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The Experion™ System

Automated Electrophoresis Station

Priming Station

Vortex Station

700-7000

700-7001 (with Vortex Station, 115 V)

700-7002 (with Vortex Station, 230 V)

Instruction Manual

BIO-RAD

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Table of Contents

Page

Safety

Section 1 Introduction 1
1.1 Background Information 1
1.2 Unpack System 2
1.3 Product Descriptions 2
1.3.1 Electrophoresis Station 2
1.3.2 Priming Station 3
1.3.3 Vortex Station 4
1.3.4 Software 4
1.3.5 Analysis Kits 5
1.4 Computer Requirements 5
1.5 System Setup 6
1.5.1 Load Software 6
1.5.2 Cable Connections 6
1.5.3 Power Up & Establish Communication 8

Section 2 Procedure 10
2.1 Essential Practices 10
2.2 Deep Cleaning the Electrodes 11
2.3 Cleaning the Electrodes 13
2.3.1 Cleaning the Electrodes Before an RNA Analysis Run 13
2.3.2 Cleaning the Electrodes After an RNA Analysis Run 13
2.3.3 Cleaning the Electrodes After a Protein Analysis Run 14
2.4 Preparing the Reagents 14
2.5 Priming the Chip 14
2.6 Vortexing the RNA Chip 17
2.7 Running the Analysis 17

Section 3 Data Storage and Analysis Software 19

Section 4 Troubleshooting 19
4.1 Electrophoresis Station 19
4.2 Priming Station 19
4.3 Vortex Station 20
4.4 Sample Preparation 20

Section 5 Care and Maintenance 21
5.1 Electrophoresis Station 21
5.1.1 To Remove the Electrode Manifold 22
5.1.2 To Install the Electrode Manifold 23
5.2 Priming Station 24
5.2.1 To Remove the Priming Seal 24
5.2.2 To Install the Priming Seal 24
5.3 Vortex Station 25
5.3.1 To Remove the Vortex Adaptor 25
5.3.1 To Install the Vortex Adaptor 25

Section 6 Specifications 26
6.1 Electrophoresis Station 26
6.2 Priming Station 26
6.3 Vortex Station 27

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Appendix A Ordering Information.....28
Appendix B References and Legal Notices.....29

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Safety



General Use Information

Always connect the Experion automated electrophoresis station and priming station power supply to a grounded AC outlet rated 10 A/100–240 V using the AC power cord provided. Be sure the power cord supplied with your vortex station matches your AC power requirements (115 V or 230 V) and only use a three-prong (earth grounded) power cord with the vortex station.

Never remove the outer casing of the electrophoresis station or other system components. This will void the manufacturer's warranty. The only user-serviceable parts of the Experion system are the electrode manifold and lid of the electrophoresis station, the priming seal gaskets of the priming station, and the vortex adapter of the vortex station. If you suspect other parts need serviced call your local Bio-Rad Laboratories office.

These instruments are intended for laboratory use only. Do not use equipment except as intended.

Do not operate the Experion system in extreme humidity (>90%) or where condensation can short the internal electrical circuitry.

Periodically inspect your Experion instruments for obvious damage that might affect normal operation.

Do not operate after the equipment malfunctions, or has been damaged in any manner. Return the instrument to Bio-Rad Laboratories for service for examination, repair, electrical or mechanical adjustment.

When using electrical equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and personal injury. To reduce the risk of electric shock, do not immerse the electrophoresis, priming, or vortex stations in water or liquids.

Instrumentation Safety Notice

These Bio-Rad instruments are designed and certified to meet EN61010-1 and IEC 61010-1 safety standards. EN61010-1 and IEC 61010-1 certified products are safe to use when operated in accordance with the instruction manual. This equipment should not be modified in any way. Alteration of these instruments will:

- Void the manufacturer’s warranty
- Void the EN61010-1 and IEC 61010-1 safety certification
- Create a potential safety hazard

Bio-Rad Laboratories is not responsible for any injury or damage caused by the use of this system for purposes other than those for which it is intended, or by modifications of the components not performed by Bio-Rad Laboratories or an authorized agent.

These products conform to the “Class A” standards for electromagnetic emissions intended for laboratory equipment applications. It is possible that emissions from these products may interfere with some sensitive appliances when placed nearby or in the same circuit as those appliances. The user should be aware of this potential and take appropriate measures to avoid interference.

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The vortex station is built in accordance with electrical requirements for measurement, control and laboratory by “IEC 61010-1”; UL 61010-1 (USA), CAN/CSA C22.2 No. 61010-1 (Canada), Règles de sècuritè pour appareils èlectriques de mesurage, de règulation et de laboratoire; Partie 1: Prescriptions gènèrales (CEI 1010-1, France), DIN EN 61010-1 class. VDE 0411 (Germany)

Laser Safety Notice

Use of controls, adjustments or performance of procedures other than those specified in this instruction manual may result in access to hazardous laser light. Do not attempt to remove any parts of the housing. The instrument is to be serviced only by the factory; there are no user serviceable parts in the instruments, except the electrode manifold located in the lid. Opening the housing of the electrophoresis station will void the warranty.

The electrophoresis station is a laser product that is classified as Class 1 under 21CFR chapter 11, subchapter J, and under EN 60825-1. It presents no laser hazard to the user.

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Section 1
Introduction

1.1 Background Information

Automation of electrophoresis methodologies through the emergence of “lab-on-a-chip” microfluidics technology provides new opportunities in the development of proteomics and genomic expression analysis.

The chips consist of a plastic caddy with a small glass plate affixed to it. The glass plate is etched with numerous microchannels in an optimized network pattern. The electrophoresis station directs the samples through microchannels by controlling the applied voltage and current. Using a microfluidic chip, it is possible to accomplish several sequential procedures including separation, staining, destaining, detection and basic data analysis without any need for user intervention.

The Experion system (Figure 1.1) employs LabChip® microfluidic technology to automate electrophoresis for protein and RNA analysis.



Figure. 1.1. The Experion system includes the following components: (1) Automated electrophoresis station, (2) Priming station, (3) Vortex station for RNA analysis, (4) System operation and data analysis software, and (5) Analysis kits (sold separately), which include the (a) chips and (b) reagents for protein, standard sensitivity RNA, and high sensitivity RNA analysis.

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1.2 Unpack System

Experion system components are shipped in three (catalog #700-7000) or four (catalog #s700-7001 and 700-7002) boxes:

- Box 1—Electrophoresis station, power cord, USB 2.0 cable, test chip, and instruction manual, 100–120/220–240 V
- Box 2—Priming station, power adapter, power cord, and 2 extra priming seals, 100–120/220–240 V
- Box 3—Software
- Box 4 (for RNA analysis)—Vortex station with green vortex adapter installed, 100–120 V or 220–240 V

Please note, when removing the contents from each shipping box:

- Carefully lift the electrophoresis station by grasping the underside of the unit (in between the green rubber feet) and the top of the unit.
- Remove the instruments from the protective plastic bags and inspect them for any external damage. If any part is missing or damaged, contact Bio-Rad Laboratories immediately.
- Remove the plastic film (sticky protective layer) of foam from the green lids of the electrophoresis and priming stations.
- The current test chip is in the plastic sleeve along with the instruction manual.

1.3 Product Descriptions

1.3.1 Electrophoresis Station

The Experion electrophoresis station (Figures 1.3.1a and b) houses all the electrical, optical, and hardware components necessary to perform the separation, staining, destaining, band detection, and imaging of your samples in one, automatic 30-minute step.



Figure. 1.3.1a. The Experion Automated Electrophoresis station.

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Figure. 1.3.1b. The Experion Electrophoresis station with lid open.

1.3.2 Priming Station

The Experion priming station (Figure 1.3.2a and b) is designed to prepare all chips for sample analysis. The priming station applies pressure to the priming well of the chip and fills the network of microchannels with gel-stain solution using predetermined time and pressure settings.

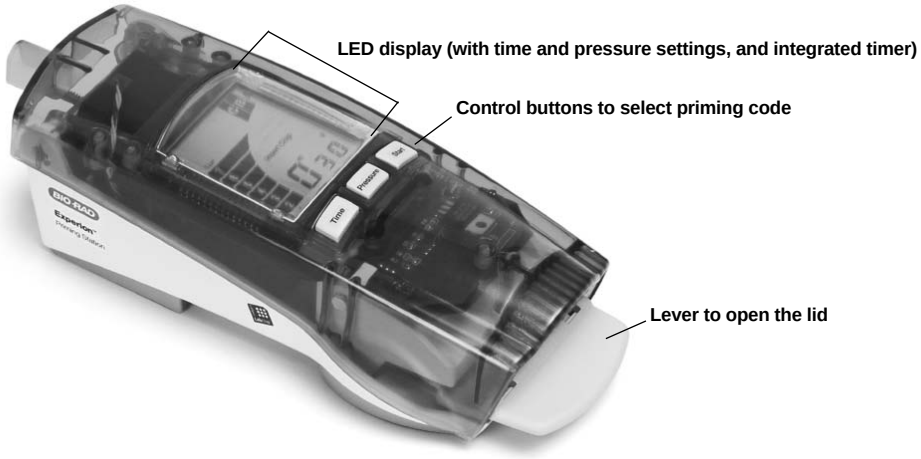


Figure. 1.3.2a. The Experion Priming station (closed).

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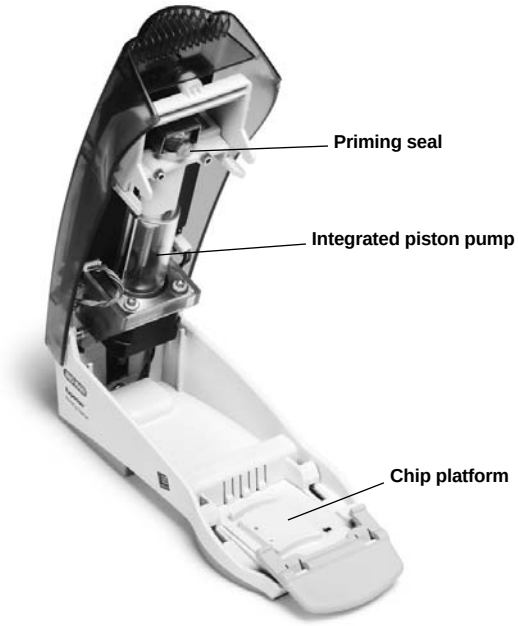


Figure. 1.3.2b. The Experion Priming station (open).

1.3.3 Vortex Station

The Experion vortex station (Figure 1.3.3) ensures complete mixing of RNA samples and loading buffers (supplied in the kits) in the chip wells. The Vortex adaptor securely holds the chip during the 1 minute vortex cycle.



Figure. 1.3.3. The Experion Vortex station (with and without chip inserted).

1.3.4 System Operation and Data Analysis Software

The Experion software program includes the controls to operate the electrophoresis station and the data analysis tools to assess the results. During a run, the software provides the ability to monitor run progress or review previous sample results. Refer to the instruction manual in the software for additional information and instructions.

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1.3.5 Analysis Kits (sold separately)

The three Experion analysis kits (Figure 1.3.5) contain the chips and reagents required to perform protein or RNA separation and analysis. The kits are available in both 10- and 25-chip configurations.



Figure. 1.3.5. The Experion Analysis kits.

The Pro260 Analysis Kit

The Experion Protein Analysis Kit resolves and quantitates protein samples from 10 to 260 kD in size. The high sensitivity of the kit is comparable to colloidal Coomassie SDS-PAGE gel staining. The Pro260 kit includes the Experion Pro260 ladder, a modified version of the Precision Plus Protein™ standards that have been optimized for use on the system. The Experion Pro260 ladder contains nine highly purified recombinant proteins with molecular weights from 10 to 260 kD for accurate sizing of samples analyzed on a chip. Each chip can separate up to 10 samples per analysis.

The RNA StdSens and HighSens Analysis Kits

The Experion RNA Analysis Kits offer one-step determination of RNA purity. Accurate quantitation is achieved through the combination of chip design innovations and a highly accurate RNA ladder, which is included in the kit. The RNA kits are available in nanogram (StdSens) and picogram (HighSens) sample concentration ranges. The RNA kits can analyze up to 11 (HighSens) or 12 (StdSens) samples.

Refer to the individual analysis kit instruction manuals for additional information.

1.4 Computer Requirements

- The minimum computer requirements: Pentium 3, 600 MHz, 512 K RAM, Windows 2000 or XP, USB port.
- The recommended computer requirements: Pentium 4, 2GHz, 512 K RAM, Windows 2000 or XP, multiple USB ports.

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1.5 System Setup

1.5.1 Software Installation

1. Insert the Experion CD-ROM into your computer. The installation program will start automatically and guide you through the installation process.
2. The installation program will place an application icon on your desktop, and create a folder named “Experion” under Programs in your Windows Start menu.
3. After installation, you must reboot your computer before using your Experion system.

1.5.2 Cable Connections

The **Electrophoresis station** is equipped with a universal power supply to operate from 100–120/220–240 VAC, 50–60 Hz.

1. Connect one end of the power cable supplied to the electrophoresis station and the other end to a grounded AC outlet rated 10 A/100–120/220–240 VAC (Figure 1.5.2a).
2. Connect the electrophoresis station to your PC via the USB 2.0 cable (Figure 1.5.2b).



Figure. 1.5.2a. Power connection for electrophoresis station.



Figure. 1.5.2b. USB 2.0 cable connection for electrophoresis station.

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The **Priming station** is equipped with a universal power supply that operates from 100–240 VAC, 50–60 Hz. Follow these steps to set up the priming station:

1. Connect one end of the power adapter cable to the priming station and the other end to a grounded AC outlet rated 10 A/100–240 VAC (Figure 1.5.2c).



Figure. 1.5.2c. Power connection on the priming station.

2. The priming station will automatically power up when the power cable is plugged in. There is no "on/off" switch.

The **Vortex station** comes in two different power configurations, 115 V or 230 V. Follow these steps to set up the vortex station.

1. Connect one end of the appropriate power cable to the vortex station, and the other end to a grounded AC outlet (Figure 1.5.2d).



Figure. 1.5.2d. Power connection on the vortex station.

Note: Be sure the power cord supplied with your vortex station matches your AC power requirements (115 V or 230 V). Only use a three-prong (grounded) power cord.

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1.5.3 Power Up and Establish Communication

Electrophoresis station

1. Turn on the power to the Experion electrophoresis station by pushing the green button in the front of the station (Figure 1.5.3a). The green LED, which is above the green button in the center of the front panel, will illuminate indicating the unit is on. If the LED does not light, then the unit is not receiving power (refer to Section 4, Troubleshooting).

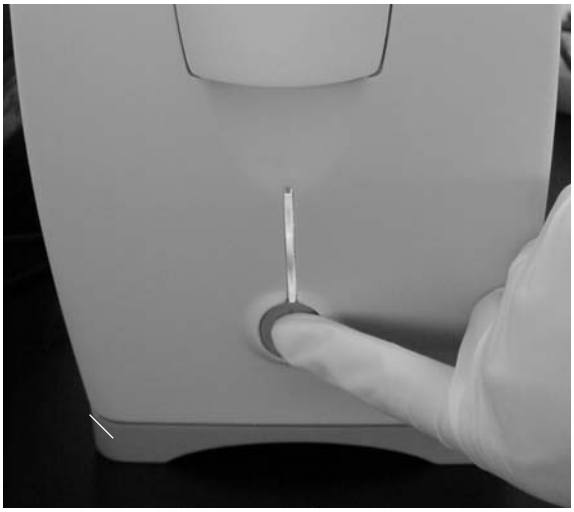


Figure. 1.5.3a. Powering up the electrophoresis station.

   Note: A blinking LED indicates that a chip is loaded and an analysis is in progress. Do not open the lid while the LED is blinking (opening the lid aborts the run).

2. Open Experion software program.
3. The appearance of an electrophoresis station icon in the upper left corner of the main software screen on the computer indicates that communication has been established between the computer and the electrophoresis station. A grayed-out instrument icon indicates that communication has not been established (refer to Section 4, Troubleshooting).

   Note: Please see the software manual for detailed instructions.

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Priming Station

1. The priming station will automatically power up when the cable connections are made. There is no "on/off" switch.
2. After power up the LCD screen will go through the following start up steps, (1) the initial screen will appear, (2) go blank, (3) display firmware revision number, and (4) load the default settings and display final screen (Figure 1.5.3b).



Figure. 1.5.3b. Final screen display for the priming station.

Vortex station

1. The rocker switch of vortex station has an “on” and “off” position. Once the rocker switch is set to the “on” position the vortex station will immediately start to rotate. After one minute the vortex station will stop and a “beep” will indicate the end of the cycle. To reset the vortex station, the rocker switch must be set to the “off” position, and then switched back to the “on” position for the cycle to repeat.

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Section 2
Procedures

Follow these suggestions to ensure clean and reproducible results:

2.1 Essential Practices

Storing and Preparing the Samples and Reagents

– Store all reagents at 4°C when not in use. Allow the gel solution to equilibrate to room temperature before using to prime the chip.

– Store the stains, sample buffer, and gel-stain solution in a dark location. The components in these reagents are sensitive to light.

– Before using, allow all kit reagents to equilibrate to room temperature (approximately 15–20 minutes). The Pro260 stain contains DMSO, and must be completely thawed before use. Keep the RNA ladder on ice.

– Gently vortex all kit reagents before use.

– To avoid contamination wear gloves and handle chips by the edges.

– Avoid sources of dust or other contaminants when preparing samples and loading the chip. Foreign particles in reagents, samples, or in the wells of the chip will interfere with the results.

Priming and Loading the Chip

– Do not load the chip when it is in the electrophoresis station. Primed chips may be loaded with sample and ladder in the priming station or on the benchtop.

– Always insert the pipette tip all the way to the bottom of the chip well when dispensing liquids. This practice will reduce the possibility of air bubbles being trapped between the reagent and the microchannels at the bottom of the chip wells.

– Avoid introducing air bubbles by dispensing chip reagents slowly. Do not expel air into the liquids.

– Use a primed and loaded chip immediately, or within 5 minutes. When chips are not used within the recommended time, reagents may evaporate, leading to poor results or a chip performance error.

Running the Analysis

– Fill all the chip wells when running an analysis: If necessary, use blank samples in unused sample wells.

  The suggested blank samples are:

  - For proteins–2 µl sample buffer plus 4 µl 1x PBS
  - For RNA–5 µl loading buffer plus 1 µl H_20

– Place the electrophoresis station on a sturdy surface where it will not be subjected to vibrations or other movement.

– While running an analysis, do not open the electrophoresis station lid. The run will abort if the lid is opened.

Cleaning the Electrodes

– Clean the electrodes immediately after EACH run to maintain the instrument in optimal condition. See Section 2.3 for instructions.

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2.2 Deep Cleaning the Electrodes

Please perform this Deep Cleaning Electrode procecure for the 16 electrode platinum pins of the electrode manifold (Figure 1a and 1b) in the Experion Electrophoresis station before use, and if serious RNase contamination is suspected. This procedure is important to obtain quality results, especially for RNA analysis.

For regular mainenance, the standard cleaning protocol specified in the Electrophoresis station instruction manual is sufficient (Section 2.3, Cleaning the Electrodes, and Section 5, Care and Maintenance). However, occasionally it is necessary to perform a deep cleaning of the electrode platinum pins of the electrode manifold.



Figure 1a. Open electrophoresis station lid showing the electrode manifold.

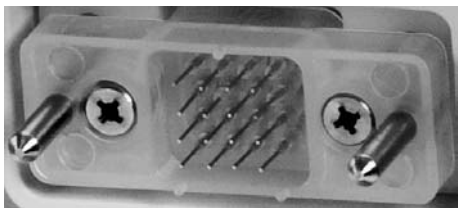


Figure 1b. Close up of the Electrode Manifold with 16 electrode platinum pins.

Additional Materials Required

1. Experion Electrode Cleaner, 250 ml, Bio-Rad catalog #700-7252.
2. Experion DEPC-Treated Water, 100 ml, Bio-Rad catalog #700-7253.
3. Foam Swabs, 3.3 mm head width, VWR catalog #TWTX757B or equivalent clean-room quality swab.

Deep Cleaning Procedure

This procedure is performed with the electrode manifold installed in the Experion Electrophoresis station.

1. Ensure the power to the Electrophoresis station is OFF.
2. Cover the chip platform to protect it from spray or liquid droplets (Figure 2). Prevent any liquid from soaking through to the chip platform. For example, cover first with plastic wrap and then with a paper towel.

   CAUTION: Do not get the chip platform wet.

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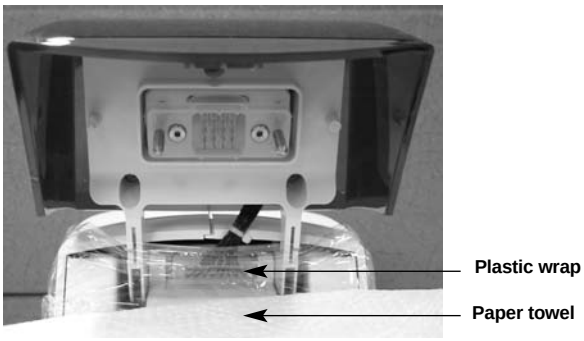


Figure 2. Cover the chip platform to protect it from spray or liquid droplets.

3. Add approx. 1 ml of Experion Electrode Cleaner to a microcentrifuge tube. Insert a swab into the tube until it is saturated with the electrode cleaner.
4. Carefully, clean each electrode platinum pin one at a time, on all four sides (top, bottom, left, and right faces) by moving the swab along the length of the pin (Figure 3a). Repeat for the remaining electrode platinum pins. Alternatively, move the swab up and down and side to side (Figure 3b) 2 to 3 times along the columns and rows of pins. Finally, clean the tips of each of the pins.

   Note: While cleaning, re-insert the swab into the tube of electrode cleaner solution frequently.

   CAUTION: Use caution not to bend the electrode platinum pins while cleaning.

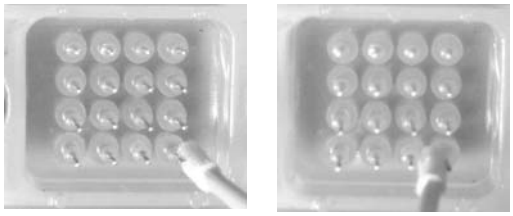


Figure 3a. Position the swab along the length of the pin on all four sides

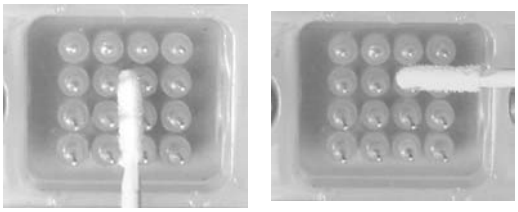


Figure 3b. Position the swab up and down and side to side along the columns and rows of pins.

5. Repeat steps 3 and 4 with a fresh swab soaked with Experion DEPC-Treated Water.

   Note: To ensure the electrode platinum pins are dry, blot them using a dry swab. Allow the pins to completely dry by leaving the lid open for at least 10 minutes.
6. If RNA StdSens or HighSens analyses are to be performed, follow the routine RNase decontamination procedure of the electrodes as instructed in the Electrophoresis station instruction manual, Section 2.3, page 13 or in Section 2.3 of the Experion RNA StdSens or HighSens Analysis Kit instruction manuals.

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2.3 Cleaning the Electrodes

The electrode cleaning procedures are necessary to prevent build-up and cross-contamination.

Important: Never store the cleaning chip inside the electrophoresis station. Store the empty cleaning chip covered to keep the wells clean.

Note: The cleaning chips are reusable.

2.3.1 Cleaning the Electrodes Before an RNA Analysis Run

This procedure should be performed daily. If RNase contamination is suspected, this procedure should be performed between each run.

1. Fill a cleaning chip with 800 µl Experion electrode cleaner. Check to make sure there are no air bubbles trapped in the reservoir. Gently tap the side of the cleaning chip to dispel any bubbles. Label this cleaning chip as the electrode cleaner chip.
2. Open the lid of the electrophoresis station and place the chip on the platform.
3. Close the lid and leave the chip in the instrument for 2 minutes.
4. Fill a separate cleaning chip with 800 µl DEPC-treated water. Label this cleaning chip as the DEPC water chip.
   - If this cleaning chip is being used for the first time, treat it with the Experion electrode cleaner to remove any RNase contamination prior to use
   - Fill a new cleaning chip with 800 µl Experion electrode cleaner. Let sit for 5 minutes
   - Wash the chip by adding 800 µl DEPC-treated water and letting it sit for 1 minute. Repeat the DEPC-treated water wash 4 more times
5. Open the lid and remove the cleaning chip containing the electrode cleaner; replace it with the chip containing the DEPC-treated water.
6. Close the lid and leave the chip in the instrument for 5 minutes to rinse the electrodes.
7. Replace the DEPC-treated water in the DEPC water chip and repeat the rinse step for 60 seconds.
8. Open the lid and remove the DEPC water chip.
9. Leave the lid open and wait about 30–60 seconds for any water remaining on the electrodes to evaporate.
10. When finished for the day, remove liquid from the cleaning chips.

2.3.2 Cleaning the Electrodes After an RNA Analysis Run

1. Fill the cleaning chip labeled DEPC water with 800 µl DEPC-treated water. Gently tap the side of the cleaning chip to remove any trapped bubbles from the wells.
2. Open the lid of the electrophoresis station and place the cleaning chip on the chip platform.
3. Close the lid and leave it closed for about 60 seconds.
4. Open the lid and remove the DEPC water chip.
5. Allow the electrodes to dry for 30 seconds.
6. Close the lid.
7. Replace the water in the cleaning chip after use to avoid contamination. For storage, remove the water from the cleaning chip and store the chip in a clean location.

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2.3.3 Cleaning the Electrodes After a Protein Analysis Run

1. Fill a cleaning chip with 800 µl deionized water (0.2 µm filtered). Gently tap the side of the cleaning chip to remove any trapped bubbles from the wells.
2. Open the lid of the electrophoresis station and place the cleaning chip on the chip platform.
3. Close the lid and leave it closed for about 60 seconds.
4. Open the lid and remove the cleaning chip.
5. Allow the electrodes to dry for 30 seconds.
6. Close the lid.
7. Replace the water in the cleaning chip after use to avoid contamination. For storage, remove the water from the cleaning chip and store the chip in a clean location.

2.4 Preparing the Reagents

Reagent preparation protocols are detailed in the Pro260, RNA StdSens, and RNA HighSens Analysis Kit instruction manuals.

2.5 Priming the Chip

Important: Use a primed and loaded chip immediately. When chips are not used within the recommended time (≤5 minutes), reagents may evaporate and lead to poor results.

1. The priming station should be plugged in and ready to go. If not, see Section 1.5.2.
2. To open the priming station, press the lever on the front. (Figure 2.4a)



Figure. 2.4a. Opening the priming station.

3. The entire green portion of the priming station will open to approximately an 80-degree angle.
4. Place a new chip onto the chip platform.

   Important: Confirm the chip placement is correct by matching the alignment arrow on the chip with the alignment arrow on the chip platform (Figure 2.4b). Additionally, the chips have alignment posts located on the underside of the chip caddy (next to the glass) that match with holes in the chip platform. These alignment features ensure correct positioning of the Pro260, RNA StdSens, and RNA HIghSens chips in the priming station.

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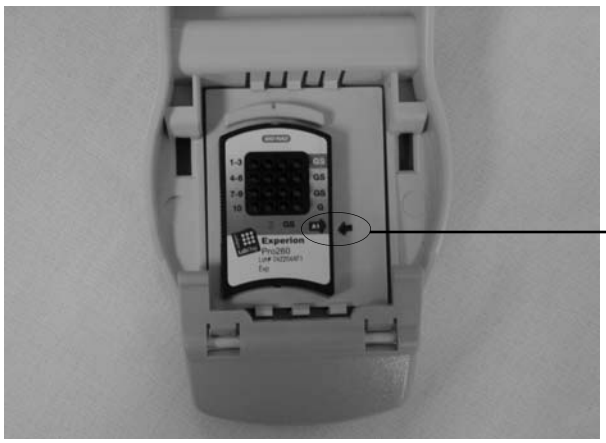


Figure. 2.4b. Proper chip placement in the priming station.

5. Add the required amount of gel-stain (GS) mix into the priming well (color-highlighted well labeled GS, Figure 2.4c) according to the procedures in the appropriate protein or RNA analysis kit manual.

   Important: Insert the pipet tip to the bottom of the well when dispensing liquids into the well. Placing the pipet at the edge of the well may create bubbles, which may lead to poor results. Expell the GS solution slowly to avoid creating bubbles.

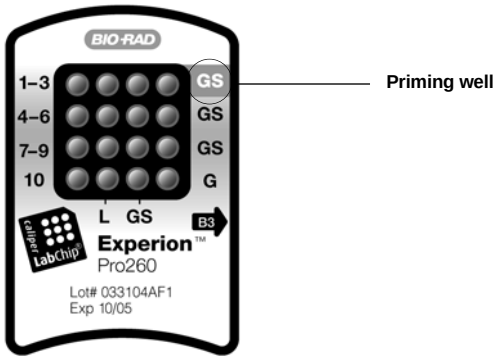


Figure 2.4c. Pro260 chip with priming well circled.

6. Close the priming station by gently pressing down on the front (Figure 2.4d). The lid should snap completely closed.



Figure. 2.4d. Closing the priming station.

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7. Enter the alphanumeric priming code printed in the alignment arrow of the chip (Figure 2.4e), to set the time and pressure settings. Push the “Time” button to scroll through the numeric time codes (Table 2.4), and the “pressure” button to scroll through the alphabetic pressure codes.

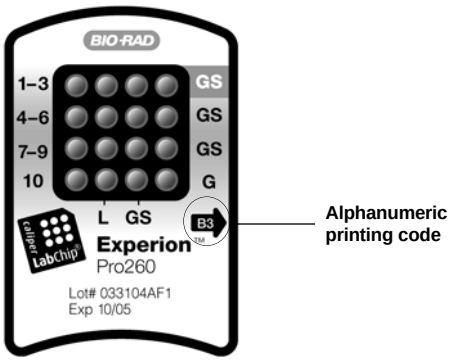


Figure 2.4e. Pro260 chip with alphanumeric priming code circled.

Table 2.4. Priming station time settings.

Setting	Priming Duration
1	30 sec
2	45 sec
3	1:00 min
4	1:15 min
5	1:30 min
6	2:00 min
7	2:30 min

8. Once the settings are selected, press the start button. The “Priming” message will appear on the LCD screen. The piston-barrel pump will be activated immediately to deliver the appropriate amount of pressure. There will be an audible sound from the piston motor moving.

   Important: If any of the following occurs when the Start button is pushed, a “Check seal” message will appear on the screen;

   (1) no chip in the priming station,

   (2) the chip is not situated properly on the platform,

   (3) the priming station is unable to maintain pressure because the seal is malfunctioning, or

   (4) the gel-stain was added to the wrong well.

9. The timer begins to count down once the piston is set at the appropriate pressure.
10. Once the timer reaches zero, the piston retracts, an audible signal sounds indicating the priming is complete, and the "Ready" message appears on the screen.
11. Press the lever in front to open the priming station.
12. Remove the chip, turn it over, and inspect the microchannels in the glass for air bubbles. The glass chip will appear opaque and the microchannels will be difficult to see once filled. If you detect a bubble, discard the chip and prime a new chip.

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13. Reposition the chip back on the chip platform or place the chip on the benchtop for sample loading.
14. Prepare and load samples, ladder, and other reagents according to the procedures detailed in the protein and RNA Analysis kit instruction manuals.

2.6 Vortexing the RNA Chip

The vortex station is used for RNA analysis. The sample and loading buffer are pipetted directly into the wells of the chips to minimize sample volume requirements. The vortexing cycle mixes the RNA samples and buffers thoroughly prior to placing the chip into the electrophoresis station.

1. After loading all of the wells on the chip, slide the chip under the two prongs of the vortex adapter. Make sure the chip is inserted all the way until it is seated inside the chip indentation in the green vortex adapter. (Figure 2.5)



Figure. 2.5. Inserting a chip into the vortex station.

2. Turn the rocker switch on the left side of the vortex station to the “on” position. It will start to mix immediately and run through the vortexing cycle for 1 minute.
3. After 1 minute, the vortex station stops automatically and an audible signal sounds. Remove the chip by slightly lifting up while sliding it from under the prongs.
4. Reset the vortex station by setting the rocker switch to the “off” position.

2.7 Running the Analysis

1. The electrophoresis station should be powered up and connected. If not, see Section 1.5.3.
2. Click on the Experion icon on the computer desktop to launch the Experion software.

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3. Gently lift the latch on the front to open the lid of the electrophoresis station (Figure 2.6a).



Figure. 2.6a. Opening the electrophoresis station.

4. Place the primed chip, which has been loaded with samples onto the chip platform (Figure 2.6b). Ensure that the chip is seated properly, and then carefully close the lid.



Figure. 2.6b. Proper chip placement in the electrophoresis station.

5. Click on the “New Run” button, and select the appropriate Experion analysis, Pro260, or one of the RNA analyses, StdSens or HighSens (total RNA or mRNA), in the analysis window.
6. Select a project. A text box is available to insert a name for the analysis run.
7. Click the Start button to begin the run. A dialogue box will appear. Select the number of samples to run. Click OK to start the analysis.

   Note: A blinking green LED, in the center of the front panel on the electrophoresis station indicates that an analysis is in progress. Do not open the lid, it will abort the run.
8. Both the electropherogram and gel views are available on the software screen to monitor the progress of the run.

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Note: During a run, you can review previous sample results by toggling between the lanes in the gel view.

9. When the run is finished, the “Run Complete” message is displayed. Remove the chip from the electrophoresis station and dispose of it properly. Leaving the chip in the instrument for an extended time may cause contamination of the electrodes.

   Note: The analysis chips are designed to be used once. Discard the analysis chips after use. The cleaning chips are reusable.

10. Follow the electrode cleaning procedures in Sections 2.3.2 and 2.3.3.

11. When finished for the day, empty the cleaning chip and close the lid on the electrophoresis station.

    Important: Never store the cleaning chip inside the electrophoresis station. Store the empty cleaning chip covered to keep the wells clean.

12. Data can be analyzed in the Experion software or it can be exported to a statistical program or database. For more information, see the online help section of the software.

Section 3
Data Storage and Analysis Software

Instructions for using the software analysis tools are provided in the online instruction manual/help in the software. Data files are stored in the default drive (C) in the Experion software folder.

Section 4
Troubleshooting

4.1 Electrophoresis Station

1. **Green LED at the center of the front panel is not illuminated**—Check the power cord connections; confirm that the power switch is in the “on” position.

2. **Experion icon on the software screen is grayed-out**—There is no communication between the computer and the electrophoresis station. Check the connections. Confirm that the power switch is in the “on” position. If the problem persists, reboot the computer.

3. **Chip error message is displayed onscreen**—The filling of one or more wells is inadequate and the electrode is not immersed. All sample wells must be filled, use blanks if necessary.

   Note: For protein blanks use 2 µl sample buffer plus 4 µl 1x PBS and for RNA use 5 µl loading buffer plus 1 µl H_2O. Alternatively, pipetting technique has introduced bubbles. Tap the chip or use a pipette tip to dislodge the bubble(s). When pipetting, place the tip all the way down and dispense toward the bottom of the well. Do not expel air into the well after dispensing reagents into the wells.

4.2 Priming Station

1. **LCD screen is blank**—Check the power cord connections. Also check for AC power at the outlet.

2. **Nothing happens when the Start button is pushed**—Confirm that there is a chip in the priming station and that the chip is properly positioned on the chip platform.

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3. **Timer fails to count down to zero after pushing the Start button**—Check/replace the priming seal (refer to Section 5, Care and Maintenance).
4. **Check Seal message lights up**—Check and replace the priming seal if needed. (See Section 5.2 for instructions)
5. **Service message and wrench icon appear**—Contact your local Bio-Rad office.
6. **After priming, a bubble is present in the microchannels**—Discard the chip. Be certain there are no bubbles at the bottom of the well when pipetting the gel solution into the priming well. When pipetting, place the tip all the way down and dispense toward the bottom of the well.

   Note: To reset the priming station, unplug it for a few seconds and then reconnect the power cord.

4.3 Vortex Station

1. **There is no movement and no sound**—Unplug power cord and check both fuses. If the fuses are OK the vortex station may require service, contact your local Bio-Rad Laboratories office.
2. **The adaptor does not move, but motor makes some noise**—Refer servicing to your local Bio-Rad Laboratories office.
3. **The vortex adaptor is damaged**—Replace the vortex adaptor, see ordering information in Appendix A and instructions in Section 5.3.

4.4 Sample Loading

1. **After sample loading, a bubble is present at the bottom of one or more chip wells**—Gently tap the chip to dislodge the bubble(s) or use a pipette tip to gently dislodge the trapped bubble. Generally, only bubbles at the bottom of the sample well pose a concern and should be removed prior to starting the analysis. A small number of bubbles on the top of the liquid are acceptable.

   Note: When pipetting, place the tip all the way down and dispense toward the bottom of the well.

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Section 5
Care and Maintenance



CAUTION:
Never place equipment in water or other liquids.

– To avoid electrical shock, never open the housing.

– Refer servicing to qualified personnel only.

– If the liquid you work with is aggressive to any of the materials list above, clean immediately upon contact.

5.1 Electrophoresis Station

– Use the cleaning chip after every analysis. For RNA analyses clean electrodes weekly with the Experion electrode cleaner and whenever RNase contamination is suspected.

– Do not leave the cleaning chip in the electrophoresis station longer than 10 minutes (don't store the cleaning chip in the instrument), as water may wick up the electrodes.

– There is no need to manually dry the electrodes after cleaning.

– Never place objects other than chips on the chip platform beneath the electrode manifold.

– Ensure that no liquid is spilled onto or into the electrophoresis station.

– Keep the lid down when the instrument is not in use so that the electrodes and optic system stay clean.

– Periodically wipe the electrophoresis station clean using a soft, lint-free cloth and deionized water.

– If the electrode platinum pins become damaged, replace the whole electrode manifold. To replace the electrode manifold, follow the instructions in Sections 5.1.1 and 5.1.2 (next).

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5.1.1 To Remove the Electrode Manifold

1. Disconnect the power cord and USB2 cable from the electrophoresis station.
2. Remove the green lid.
   a) Open the lid.
   b) Remove the three screws holding the lid (Figure 5.1a). Hold the lid when removing the screws so it doesn't fall.

      Caution: Be careful when removing screws. Do not allow them to fall into the electrophoresis station. If they fall into the electrophoresis station, call your local technical support group.

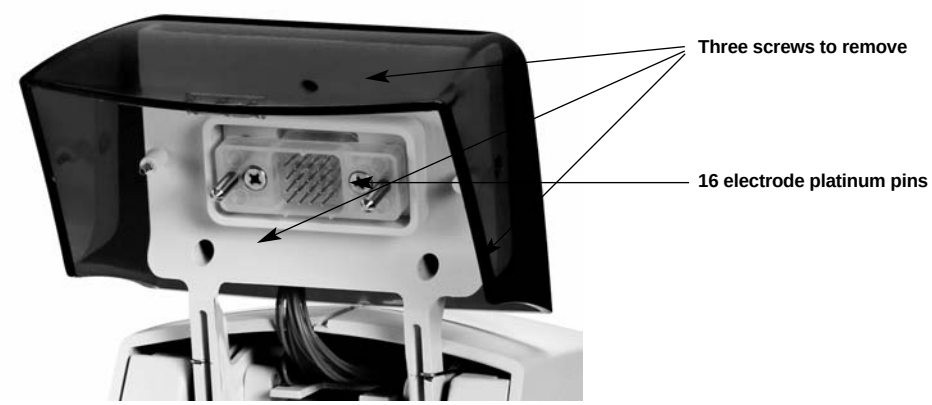


Figure 5.1a. Open electrophoresis station lid illustrating the location of the three screws to remove.

   c) Remove the lid and set it aside.
4. Follow the 16 electrode wires towards the back of where the lid was positioned on top. Slide your finger under the casing until it reaches a tab on the connector that holds the 16 electrode wires (Figure 5.1b).
5. Remove the connector by simultaneously using your finger to push down on the tab in the center of the connector and pulling straight on the wires.

   Important: Make sure you pull **straight** on the wires. Do not twist up and down or side-to-side, otherwise the wires may loosen from the connector.

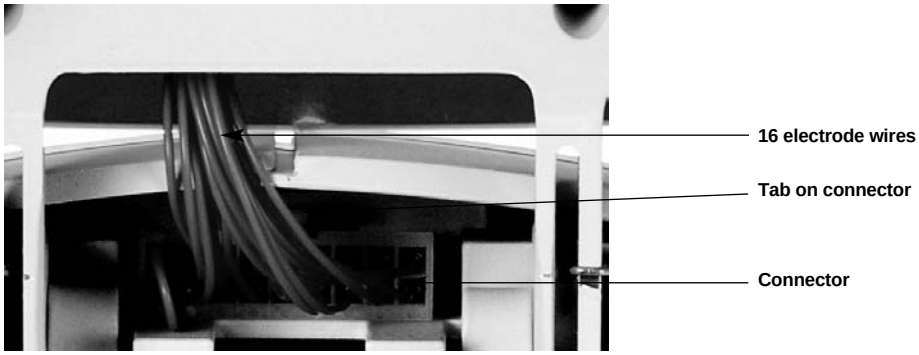


Figure 5.1b. Close up of the 16 electrode wires and connector.

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6. Remove the two screws on both sides of the 16 electrode platinum pins (Figure 5.1c). Watch for the springs when removing the screws, they will be loose.

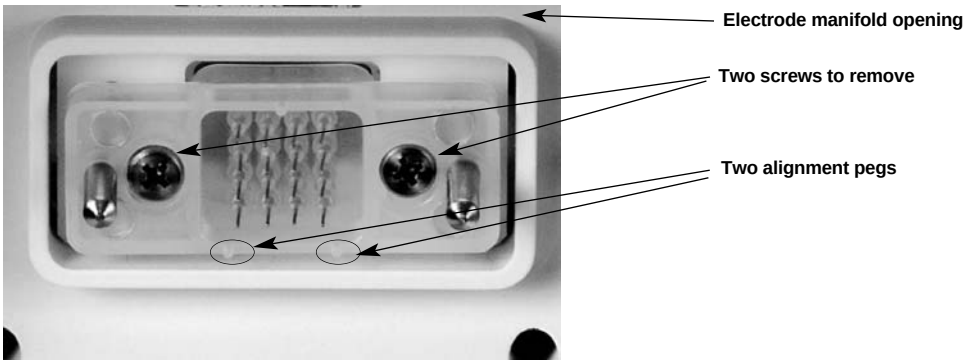


Figure 5.1c. Close up of Electrode Manifold illustrating the location of the two screws to remove.

7. Pull the electrode manifold forward.
8. Once the connector reaches the electrode manifold opening, rotate the connector 90 degrees to fit through the opening.
9. Discard the damaged electrode manifold.

5.1.2 To Install the Electrode Manifold

1. Insert the connector of the new electrode manifold through the electrode manifold opening by rotating it 90 degrees.
2. Make sure the electrode manifold is in proper position. The two alignment pegs beneath the 16 electrode platinum pins should be on the bottom, and three on top above the 16 pins (See Figure 5.1c).
3. Install the two screws on either side of the 16 pins. Make sure the springs are in position in the back.

   Note: The screws will tighten but the electrode manifold should not sit completely tight because of the springs.
4. Slide the connector under the casing and insert it by pushing **straight** back. You should here a soft click, indicating that it is in the correct position.

   Note: Be sure to push the connector in straight so that all the wire connectors are in the proper position. If it doesn't go in correctly, pull the wires straight out and try again.
5. Reinstall the green lid.
   a) Install the top screw.First insert the screw into the hole and then place the lid on top and then begin tightening the screw. Hold the lid when inserting the screw so it doesn't fall.
   b) Install the bottom 2 screws.

      Caution: Be careful not to trap the electrode wires when installing the bottom two screws.
   c) Check to make sure the lid is secure.
   d) Insert a cleaning chip. Open and close the lid to check that the lid was properly installed.

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5.2 Priming Station

– Replace the Priming seal every 3–4 months, or as needed if usage is heavy, to maintain optimal performance. To replace the priming seal follow the instructions below.

– If the “check seal” error message comes up on the LCD, it is time to replace the priming seal. To replace the priming seal use the following instructions.

52.1 To Remove the Priming Seal

1. Disconnect the power cord from the priming station.
2. Open the priming station.
3. Pull the priming seal tab forward to remove it (Figure 5.2a).

   Note: Hold the tab as close as possible to the seal.



Figure 5.2a. Close up of priming seal illustrating how to pull the tab forward.

5. Discard the used priming seal.

5.2.2 To Install the Priming Seal

1. Remove the new priming seal from the plastic bag.
2. Position the priming seal so the tab is located to the right.
3. Insert the seal into the hole. Use your thumb to push the seal back into position.

   Note: The cylinder-like portion of the seal has a ridge on one side. The ridge fits into a cutout in the seal opening of the priming station. If the ridge and cutout are not lined up properly, it may be difficult to insert.

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5.3 Vortex Station

– Unplug the vortex station.

– Clean carefully with damp cloth and warm water.

– Do not clean with acetone or other organic liquids, except alcohol.

– In extreme cases, mild alcohols may be used.

– Rinse and dry thoroughly.

– If the vortex adaptor becomes damaged replace the whole adaptor. To replace the vortex adaptor follow the instructions below.

5.3.1 To Remove the Vortex Adaptor

1. Disconnect the power cord from the vortex station.
2. Remove the three screws on top of the vortex adaptor.
3. Pull the vortex adaptor straight up to remove.
4. Discard the damaged vortex adaptor.

5.3.2 To Install the Vortex Adaptor

1. Align the new vortex adaptor with the posts in the vortex station.
2. Install the three screws.

   Caution: Do not over tighten the screws.
3. Plug the vortex adaptor in and turn it on.
4. Make sure the vortex adaptor doesn't rattle or move incorrectly. If it does, then check the screws and make sure they are securely installed.

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Section 6
Specifications

6.1 Electrophoresis Station

Electrophoresis Station Material Specifications

Casing	ABS + Polycarbonate (in cadet gray)
Lid	Polycarbonate (in translucent green)
Open latch	Polycarbonate (in kahki stone)
Rubber feet	Thermoplastic Rubber (TPR)
Power button	ABS + Polycarbonate (in green)

Electrophoresis Station Technical Specifications

Power supply	100–120/220–240 V AC 50/60 Hz, 31 VA
Power indicator	LED
Electrode wires	90% Platinum 10 % Iridium alloy, 0.5 mm dia.
Laser	Photo diode
Laser Safety	Class 1 Product (non-hazardous)
Detector	Photo emmission
Voltage limit	2200 volts (when multiple channels are driven)
Operating conditions	15–40°C, 0–90% humidity
Safety conformances	
USA	IEC 61010-1, EN 61010-1:2001 and UL 61010-1
Canada	CAN/CSA C22.2 No. 61010-1
EMC compliance	EN 61326:Class A
Computer connection	USB 2.0 cable
Weight	4.58 kg (10 lbs. 1 oz)
Dimensions (W x D x H)	15 x 31 x 29 cm (5.9 x 12.2 x 11.4 in.)

6.2 Priming Station

Priming Station Material Specifications

Base casing	Glass-filled polycarbonate (in cadet gray)
Lid	Polycarbonate (in translucent green)
Open latch	Polycarbonate (in kahki stone)
Rubber feet	Thermoplastic rubber (TPR)
Priming seal	Silicone rubber

Priming Station Technical Specifications

Power supply	100–120/220–240 V AC 50/60 Hz, 31 VA
Pressure range	50–125 psi
Time range	30–150 seconds
Display	LCD
Safety conformances	
USA	IEC 61010-1, EN 61010-1:2001 and UL 61010-1
Canada	CAN/CSA C22.2 No. 61010-1
EMC compliance	EN 61326:Class A
Weight	1.36 kg (3 lbs)
Dimensions (W x D x H)	9.5 x 26 x 7.5 cm (3.7 x 10.2 x 3.0 in.)

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6.3 Vortex Station

Vortex Station Material Specifications

Casing	Zinc die cast
Paint on casing	Polyurethane (in cadet gray)
Front panel	Polyester
Platform	Polyamide
Rubber foot	Neoprene
Vortex Adapter	Polycarbonate (in translucent green)

Vortex Station Technical Specifications

Power supply	115 V AC 50/60 Hz, 31 VA or 230 V AC 50/60 Hz, 31 VA
Wire	2 + ground (single phase)
Fuse	2 x 630 mA (115 V) or 2 x 400 mA (230 V)
Time setting	60 seconds (1 minute)
Eccentric Orbital Movement	4.5 mm
Safety conformances	
USA	IEC 61010-1, EN 61010-1:2001 and UL 61010-1
Canada	CAN/CSA C22.2 No. 61010-1
France	CEI 1010-1
Germany	DIN EN 61010-1 Class. VDE 0411
EMC compliance	EN 61326:Class A
Weight	3.5 kg (7 lbs. 7 oz)
Dimensions (W x D x H)	11.5 x 22.7 x 7.7 cm (4.5 x 8.9 x 3.0 in.)

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Appendix A
Ordering Information

Catalog #	Descriptions
Experion Systems	
700-7000	**Experion System, for protein analysis**, 100120/220–-240 V, includes the electrophoresis station, priming station, software, USB2 cable, test chip and instructions (analysis kits sold separately)
700-7001	**Experion System, for RNA analysis**, 115 V, includes the electrophoresis station, priming station, vortex station, software, USB2 cable, test chip and instructions (analysis kits sold separately)
700-7002	**Experion System, for RNA analysis**, 230 V, includes the electrophoresis station, priming station, vortex station, software, USB2 cable, test chip and instructions (analysis kits sold separately)
Electrophoresis station and replacement parts	
700-7010	**Experion Electrophoresis Station**, 100120/220–-240 V, includes USB2 cable, test chip and instructions
700-7020	**Experion Electrode Manifold**, replacement
700-7021	**Experion Lid**, replacement
700-7022	**Experion USB2 Cable with Ferrite**, replacement, revision 2.0
Priming station and replacement parts	
700-7030	**Experion Priming Station**, 100–120/220–240 V, two priming seals, instructions
700-7031	**Experion Priming Seal**, replacement for priming station, provides air seal on top of priming well, 2
Vortex station and replacement parts	
700-7040	**Experion Vortex Station**, 115 V
700-7041	**Experion Vortex Station**, 230 V
700-7042	**Experion Vortex Adapter**, holds analysis chip in vortex station
Experion Software	
700-7050	**Experion Software**, system operation and data analysis tools, PC
Analysis Kits	
700-7101	**Experion Pro260 Analysis Kit for 10 Chips**, includes 10 Pro260 chips, 3 x 520 µl Pro260 gel, 45 µl Pro260 stain, 60 µl Pro260 ladder (10–260 kD), 400 µl Pro260 sample buffer, 3 spin filters
700-7102	**Experion Pro260 Analysis Kit for 25 Chips**, includes 25 Pro260 chips, 5 x 520 µl Pro260 gel, 2 x 45 µl Pro260 stain, 2 x 60 µl Pro260 ladder (10–260 kD), 2 x 400 µl Pro260 sample buffer, 5 spin filters
700-7103	**Experion RNA StdSens Analysis Kit for 10 Chips**, includes 10 RNA StdSens chips, 1,250 µl RNA gel, 20 µl RNA StdSens stain, 20 µl RNA ladder, 900 µl RNA StdSens loading buffer, 2 spin filters

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Catalog #	Descriptions
700-7104	**Experion RNA StdSens Analysis Kit for 25 Chips**, includes 25 RNA StdSens chips, 2 x 1,250 µl RNA gel, 2 x 20 µl RNA StdSens stain, 2 x 20 µl RNA ladder, 2 x 900 µl RNA StdSens loading buffer, 4 spin filters
700-7105	**Experion RNA HighSens Analysis Kit for 10 Chips**, includes 10 RNA HighSens chips, 1,250 µl RNA gel, 20 µl RNA HighSens stain, 20 µl RNA ladder, 900 µl RNA HighSens loading buffer, 100 µl RNA sensitivity enhancer, 2 spin filters
700-7106	**Experion RNA HighSens Analysis Kit for 25 Chips**, includes 25 RNA HighSens chips, 2 x 1,250 µl RNA gel, 2 x 20 µl RNA HighSens stain, 1 x 20 µl RNA ladder, 2 x 900 µl RNA HighSens loading buffer, 2 x 100 µl RNA sensitivity enhancer, 4 spin filters
Additional Chips and Reagents	
700-7151	**Experion Pro260 Chips**, 10
700-7152	**Experion Pro260 Reagents and Supplies,** for 10 chips
700-7153	**Experion RNA StdSens Chips**, 10
700-7154	**Experion RNA StdSens Reagents and Supplies,** for 10 chips
700-7155	**Experion RNA HighSens Chips**, 10
700-7156	**Experion RNA HighSens Reagents and Supplies,** for 10 chips
700-7251	**Experion Cleaning Chips**, 10
700-7252	**Experion Electrode Cleaner**, 250 ml
700-7253	**Experion DEPC-treated Water**, 100 ml
700-7255	**Experion Spin filters**, 10

Appendix B
References and Legal Notices

References

Thorsen T, Maerkl SJ, and SR Quake, Microfluidic large-scale integration, Science 298, 580–584 (2002)

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