Attaching to a Clave™ or capped secondary port:	Attach the syringe directly to the port. If using a syringe adapter, attach the adapter to the syringe and prime the adapter before attaching the syringe/adapter assembly to the port.
Attaching to a prepierced secondary port:	Fit the syringe with a locking blunt cannula before attaching to the port. If using a syringe adapter, attach the adapter to the syringe and prime the adapter, and then attach the locking blunt cannula to the adapter before attaching the syringe/adapter/ cannula assembly to the port.

You do not need to remove the primary administration set from the infusion pump or the patient before attaching a syringe to the secondary port.

NOTE: See ***Priming the Syringe Adapter*** for the steps to adequately remove air from the syringe adapter.

WARNING: WHEN USING A SYRINGE ADAPTER, RETRACT THE PLUNGER TO DRAW APPROXIMATELY 1 mL OF FLUID INTO THE SYRINGE TO CLEAR AIR FROM THE ADAPTER FILTER.

List of Administration Sets

The following is a list of compatible administration sets that are available for use with the Plum Solo infusion pump at the time of publication and is subject to change. Administration sets are non-DEHP and latex free. PE lined tubing are generally thicker walled, in comparison to PVC. For more details, refer to the labeling on the administration set packaging. Some administration sets may not be available in your region. For information about additional compatible administration sets, contact your local sales representatives.

To find the most up-to-date contained volume and downstream (distal) contained volume, refer to the administration set packaging. The volume of the cassette is approximately 3.5 mL. Most administration sets include the cassette volume in the total volume distal (downstream) priming volume.

Review the administration set labeling being used. If the cassette volume is not listed on the administration set, include the cassette volume as part of the distal (downstream) priming volume used in calculating a flush volume when precision delivery is needed.

Table 1: Primary Macrobore IV Sets

List Number	Description	Total Priming Volume (mL)	Downstream Priming Volume (mL)
14242-28	Primary PLUMSET, Clave Y-Site, 104 Inch	19.9	14.2
14243-28	Primary PLUM Set, 2 Clave Y-Sites, Secure Lock, 104 Inch	19	14
14248-28	Primary PLUMSET, PE Lined Tubing, 107 Inch	20	14
14251-28	Primary PLUMSET Piggyback, Backcheck Valve, 2 CLAVE Y-Sites, Secure Lock, 103 Inch	20	11.8
14687-28	Primary PLUM Set, CLAVE Secondary Port, Clave Y-Site, Secure Lock, 103 Inch	19	13
14951-88	Primary PLUM Set CLAVE Port, 2 CLAVE Y-Sites, Secure Lock, 104 Inch	19	14

List Number	Description	Total Priming Volume (mL)	Downstream Priming Volume (mL)
15244-28	Primary PLUM Set, CLAVE Secondary Port, 2 CLAVE Y-Sites, Secure Lock, 129 Inch	22	17
15687-28	Primary PLUM Set, CLAVE Secondary Port, CLAVE Y-Site, Secure Lock, 128 Inch	22	17
15951-28	Primary PLUM Set, CLAVE Secondary Port, Backcheck Valve, 2 CLAVE Y-Sites, Secure Lock, 128 Inch	23	18

NOTE: All Downstream (distal) Priming Volumes (mL) in this table include the cassette volume of 3.5 mL.

Table 2: Primary Microbore IV Sets

List Number	Description	Total Priming Volume (mL)	Downstream Priming Volume (mL)
12338-28	Microbore Conversion PLUMSET, 2 CLAVE Y-Sites, 76in	6.8	6.8
14247-28	Primary PLUM Set, CLAVE Y-Site, Distal Microbore Tubing, Secure Lock, 104 Inch	12	6.7
15247-28	Primary PLUM Set, CLAVE Secondary Port, CLAVE Y-Site, Distal Microbore Tubing, Secure Lock, 105 Inch	12	6.7
19732-01	Primary PLUM MICRODRIP Set, Backcheck Valve, CLAVE Secondary Port, CLAVE Y-Site, Secure Lock, 104 Inch	13	7

NOTE: All Downstream (distal) Priming Volumes (mL) in this table include the cassette volume of 3.5 mL.

Table 3: Burette IV Sets

List Number	Description	Total Priming Volume (mL)	Downstream Priming Volume (mL)
14271-28	PLUM 150 mL Burette Set, CLAVE Injection Site, CLAVE Port, 0.2 Micron Filter, (3)CLAVE Y-Sites, SL, 140in	13	9
14273-29	PLUM 150 mL Burette Set, CLAVE Injection Site, 2 CLAVE Y-Sites, SL, 114in	12	7.5
14955-88	Primary PLUM MICRODRIP 150 mL Burette Set, CLAVE Additive Port, 3 CLAVE Y-Sites, Secure Lock, 125 Inch	13	8

NOTE: All Downstream (distal) Priming Volumes (mL) in this table include the cassette volume of 3.5 mL.

Table 4: Blood Sets

List Number	Description	Total Priming Volume (mL)	Downstream Priming Volume (mL)
14211-28	Primary PLUM Blood Set, CLAVE Secondary Port, 200 Micron Filter, Secure Lock, 110 Inch	52	16
14212-28	Primary PLUM Y-Type Blood Set, 200 Micron Filter, CLAVE Secondary Port, Secure Lock, 110 Inch	49	15
14220-28	Primary PLUM Y-Type Blood Set, 200 Micron Filter, CLAVE Secondary Port, CLAVE Y-Site, Non-Vented, Secure Lock, 110 Inch	52	16

NOTE: All Downstream (distal) Priming Volumes (mL) in this table include the cassette volume of 3.5 mL.

Table 5: Specialty IV Sets

List Number	Description	Total Priming Volume (mL)	Downstream Priming Volume (mL)
12339-12	Primary PLUM Set, Orange Polyethylene Lined Light Resistant Tubing, CLAVE Y-Site, Secure Lock, 103 Inch	11	5.6
12539-05	Primary PLUM Set, 1.2 Micron Filter, CLAVE Y-Site, Secure Lock, 104 Inch	21.8	15.7
14018-04	Primary Plum Set, Single Channel Cassette, Secure Lock, 107 inch	19	14
14019-04	Primary Plum Set, Single Channel Cassette, Clave Y-Site, Secure Lock, 107 Inch	19	14
14254-28	Primary PLUM Set, CLAVE Secondary Port, 2 CLAVE Y-Sites, 0.2 Micron Filter, Secure Lock, 112 Inch	24	18
14255-28	Primary PLUMSET, 0.2 Micron Filter, CLAVE Y-Site, PE Lined Tubing, 104 Inch	22	15
14954-88	Primary PLUM Set, CLAVE Secondary Port, 0.2 Micron Filter, Secure Lock, 112 Inch	24	15

List Number	Description	Total Priming Volume (mL)	Downstream Priming Volume (mL)
15248-28	Primary PLUM Set, CLAVE Secondary Port, Polyethylene-Lined Tubing, Secure Lock, 107 Inch	20	14
15256-28	Primary PLUM Set, CLAVE Secondary Port, 0.2 Micron Filter, CLAVE Y-Site, Polyethylene-Lined Light Resistant Tubing, Distal Microbore Tubing, Secure Lock, 104 Inch	15	8.7
15339-28	Primary PLUM Set, CLAVE Secondary Port, CLAVE Y-Site, Polyethylene-Lined Light Resistant Tubing, Secure Lock, 103 Inch	11	5.6
19554-88	Primary PLUM Set, 1.2 Micron Filter, Secure Lock, 119 Inch	23.2	15.7

NOTE: All Downstream (distal) Priming Volumes (mL) in this table include the cassette volume of 3.5 mL.

Table 6: Enteral Sets

List Number	Description	Total Priming Volume (mL)	Downstream Priming Volume (mL)
4258-28	Primary Enteral PLUM Set, 40 mm Screw Cap, 98 Inch	18	13

Table 7: Epidural Sets

List Number	Description	Total Priming Volume (mL)	Downstream Priming Volume (mL)
14261-28	Primary PLUMSET, Yellow Striped Tubing, Distal Microbore Tubing, SL, 107in	13	3.3
24006-01	PLUM Epidural Set with NRFit Connector, Yellow-Striped Tubing, Distal Microbore Tubing, 107 Inch	13	6.5

NOTES:

Priming

Priming fills the cassette, tubing, and any other special features of the set with fluid, displacing air. Proper priming is an important part of air management.

Sterile administration sets are indicated on the administration set packaging. Refer to the packaging for the method of sterilization.

The following procedure gives the general steps for priming a Plum administration set. Refer to the administration set packaging for complete instructions on how to prime the set.

WARNING: DO NOT PRIME THE ADMINISTRATION SET WHILE IT IS CONNECTED TO A PATIENT.

To prime an administration set:

1. Inspect the administration set packaging. If the packaging is not intact, discard it and use a new set.
2. Open the package and remove the administration set.

PRECAUTION: INSPECT THE SET, INCLUDING THE CASSETTE AND CASSETTE PORTS, FOR LEAKAGE PRIOR TO USE.

3. Press the cassette flow regulator in to make sure it is closed and confirm that there is no flow during priming.

PRECAUTION: BE CAREFUL WHEN PIERCING THE SOLUTION CONTAINER TO AVOID PUNCTURING IT.

4. Insert the piercing pin into the outlet on the fluid container using a twisting motion.

PRECAUTION: DO NOT INSERT THE PIERCING PIN WHILE THE CONTAINER IS HANGING ABOVE THE INFUSION PUMP.

5. Suspend the container on an IV pole with the bag elevated approximately 12-24 inches above the cassette/pump.

PRECAUTION: CHECK THE CONTAINER FOR LEAKS. IF ANY PART OF THE CONTAINER IS LEAKING, REPLACE IT.

6. Squeeze the drip chamber to fill to the score mark. Do not completely fill the drip chamber.
7. If using a rigid fluid container (i.e., a glass bottle), open the filter vent cover above the drip chamber. If using a flexible plastic container, make sure the vent cover is closed.
8. Invert the cassette so that the secondary port is pointing down.
9. Slowly open the flow regulator by turning it counter-clockwise while holding the cassette in the inverted position, to allow the fluid to flow into the cassette at a controlled rate.

NOTE: To quickly stop the flow at any time, push in on the flow regulator.

10. When the first drop appears in the pumping chamber, turn the cassette upright.
11. Continue to slowly prime the set until all air is removed from the cassette and the remainder of the tubing. Tap the cassette and tubing to dislodge air bubbles.

NOTE: Invert & tap each Y-site to fill it with fluid, then turn the Y-site upright.

NOTE: If the filter cap at the downstream (patient) end of the tubing gets wet, you must temporarily remove the cap to continue priming.

12. Once priming is complete, push the flow regulator “in” to close it.
13. Check the drip chamber and the tubing to confirm that there is no flow and that no kinks appear in the tubing.

PRECAUTION: WHEN PRIMING IS COMPLETE AND THE CASSETTE FLOW REGULATOR IS CLOSED, ENSURE THAT FLUID IS NOT FLOWING FROM THE DOWNSTREAM END OF THE ADMINISTRATION SET. DO NOT USE THE ADMINISTRATION SET IF FLUID FLOW IS OBSERVED.

Loading a Cassette

Opening the Cassette Door

Infusion pump components located behind the cassette door interact with the cassette to control fluid flow, preventing primary and secondary fluids from mixing, and allowing fluid to reach the patient only when the infusion pump is pumping. The fluid regulator closes to prevent fluid flow to a patient.

When you open the cassette door, infusion pump components are no longer in contact with the cassette. **Always close all clamps before you open the cassette door** so that fluid does not flow into drip chambers.

WARNING: A SMALL AMOUNT OF FLUID IS EXPELLED FROM THE SET (LESS THAN OR EQUAL TO 0.1 mL) EACH TIME THE CASSETTE DOOR IS OPENED OR CLOSED WITH A SET INSTALLED. IF POTENT DRUGS ARE BEING USED, TAKE APPROPRIATE ACTION TO GUARD AGAINST OVERMEDICATION OF THE PATIENT.

If anything falls into the door recesses, open the door completely before removing them.

To open the cassette door:

1. Make sure that all slide clamp and lower CAIR (roller) clamps are closed before opening the cassette door.
2. Lift the cassette door lever.

Opening the Cassette Door Completely

The cassette door can be opened flat if needed, for example, to retrieve a dropped cap, remove a stuck cassette, or wipe a spill.

To open the cassette door completely:

1. Close all slide clamp and lower CAIR (roller) clamps before opening the cassette door.

2. Lift the cassette door lever to open the cassette door.
3. Press the door release tab on the lower part of the door lever to disengage the cassette door from the door latch, and then gently press the cassette door down until it opens completely.

Closing the Cassette Door

Keep the cassette door closed while not in use to avoid damage to the cassette door.

To close the cassette door, press down on the cassette door lever.

If the infusion pump is turned on when you close the cassette door with a cassette installed, the cassette test begins automatically.

Loading a Cassette

To load a primed cassette into the infusion pump:

1. Lift the lever to open the cassette door.
2. Grasp the cassette by the finger grip.
3. Slide the cassette between the cassette door and the door guides at a 45 degree angle.
4. Press the lever down to close the cassette door.
5. Optionally, you may insert the upstream line into the Line 1 tubing guide.
   If the tubing guide is used, trace the upstream tubing into the guide. Avoid crossing the lines.
6. Ensure all clamps are open.

PRECAUTION: CHECK THE DRIP CHAMBER AND THE DOWNSTREAM END OF THE TUBING TO CONFIRM THAT THERE IS NO FLOW AND THAT NO KINKS APPEAR IN THE TUBING. IF YOU OBSERVE FLOW OR LEAKS, CLOSE ALL CLAMPS AND REPLACE THE ADMINISTRATION SET.

7. Press the POWER button to turn on the infusion pump.
   The infusion pump initiates its startup sequence.

8. Connect the Plum Set to the patient.
9. Program a delivery on the Primary Line 1.
   Infusions may be programmed during the startup sequence, but will only begin once the Self Test has successfully completed.

NOTE: After the cassette is inserted, the pump will perform cassette test.

NOTE: During cassette check the START button will be accessible to queue the start of delivery after the cassette check completes. Delivery will not start if air, occlusion, or cassette issues are detected (an alarm will occur specific to the issue).

NOTE: An infusion pump may be programmed without a cassette to facilitate treatment. If an infusion is programmed without a cassette, perform a line trace to the programmed line before starting infusion.

NOTE: Tubing guides are available above the cassette to assist in tubing organization and line tracing. They may assist in the avoidance of tubing kinks that can cause upstream occlusion alarms. If multiple infusion devices have been stacked, infusion bag hangers may be used if additional length is required.

NOTE: During cassette check, the START button will be accessible to queue the start of delivery after the cassette check completes. Delivery will not start if air, occlusion, or cassette issues are detected (an alarm will occur specific to the issue).

Preparing a Secondary Delivery from an Administration Set

The following procedure gives the general steps for preparing a secondary administration set for a Piggyback or Concurrent delivery.

Refer to the set packaging for complete instructions on how to prime the administration set you are about to use.

WARNING: ENSURE MEDICATIONS THAT ARE DELIVERED CONCURRENTLY OR IN PIGGYBACK ARE COMPATIBLE.

WARNING: USE ONLY ICU MEDICAL PLUM ADMINISTRATION SETS WITH A CASSETTE SPECIFIED FOR USE WITH THE PLUM SOLO INFUSION PUMP. USE OF NON-PLUM CASSETTES CAN RESULT IN IMPROPER FUNCTIONING OF THE INFUSION PUMP OR INACCURATE DELIVERY.

WARNING: DO NOT RESTERILIZE ADMINISTRATION SETS. RESTERILIZATION MAY RESULT IN INACCURATE DELIVERY, INFECTION, AND ALLERGIC REACTION.

WARNING: DO NOT REUSE ADMINISTRATION SETS. REUSE RAISES THE RISK OF INFECTIONS AND ALLERGIC REACTIONS. REUSE MAY ALSO RESULT IN INACCURATE FLOW RATES.

WARNING: INSPECT PLUM ADMINISTRATION SET PACKAGING BEFORE USE. IF PACKAGING IS BREACHED, DISCARD AND USE A DIFFERENT ADMINISTRATION SET.

WARNING: CLOSE THE CLAMP ON THE UPSTREAM LINE TO PREVENT FLUID SPILL IF THE CAPPED PORT ON THE SECONDARY MUST BE REMOVED.

PRECAUTION: USE ASEPTIC TECHNIQUE WITH ALL FLUID PATH CONNECTIONS TO PREVENT CONTAMINATION. REMOVE CAPS WHEN REQUIRED AND SECURE ALL CONNECTIONS.

NOTE: You do not need to remove the primary administration set from the infusion pump or detach it from the patient before attaching a primed secondary administration set.

To prime a secondary administration set:

1. Prime per the administration set packaging.

PRECAUTION: CHECK THE SECONDARY CONTAINER FOR LEAKS. IF ANY PART OF THE CONTAINER IS LEAKING, REPLACE IT.

2.Attach the line to the secondary port.

3. Optionally, insert the secondary line into the Line 2 tubing guide. If the tubing guide is used, trace the upstream tubing into the guide. Avoid crossing the lines.

WARNING: ARRANGE ALL TUBING, CORDS, AND CABLES TO MINIMIZE THE CHANCE OF PATIENT STRANGULATION OR ENTANGLEMENT.

Connecting a Secondary Line or Syringe

A primary PlumSet may have a Clave™ connector, a prepierced connector, or a capped port on the secondary port. The following sections describe how to attach a secondary line or syringe to each secondary port type.

NOTE: Accepted syringe sizes are 3-60mL on the secondary line. Small volume syringes, i.e., 3-10 mL, require a vented syringe adapter to ensure delivery accuracy and reduce upstream occlusion alarms.

Connecting to a Clave Port

The Clave™ is a needle-free connector with an internal design that prevents leakage from the top of the connector. The secondary line or syringe can be attached directly to the port. Avoid twisting or bending the port during attachment to prevent damage or breakage.

To connect a line or syringe to a Clave secondary port:

1. Grasp the base of the Clave connector to support it, and then insert the end of the secondary line or syringe into the Clave.
2. Secure the connection:
   If attaching a secondary line, continue to support the Clave with one hand as you move the locking collar over the port with the other hand and twist the collar clockwise to secure the line.
   If attaching a Luer-Lok syringe or syringe adapter, continue to support the Clave connector with one hand as you twist the Luer-

Lok or adapter connector clockwise with the other hand to lock the connection in place.

Connecting to a Prepierced Port

The prepierced port requires the use of a locking blunt cannula to provide needle-free access and a secure connection.

To connect a line or syringe to a prepierced port:

1. Remove the protective sleeve from the locking blunt cannula.
2. Insert the connector on the secondary line or syringe into the locking blunt cannula, and then twist the locking collar on the line to secure the connection.

NOTE: If using a syringe adapter, attach the adapter to the syringe and then attach the locking blunt cannula to the adapter.

3. Center the cannula over the prepierced secondary port and push until the cannula clicks into place.
4. Gently pull the connection between the secondary line or syringe and the locking blunt cannula to confirm that all connections are secure.

Connecting to a Capped Port

A secondary line or syringe attaches directly to the capped port. To prevent leakage from the top of the connector during the following procedure, you must ensure that the cassette door remains closed or clamp the primary line before opening the cassette door.

To connect a line or syringe to a capped port:

1. Confirm that the cassette door is closed, to prevent leakage.
2. Loosen, remove, and discard the cap.
3. Insert the connector on the secondary line or syringe into the secondary port.

4. Secure the connection:
   If attaching a secondary line, move the locking collar over the port and twist the collar clockwise to secure the line.
   If attaching a Luer-Lok syringe or syringe adapter, twist the Luer-Lok or adapter connector clockwise to lock it in place.

Priming the Syringe Adapter

NOTE: Small volume syringes, i.e., 3-10 mL on the secondary line, require a vented syringe adapter to ensure delivery accuracy and reduce upstream occlusion alarms. All syringes on the primary line require a vented syringe adapter.

To prime the syringe adapter:

1. Fill the syringe with solution.
2. Attach the vented syringe adapter by inserting the vent into the syringe and secure.
3. Press on the syringe plunger until the vented syringe adapter fills up and fluid is seen at the open end of the syringe adapter.

WARNING: WHEN USING A SYRINGE ADAPTER, RETRACT THE PLUNGER TO DRAW APPROXIMATELY 1 mL OF FLUID INTO THE SYRINGE TO CLEAR AIR FROM THE ADAPTER FILTER.

4. Refill the syringe as needed.

Removing a Secondary Line or Syringe

The following procedure describes how to disconnect a secondary line or syringe from the Plum cassette.

NOTE: You do not need to disconnect the set from the patient during this procedure.

NOTE: You do not need to stop Line 1 during this procedure.

To remove a secondary line or syringe during delivery:

PRECAUTION: USE ASEPTIC TECHNIQUE WITH ALL FLUID PATH CONNECTIONS TO PREVENT CONTAMINATION. REMOVE CAPS WHEN REQUIRED AND SECURE ALL CONNECTIONS.

1. Press STOP and then select Line 2.
2. Remove the syringe or line as follows:
   To remove a secondary line from a Clave secondary port - Clamp the line, twist counterclockwise to release the locking collar, and then pull up to disconnect the line.

   To remove a syringe from a Clave secondary port - Pull up the plunger slightly to avoid spilling fluid. Twist counterclockwise to disconnect a Luer-Lok or syringe adapter, if present, and remove the syringe from the port.

   To remove a secondary line or syringe from a prepierced secondary port - Pull up the plunger slightly to avoid spilling fluid. Clamp the secondary line (if present), fully depress the levers on the locking blunt cannula, and then pull upward.
3. Discard the secondary line or syringe (with fluid container, if present) per hospital procedure.

Discontinuing Fluid Administration

The following procedure describes how to remove a primary administration set from the patient, either to discontinue fluid delivery, or to change the set.

PRECAUTION: DO NOT USE A PLUM ADMINISTRATION SET FOR LONGER THAN 96 CONTINUOUS HOURS. CHANGE SETS PER SET PACKAGE LABELING OR FACILITY POLICY. ADMINISTRATION SETS ARE SINGLE-PATIENT USE ONLY.

To discontinue fluid delivery:

1. Press STOP. If two lines are pumping, select the line(s) to discontinue.
2. Press the POWER button to turn off the infusion pump.
3. Close all clamps.
4. Detach the downstream line from the patient access device.
5. Open the cassette door and remove the cassette by grasping the finger grips.
   The cassette door must be fully opened to remove the cassette if it is stuck in the door.
6. Close the cassette door.
7. Discard the set and fluid container per hospital procedure.

Changing Administration Sets

Plum administration sets should be changed per facility policy or every 96 hours, whichever is less.

PRECAUTION: DO NOT USE A PLUM ADMINISTRATION SET FOR LONGER THAN 96 CONTINUOUS HOURS. CHANGE SETS PER SET PACKAGE LABELING OR FACILITY POLICY. ADMINISTRATION SETS ARE SINGLE-PATIENT USE ONLY.

To change the administration set:

PRECAUTION: USE ASEPTIC TECHNIQUE WITH ALL FLUID PATH CONNECTIONS TO PREVENT CONTAMINATION. REMOVE CAPS WHEN REQUIRED AND SECURE ALL CONNECTIONS.

1. Stop the infusion pump, close all clamps, and then remove and discard the old set. See ***Discontinuing Fluid Administration*** for instructions.
2. Prepare and install a new administration set. See ***Priming*** for instructions.

Programming

This section will describe the various paths and interactions that may be encountered while programming an infusion. These are:

- *Getting Started*
- *Primary/Single Step Infusion*
- *Secondary Infusion: Concurrent, Piggyback, or Deliver Alone*
- *Flush*
- *Multi-Step*
- *Loading Dose*
- *Bolus*
- *Options*
- *VTBI Complete Alarm*
- *Stopping an Infusion*
- *Titration*
- *Standby*
- *Clearing a Line*

Getting Started

Programming With or Without a Cassette

The Plum Solo infusion pump can be programmed with and/or without a Plum administration set inserted.

NOTE: It is recommended to insert the cassette before programming.

Programming With a Cassette

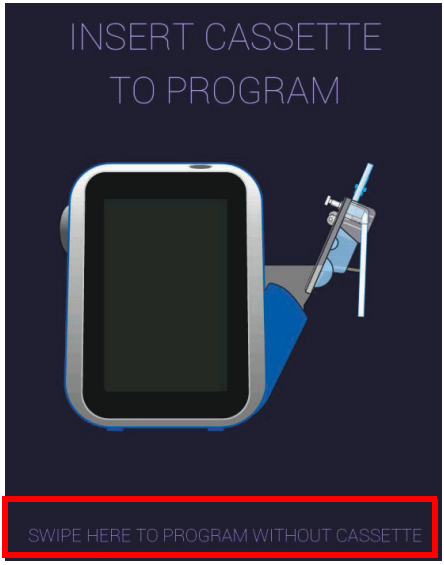
See ***Loading a Cassette*** for instructions on inserting an administration set into the pump.

After loading a cassette into the infusion pump, the cassette load animation will cease and the appropriate line selection screen will display with the Primary Line icon flashing, designating it is ready to be programmed.

Programming Without a Cassette

The infusion pump provides the ability for the user to program without a cassette

.



Touch the bottom of the screen to enable programming. A popup message will be displayed. Tap CONTINUE to confirm programming without a cassette.

New Patient

When turning on an infusion pump within five hours of the last shutdown, if patient data was saved on the pump before Power Off, the pump prompts “New Patient?” to give you the option to clear all settings on all lines.

Select yes to clear the settings and programming for all lines. Select no to retain the settings and programming for all lines. This is not displayed if patient information was cleared during powering off.

During Power Off, if there is uncleared programming, the pump prompts to "CLEAR PATIENT" or "SAVE PATIENT" to proceed with the power off process.

Current CCA and Changing a CCA

The system CCA determines the drugs available for programming, as well as certain parameters for individual drugs, such as hard and soft limits. The current system CCA is displayed at the top of the screen.

When initially programming the pump, the last CCA used will be retained and act as the current CCA.

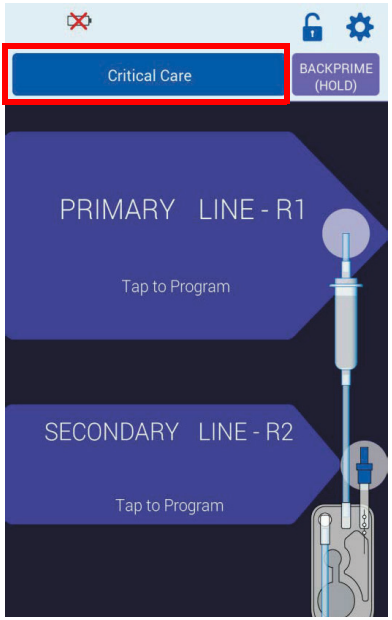
If a currently infusing line was programmed under a different CCA, the previous CCA will display on that line's Programming and Review pages.

Changing a CCA

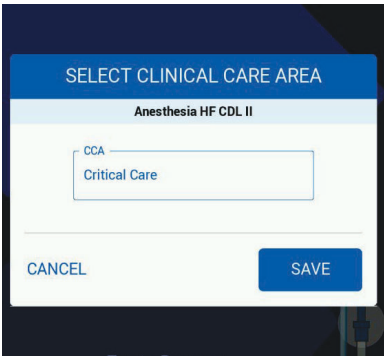
You may change the current system CCA before, during, or after an active infusion.

To change the current system CCA:

1. Tap the name of the CCA at the top of the Main Delivery page.



The CCA selection popup appears.

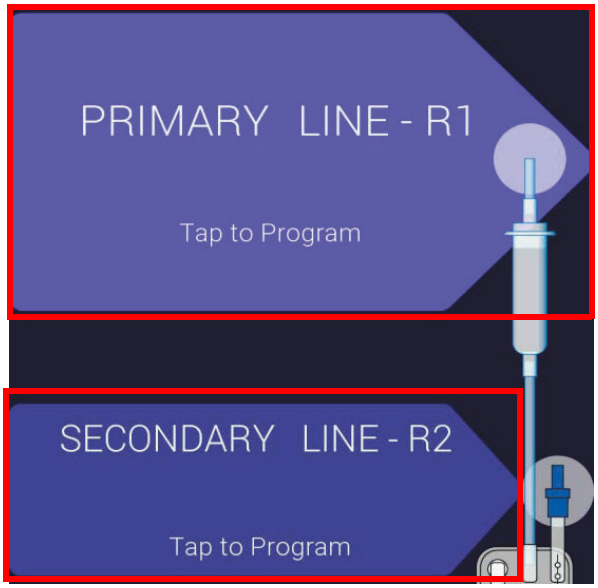


2. Tap the CCA selection field.
   Only a few CCAs are visible at one time. To navigate the list, drag your finger vertically.
3. Select the desired CCA in the drop-down list.
   The name of the selected CCA appears at the top of the screen and is now the current system CCA for all four lines.

Changing the system CCA does not affect current infusions programmed prior to the change. Settings for previously programmed infusions, such as hard and soft limits, are still determined by the previous system CCA.

When the Delivery page displays, the infusion pump will inform the user that line is delivering under a prior CCA. Until a VTBI Complete alarm occurs for the line, you can still titrate the infusion on that line under the old CCA.

Selecting a Line to Program

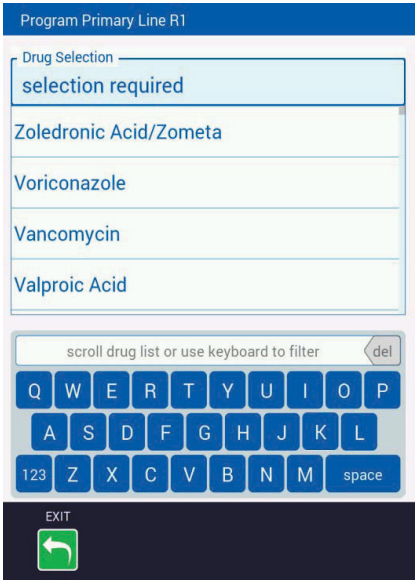


When a cassette is inserted the line selection option will be presented to the user. To select a line for programming, tap the highlighted area of the line to navigate to the Drug Selection page.

If a secondary line is selected without an infusion present on the primary line, the infusion pump will display a popup asking if this was intended.

The Plum Solo infusion pump can run up to two concurrent infusions simultaneously, depending on drug compatibility.

Selecting a Drug



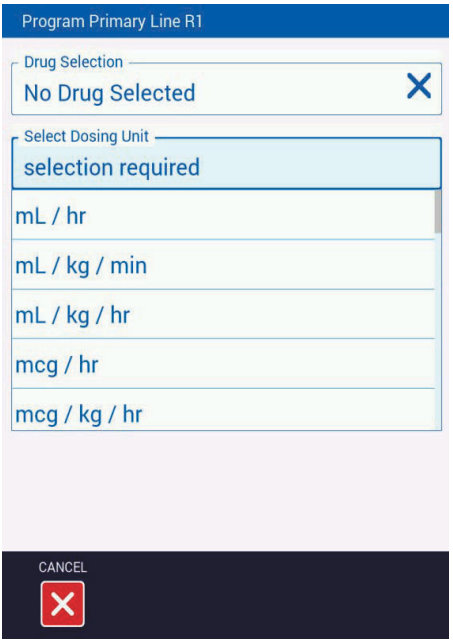
The current CCA determines the list of available drugs, as well as their configurations. Depending on how the drug is configured, the option to select a clinical use, delivery unit of measure, or concentration will be available.

Use one of the following methods to search for a drug or fluid:

- Enter the name using the keyboard. The list will filter as you enter characters. Tap the backspace button to clear characters.
- Search numerically (example “0.9% NaCl”) by tapping the 123 button in the lower left of the keyboard.
- Scroll through the medication list manually. Drag your finger vertically through the list to scroll.

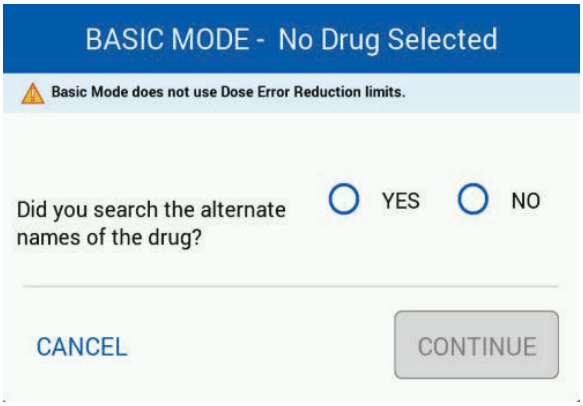
Clinical advisories for a medication will display when the associated drug is selected while manually programming the infusion pump and must be acknowledged before programming can continue.

No Drug Selected (Basic)



No Drug Selected (Basic) is available for when the drug of choice is not within the drug library. When utilizing this option, the clinician can program the medication, although no hard or soft limits will be applied to the infusion except for those determined by the pump's flow rate limitations. The available units of measure for programming for this feature are determined by the drug library, and mL /hr may be the only available unit.

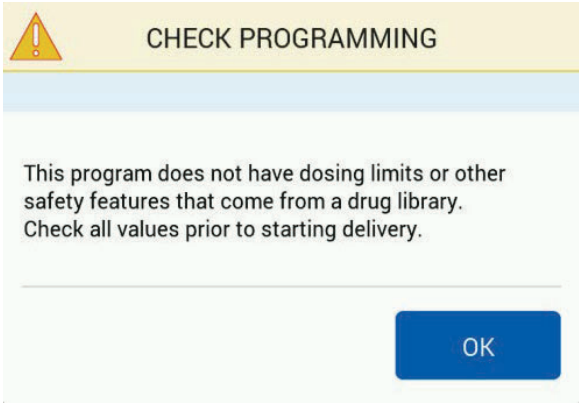
When selecting No Drug Selected, a pop-up will appear asking if the user has searched for the drug under alternate names. Tap either button to continue.



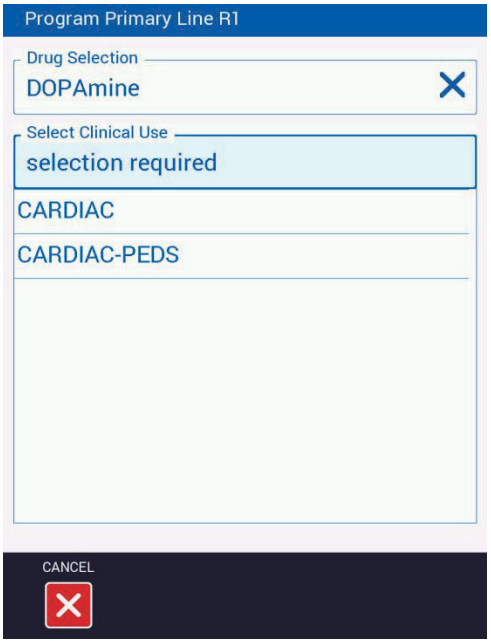
WARNING: THERE ARE NO MEDICATION LIMITS IN PLACE WHILE USING THE "NO DRUG SELECTED" OPTION.

No Drug Selected (Basic) offers only mL/hr programming, as well as a limited selection of dosing unit options if enabled by the drug library for each CCA. When programming parameters are entered, a "CHECK PROGRAMMING" alert will appear. Carefully review all parameters before starting delivery

.



Selecting Clinical Use

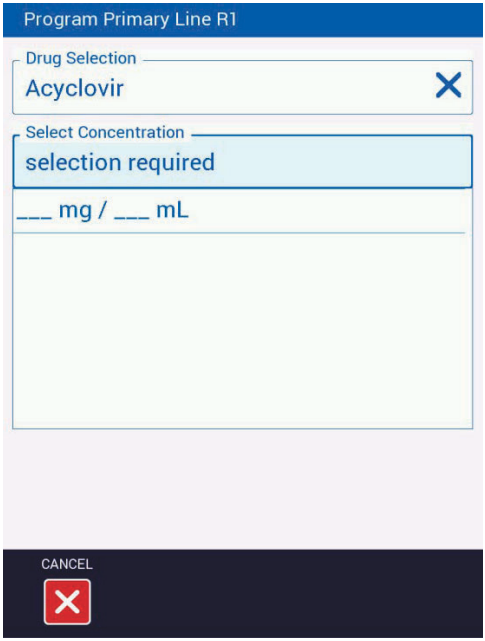


Options may be presented for a fluid or drugs clinical use. There may be different limits to each clinical use. Clinical uses are configured by the pharmacy based on the facility's best practices.

Example: selecting the medication Dopamine could open a list of different clinical uses, for example Renal or Cardiac. These specific clinical uses may then display multiple concentrations.

WARNING: IF A SELECTED MEDICATION CONTAINS MORE THAN ONE CLINICAL USE, CHOOSE THE APPROPRIATE CLINICAL USE FOR THE INFUSION AS IT DETERMINES THE MEDICATION RULESETS FOR THAT INFUSION.

Selecting a Concentration and/or a Unit of Measure



Medications may or may not have predetermined concentrations and units of measure. In most custom drug library entries, these values are already predefined and will not require manual programming.

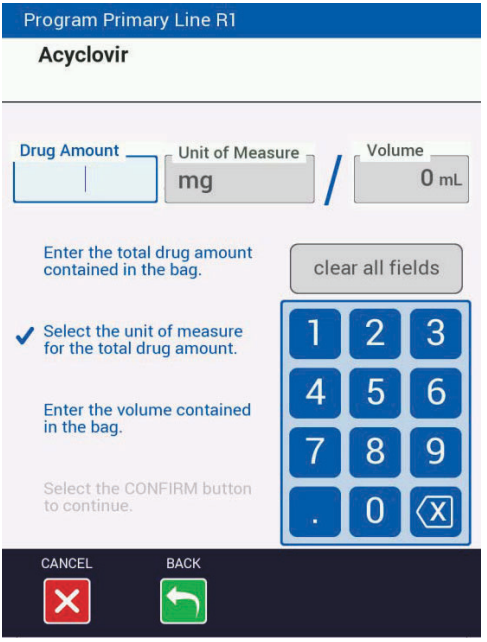
When a medication does not have a concentration and/or unit of measure, the user has the ability to enter these values.

Concentration Entry

The Plum Solo infusion pump allows the user to input custom values (drug amount and diluent volume) for medications whose values are not specified in the custom drug library. Drug amount and diluent volume may have hard limits determined by the custom drug library.

To program medications whose values are not specified in the drug library:

1. From the drug list, tap the Concentration option of the desired unit of measure (for example, “__mg/__mL” or “__mg/100mL”).



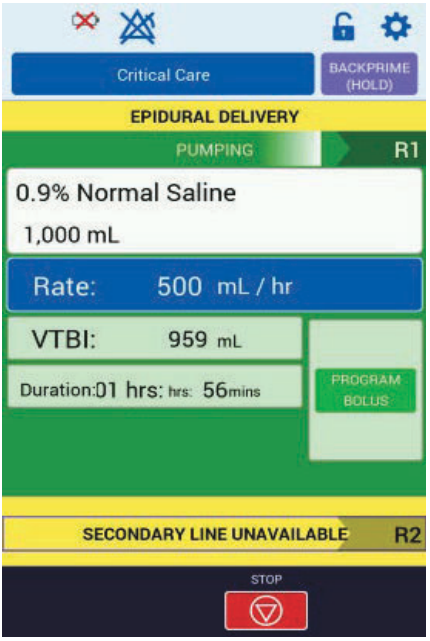
2. Enter the total Drug Amount.

NOTE: Depending on the drug’s configuration, certain values (such as Units of Measure) may not be editable.

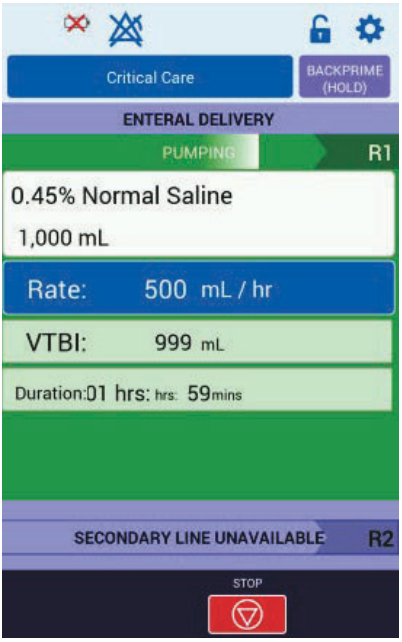
3. Enter Volume if it is not pre-filled.
4. Tap CONFIRM.
   A pop-up appears to verify the concentration.
5. Tap CONTINUE if the concentration is correct or EDIT to change it.
6. See ***Programming*** for programming options.

Routes

Depending on how the medication is configured through the drug library, the route of delivery may have been specified, and its color cannot be changed by the clinical pump user. For example, for an epidural delivery, the pump user interface can be configured to change to yellow.

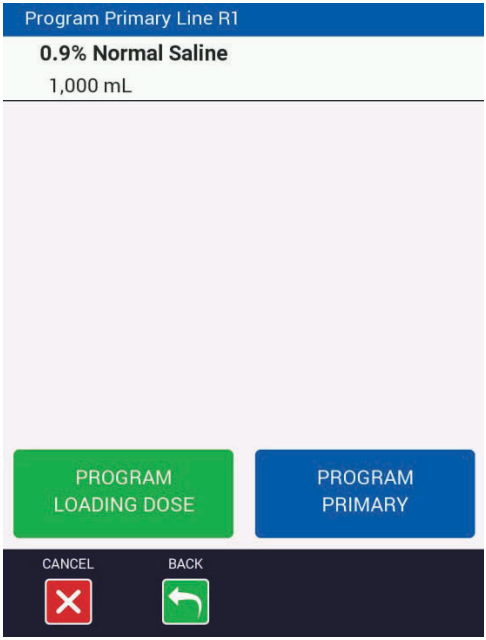


For enteral delivery, as configured in the drug library, the pump user interface can be configured to be either purple or orange.



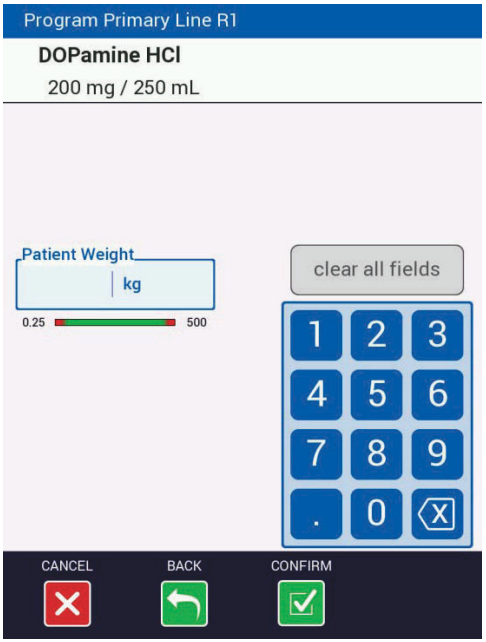
WARNING: USE THE TWO CHANNELS ON THE INFUSION PUMP FOR A SINGLE PATIENT FOR THE SIMULTANEOUS DELIVERY OF THERAPIES BY THE SAME ROUTE. THE USE OF THE CHANNELS FOR DIFFERENT PATIENTS AND/OR ROUTES, SUCH AS INFUSING IV AND EPIDURAL INFUSIONS ON THE SAME INDIVIDUAL PUMP, COULD POTENTIALLY LEAD TO INCORRECT THERAPY.

Selecting Delivery Method



Depending on how the medication is configured through the drug library, the user may have the option to configure with a Loading Dose or Multistep, along with a Primary, Piggyback or Concurrent Infusion. If the drug ruleset is configured for Bolus, then Bolus will be available at the start and during delivery. Tap one of the options to select it.

Setting Patient Parameters

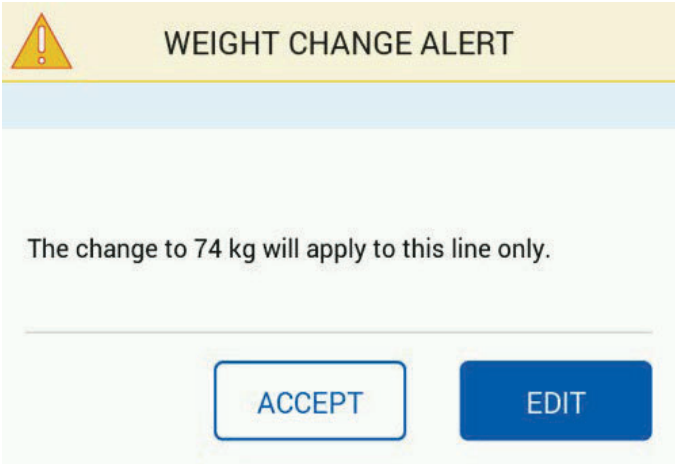


Depending on drug selection and therapy, the user may be required to input patient parameters to deliver the infusion. These parameters may have limits based on the CCA. To enter values (for example patient weight, patient height, and BSA), use the keypad on the right and then tap CONFIRM.

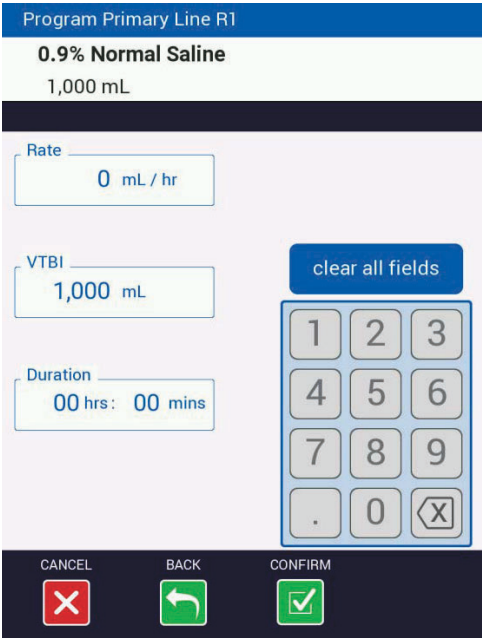
BSA can be entered manually or, if a weight and height is entered, will be automatically calculated using the DuBois method.

Changing Patient Parameters

The infusion pump will pre-populate weight or BSA if those parameters were already programmed for the same patient. These patient values can be changed to only impact one line. The infusion pump can have up to two different patient weights per device. When the patient weight is changed, the affected rate or dose will be recalculated to reflect the new parameter. In addition, an alert will display to inform the user that the change applies only to that line.

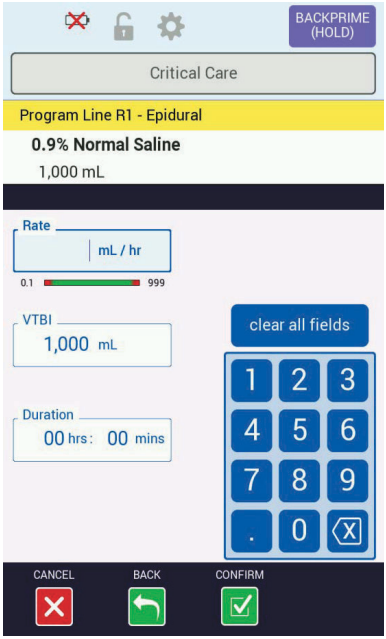


Setting Values Through the Programming Page



The Programming page is used to set values for an infusion, such as Dose, Rate, VTBI, and Duration. You can select a field by tapping it.

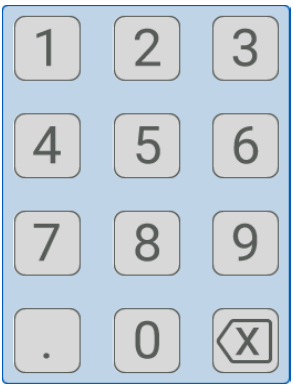
When you have done so, the field will change color, the value's limit bar will appear, and the keypad on the right will unlock.



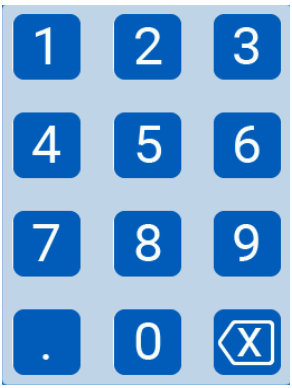
NOTE: You must touch the hours and minutes fields separately when programming duration.

Keypad Interactions

The keypad on the Programming page will display differently depending on user interactions.



The keypad will appear grayed out when first navigating to the programming page and before selecting a programming field (Dose, Rate, VTBI). The keypad cannot be interacted with in this state.



The keypad will change colors once a programming field has been selected. It can now be interacted with.

The keypad background will turn yellow, and a yellow arrow will appear, when a value falls below or above a soft limit. The direction of the arrow, as well as the value's limit bar, indicates if it is an upper or lower soft limit.

Example: the yellow arrow here indicates that the Rate of 0.01 mL/hr falls below the soft limit of 1 mL/hr.

The keypad background will turn red, and a red arrow will appear, when a value falls below or above a hard limit. The direction of the arrow, as well as an alert message below the relevant field, indicates if it is an upper or lower hard limit. The keypad will gray out except for the backspace button. Tap "X" to clear and then reenter values.

Dose Calculation

There are three ways that the Plum Solo pump performs auto-calculations:

- In a time-based dosing unit such as mL/hr or mg/kg/hr, where entering the dose calculates the rate and entering the VTBI calculates the duration.

- In a non-time-based dosing unit such as mg/mL, where entering the dose calculates the VTBI, and entering the rate calculates the duration. Calculated VTBIs are rounded to the nearest 0.01 mL resolution.

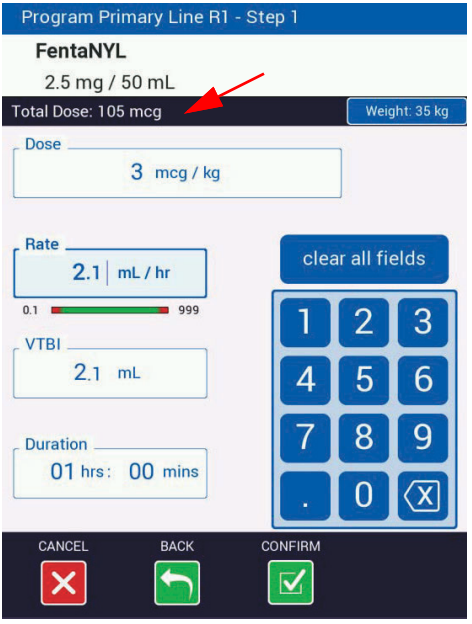
  NOTE: On the delivery screen, the VI/VTBI will be rounded to the nearest whole number when the VI or VTBI is greater than 100mL.

- In mL/hr, where there is no dose value entry.

See ***Examples of Automatic Calculation*** for additional information on how the infusion pump performs auto-calculations.

Total Dose Calculation

With non time-based/intermittent infusions that uses weight or BSA, the Plum Solo infusion pump will display the calculated total dose. The following is an example:

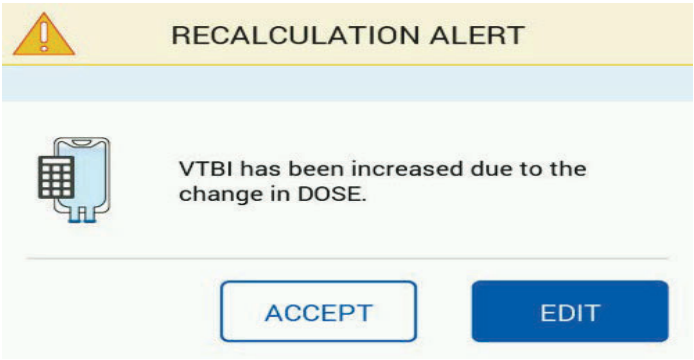


Plum Solo will calculate the total dose by using the entered dose value multiplied by the patient unit of measure. Any limits for this type of program are configured for the dose per patient value.

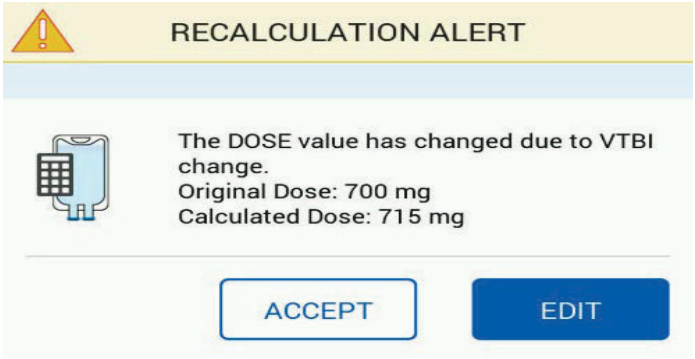
Recalculation Alert

There are three conditions that can trigger a Recalculation Alert on non-time based (intermittent that displays dose) infusions.

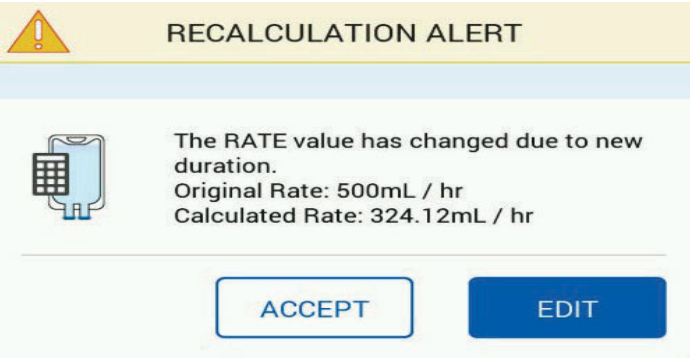
1. Anytime a pump performs a calculation that drives the VTBI higher than the selected concentration volume, a recalculation alert displays.



2. If a recalculation occurs on the dose of a non-time-based infusion, a Recalculation Alert will be displayed.



3. If you change the Duration of a confirmed mL/hr or non-time-based dosing unit program and tap START to confirm the titration, a Recalculation Alert will be displayed indicating that the rate has been recalculated due to the duration change.

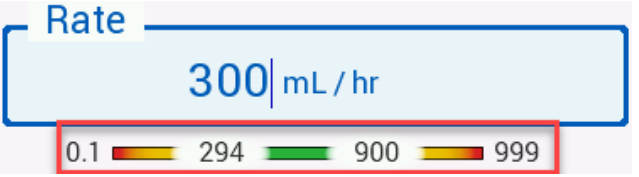


When the alert appears, tap ACCEPT to continue to the Review page or tap EDIT to remain on the Programming page.

The Recalculation Alert will not occur for initial programming or programming after a VTBI Complete alarm.

Understanding Limits

Medications may have hard and soft limits configured through the drug library. These limits will be displayed using the limit bar under the relevant field on the Programming page.



If the user programs outside a drug's soft limits, the soft limit override icon appears and the keypad turns yellow. After tapping CONFIRM,

the infusion pump will notify them to accept or edit the programmed infusion.

If the user programs outside a drug's hard limit, the relevant field turns red and is cleared. The pump will then notify them to edit within the approved limits. Tap the backspace button to clear the entry and enter a new value.

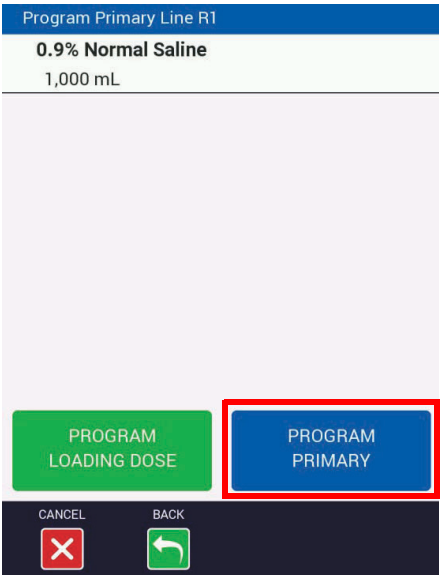
Primary/Single Step Infusion

To program a primary infusion:

1. Tap PRIMARY LINE - R1.
2. Locate the drug in the Drug Selection page by scrolling through the list, or by typing the name of the drug. The selection of drugs will narrow as you tap each letter.
3. Tap the drug and select the clinical use and/or concentration.

WARNING: IF A SELECTED MEDICATION CONTAINS MORE THAN ONE CLINICAL USE, CHOOSE THE APPROPRIATE CLINICAL USE FOR THE INFUSION AS IT DETERMINES THE MEDICATION RULESETS FOR THAT INFUSION.

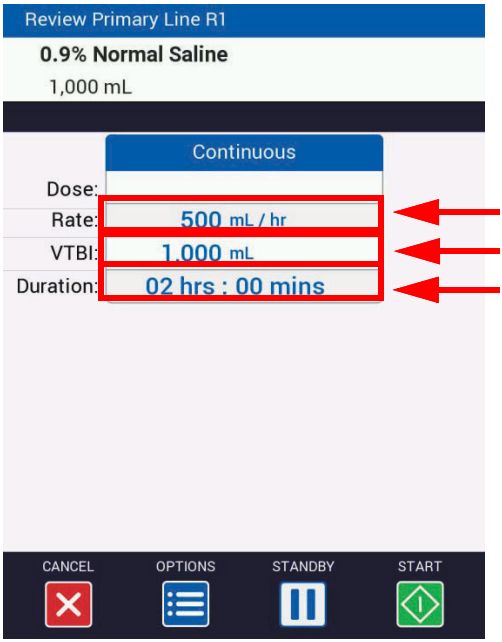
4. Select PROGRAM PRIMARY INFUSION.



5. Input parameters such as rate, VTBI, and/or duration of infusion using the keypad.
6. Tap CONFIRM and review the program on the Review page. If the program requires editing, tap the relevant field to be

directed back to the
Programming page

.



WARNING: CONFIRM AND VERIFY ALL THERAPY VALUES BEFORE TAPPING START.

7. Tap START to begin infusing.

NOTE: After the cassette is inserted, the pump will perform the cassette test. During cassette testing the START button will be accessible to queue the start of delivery after the cassette test completes. Delivery will not start if air, occlusion, or cassette issues are detected (an alarm will occur specific to the issue).

Secondary Infusion: Concurrent, Piggyback, or Deliver Alone

The Plum Solo infusion pump allows for a secondary infusion. There are three delivery modes for a secondary infusion: Concurrent, Piggyback, and Deliver Alone (secondary line disabled).

During Concurrent delivery, both lines will infuse at the same time. Bolus and Loading Dose are prohibited with Concurrent delivery. **Concurrent delivery is prohibited if the max combined flow rate of both lines would exceed 500 mL/hr, or if the minimum flow rate of either line would fall below 0.5 mL/hr.** These modes are defined in the drug library by the medication ruleset. The No Drug Selected (Basic) ruleset can also be defined in the drug library for a Clinical Care Area.

PRECAUTION: THE MAXIMUM COMBINED RATE OF THE PRIMARY AND SECONDARY LINES ON THE SAME CHANNEL IN CONCURRENT MODE IS 500 mL/HR, THE MINIMUM RATE IS 0.5 mL/HR PER LINE.

Piggyback delivery suspends the primary line delivery while the secondary line infuses. By default, the primary line resumes when the secondary line completes. Piggyback delivery may only be used if the drug on the primary line is configured to be interruptible in the safety software. Additionally, the drug to be piggybacked must be configured to be deliverable in this mode.

WARNING: CONSULT DRUG LABELING TO CONFIRM DRUG COMPATIBILITY, CONCENTRATION, DELIVERY RATES, AND VOLUMES ARE ALL SUITABLE FOR CONCURRENT AND PIGGYBACK DELIVERY MODES.

When configured at the ruleset, Deliver Alone disables access to the secondary line and prohibits it from being programmed.

Programming the Secondary Line

When programming the secondary line, you can select Piggyback or Concurrent as the delivery mode. When using a drug library, there may be some restrictions.

The following rules apply when programming the secondary line:

- The secondary delivery mode will be set to concurrent and cannot be changed when:

    - a drug programmed on the secondary line cannot be programmed as a piggyback (as defined by the drug library)
      OR
    - there is a confirmed program on the primary line with a drug that cannot be interrupted (as defined by the drug library).

- The secondary delivery mode will be set to piggyback and cannot be changed when:

    - there is a confirmed program on the primary line with a medication that can be interrupted by a piggyback (as defined by the drug library)
      AND
    - the medication on the secondary line may be given as a piggyback (as defined by the drug library)
      AND
    - the infusion would result in a concurrency violation if programmed concurrently.

- If (1) the primary line is programmed with a medication that is interruptible (or there is no program on the primary line), (2) the medication on the secondary line is allowed to be given as a piggyback, and (3) the infusion would not result in a concurrency violation if programmed concurrently, then the secondary line delivery mode is set as follows, but CAN be changed by the pump user:

    - when a medication, other than No Drug Selected (Basic), is programmed on the secondary line, the secondary line delivery mode is set based on that medication's secondary mode default setting as defined in the drug library.

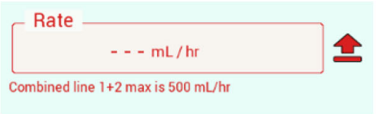
    - when No Drug Selected (Basic) has been selected, the secondary delivery mode is set based on the default secondary mode setting for No Drug Selected (Basic) in the drug library.

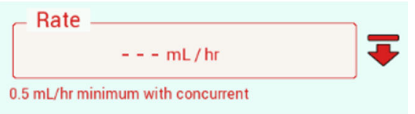
- The secondary line is disabled and unavailable for programming if the medication on the primary line is configured to be delivered alone (as defined by the drug library).

- If the pump is not using a drug library, No Drug Selected (Basic) can be set to either concurrent or piggyback mode and can be changed as there are no configurations/settings defined by a drug library. The use of a drug library is recommended.

NOTE: A concurrency violation occurs when 1) the cumulative rate of the concurrent infusions would violate the concurrent minimum or maximum rate, or 2) a bolus or loading dose is programmed on the primary line and therefore concurrent delivery is prohibited. In this case, a piggyback can be programmed, but will begin infusing when the bolus/loading dose completes.

NOTE: A hard limit alert will be displayed if any concurrency limits are exceeded. For example, the following alerts will display when the combined rate of both lines exceeds 500 mL/hr, or when a line is programmed for less than 0.5 mL/hr in concurrent mode.





Backprime

WARNING: THERE IS A POSSIBILITY OF THE SECONDARY SOLUTION BEING DILUTED WITH THE PRIMARY SOLUTION DURING BACKPRIMING.

WARNING: BACKPRIMING SHOULD NOT BE PERFORMED FOR RECONSTITUTING SECONDARY CONTAINERS CONTAINING DRY POWDERS.

Backpriming resolves upstream air-in-line alarms on primary and secondary lines without the need to disconnect the administration set from a patient. Backpriming can also relieve built-up pressure in the cassette caused by some occlusion conditions, resolving the occlusion alarms while the patient is still connected to the set.

However, backpriming is not necessary to clear alarms. See ***List of Alarms and Corrective Actions*** for alarms that can be resolved by backpriming and their corrective actions.

During a backprime, fluid is pumped from the container on the primary line to a line or syringe attached to the secondary port at a rate of approximately 1 mL every 5 seconds. In the process, air is cleared from the cassette air trap and upstream line(s). The pump closes valves to ensure that the backprimed fluid does not reach the patient.

Auto-backprime is an automatic 6-second backprime that occurs following a secondary infusion using the ***Infuse to Empty*** feature. Auto-backprime clears any air from the air trap before the primary infusion resumes to prevent downstream air.

The approximate volume used to backprime can be viewed under Settings on the Volume Infused page. The backprime volume will accumulate until the primary line VI is cleared, either on the Volume Infused screen or when patient data is cleared.

NOTE: To determine if there is sufficient volume on the primary line for features, including piggyback flush and auto-backprime, the backprime volume will be deducted from the VTBI of the primary program if this is defined as a continuous infusion through the drug library, that can be interrupted by a piggyback and delivered in mL/hr.

Preparing to Backprime

To accept the backprimed air and/or fluid, a line with a container or syringe must be attached to the secondary port. This attachment prevents upstream occlusion alarms on the secondary line during the backprime operation.

NOTE: If you are using a syringe adapter, you must open and close the lever before you will be able to backprime.

NOTE: A small amount of fluid may be expelled from the set (less than or equal to 0.05 mL) after backpriming. If potent drugs are being used, take appropriate action to guard against over-medication of the patient.

NOTE: Ensure the primary container has a sufficient volume of at least 5 mL in order for an auto-backprime to occur when using the Infuse to Empty feature. If there is not sufficient volume, the user will be notified that the infusion will STOP when air-in-line is detected (See piggyback ***Infuse to Empty***).

Setup for Backpriming into a Secondary Line

If you already have a delivery set up for the secondary line, you can backprime into the secondary line fluid container. This setup will resolve an upstream air-in-line alarm for either lines.

NOTE: Since the Plum Solo infusion pump delivers the exact VTBI that is programmed for a line, you may need to adjust the VTBI on the secondary line to account for the extra volume from backprimed fluid. Using the ***Infuse to Empty*** feature will deliver this overfill up to a maximum of an additional 15% of the container volume.

Setup for Backpriming into a Syringe

If you do not have a delivery set up on the secondary line, or you need to avoid pumping air and fluid from the primary line into the secondary, you can attach a syringe to the secondary port to accept the fluid and/or air from the primary line and the cassette when backpriming.

NOTE: Before you begin a backprime, ensure that the syringe has enough free space to accept the backprimed fluid. Backpriming into a full syringe will trigger an upstream occlusion alarm.

Backpriming Procedure

Before you begin a backprime, ensure that there is a line or syringe on the secondary port and a secondary container to accept the backprimed fluid and expelled air.

To backprime:

1. Press and hold the BACKPRIME button until fluid pumped from the primary line to the secondary line clears air from the cassette and from the secondary line (if present).

When you release the BACKPRIME button, the infusion pump performs a cassette test.

2. If the cassette test detects that there is still air in the line, repeat Step 1 until the cassette test is successful.

NOTE: If the cassette test fails, tap BACKPRIME to close the pop-up, and then hold down BACKPRIME as described above to clear air from the cassette.

NOTE: When using the Infuse to Empty feature, no steps are required to perform an auto-backprime (See ***Infuse to Empty***).

Infuse to Empty

Infuse to Empty is a feature for a piggyback infusion that ensures the full dose is given to the patient by emptying the containers of the upstream bag or bottle, including the upstream drip chamber and secondary tubing. Infuse to Empty is only available if the medication ruleset in the drug library is configured as intermittent and has this feature enabled.

When the feature is programmed by the user, the pump will continue to deliver at the programmed rate after the defined VTBI reaches 0 and until upstream air is detected by the upstream air sensor. When air is detected, the pump will automatically backprime to clear any air from the cassette's air trap, then proceed with the flush and/or primary delivery.

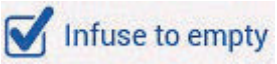
NOTE: This feature infuses the medication on the secondary line until air is detected, and it does not work effectively with syringes as a piggyback.

NOTE: There must be a sufficient volume of at least 5 mL on the primary line for an auto-backprime to occur. If the primary VTBI is not sufficient, an alert will be displayed notifying that the infusion will STOP after the piggyback completes. Ensure there is sufficient VTBI on the primary line for best performance of the Infuse to Empty feature.

NOTE: If the VTBI of the piggyback infusion is modified, the Infuse to Empty feature is no longer available.

To program Infuse to Empty with an intermittent Piggyback infusion:

1. On the mode selection page, toggle to piggyback mode.
2. Tap the "Infuse to Empty" checkbox to enable the feature.



3. Tap PROGRAM PIGGYBACK
   The programming page appears.
4. Program the piggyback infusion.

   NOTE: Do NOT edit the VTBI

5. Tap CONFIRM.
   The Review page appears.

   NOTE: Infuse to Empty can also be enabled on the Review page

6. Tap START

To turn off the Infuse to Empty feature, tap the "Infuse to Empty" checkbox to remove the check from the box.

PRECAUTION: RUNNING THE BAG DRY MAY RESULT IN STUCK FLUID DROPLETS INTERFERING WITH THE UPSTREAM AIR SENSOR, RESULTING IN A POTENTIAL FAILURE TO DETECT UPSTREAM AIR.

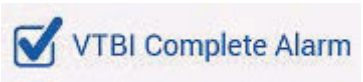
Disable Intermittent Concurrent VTBI Complete Alarm

The VTBI Complete alarm can be disabled for intermittent infusions on the secondary line delivered in Concurrent mode. When the VTBI Complete alarm is disabled and VTBI reaches 0 mL, the secondary infusion will end silently and the primary infusion will resume, similarly to the completion of piggyback infusions to enhance clinician workflow.

The VTBI Complete alarm is enabled by default for every infusion. The pump user can disable the alarm, depending on the patient's needs, only if this feature is configured in the drug library for an intermittent ruleset and if it is configured to allow disabling the infusion complete alarm.

To disable the VTBI Complete Alarm:

1. On the mode selection page, toggle to Concurrent mode.
2. Tap the “VTBI Complete Alarm” checkbox to uncheck the box.



NOTE: The “VTBI Complete Alarm” checkbox will be checked by default (enabled).

3. Tap PROGRAM CONCURRENT
4. Input parameters such as rate, VTBI, and/or duration of infusion using the keypad.
5. Tap Confirm and review the program on the Review page. If the program requires editing, tap the relevant field to be directed back to the Programming page.

NOTE: The VTBI Complete alarm can also be disabled on the review page.

6. Tap START.

To re-enable the VTBI Complete Alarm, tap the "VTBI Complete Alarm" checkbox to add the check to the box.

NOTE: If the VTBI Complete alarm is disabled, it is listed under the Disabled Alarms icon as well as in the footer message of the secondary line.

Flush

The Flush feature enables the clinician to flush the downstream tubing volume after a piggyback therapy. The programmed Flush volume is delivered from the primary line container at the piggyback therapy rate after the Piggyback therapy completes.

WARNING: DETERMINE THE PIGGYBACK FLUSH VOLUME BY CONSIDERING THE MAXIMUM VOLUME OF THE CASSETTE (3.5 mL), DOWNSTREAM VOLUME, AND VOLUME OF THE EXTENSION SET OR ADD-ONS TO AVOID UNDER-DELIVERY OR OVER-DELIVERY TO THE PATIENT.

The clinician must determine the appropriate flush volume based on patient needs and the administration set in use. Approximate downstream (distal) contained volume varies based on the internal diameter and length of the downstream tubing. To determine the appropriate volume to program for the flush, the contained downstream (distal) volume is provided on the administration set packaging.

The maximum volume of the cassette (3.5 mL) should be considered when precise volume is required based on patient needs. Most administration sets include the cassette volume in the total volume downstream (distal) priming volume.

Review the administration set labeling being used. If the cassette volume is not listed on the administration set, include the cassette volume as part of the downstream (distal) priming volume used in calculating a flush volume.

The allowable range for a flush is 5 to 30 mL. Downstream filters and extension sets should also be considered when determining and programming the flush volume.

A flush can be programmed under the following conditions:

- the primary line is programmed with a fluid (medication) that is interruptible
- the primary line cannot be in Delayed Start, Standby, or programmed as a Multistep delivery
- the primary line VTBI must be greater than the Flush volume
- the secondary line delivery mode is Piggyback

Flush duration and volume are not considered when the infusion pump is checking for Hard Limit or Soft Limit violations for the primary or secondary line programs.

To program a flush with a new Piggyback delivery under the conditions listed above:

1. On the Review page, tap the TAP TO ADD LINE FLUSH button.
2. Input the flush VTBI using the keypad.
3. Tap CONFIRM.
   The Review page appears.
4. Tap START.

You can also add flush to an infusion from the Delivery page. To do so, tap ADD FLUSH on the secondary delivery and follow steps 2-4 above.

When the Piggyback VTBI reaches 0, the flush will be delivered from the primary line container at the secondary line Piggyback delivery rate until the flush has been delivered. The primary line will display FLUSHING LINE.

Clear Flush

To clear a flush from the Main Delivery page:

1. Tap CLEAR FLUSH on the relevant infusion.
2. Tap CLEAR.

Alternatively, to cancel a flush from the Review page:

1. Tap the trash can icon underneath the flush delivery.
2. Tap CLEAR.
3. Tap START.

Multi-Step

Multistep delivery is a sequential program that can deliver up to 10 steps from one container at different rate/dose/VTBI and durations using the same dosing unit and concentration. Multi-step delivery is available for drugs not configured for bolus.

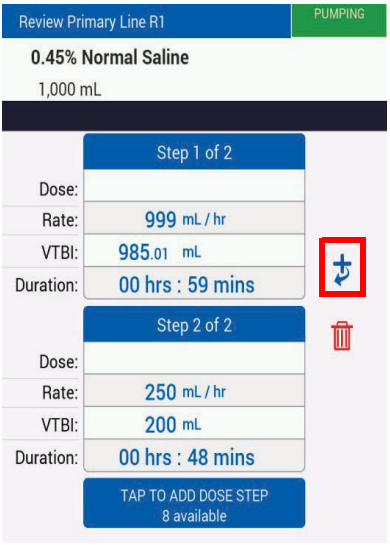
To program a Multi-Step infusion:

1. Tap Program Multi-step.
2. See ***Setting Patient Parameters*** and ***Titration*** for inputting values.
3. On the Review page, select TAP TO ADD DOSE STEP HERE to add a step.
   The Programming page for the step appears.

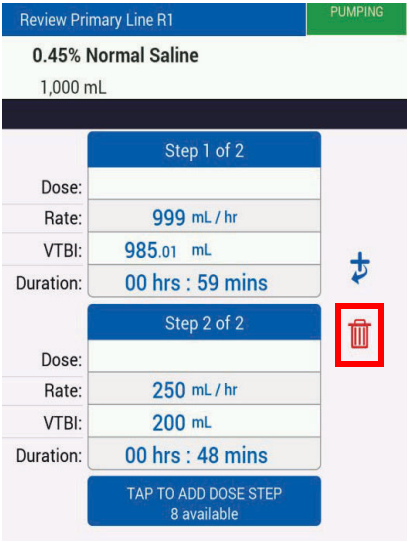
NOTE: The currently selected step number is displayed at the top of the Programming page.

4. Follow steps 2-3 as necessary.

5. To insert a step between other steps, tap the plus icon below the previous step.



6. To delete a step, tap the red trash icon below the relevant step.



7. If a certain number of steps are added (3 or more on the primary line, 2 or more on the secondary line) the START button will turn into a REVIEW button, and a review of all steps is required prior to starting. Once the steps have been reviewed, the REVIEW button will turn back into a START button.
8. Tap START to begin infusing.

NOTE: The current step number is displayed on the Main Delivery page.

NOTE: Steps may be added, edited, or deleted on a running infusion. However, you cannot delete an active step.

NOTE: When three or more steps are programmed, the start button changes to a review button. Tapping the review button brings the view to the first step. A review of all steps is required to change the button to start, by sliding the programming field to the left.

NOTE: Bolus and Loading dose deliveries are not available for therapies that have Multistep delivery enabled.

Adding VTBI to Multistep Program After VTBI Complete Alarm

During a Multistep delivery, after the VTBI Complete alarm activates and post-infusion rate delivery has begun, as long as the post-delivery rate infusion has not been stopped you can add more VTBI to the last delivery step. If you stop infusion after VTBI has completed, you can add more VTBI, but only to the last step.

To add VTBI to a Multi-step program:

1. Select the line.
2. Navigate to the VTBI for the last step.
3. Enter a VTBI.
4. Tap CONFIRM.
5. Tap REVIEW and review steps, if necessary.

6. Tap START to restart infusion.

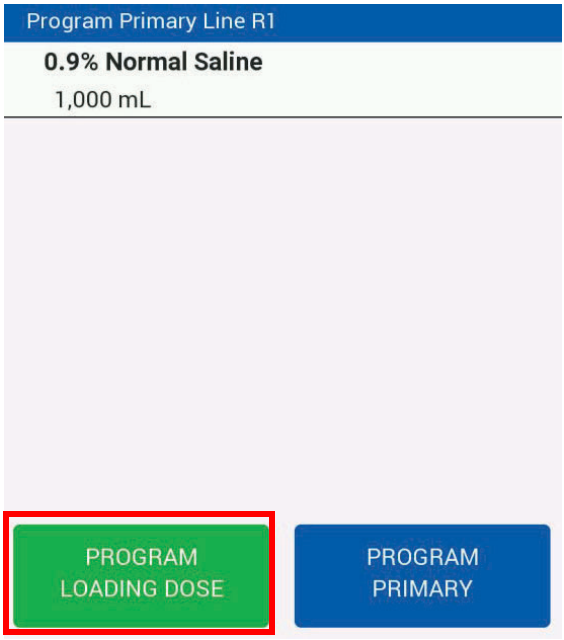
NOTE: When adding VTBI to the last step, you can also update other parameters if necessary.

Loading Dose

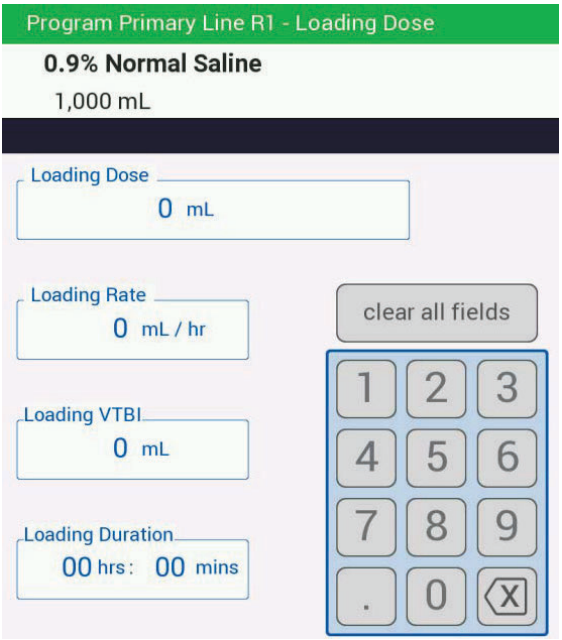
A Loading Dose delivery is defined as a dose of fluid or medication at the initial onset of delivery, to magnify a therapeutic response, that may be followed by a continuous infusion from the same IV solution container. The configurable limits may differ from bolus. A stand-alone loading dose of a new medication can be delivered. Additionally, the device must be in Piggyback mode (not Concurrent mode) if the Loading Dose is to be delivered on the secondary line. A Loading Dose cannot be repeated and is not available once the continuous infusion has started. If a loading dose is programmed without a continuous infusion, upon completion the post infusion will STOP while alarming for Loading Dose Complete. The post-infusion setting cannot continue at the loading dose rate.

To program a Loading Dose Delivery:

1. Tap PROGRAM LOADING DOSE.



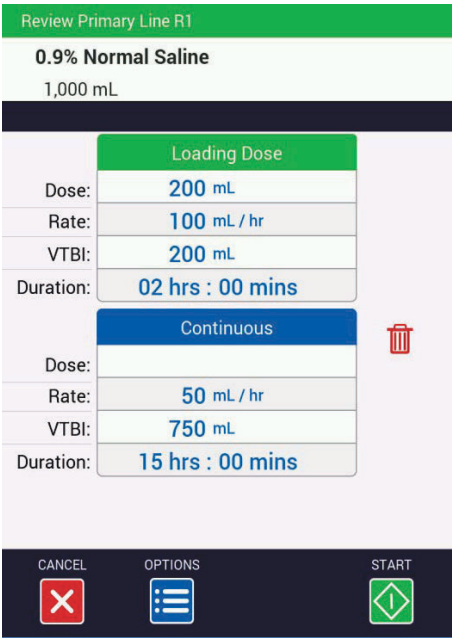
2. Input Dose, Rate, VTBI, and Duration.



NOTE: Some values will auto-calculate as you fill certain fields.

3. Tap CONFIRM.
   The Review page appears.
4. To program the continuous infusion, select TAP TO ADD CONTINUOUS.
5. Input Dose, Rate, VTBI, and Duration for the continuous infusion.
6. Tap CONFIRM.
   The Review page appears.

7. Review the parameters.



8. Tap START to begin infusion.

NOTE: Multistep delivery is not available for therapies that have Loading Dose delivery enabled.

NOTE: Standby is not available for therapies that have Loading Dose deliveries enabled.

Bolus

A Bolus delivery is defined as a rapid infusion of a single or repeated delivery of fluid, or dose, of the drug currently being administered (same medication, concentration, and dosing unit) to magnify a therapeutic response. A stand-alone bolus dose of a new medication can be delivered. If a bolus is programmed without a continuous

infusion, upon completion the post infusion will STOP while alarming for Bolus Complete. Bolus can be delivered from the primary or secondary line (the latter only while in piggyback mode). Those medications which can be delivered by bolus may have dose, time, and bolus limits defined in the drug library. The post-infusion setting cannot continue at the bolus rate if no continuous infusion is programmed. The delivery will STOP when the bolus VTBI reaches 0.

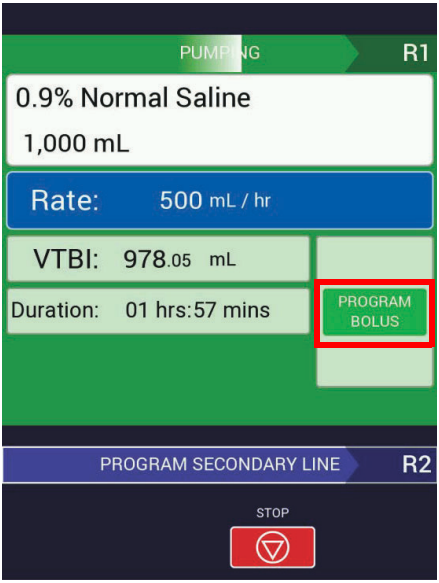
A Bolus can be completed only if the following conditions are present:

- Bolus Dose is enabled within the medication's selected profile at the ruleset level,
- there is adequate VTBI of the medication to complete the bolus dose, and
- the device is in Piggyback mode (not Concurrent mode) if the bolus is to be delivered on the secondary line

Programming a Bolus Dose

To program a Bolus Dose:

1. For a Bolus Dose from a continuous infusion, tap PROGRAM BOLUS on the relevant infusion.

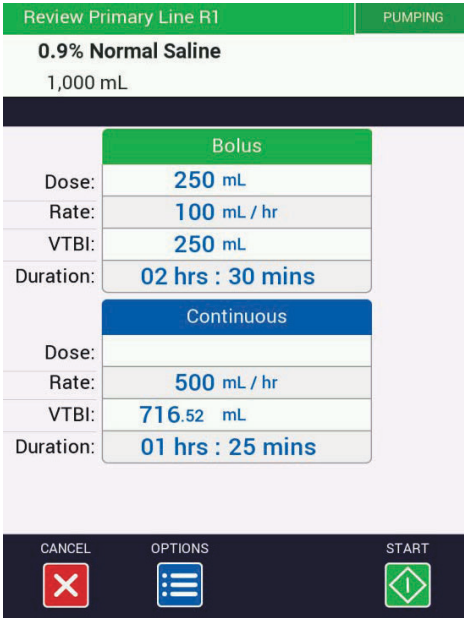


The Programming page appears.

2. Input Dose, Rate, VTBI, and Duration.

NOTE: Some values will auto-calculate as you fill certain fields.

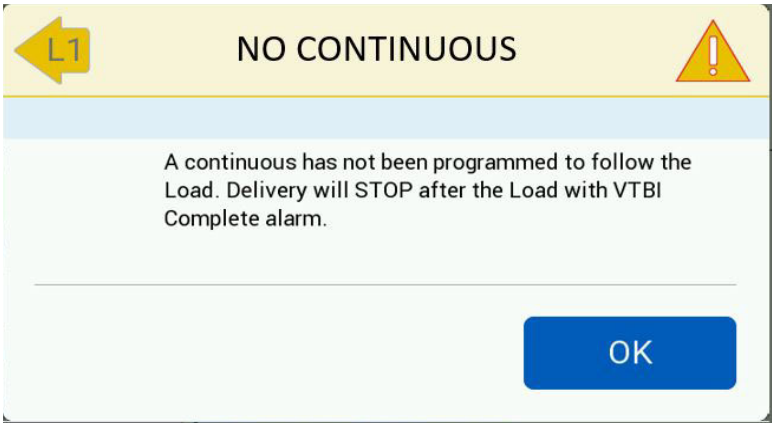
3. Tap CONFIRM.
   The Review page appears.



4. Review the parameters.
5. Tap START to begin infusion.

NOTE: If a bolus is delivered on the secondary line, the Main Delivery screen will show BOLUS on the secondary line. Upon completion, the infusion pump will resume the piggyback which was previously infusing and the callback alarm will activate if configured. If the primary line was previously in a PENDING state, it will remain in PENDING until the bolus and the underlying piggyback are complete.

NOTE: If a Loading Dose or Bolus has been programmed without a continuous, an alert will be presented.



Stopping and Clearing a Loading or Bolus Dose Delivery

Once a Loading Dose or Bolus has started, the Loading Dose or Bolus cannot be modified. The continuous infusion may be added and/or modified during Bolus or Load delivery.

To stop and clear a Loading Dose or Bolus:

1. Tap CLEAR LOAD or CLEAR BOLUS on the Main Delivery page. A confirmation prompt appears.
2. Tap STOP AND CLEAR to confirm. The Loading Dose or Bolus is cleared, and the continuous infusion (if programmed) is displayed.
3. The continuous infusion can be cleared by tapping CLEAR PROGRAM, edit it by tapping one of the values, or start the continuous infusion by tapping START.

NOTE: Multistep delivery is not available for therapies that have Bolus delivery enabled.

NOTE: Standby is not available for therapies that have Bolus deliveries enabled.

Options

The Options page provides a number of editable infusion options, depending on drug library configuration. These options may include: Delay Start, When VTBI Complete Alarms, Callback, Near End of Infusion, and Downstream Pressure Occlussion Alarm Limit.

Any alarms that are turned off or default to off are included under an icon called Disabled Alarms. These include the Near End of Infusion and Callback alarms found under Options.

To navigate to the options page, program the infusion and tap OPTIONS on the Review page.

Delay Start

You may set a delay for an infusion on the Options page.

To program a line with a delayed start:

1. If you have yet to program the infusion, program the line and tap CONFIRM.
   See ***Programming*** for options.
2. On the Review page, tap OPTIONS.
3. Tap the hours and minutes fields under Delay Duration.
4. Scroll through the hours and minutes drop down by dragging your finger and tap the desired hours and minutes, which can be any period between 1 minute and 4 hours.
5. Tap CONFIRM.
6. Tap START DELAY.
   You may view the remaining delay duration on the Main Delivery page, next to START DELAYED. Once the delay duration ends, the line will begin infusing.

Editing Delay Duration

To edit the duration of a delayed start:

1. Tap the name of the programmed drug on the Main Delivery page.
   The Review page appears.
2. Tap OPTIONS.
3. Set a new duration by tapping the hours and minutes fields under Delay Duration.
4. Tap CONFIRM.
5. Tap SET DELAY.
   Delay duration is edited and now appears on the Main Delivery page, next to START DELAYED. Once the delay duration ends, the selected line begins infusing.

Ending a Delay Early

To end a delayed start early:

1. Tap CANCEL DELAY on the Main Delivery page.
2. The delay will be canceled, and the infusion will be set to STOPPED.
3. Tap START to begin the infusion.

Callback and Near End of Infusion Alarm

You can program a Callback Alarm to alert you to each interim step of a Loading Dose, Bolus, or Multistep delivery, or to notify you that a Piggyback delivery has ended. A Callback alarm can only be configured when there is a minimum of 2 steps. For example, a bolus followed by a continuous has 2 steps. If a Callback Alarm was configured, the medium priority alarm would occur after the bolus completed and the continuous started. A Callback cannot be configured at the end of the last step as a VTBI Complete alarm occurs. You may program a near-end of infusion alarm to alert you before an infusion completes.

A Callback Alarm is a medium priority alarm that must be acknowledged by the clinician. A Callback Alarm and Stop configuration triggers a high priority alarm when the step VTBI

reaches zero. For example, a bolus followed by a continuous has 2 steps. If a Callback Alarm and Stop was configured, the high priority alarm would occur after the bolus completes and delivery would stop. A Near End of Infusion Alarm occurs 10 minutes before VTBI reaches zero and is a low priority alarm.

Any alarms that are turned off or default to off are included under an icon called Disabled Alarms. These include the Near end of infusion and callback alarms found under Options.

NOTE: If a Callback or Near End of Infusion alarms are turned off or are off by default as configured in the drug library, these alarms will be listed under the ***DISABLED ALARMS*** icon.

To add a callback alarm to a Loading Dose, Bolus, Multistep, or Piggyback delivery:

1. Tap OPTIONS on the Review page.
   The Options page appears.
2. Tap the CALLBACK.
   The Callback list appears.
3. Drag your finger to scroll through the list and then tap the action to occur after the dose completes.
   Selecting Stop Delivery will stop delivery and alarm between the dose steps. This will NOT stop the line when the total VTBI (Volume To Be Infused) of all steps is complete. If you need the infusion to stop after all steps complete, see section ***VTBI Complete Alarms With Post Infusion Rate***.
4. Tap CONFIRM.

To add a near end of infusion alarm:

1. Tap OPTIONS on the Review page.
   The Options page appears.
2. Tap the NEAR END OF INFUSION.
   The Near End of Infusion list appears.
3. Select the Alarm 10 minutes Prior option from the drop-down.
4. Tap CONFIRM.

VTBI Complete Alarms With Post Infusion Rate

After the programmed VTBI is delivered, the infusion pump issues a VTBI Complete alarm and begins delivering a post infusion rate as one of three options defined by the drug library ruleset. These options are to KVO, CONTINUE at rate, or STOP delivery. If KVO is configured, the rate is defined at the CCA level at a rate of 1 to 20 mL/hr. The post infusion setting from the drug library configuration can be changed by the pump user at any time under OPTIONS.

The VTBI complete alarm can be turned off with intermittent concurrent programs on the secondary line. In this case, the infusion will go into a COMPLETED state, and the post-infusion rate will STOP (See ***Disable Intermittent Concurrent VTBI Complete Alarm***).

To set a WHEN VTBI COMPLETE ALARMS (post infusion rate):

1. Tap OPTIONS on the Review page.
   The Options page appears.
2. Tap WHEN VTBI COMPLETE ALARMS.
   The Post Infusion Rate list appears.
3. Drag your finger to scroll through the list and then tap the desired post infusion rate.
4. Tap CONFIRM.

You may change the post infusion rate drug library configuration to one of the following:

- KVO (Keep Vein Open) - The pump will continue to infuse at the CCA's KVO rate after the programmed infusion has ended.
- CONTINUE at rate - The pump will continue to infuse the selected line at the same rate as the programmed infusion.
- STOP delivery - The pump will stop infusing on that line after the programmed infusion has ended.

NOTE: A Loading dose or Bolus without a continuous infusion will not continue, but instead STOP.

NOTE: If KVO is selected to occur post infusion, the KVO rate is defined as a general setting for a CCA at a rate of 1-20 mL/hr. The post infusion KVO rate will never exceed the programmed rate under any circumstance. Example: If the Post Infusion Setting defined by the ruleset is to KVO at 20 mL/hr, but the programmed rate is 5 mL/hr, the post infusion KVO will be 5 mL/hr.

Downstream Pressure

The Downstream Pressure option controls the pressure at which the Occlusion Limit alarm will sound for that side of the infusion pump. It can be adjusted via Options or Settings. For setting the Downstream Pressure limit via the Settings page, see ***Downstream Pressure***.

To adjust the Downstream Pressure limit using the Options page:

1. Tap OPTIONS on the Review page.
   The Options page appears.
2. Use the arrow buttons under DOWNSTREAM PRESSURE to raise or lower the Occlussion Alarm limit.
3. Tap CONFIRM.

VTBI Complete Alarm

Upon completion of delivery, the screen will display a “VTBI Complete” message and an alarm will sound. The line will KVO (Keep Vein Open), continue, or stop as defined at the ruleset level. Each CCA may define the KVO rate from 1-20 mL/hr.

NOTE: The VTBI Complete alarm can be turned off with intermittent concurrent programs on the secondary line (See ***Disable Intermittent Concurrent VTBI Complete Alarm***).

1. If a VTBI Complete alarm sounds, you may pause the audio to stop the alarm sound.

2. Tap CLOSE to close the message.
   A confirmation popup appears.
3. Follow the instructions for ***Titration*** to add a new VTBI, or follow the instructions for ***Stopping an Infusion*** and clear the program.

Stopping an Infusion

One or more infusions may be stopped from the Main Delivery page at any time.

To stop one or two infusions on the same side of the pump:

1. Tap STOP at the bottom of the Main Delivery page on the same side as the infusion.
   A popup appears.
2. Select the line(s) to stop.
   Infusion on the selected line(s) will cease.

To clear the program, tap CLEAR PROGRAM in the stopped infusion. To edit the program, follow the instructions for ***Titration***. To restart the program, see ***Restarting an Infusion***.

NOTE: When two lines are active when you tap STOP, the infusion pump will alarm after 15 seconds if you don't select the line(s) to stop.

Alternatively, you may stop the infusion on one or both lines by opening the cassette door of the pump.

WARNING: CLOSE ALL CLAMPS BEFORE OPENING THE CASSETTE DOOR.

Restarting an Infusion

To restart a stopped infusion:

1. Tap START on the Main Delivery page.
   If only one infusion on that side is stopped, infusion restarts.

Alternatively, tap START on the Review page to restart that particular infusion.

2. If more than one line on the same side is stopped, select which line(s) you wish to restart.

Changing Delivery Modes on the Secondary Line

You can change the delivery mode of the Secondary Line from the Review page.

To change the delivery mode on the Secondary Line:

1. Navigate to the Review page of the relevant infusion.
2. Tap the Piggyback-Concurrent widget to change selections.
3. Tap CONFIRM.

NOTE: See ***Secondary Infusion: Concurrent, Piggyback, or Deliver Alone*** for concurrent flow rate parameters.

Titration

Titration is a change in Dose/Rate, Duration, and/or VTBI of a running infusion.

To titrate a line:

1. Tap the field to be changed (Rate, VI, or Duration) on the Main Delivery page.
   The Programming page appears and the relevant field will be selected.

   Alternately, tap the name of the drug or any space to navigate to the Review page, and then tap the field to be changed.
   The Programming page appears and the relevant field will be selected.
2. Edit one or more fields by tapping them and using the keypad.
3. Confirm the change by tapping CONFIRM.

4.Review the edited infusion and then tap START.

NOTE: Titration cannot be performed on a bolus or load after it has started. Titration can be performed on a continuous infusion during a load or bolus delivery.

NOTE: Certain drugs may have percent dose change limits set by the facility biomed administrator via LifeShield™ Infusion Safety Software Suite.

Titration with Multistep Delivery

In a Multistep delivery, titration may be performed on any steps where VTBI is not complete, including the step currently infusing. To titrate a Multistep delivery, follow the instructions for ***Titration***, selecting the relevant steps from the Review page. You may scroll through the steps by swiping your finger horizontally. A review of all steps is required to start the infusion.

Standby

Standby allows you to postpone the start of delivery. The maximum standby time is defined by the CCA and the range of the standby duration is from 5 minutes to 72 hours. If a line is in standby and the programmed time expires, the pump will display a Standby Expired alarm.

Standby is only available during initial infusion programming and on stopped infusion.

Putting a Line on Standby from the Review Page

To put a line on Standby from the Review page:

1. Program a line. See ***Programming*** for options.

2. Once you reach the Review page, tap STANDBY.
   A pop-up appears to configure the standby duration.
3. Select the desired standby duration and tap CONFIRM.
   The line is now on standby, as displayed on the Main Delivery page.

NOTE: The time until standby expires flashes on the Main Delivery page.

Putting 1 or 2 Lines on Standby During Active Infusion

To put lines on Standby during an active infusion:

1. Tap STOP on the Main Delivery page.
2. If both lines have been stopped, select the line(s) you wish to place on standby.

NOTE: You must stop a line before it can be put on standby.

3. Tap STANDBY on the Main Delivery page.
   A pop-up appears to configure the standby duration.
4. Select the desired standby duration in the STANDBY Alarm box.
5. Select the line(s) you wish to place on standby.
   The line(s) are now on standby, as displayed on the Main Delivery page.

NOTE: The time until standby expires flashes on the Main Delivery page.

When Standby Expires

When the configured standby time expires, the pump will display a Standby Expired alarm. Clear the alarm and tap START to start the infusion. If delivery was never started, the Standby Expired alarm priority is low. If the delivery had been started prior to standby, the priority of the alarm is medium.

Cancel Standby on 1 or 2 Lines

To cancel Standby:

1. From the Main Delivery page, tap START or STOP.
2. Select one or both lines to START or STOP.

Clearing a Line

When you clear a line, all the programming is cleared for that line. The Volume Infused reading for that line is not cleared. The Volume Infused reading for the other line and the Total Volume reading are not affected.

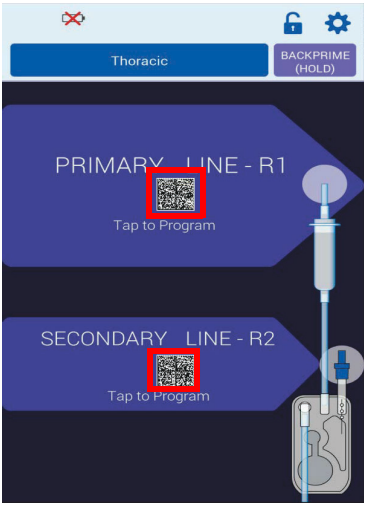
Each time you close the cassette door or turn the infusion pump on, the pump prompts “New Patient?” to give you the option to clear all settings on all lines. This is a safety feature to ensure that a patient does not get a stored delivery that was programmed for a different patient. If you tap YES, all programming and Volumes Infused data are cleared, and settings are returned to their defaults.

Auto-Programming

LifeShield™ Infusion Safety Software Suite connectivity for Auto-Programming and auto-documentation is a licensable feature. For the list of features, such as Auto-Programming, available with the version of LifeShield™ Infusion Safety Software Suite installed at your facility, contact your local representative.

Auto-Programming (AP) is the ability to take an I.V. medication order from the electronic medical record (EMR) and translate it into program settings that can automatically populate the infusion pump. The programmable settings can include the medication name, concentration, dose, rate, and volume to be infused.

The process is facilitated by the physician's order in the EMR and verified by pharmacy. The clinician then utilizes the EMR bar code scanner to scan the barcodes for patient identification, medication container, and infusion pump. The physician’s order is transferred to the infusion pump wirelessly and is confirmed or modified by the clinician. After starting the infusion, delivery information is documented automatically in the EMR.



Auto-Programming with the Plum Solo Infusion Pump

For optimal use, ensure the device is plugged in and make sure a cassette is installed in the infusion pump before you begin programming. While the pump can receive an order and Auto-Program without a cassette installed, the program needs to be confirmed and started within a defined time-frame of the system.

Check for the presence of the Wi-Fi signal  and the LifeShield™ Infusion Safety Software Suite icon  visible on the top of the pumps user interface to indicate connectivity to the system.

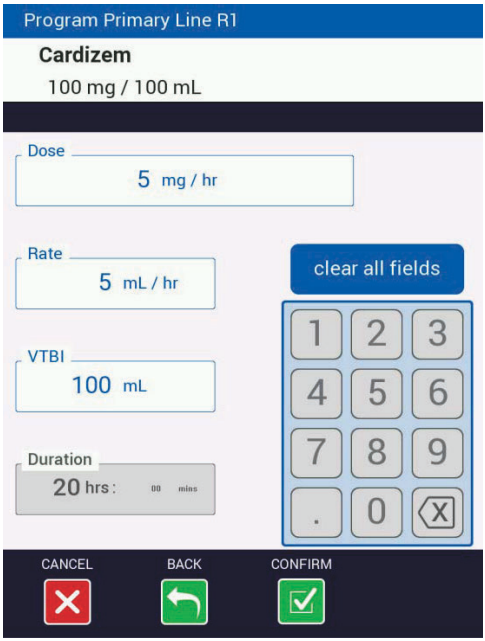
To perform Auto-Programming:

1. Press the ON/OFF button.
   The infusion pump begins its startup process.
2. Spike the IV container and prime the tubing. Insert cassette into the infusion pump.
3. Initiate the EMR/ hospital workflow to program the Plum Solo infusion pump.
4. Answer the New Patient prompt on the pump screen.
5. Select a CCA.
6. Scan the barcode on the patient wristband.
7. Scan the IV bag or syringe barcode on the medication label.
8. Review the order details that are displayed on the EMR.
9. Scan the barcode label for the intended line of the infusion pump. Each line has a barcode to be scanned.

NOTE: The barcode can be enlarged by tapping it to ease the scanning. Alternatively, you may input the numbers below the barcode into your facility's EMR to facilitate order transfer.

WARNING: SCAN THE CORRECT LINE IDENTIFICATION TAGS WHEN AUTO-PROGRAMMING TO AVOID THE AUTO-PROGRAM BEING SENT TO THE WRONG LINE.

The programming page will appear on the pump screen, with the fields automatically filled when the pump barcode is scanned.



NOTE: The Auto-Program will map to a medication ruleset within the selected CCA. If the scanned medication does not exist in the drug library, no medication will be displayed on the infusion pump and "No Drug Selected" will be shown on the subsequent screens.

10. Verify ALL parameters. If changes are required, you can manually change the infusion parameters per clinical need.

11. When all values are completed, tap CONFIRM on the pump screen to confirm the program with the received order.

WARNING: CONFIRM AND VERIFY ALL THERAPY VALUES BEFORE TAPPING START.

12. Tap START on the pump screen to begin delivery.
    The EMR will confirm the program with the original order.
13. Complete the workflow in the EMR and document the process per hospital procedure.

NOTE: Loading Dose, Bolus, Multistep, and Flush are not accommodated by auto-programming. Program these deliveries manually.

NOTE: Any changes or titrations to the original EMR auto-programmed order do not arrive on the pump automatically. The Auto-Program process needs to be repeated, or manual programming needs to occur, depending on EMR vendor and hospital facility procedure.

Auto-Programming Rejections

There are a number of reasons for an automatically programmed therapy to be rejected. These include the following:

- The automatically programmed therapy exceeds the capabilities of the infusion pump.
- The mode of the other line may prevent the incoming order from being accepted. E.g., if a concurrency limit would be exceeded.
- The therapy is above a hospital-defined hard drug limit.
- The infusion pump is not in a state to receive Auto-Programming (alarming).
- The connection between the pump and the facility's wireless network has been interrupted.

When an automatically programmed therapy is rejected, the infusion pump will display an alert stating the reason. If your order is rejected, recheck the order with the pharmacy or ordering physician. Alternatively, you may manually program the order to proceed.

NOTES:

Alarms and Troubleshooting

The Plum Solo infusion pump has an intelligent alarm system that handles more than one alarm simultaneously. An alarm condition is determined by a number of variables, including time. Alarms have two components, a message that appears on the display and an audible signal. You can distinguish the priority (high, medium, or low) by the number of audio pulses and/or the alarm color.

Priority	Number of Audio Pulses	Alarm Color
High	Ten-note melody	Red
Medium	Three-note melody	Yellow
Low	Two-note melody	Cyan

The alarm sound pressure range is from 45 dBa to 70 dBa, depending on the setting of the alarm loudness control located in the Pump Settings page. If power is interrupted for ≤ 30 seconds, the alarm settings previous to the interruption are automatically restored. See ***Audio*** for instructions on how to adjust alarm volume.

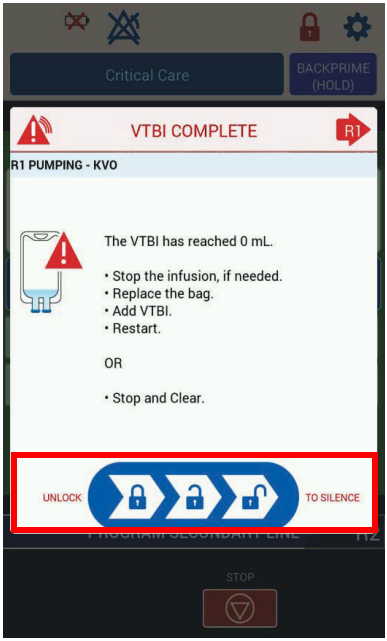
The alarm sound pressure is measured in accordance with IEC 60601-1-8:2012.

WARNING: SETTING THE ALARM SOUND PRESSURE LEVEL LOWER THAN THE AMBIENT SOUND PRESSURE LEVEL CAN IMPEDE OPERATOR RECOGNITION OF ALARM CONDITIONS.

Alarms

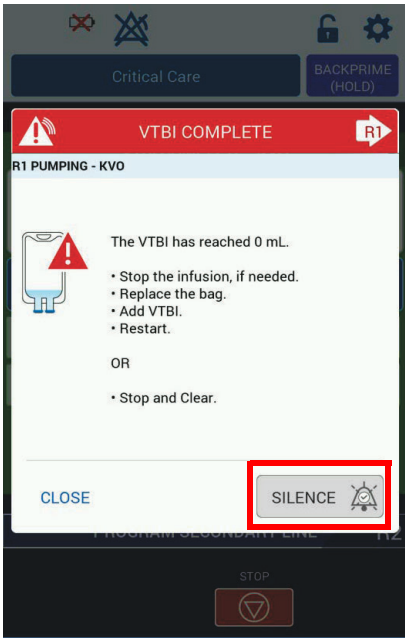
Responding to an Alarm

1. If the pump user interface is locked and requires a passcode, tap the touchscreen.
   Or, if inadvertent touch protection is active, touch each chevron to unlock and silence.



2. If the pump user interface was locked using a passcode, enter the passcode to gain access to the alarm pop-up.
3. Check the display for the alarm message and troubleshooting details.

4. Tap SILENCE to silence the audible part of an alarm for 2 minutes. The alarm symbol on the display flashes when the alarm is active.

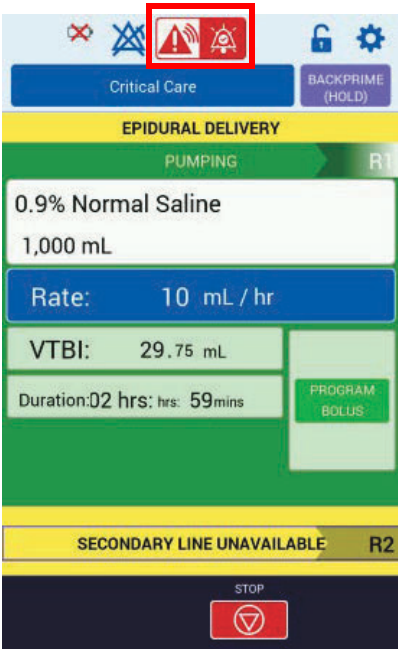


5. Tap CLOSE to remove the alarm message from view, but with the ability to recall it during alarm resolution.
   Or, tap CLEAR to clear the current alarm from the infusion pump.

NOTE: Tapping CLOSE allows the clinician to troubleshoot the issue, such as removing the pop-up to enter more volume for an Infusion Complete alarm. CLOSE also temporarily silences the alarm.

NOTE: CLEAR is an action used for specific alarms, such as Near End of Infusion alarms, where the only clearing condition is that the user acknowledges their return to the infusion pump.

6. If you selected CLOSE, tap the alarm button to recall alarm messaging if needed.
   The alarm icon flashes until the alarm condition is resolved.



NOTE: The Low Battery and low priority Replace Battery alarms are silenced for 15 minutes and will then alarm again.

NOTE: An alarm that is not cleared will reassert with alarm audio and display the troubleshooting pop-up message after 2 minutes. Alarm sounds resume after the silence period expires, but can be paused again if resolving the alarm condition takes more time.

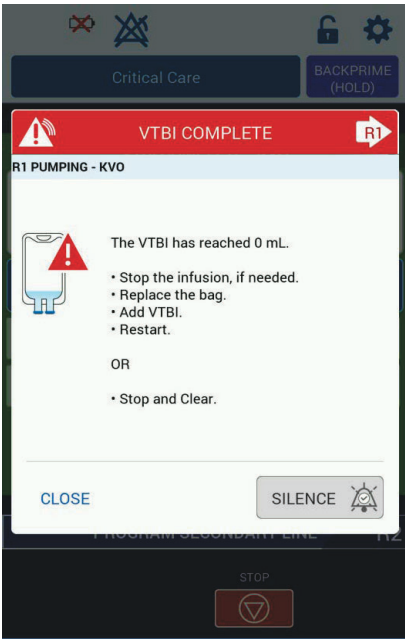
7. Correct the alarm condition (See ***List of Alarms and Corrective Actions***).
8. Tap START to resume infusion. If more than one line is programmed, tap the line you wish to resume, or BOTH.
   Or, tap STOP and clear the program for VTBI complete alarm.

NOTE: When a low, very low, or depleted battery alarm occurs, connect to AC power immediately.

NOTE: Each alarm puts an entry in the logs. If troubleshooting does not correct the problem, replace the pump and then contact the Biomedical department, who can check the logs and further isolate the problem.

NOTE: A malfunction alarm may prompt you to turn off the infusion pump and restart it. This may resolve the alarm condition. If the alarm continues, replace the infusion pump.

Example Alarm Message



Plum Solo alarm messages indicate the alarm's name at the top of the message. The severity of the alarm is shown by the color of the top bar. The affected channel and line(s) are indicated with an arrow in the top right corner and a line of text below it. A series of corrective

actions is listed below the alarm name. A graphic indicates the possible site of the alarm's cause (for example, if the alarm is triggered by an air bolus in a downstream line, a red arrow will point to a downstream line in the graphic). If an arrow icon is present in the title bar, it indicates the channel is affected and when applicable, indicates the line that is affected within the arrow icon.

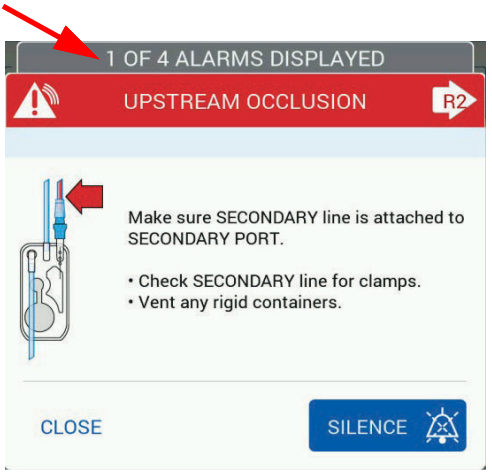
If CLOSE is tapped, the pop-up will temporarily be removed. Both the affected line and alarm icon will flash until the condition is resolved.

NOTE: If there is a touchscreen failure, to stop an infusion, close all clamps and open the cassette door.

Displaying Multiple Alarms

If more than one alarm condition occurs at the same time, the number of alarms to be viewed will be displayed in a tab above the alarm pop-up with the highest priority alarm view always first. To view the stacked alarms, CLEAR or CLOSE the alarm in view.

NOTE: Pressing SILENCE will silence all the alarms on the pump. Any alarm that is not cleared will sound and display the pop-up alarm in 2 minutes.



Disabled Alarms

When alarms such as Near End of Infusion, Call Back, or VTBI Complete are disabled, the Disable Alarms icon will be displayed at the top of the pump user interface. To view disabled alarms, tap the icon to open the list. The Disabled Alarms are ordered with the highest priority on the top and by line.

The following alarms can be disabled:

- High-priority VTBI Complete alarm for intermittent concurrent infusions - Will be ENABLED by default but may be disabled by the pump user (when the feature is available in the drug library)
- Medium priority Callback alarm - May be disabled by configuration through the drug library, by default, or by the pump user.
- Low priority Near End of Infusion alarm - Disabled by default or by the pump user.

See ***Disable Intermittent Concurrent VTBI Complete Alarm*** to enable VTBI complete alarm and ***Callback and Near End of Infusion Alarm*** to enable Callback and Near End of Infusion alarms.

List of Alarms and Corrective Actions

Alarm Message and Priority	Possible Cause	Line Applicable	Corrective Action
STOPPED WHILE LOCKED **High** **N255**	While the touchscreen user interface was passcode-protected locked, someone pressed the stop or opened the cassette door during delivery.	Primary or Secondary Line	Infusion is stopped. Enter code to unlock the pump to address alarm.
POWER CYCLE PUMP **High** **Various E### Alarms**	When an issue has been detected that may be resolved with a power cycle.	N/A	Power off the pump, then on. Send for service if the alarm returns.
PUMP MALFUNCTION **High** **Various E### Alarms**	A malfunction has been detected.	N/A	Power off the pump. Close all clamps and remove the cassette(s). Send for service.

Alarm Message and Priority	Possible Cause	Line Applicable	Corrective Action
PUMP MALFUNCTION **High** **Various E### Alarms**	When a malfunction has been detected to the channel on the pump.	Right Channel	Send for service when possible. Close all clamps and remove the cassette from malfunctioning channel.
VERY LOW BATTERY **High** **N248**	The infusion pump is running on battery power and there is approximately 15 minutes or less of battery life remaining.	N/A	Plug into AC (mains) power source immediately. **NOTE:** If not resolved, the alarm will assert again after 2 minutes.
DEPLETED BATTERY **High** **N252**	The infusion pump is running on battery power and the battery voltage is below the depleted battery threshold.	N/A	Plug into AC (mains) power source immediately. The pump is about to shutdown. Delivery has been stopped. Resume infusion as necessary.

Alarm Message and Priority	Possible Cause	Line Applicable	Corrective Action
BATTERY NEEDS SERVICE **High** **N57** **Various E ### Alarms**	The battery or the charger circuit needs servicing.	N/A	The pump may shutdown unexpectedly if unplugged from AC (mains). Keep plugged in until replacement is obtained. Discontinue use immediately. Send for service.
DOOR OPENED **High** **N250**	The Cassette door was opened during delivery or cassette test.	Right Channel	Close Upstream Clamps to prevent backflow. Stop infusion before opening door. Close cassette door with cassette inserted to complete cassette test to clear alarm. Refrain from opening door during cassette test.

Alarm Message and Priority	Possible Cause	Line Applicable	Corrective Action
DOWNSTREAM AIR **High** **N234, N233**	The single air bolus of 0.1 mL or larger, or the cumulative air of 0.25 mL of air out of 4.9 mL of fluid has been detected at the downstream sensor exceeds the air detection threshold.	Primary or Secondary Line	Close all clamps. Disconnect downstream line from the patient. Remove cassette and reprime to remove air. Open and close the cassette door. Also see ***Resolving a Downstream Air-in-Line Alarm***.

Alarm Message and Priority	Possible Cause	Line Applicable	Corrective Action
UPSTREAM AIR **High** **N230, N231**	The single air bolus of 0.5 mL or larger is detected at the upstream sensor in the Primary Line exceeds the air detection threshold. Or The cumulative air detected at the Upstream sensor in Primary Line exceeds the air detection threshold. The limit is 1 mL of cumulative air (0.5 mL of air per Line for concurrent delivery).	Primary Line	Check for empty container on the PRIMARY Line. Backprime into secondary line or syringe to remove air (See ***Backprime***). Press and hold Back Prime. Check the syringe size (See ***Administration Sets and Accessories Guidelines***).

Alarm Message and Priority	Possible Cause	Line Applicable	Corrective Action
UPSTREAM AIR **High** **N231**	The single air bolus of 0.5 mL or larger is detected at the upstream sensor in the Secondary Line exceeds the air detection threshold.	Secondary Line	Check for empty container on the SECONDARY Line. Backprime into secondary line or syringe to remove air (See ***Backprime***). Press and hold Back Prime. Check the syringe size (See ***Administration Sets and Accessories Guidelines***).

Alarm Message and Priority	Possible Cause	Line Applicable	Corrective Action
UPSTREAM OCCLUSION **High** **N188, N189**	An upstream occlusion or air detected on the Primary Line during deliver. The upstream occlusion pressure limit of 7 PSI (362 mmHg) is fixed and cannot be adjusted.	Primary Line	Check the Primary upstream line for clamps or kinks and correct any found. Vent any rigid containers. If the occlusion is caused by a closed clamp, open the clamp. If all clamps are open, the alarm may be caused by excessive air that is creating backpressure in the cassette. Backprime into secondary line or syringe to remove air (See ***Backprime***). Check the syringe size. (See ***Administration Sets and Accessories Guidelines***).