

SETTING UP THE PUMP

Unpack the Pump

The SIGMA Spectrum is packaged to provide protection during transportation and storage. When unpacking the pump, remove the Spectrum from the protective anti-static bag, remove the protecting foam end caps and discard the desiccant package.

A battery tab isolates the battery voltage from the pump during transport and distribution. Remove the battery insulating tab prior to charging the pump's battery or operating the pump. To remove the battery tab, pull the tab away from the Battery Pack mounting cavity. (See Figure 7.)



Figure 7. Battery Tab.

1. Save all packaging materials, except for the desiccant package, for reuse. This is advised in the event product repair or warranty replacement is necessary.
2. Fully charge the battery prior to use.
3. For battery charge specifications see “Battery Power and Capacity” section, beginning on page 88.

AC Power Adaptor

CAUTION: Only use the power adaptor specified for this equipment. Using other power adaptors may cause personal injury or damage to equipment.

When plugged into a powered wall outlet, the AC Power Adaptor charges the pump's battery. The AC Power Adaptor uses a locking cord connection to prevent inadvertent disconnection.

NOTE: Avoid dropping AC Power Adaptors on the floor. Drops will cause them to malfunction. As with all electronic devices, drops should always be prevented.

Cleaning the Power Adaptor

CAUTION: The Power Adaptor with Protector is compatible with the cleaners mentioned in this Operators manual. For the methods of cleaning and compatible cleaners that can be used on the AC Power Adaptor with Protector, see “Cleaning and Storage” section, beginning on page 70.

Connecting the Power Adaptor

To engage the Power Adaptor:

1. Insert the Power Adaptor module into the appropriate powered outlet receptacle.
2. The green LED on the Power Adaptor is on when the adaptor is plugged into a powered wall outlet. (See Figure 9.)
3. A plug symbol appears in the top left corner on the Spectrum Pump display, if the Power Adaptor is working properly when the pump is in operation. (See Figure 8.)



Figure 8. External Power Symbol.

Removing the Power Adaptor

NOTE: Improper removal may damage the AC Power Adaptor.

To remove the AC Power Adaptor, grasp the handle of the Protector and pull it back from the receptacle in a straight direction. (See Figure 9.).

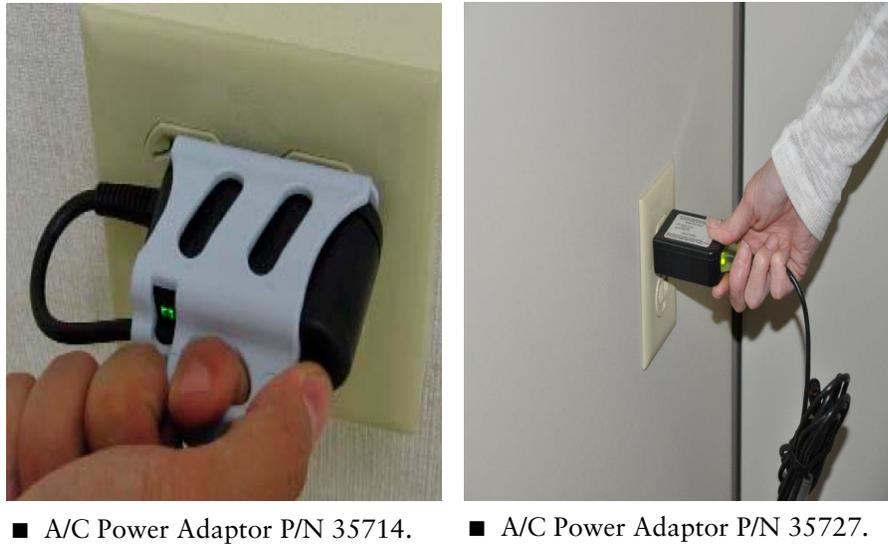


Figure 9. Pull the adaptor straight out.

Do not pull the adaptor at an angle. This could bend the prongs. Do not pull the cord to unplug the adaptor from the receptacle. Improper twisting or pulling of the connector or cord may damage the power supply.

Charging the Battery

When the SIGMA Spectrum is connected to the AC Power Adaptor and the adaptor is plugged into a powered outlet receptacle, the pump's Standard Battery Pack or Wireless Battery Module will be charged to full capacity. It is not necessary to turn the pump on.

Refer to "APPENDIX G - Icons" section, beginning on page 111 for a listing of the symbols used and their description.

Configuring User Options

The Spectrum Pump has two sets of configuration options:

- User options
- Biomed options



WARNING: Operation is Limited to Trained and Tested Operators

SIGMA Spectrum operation is strictly limited to trained operators whose competency in safe Spectrum operation and in safe IV therapy practices has been tested and proven. Pump owners have sole responsibility for operator training and testing even when SIGMA personnel assist in training processes.

NOTE: For a description of the Biomed options, refer to the SIGMA Spectrum Service Manual (P/N 41019).

User Options

To access the User Options menu:

From the Care Area selection screen:

1. Press the **OPTIONS** soft key.
2. Select User Options from the menu and press **OK**.

From the RUN or STOPPED screen:

1. Press the **OPTIONS** soft key.

The User Options menu has three categories:

- Alarm Settings
- Display Settings
- View Information

1. Alarm Settings

- **Audio** – Speaker actuated audio alarm.
- **Audio Volume** – The audio volume of the pump has three levels; **LOW**, **MEDIUM**, and **HIGH**.
 - Audio Volume may be preset in the Master Drug Library Editor. The default setting is “Use Pump Setting”. “Use Pump Setting” is adjustable at the pump.
- **Audio Tone** – The audio tone has two types of tones, short and long. Set the type of alarm tone required.
- **Standby (hr:min)** – Set the length of time to keep the pump in Standby (or Hold) after setup of the infusion has completed. Settings are from 00:01 to 99:59 (hr:min). Setting the value to 00:00, or Infinite, results in an infinite Hold period.
- **Near-Empty alert** – When enabled, a Near-Empty alert is displayed when 30 minutes or less of infusion remains. If the initially programmed infusion is less than 30 minutes, the alert shall not be generated regardless of the setting.

- Near-Empty alert has three settable options in the Master Drug Library Editor, ON, OFF, or “Use Pump Setting”. The default setting is “Use Pump Setting”. “Use Pump Setting” is adjustable at the pump
- **Downstream Pressure Limit** – The Downstream Pressure limit has three levels: LOW (6 psi \pm 4 psi), MEDIUM (13 psi \pm 6 psi), and HIGH (19 psi \pm 9 psi).
 - The default Pressure Limit may be preset for a Care Area in the Master Drug Library Editor. The default setting is “Use Pump Setting”. “Use Pump Setting” is adjustable at the pump.

NOTE: An icon (see Figure 10.) shall be displayed next to any configuration item in the options menu (User or Biomed) whose setting has been assigned in the Master Drug Library Editor.



Figure 10. Icon indicating setting assigned in MDL.

2. Display Settings

- **Run Screen Options** – Each of the items in this list may be turned ON or OFF. If enabled, they are included in the alternating screens that are displayed while the pump is running.
 - Audio level indicator – Shows L, M, or H (as selected in Audio Volume).
 - Rate mL/hr – Shows the mL/hr infusion rate of the current delivery.
 - Dose rate – Shows the dose rate of the current delivery.
 - mL VTBI – Shows the remaining Volume To Be Infused, in mL.
 - Time (hr:min) – Shows the time remaining in the current infusion, in hr:min format.
- **Display Adjust**
 - Backlight Level – The display backlight level may be adjusted from 1 to 10 (with 10 being the highest) or turned OFF. The backlight consumes approximately 400 mW when set to maximum brightness; therefore, battery life is maximized when the backlight is set to OFF.

3. View Information

- **Pump Information** – The pump information screen has the following read-only information that either the user (clinician) or Bio-Medical Engineer may find useful.
 - SW Version
 - Serial number – The serial number assigned by SIGMA for tracking and device history.
 - Tube type – The name of the IV tube set manufacturer that the device is calibrated for use with.
 - Wireless Module
- From the Pump information screen, press the **sw info** soft key to display the Software Version screen, which show the versions of the individual software components that are installed.
 - SW Version
 - Sharp
 - PIC

- CPLD
- SmartBatt Charger build
- Network Module
- **Library Information** – The library information screen identifies the name of the Active Drug Library in pump memory as well as the Name, Date Modified, Version Number, Format Indicators, Drugs, Care Areas and Advisories.
- **Show Clinical Advisory** – If the current infusion has a clinical advisory associated with it, selecting this option will display the advisory. If the current infusion does not have a clinical advisory associated with it, this option is not selectable and appears in grey text in the display.
- **Infusion Information** – The infusion information screen identifies the infusion-specific primary and secondary bag parameters that are not otherwise displayed on the setup screen. The information includes the following information for each bag (if programmed): audio level, near empty alert status (primary only), pressure setting, KVO rate (primary only), and primary siphoning alert or secondary complete alert status (secondary only).
- **History Log** – Selecting this option provides access to the event log. Available options for viewing the log are listed below.
 - NOTE:* Access to this option is provided only when the pump is not running (delivering). If the pump is running, this option is not selectable and appears in grey text in the display.
- **View History Log** – Select this option to view the entire history log on the pump screen.
- **View System Error Log** – Select this option to view only the system errors recorded in the history log.
- **View Drug Error Log** – Select this option to view only the events associated with programming an infusion; including any drug limits that may have been exceeded during setup.
- **Dump History Log** – Select this option to send the entire history log out of the pump via the IrDA port (refer to the Logging section of the SIGMA Spectrum Service Manual, (P/N 41019).