time points could have

.2mls, .3mls, .4mls and .5mls (user defined volumes) added to rows 1, 2, 3, 4, and 5 respectively. This method allows for more flexibility in programming a method if necessary.

The following procedure describes programming a dilution action:

1. Create a method as described in Programming a New Method on page 3-14.
2. After all sample time points have been added, add an additional step and set the 'ACTION' to 'DILUTION'.
3. Set the 'ROW #' to the desired row.
4. Set the 'VOLUME' field to the desired volume.
5. Repeat steps 2-4 until all dilution steps have been programmed.



It is not possible to program in the time because the system will automatically begin the dilution step after all samples have been acquired.

Programming a Method using the pH Change Functionality



- When using pH Change, media replacement and Dilutions cannot be used due to the fact that all three actions pull media from the same set of tubing.
-

The pH change functionality allows for media addition at any point throughout the method. The volume can be set to obtain the necessary pH value. The user must calculate the necessary volume addition to obtain the desired pH (this functionality is not based on a ratio).

Ample time must be set between a pH adjustment and the next collection time point to allow the unit to transfer the necessary volume. A warning will be display if the unit detects a conflict.

The following procedure describes programming a pH Change action:

1. Create a method as described in Programming a New Method on page 3-14.
2. At any point in the sample list a pH adjustment step may be added. Add a step at the desired time and set the 'ACTION' to 'PH_ADJ'.
3. Set the 'VOLUME' field to the desired volume.

Programming a Method for Large Volume Sampling (> 10 ml)

The Evolution 4300 is capable of sampling up to 20mL per time interval. In order to obtain large volume sample results, one time point must be dispensed into multiple rows. For example to sample a volume of 20mL the method can be programmed to dispense 8mL into Row #1, 8mL into Row #2 and 4mL into Row #3 all at the same time points. Notice in Figure 3-15 that Steps 1-3 are all sampled at the same time (5 minutes) and dispensed into 3 different rows. This will allow all 20mL to be sampled at 5 minutes.

STEP	TIME	ROW#	ACTION	VOL (ML)
01	0000:05	01	AUTO	8.0
02	0000:05	02	AUTO	8.0
03	0000:05	03	AUTO	4.0
04	0000:15	04	AUTO	8.0
05	0000:25	05	AUTO	8.0

Figure 3-15: Large Volume Sampling

Programming a Sample Timepoint During Infinity RPM



An infinity RPM sampling step can only be added at the end of the method list.

The infinity RPM sampling capability allows a sample to be collected while the dissolution bath is running in IRPM (infinity RPM) mode. Media is collected from the vessels and dispensed into the test tubes or vials.

Setting an ISAMPLE action will automatically set the infinity duration time. After the last sample step is created the dissolution system will begin IRPM and end after the ISAMPLE is collected.

The following procedure describes programming a ISAMPLE action:

1. Create a method as described in Programming a New Method on page 3-14.
2. After all sample time points have been added, add an additional step and set the 'ACTION' to 'ISAMPLE'.
3. Change the 'ROW #' to the desired row.
4. Set the 'VOLUME' field to the desired volume.

Open/View an Existing Method



If the operator is logged into the system with Manager group privileges then the menu bar will contain a selection for OPEN. If the operator is logged in with USER group privileges then the menu bar will contain a selection for VIEW because a USER does not have access to modify a method.

There are 2 ways to open a method:

Method 1: Using the keypad

1. Use the **arrow** keys to highlight the method from the method list.
2. Press the **NEW/OPEN** button from the keypad.

Method 2: Using the menu

1. Use the **arrow** keys to highlight the method from the method list.
2. Press the **ENTER** button from the keypad.
3. Highlight the OPEN menu.
4. Press the **ENTER** button from the keypad.

Modify a Saved Method



- The operator logged in to the system must be part of the Manager group to modify a method.
 - The method name of a saved method cannot be modified. Modifying the method name will create a new method using the modified name.
-

1. Use the **arrow** keys to highlight the method to modify from the method list.
2. Press the **NEW/OPEN** button from the keypad.
3. Using the **arrow** keys highlight the field to be modified and change to the desired values.
4. To append a step to the list (add a step to the end of the list): Make sure the active (highlighted) field is not in the sample time point list. Press **NEW/OPEN** button from the keypad. (If the highlighted field is in the method list, the **NEW/OPEN** button will insert a step.)
5. To insert a step: Highlight a row in the sample time point list and press the **NEW/OPEN** button. This will insert a step below the highlighted row.
6. To delete a step: Highlight a row in the sample time point list and press the **DEL** key.
7. The time, row #, action and setup fields can be modified by highlighting the field and selecting the + or - button to toggle through the available options.

- Using the *arrow* keys, navigate to the SAVE menu and press *ENTER*.

Deleting a Method



The operator logged in to the system must be part of the Manager group to delete a method.

- From the Method screen (see Figure 3-10) highlight the method from the method list using the *arrow* keys.
- Press *DEL* from the keypad.
- The system will prompt the operator with a confirmation message. Highlight YES and press *ENTER*.

Copy a Saved Method to a New Name

- Use the *arrow* keys to highlight the method to copy from the method list.
- Press the *NEW/OPEN* button from the keypad.
- Highlight the METHOD NAME field and press *ENTER*.
- Modify the method name using the virtual keyboard. Use the *arrow* keys to navigate through the keyboard and press *ENTER* to select an alphanumeric value (maximum of 16 characters).
- Once the method name is entered navigate to the OK button and press *ENTER*.
- Using the *arrow* key navigate to the SAVE menu and press *ENTER*. A new method with the modified name will now be created.

Printing Method Settings

- Use the *arrow* keys to highlight the method from the method list.
- Press the *ENTER* button from the keypad.
- Highlight the PRINT menu.
- Press the *ENTER* button from the keypad.

3. The Evolution 4300 will display the message “PLEASE WAIT FOR BATH TEMPERATURE” on the Main screen.
4. When the bath temperature has been reached the unit will display the message:

REACHED TEMP SETTING!
DROP TABLET AND START TEST!

5. Drop the tablets into the dissolution bath’s vessels.
6. Press OK on the Evolution 4300’s screen to start the test.

Controlling a Distek Premiere 5100 Dissolution System (Baskets)



The Distek Premiere 5100 Dissolution System **must** be run in AUTO mode when a basket apparatus is used!

1. Verify that bath communication has been configured (see Setting Up Communication with Distek Premiere 5100 on page 2-11) and bath parameters are correctly set (see Working with Methods on page 3-13).
2. Create a method on the 5100 with the same settings that were configured on the Evolution 4300. This method will be run in AUTO mode on the Premiere 5100.
3. Select START BATH from the Main screen.
4. The Evolution 4300 will display the message “PLEASE WAIT FOR BATH TEMPERATURE” on the Main screen.
5. After about 1-2 minutes the method settings will be transferred to the Premiere 5100. The STIR and HEAT LEDs should be lit.
6. Once the settings have been transferred to the Premiere 5100 the AUTO method created in step 2 must be started on the Premiere 5100. Activate the method on the Premiere 5100 and press the HEAT button to start the test.
7. The test can **only** begin when both the Evolution 4300 and the Premiere 5100 display ready messages. When the bath temperature has been reached the Evolution 4300 will display the message:
REACHED TEMP SETTING!
DROP TABLET AND START TEST!
The Premiere 5100 will display the message:
ATTACH BASKET
BEGIN TEST
8. Once both message windows are displayed, raise the Premiere 5100 drive head.
9. Attach baskets to the shafts.
10. Lower the drive head.

11. The Evolution 4300 will automatically start once the Premiere 5100 drive head has been lowered.

Controlling a Distek Evolution 6100/6300 Dissolution System (Paddles)

1. Verify that bath communication has been configured (see Setting Up Communication with Distek Evolution 6100/6300 Dissolution System on page 2-12) and bath parameters are correctly set (see Working with Methods on page 3-13).
2. Select START BATH from the Main screen.
3. The Evolution 4300 will display the message “PLEASE WAIT FOR BATH TEMPERATURE” on the Main screen.
4. When the bath temperature has been reached the unit will display the message:

BATH_NAME
VESSEL TEMP HAS BEEN REACHED. PLEASE
FOLLOW INSTRUCTIONS ON THE 6100/6300.
5. On the dissolution system press ENTER on the keypad (on the dissolution bath), drop the tablets and either press ENTER again or wait for the 20 second timer to expire.
6. The Evolution 4300 will automatically begin the test.

Controlling a Distek Evolution 6100/6300 Dissolution System (Baskets)

1. Verify that bath communication has been configured (see Setting Up Communication with Distek Evolution 6100/6300 Dissolution System on page 2-12) and bath parameters are correctly set (see Working with Methods on page 3-13).
2. Select START BATH from the Main screen.
3. The Evolution 4300 will display the message “PLEASE WAIT FOR BATH TEMPERATURE” on the Main screen.
4. When the bath temperature has been reached the unit will display the message:

BATH_NAME
VESSEL TEMP HAS BEEN REACHED. PLEASE
FOLLOW INSTRUCTIONS ON THE 6100/6300.
5. On the dissolution system raise the drive head, attach baskets with tablets and lower the drive head.
6. The Evolution 4300 will automatically begin the test.

Controlling a Distek Model 2500 Dissolution System (Paddles)

1. Verify that bath communication has been configured (see Setting Up Communication with Model 2500 and symphony 7100 Dissolution System

- on page 2-13) and bath parameters are correctly set (see Working with Methods on page 3-13).
2. Select START BATH from the Main screen.
 3. The Evolution 4300 will display the message “PLEASE WAIT FOR BATH TEMP.” on the Main screen.
 4. On the dissolution bath, click OK. (DO NOT enter the Lot or Batch Number, they will be entered on the EVO 4300 at the end of the test.)
 5. When the bath temperature has been reached the unit will display the message:

BATH_NAME: VESSEL TEMP HAS BEEN REACHED.
PLEASE FOLLOW INSTRUCTIONS ON THE 2500.
 6. On the 2500, the operator is prompted as follows:

“Verify vessels have reached set temperature. Would you like to pause the shafts and begin the test?”

 Select YES on the dissolution bath and introduce the samples and either press START or wait for the timer to expire.
 7. The Evolution 4300 will automatically begin the test.

Controlling a Distek Model 2500 Dissolution System (Baskets)

1. Verify that bath communication has been configured (see Setting Up Communication with Model 2500 and symphony 7100 Dissolution System on page 2-13) and bath parameters are correctly set (see Working with Methods on page 3-13).
2. Select START BATH from the Main screen.
3. The Evolution 4300 will display the message “PLEASE WAIT FOR BATH TEMP.” on the Main screen.
4. On the dissolution bath, click OK. (DO NOT enter the Lot or Batch Number, they will be entered on the EVO 4300 at the end of the test.)
5. When the bath temperature has been reached the unit will display the message:

BATH_NAME: VESSEL TEMP HAS BEEN REACHED.
PLEASE FOLLOW INSTRUCTIONS ON THE 2500.
6. On the 2500, the operator is prompted as follows:

“Verify vessels have reached set temperature. Continue?”

 Select START on the dissolution bath and another prompted message is displayed as follows:

“Raise drive head and attach baskets to introduce dosage then lower drive head in XX seconds or press START to continue test”. (XX seconds start at 60 seconds and will countdown)
7. The Evolution 4300 will automatically begin the test.

Controlling a symphony 7100 Dissolution System (Paddles)

1. Verify that bath communication has been configured (see Setting Up Communication with Model 2500 and symphony 7100 Dissolution System on page 2-13) and bath parameters are correctly set (see Working with Methods on page 3-13).
2. Select START BATH from the Main screen.
3. The Evolution 4300 will display the message “PLEASE WAIT FOR BATH TEMP.” on the Main screen.
4. On the dissolution bath, click OK. (DO NOT enter the Lot or Batch Number, they will be entered on the EVO 4300 at the end of the test.)
5. When the bath temperature has been reached the unit will display the message:

BATH_NAME: VESSEL TEMP HAS BEEN REACHED.
PLEASE FOLLOW INSTRUCTIONS ON THE 7100.

6. On the 7100 Status, the operator is prompted as follows:
“Ready - Select Vessel to Start” then,
“Vessels have reached test settings. Would you like to pause the shafts(s) and begin test?”
Select YES on the dissolution bath and another prompted message is displayed as follows:
“Introduce dosage in the vessel. Stirring begins within XX seconds. Press START to begin test.” (XX seconds start at 60 seconds and will countdown)
7. The Evolution 4300 will automatically begin the test.

Controlling a symphony 7100 Dissolution System (Baskets)

1. Verify that bath communication has been configured (see Setting Up Communication with Model 2500 and symphony 7100 Dissolution System on page 2-13) and bath parameters are correctly set (see Working with Methods on page 3-13).
2. Select START BATH from the Main screen.
3. The Evolution 4300 will display the message “PLEASE WAIT FOR BATH TEMP.” on the Main screen.
4. On the dissolution bath, click OK. (DO NOT enter the Lot or Batch Number, they will be entered on the EVO 4300 at the end of the test.)
5. When the bath temperature has been reached the unit will display the message:

BATH_NAME: VESSEL TEMP HAS BEEN REACHED.
PLEASE FOLLOW INSTRUCTIONS ON THE 7100.

6. On the 7100 Status, the operator is prompted as follows:
“Ready - Select Vessel to Start” then,
“Vessels have reached test settings. Would you like to raise shafts(s) and begin test?”
Select YES on the dissolution bath and another prompted message is displayed as follows:

“Attach all baskets with dosage within XX seconds. Press START to lower shafts and begin test.” (XX seconds start at 60 seconds and will countdown)

7. The Evolution 4300 will automatically begin the test.

Rack Visualization (Map Screen)

The map screen allows the operator to get a visual display of the sampling tray (rack of tubes/vials). It will create a visual representation of the rows that have already collected samples.

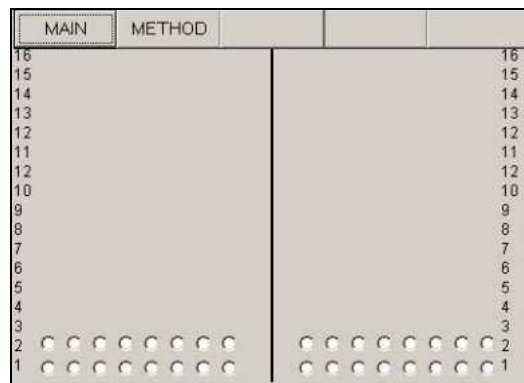


Figure 3-16: Map Screen

To display the map screen:

1. Highlight the MAP menu from the main screen and press **ENTER**.

Serial Port Control of Evolution 4300

For PC control, monitoring and reporting, the Evolution 4300 has a serial RS-232 port.



Test commands carefully. Improper PC control of remote instruments may lead to unexpected operation.

Collector Serial Command Reference

<i>Command Function</i>	<i>Command Format</i>	<i>Response Format</i>
Check Serial Number and Needle Position Setting	[R]	[32 S/N XXXXXXXX 25] where XXXXXXXX is S/N and 25 is Needle Position Setting
Return Carriage Head Position	[ROW:x]	[NN]
Home collector and Pump A or B	[B:n:1:0] Where n is 0 for Pump A or 1 for Pump B	[!]
Move Carriage Head to Row rr	[C:1:rr:1] (Home=18,Rinse Tank=17)	[!]
Lower Needles of Bath n	[D:n:0:0] Where n is 0 for Bath A or 1 for Bath B	[!]
Raise Needles of Bath n	[D:n:1:0] Where n is 0 for Bath A or 1 for Bath B	[!]
Reset Pump A or B	[J:n:mm] Where n is 0 for Pump A or 1 for Pump B mm=36 - Send liquid to vessels mm=37 - Sends liquid to replacement	[!]
Release All Pinch Valves	[K:n] Where n is 0 for Bath A or 1 for Bath B	[!]

<i>Command Function</i>	<i>Command Format</i>	<i>Response Format</i>
Activate Valves	[M:n:m:t] m: Recycle Valve 0: closed, 1: open t: Sample Valve 0: closed, 1: open	[!]
Shake Needles of Bath n	[N:n:m] Where m: 0 - shake at lower position 1 - shake at higher position	[!]

Syringe Pump Serial Command Reference

<i>Command Function</i>	<i>Command Format</i>	<i>Response Format</i>
Pause	[AA_X]	[X]
Continue	[AA_C]	[C]
Terminate	[AA_T:T]	[T]
Home Pump A	[AA_G:G:A]	[G]
Home Pump B	[AA_G:G:B]	[G]
Home Pump (Liquid to Sampler)	[AA_G:G:S]	[G]
Release all valves	[AA_G:G:R]	[G]
Set Flow Rate as NN.N ml for A	[AA_M:P:A NNN]	[NNN]
Set Flow Rate as NN.N ml for B	[AA_M:P:B NNN]	[NNN]
Sample liquid (NN.N ml) from A	[AA_M:F:A NNN]	[NNN]
Sample liquid (NN.N ml) from B	[AA_M:F:B NNN]	[NNN]
Sample liquid (NN.N ml) from Sampler	[AA_M:F:S NNN]	[NNN]
Set up unit address	[AA_Z_NN]	[NN]

<i>Command Function</i>	<i>Command Format</i>	<i>Response Format</i>
Get Serial Number	[AA_R]	[SPXXXXXX]
Check Unit Status	[AA_S:S]	[0] = Ready [9] = Not Home



AA represents the unit address.



4

Maintenance

This chapter gives a very brief overview of properly maintaining the Evolution 4300. To ensure consistent performance a Preventive Maintenance/Operational Qualification (PM/OQ) should be conducted periodically. Contact Distek for more information.

General Information	4-2
Replacement of Tubing Lines	4-2

General Information

1. The unit should be cleaned periodically by wiping with a slightly damp cloth. Do not use any harsh chemicals or detergents.
2. The top of the syringes should be periodically wiped clean.
3. Electronics require no customer attention. In the event of a malfunction, please call the factory before attempting any repairs.
4. Do not allow acids or buffers to remain on the rack plates. WIPE THE PLATES CLEAN AFTER USE.
5. Collector Fuse Replacement:

110V	Fast Blow 5x20mm – 2.5A 250V or Fast Blow 11/4 – 2.5A 250V
230V	Fast Blow 5x20mm – 2.5A 250V or Fast Blow 11/4 – 2.5A 250V

6. Syringe Pump Fuse Replacement:

110V	Fast Blow 5x20mm – 3A 250V or Fast Blow 11/4 – 3A 250V
230V	Fast Blow 5x20mm – 3A 250V or Fast Blow 11/4 – 3A 250V

- 7.

CAUTION: Do not clean plastic and rubber parts with organic solvents.

Replacement of Tubing Lines

The tubing line in both the collector and syringe pump should be replaced as needed. With routine unit usage the tubing can get very dirty, thus requiring replacement. Distek recommends a six month Preventative Maintenance/Operational Qualification (PM/OQ). Contact Distek's Service Department for more information. The only tubing that Distek recommends to be replaced by the customer is the waste tubing lines. All other media lines should be replaced by a trained professional.

Contact Distek to obtain a tubing replacement kit. The following procedure describes how to change the waste tubing lines.

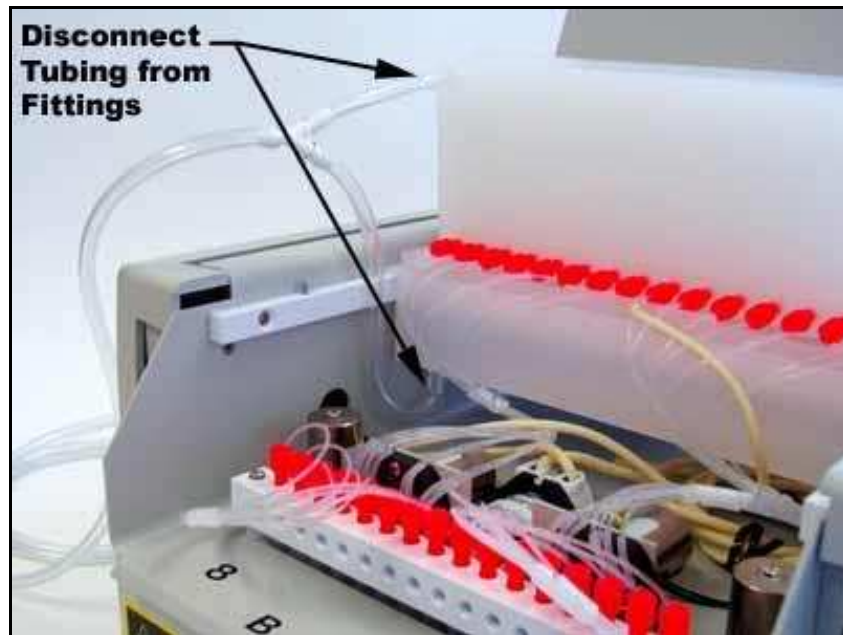


Figure 4-1: Waste Tubing Replacement Diagram

1. Remove the recycle bin and the rinse tank by lifting the bin upward to disengage the two metal posts located on each side.
2. Disconnect the two waste tubing lines from the fittings (see Figure 4-1).
3. Disconnect the tubing from the white y-connector (three places).
4. Replace all three tubing sections with PVC tubing (3/16"ID x 5/16"OD) of equivalent length on to the y-connector. Contact Distek for replacement tubing.
5. Insert the tubing back on to the fittings located on the recycle bin and rinse tank. Make sure to insert the smaller section of tubing on to the recycle bin (see Figure 4-1).
6. Place bins back into their original position.

5

Troubleshooting

This chapter provides troubleshooting information to identify the most common problems and their solution.

Troubleshooting	5-2
Error Messages	5-3
Warning Messages	5-6
General Messages	5-8

Troubleshooting

<i>Symptom</i>	<i>Possible Cause</i>	<i>Solution</i>
When powering on the carriage head is unable to complete its motion during the self-test and appears to be stuck.	The carriage head was manually moved.	Turn the unit off. Manually move the carriage head forward or backwards. Power the unit back on.
Inconsistent or incorrect volumes.	<ul style="list-style-type: none"> - Improper sealing of the fittings. - Problems with the syringe filter or probe filter. 	<p>Check all fittings for leaks. The rear manifold is a likely area for leaks (green fittings - See Figure 2-2). If there are no visible leaks, check all fittings to make sure they are tight (DO NOT OVER TIGHTEN!).</p> <p>If filters are used, change the filter.</p>
Pump not responding.	Communication with the pump is not correct.	This is usually related to the incorrect address set for the pump. See Setting up Communication section on page 2-9 or Configuring the Syringe Pump Address (Dual Bath System).



On older EVO 4300, a “Cool-Chip” board is required on the syringe pumps and the controller to prevent the pinch valves from overheating, that can cause inconsistent or incorrect volumes. Contact Distek to find out if the instrument is equipped with the “Cool-Chip” board.

Error Messages

<i>Message</i>	<i>Possible Cause</i>	<i>Solution</i>
CANNOT DELETE AN ACTIVE METHOD.	The user was trying to delete a method that is set to run on Bath A or B.	A method that is set to run on a bath cannot be deleted. On the method window turn that method to off (run column) by setting a different method to be active.
CANNOT DELETE YOURSELF.	The user was trying to delete the login profile that they are currently logged in as.	You cannot delete a login if it is currently being used. Log out and log back in using a different user and then delete that user.
CANNOT MODIFY AN ACTIVE METHOD.	This occurs when trying to modify a method that is currently running.	It is not possible to modify a method that is running. An alternate option would be to copy the method to a different name and then make the changes. Open the method, highlight the method name field and press enter. Enter a new name and make the necessary changes to the method.
BATH A IS BUSY. DO NOT MODIFY IT.	Trying to modify parameters while the pump is busy.	It is not possible to modify parameters while the pump is running. Wait until the pump is not active (idle) and modify the parameters.

<i>Message</i>	<i>Possible Cause</i>	<i>Solution</i>
BATH B IS BUSY. DO NOT MODIFY IT.	Trying to modify parameters while the pump is busy.	It is not possible to modify parameters while the pump is running. Wait until the pump is not active (idle) and modify the parameters.
DISK IS FULL, PLEASE DEL FILES.	Trying to save information when all system resources are full.	Delete methods or users that are not being used to free up disk space.
WRONG PASSWORD, CANNOT LOGIN!	Entered incorrect password while logging in.	Login again and retry password.
ONE BATH IS BUSY, CAN'T LOGOUT!	Trying to logout while a method is running.	Wait until the method is finished and then logout.
TIME INTERVALS ARE INCORRECT. MODIFY?	Sampling time intervals are set smaller than the minimum allowable interval.	If the user selects OK then the instrument will automatically update the sample time point list based on the minimum interval. The minimum interval is displayed on the parameters screen and it is based on flow rates, volume and options (replacement & recycle).
SAMPLING TIME INTERVALS ARE INCORRECT. CANNOT SAVE IT!	Sampling time intervals are set smaller than the minimum allowable interval.	Modify the sample time point list.

<i>Message</i>	<i>Possible Cause</i>	<i>Solution</i>
RACKS NOT DETECTED!/THE LEFT RACK IS NOT DETECTED!/THE RIGHT RACK IS NOT DETECTED!	The rack is not properly seated or not in place.	Reseat the rack to ensure the posts on the front are properly positioned.
ERRORS WHEN CARRIAGE IS MOVING.	The drive head (carriage) cannot move properly.	Turn the sampler off. Make sure there are no obstructions in the way of the drive head mechanism. Manually move the head slightly and power on the unit.
NEEDLE A/B: NEEDLE ERROR!	The needles on the carriage are unable to move.	Turn the sampler off. Make sure there are no obstructions restricting the needle movement. Power the unit back on. If the issue is not resolved contact Distek Customer Support.
PUMP A NO RESPONSE.	The sampler is unable to detect Pump A.	Make sure the pump is powered on (light power switch). Check the 485 connect from the pump to the samplers. See Setting Up the Power and Communication Connections on page 2-8.

<i>Message</i>	<i>Possible Cause</i>	<i>Solution</i>
PUMP B NO RESPONSE.	The sampler is unable to detect Pump B.	Make sure the pump is powered on (light power switch). Check the 485 connect from the pump to the samplers. See Setting Up the Power and Communication Connections on page 2-8.
PUMP A AND B NO RESPONSE.	The sampler is unable to detect Pump A and B.	Make sure the pump is powered on (light power switch). Check the 485 connect from the pump to the samplers. See Setting Up the Power and Communication Connections on page 2-8.

Warning Messages

<i>Message</i>	<i>Reason</i>
METHOD NAME: "METHOD_NAME" CONFIRM DELETION OF THIS METHOD.	Verification of method deletion.
USER: "USER_NAME" CONFIRM DELETION OF THIS USER.	Verification of user deletion.
METHOD NAME: "METHOD_NAME" DO YOU WANT TO SAVE THIS METHOD?	Verification to save method changes.
BATH A/B: "BATH_NAME" DO YOU WANT TO SAVE PARAMETERS?	Verification to save parameter modifications.

<i>Message</i>	<i>Reason</i>
BATH A/B: "BATH_NAME" DO YOU WANT TO SAVE BATH PARA?	Verification to save bath parameter modifications.
EXISTING METHOD: "METHOD _NAME" WOULD YOU LIKE TO OVERWRITE IT?	Confirmation to overwrite existing method.
BATH_NAME BATH A/B IS RUNNING. ABORT TEST?	If the Evolution 4300 is configured to control an Evolution 6100 or 6300 this message will be display when trying to start a method on the Evolution 4300 when another test is running on the dissolution system. Selecting yes will abort the method on the dissolution system.
PLEASE LOG IN TO BATH A/B.	If the Evolution 4300 is configured to control an Evolution 6100 or 6300 this message will be displayed when trying to start a method on the Evolution 4300 without having a user logged into the dissolution system.

General Messages

<i>Message</i>	<i>Reason</i>
YOU ARE LOGGED IN AS A USER. YOU CANNOT MODIFY METHOD OR PARAMETER.	User access restrictions. Must be a part of the manager group to perform this action.
YOU ARE LOGGED IN AS A USER. ONLY A MANAGER CAN CREATE NEW METHOD.	User access restrictions. Must be a part of the manager group to perform this action.
YOU ARE LOGGED IN AS A USER. ONLY A MANAGER CAN ADD OR DEL USER.	User access restrictions. Must be a part of the manager group to perform this action.
CONTINUOUS WASH WAS TERMINATED!	User aborted the SYS_WASH.
BATH TEMP REACHED, CHECK VESSEL TEMP, INTRODUCE DOSAGE FORM AND START TEST?	If the instrument is configured to control a Distek Model 2100 (B or C) system the Evolution 4300 will display this prompt when bath temperature has equilibrated. The user should check the vessel temperature to ensure the bath temperature correlates to the vessel temperature, then introduce the dosage form and press OK to begin the test.
VESSEL TEMP REACHED HAS BEEN REACHED. INTRODUCE DOSAGE FORM AND START TEST?	If the instrument is configured to control a Distek Model 5100 system the Evolution 4300 will display this prompt when the vessel temperature has equilibrated to the set temperature. The user introduces the dosage form and presses OK to begin the test.
BATH_NAME IS THE TCS PROPERLY PRIMED? SELECT YES TO INITIALIZE HEATER.	The sampler has detected that the TCS has been powered down. This is a check to make sure the TCS is properly primed. For more information see the section entitled 'Priming the Pump' in the Evolution Dissolution Test System Operation Manual.

<i>Message</i>	<i>Reason</i>
BATH_NAME VESSEL TEMP HAS BEEN REACHED. PLEASE FOLLOW INSTRUCTIONS ON THE 6X00.	If the instrument is configured to control a Distek Evolution 6100 or 6300 system the Evolution 4300 will display this prompt when the vessel temperature has equilibrated to the set temperature. The user should follow the instructions displayed on the dissolution unit's screen.
ABOUT TO CHANGE ADDRESS OF PUMP X. ACCEPT NEW ADDRESS: 03?	Confirmation of pump address change.
METHOD "METHOD_NAME" IS DONE. PUT PROBES INTO DI WATER SOURCE, START SYS_WASH!	This message will appear when a test has completed giving the user the option to run a SYS_WASH.

Appendix A : Spare Parts and Accessories

<u>Description</u>	<u>P/N</u>	<u>Description</u>	<u>P/N</u>
<u>Sampling Probes</u>		<u>Filter Disks</u>	
Sampling Probe, 500ml for Paddles	2910-0500	Filter Disks-10 micron 1000 per pkg.	5720-0203
Sampling Probe, 500ml for Baskets	2910-0501	Filter Disks-45 micron 1000 per pkg.	5720-0275
Sampling Probe, 500ml for Paddles -Lower Portion Only	2910-0502	<u>Fittings/Ferrules/Adaptors</u>	
Sampling Probe, 500ml for Baskets-Lower Portion Only	2910-0503	Blue Ferrule	5720-9066
Sampling Probe, 500ml for Paddles -2L	2910-0504	Black Fitting 1/4 x 28 Thread	5720-9067
Sampling Probe, 500ml for Baskets-2L	2910-0505	Red Fitting 1/4 x 28 Thread	5720-9068
Sampling Probe, 500ml for Paddles -Solid Housing	2910-0506	Translucent/White Fitting 1/4 x 28 Thread	5720-9069
Sampling Probe, 500ml for Baskets-Solid Housing	2910-0507	Yellow Fitting 1/4 x 28 Thread	5720-9070
Sampling Probe, 750ml for Paddles	2910-0750	Green Fitting 1/4 x 28 Thread	5720-9071
Sampling Probe, 750ml for Baskets	2910-0751	Blue Fitting 1/4 x 28 Thread	5720-9072
Sampling Probe, 750ml for Paddles -Lower Portion Only	2910-0752	Orange Fitting 1/4 x 28 Thread	5720-9073
Sampling Probe, 750ml for Baskets-Lower Portion Only	2910-0753	Luer Adaptor-Female	5720-9059
Sampling Probe, 750ml for Paddles -2L	2910-0754	Luer Adaptor-Male	5720-9060
Sampling Probe, 750ml for Baskets-2L	2910-0755	Syringe Filter Sampling Probe Assembly	2800-0110
Sampling Probe, 750ml for Paddles -Solid Housing	2910-0756	<u>Modules</u>	
Sampling Probe, 750ml for Baskets-Solid Housing	2910-0757	Space saver shelving unit for EVO 4300	5650-0002
Sampling Probe, 900ml for Paddles	2910-0900	<u>Racks/Plates/Assemblies</u>	
Sampling Probe, 900ml for Baskets	2910-0901	HPLC Vial Rack (8 x 16)	2800-0134
Sampling Probe, 900ml for Paddles -Lower Portion Only	2910-0902	Test Tube Rack (8 x 16)	2800-0135
Sampling Probe, 900ml for Baskets-Lower Portion Only	2910-0903	HPLC Vial Adapter 2mL, Set of 6	3250-0011
Sampling Probe, 900ml for Paddles -2L	2910-0904	HPLC Vial Adapter 4mL, Set of 6	3250-1006
Sampling Probe, 900ml for Baskets-2L	2910-0905	<u>Test Tubes</u>	
Sampling Probe, 900ml for Paddles -Solid Housing	2910-0906	13 x 100mm Test Tubes-8mL 500 pcs.	5730-0001
Sampling Probe, 900ml for Baskets-Solid Housing	2910-0907	<u>Misc</u>	
Sampling Probe, 1000ml for Paddles	2910-1000	Coupling 1/4-28 Thread for Sampling Probe	5720-1009
Sampling Probe, 1000ml for Baskets	2910-1001	O-ring for probe	5072-8032
Sampling Probe, 1000ml for Paddles -Lower Portion Only	2910-1002	Probe plug w. O-Ring	3200-0034
Sampling Probe, 1000ml for Baskets-Lower Portion Only	2910-1003	Probe tip SS for 900ml probe	5072-0204
Sampling Probe, 1000ml for Paddles - for 2L Vessel	2910-1004		
Sampling Probe, 1000ml for Baskets-2L	2910-1005		
Sampling Probe, 1000ml for Paddles -Solid Housing	2910-1006		
Sampling Probe, 1000ml for Baskets-Solid Housing	2910-1007		
Sampling Probe, 1800ml for Paddles	2910-1800		
Sampling Probe, 1800ml for Baskets	2910-1801		
Sampling Probe, 1800ml for Paddles -Lower Portion Only	2910-1802		
Sampling Probe, 1800ml for Baskets-Lower Portion Only	2910-1803		
Sampling Probe, 1800ml for Paddles -Solid Housing	2910-1806		
Sampling Probe, 1800ml for Baskets-Solid Housing	2910-1807		
Return Probe	2910-0001		

Appendix B : Pre-Installation Considerations: Electrical Power Supply¹

1. Locations using 115V, 60-cycle AC should provide a 10.5A circuit for each Distek Evolution 4300 for a dual sampler configuration. The sampler requires 2.5A and each pump requires 4A.
2. Similarly, if 220V, 50 cycle AC systems are being installed, each system should be wired to a 7A circuit.
3. It is not recommended to use a shared power supply inlet with other powerful devices such as air compressors, centrifuge, air conditioners, etc...
4. Because of the extensive use of microprocessor technology, it is recommended, where possible, that 12-gauge stranded-copper wiring be used for all circuit wiring. In cases where the distance from the circuit breaker sub-panel to the outlet exceeds 500 feet (150m), 12-gauge wire is the minimum that should be used. The use of larger diameter wiring reduces the voltage drop in the wiring, helps reduce power consumption, and increases the inductive impedance of the circuit which helps smooth voltage fluctuations.
5. In addition, if possible, an isolated ground wire should be used and the site should be wired in a 3-phase, 4-wire configuration with an approximate load balancing among the phases. In sites where many systems are being installed, the number of systems wired to each phase should be balanced as much as possible.
6. To minimize the risk of damage to a system from electrical system problems:
 - ◆ Verify that the power wiring configuration is proper.
 - ◆ Verify that the mains voltage (“supply” to “neutral”) is within 7% of the nominal supply voltage.
 - ◆ If possible, verify the current dissipation capacity of the “ground” and the “neutral” lines in the circuit wiring.
 - ◆ Building mains should be protected with “lightning suppressors” and, ideally, each circuit should be terminated by the appropriate “surge protection” receptacle. (In the United States, suitable receptacles are supplied by Hubbell, Inc. Alternately, a sized computer-grade

¹ Although the Distek Model 4300 is designed with internal surge protection, failure to follow these recommendations may compromise the operation of the system and, should the system be damaged by power surges, lightning or other significant power fluctuations, such system damage is not covered by Distek’s warranty.

surge-suppression accessory with the appropriate current rating can be added to existing circuits.)

- ◆ For those users who require protection from voltage drop-outs, short term power interruptions, and supply voltage reductions, a suitable standby Uninterruptible Power Supply (UPS) should be installed between the supply and the dissolution system.
- ◆ For those sites whose power quality is compromised either by the nature of the generation source or imposed fluctuations and pulses, an isolation transformer or an on-line UPS may be needed.

Appendix C : CE Declaration of Conformity

CE DECLARATION OF CONFORMITY

NOT TRANSFERABLE

Responsible Company:	Distek, Inc. 121 North Center Dr. North Brunswick, NJ. 08902
Equipment Type & Model:	Distek Dissolution Systems: Evolution 6100 Evolution 6300 (with TCS) Distek Autosamplers: DS 4300 Evolution 4300 Syringe Pump
Equipment Classification:	Electrical equipment for measurement, control and laboratory use.
Declared Compliance & Test Standards:	EMC Directives 89/336/EEC/93/68/EEC IEC 61326:2002 EN 61000-3-2 EN 61000-3-3 EN 61010-1:2001 (2 nd Edition) IEC 1010-2-010:92 (as applicable) UL 61010A-1 CAN/CSA 1010.1-92



Jeff Brinker
Engineering Manager
November 11, 2003

Appendix D : Sample Printouts from Parallel Printer



Actual printouts may vary from samples shown.

Method Printout

DISTEK AUTOSAMPLER Firmware V1.3 8/14/02 01:41:19PM

Autosampler Serial Number: 4300001

METHOD

USER NAME : DISTEK
METHOD NAME: DISTEK

METHOD WAS CREATED ON: 08/14/02
NUMBER OF STEPS: 02 INTERVALS: 30 MINS

SAMPLING: 10.0ml/min PASS FILTER: 10.0ml/min
OTHER RATES: 16.0ml/min
FLUSH VOL: 04.0ml OFFSET VOL: 02.0ml
LINE1 VOL: 01.0ml LINE2 VOL: 01.0ml

AUTO:
FLUSH SAMPLE PURGE IDLE

SEQ.	TIME	ACTION	ROW	SETUP
01	00:02:00	AUTO	1	02.0ml
02	00:07:00	AUTO	2	02.0ml
02	00:07:00	STOP	2	00.0ml

Saved Report Printout

DISTEK AUTOSAMPLER Firmware V1.3 8/14/02 01:41:19PM

Autosampler Serial Number: 4300001

REPORT

USER NAME : DISTEK
METHOD NAME: DISTEKDATE: 08/14/02
START TEST AT: 11:48:27AM BATH: 399

SAMPLING: 20.0ml/min	AUTO INCLUDES:			
PASS FILTER: 18.0ml/min	FLUSH	SAMPLE	PURGE	IDLE
OTHER RATES: 20.0ml/min				
FLUSH VOL: 03.0ml				
OFFSET VOL: 02.0ml				
LINE1 VOL: 02.0ml				
LINE2 VOL: 01.6ml				

SEQ.	TIME	ACTION	ROW	SETUP
00	00:00:04	READY	H	00.0ml
01	00:00:07	FLUSH	1	03.0ml
01	00:02:00	SAMPLE	1	02.0ml
01	00:03:49	PURGE	1	07.8ml
02	00:04:42	FLUSH	2	03.0ml
02	00:07:00	SAMPLE	2	02.0ml
02	00:08:28	PURGE	2	07.8ml
02	00:08:53	STOP	2	00.0ml

Saved Report Printout - With Distek Premiere 5100 Control



For instruments 6100, 6300 and 7100 the report printout will be similar as shown below example (except for the "BATH TYPE :").

DISTEK AUTOSAMPLER Firmware V1.3 8/14/02 01:41:19PM

Autosampler Serial Number: 4300001

REPORT

USER NAME : DISTEK
METHOD NAME: DISTEK

DATE: 08/14/02
START TEST AT: 11:48:27AM

PUMP PARAMETERS		BATH PARAMETER	
SAMPLING: 20.0ml/min		BATH TYPE: 5100	BATH A
PASS FILTER: 18.0ml/min		TEMPERATURE: 37.0 DEG C	
OTHER RATES: 20.0ml/min		RPM: 100	
FLUSH VOL: 03.0ml		STIRRER TYPE: PADDLES	
OFFSET VOL: 02.0ml		VESSEL VOLUME: 500 MLS	
LINE1 VOL: 02.0ml		VESSELS ENABLED: 1 2 3 4	
		5 6	
LINE2 VOL: 01.6ml		INF RPM: 200	
		IRPM DURATION: 01 MINS	

AUTO INCLUDES: FLUSH SAMPLE PURGE IDLE

```

-----
      SEQ.          TIME          ACTION          ROW          SETUP
      00           00:00:04         READY           H           00.0ml
      01           00:00:07         FLUSH           1           03.0ml
      01           00:02:00         SAMPLE           1           02.0ml
VES 1   VES 2   VES 3   VES 4   VES 5   VES 6   VES 7
37.1    37.0    37.1    37.0    37.0    37.0    ****
                                RPM:      100.0
      01           00:03:49         PURGE           1           07.8ml
      02           00:04:42         FLUSH           2           03.0ml
      02           00:07:00         SAMPLE           2           02.0ml
VES 1   VES 2   VES 3   VES 4   VES 5   VES 6   VES 7
37.1    37.0    37.1    37.0    37.0    37.0    ****
                                RPM:      100.0
      02           00:08:28         PURGE           2           07.8ml
      02           00:08:53         STOP            2           00.0ml
  
```


Saved Report Printout - With Distek Model 2100C Control



For instrument Model 2500 the report printout will be similar as shown below example (except for the "BATH TYPE :").

DISTEK AUTOSAMPLER Firmware V1.3 8/14/02 01:41:19PM

Autosampler Serial Number: 4300001

REPORT

USER NAME : DISTEK
METHOD NAME: DISTEK

DATE: 08/14/02
START TEST AT: 11:48:27AM

PUMP PARAMETERS	BATH PARAMETER	BATH
SAMPLING: 20.0ml/min	BATH TYPE: 2100	
PASS FILTER: 18.0ml/min	TEMPERATURE: 37.0 DEG C	A
OTHER RATES: 20.0ml/min	RPM: 100	
FLUSH VOL: 03.0ml	STIRRER TYPE: PADDLES	
OFFSET VOL: 02.0ml	VESSEL VOLUME: 500 MLS	
LINE1 VOL: 02.0ml	INF RPM: 200	
LINE2 VOL: 01.6ml	IRPM DURATION: 01 MINS	

AUTO INCLUDES: FLUSH SAMPLE PURGE IDLE

SEQ.	TIME	ACTION	ROW	SETUP
00	00:00:04	READY	H	00.0ml
01	00:00:07	FLUSH	1	03.0ml
01	00:02:00	SAMPLE	1	02.0ml
	TEMP: 36.9 C		RPM: 100.0	
01	00:03:49	PURGE	1	07.8ml
02	00:04:42	FLUSH	2	03.0ml
02	00:07:00	SAMPLE	2	02.0ml
	TEMP: 36.9 C		RPM: 100.0	
02	00:08:28	PURGE	2	07.8ml
02	00:08:53	STOP	2	00.0ml

BATH REPORT DURING THIS TEST:
BATH A: 399

RPM RESULTS

MAX	MIN	DELTA (MAX-MIN)
RPM 101	99	2

TEMPERATURE PROFILES

```

-----
MAX TEMP.    MIN TEMP.    DELTA
              (MAX-MIN)
    36.9      36.9      0.0

```

Real Time Test Printout - Single Pump Configuration

DISTEK AUTOSAMPLER Firmware V1.3 8/14/02 04:58:19PM

Autosampler Serial Number: 4300001

USER NAME : DISTEK
METHOD NAME: DISTEK

BATH 398
PUMP SERIAL NUMBER: SP00001
SAMPLING: 20.0ml/min
PASS FILTER: 18.0ml/min
OTHER RATES: 20.0ml/min
FLUSH VOL: 03.0ml
OFFSET VOL: 02.0ml
LINE1 VOL: 02.0ml
LINE2 VOL: 01.6ml

TEST STARTED AT: 04:58:15PM

SEQ.	TIME	ACTION	ROW
00	00:00:04	READY	H
01	00:00:07	FLUSH	1
01	00:02:00	SAMPLE	1
01	00:03:49	PURGE	1
02	00:04:42	FLUSH	2
02	00:07:00	SAMPLE	2
02	00:08:28	PURGE	2
02	00:08:53	STOP	2

Real Time Test Printout - Dual Pump Configuration



In a dual bath configuration the printout will contain data from both Pump A and Pump B on one printout. The information will be divided by the left and right halves of the printout, the left containing Pump A results and the right side will have Pump B results.

DISTEK AUTOSAMPLER Firmware V1.3 8/14/02 04:58:19PM

Autosampler Serial Number:
4300001

USER NAME : DISTEK
METHOD NAME: DISTEK
BATH 398
PUMP SERIAL NUMBER: SP00001
SAMPLING: 20.0ml/min
PASS FILTER: 18.0ml/min
OTHER RATES: 20.0ml/min
FLUSH VOL: 03.0ml
OFFSET VOL: 02.0ml
LINE1 VOL: 02.0ml
LINE2 VOL: 01.6ml

TEST STARTED AT: 04:58:15PM

SEQ.	TIME	ACTION	ROW
00	00:00:04	READY	H
01	00:00:07	FLUSH	1
01	00:02:00	SAMPLE	1

METHOD NAME: DISTEK
BATH 399
PUMP SERIAL NUMBER: SP00002
SAMPLING: 20.0ml/min
PASS FILTER: 18.0ml/min
OTHER RATES: 20.0ml/min
FLUSH VOL: 03.0ml
OFFSET VOL: 02.0ml
LINE1 VOL: 02.0ml
LINE2 VOL: 01.6ml

TEST STARTED AT: 04:58:20PM

SEQ.	TIME	ACTION	ROW
01	00:03:49	PURGE	1
02	00:04:42	FLUSH	2
02	00:07:00	SAMPLE	2
02	00:08:28	PURGE	2
02	00:08:53	STOP	2

Real Time Test Printout - Single Bath Configuration with Distek Model 2100C Control

DISTEK AUTOSAMPLER Firmware V1.3 8/14/02 04:58:19PM

Autosampler Serial Number:
4300001

USER NAME : DISTEK
BATH: 399
START TEST AT: 04:58:15PM
METHOD NAME: DISTEK
SAMPLE VOL: 02.0ml
PUMP SERIAL NUMBER: SP00001

BATH TYPE: 2100CBATH A
TEMPERATURE: 37.0 DEG C
RPM: 100 INF RPM: 200
IRPM DURATION: 01 MINS
STIRRER TYPE: PADDLES
VESSEL VOLUME: 500 MLS

SEQ.	TIME	ACTION	ROW
00	00:00:04	READY	H
01	00:00:07	FLUSH	1
01	00:02:00	SAMPLE	1
	TEMP: 37.1	RPM: 101	
01	00:03:49	PURGE	1
02	00:04:42	FLUSH	2
02	00:07:00	SAMPLE	2
	TEMP: 37.0	RPM: 100	
02	00:08:28	PURGE	2
02	00:08:53	STOP	2

BATH SUMMARY DURING THIS TEST:
BATH A: 399

<u>RPM RESULTS</u>			
	MAX	MIN	DELTA (MAX- MIN)
RPM:	101	99	2

<u>TEMPERATURE PROFILES</u>			
	MAX TEMP.	MIN TEMP.	DELTA (MAX- MIN)
	101	99	2

Real Time Test Printout - Single Bath Configuration with Distek Premiere 5100 Control

DISTEK AUTOSAMPLER Firmware V1.3 8/14/02 04:58:19PM

Autosampler Serial Number: 4300001

USER NAME : DISTEK
 BATH: 399
 START TEST AT: 04:58:15PM
 METHOD NAME: DISTEK
 SAMPLE VOL: 02.0ml
 PUMP SERIAL NUMBER: SP00001
 BATH TYPE: 5100 BATH A
 TEMPERATURE: 37.0 DEG C
 RPM: 100 INF RPM: 200
 IRPM DURATION: 01 MINS
 VESSELS ENABLED: 1 2 3 4 5 6
 STIRRER TYPE: PADDLES
 VESSEL VOLUME: 500 MLS

SEQ.	TIME		ACTION		ROW	
00	00:00:04		READY		H	
01	00:00:07		FLUSH		1	
01	00:02:00		SAMPLE		1	
V1	V2	V3	V4	V5	V6	V7
37.0	37.0	37.0	37.0	37.0	37.0	37.0
RPM:				100.0		
01	00:03:49		PURGE		1	
02	00:04:42		FLUSH		2	
02	00:07:00		SAMPLE		2	
V1	V2	V3	V4	V5	V6	V7
37.0	37.0	37.0	37.0	37.0	37.0	37.0
RPM:				100.0		
02	00:08:28		PURGE		2	
02	00:08:53		STOP		2	

 BATH SUMMARY DURING THIS TEST:

BATH A: 399

	<u>RPM RESULTS</u>		DELTA (MAX- MIN)
	MAX	MIN	
RPM	101	99	2

**Real Time Test Printout - Single Bath Configuration with Distek
Premiere 5100 Control (Continued)**

VES #	<u>TEMPERATURE PROFILES</u>		DELTA (MAX- MIN)
	MAX TEMP.	MIN TEMP.	
1	37.06	37.04	0.02
2	37.06	37.01	0.05
3	37.03	37.01	0.02
4	37.10	37.05	0.05
5	37.07	37.04	0.03
6	37.07	37.05	0.02

Real Time Test Printout - Dual Bath Configuration with Distek Premiere 5100 and Model 2100C Control



In a dual bath configuration the printout will contain data from both Pump A and Pump B on one printout. The information will be divided by the left and right halves of the printout, the left containing Pump A results and the right side will have Pump B results.

DISTEK AUTOSAMPLER Firmware V1.3 8/14/02 04:58:19PM

Autosampler Serial Number:

4300001

USER NAME : DISTEK

METHOD NAME: DISTEK

BATH 398

PUMP SERIAL NUMBER: SP00001

SAMPLING: 20.0ml/min

PASS FILTER: 18.0ml/min

OTHER RATES: 20.0ml/min

FLUSH VOL: 03.0ml

OFFSET VOL: 02.0ml

LINE1 VOL: 02.0ml

LINE2 VOL: 01.6ml

BATH TYPE: 2100

BATH A

TEMPERATURE: 37.0 DEG C

RPM: 100

STIRRER TYPE: PADDLES

VESSEL VOLUME: 500 MLS

INF RPM: 200

IRPM DURATION: 01 MINS

TEST STARTED AT: 04:58:15PM

SEQ.	TIME	ACTION	ROW
00	00:00:04	READY	H
01	00:00:07	FLUSH	1
01	00:02:00	SAMPLE	1
TEMP: 37.0		RPM: 100	

METHOD NAME: DISTEK
 BATH 399
 PUMP SERIAL NUMBER: SP00002
 SAMPLING: 20.0ml/min
 PASS FILTER: 18.0ml/min
 OTHER RATES: 20.0ml/min
 FLUSH VOL: 03.0ml
 OFFSET VOL: 02.0ml
 LINE1 VOL: 02.0ml
 LINE2 VOL: 01.6ml

**Real Time Test Printout - Dual Bath Configuration with Distek
Premiere 5100 and Model 2100C Control (continued)**

METHOD NAME: DISTEK
 BATH 399
 PUMP SERIAL NUMBER: SP00002
 SAMPLING: 20.0ml/min
 PASS FILTER: 18.0ml/min
 OTHER RATES: 20.0ml/min
 FLUSH VOL: 03.0ml
 OFFSET VOL: 02.0ml
 LINE1 VOL: 02.0ml
 LINE2 VOL: 01.6ml
 BATH TYPE: 5100 BATH A
 TEMPERATURE: 37.0 DEG C
 RPM: 100
 STIRRER TYPE: PADDLES
 VESSEL VOLUME: 500 MLS
 VESSELS ENABLED: 1 2 3 4 5 6
 INF RPM: 200
 IRPM DURATION: 01 MINS

TEST STARTED AT: 04:58:20 PM

01	00:03:49	PURGE	1	SEQ.	TIME	ACTION	ROW			
02	00:04:42	FLUSH	2	00	00:00:04	READY	H			
02	00:07:00	SAMPLE	2	01	00:00:07	FLUSH	1			
	TEMP: 37.0	RPM: 100		01	00:02:00	SAMPLE	1			
02	00:08:28	PURGE	2	V1	V2	V3	V4	V5	V6	V7
02	00:08:53	STOP	2	37.0	37.0	37.0	37.0	37.0	37.0	37.0
					RPM:					100.0
				01	00:03:49	PURGE				1
				02	00:04:42	FLUSH				2
				02	00:07:00	SAMPLE				2
				V1	V2	V3	V4	V5	V6	V7
				37.0	37.0	37.0	37.0	37.0	37.0	37.0
					RPM:					100.0
				02	00:08:28	PURGE				2
				02	00:08:53	STOP				2

**Real Time Test Printout - Dual Bath Configuration with Distek
Premiere 5100 and Model 2100C Control (continued)**

BATH REPORT DURING THIS TEST:

BATH A: 398

<u>RPM RESULTS</u>			
	MAX	MIN	DELTA (MAX- MIN)
RPM:	101	99	2
<u>TEMPERATURE PROFILES</u>			
	MAX TEMP.	MIN TEMP.	DELTA (MAX- MIN)
TEMP:	36.9	36.9	0.0

BATH SUMMARY DURING THIS TEST:

BATH A: 399

<u>RPM RESULTS</u>			
	MAX	MIN	DELTA (MAX- MIN)
RPM	101	99	2
<u>TEMPERATURE PROFILES</u>			
VES #	MAX TEMP.	MIN TEMP.	DELTA (MAX- MIN)
1	37.06	37.04	0.02
2	37.06	37.01	0.05
3	37.03	37.01	0.02
4	37.10	37.05	0.05
5	37.07	37.04	0.03
6	37.07	37.05	0.02

Appendix E : User Interface Flow Chart

