

## Clinician Guide



### CADD®-Solis VIP Ambulatory Infusion Pump Model 2120



# Contents

Description of the CADD®-Solis VIP Pump .....	1
Indications .....	1
Pump Diagram .....	2
Pump Descriptions .....	2
Pump Screens .....	4
Security Settings .....	5
Programming the Pump .....	8
Start New Patient – Single Protocol .....	8
Start New Patient – Protocol Library .....	9
Delayed Start / Next Dose Start Time .....	10
Edit / View Delivery Settings .....	11
Review Pump Settings .....	12
PCA Delivery Mode .....	12
Continuous Delivery Mode .....	15
Intermittent Delivery Mode .....	16
Step Delivery Mode .....	17
Taper Delivery Mode .....	20
Operating the Pump .....	23
Power Sources .....	23
Installing Batteries or a Battery Pack .....	23
Replacing the Battery Door .....	24
Power Up .....	24
Power Down .....	24
Cassettes .....	24
Prime Tubing .....	26
Start the Pump .....	28
Stop the Pump .....	28
Reset Reservoir Volume .....	29
Tasks and Advanced Tasks .....	29
Task Menu Overview .....	29
Display and Sound Settings .....	30
Time and Date .....	31
Reports .....	33
Advanced Tasks Menu Overview .....	33
Patient Permissions .....	34
References and Troubleshooting .....	35
Alarms and Messages .....	35
Troubleshooting .....	37
Alarms and Messages, Alphabetical List .....	37

*For detailed instructions, specifications, warnings and additional information on the CADD®-Solis VIP ambulatory infusion pump, please refer to the User Manual for this product.*

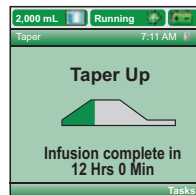
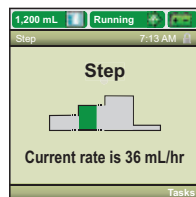
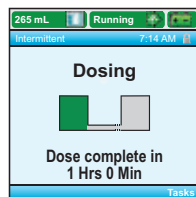
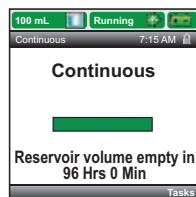
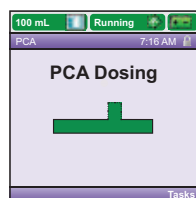
## Description of the CADD®-Solis VIP Pump

The CADD®-Solis VIP ambulatory infusion pump provides measured drug therapy to patients in hospital or outpatient settings. Therapy should always be overseen by a physician or a certified, licensed healthcare professional. As appropriate, the caregiver and patient should be instructed in using the pump.

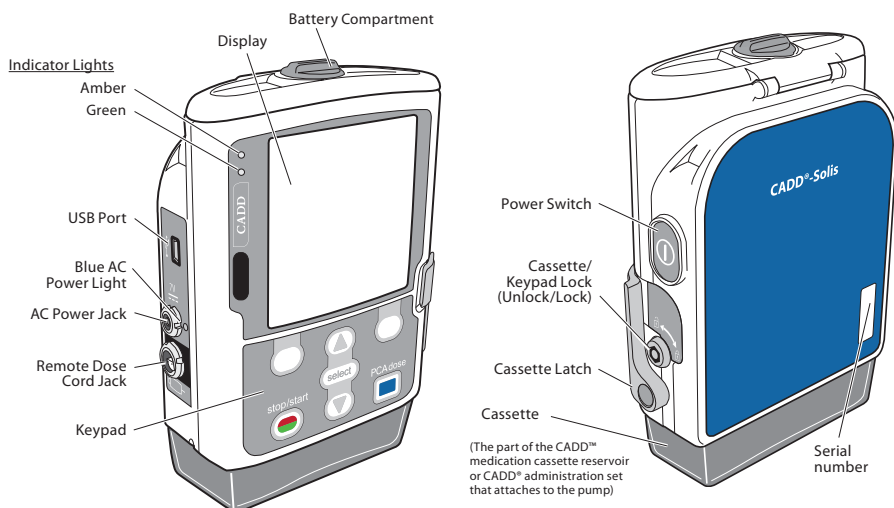
### Indications

The CADD®-Solis VIP ambulatory infusion pump is indicated for intravenous, intra-arterial, subcutaneous, intraperitoneal, perineural, surgical site, epidural space, or subarachnoid space infusion.

- > **PCA** (patient controlled analgesia) delivery is used for therapies that require a continuous rate of infusion, patient-controlled demand doses, or both, such as patient-controlled analgesia
- > **Continuous delivery** allows the infusion of drug/fluid at a constant, programmed rate
- > **Intermittent delivery** allows the infusion of a specific volume of drug/fluid at a regular, programmed interval
- > **Step delivery** allows an incremental increase in infusion rate to a specified maximum infusion rate for a specified total infusion volume
- > **Taper delivery** allows a plateau rate of infusion with the option of tapering at the beginning and/or end and has a programmable KVO rate at the end of the infusion



## Pump Diagram



## Pump Descriptions

### Indicator Lights

- > **Green** – Flashes when the pump is running and delivering fluid as programmed
- > **Amber** – Flashes when the pump is stopped, an alarm condition exists, or the battery or the reservoir volume is low. It stays on continuously when the pump is inoperable.

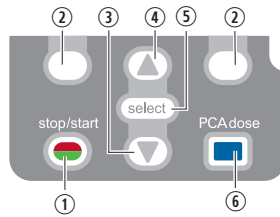
***Note:** If both lights flash the pump is running but there is a condition that needs attention.*

**Display with Backlighting** - The display shows programming information and messages. If no keys are pressed after a period of time, the backlight turns off and the display goes blank to save battery power (except during an alarm or when the AC adapter is in use). Press any key to turn the display back on except the PCA dose key when in PCA mode.

**Power Switch** - Turns the pump on or off. Press and hold the switch.

**Power Jack** - The AC adapter can be plugged into the power jack. When the AC adapter is plugged in, the blue power light turns on. The light is on regardless of the pump's on or off status.

## Keypad



- |               |   |
|---------------|---|
| 1. stop/start | Start and stops pump delivery   |
| 2. soft keys  | Answer questions on the pump's display or navigate through pump screens                           |
| 3. ▼          | Navigates through the pump menus, scrolls down or decreases values                                |
| 4. ▲          | Navigates through the pump menus, scrolls up or increases values                                  |
| 5. select     | Selects a menu item   |
| 6. PCA dose   | Requests a PCA dose if the remote dose cord is not connected and the PCA dose option is available |

**USB Port** - A mini-B USB cord can be attached to the USB port for communication with the CADD®-Solis medication safety software

**Remote Dose Cord Jack** - Used for attaching the remote dose cord to the pump

**Battery Compartment** - Four AA batteries or the rechargeable battery pack fit into this compartment. The batteries are the primary source of power or serve as a back-up when the AC adapter is in use.

**Cassette Latch** - Used to attach the cassette to the pump

**Cassette / Keypad Lock** - Secures the cassette to the pump using the pump key. The cassette latch must be closed before it can be locked.

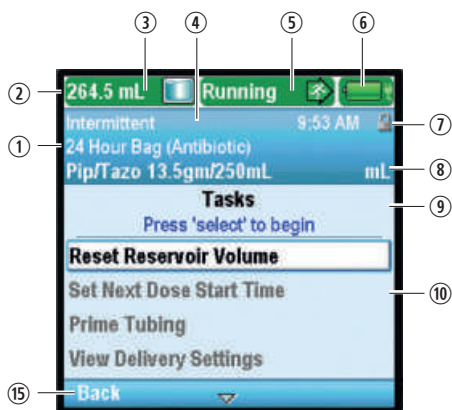
**Air Detector** - The air detector can be turned on or off, depending on facility or therapy requirements. If it is turned on and air is detected in the part of the tubing that passes the air detector sensor, an alarm sounds and delivery stops.

**Downstream Occlusion Sensor** - When a downstream occlusion (between the pump and the patient) is detected, an alarm sounds, delivery stops and the display shows a message

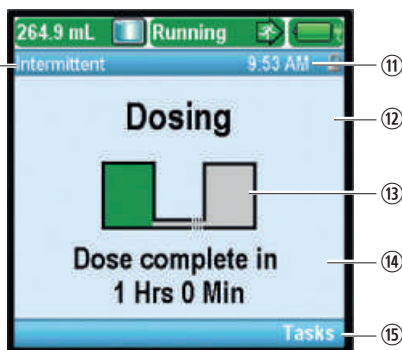
**Upstream Occlusion Sensor** - When an upstream occlusion (between the pump and the reservoir) is detected, an alarm sounds, delivery stops and the display shows a message

## Pump Screens

The sample screens shown below are only examples of what might be displayed. The protocols and all associated pump settings will be established by your facility.



Menu Screen



Home Screen

1. The therapy, qualifier and drug in the current protocol. On a home screen, only the therapy is listed.
2. The status bar shows the status of the pump. It may also display messages and alerts.
3. Current reservoir volume
4. The screen color is unique for each therapy
5. Delivery status of the pump – stopped or running
6. The type of battery in use, the approximate amount of life remaining and if an AC adapter is in use



AA batteries



AA batteries  
with  
AC adapter



Rechargeable  
battery pack



Rechargeable  
battery with  
AC adapter

7. Keypad lock status – locked or unlocked
8. Units of measurement and concentration (if applicable) for the drug or solution used in the current protocol
9. Screen name and blue help text, if any

10. The work area/contents for the displayed screen
11. The current time
12. The current status of the programmed infusion
13. Graphic that identifies which therapy is programmed and the status of the infusion
14. Information indicating important upcoming events
15. Options for navigating the pump that change depending on the screen and the functions being performed

## Security Settings

Security settings are used to limit patient and unauthorized access to certain programming and operating functions of the pump. Pump functions are protected by three different security codes that can be customized.

**Keypad Code** - The keypad code is for clinicians who need to modify and review patient-specific parameters and manage air and occlusion parameter settings.

**Clinician Code** - The clinician code allows access to all the functions the keypad code allows. In addition, it allows users to modify most advanced task settings, format the time and date, change delayed start and priming security options, and select new protocols.

**Administrator Code** - The administrator code allows access to all pump functions and allows users to change protocol ranges for delivery settings, reset the pump to factory defaults, and select manual mode protocols.

## Security Levels

Pump Operations and Tasks	Available without a security code		Available with keypad code		Available with clinician code	
	Running	Stopped	Running	Stopped	Running	Stopped
Stop/Start 	✓	✓	✓	✓	✓	✓
PCA Dose  (PCA only)	*		*		*	
Reset Reservoir Volume		✓		✓		✓
Taper Down Now (Taper only)	✓		✓		✓	
Taper Down Period of Taper Down Now (Taper only)			✓		✓	
Set Delayed Start (not available in Intermittent)		*		✓		✓
Next Dose Start Time (Intermittent only)		*		✓		✓
Prime Tubing		*		✓		✓
View Delivery Settings	✓	✓	✓	✓	✓	✓
Edit Delivery Settings (Therapy type determines which submenus appear)				✓		✓
Display and Sound Settings menu	✓	✓	✓	✓	✓	✓
Backlight Intensity	✓	✓	✓	✓	✓	✓
Alarm Volume	✓	✓	✓	✓	✓	✓
Sound Theme	✓	✓	✓	✓	✓	✓
Key Beep On/Off	✓	✓	✓	✓	✓	✓
Numeric Format						✓
Change Time and Date menu		✓		✓		✓
Current Time		✓		✓		✓
Current Date		✓		✓		✓
Time Format						✓
Date Format						✓
View Reports	✓	✓	✓	✓	✓	✓
View Advanced Tasks (see <i>Security Levels</i> , <i>Advanced Tasks</i> on page 20)	✓	✓	✓	✓	✓	✓

**Table Key:**  Yes  No  Availability based on facility protocol

The Administrator code allows access to all of the above operations and tasks, while stopped.



Advanced Tasks	Available without a security code		Available with keypad code		Available with clinician code	
	Running	Stopped	Running	Stopped	Running	Stopped
Step Down (Step only)	✓	✓	✓	✓	✓	✓
Step Up (Step only)			✓	✓	✓	✓
Give Clinician Bolus (PCA only)					✓	
Patient Permissions						✓
Air and Occlusion Settings				✓		✓
Alarm Settings						✓
Security Settings menu						✓
Keypad Security						✓
Keypad Code						✓
Clinician Code						✓
Admin Code						
Manual Programming Security						
Start New Patient						✓
Select a manual mode protocol						*
Start New Protocol Same Patient						✓
Select a manual mode protocol						*
Delivery Hard and Soft Limits menu (Therapy type determines which submenus appear)						
Reset to Factory Settings						

**Table Key:**  Yes  No  \* Availability based on facility protocol

The Administrator code allows access to all of the above operations and tasks, while stopped.

## Autolock

The autolock feature reduces the chance of unauthorized pump programming. When the keypad is unlocked with a security code and left unlocked, the software automatically locks the keypad. When the pump is on the home screen, the autolock feature takes effect 30 seconds after the last key press. Autolock takes longer on programming or task screens when you typically need more time to perform an action. Depending on which screen was on the pump last, and if the pump is not alarming, it can take up to four minutes after the last key press before the pump reverts to the home screen and autolocks immediately. When the pump is alarming, autolock does not take effect.

**Note:** The keypad can be re-locked by pushing the right soft key twice from the home screen or once from the Tasks or Advanced Tasks menu. As a recommended safety precaution, always manually lock the pump using this feature.

## Entering Security Codes

Press ▲ or ▼ to scroll to the correct digit. Press **Select** or **Accept Value** to advance to the next digit. Once the complete code has been entered, press **Select** or **Accept Value**.

If an incorrect code is entered, a wrong code error appears. Select **Retry** to enter the code again.

**Note:** If you enter a code that you believe is correct and receive a wrong code message, check the screen to see if the code has been customized.

Depending on the level of security required and how the security settings have been programmed, you may be able to use the pump key to unlock the keypad. To unlock the keypad with the pump key, turn the key counterclockwise.

# Programming the Pump

## Start New Patient - Single Protocol

To start a new patient using the single protocol that was downloaded to the pump:

1. Power on the pump. The pump will display the home screen.
2. Attach a cassette. (see page 25 for instructions)
3. You will be prompted to prime the tubing. (see page 26 for instructions)
4. Depending on your facility's policies and procedures, one of two messages will appear on the screen:

- a. "Review pump settings" may appear on the screen.
  - > Press the right soft key **Review**
  - > Unlock the keypad, if required, the delivery settings will appear
  - > Review and accept each delivery setting by pressing the right soft key **Accept Value**
  - > If any of the delivery setting values need to be edited, press the **Select** key
  - > Once all the values have been accepted, press the right soft key **Next**
  - > "Start Pump?" appears, choose **Yes**
- b. "Start Pump?" may appear on the screen  
 Choose **No**. The home screen will appear. To review the delivery settings before starting the infusion:
  - > Press the right soft key **Tasks**
  - > Scroll to highlight **View Delivery Settings**, press **Select**
  - > Review each setting by scrolling through each parameter
  - > Press **Select** to edit any specific parameter. Unlock keypad if required.
  - > When all parameters have been reviewed, press the left soft key **Back** until you return to the home screen
  - > Now press the **Stop/Start** key, "Start Pump?" appears. Choose **Yes**.

## Start New Patient – Protocol Library

### To Start a New Patient Using a Protocol From a Library on the Pump:

1. Make sure the pump is stopped
2. In the **Advanced Tasks** menu, press ▲ or ▼ to highlight **Start New Patient** or **Start New Protocol Same Patient** and press **Select**
3. The next screen informs you completing this task will overwrite all delivery settings. Press continue to unlock the keypad and continue programming the pump.  
*Note: To edit individual settings rather than starting a new patient or protocol, see page 11 for more information on editing delivery settings.*
4. Unlock the keypad
5. Press ▲ or ▼ to highlight a therapy and press **Select**
6. Press ▲ or ▼ to highlight a qualifier and press **Select**
7. Press ▲ or ▼ to highlight a drug and press **Select**
8. A screen appears with a summary of your selections. Review them to confirm they are correct. Select **Yes**.
9. The "Review pump settings" screen appears. Select **Review**.

10. Press ▲ or ▼ to scroll through and review all the settings. Press **Accept Value** if the highlighted setting is correct or press **Select** to edit the value. Then press **Save**.
11. When the review is complete, select **Next**
12. If a cassette is attached, latched and locked (if using the PCA therapy), the “Prime tubing?” screen may appear. The “Start pump?” screen appears. Select **Yes** to start the pump immediately or **No** to start the pump at a later time.

## Manual Mode Programming

You can manually program the CADD®-Solis VIP pump if the physician's orders do not match the single protocol or any of the protocols in the library or if the patient's therapy requires wider programming ranges than available in a standard protocol.

Unlike protocols that are created and downloaded into the pump by the CADD®-Solis medication safety software, manual programming does not contain any programming limits. For more information, see the Operator's Manual or your CADD®-Solis system administrator.

## Delayed Start/Next Dose Start Time

### Delayed Start

**Note:** This task is available for all therapies except intermittent.

The Set Delayed Start task allows you to delay the start of an infusion by up to 96 hours by selecting the date and time the infusion should begin. If the Set Delayed Start task is programmed, the start time is displayed as the last delivery setting. This is the time the next infusion will begin. The pump must be running on the selected date and time in order for delivery to begin.

If the Set Delayed Start is programmed, the KVO rate is active until the infusion begins.

**Note:** In step and taper therapies, you may not set a delayed start after an infusion has been started.

### To Set a Delayed Start:

1. From the Tasks menu, press ▲ or ▼ until Set Delayed Start is highlighted, then press **Select**
2. Unlock the keypad, if required
3. Press ▲ or ▼ until the desired start time appears on the screen and select **Confirm**
4. Confirm the new start time by selecting **Yes**

## Next Dose Start Time

**Note:** This task is available for intermittent therapies only.

A Next Dose Start Time may be programmed to delay the start of the next dose of an infusion. However if a dose is in progress, this cancels the remainder of the current dose. To avoid interrupting the dose in progress, adjust the next dose start time when the pump is in KVO.

**Note:** During dosing, the home screen shows “Dosing”. If a dose is stopped in progress, the home screen shows “Interrupted.” If the infusion is in KVO, “Between Doses” appears on the home screen.

The Next Dose Start Time may also be set to delay delivery of the first dose of the infusion by up to 96 hours. The pump must be running on the selected date and time in order for delivery to begin.

### To Set the Next Dose Start Time:

1. Stop the pump if it is running. If a dose was delivering when the pump was stopped, the “Interrupted” screen appears.

*Note: If a dose is in progress, this cancels the remainder of the dose.*

2. From the Tasks menu, press ▲ or ▼ until Set Next Dose Start Time is highlighted, then press **Select**
3. Unlock the keypad, if required
4. Press ▲ or ▼ until you reach the time that you want the next dose to begin. The length of the delay is listed below the time. Select **Confirm**.
5. Confirm the new start time and length of the delay. Select **Yes**.

## Edit/View Delivery Settings

The delivery settings are patient-specific parameters of a therapy that are directly related to the drug being infused and can be edited within limits established in the protocol. The CADD®-Solis system administrator establishes the initial values of the parameters, any applicable programming units and drug concentration, other parameter limits, and which parameters can be viewed and/or edited. A security code (or the pump key, if enabled) are required to edit the parameters.

**Note:** Editing individual delivery settings in Step or Taper mode will reset the infusion back to the beginning.

### Editing Delivery Settings

To view and edit delivery settings:

1. Stop the pump if it is running
2. In the Tasks menu, press ▲ or ▼ until View Delivery Settings is highlighted, then press **Select**

3. Press ▲ or ▼ until the desired setting is highlighted, then press **Select**
4. If requested, unlock the keypad
5. Press ▲ or ▼ until the desired value appears on the screen, then select **Save**

***Note:** If the new value is above the maximum soft limit or below the minimum soft limit, the value appears in amber on the screen. To select a value above the maximum soft limit or below the minimum soft limit, select **Confirm** and then select **Yes**.*

Change any additional settings by scrolling through the remaining delivery settings and press **Select** to edit each setting as necessary.

## Review Pump Settings

When starting a new patient or a new protocol for the same patient, or after adjusting any delivery settings, the pump settings must be reviewed and accepted as accurate.

### To Review Pump Settings:

1. When the “Review pump settings” screen appears, select **Review**
2. Press ▲ or ▼ to scroll through and review all the settings. If the highlighted setting is correct, press **Accept Value**. If the highlighted setting is incorrect, press **Select** to edit the setting. Press ▲ or ▼ to modify the setting and then press **Save** or **Confirm**.
3. When the review is complete, select **Next**

## PCA Delivery Mode

PCA (patient-controlled analgesia) delivery is used for therapies that require a continuous rate of infusion, patient-controlled demand doses, and/or a clinician-activated bolus. The delivery methods available are:

- > Continuous rate
- > PCA dose, a demand dose activated by the patient
- > Clinician bolus, a dose activated by the clinician

### Home Screen

The delivery mode and status of the infusion are indicated on the home screen with messages appearing in text, a graphic in a shape unique to the therapy, and with the colors green, red, and grey.

Examples specific to the PCA delivery mode are:

- > The pump is stopped with a programmed delayed start
- > The pump is running and delivering at a continuous rate
- > The pump is running and delivering a PCA bolus



## Programming Screens

### > Continuous Rate

The desired continuous rate of medication delivery

### > PCA Dose

The amount of drug delivered when the patient requests a PCA dose by either pressing the PCA dose key or using the remote dose cord button. The PCA dose key on the pump is inactive when the remote dose cord is connected to the pump.

### > PCA Lockout

The minimum time that must elapse between the time one PCA dose starts and the time that the next PCA dose is available

### > Delivery Limit

Restricts the amount of drug delivered to the patient within a specified time frame. The programmable range is 1 hour to 12 hours. The limit includes the continuous rate and PCA doses, but does not include clinician boluses.

### > Max Doses/Hr

The maximum number of PCA doses allowed in a one-hour period. The frequency of available doses is limited by the programmed PCA lockout time. If the PCA Lockout is one hour or greater, this setting will not appear in the menu.

### > KVO Rate

The KVO or “keep vein open” rate is calculated by the pump. It allows the delivery of a minimal amount of drug to help maintain catheter patency. If a continuous rate is programmed, it will display as 0.1 mL/hr (or the mg or mcg equivalent). If no continuous rate is programmed, the KVO rate will display 0 mL/hr (or the mg or mcg equivalent). If a delayed start is programmed, the KVO rate is active until the infusion begins. If a delivery limit is programmed, the KVO rate is active when the delivery limit is reached.

### > Reservoir Volume

The volume of fluid contained in the reservoir. The reservoir volume value decreases as the pump is primed or delivers fluid.

### > Start Time

The time the next infusion will begin. It is displayed only if the delayed start is programmed. The pump must be running on the selected date and time in order for the infusion to begin.

## Giving a Clinician Bolus

A clinician bolus may be delivered only when the pump is running. It allows delivery of a specific amount of drug, such as a loading dose. A clinician bolus cannot be started while a PCA dose is in progress. The clinician

bolus increases the given amount, but does not add to the dose counters or to the delivery limit. A clinician bolus may be stopped in progress.

**Note:** *The maximum clinician bolus may be limited by the settings in the protocol, which is determined by the CADD®-Solis system administrator.*

To start a clinician bolus:

1. Make sure the pump is running
2. From the View Advanced Tasks menu, press ▲ or ▼ to highlight Give Clinician Bolus and press **Select**
3. Unlock the keypad
4. Press ▲ or ▼ to change the value of the clinician bolus. Select **Deliver**.
5. If you enter a value outside the soft limit, a screen appears asking you to confirm the soft limit override. Select **Confirm** to deliver the bolus.
6. The screen shows the decreasing amount as the bolus is delivered. You may stop the bolus at any time by selecting **Stop Bolus**.
7. When the bolus has been delivered, the screen says, "Clinician bolus complete." Select **OK**.

### Start a PCA Dose

If a PCA dose is programmed, the patient may start a PCA dose while the pump is running. The amount delivered is added to the amount provided by the continuous rate. Each time the patient requests a PCA dose, the pump automatically adds it to the Given and PCA Dose Counters report.

The remote dose cord can be attached to the pump and provided to the patient as an alternative to pushing the PCA dose key when requesting a PCA dose. The LED on the remote dose cord indicates PCA dose status:

- > **Off:** A PCA dose is not available
- > **Flashing:** A PCA dose is available
- > **On:** A PCA dose has been requested and delivery has started

#### Notes:

- > *A PCA dose cannot be started while another PCA dose or a clinician bolus is in progress*
- > *The PCA dose key on the pump is inactive when the remote dose cord is connected to the pump*
- > *If the display has automatically blanked, pressing the PCA dose key turns the display back on and delivers a PCA dose, if available*

### To Start a PCA Dose:

Press the **PCA dose** key on the pump or the remote dose cord. If a dose is available, it will start infusing.



## Stopping a Clinician Bolus or PCA Dose

### To Stop a Clinician Bolus:

While the clinician bolus is delivering, the Clinician Bolus screen appears on the pump and shows the decreasing amount of the bolus remaining to be delivered. You may stop the clinician bolus from the screen by selecting **Stop Bolus**.

### To stop a PCA dose:

From the “PCA dose started” screen you may stop the PCA dose while it is delivering by selecting **Stop Dose**.

**Or**

If the pump is on the home screen, press the **Stop/Start** button.

You will first be asked if you want to stop the dose, select **Yes**.

Then you will be asked if you want to stop the pump, select **No**.

## Continuous Delivery Mode

Continuous delivery allows the infusion of drug fluid at a constant, programmed rate.

### Home Screen

The delivery mode and status of the infusion are indicated on the home screen with messages appearing in text, a graphic in a shape unique to the therapy, and with the colors green, red, and grey.

Examples specific to the continuous delivery mode are:

- > The pump is running with a programmed delayed start
- > The pump is stopped. It will deliver at a continuous rate once it is started



### Programming Screens

#### > Continuous Rate

The desired continuous rate of medication delivery. Rates above 250 mL/hr require a CADD® high volume administration set.

#### > KVO Rate

The KVO or “keep vein open” rate is optional. It allows the delivery of a minimal amount of drug to help maintain catheter patency. If a KVO rate is programmed, it will only be active if a delayed start is programmed. The pump will infuse at the KVO rate until the programmed infusion begins.

#### > Reservoir Volume

The volume of fluid contained in the reservoir. The reservoir volume value decreases as the pump is primed or delivers fluid.

### > Start Time

The time the next infusion will begin. It is displayed only if the delayed start is programmed. The pump must be running on the selected date and time in order for the infusion to begin.

## Intermittent Delivery Mode

Intermittent delivery allows the infusion of a specific volume of drug at a regular, programmed interval and over a specified duration. A dose may be repeated in a cycle up to 96 hours.

### Home Screen

The delivery mode and status of the infusion are indicated on the home screen with messages appearing in text, a graphic in a shape unique to the therapy, and with the colors green, red, and grey.

Examples specific to the intermittent delivery mode are:

- > The pump is running with a manually programmed next dose start time
- > The pump is running and delivering a dose
- > The pump is stopped between doses while at the KVO rate



### Programming Screens

#### > Dose Volume

The volume of the dose cannot be programmed to a value that would cause the rate of delivery for the programmed dose duration to exceed the dose rate maximum of 500 mL/hr. Therefore, programming the dose volume may result in the automatic lengthening of the dose duration to accommodate the maximum dose rate.

#### > Dose Duration

The length of time required to deliver the dose. The dose duration cannot be programmed to a value that would cause the rate of delivery for the programmed dose volume to exceed the maximum dose rate of 500 mL/hr.

#### > Dose Cycle

The time from the start of one dose to the start of the next dose. The programmable values for the dose cycle are dependent on the dose duration. There must be at least five minutes between the end of one dose and the start of the next dose. Therefore, the minimum programmable cycle is the dose duration plus five minutes.

> **Dose Rate**

This setting is for review only and shows the rate at which the dose is delivered based on the programmed dose volume and dose duration. The maximum allowable rate is 500 mL/hr. Rates above 250 mL/hr require a CADD® high volume administration set.

> **Next Dose**

The time the next dose is scheduled to begin. The pump must be running on the selected date and time in order for the dose to begin. The next dose time can be programmed at any time to delay the start of the next dose, but if a dose is in progress, this cancels the remainder of the dose.

> **KVO Rate**

The KVO or “keep vein open” rate is optional. It allows the delivery of a minimal amount of drug to help maintain catheter patency. The KVO rate is active between doses or until a dose begins if the next dose start time has been set to a value other than “immediate.”

> **Reservoir Volume**

The volume of fluid contained in the reservoir. The reservoir volume value decreases as the pump is primed or delivers fluid.

> **Stopping the Pump During an Infusion**

Stopping the pump between doses does not affect the start time of subsequent doses. Stopping the pump while a dose is in progress shifts all subsequent doses by the amount of time the pump is stopped.

> **Resuming the Dose**

To resume delivery of a dose stopped in progress, simply restart the pump by pressing stop/start

> **Resetting the Cycle**

To reset the cycle, stop the pump between doses, and reprogram the next dose start time. When a dose is stopped in progress, the “Interrupted” screen appears. To cancel the current dose and reset the cycle, reprogram the next dose start time through the Tasks menu. The next cycle will start at the time you select.

## Step Delivery Mode

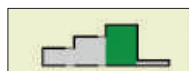
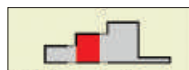
Step delivery allows the infusion of a specified volume of drug at an initial rate with linear step increases up to a plateau rate. Multiple steps down may also be applied, reducing the continuous rate as low as the initial rate. An optional KVO rate may be delivered at the end of the infusion, depending on protocol settings.

## Home Screen

The delivery mode and status of the infusion are indicated on the home screen with messages appearing in text, a graphic in a shape unique to the therapy, and with the colors green, red, and grey.

Examples specific to the step delivery mode are:

- > The pump is running with a programmed delayed start
- > The pump is stopped and has not yet reached the plateau
- > The pump is running at the plateau rate
- > The pump is running at continuous hold after a manual step down
- > The infusion is complete



## Programming Screens

### > Infusion Volume

The total volume of fluid to be delivered. The reservoir volume must be large enough to support the entire infusion volume. Therefore, programming the infusion volume may result in an automatic increase in the reservoir volume. Entering a new infusion volume resets the infusion so that delivery starts at the beginning.

### > Initial Rate

The initial rate of medication delivery. Entering a new initial rate resets the infusion so that delivery starts at the beginning.

### > Rate Increment

The amount that you want medication delivery to increase by for each step. Entering a new rate increment resets the infusion so that delivery starts at the beginning.

### > Plateau Rate

The maximum rate at which you want the medication to be delivered. The pump begins at the initial rate, and increases by the rate increment until the plateau rate is reached. The pump runs at the plateau rate until the infusion volume is fully delivered. Entering a new plateau rate resets the infusion so that delivery starts at the beginning.

### > Step Duration

The length of time programmed for each step during medication delivery. After infusion occurs for the step duration, the rate increases by the rate increment unless the current rate is equal to

the plateau rate. Entering a new step duration resets the infusion so that delivery starts at the beginning.

> **Infusion Duration**

The time required to deliver the infusion volume. It is calculated by the pump based on the initial values programmed for infusion volume, initial rate, rate increment, step duration, and plateau rate. It appears on the screen for review only.

> **KVO Rate**

The KVO or “keep vein open” rate is optional. It allows the delivery of a minimal amount of drug to help maintain catheter patency. If a delayed start is programmed, the KVO rate is active until the infusion begins. It is also active after the infusion volume is delivered if the reservoir volume is programmed greater than the infusion volume.

> **Reservoir Volume**

The volume of fluid contained in the reservoir. The reservoir volume value decreases as the pump is primed or delivers fluid. The reservoir volume should not be programmed or edited to be less than the programmed infusion volume. Entering a new reservoir volume resets the infusion so that delivery starts at the beginning.

> **Start Time**

The time the next infusion will begin. It is displayed only if the delayed start is programmed. The pump must be running on the selected date and time in order for the infusion to begin.

***Note:** In the Step therapy, you may not set a delayed start after an infusion has started.*

## **Starting Each Infusion**

When a new cassette is attached to the pump at the beginning of the infusion, the reservoir volume should be reset. This also resets the infusion. When the pump is started, delivery will start at the beginning of the infusion.

## **Stopping and Restarting the Pump During an Infusion**

If you stop the pump before a step infusion was fully delivered and then restart the pump, you may choose to either restart the infusion from where delivery left off, or you may reset the infusion.

When you press stop/start to restart the pump, a screen appears with the message, “Infusion was interrupted before completion. Finish interrupted infusion or start from beginning with new bag.” Select New Bag to reset the reservoir volume and reset the infusion. Or, select Finish to resume the infusion from the point it was at when it was last running.

## Step Up

This option allows you to increase the rate of infusion at a time other than what is programmed. You cannot step up to a higher rate than the plateau rate.

To step up from the current rate:

1. In the Advanced Tasks menu, press ▲ or ▼ to highlight Step Up and press **Select**
2. Unlock the keypad
3. The pump displays a screen that tells you the current rate, and asks you if you want to step up to the next step rate. Select **Yes**.

## Step Down

This option allows you to reduce the rate of infusion at any time. You cannot step down lower than the initial rate. Once the step down task has been performed successfully, the automatic step increases after each step duration are cancelled. Delivery continues at the step down (hold) rate. The step up task can be used to restart the automatic step increases.

To step down from the current rate:

1. In the Advanced Tasks menu, press ▲ or ▼ to highlight Step Down and press **Select**
2. The pump displays a screen that tells you the current rate, and asks you if you want to step down to the previous step rate and hold at that rate. Select **Yes**.

## Taper Delivery Mode

Taper delivery allows the infusion of nutritional solutions (TPN, total parenteral nutrition) or other fluids, with optional tapering. Delivery can be gradually increased, or tapered up, at the beginning of the infusion, and it can be gradually decreased, or tapered down, at the end of the infusion. An optional KVO rate may be delivered at the end of the infusion, depending on protocol settings.

## Home Screen

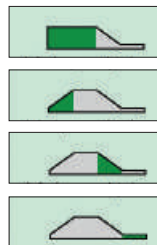
The delivery mode and status of the infusion are indicated on the home screen with messages appearing in text, a graphic in a shape unique to the therapy, and with the colors green, red, and grey.

Examples specific to the taper delivery mode are:

- > The pump is running with a programmed delayed start
- > The pump is stopped at the plateau rate



- > The pump is running at the plateau rate. No taper up was programmed.
- > The pump is running at taper up
- > The pump is running at taper down
- > The infusion is complete and running at KVO



## Programming Screens

Entering a new infusion volume, taper up, taper down, infusion duration or reservoir volume resets the infusion so that delivery starts at the beginning of the infusion duration.

- > **Infusion Volume** - The total volume of fluid to be delivered. The reservoir volume must be large enough to support the entire infusion volume. Therefore, programming the infusion volume may result in an automatic increase in the reservoir volume. Entering a new infusion volume resets the infusion so that delivery starts at the beginning.
- > **Taper Up** - The duration for the taper up period. The maximum programmable taper up is limited by a combination of the plateau rate, infusion duration, infusion volume, and taper down. You cannot select a taper up duration that would cause the plateau rate to exceed the maximum allowable rate. Entering a new taper up duration resets the infusion so that delivery starts at the beginning.
- > **Taper Down** - The duration for the taper down period. The maximum programmable taper down is limited by a combination of the plateau rate, infusion duration, infusion volume, and taper up. You cannot select a taper down duration that would cause the plateau rate to exceed the maximum allowable rate. Entering a new taper down duration resets the infusion so that delivery starts at the beginning.
- > **Infusion Duration** - The time required to deliver the infusion volume. The minimum programmable infusion duration is limited by a combination of the plateau rate, infusion volume, taper up, and taper down. You cannot select an infusion duration that would cause the plateau rate to exceed the maximum allowable rate. Entering a new infusion duration resets the infusion so that delivery starts at the beginning.
- > **Plateau Rate** - The maximum rate at which medication is delivered during the plateau portion of the infusion. It appears on the screen for review only and is calculated by the pump based on the infusion volume, infusion duration, and any programmed tapering. Rates above 250 mL/hr require a CADD® high volume administration set.
- > **KVO Rate** - The KVO or “keep vein open” rate is optional. It allows the delivery of a minimal amount of drug to help maintain catheter patency. If a delayed start is programmed, the KVO rate is active

until the infusion begins. It is also active after the infusion volume is delivered if the reservoir volume is programmed greater than the infusion volume.

- > **Reservoir Volume** - The volume of fluid contained in the reservoir. The reservoir volume value decreases as the pump is primed or delivers fluid. The reservoir volume should not be programmed or edited to be less than the programmed infusion volume. Entering a new reservoir volume resets the infusion so the delivery starts at the beginning.
- > **Start Time** - The time the next infusion will begin. It is displayed only if the delayed start is programmed. The pump must be running on the selected date and time in order for the infusion to begin.  
*Note: In the Taper therapy, you may not set a delayed start after an infusion has started.*

### Starting Daily Infusion

When a new cassette is attached to the pump at the beginning of the infusion, the reservoir volume should be reset. This also resets the infusion.

### Stopping and Restarting the Pump During an Infusion

If you stop the pump and then restart it before a taper infusion was fully delivered, you may choose to either restart the infusion from where delivery left off, or you may reset the infusion.

When you press stop/start to restart the pump, a screen appears with the message, "Infusion was interrupted before completion. Finish interrupted infusion or start from beginning with new bag." Select New Bag to reset the reservoir volume and reset the infusion. Or, select Finish to resume the infusion from the point it was at when it was last running.

### Taper Down Now

This task allows you to stop an infusion early by immediately tapering down. The following conditions are necessary for Taper Down Now:

- > The pump must be running
- > The pump must be delivering at the plateau rate or already be in taper down

Access the Taper Down Now option:

1. From the Tasks menu, press ▲ or ▼ until Taper Down Now is highlighted, then press **Select**

*Note: If a taper down was not programmed, you can edit the setting by pressing Select. Enter the security code, and then press ▲ or ▼ to set the taper down duration. Press Confirm to accept the change.*

2. Select **Yes** to continue with taper down now or press **Select** to edit the taper down period. Editing the taper down now period only affects the period for this immediate taper. It has no effect on the taper period of the protocol that is seen in the delivery settings.



**Note:** Once you select Yes, you can not restart delivery at the plateau rate without resetting the infusion period.

- When “Beginning Taper Down....” appears, select **OK**

## Operating the Pump

### Power Sources

#### AA Batteries

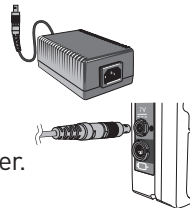
To power the CADD®-Solis VIP pump, it is recommended that four AA, 1.5 volt non-rechargeable alkaline batteries are used or the CADD®-Solis pump rechargeable battery pack.

**Note:** Mixing new and used batteries is not recommended because it may affect low battery alarm times. Always use four new batteries when replacing depleted batteries.

The pump retains all programmed values when the batteries are removed, but the batteries must be in place during delivery. If the batteries are removed while the pump is delivering, and an AC adapter is connected, delivery stops. If an AC adapter is not connected and the batteries are removed, delivery stops and the pump loses power.

#### AC Adapter

The AC adapter can be used as an alternate source of power for the pump and/or to recharge the rechargeable battery pack. The pump requires AA batteries or the rechargeable battery pack to be installed as a backup while using the AC adapter.



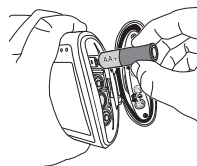
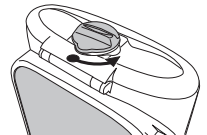
#### Rechargeable Battery Pack

The rechargeable battery pack is an alternative to using four AA batteries. The rechargeable battery pack can be recharged with the AC adapter, either inside or outside of the pump.

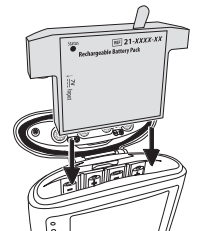


### Installing Batteries or a Battery Pack

- Make sure the pump is stopped and powered off. Using your fingers, the pump key, or a coin, turn the knob on the battery door counterclockwise to open the battery door.
- Hold the pump at an angle and place four AA batteries in the pump, from the bottom up. Match the + and – markings on the new batteries with the markings on the pump.



OR



**Or**

If using a rechargeable battery pack, insert it into the pump as shown.

3. Close the battery door and using your fingers, the pump key, or a coin, turn the knob on the battery door clockwise to lock it.

**Note:** If you put the batteries in backwards, the pump will not power up. Check the batteries, making sure to match the + and – markings.



AA batteries



AA batteries  
with  
AC adapter



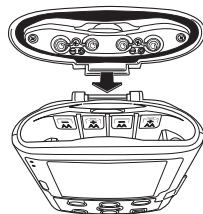
Rechargeable  
battery pack



Rechargeable  
battery with  
AC adapter

## Replacing the Battery Door

If the battery door is removed or needs replacing, simply snap the door onto the bar that is located on the pump.



## Power Up

Press and hold the power switch to turn the pump on. The pump starts the power up sequence during which it performs various self-tests and tests for alarm conditions.

- > If any issues are found while the pump is performing the self tests, alarms will sound
- > If you believe there is a problem, remove the pump from service and contact Smiths Medical Customer Service

**CAUTION:** If the power up results in an error message indicating that the protocol library was lost, do not proceed with using the pump. Follow your facility's procedures for downloading protocol libraries.

## Power Down

Press the power switch to turn the pump off. You must acknowledge the "Power down?" prompt by selecting **Yes**. The pump then powers down.

## Cassettes

The cassette is part of the CADD™ medication cassette reservoir or CADD® administration set that attaches to the bottom of the pump.

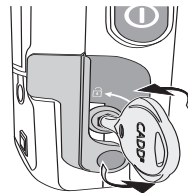
### Notes:

- > A CADD® administration or extension set with free-flow protection must be used
- > A CADD® high volume administration set is required for rates above 250 mL/hr

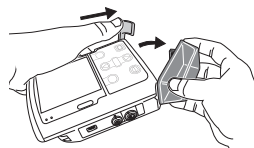
## Removing a Cassette

1. Make sure the pump is stopped before removing the cassette
2. Close the tubing clamp
3. If locked, insert the pump key and turn the cassette/keypad lock counter-clockwise into the unlocked position. "Cassette Unlocked" briefly appears in the status bar.

**Note:** Only PCA infusions require the cassette to be locked in order to run the pump.



4. Push down on the cassette latch until cassette detaches

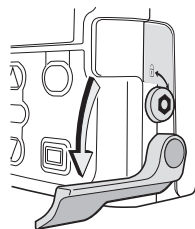


## Attaching a Cassette

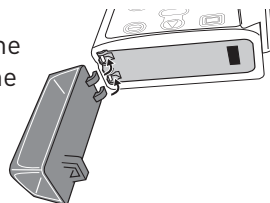
Obtain a new, filled CADD™ medication cassette reservoir or CADD® administration set attached to a flexible IV bag.

Before attaching a new cassette, make sure the pump is powered on. Once the cassette is attached, the pump automatically displays screens that allow you to verify the cassette type, prime the fluid path, reset the reservoir volume, review pump settings, and/or start the pump.

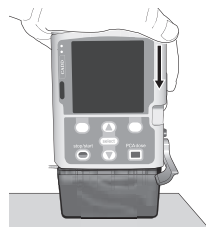
1. Clamp the tubing
2. Make sure the cassette latch is unlocked then open the latch



3. Insert the cassette hooks into the hinge pins on the bottom of the pump, then swing the cassette to the latch position



4. Place the pump upright on a firm, flat surface, and then press down on the latch side of the pump so the cassette fits tightly against the pump



5. Lift the cassette latch handle into the closed position. If you experience resistance when lifting the cassette latch handle, do not force the latch. If the pump doesn't latch easily, unlatch the cassette and repeat the process. A message briefly appears in the status bar so you can verify the type of cassette you have attached.

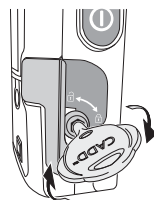


6. Verify the cassette is attached correctly. Looking from left to right, the top of the cassette should line up evenly with the bottom of the pump and be securely attached. If an uneven gap exists, unlatch the cassette and repeat the process.



7. If you wish to lock the cassette, insert the pump key into the cassette/keypad lock and turn clockwise into the locked position. "Cassette Locked" appears briefly in the status bar.

**Note:** For PCA infusions, the cassette must be locked in order to start the pump.



## Prime Tubing

When priming the fluid path, the tubing downstream of the pump is filled with fluid, removing any air bubbles. Prime the tubing before connecting it to the patient's infusion set or indwelling catheter.

Fluid delivered by priming is subtracted from the reservoir volume, but is not added to the amount given because this fluid is not delivered to the patient. Priming is not allowed with the reservoir volume is 0 mL.

### Notes:

- > The air detector is disabled while the pump is priming
- > If the fluid path contains an air eliminating filter, it is acceptable for air bubbles to be present on the vent side of the filter.

## Prime Tubing After Changing a Cassette

**Note:** If you are not changing the cassette but wish to prime the fluid path, use the *PrimeTubing, No Cassette Change* task.

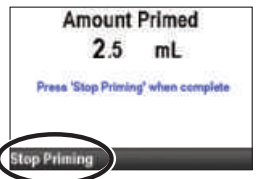
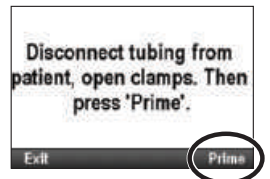
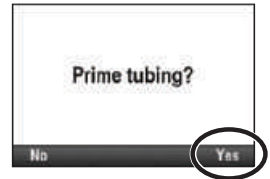
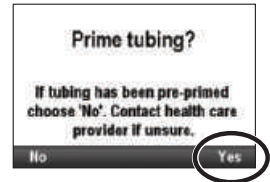
1. When a cassette is attached after the pump is powered on, a “Prime Tubing?” screen always appears

2. Select **Yes**

3. Unlock the keypad, if required

4. If you have not already done so, disconnect the tubing from the patient, open the clamps and select **Prime**

5. Stop priming at any time by selecting **Stop Priming**. Priming automatically stops after 10 mL (or 20 mL if a high volume set is attached) are primed. Continue priming as needed.



## Prime Tubing, No Cassette Change

1. Stop the pump if it is running

2. In the Tasks menu press ▲ or ▼ until Prime Tubing is highlighted, and then press **Select**

3. Unlock the keypad, if required

4. If you have not already done so, disconnect the tubing from the patient, open the clamps, and select **Prime**

5. Stop priming at any time by selecting **Stop Priming**. Priming automatically stops after 10 mL (or 20 mL if a high volume set is attached) are primed. Continue priming as needed.

## Start the Pump

Infusion begins when the pump starts. When the pump is running, “Running” appears on the status bar, the graphic on the home screen is green, and the green indicator light flashes. If the pump will not start, a message appears on the display.

**Note:** Before starting the pump, be sure the tubing is primed and the pump is connected to the patient according to your facility’s standards of practice.

1. Press Stop/Start.

**Note:** If the delivery settings have not been reviewed and the values have not been accepted, you must do so before the pump will run. (See instructions to review pump settings on page 12.) If a step or taper infusion was previously stopped and delivery was not completed (the infusion was not fully delivered), a screen appears with the message, “Infusion was interrupted before completion. Finish interrupted infusion or start from beginning with new bag.” Select **New Bag** to reset the reservoir volume and reset the infusion. Or, select **Finish** to resume the infusion from the point it was at when it was last running.

2. When “Start Pump?” appears, select **Yes**
3. The pump begins running. The red “Stopped” message in the status bar changes to a green “Running” message, and “Infusion is starting now...” appears briefly on the screen.

If a delayed start was programmed, the display turns green and a message that the infusion is delayed appears briefly on the screen. Then the “Delayed Start” screen appears along with the time remaining until the infusion starts. The pump infuses at the programmed KVO rate.

## Stop the Pump

Stopping the pump stops delivery. After the pump is stopped, “Stopped” appears in red on the status bar, the graphic on the home screen is red, the amber indicator light flashes, and the green indicator light is off.

1. Press **Stop/Start**. In a PCA protocol, if a PCA dose is in progress, “Stop PCA dose?” appears. Select **Yes** to stop the dose. In a PCA protocol, if a clinician bolus is in progress, “Stop clinician bolus?” appears. Select **Yes** to stop the bolus. A confirmation screen appears stating, “Clinician bolus stopped.” Select **OK** to continue. In a taper protocol, “Taper down instead?” appears. Select **No** to stop the infusion.
2. When “Stop Pump?” appears, select **Yes**
3. The pump stops running. The green “Running” message in the status bar changes to a red “Stopped” message, and “Pump is stopping...” appears briefly on the screen.

## Reset Reservoir Volume

The reservoir volume setting indicates the amount of fluid contained in the reservoir. Once this number is set, the pump keeps track of how much fluid has been delivered and adjusts the reservoir volume setting accordingly.

**Note:** If you are running a step or taper therapy, resetting the reservoir volume also resets the infusion. When you restart the pump, delivery starts at the beginning of the infusion duration.

### To reset the reservoir volume after attaching a new cassette:

1. The pump displays a question asking if you wish to reset the volume to the default amount. If this screen does not appear, the reservoir volume may already be reset.
2. If you are running a step or taper therapy, you also see, "Infusion will be reset". Select **Yes** to reset the volume and infusion. Select **No** to keep the reservoir volume at the current setting.

### To reset the reservoir volume without changing the cassette:

1. Stop the pump if it is running
2. In the Tasks menu, press ▲ or ▼ until Reset Reservoir Volume is highlighted, and then press **Select**
3. The pump displays a screen asking you to confirm that you want to reset the reservoir volume. Select **Yes**.

## Tasks and Advanced Tasks

### Tasks Menu Overview

The Tasks menu leads to most of the pump's operating functions. Some items in the Tasks menu will require a security code to view/edit the item.

Task Menu Function	Description on Page
Reset Reservoir Volume	28
Taper Down Now (Taper therapy)	22
Set Delayed Start (all therapies except Intermittent)	10
Set Next Dose Start Time (intermittent therapy)	10
Prime Tubing	26
View Delivery Settings	11
Display and Sound Settings	29
View Reports	32
View Advanced Tasks	33

## Display and Sound Settings

The Display and Sound Settings menu allows you to adjust various factors such as the intensity of the backlight on the screen, alarm volumes, sound themes, key beeps, and numeric formats. This change is for the current protocol only and remains in effect until the Start New Patient or Same Patient New Protocol task is selected.

### To view or change any of these settings:

- > In the Tasks menu, press ▲ or ▼ to highlight Display and Sound Settings and press **Select**
- > Press ▲ or ▼ to highlight the setting you wish to view or change and press **Select**
- > Unlock the keypad, if required
- > Edit the setting, if appropriate, and press **Save** or press **Don't Save** to exit the task

### The items in the Display and Sound Settings menu are:

#### Backlight Intensity

The backlight intensity feature allows you to adjust the screen backlight intensity within the range of 1 to 10, with 1 being low and 10 being high.

**Note:** Increasing the backlight intensity shortens the battery life.

#### Alarm Volume

The alarm volume feature allows you to set the volume of the alarms in the therapy. You may choose between three volumes: low, medium, and high.

#### Sound Theme

The Sound Theme setting allows you to choose between three different sound themes for the alarms and beeps that the pump makes. The three themes are standard, intense, and distinctive. You may preview the sound themes in the menu. The alarms and beeps that use the sound theme are:

- > High Priority Alarm
- > Medium Priority Alarm
- > Low Priority Alarm
- > Informational Alarm

### To preview/choose a sound theme:

1. In the Display and Sounds Settings menu, press ▲ or ▼ to highlight Sound Theme and press **Select**



2. Press ▲ or ▼ to highlight Standard, Intense, or Distinctive, and press **Select** to preview the theme, or select **Save** to save the theme without a preview
3. To preview the theme, press ▲ or ▼ to scroll through the alarms and beeps. Press **Select** to listen to each alarm or beep. Continue until you have decided which one to apply. To exit, select **Back**.
4. Highlight the desired theme and select **Save**

### Key Beep On/Off

The key beep on/off feature allows you to turn on or off the audible beep that accompanies each key press. This feature does not turn off any audible alarms associated with alarm or alert conditions of the pump.

***Note:** If the key beep feature is turned on, the key beeps will not sound while any alarm screens are being displayed or when entering a security code.*

### Numeric Format

The numeric format setting allows you to select the character or space used to indicate the decimal point and thousands units separators. This will be determined by your CADD®-Solis system administrator when the protocol library is created. Contact your CADD®-Solis system administrator or see the Operator's Manual for more information.

### Time and Date

The Change Time and Date setting allows you to edit the time and date, and to choose a time and date format. The time and date options should reflect the current time and date. The clock is powered by a separate, internal battery, which retains the time and date even when the 4 AA batteries or the battery pack is removed. The pump uses this feature to record the time and date of events in the delivery and event logs, and in other reports. It is also used to determine when delayed starts and next dose start times begin, and when preventative maintenance alarms occur.

***Note:** The internal battery is rechargeable and automatically recharges when the pump is powered on. If the pump is off for a long period of time, it may not show the correct time and date when it is powered on. Check the time and date, and edit these settings if necessary.*

In the Tasks menu, press ▲ or ▼ to highlight Change Time and Date and press **Select**.

## Current Time

### To set the current time:

1. In the Change Time and Date menu, press ▲ or ▼ to highlight Current Time and press **Select**
2. Press ▲ or ▼ to scroll to the correct hour and press **Select** to navigate to the minutes
3. Press ▲ or ▼ to scroll to the correct minutes and press **Select** to navigate to the am or pm field
4. Press ▲ or ▼ to scroll between am and pm and press **Select** when the correct setting appears. If you are using a 24-hour clock, the am/pm field does not appear. Select **Save**.

## Current Date

### To set the current date:

1. In the Change Time and Date menu, press ▲ or ▼ to highlight Current Date and press **Select**
2. Press ▲ or ▼ to scroll to the correct month and press **Select** to navigate to the day
3. Press ▲ or ▼ to scroll to the correct day and press **Select** to navigate to the year
4. Press ▲ or ▼ to scroll to the correct year and select **Save**

## Time Format

The time format setting allows you to select either a 12-hour or 24-hour clock format, and to set the character used for indicating the hours, minutes and seconds separators. This will be determined by your CADD®-Solis system administrator when the protocol library is created. Contact your CADD®-Solis system administrator or see the Operator's Manual for more information.

## Date Format

The date format option allows you to select 1 of 3 formats for indicating the day, month, and year. This will be determined by your CADD®-Solis system administrator when the protocol library is created. Contact your CADD®-Solis system administrator or see the Operator's Manual for more information.

## Daylight Savings Time

The pump time and date do not automatically update for daylight savings time. If you live in a geographical area that follows daylight savings time, you must manually update the time and date. You may choose to change the time while the pump is currently being used by a patient, or

wait until the patient is finished with the infusion. However, because delivery of some therapies is affected by a time and/or date change, it is recommended that you wait until the infusion is complete.

**Note:** *If you update the time while the pump is in use, the timestamps in the event and delivery logs are not updated to reflect daylight savings time prior to the change. All events record the reported time from when the event actually occurred. For your reference, the event log records the time when it was changed.*

## Reports

The reports screen is used to view a variety of reporting and record-keeping functions. The reports available are:

- > Total Given (not available for PCA therapies)
- > Given and PCA Dose Counters (PCA therapies only)
- > PCA Dose Graph (PCA therapies only)
- > Delivery History and Pie Chart
- > Delivery Log
- > Event Log
- > Protocol Library Summary
- > Device Information

The reports can be viewed at any time, with the pump running or stopped. In the Tasks menu, press ▲ or ▼ to highlight View Reports and press **Select**. For details on what each report contains, see the Operator's Manual.

## Advanced Tasks Menu Overview

Most pump configurations are set up by a CADD®-Solis system administrator. Protocol libraries consisting of therapies, qualifiers, and drugs are created using the CADD®-Solis medication safety software. The Advanced Tasks menu allows you to select a standard therapy protocol created by the CADD®-Solis system administrator, or make changes to an individual protocol for single use, or to manually program a protocol.

### Notes:

- > *When creating or editing a protocol under Advanced Tasks, it is important to note that the edits made affect only the protocol currently in use.*
- > *The Advanced Tasks screens revert to the home screen if there is a four minute delay between button presses. Make certain you are still in the Advanced Tasks menu after any delays.*
- > *Most of the advanced tasks require a security code to unlock the keypad. This step is necessary only if the keypad is not already unlocked.*

The following functions are in the Advanced Tasks menu:

Advanced Task Menu Function	Description on Page
Give Clinician Bolus (PCA Therapy)	13
Step Up (Step therapy)	19
Step Down (Step therapy)	20
Patient Permissions	34
Air and Occlusion Settings	See Operator's Manual
Alarm Settings	See Operator's Manual
Security Settings	5
Start New Patient	8
Start New Protocol Same Patient	9
Delivery Hard and Soft Limits	See Operator's Manual
Reset to Factory Defaults	See Operator's Manual

### To access any item in the Advanced Tasks menu:

1. From the home screen, select Tasks
2. Press ▲ or ▼ to highlight View Advanced Tasks and press **Select**
3. Press ▲ or ▼ to highlight the Advanced Tasks you wish to view/edit and press **Select**
4. Unlock the keypad, if required
5. View/edit the setting and press either **Save** to confirm the edit or **Don't Save** to exit the task

## Patient Permissions

Security levels are used to limit unauthorized access to certain programming and operating functions. In some cases, the default security settings may be changed to allow patients additional access to pump functions. Do not reduce security settings without providing proper training to patients.

The Patient Permissions task allows you to control a patient's access to two specific tasks: priming and setting a delayed start. Setting the permission to "Off" allows the patient to access one or both tasks without having to enter a security code. Setting the permission to "On" restricts the patient's access to one or both tasks because a security code is required.

**There are two items under patient permissions:**

**Priming Security On/Off** - Setting this value to "Off" allows the patient/caregiver to prime the tubing on the pump without having to enter a security code. If this value is set to "On", the pump will ask for a security code before allowing the user to use the priming function on the pump.

**Delayed Start Security On/Off-** Setting this value to “Off” allows the patient/caregiver to set Delayed Starts or Next Dose Start Times without having to enter a security code. If this value is set to “On”, the pump will ask for a security code before allowing the user to enter and complete this task.

## References and Troubleshooting

### Alarms and Messages

The pump can sound multiple alarms. For many of the alarms, you have the option to “acknowledge” or “silence.”

- > Acknowledge—the alarm clears from the screen
- > Silence—the alarm stays on the screen, but is silenced for 2 minutes before it sounds again

The alarm continues until it is acknowledged or resolved. The alarms may have different sounds depending on the sound theme selected. There are three different sound themes for the alarms and beeps that the pump makes: standard, intense, and distinctive.

### Types of Alarms

#### > System Fault Alarm

If this screen appears, an unrecoverable error may have occurred, such as a hardware or software fault. The amber indicator light is continuously illuminated during these conditions and is accompanied by an audible two-tone alarm. If a system fault occurs, the fault should be reported to Smiths Medical Customer Service at 1-800-258-5361.

To clear this alarm, remove power from the pump by opening the battery door, and if necessary, removing the AC power. Close the battery door and turn the pump back on. If the error code does not repeat, Customer Service may suggest continued use of the pump. If the error is persistent, the pump must be returned for service.

**Note:** Document the error numbers displayed on the system fault screen to help Customer Service identify the problem.

#### > High Priority Alarm

A high priority alarm always pauses or stops the pump if it is running. The alarm is accompanied by a red screen, and it persists until acknowledged by the press of a key on the pump or until the condition that triggered the alarm goes away (for example, high pressure going down). The alarm can be silenced with a key press and will sound again after two minutes if the alarm condition still exists.

> **Medium Priority Alarm**

A medium priority alarm does not stop the pump if it is running. The alarm is accompanied by an amber screen, and it persists until acknowledged by the press of a key on the pump or until the condition that triggered the alarm goes away. The alarm can be silenced with a key press and will sound again after two minutes if the alarm condition still exists.

> **Low Priority Alarm**

A low priority alarm does not stop the pump if it is running. The alarm is accompanied by a blue screen, and it persists for five seconds unless it is acknowledged by the press of a key or the condition that triggered the alarm goes away before the five seconds have passed. (Some low priority alarms persist for longer than five seconds.)

> **Informational Message**

An informational priority message does not stop the pump if it is running. This message appears in the status bar, and does not display a new alarm screen. It persists for five seconds and may be silent, requiring no acknowledgement. Some informational examples are “Cassette Locked,” and “Cassette Unlocked”.

## **Alarm Help Screens**

Additional information may be displayed when certain alarms occur. The help screens describe what you can do to try to solve the current problem that is causing the alarm.

1. When an alarm occurs, select **Silence** to quiet the alarm
2. If help screens are available for the alarm, “Help” appears above the right soft key. To view the help screens, select **Help**.
3. Follow the applicable instructions provided on the help screen. To page through all available help screens, press **Next** repeatedly. Press **Acknowledge** at any time to exit Help.
4. “Retry Help” appears when no additional help steps are available. To page through the help screens again, press **Retry Help**. The Alarm screen reappears as in Step 2 above. Repeat Steps 2 and 3. When the alarm clears, the help screens will no longer be displayed.

## Troubleshooting

Issue	Possible Solution
A continuous two-tone alarm is sounding, and the amber light is lit or flashing.	Delivery has stopped. Read the message on the display and refer to the list of messages in the table below. If the display is blank or contains random characters, the 4 AA batteries or the rechargeable battery pack may be depleted. Install 4 new AA batteries or a rechargeable battery pack.
The pump is sounding 2 beeps every 2 seconds, and the amber light is flashing.	Look at the message on the display and refer to the list of messages in the table below.
Three beeps sound every 5 minutes.	This is a reminder that the pump is stopped.
After installing 4 new AA batteries and powering up the pump, no screen appears and no beep sounds.	The batteries may be installed incorrectly. Review the procedure for installing batteries. Be sure to match the polarity (+ and -) markings inside the battery door with the markings on the batteries. If there is still no power, the batteries may be completely depleted.

## Alarms and Messages, Alphabetical List

A more detailed list of alarms and messages is included in the Operator's Manual.

Alarm / Message	Alarm Priority	Description / Corrective Action
[Screen is blank and alarm is sounding]	High	The pump was delivering and the batteries were removed or the battery door was opened. The pump lost power and is no longer delivering. Clear the alarm by turning the pump back on, or the alarm will stop after the power has been off for a minimum of 2 minutes.
A setting was edited, but not saved, and the edit was lost.	Medium	A parameter was being manually edited, but it was not saved and the pump reverted to the home screen. Select <b>Acknowledge</b> to clear the alarm and if appropriate, edit the parameter and save.
Air in-line detected. Press <b>Acknowledge</b> then prime tubing.	High	The air detector has detected air in the fluid path. The fluid path may contain air bubbles. The pump was delivering and is now stopped and will not run. Select <b>Acknowledge</b> to clear the alarm.  If the fluid path contains air bubbles, close the clamps and disconnect the fluid path from the patient. Follow the instructions in the Operator's Manual for removing air by priming. Restart the pump.
Battery depleted. Pump stopped.	High	The pump was delivering but is now stopped and the battery power is too low to operate the pump. If the AC adapter is attached, select <b>Acknowledge</b> to clear the alarm.  Remove the batteries. Install 4 new AA batteries or a rechargeable battery pack. To start delivery, good batteries must always be installed even when an external source of power is connected. If appropriate, restart the pump.
Battery low. Replace battery.	Low	The rechargeable battery pack or the 4 AA batteries are low but the pump is still operable. Select <b>Acknowledge</b> to clear the alarm, or the alarm will automatically clear after 5 seconds.  Recharge or change the rechargeable battery pack or replace the 4 AA batteries soon.

Alarm / Message	Alarm Priority	Description / Corrective Action
Battery removed. Pump will not run.	Medium	The pump is stopped and the rechargeable battery pack or the 4 AA batteries were removed, but the pump is still powered by the AC adapter. Select <b>Acknowledge</b> to clear the alarm. Install a fully charged rechargeable battery pack or 4 new AA batteries. To start delivery, good batteries must always be installed, even when an external source of power is connected.
Cannot start pump with a depleted battery.	Medium	The battery power is too low to operate the pump. To start delivery, good batteries must always be installed even when an external source of power is connected. Select <b>Acknowledge</b> to clear the alarm. Install 4 new AA batteries or a fully charged rechargeable battery pack. If appropriate, start the pump.
Cannot start pump with a reservoir volume of zero.	Medium	The reservoir volume in the pump is set to zero. Select <b>Acknowledge</b> to clear the alarm. Edit or reset the reservoir volume to the correct value. If appropriate, start the pump. See page <?> for more information about resetting the reservoir volume.
Cannot start pump without a latched cassette.	Medium	The pump will not start without a cassette attached. Select <b>Acknowledge</b> to clear the alarm. Make sure a cassette is properly attached, then start the pump. <b>NOTE:</b> This alarm has associated help screens.
Cassette not attached properly. Reattach cassette.	High	The cassette is not properly attached. Close the tubing, remove the cassette, then reattach. If the alarm persists, replace the cassette. <b>NOTE:</b> You must remove the cassette to continue.
Cassette was partially unlatched. Fully remove and reattach the cassette.	Medium	The cassette was not completely removed from the pump before it was reattached and the pump's sensors are not able to detect the cassette type. Remove the cassette and reattach it, then verify the cassette type in the pump display. If the alarm persists, replace the cassette. <b>NOTE:</b> You must remove the cassette to continue.
Check for empty tubing or reservoir. Pump stopped.	High	The tubing beneath the pump may not contain fluid, or the fluid container may be empty. The pump is stopped and will not run. Select <b>Acknowledge</b> to clear the alarm. Check to see if the fluid container is empty. If fluid is present in the reservoir, clamp the tubing, remove the cassette, and check for air in the tubing. If the alarm persists, remove the pump from service and contact Customer Service to return the pump for service.
Dose is now overdue. Pump is stopped.	Medium	The pump is stopped and a dose is overdue for its scheduled delivery. Select <b>Acknowledge</b> to clear the alarm, and then start the pump.



Alarm / Message	Alarm Priority	Description / Corrective Action
Downstream occlusion. Clear occlusion between pump and patient.	High	<p>The pump has detected high pressure, which may be resulting from a downstream blockage, a kink in the fluid path, or a closed tubing clamp. Delivery is paused and will resume if the occlusion is removed. Remove the obstruction to resume operation. Or select <b>Stop Pump</b> to stop the pump and silence the alarm for 2 minutes, then remove the obstruction and restart the pump.</p> <p><b>NOTE:</b> To reduce the potential for a bolus delivery after an occlusion, perform the following:</p> <ol style="list-style-type: none"> <li>1. Select <b>Stop Pump</b> to stop the pump.</li> <li>2. Close the distal clamp. If the distal clamp is the cause of obstruction, keep it closed and continue with step 4.</li> <li>3. Remove the obstruction.</li> <li>4. Detach the CADD™ medication cassette reservoir or CADD® administration set from the pump.</li> <li>5. Open the Flow Stop feature, if present.</li> <li>6. Wait 10 seconds.</li> <li>7. Close the Flow Stop feature, if present.</li> <li>8. Reattach the CADD™ medication cassette reservoir or CADD® administration set to the pump.</li> <li>9. Open the distal clamp.</li> <li>10. Review the pump program.</li> <li>11. Restart the pump.</li> </ol> <p><b>NOTE:</b> This alarm has associated help screens.</p>
High flow admin set required. Remove cassette.	High	<p>The delivery-specific parameters are programmed to values that cause the maximum rate of delivery to exceed 250 mL/hr.</p> <p><b>NOTE:</b> You must remove the standard volume cassette to continue.</p>
High volume admin set not allowed. Remove cassette.	High	<p>The CADD® high volume administration set cannot be used. The pump is stopped and will not run.</p> <p><b>NOTE:</b> Remove the administration set to continue.</p>
Infusion is now overdue. Pump is stopped.	Medium	<p>The pump is stopped and the infusion is overdue for its scheduled delivery. Select <b>Acknowledge</b> to clear the alarm, and then start the pump.</p>
Lock cassette to start pump.	Medium	<p>PCA mode only. The cassette must be locked onto the pump before beginning delivery. Lock the cassette to clear the alarm and the pump will automatically start.</p> <p><b>NOTE:</b> This alarm has associated help screens.</p>
Pump does not have a protocol library.	Medium	<p>The pump had a protocol library the last time it was powered on, but now it does not. This may happen if the pump was manually reverted to the factory default, recently had a software update, or if an attempt to install a protocol library failed. Select <b>Acknowledge</b> to clear the alarm and contact the CADD®-Solis system administrator to download a new protocol library.</p>
Pump settings and patient data lost.	Medium	<p>The pump reverted to the factory default. The pump was either manually reverted to this default, recently had a software update, or has not been in use for some time. Select <b>Acknowledge</b> to clear the alarm and contact the CADD®-Solis system administrator to reprogram the pump.</p>

Alarm / Message	Alarm Priority	Description / Corrective Action
Pump stopped by an alarm that has since cleared.	High	<p>The pump was stopped by another high priority alarm. That alarm was not acknowledged, but the problem has since cleared. Select <b>Acknowledge</b> to clear the alarm and if appropriate, restart the pump.</p> <p>The event log recorded the alarm that stopped the pump. For information on accessing the event log, see page 32.</p>
Reservoir volume is zero. Pump stopped.	High	<p>The reservoir volume is 0.0 mL. The pump was delivering, but is now stopped and will not run. Select <b>Acknowledge</b> to clear the alarm. Attach a new reservoir, and reset or edit the value of the reservoir volume, if appropriate.</p>
Reservoir volume low.	Medium Low	<p>Medium: The programmed reservoir volume trip point has been reached, indicating the level of fluid in the reservoir is low. Select <b>Acknowledge</b> to clear the alarm.</p> <p>Low: The programmed reservoir volume trip point has been reached, indicating the level of fluid in the reservoir is low. Select <b>Acknowledge</b> to clear the alarm, or the alarm will automatically clear after 5 seconds.</p> <p>Prepare to install a new reservoir, and reset or edit the value of the reservoir volume, if appropriate.</p>
Upstream occlusion. Clear occlusion between pump and reservoir.	High	<p>Fluid is not flowing from the fluid container to the pump, which may be due to a kink, closed clamp, or air bubble in the tubing between the fluid container and pump. Delivery is paused and will resume if the occlusion is removed. Remove the obstruction to resume operation. The alarm will clear when the occlusion is removed. You must acknowledge this alarm after it clears if it has occurred and cleared more than 3 times within 15 minutes.</p> <p><b>NOTE:</b> This alarm has associated help screens.</p>



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