symbiq™ System Operating Manual

For use with the SYMBIQ™ One-Channel Infuser
List Number 16026-04-79 and above
and SYMBIQ™ Two-Channel Infuser
List Number 16027-04-79 and above

Hospira

Hospira, Inc., Lake Forest, IL 60045
430-11348-005 (A, 03/08)

System Operating Manual

For List Number 16026-04 (One-Channel Infuser),
16027-04 (Two-Channel Infuser).

The SYMBIQ™ Infusion System is designed for use by health care professionals. The Hospira Customer Support hotline is available 24 hours a day (in the USA) to provide consultation and technical assistance regarding the SYMBIQ™ Infusion System.

Hospira Technical Support Operations
1-800-241-4002

To order additional copies of this manual
call 1-877-946-7747

Change History

Part Number	Description of Change	Pages Changed	Revision Date
430-11348-001	Initial Release		11/22/06
430-11348-002	Second Release	All	12/06
430-11348-003	Third Release	All	07/07
430-11348-004	Fourth Release	All	08/07
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NOTES:

Contents

Chapter 1: Introduction

The SYMBIQ™ Infusion System is a general purpose infuser designed to deliver fluids, solutions, medications, agents, nutritionals, electrolytes, blood and blood products for parenteral, enteral, intravenous, intra-arterial, subcutaneous, epidural, or irrigation routes of administration.

The SYMBIQ™ Infusion System is available as a one-channel or a two-channel infuser. These infusers may be connected to configure a three or four channel pump. The connecting mechanism is designed to allow a maximum of 1 additional pump to be connected. The Symbiq Infusion System can be configured as a one-, two-, three-, or four-channel pump.

A cassette-based, multi-function device, the SYMBIQ™ Infusion System is powered by either AC power or can be powered by the enclosed rechargeable battery. The SYMBIQ™ Infusion System delivers Basic therapy or Advanced therapies such as Multistep, Intermittent, and Interchannel Sequencing.

The SYMBIQ™ Infusion System is intended for use primarily in a hospital setting. Other care areas where the infuser can be used include: home care, nursing homes, mobile intensive care, ambulatory infusion centers, hospice, subacute facilities, outpatient/surgical centers, long term care, urgent care, transport, and physician offices.

Intended Audience

The SYMBIQ™ Infusion System is intended for use at the direction of or under the supervision of licensed physicians or certified healthcare professionals who are trained in the use of infusers and the administration of parenteral, enteral, and epidural fluids and medications. Training should emphasize preventing I.V. related complications including appropriate precautions to prevent accidental infusion of air. Use the SYMBIQ™ Infusion System according to established hospital or institution guidelines, policies, and procedures.

CAUTION: Federal (USA) law restricts this device to sale by or on the order of physicians or other licensed health practitioners.

Document Conventions

Throughout this manual, the following conventions are used to call attention to warnings, cautions, notes, and tips:

WARNING: A warning message contains special safety emphasis and must be observed at all times. Failure to observe a warning message is potentially life threatening.

CAUTION: A caution appears in front of a procedure or statement. It contains information that could prevent product damage or hardware failure. Failure to observe a caution could result in patient or user injury.

Note: *A Note highlights information that helps explain a concept or procedure.*

Tip: A Tip contains useful information, hints, and shortcuts that make the product easier to use.

Figures and graphics are rendered as representations to approximate the actual product, and may not exactly reflect the product.

Type Conventions

This manual uses the following style conventions to identify recurring objects.

Table 1.1 Type Conventions

Convention	Description	Example
Blue text	This indicates that it is a hypertext link.	*See* Table 1-1.1, "Type Conventions," on page 6.
Bold	Introduces important terms	The secondary container must be **higher** than the primary container.
Arial narrow	Names a button	Press **Enter button**
Small Capitals	Names of screens	The **STARTUP SCREEN** displays

Warnings and Cautions

The SYMBIQ™ Infusion System is designed and manufactured to be safe, reliable, and easy to use. This section describes possible hazards and explains how to prevent these hazards.

Warnings

- When infusing at low delivery rates (5.0 mL/hr or less), use thick-walled microbore sets to reduce the fluid bolus amount that may be delivered when a distal line occlusion is released.
- To obtain optimal low flow continuity at rates (between 0.1 and 1.0 mL/hr) manually prime the set.
- DO NOT use medications incompatible with silicone rubber or PVC plastic or medications not stable under infusion conditions.
- ALWAYS prime the administration set to remove air from the cassette, tubing, and injection sites prior to connecting to the patient. ALWAYS disconnect the administration set from the patient prior to priming or purging.
- Arrange tubing, cords, and cables to minimize the risk of patient strangulation or entanglement.
- Consult medication labeling to confirm medication compatibility, concentration, delivery rates, and volumes are all suitable for desired delivery mode.
- When using the infuser for secondary deliveries (piggybacking), ensure the fluids being infused are both chemically and physically compatible.

- When an administration set is loaded in the infuser, a small amount of fluid is expelled each time the cassette carriage is opened or closed. If potent medications are being used, disconnect the administration set from the patient to prevent over medicating the patient.
- Delayed respiratory depression following continuous epidural administration of preservative-free morphine sulfate has been reported.
- Administer only anesthetics and analgesics approved for epidural administration (as indicated by the medication's FDA approved labeling). Epidural administration of medications other than those indicated for epidural use could result in serious patient injury.
- Rate accuracy can be affected by variations of fluid viscosity, fluid temperature, head height, back pressure or any combination of these. Additional factors that may influence rate accuracy are administration set configuration and the duration of time the administration set is utilized.
- When delivering a secondary infusion, use a SYMBIQ™ primary administration set with a backcheck valve.
- For piggyback deliveries from a secondary container, ensure the secondary container is hung higher than the primary container.
- Use of additional non-SYMBIQ™ equipment or accessories on the same I.V. line to the patient may cause potential safety hazards.
- After pressing **Emergency Stop,** verify that the Emergency Stop Banner is displayed and delivery has stopped.

General Cautions

- Federal (USA) law restricts the sale of this device. It is sold by order of a physician or other licensed health practitioner.
- DO NOT place the SYMBIQ™ Infusion System in service if it fails any of the diagnostic self-tests.
- Before use, inspect the AC cord for defects.
- Before use, ensure the infuser has a functional battery installed. Use of a properly installed and functional battery ensures that the infuser operates properly.
- Only qualified biomedical technicians should access the infuser's Biomed mode.
- To prevent product damage, use proper care during unpacking and installation. DO NOT use a SYMBIQ™ Infusion System if it appears damaged in any way.
- DO NOT attach more than two connected infusers to an I.V. pole (see "Attaching and Removing an Infuser from an I.V. Pole" on page 53).
- When a primary infuser is connected to an AC power main, never connect more than one additional infuser in series to the rear infuser AC power outlet. Connecting more than one additional infuser in series may cause an electrical safety hazard (see "Rear Infuser AC Power Outlet" on page 22 for more information).
- Use ONLY Hospira MedNet® Server Suite with the SYMBIQ™ Infusion System.
- To prevent personal injury or product damage, make sure the pole clamp is tightened properly and the infuser is securely attached.

- Disconnect AC power line prior to opening unit or changing battery.
- Manually ejecting a cassette renders that channel incapable of infusing until it is reset by Biomed.
- NEVER use sharp objects such as fingernails, pens, pencils, paper clips, or needles as means to program the infuser. The **LCD** screen may scratch.

Epidural Administration

Recommended use of the epidural route is to provide anesthesia or analgesia for periods up to 96 hrs.

- This device can be used to administer only those anesthetics/analgesics approved for epidural administration (as indicated or allowed by the medications' FDA approved labeling). Epidural administration of medications other than those indicated for epidural use could result in serious injury to the patient.
- For epidural administration, the use of Hospira catheters, SYMBIQ™ sets without Y-sites, and "epidural" stickers indicating ongoing epidural administration are recommended.

Administration of medications via the epidural route should be limited to personnel familiar with associated techniques and patient management problems. Proper epidural placement of the catheter is essential since catheter migration could result in intravascular or intrathecal administration. Facilities practicing epidural administration must be equipped with resuscitative equipment, oxygen, naloxone, and other resuscitative medications. Adequate monitoring equipment (e.g., Oximetry and/or Capnography) is recommended for continuous monitoring of the patient during epidural administration. Patients must be observed frequently for side effects in a fully-equipped and staffed environment for at least 24 hours following completion of medication administration by the epidural route. DELAYED RESPIRATORY DEPRESSION FOLLOWING CONTINUOUS EPIDURAL ADMINISTRATION OF PRESERVATIVE-FREE MORPHINE SULFATE HAS BEEN REPORTED. If over-delivery occurs during administration, observe the patient closely for signs of spinal cord compression (disorientation, headache, transient neuralgias) and medication overdose.

Administration Sets and Delivery Cautions

- USE ONLY Hospira SYMBIQ™ administration sets with the SYMBIQ™ Infusion System. Use of unauthorized sets may result in injury to the patient or damage to the infuser. GemStar® administration sets are not compatible with the SYMBIQ™ Infusion System.
- To prevent contamination, use aseptic techniques with all fluid-path connections. Remove protective coverings as administration set assembly progresses.
- When priming is complete and the cassette flow stop is closed, ensure no fluid flows at the distal end of the administration set. If fluid flow is observed, DO NOT use the administration set.
- Before using a CLAVE® connector, ensure administration set and fluid compatibility. DO NOT use needles to access the CLAVE® connector.
- Before removing the cassette from the infuser, close ALL slide clamps for added free flow protection.

- In vitro studies suggest that packed red blood cells with unusually high hematocrit be diluted with blood-compatible fluids like 0.9% sodium chloride injection to decrease hemolysis and increase flow rate.
- Before disconnecting a syringe from the CLAVE®, pull the plunger up slightly to avoid spilling fluid. For rigid containers, close the upper slide clamp, open the cassette carriage, remove and invert the cassette (ports down).
- Air bubbles may form in the administration set as result of normal outgassing of dissolved air in the fluid. This may occur if using a chilled solution if the infuser is mounted significantly above the patient when an administration set is used for more than 24 hours, or when using certain fluids known to routinely outgas. In these cases, an air eliminating filter may be used.
- Repeatedly opening and closing the cassette carriage may defeat the proximal air-in-line alarm and may cause a distal alarm requiring repriming.
- SYMBIQ™ administration sets with integral non-blood filters are not for administration of blood, blood products, emulsions, suspensions, or any medications not totally soluble in the solution being administered. These medications may be administered through the lower Y-injection site below the filter or via SYMBIQ™ administration sets with blood filters.
- Administration sets should be changed per CDC guidelines or hospital policy. Ensure administration sets are properly discarded per CDC guidelines or hospital policy**.**
- DO NOT push the cassette carriage closed. Use the **LOAD/EJECT button** to open and close the cassette carriage.
- If a cassette is manually ejected from a channel, that channel must not be used until it is reset in Biomed mode.
- To protect the patient from equipment error resulting in over-infusion and - where applicable - in under-infusion refer to the Technical Service Manual and to “Chapter 10: Alarm and System Messages” on page 145 and “Appendix B: Alarm Messages and Troubleshooting” on page 199.
- The syringe container size must be between 1 mL and 60 mL. DO NOT use syringe containers larger than 60 mL with the syringe holder adapter.
- Use a vented syringe adapter to assure accurate delivery and reduce the risk of an occurrence of proximal occlusion.
- DO NOT operate or store a SYMBIQ™ Infusion System with the cassette carriage opened. To avoid damaging the cassette carriage, keep it securely closed while the infuser is not in use.
- Accuracy of medication amounts recorded in the logs are dependent on the fill accuracy of IV container and amount discarded during priming.
- Programming a Piggyback VTBI less than the actual container volume results in the remaining volume being delivered at the primary rate after the completion of the Piggyback Program.
- Incorrect selection of proximal occlusion setting may result in a delayed proximal occlusion alarm and under delivery.

Battery Operation Cautions

- The battery may not be fully charged upon receipt. Connect the infuser to AC power for at least four hours prior to initial use. Failure to fully charge the battery may significantly reduce battery life.
- Before connecting a patient to the infuser, ensure the infuser has a fully charged battery installed for continuous infuser operation.
- If the low-battery alarm activates, connect the infuser to AC power immediately.
- Use AC power as the primary power source whenever possible. Before use, inspect the AC cord to check for defects. Connect to AC power during storage to ensure a fully charged battery for emergencies. If the quality of the earth grounding source is in doubt, DO NOT use the infuser on AC power, use only battery power.

Unintended Bolus Delivery

- To avoid delivering a bolus when a distal occlusion is cleared, disconnect the tubing from the patient while eliminating a distal occlusion.

Cleaning Cautions

- To avoid mechanical or electronic damage, DO NOT immerse the SYMBIQ™ Infusion System in fluids or cleaning solutions. DO NOT spray cleaning solutions in or near infuser openings. DO NOT allow cleaning solutions to saturate the air-in-line detectors or enter the infuser when cleaning the air-in-line detectors.
- USE ONLY the recommended cleaning solutions and follow the manufacturer's recommendations. Using cleaning solutions not recommended by Hospira may result in product damage. The disinfecting properties of cleaning solutions vary; consult the manufacturer for specific information. See "Chapter 12: Cleaning, Maintenance, and Storage" on page 171.
- DO NOT use compounds containing combinations of isopropyl alcohol and dimethyl benzyl ammonium chloride.
- NEVER use sharp objects such as fingernails, paper clips, or needles to clean any part of the infuser.
- DO NOT sterilize by heat, steam, ethylene oxide (ETO), or radiation.
- DO NOT use abrasive scrub pads or brushes on the **LCD TOUCH SCREEN** as it may become scratched or damaged. Use only soft cloths or sponges.

US FCC (Federal Communications Commission) Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including that which may cause undesired operation of these devices.

FCC Interference Statement

- This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:
  - Reorient or relocate the receiving antenna.
  - Increase the distance between the equipment and the receiver.
  - Connect the equipment to an outlet on a different circuit from the circuit the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.
- Changes or modifications not expressly approved by Hospira could void the user's authority to operate the equipment.

Wireless Device Caution

- The wireless 802.11 a/b/g device usage in the 5150-5250 MHz band is limited to indoor use to reduce potential for harmful interference to co-channel mobile satellite systems.
- In the 5250-5350 MHz and 5650-5850 MHz frequency bands, high power radars are allocated as primary users and these radars could cause interference and/or damage to LE-LAN devices.
- Operation is subject to the following two conditions: (1) the wireless device may not cause interference, and (2) the wireless device must accept any interference, including interference that may cause undesired operation of the wireless device.

Radio Frequency Exposure Statement

- The Wireless LAN radio device in the Connectivity Engine peripheral board with this infusion device has been evaluated and found compliant to the requirements of the following Radio Frequency exposure standards:
  - Federal Communications Commission, OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01), Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields, July 2001.
  - Industry Canada, Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields, Radio Standards Specification RSS-102 Issue 1 (Provisional): September 1999.
- The radiated output power of this Wireless LAN device is far below the FCC radio frequency exposure limits. The Wireless LAN device has been evaluated with zero inches of human body separation from the antenna and found to be compliant with FCC RF exposure limits.

Electrical Artifacts in Clinical Settings

The SYMBIQ™ Infuser has been tested and found to comply with EMC/EMI limits in accordance with:

- The use of portable and mobile RF equipment may have an impact on this and other pieces of medical equipment
- Nonhazardous, low-level electrical potentials commonly occur when fluids are administered using infusion devices. These potentials are well within accepted safety standards but may create artifacts on voltage-sensing equipment such as ECG, EMG, and EEG machines. If the monitoring equipment is not operating correctly or has loose or defective connections to its sensing electrodes, these artifacts may be accentuated to the point of simulating actual physiological signals. To determine if the abnormality in the monitoring equipment is caused by the infusion device instead of some other source in the environment, temporarily suspend fluid delivery (a therapy should only be suspended if doing so does not pose a clinical risk to the patient). Disappearance of the abnormality indicates it was probably caused by the electronic noise generated by the infusion device. Proper setup and maintenance of the monitoring equipment should eliminate the artifact. Refer to the appropriate monitoring equipment system documentation for setup and maintenance instructions.
- The SYMBIQ™ Infusion System is designed to operate around normally encountered electromagnetic interference (EMI) conditions. If extreme levels of interference like that produced by an electrosurgical generator are encountered, normal operation of a sensor or microcomputer might be disrupted.
- This equipment has been tested and found to comply with EMC/EMI limits in accordance with IEC/EN 60601-1-2 (2001). These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. The equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment

does cause harmful interference with other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving device
- Increase the separation between the equipment
- Connect the equipment into an outlet on a circuit different from that to which the other device is connected
- Consult the manufacturer or field service technician for help

- The use of portable and mobile RF equipment may have an impact on this and other pieces of medical equipment.
- Use of radio frequency emitting devices (other than the wireless communication module if installed in the SYMBIQ™ Infuser) such as cellular telephones and 2-way radios in close proximity of this device may affect its operation. Take the following measures to correct interference caused by these devices:
  - Relocate or re-orient other radio frequency emitting devices
  - Increase the distance between the infuser and other radio frequency emitting devices
  - DO NOT connect other radio frequency emitting devices to the same AC power source used by the infuser

NOTES:

Chapter 2: Infuser Overview

Chapter 2 describes the SYMBIQ™ Infusion System layout (front, rear, and bottom), infuser buttons and touchscreen buttons, touchscreen icons & symbols, and infuser features.

Many features of the SYMBIQ infuser system are configurable through Hospira MedNet® Meds™ software. For facility-defined configuration details, contact the facility software administrator.

Infuser Layout—Front

Figure 1 depicts the front of both a one- and two-channel SYMBIQ™ Infusion System and the infuser touchscreen.

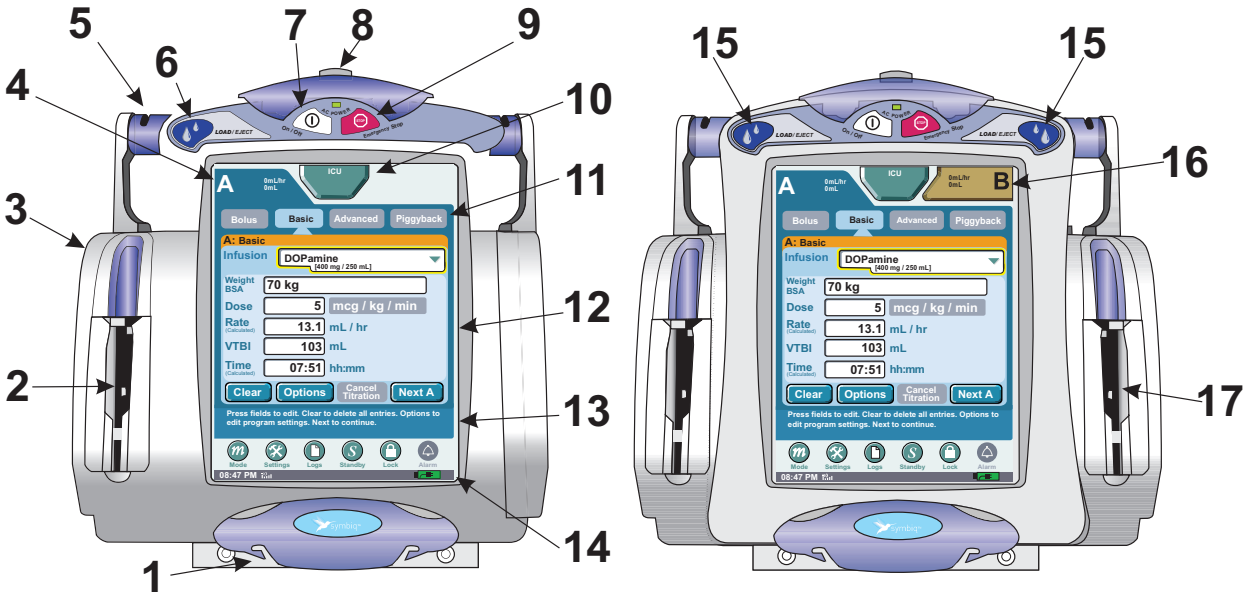


Figure 1: Front View and Touchscreen of the One- and Two- Channel SYMBIQ™ Infuser

Table 2 outlines the buttons and touchscreen elements corresponding to the numbers in Figure 1.

Table 2: Item Number and Corresponding Feature

#	Feature
1	Distal tubing guide
2	Cassette carriage
3	Cassette loader housing
4	Channel Identifier tab
5	Proximal tubing guide
6	Cassette LOAD/EJECT button

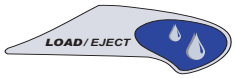
#	Feature
7	On/Off button
8	SILENCE button
9	Emergency Stop button
10	CCA (Clinical Care Area)/ Patient Information button
11	Channel-level therapy buttons
12	Programming screen

#	Feature
13	Help/status text area
14	Battery /AC power indicator
15	Cassette LOAD/EJECT button
16	Channel Identifier tab
17	Cassette carriage

Infuser Buttons

Buttons on the infuser casing function in the following manner:

Table 3: Infuser Buttons

Infuser Button	Button Appearance
LOAD/EJECT(S)—opens and closes the cassette carriage	
On/Off—turns power on and off	
SILENCE—silences a silenceable alarm for a specified period of time, usually two minutes	
Emergency Stop—stops all channels, generates high urgency alarm	
Cleaning Lock (label, located on the rear of the infuser)—this label points to the button which activates and deactivates the touchscreen	

Touchscreen Buttons

The SYMBIQ™ Infusion System touchscreen allows the user to access and use on-screen buttons and keypads. A membrane covers the LCD display so a single keypress does not cause significant infuser pole movement nor is it mistaken for a double keypress. When an active touchscreen button is pressed, the infuser sounds an audible valid key tone. The touchscreen also accommodates a keypress whether users are wearing wet gloves, dry gloves, or no gloves.

Note: *A triple-beep will sound when making entries that are touchscreen errors.*

Note: *NEVER use sharp objects such as fingernails, pens, pencils, paper clips, or needles to program the infuser because they may scratch the LCD screen.*

Touchscreen Button Appearance

The appearance of touchscreen buttons varies depending on their status. A touchscreen button can be either active, depressed, selected, or unavailable. Table 4 depicts how touchscreen buttons appear based on their status.

Table 4: Touchscreen Button Appearance

Touchscreen Button Status	Touchscreen Button Appearance
Active	
Depressed	
Selected	
Unavailable	

Touchscreen Icons and Symbols

Table 5 describes and illustrates the various touchscreen icons and symbols.

Table 5: Touchscreen Icons and Symbols

On-Screen Item Description	On-Screen Item Illustration
Waiting icons (display when a keypress requires processing time)	
Horizontal navigation arrow buttons	
Vertical short scroll bar (up and down arrows scroll a list by one item)	

Table 5: Touchscreen Icons and Symbols (Continued)

On-Screen Item Description	On-Screen Item Illustration
Vertical hot scroll bar - white interior arrows scroll a list by one item; each yellow arrow increases the scrolling increment by one item more than the previous arrow.	
Drop-down list field	
End-of-list indicator for drop-down lists	
CCA/Patient Information button	
Infusion running drip icon	
Basic program icon	
Multistep therapy icon	
Intermittent therapy icon	

Table 5: Touchscreen Icons and Symbols (Continued)

On-Screen Item Description	On-Screen Item Illustration
Interchannel Sequence icon	
Piggyback icon	
Bolus icon	
Upper hard limit icon - displays on a channel tab when an upper hard limit is overridden and the program confirmed on that channel.	
Lower hard limit icon - displays on a channel tab when a lower hard limit is overridden and the program confirmed on that channel.	
Upper soft limit icon - displays on a channel tab when an upper soft limit is overridden and the program confirmed on that channel.	
Lower soft limit icon - displays on a channel tab when a lower soft limit is overridden and the program confirmed on that channel.	

Table 5: Touchscreen Icons and Symbols (Continued)

On-Screen Item Description	On-Screen Item Illustration
No rule set icon - displays on a channel tab when a medication with no defined dose or dose rate limits is selected on a channel.	
Device Status Bar has two rows. The first row provides user adjustable device settings of Mode, Settings, Logs, Standby, Lock, and Alarm. The second row displays WiFi Enabled Icon, Time, and Battery Status.	

Infuser Layout—Rear

Figure 2 depicts the rear layout of the two-channel SYMBIQ™ Infusion System.

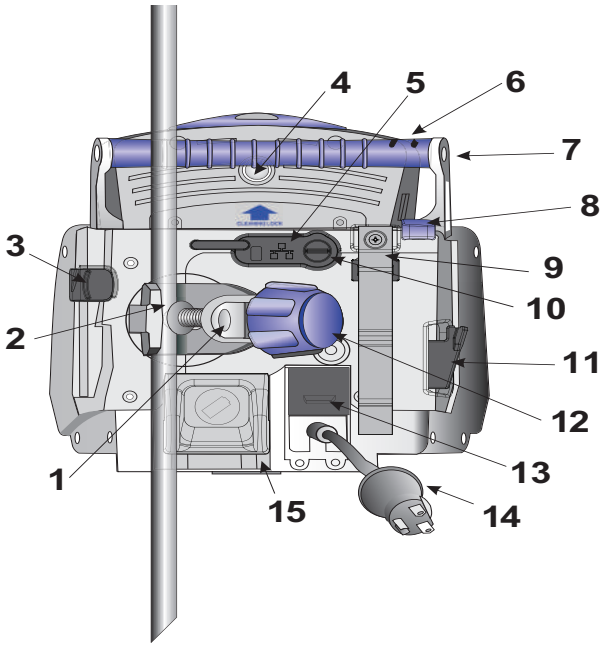


Figure 2: Rear View and Layout of the SYMBIQ™ Infusion System

Table 6 outlines features on the rear of the infuser corresponding to the numbers in Figure 2.

Table 6: Item Number and Corresponding Feature

Graphic #	Feature
1	Pole Clamp Assembly
2	Pole Clamp
3	Release Lever
4	Cleaning Lock
5	Ethernet Port
6	Proximal Tubing Guide
7	Carrying Handle
8	Release Lever
9	AC Power Cord Retention Strap
10	Nurse Callback Jack
11	Locking Mechanism
12	Pole Clamp Knob
13	AC Power Outlet (Specifically for one additional SYMBIQ™ Infusion System only.)
14	AC Power Cord
15	Battery Compartment Access Door

Rear Infuser AC Power Outlet

The rear infuser AC power outlet on the back of the SYMBIQ™ Infusion System is designed to accommodate one additional SYMBIQ™ Infuser. Never connect more than one additional infuser to the primary infuser when connected to an AC power outlet. Connecting additional infusers may cause an electrical safety hazard. Before use, inspect the AC cord for defects.

For example, consider operating a primary infuser using AC (mains) power with a second infuser attached to it using the rear infuser AC power outlet. DO NOT attach an additional infuser to the rear infuser AC power outlet of the second infuser (Figure 3).

CAUTION: Never connect more than two infusers when using the rear infuser AC power outlet; connecting more than two infusers may cause an electrical safety hazard.

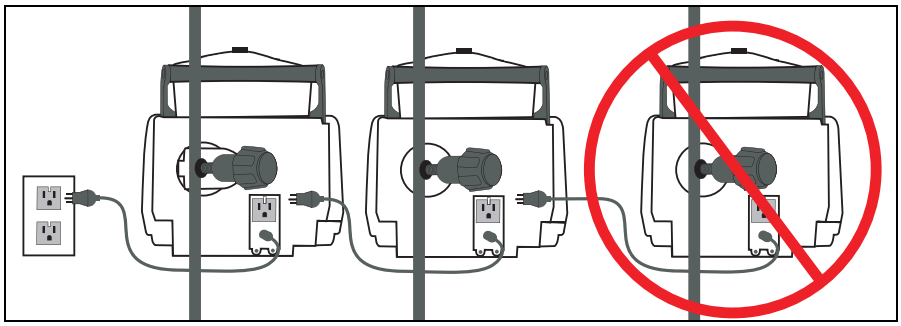


Figure 3: Incorrect Use of Rear Infuser AC Power Outlet

Instead, attach an additional infuser directly to an AC (mains) power source (Figure 4).

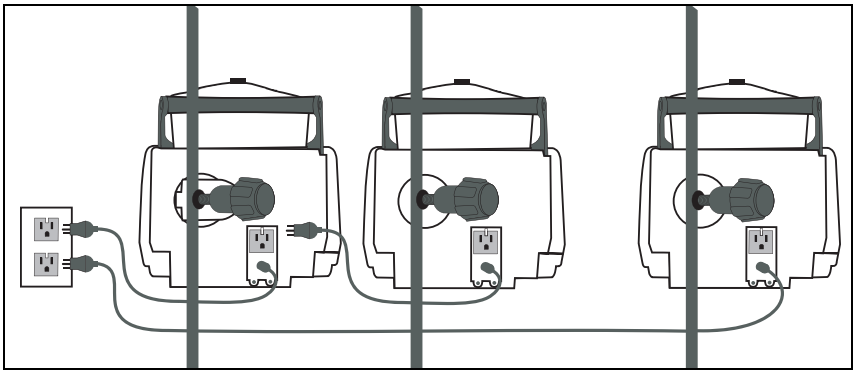


Figure 4: Correct Use of Rear Infuser AC Power Outlet

Wireless Communication

The *Wireless Connection Available* icon is displayed when the device is receiving a wireless signal. The infuser will connect to the network if a wireless network access point is recognized.

The SYMBIQ™ Infusion System supports wireless communication via an internal wireless communications module and antennae. Use the SYMBIQ™ Infusion System's wired or wireless connectivity options to communicate with server-based networks or hospital local area networks. Wireless communication to an infuser is direct rather than indirect through another infuser.

The touchscreen displays a wireless enabled icon when the wireless module is active (Figure 5).

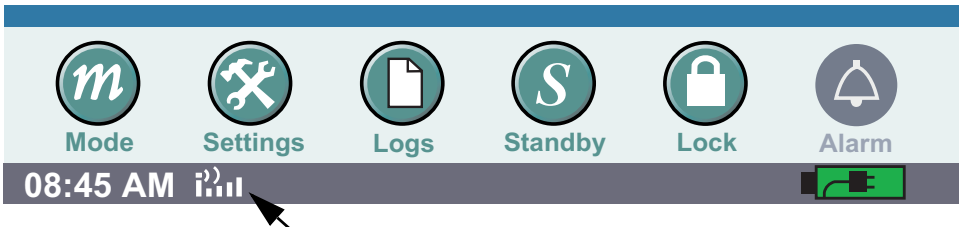


Figure 5: Wireless Enabled Icon on Infuser Touchscreen

Infuser Layout—Underside

The underside layout of the SYMBIQ™ Infusion System is shown in Figure 6.

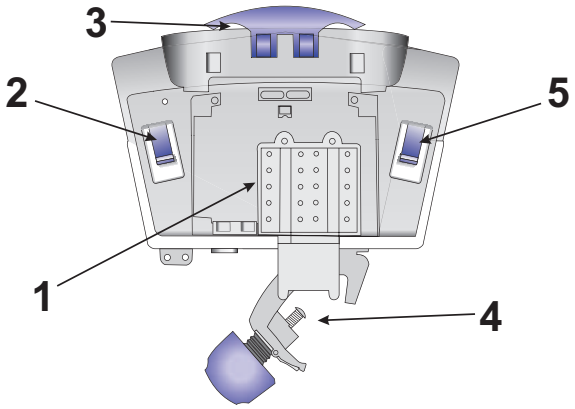


Figure 6: Underside View and Layout of the SYMBIQ™ Infusion System

The numbers on the bottom of the infuser shown on Figure 6 correspond to the numbers on Table 7.

Table 7: Item Number and Corresponding Feature

Graphic #	Feature
1	Battery Compartment Access Door
2	Cassette Eject Lever (EMERGENCY USE ONLY)

Graphic #	Feature
3	Distal Tubing Guide
4	Pole Clamp
5	Cassette Eject Lever (EMERGENCY USE ONLY)

Infuser Features

The SYMBIQ™ Infusion System has five levels of features:

- **Patient Information button**
  - Pressing this button accesses **PATIENT INFORMATION SCREEN**.
- **Channel Tabs**
  - Pressing Tab A accesses Channel A (blue display).
  - Pressing Tab B accesses Channel B (brown display).

Note: *This feature only applies to the two- channel.*

- **Channel Level**—accessed by buttons on the infuser touchscreen. Used to select therapies and supplemental deliveries, these features include:
  - *Bolus*—displays the **BOLUS PROGRAMMING SCREEN** (if a Bolus therapy is partially or fully programmed) or the **BOLUS SELECTION SCREEN** (if a Bolus therapy is not programmed)
  - *Basic*—displays the **PROGRAMMING SCREEN**
  - *Advanced*—displays the **ADVANCED THERAPIES PROGRAMMING SCREEN** (if an Advanced therapy is partially or fully programmed) or the **ADVANCED THERAPIES SELECTION SCREEN** (if an Advanced therapy is not programmed)
  - *Piggyback*—displays the **PIGGYBACK PROGRAMMING SCREEN**
- **Program Level**—accessed by pressing **Options button**, these features include:
  - *Power Prime*—displays the **POWER PRIME SCREEN**
  - *Deliver at End of Infusion*—None, KVO, Continue Rate
  - *KVO Rate*—mL/hr
  - *Delayed Start*—displays the Delayed Start Time entry keypad
  - *Alarm Options*—displays alarm options:
    - Distal Occlusion
    - Proximal Occlusion
    - Infusion Complete Callback
    - Air-in-Line
    - Nearing End of Infusion

  Note: *Alarm options set for a program apply only to that program.*

- **Device Level**—accessed by buttons at the bottom of the infuser touchscreen. These buttons control device level features including:
  - *Mode*—displays the **BIOMED MODE PASSCODE ENTRY SCREEN**
  - *Settings*—displays the **SETTINGS MENU SCREEN**
  - *Logs*—displays the **CLINICAL LOGS MENU SCREEN**
  - *Standby*—displays the Standby Options Screen and places the infuser in Standby mode for up to 24 hours until the Start Basic A is pressed
  - *Lock*—displays the **PROGRAM LOCK/UNLOCK PASSCODE ENTRY SCREEN**
  - *Alarm*—displays active alarms

Channel Level Features

Channel level features are accessed via buttons across the top of the touchscreen as depicted in Figure 7 below. The default channel level screen is the **BASIC PROGRAM SCREEN**.

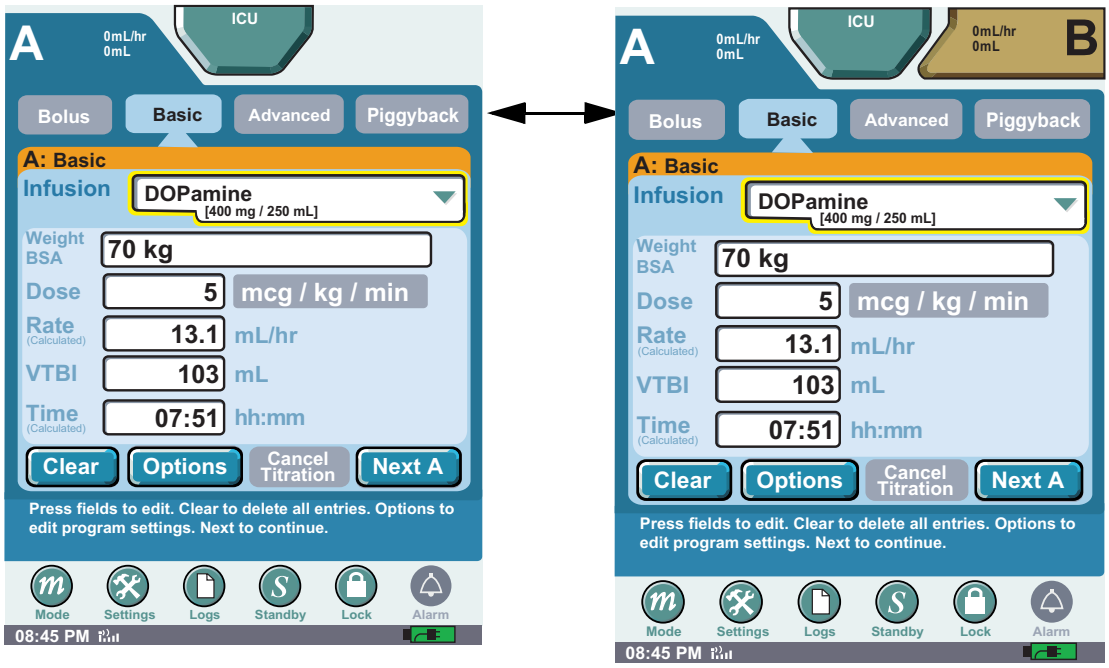


Figure 7: Channel Level Features of a One- and Two- Channel Display

Use channel level buttons to access **BOLUS**, **BASIC**, **ADVANCED**, and **PIGGYBACK PROGRAMMING SCREENS** when available.

Channel Feature Availability

Selecting a channel level feature affects the availability of other channel level features. For example, entering a single value on the **BASIC PROGRAM SCREEN** deactivates the **Advanced button** until the Basic program is cleared. Similarly, entering a single value on an **ADVANCED PROGRAM SCREEN** deactivates the **Basic button** until the Advanced program is cleared.

The **Piggyback button** is only available for a channel with a confirmed Basic program that has a volume to be infused (VTBI) greater than zero.

For more information on programming therapies, see "Chapter 5: Program (Basic) Therapy" on page 77, "Chapter 8: Advanced Therapies" on page 105, and "Chapter 9: Program Options" on page 127.

Program Level Features Options

Program level features are accessed on the **PROGRAMMING SCREEN** shown in Figure 8 below.

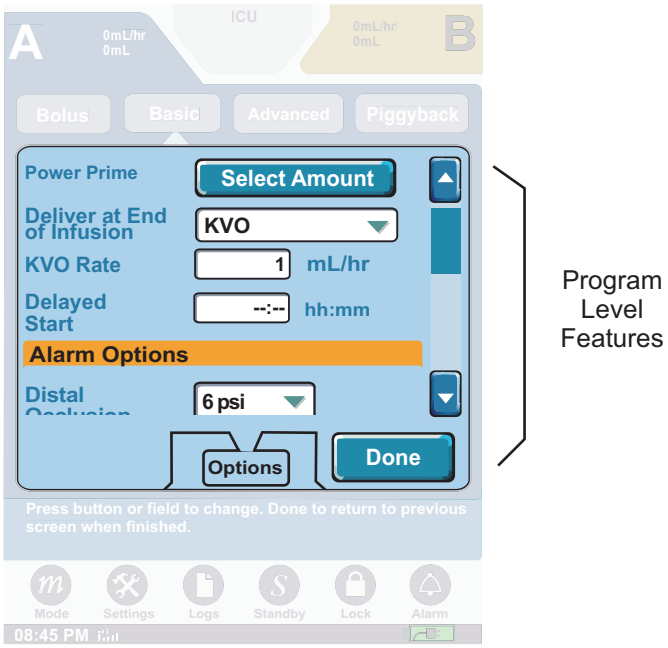


Figure 8: Program Level Features

Options allow the selection of additional functions and settings. Options are visible on the **OPTIONS SCREEN** once the infusion has been started or stopped

. Only Options allowed for the selected therapy and enabled for the CCA are available. For more information on CCAs, see “Clinical Care Areas” on page 158.

The following features are selectable on the **OPTIONS SCREEN**:

- **Power Prime**—moves a selected amount of fluid through the administration set tubing
- **Deliver at End of Infusion**—displays Deliver at End of Infusion drop-down list
- **KVO Rate**—displays KVO Rate Numeric Entry keypad
- **Delayed Start**—delays an infusion for up to 12 hours
- **Alarm Options—**alarm options include:
  - Distal Occlusion
  - Proximal Occlusion
  - Infusion Complete Callback
  - Air-in-line
  - Nearing End of Infusion

Device Level Features

Device level features are accessed via buttons across the bottom of the infuser touchscreen (Figure 9).

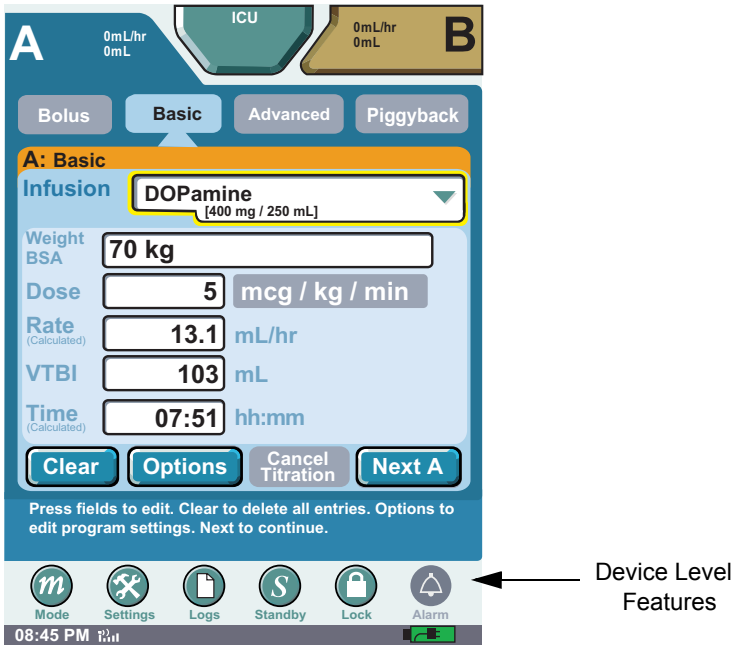


Figure 9: Device Level Features

Device level buttons are used to access the following features:

- **Mode**—displays the **BIOMED MODE PASSCODE ENTRY SCREEN**—if not in Delivery Mode and no other device-level button is currently selected
- **Settings**—adjusts key press and alarm volumes, screen brightness, time mode settings, and **FAR DELIVERY SCREEN**
- **Logs**—displays clinical logs including:
  - Program Totals
  - Shift Totals
  - Logs
    - Event Log
    - Alarm Log
    - Rule Set Alert Override Log

  For more information on Logs, refer to "Chapter 11: Stored Data" on page 157.
- **Standby**—places the infuser in Standby mode for up to 24 hours until the **Start Basic A** or **Start Basic B** is pressed. for additional information see "Standby:" on page 32.
- **Lock**—displays the **PROGRAM LOCK/UNLOCK PASSCODE ENTRY SCREEN.**
- **Alarm**——displays active alarms. For more information see "Chapter 10: Alarm and System Messages" on page 145.

Settings

Use the settings button to access and adjust the infuser settings:

- **Sound Volume**—keypress volume, alarm volume, and test alarm
- **Brightness**—screen brightness
- **Date & Time**—time mode settings
- **Far Delivery Screen —** select VTBI or Volume Infused to display on the **FAR VIEW SCREEN**

To access Settings:

1. From any infuser screen, locate and press **Settings** to display the **SETTINGS SCREEN**.

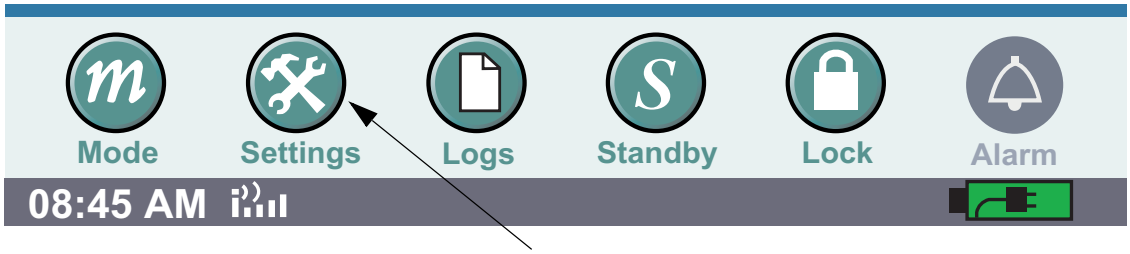


Figure 10: Settings Button

2. On the **SETTINGS SCREEN**, press the desired setting.

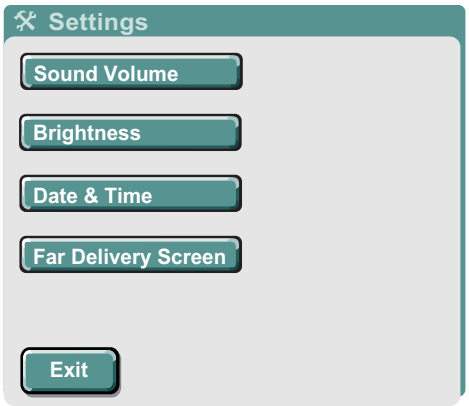


Figure 11: Settings Screen

To adjust the Sound Volume settings:

1. On the **SETTINGS SCREEN**, press the **Sound Volume button** to display the **SETTINGS: SOUND VOLUME SCREEN**. See Figure 12 below.

2. On the **Settings: SOUND VOLUME SCREEN**, press the **Key Press Volume** or **Alarm Volume buttons** to adjust volume levels. The infuser sounds a tone for the selected volume level.

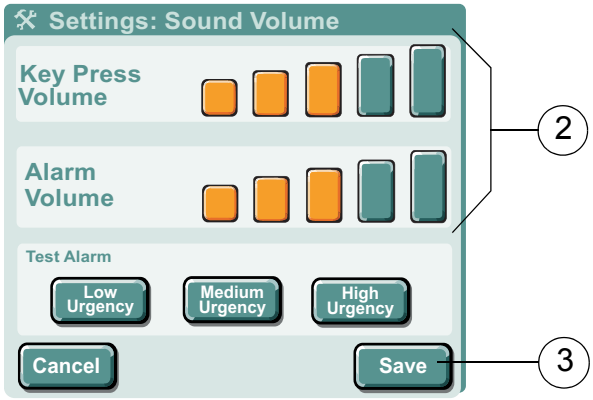


Figure 12: Settings: Sound Volume Screen

Note: *Key Press Volume sets the volume for both valid and invalid key presses.*

3. When finished adjusting settings on the **Settings: SOUND VOLUME SCREEN**, press **Save**.

4. Other **Settings: Sound Volume screen buttons** do the following:
   - Low Urgency—press button for Low Urgency alarm tone at the current level
   - Medium Urgency—press button for Medium Urgency alarm tone at the current level
   - High Urgency—press button for High Urgency alarm tone at the current level

5. Press **Cancel** to exit without saving changes. Press **Save** to exit and retain settings.

6. Press **Exit** to return to the previous screen. See Figure 11: "Settings Screen" on page 28.

7. On the **SETTINGS SCREEN**, press **Exit** to return to the screen from which the **SETTINGS SCREEN** was accessed.

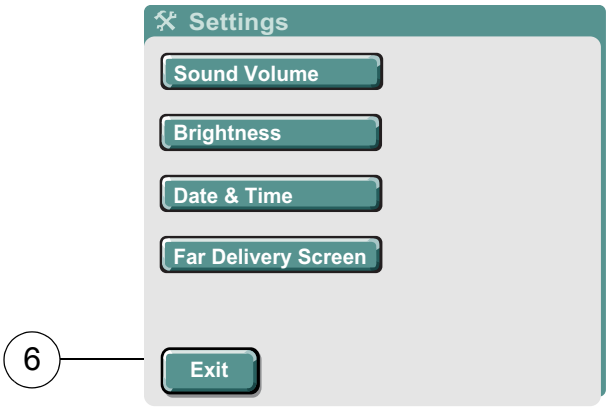


Figure 13: Settings Screen

Note: *If no keys are pressed for two consecutive minutes, the* **SETTINGS SOUND VOLUME SCREEN** *reverts to the screen from which the* **Settings button** *was pressed.*

To Adjust Screen Brightness:

1. On the **SETTINGS SCREEN**, press **Brightness** to display the **SETTINGS BRIGHTNESS SCREEN**. See Figure 14 below.

2. On the **SETTINGS BRIGHTNESS SCREEN**, adjust the screen brightness by pressing **Brightness buttons**. The infuser increases or decreases screen brightness to the selected level.

3. When finished adjusting settings on the **Settings: BRIGHTNESS SCREEN**, press **Save**.

4. Select **Yes** or **No** from the **Automatically Dim Backlight when on AC? drop-down menu**. Selecting **Yes** dims the back light when on AC power. Selecting **No**, the backlight remains on when on AC. If operating on battery power, the backlight automatically dims to conserve power.

5. Press **Cancel** to return to the **SETTINGS MENU SCREEN** without saving changes.

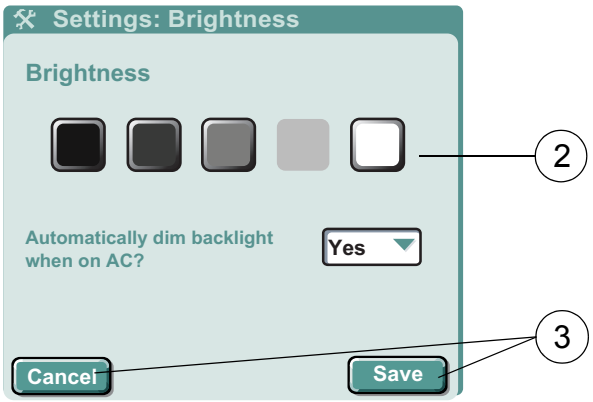


Figure 14: Settings Brightness Screen

Note: *If no keys are pressed for two consecutive minutes, the* **SETTINGS: BRIGHTNESS SCREEN** *reverts to the previous screen.*

6. On the **SETTINGS SCREEN**, press **Exit** to return to the previous screen. See Figure 11: "Settings Screen" on page 28.

To Access Date & Time Settings:

1. On the **SETTINGS SCREEN**, press **Date & Time** to display the **Settings: DATE & TIME SCREEN**. See Figure 15 below.

2. Press the **Time Format** field to specify 12-hour or 24-hour clock formats. Select the desired time format button on the drop-down list.

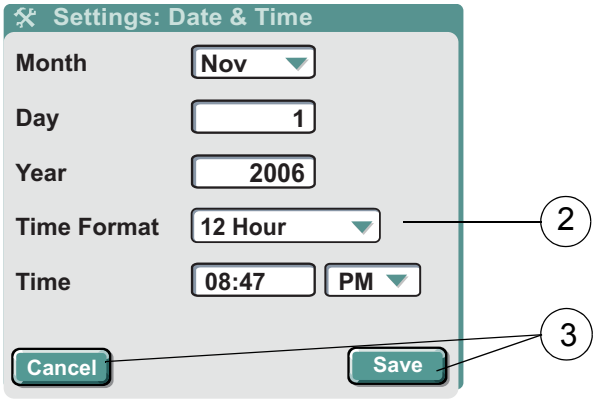


Figure 15: Settings: Date & Time Screen

3. When finished adjusting settings on the **Settings: DATE & TIME SCREEN**, press **Save**. Press **Cancel** to return to the **SETTINGS MENU SCREEN** without saving changes.

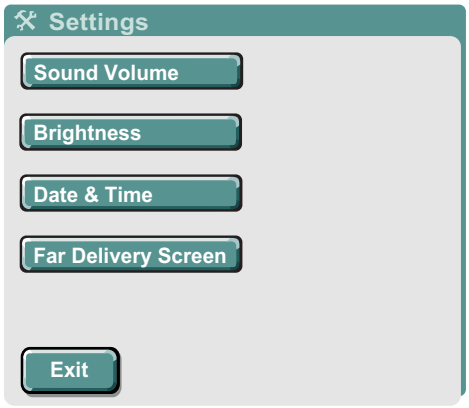
4. On the **SETTINGS SCREEN**, press **Exit** to return to the screen from which the Settings screen was accessed. See Figure 11: "Settings Screen" on page 28.

   Note: *If no keys are pressed for two consecutive minutes, the Settings: Date & Time screen reverts to the previous screen.*

To Access Far Delivery Screen:

1. On the **SETTINGS SCREEN**, press **Far Delivery Screen.**

2. Press Displayed Parameter field and select VTBI or Volume Infused from the menu.

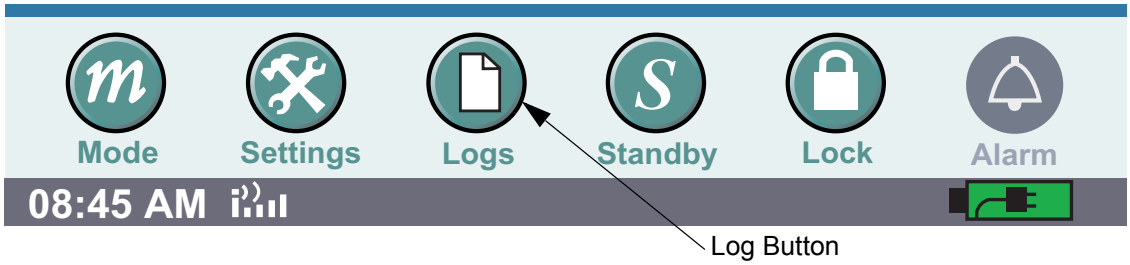


3. The selected option is displayed on the **FAR VIEW SCREEN**.

Logs

To access Logs:

1. From any infuser screen, locate and press **Logs** to display the **SHIFT TOTALS** and **LOGS** information.



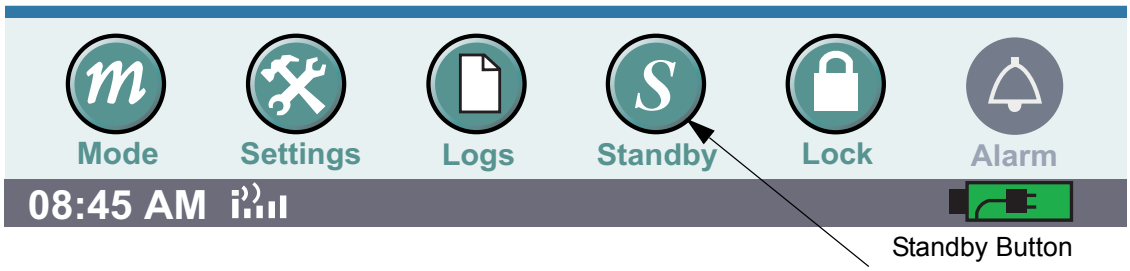
The SYMBIQ™ Infusion System collects and stores data available for on-screen viewing. Types of data stored by the infuser and viewable in Clinical mode are Shift Totals and Logs. See the following "Shift Totals Data" on page 162, "Event Log" on page 163, "Alarm Log" on page 164, and "Rule Set Alert Override Log" on page 165 for more information.

Standby:

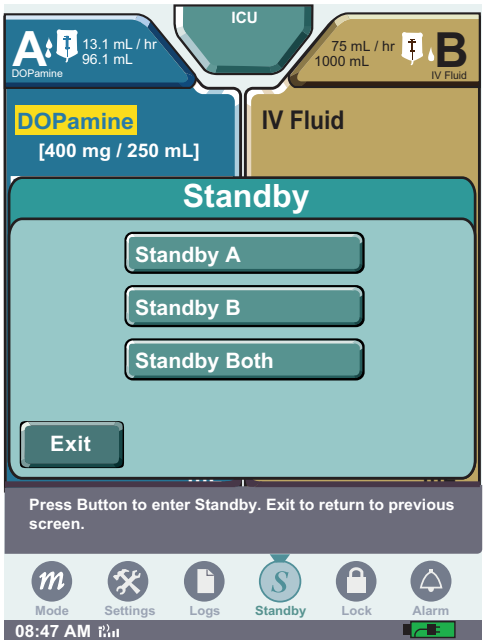
Standby is a feature that enables the clinician to program the infuser up to 23: 59 minutes in advance of Starting an infusion. While the infuser is in the standby mode, the infuser is powered on and the alarms are disabled.

To access Standby:

1. From any infuser screen, locate and press **Standby**.



2. From the Standby display screen select the channel to be placed in Standby by selecting the appropriate button. When the button is selected, the channel will go into **STANDBY MODE**.



To remove from standby, select the desired channel tab.

Program Lock

An active program lock prohibits changes to any touchscreen field or parameter related to a therapy program including:

- Programming buttons
- Date & Time settings

The program lock is ALWAYS available unless the Cleaning Lock is active, a system message is active, or the infuser is in an active alarm state.

A therapy cannot be started or stopped while the program lock is active using on-screen buttons. Pressing **Emergency Stop** will stop the infuser but does not deactivate the program lock. With the program lock active, the user can access the following infuser features:

1. Screen navigation
2. Brightness and volume control
3. Logs and program parameters
4. Emergency Stop button
5. View shift/program totals

With the Program Lock active, program-related fields and related features are not available. To access program-related fields and features you must first de-activate the Program Lock.

To activate the Program Lock:

1. From any infuser screen, locate and press **Lock** to display the Enter Code dialog box.

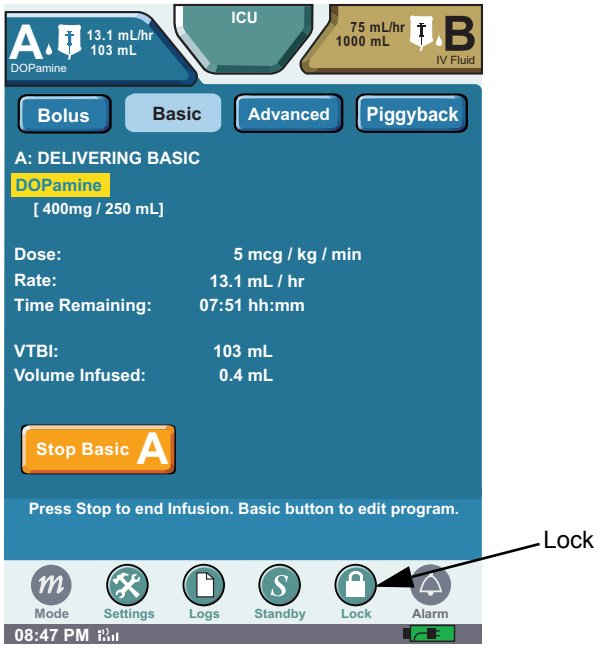


Figure 16: Accessing the Program Lock

2. On the **Enter Code** dialog box, use the touchscreen keypad to key in a valid passcode, and then press **Enter**. Press **Cancel** to return to the previous screen.

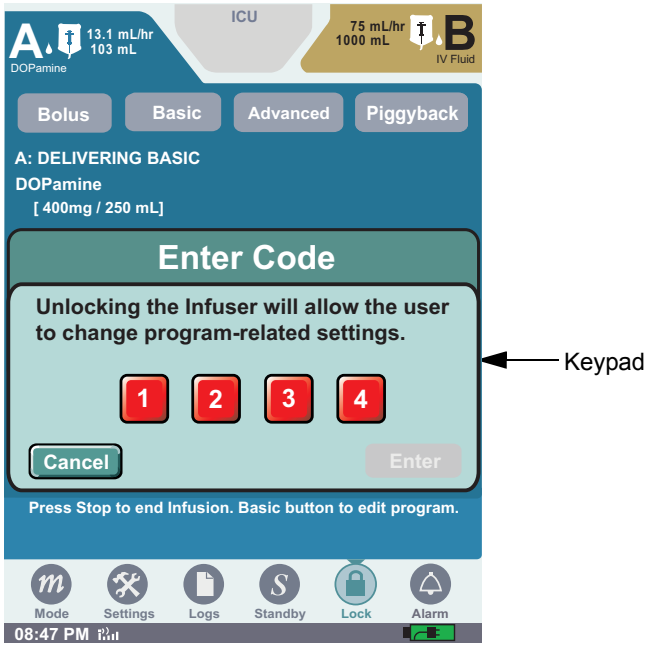


Figure 17: Enter Code Dialog Box (Activating)

Note: *See authorized facility personnel for passcode.*

3. The screen from which the program lock was accessed displays with the program lock activated.

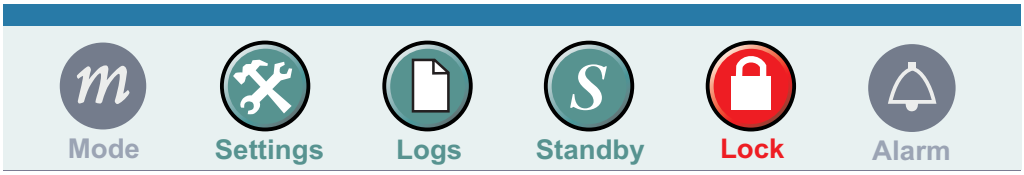


Figure 18: Program Lock Activated

Note: *Entering an invalid passcode three consecutive times activates the Invalid Passcode system message for each attempt. Entering an invalid passcode a fourth time closes the Enter Code dialog box and displays the screen from which the program lock was accessed without activating the program lock.*

To deactivate the Program Lock:

1. From any infuser screen, locate and press **Lock** to display the Enter Code dialog box.
2. At the **Enter Code** dialog box, use the touchscreen keypad to key in a valid passcode, and then press **Enter**. Press **Cancel** to return to the previous screen.

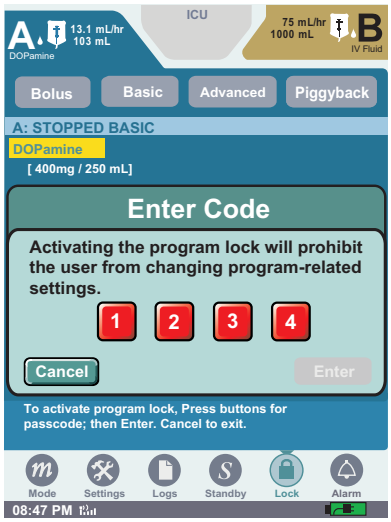


Figure 19: Enter Code Dialog Box (Deactivating)

3. The screen that the program lock was accessed displays with the program lock deactivated.

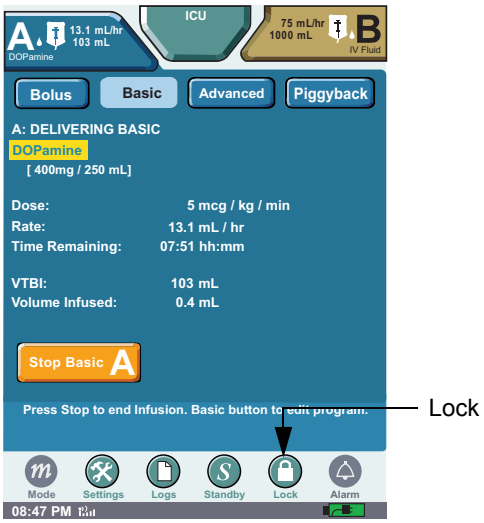


Figure 20: Program Lock Deactivated

Note: *Entering an invalid passcode three consecutive times activates the Invalid Passcode system message for each attempt. Entering an invalid passcode a fourth time closes the Enter Code dialog box and displays the screen from which the program lock was accessed without deactivating the program lock.*

Chapter 3: Infuser Operations

Chapter 3 describes the basic operations of the SYMBIQ™ Infusion System. This includes a discussion of power on, power down, programming a therapy, and delivering a therapy.

Infuser Operations Overview

The infuser has four basic operations divided into four segments: power on, program, deliver and stop.

- **Power**—to power on and power off the infuser
- **Programming**—to program the following therapies:
  - Bolus
  - Basic
  - Advanced (Multistep Interchannel Sequencing and Intermittent)
  - Piggyback
- **Delivery**—to observe and monitor the progress of an infusion
- **Stop**—to stop infusion

Power Modes

The Power mode is used to power on and power off the infuser.

AC Power

When attached to an AC power source, the SYMBIQ™ Infusion System uses AC power regardless of the level of available battery power. Use AC power whenever possible, the battery is intended as a backup or emergency power source. However, if the quality of the earth grounding source is in doubt use battery power.

Before initial use, connect the infuser to AC power for at least four hours to ensure the battery is fully charged. Whenever connected to an AC power source, the infuser charges the battery.

If one channel of a two-channel infuser fails a self-test, the other channel remains available.

To power on the infuser:

1. Ensure the infuser is securely attached to an I.V. pole and connected to an AC power source.
2. Press and hold the **On/Off button** for one second, then release.

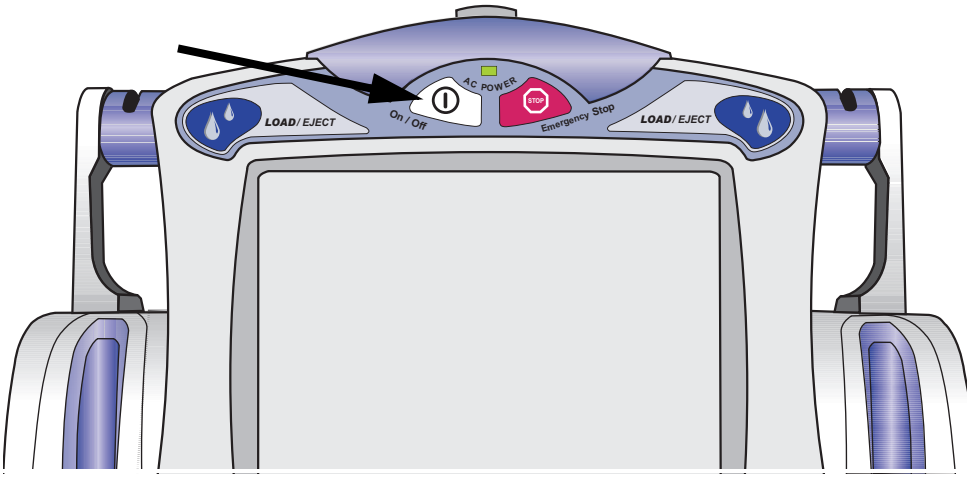


Figure 21: On/Off Button

3. At power on, the **STARTUP SCREEN** displays during diagnostic self-tests.

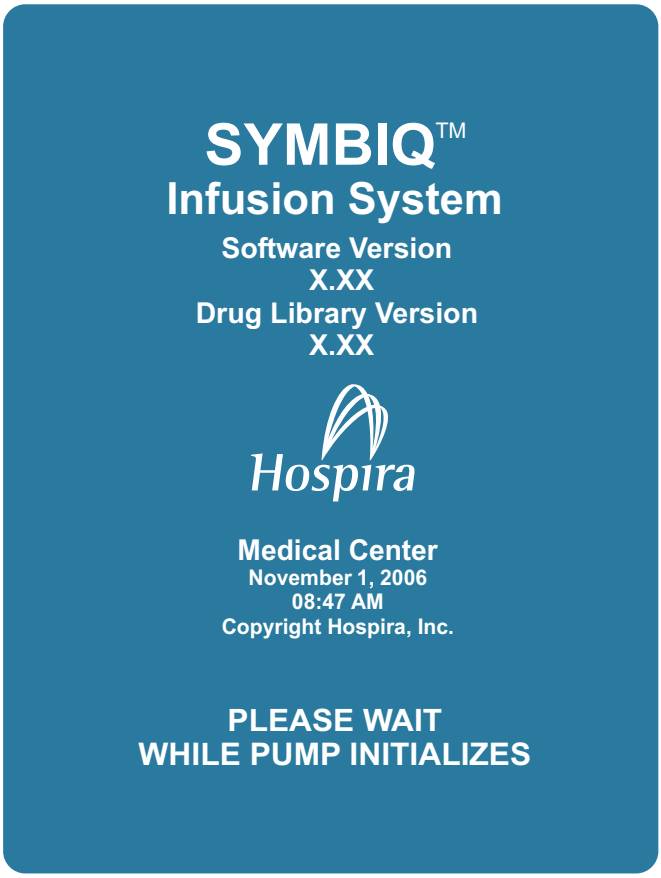


Figure 22: Infuser Startup Screen

The diagnostic self-tests take about ten seconds to complete. Once diagnostic self-tests complete, a **STARTUP SCREEN** indicates whether any program, patient, distal and proximal occlusion, or air-in-line sensitivity settings were saved. At power on, the default active channel is A. Pressing the appropriate channel tab accesses that channel.

CAUTION: DO NOT place the SYMBIQ™ Infuser in service if it fails any of the diagnostic self-tests.

Channel LEDs

During diagnostic self-tests, the channel LEDs located just above the cassette carriage (Figure 23) flash green once, yellow once, and red once.

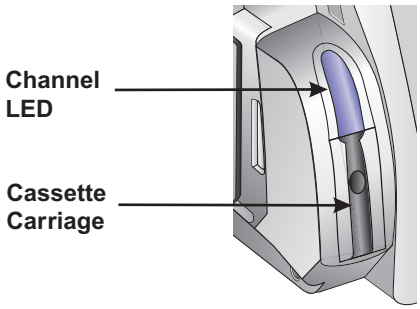


Figure 23: Channel LED Location

Table 8 outlines channel LED color and the conditions under which the channel LEDs illuminate. During an alarm state, the color and flashing characteristics of both the channel LED and channel alarm tab are the same.

Table 8: Channel LED Color and Conditions

Channel LED Color	Conditions
Solid Green	While in Delivery mode and delivery has not been interrupted.
Flashing Green	When the cassette carriage is either opening, closing, or open, and during power priming.
Solid Yellow	During a Low urgency alarm condition.
Flashing Yellow	During a Medium urgency alarm condition.
Flashing Red	During any High urgency alarm condition.
Solid Red	During a latched High urgency alarm condition. A latched High urgency condition notifies the user of a previous alarm condition—which no longer exists—until the alarm is cleared by the user.

If the infuser has been powered off for less than five hours, previous patient information, program information, and infuser settings are retained. The New Patient dialog box displays over the **STARTUP SCREEN**. See Figure 24 below.

Selecting **No** in the New Patient field and pressing **Continue** retains stored patient and program information and displays the **STARTUP SCREEN**. The **STARTUP SCREEN** shows infuser status and provides access to view both patient and program information. Selecting **Yes** in the New Patient field and pressing **Continue** clears stored patient and program information and displays a blank **PATIENT INFORMATION SCREEN**.

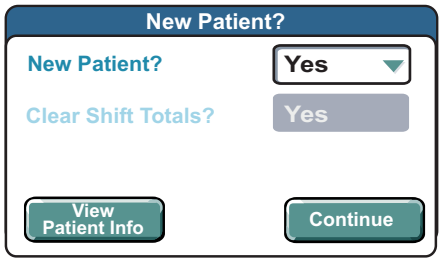


Figure 24: New Patient Dialog Box

When a Drug Library contains one or more Clinical Care Areas (CCAs), the user must specify a CCA at power on. When prompted, either confirm the current CCA or select a new one.

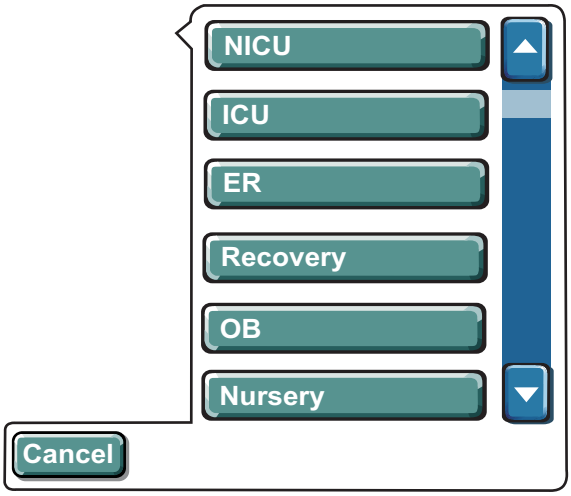


Figure 25: Specifying a CCA

Battery Power

For either a one-or two-channel infuser, the battery provides approximately four hours of power at 125 mL/hr while on battery power and with the LCD backlight at Power Saving mode.

The non-volatile battery life is sufficient to retain program parameters, delivery totals, patient information (ID, weight, and height), clinician information, and logs.

CAUTION: Before use, ensure the infuser has a functional battery installed. Use of a properly installed and functional battery helps ensure the infuser operates properly.

The battery indicator icon is located in the lower right corner of the touchscreen. Table 9 shows battery indictor icons and the associated battery life, power level, and alarm state for each indicator icon. When the infuser is attached to an AC power source, the battery indicator icon shows the current battery charge level.

Table 9: Battery Indicator Icons

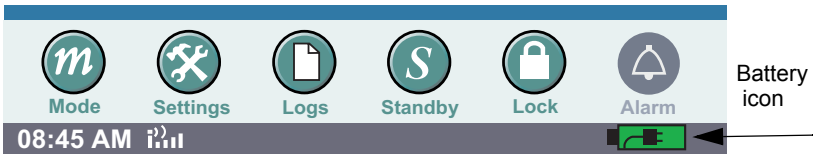
Battery Indicator Icon	Power Level	Alarm State
Battery Indicators when infuser is operating on battery power		
Battery icon location:	 *Note: Icon is located in the lower right corner of the device level area.*	
	Full (76%-100%)	None
	Three-quarters (51%-75%)	None
	Half (50%) *Note: This indicator displays when the battery is at half capacity—until the activation of the 30-min. Low battery Alarm (see next indicator) when the infuser is operating on battery power:*	None
	30 minutes	Low
	15 minutes	Medium
	5 minutes *Note: Depleted Battery Alarm occurs at this stage. The AC cord needs to be immediately plugged in. Infuser is about to shut down.*	High

Table 9: Battery Indicator Icons (Continued)

Battery Indicator Icon	Power Level	Alarm State
	Empty *Note: A flashing battery indicator shall alternate between the two battery icons illustrated on the left.*	
Charging Battery Indicators when infuser is operating on AC Power		
	AC power (infuser using AC power only, battery charged to 90% or more capacity)	None
	Charging, capacity at 75% or greater but less than 90% capacity	None
	Charging, capacity at 50% or greater but less than 75% capacity	None
	Charging, capacity at 25% or greater but less than 50% capacity	None
	Displays when the infuser is powered on and no battery above the Depleted Battery threshold is detected.	

At the first Low Battery alarm, the battery has only enough charge remaining to continue the current delivery rate for approximately 30 minutes. A Low Battery alarm also occurs when only 15 minutes of battery life remains at the current infusion rate. A Depleted Battery alarm will occur when the remaining battery life is approximately 5 minutes or less. The Depleted Battery alarm will continue until there is no power remaining. The infuser will then stop and shut down. At this point a backup buzzer will sound for about two minutes. Immediately connect the infuser to AC power when a Low or Depleted alarm sounds to assure the infusion continues.

Note: *As long as a low battery condition exists, the Low Battery alarm cannot be cleared, but it may be minimized by pressing the alarm tab.*

DO NOT use a SYMBIQ™ Infusion System without a properly functioning battery installed. If no battery is detected at power on, the Service Battery alarm activates (Figure 26). In this case, remove the infuser from service until a properly functioning battery can be installed.

When approximately 5 minutes of battery life remain, the infuser sounds and displays a high urgency alarm. Immediately connect the infuser to AC Power. The infuser will stop and shut down.

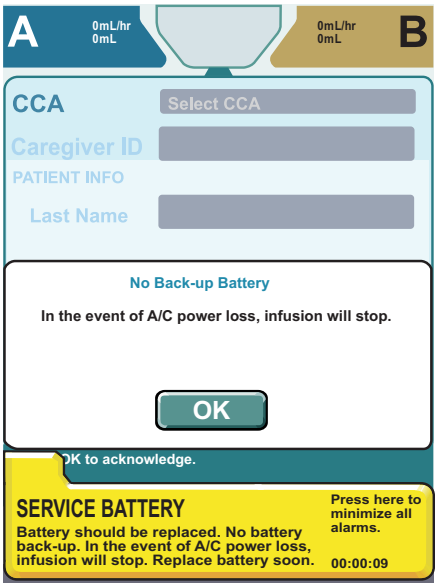


Figure 26: Service Battery System Message

CAUTION: Before use, ensure the infuser has a functional battery installed. Use of a properly installed and functional battery helps ensure the infuser operates properly.

A/C Power LED

The A/C power LED (Figure 27) is located on the front of the infuser just above the **On/Off** and **Emergency Stop buttons**. When using AC power with a fully-charged battery, the A/C power LED is lit green. When using A/C power with the battery charging, the A/C power LED flashes. When using battery power only, the power LED is off.

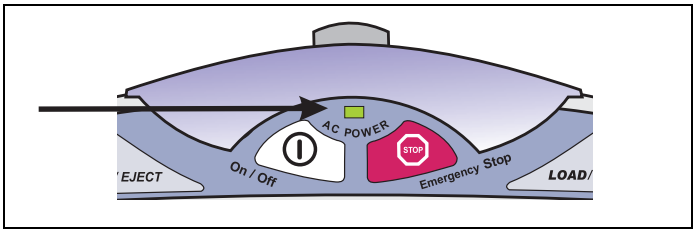


Figure 27: Location of A/C Power LED

Touchscreen Visibility

If no keystrokes or button presses are made for a CCA-defined period of time (the default is two minutes), the infuser enters Power Saving mode. Power Saving mode is marked by an 80% reduction in touchscreen brightness.

Turning touchscreen away from direct sunlight improves visibility. Any infuser alarm state or pressing the touchscreen restores brightness to normal levels.

Power Off

When power is removed from the infuser, it enters Power Down mode. If open, close the cassette carriage. During a normal power down, all critical data is saved to the appropriate logs, the current program and all user-configured settings are retained. All alarm sensitivity settings are also retained at power down.

To power down the infuser:

1. Ensure all infusions are stopped and the infuser is not in Delivery mode.
2. Press and hold the **On/Off button** for one second, and then release. The infuser powers off. See Figure 21: "On/Off Button" on page 38.

   Note: *If the infuser is powered off before completing or confirming a program, the partially entered program is cleared the next time the infuser is powered on.*

Programming Mode

Programming mode is used to program infusion therapies. Therapies and supplemental deliveries available in programming mode include:

- Bolus
- Basic
- Advanced
- Piggyback

Basic Mode

From this screen, the user can access these features:

- **Patient Information Button**—displays patient information
- **Channel Tabs**—displays the channel screen (only one channel displays at a time) Press the channel tab to select it. The selected channel tab appears in 3-D
- **Bolus**—displays the **BOLUS PROGRAM SCREEN** (**Bolus button** available before and after a primary infusion is programmed on the active channel)
- **Advanced**—displays the **ADVANCED THERAPY SELECTION SCREEN**
- **Piggyback**—displays the **PIGGYBACK PROGRAM SCREEN** (**Piggyback button** unavailable until a primary infusion is programmed on the active channel)
- **Clear**—if not in Delivery mode, removes all values entered on a programming screen
- **Options**—displays the **OPTIONS SCREEN**
- **Cancel Titration—(**if accessing the **BASIC PROGRAM SCREEN** to titrate the therapy) cancels all changes made to the program
- **Next A** —Displays the Confirm **PROGRAM SCREEN** available only when all required program parameters have been entered
- **Next B** —Displays the Confirm **PROGRAM SCREEN** available only when all required program parameters have been entered
- **Device Level Buttons**—displays device level features

Delivery Mode

Two types of screens display during Delivery mode—Near Viewing and Far Viewing. A **NEAR VIEWING DELIVERY SCREEN** is shown in Figure 28 below.

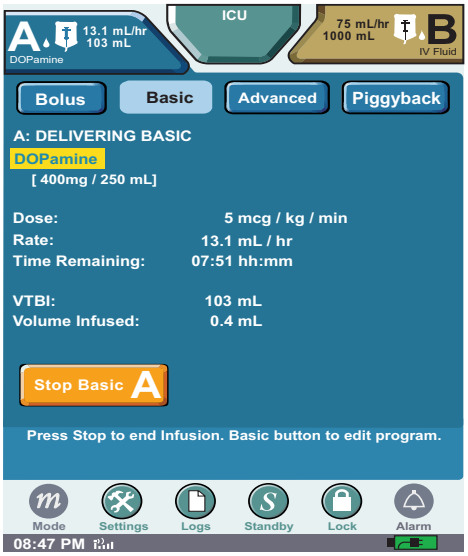


Figure 28: Near Viewing Delivery Screen

The **NEAR VIEWING DELIVERY SCREEN** displays medication name (if enabled in the selected CCA), concentration, dose rate (if applicable), time remaining, VTBI, volume infused, infusion status for advanced therapies, and alarm name for the highest priority alarm if in an alarm state. On the **NEAR VIEWING DELIVERY SCREEN**, both VTBI and Volume Infused values display with one decimal place for values up to 100.

Note: *The* **NEAR VIEWING DELIVERY SCREEN** *displays the Dose label and value if a dose is programmed.*

The **FAR VIEWING SCREEN** displays the medication name (if enabled in the selected CCA), concentration, and if in an alarm state, the alarm name for the highest priority alarm. On the **FAR VIEWING DELIVERY SCREEN**, VTBI or volume infused values display with two decimal places. For values greater than or equal to 100, values display without a decimal.

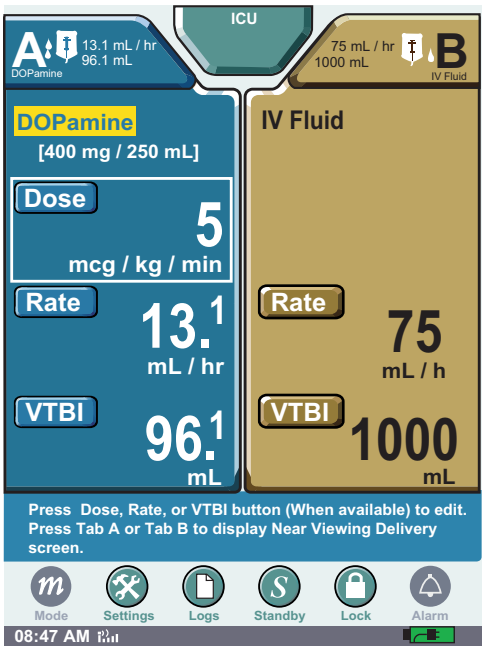


Figure 29: Far Viewing Delivery Screen

Pressing the **LOAD/EJECT button** while in delivery mode does not eject the cassette; to eject a cassette, the infuser must be in Stop mode.

Once the infuser completes a programmed therapy, the End of Infusion alarm activates. The infuser transitions to a KVO (Keep Vein Open) delivery rate. Depending on programming, the infuser continues to deliver at programmed rate or transitions to KVO.

Stop Mode

The SYMBIQ™ Infusion System stops in one of several ways:

- Pressing **Stop Basic A** on the touchscreen.
- Pressing **Emergency Stop** on the front of the infuser stops all channels.

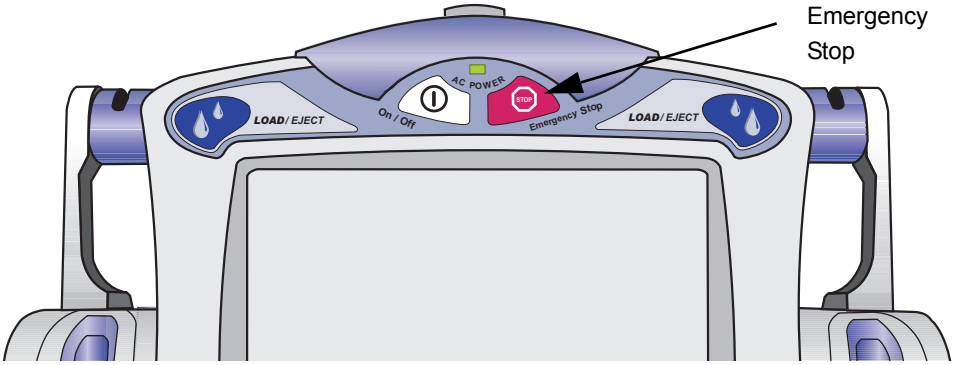


Figure 30: Emergency Stop Button

- An active alarm state will stop the infusion.
- When a programmed VTBI completes and there is no KVO.
- A Bolus is complete and Stop Infusion has been selected on the **BOLUS SETUP SCREEN**.

When a delivery is manually stopped (by pressing **Stop Basic A**) and the VTBI has not completely delivered, the **STOP MODE SCREEN** shows the **A: STOPPED BASIC MESSAGE** across the banner as in Figure 31.

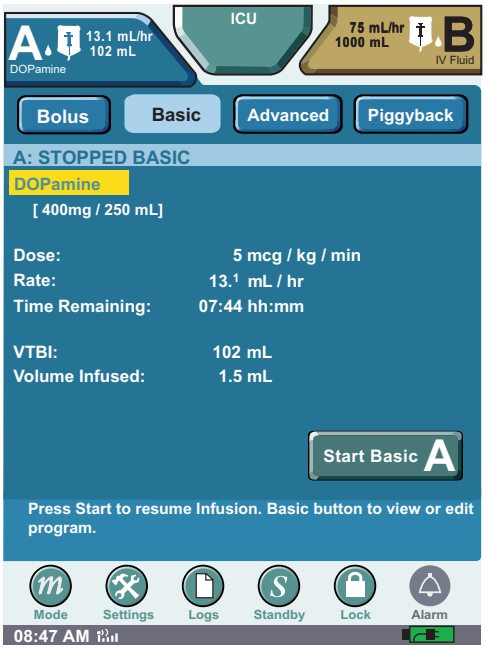


Figure 31: Stopped Basic Screen—Manual Stop in a Basic Program

When a therapy is stopped due to an alarm state including Emergency Stop, the **STOP MODE SCREEN** shown in Figure 32 displays.

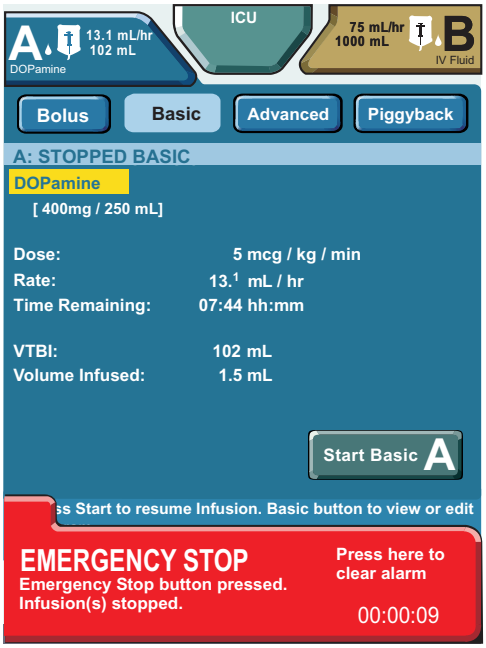


Figure 32: Stopped Basic Screen—Alarm State

WARNING: After pressing Emergency Stop, verify that the Emergency Stop Banner is displayed and delivery has stopped.

While in Stop mode, the user can

- access the current programmed therapy
- access the lock/unlock functionality
- access programming mode to start a new program or change a current program
- start a programmed therapy or continue the current therapy
- select a new CCA
- update patient information

Note: *The* **STOPPED BASIC SCREEN** *only displays the Dose label and value if a dose is programmed.*

To stop the infuser using the touchscreen Basic button:

1. If the **FAR VIEWING SCREEN** is active, you must touch the screen to display the **NEAR VIEWING SCREEN**.
2. On the **NEAR VIEWING SCREEN**, locate and press **Stop Basic A**.

Figure 33: Basic Button

3. To resume infusing, press **Start Basic A**.

To stop the infuser using the Emergency Stop button:

Note: *In an Emergency, use the* **Emergency Stop button** *to stop all channels. Otherwise, use* **Stop Basic A button** *on the touchscreen to stop individual channels.*

1. Locate the **Emergency Stop button** on the front of the infuser. See Figure 30: "Emergency Stop Button" on page 47.
2. Press and release **Emergency Stop button**. All active programs stop infusing and a high urgency alarm sounds.

3. Press **Start Basic A** on the touchscreen to resume the therapy.

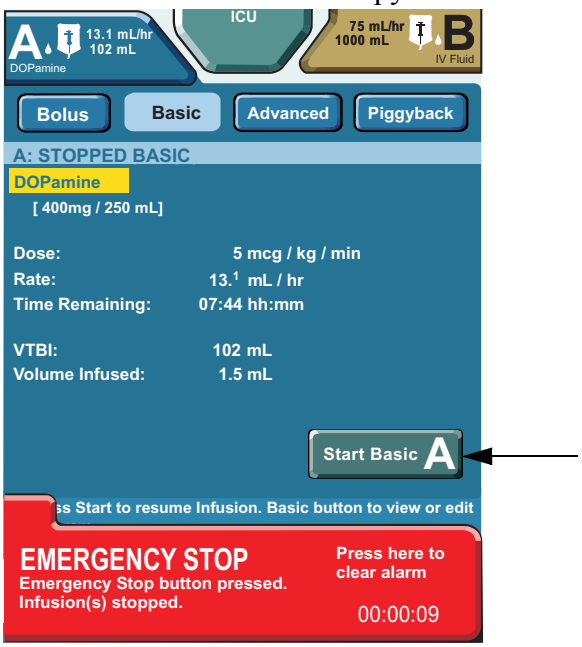


Figure 34: Start Basic A Touchscreen Button

General Programming Guidelines

If the infuser is powered off before completing or confirming a program, the partially entered program is cleared the next time the infuser is powered on. If a change is made to a program during an infusion but is neither canceled nor confirmed, a Callback alarm activates.

Calculated Values

A calculated value that either exceeds the current maximum medication delivery rate or the maximum volumetric rate for the selected CCA activates a warning message.

Invalid Value Handling

If entering a value in a field that exceeds a value limit defined for that field, the following occurs:

- activates the Invalid Entry system message
- sounds the Invalid Key tone
- replaces the value with three dashes (“---”)

There are two types of value limits for a field: maximum field length and maximum field amount.

For fields with defined maximum lengths, entering a four-character value in a field with a three-character limit exceeds the length limit for that field and activates the Invalid Entry system message.

Entering an amount that exceeds the defined limit activates the Invalid Entry system message (Figure 35).

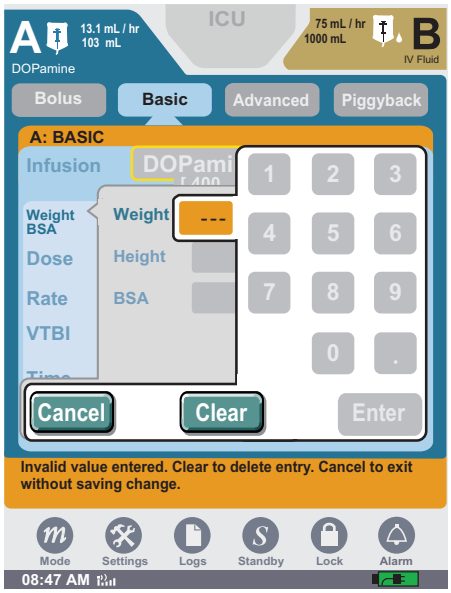


Figure 35: Invalid Entry System Message

A field must contain a valid value before exiting. To remove the Invalid Entry system message, press **Clear**. Pressing **Clear** also replaces the three dashes (“---”) in a field with field default values; either “0” for non-time fields or “--:--” for time fields.

Value Rounding

For calculated values, the infuser truncates the value one digit beyond what the screen can display, and then rounds off the value. If the therapy is based on either a calculated value or a rounded value, the infuser delivers the therapy at the stored value. For example, if the stored value is in hundredths but displays in tenths, the infusion rate has a granularity of hundredths. Stored information does not change. If a stored value contains more decimal places than can be displayed, the infuser rounds the displayed value. The infuser uses the rounding rules based on one digit beyond what can be displayed.

Note: *Calculated interim values retain all decimal places supported by the infuser’s hardware.*

Biomed Mode

Biomed mode is used to perform calibrations and diagnostic tests on the SYMBIQ™ Infusion System. In Biomed mode, a trained and qualified biomedical technician can restore the infuser's default factory settings and default drug library, configure device settings, and clear all logs and viewable data.

CAUTION: Only qualified biomedical technicians should access the infuser's Biomed mode.

Note: *Biomed mode is passcode protected.*

Chapter 4: Infuser Preparation

Overview

This chapter describes preparing the SYMBIQ™ Infusion System for use including attaching it to an I.V. pole; attaching two infusers, preparing administration sets; loading, priming, and removing cassettes; and ejecting a cassette in an emergency.

CAUTION: To prevent product damage, use proper care during unpacking and installation. DO NOT use a SYMBIQ™ Infusion System if it appears damaged in any way.

Attaching and Removing an Infuser from an I.V. Pole

The SYMBIQ™ Infusion System's pole clamp mechanism utilizes a quick-travel mechanism for attaching to an I.V. pole. Attach the infuser to a pole by pushing the pole clamp against an I.V. pole, and then turning the pole clamp knob clockwise to secure the infuser in place. To assure a secure attachment, it is helpful to keep the infuser back parallel to the I.V. pole during attachment. Detach an infuser from a pole by turning the pole clamp knob counter-clockwise approximately one-half turn, and then pressing the quick travel release button to retract the pole clamp. See Appendix C for I.V. pole list number.

The following table provides mounting height data:

Table 1: I.V. Maximum Mounting Height of Infusers on a Single I.V. Pole

One Infuser	Two Infusers (Vertical, each with their own pole clamp)	Two Infusers (Interlocked using 1" pole clamp)
72 inches	68 inches to infuser #1	58 inches
	57 inches to infuser #2	

Note: *Measurements are from the ground to the top of the infuser.*

CAUTION: To prevent personal injury or product damage, make sure the pole clamp is tightened properly and the infuser is securely attached. The pole clamp is locked when the mechanism makes a clicking noise.

Infuser Configurations on an I.V. Pole

The user can attach a one- channel infuser or a two channel infuser to an I.V. pole (Figure 36). The infuser can be attached together horizontally; attach additional infuser to the right. (See "Attaching Two Infusers" on page 57.)

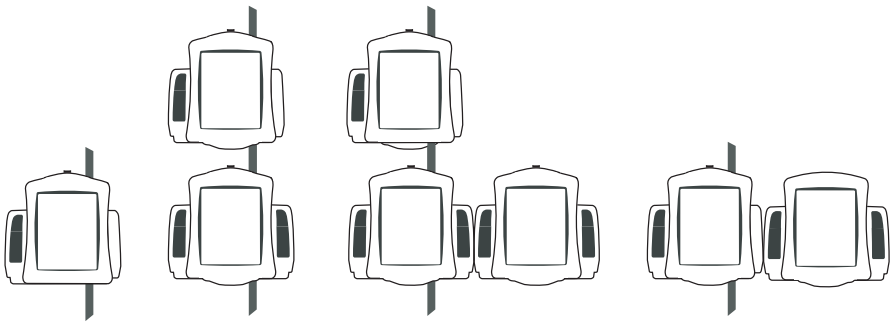


Figure 36: Acceptable Infuser Configurations on I.V. Pole

When attaching a one- channel and two- channel infuser, the one-channel is attached to the I.V. pole first. A two channel can then be attached on the right side of the one channel.

To attach an infuser to an I.V. pole:

1. Ensure the I.V. pole is correctly assembled, meets Hospira recommendations, and is on a flat surface.
2. Grasp and hold the infuser by the handle, and then place the I.V. pole inside the infuser's pole clamp.

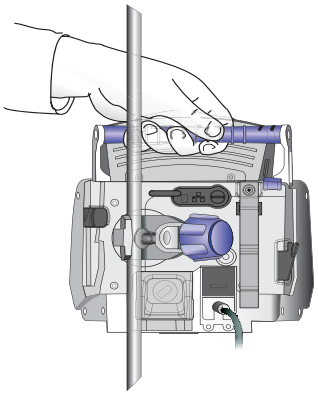


Figure 37: Placing I.V. Pole Inside Pole Clamp

3. While holding the infuser with one hand, push the pole clamp knob forward against the I.V. pole.

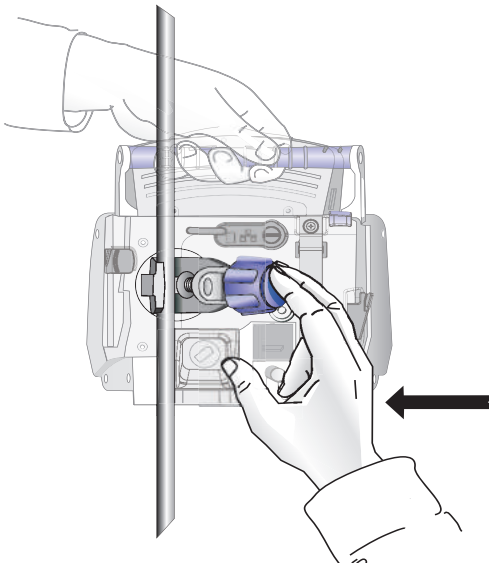


Figure 38: Pushing Pole Clamp Knob Forward against I.V. Pole

4. Turn the pole clamp knob clockwise until the user hears audible clicks to secure the infuser against the I.V. pole.

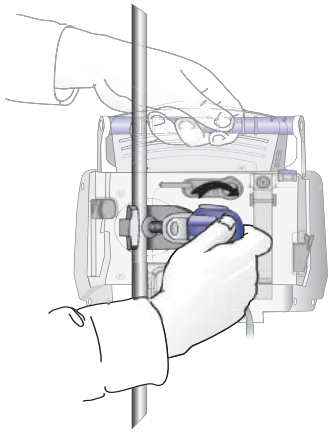


Figure 39: Turning the Pole Clamp Knob Clockwise

Note: *After tightening, push down and pull up to make sure that it is tightly clamped to the pole without slippage. If not, realign and turn the knob till it clicks.*

5. Ensure the infuser is securely attached to the I.V. pole by checking for both vertical and rotational slippage.

To detach an infuser from an I.V. pole:

1. Ensure the administration set is disconnected from the patient before removing an infuser from an I.V. pole.
2. Grasp and hold the infuser by the handle.

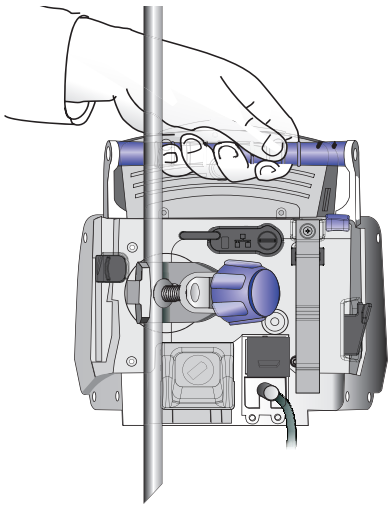


Figure 40: Grasping the Infuser

3. While grasping the infuser with one hand, turn the pole clamp knob counterclockwise approximately one-half turn with the other hand.

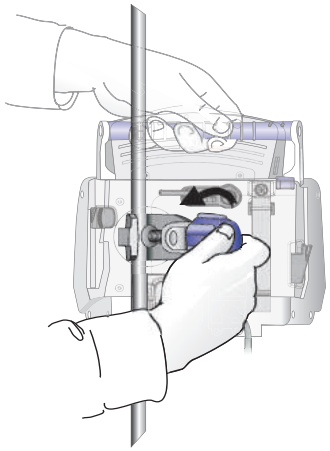


Figure 41: Turning the Pole Clamp Knob Counter-Clockwise

4. Press the **Quick Travel Release** button; the pole clamp retracts from the I.V. pole.

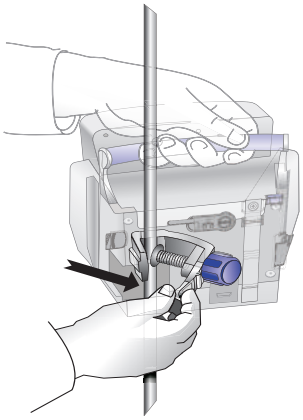


Figure 42: Pressing the Quick Travel Release Button

5. With the pole clamp retracted, remove the infuser from the I.V. pole.

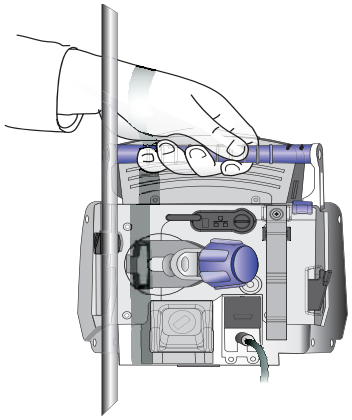


Figure 43: Removing Infuser from I.V. Pole

Attaching Two Infusers

When attaching one SYMBIQ™ Infusion System to another, follow these guidelines:

- Infusers can be attached together horizontally. Attach one additional infuser to the right (when facing the front of the infusers) of the primary infuser.
- To attach a one- channel and two- channel infuser, the one-channel is attached to the I.V. pole first. Then attach, the two-channel to the right side of the one-channel.

Note: *A one-channel infuser **CANNOT** be attached to the right (when facing the front of the infusers) of a two-channel infuser.*

- A two-channel infuser can be attached to a second two-channel infuser.
- A one-channel infuser **CANNOT** be attached to a second one-channel infuser.

To Attach One Infuser to a Second Infuser:

1. When facing the front of the infuser, the right side has a T-slot.

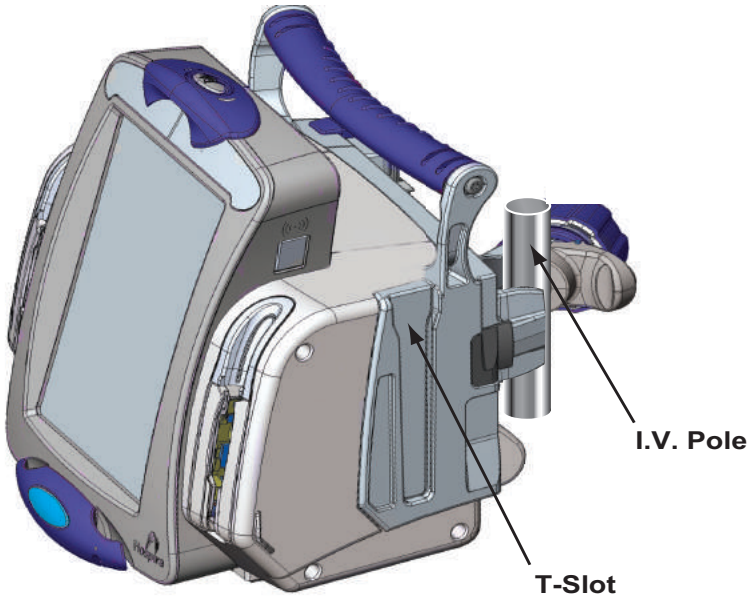


Figure 44: T-slot on Right Side of Primary Infuser

2. Ensure the second infuser (the attached infuser) has a tongue on the left.

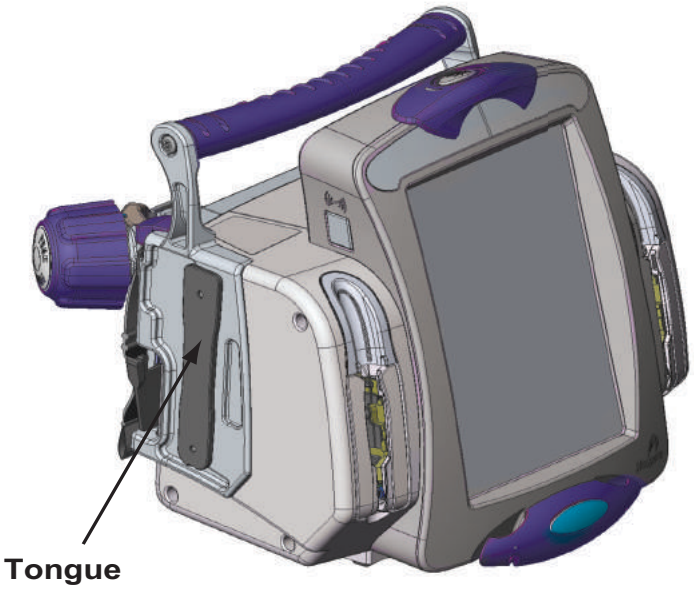


Figure 45: Tongue on Left Side of Secondary Infuser

3. Grasp the second infuser by the handle and place the bottom of the tongue in the opening at the top of the primary infuser's T-slot.
4. Slide the second infuser down until the tongue latches at the bottom of the primary infuser. Ensure the two infusers are securely attached by

- Checking for both vertical and horizontal slippage
- Visually inspecting the front of the infusers to ensure they are properly aligned

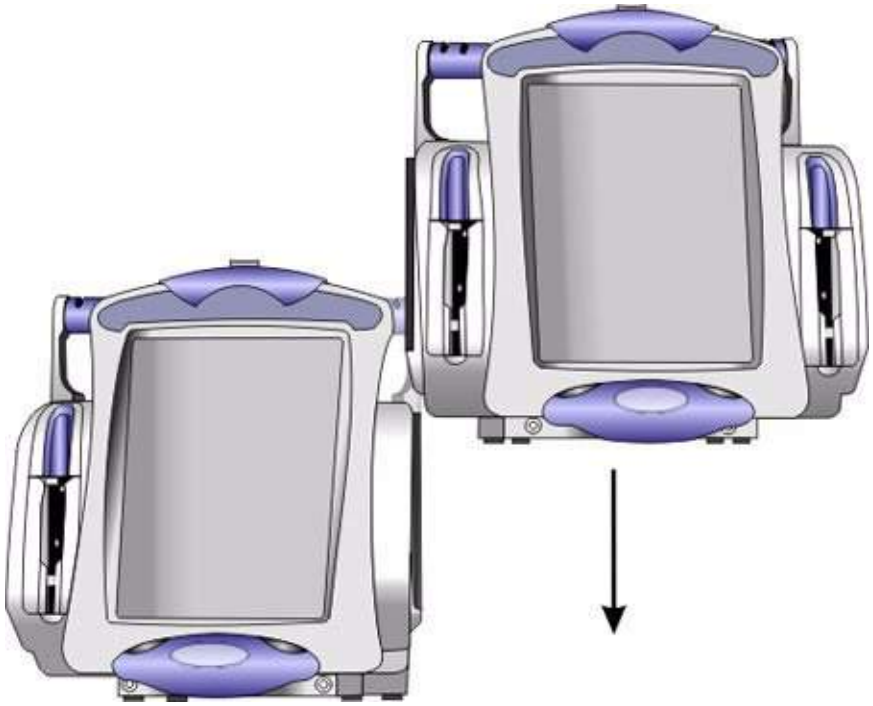


Figure 46: Latching Tongue Inside T-slot

5. Connect the primary infuser to an AC power source. Plug the AC power cord of the second infuser into the back of the primary infuser AC power outlet or into an AC power source. See “Rear Infuser AC Power Outlet” on page 22.

CAUTION: Never connect more than two infusers when using the rear infuser AC power outlet; connecting more than two infusers may cause an electrical safety hazard.

6. Shown in Figure 48 is a two-channel fully attached to a one-channel.

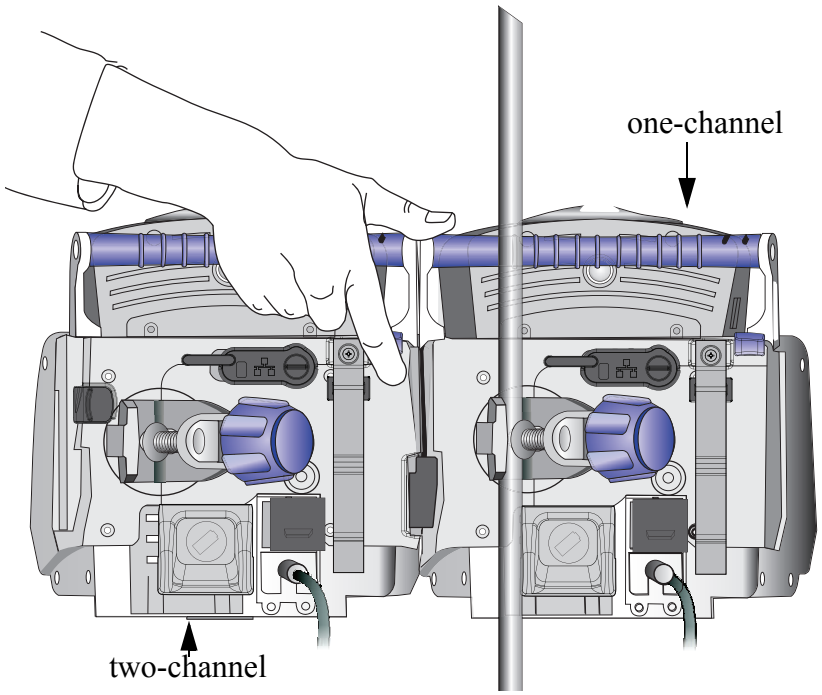
Figure 47: Two-Channel Fully Attached to a One-channel

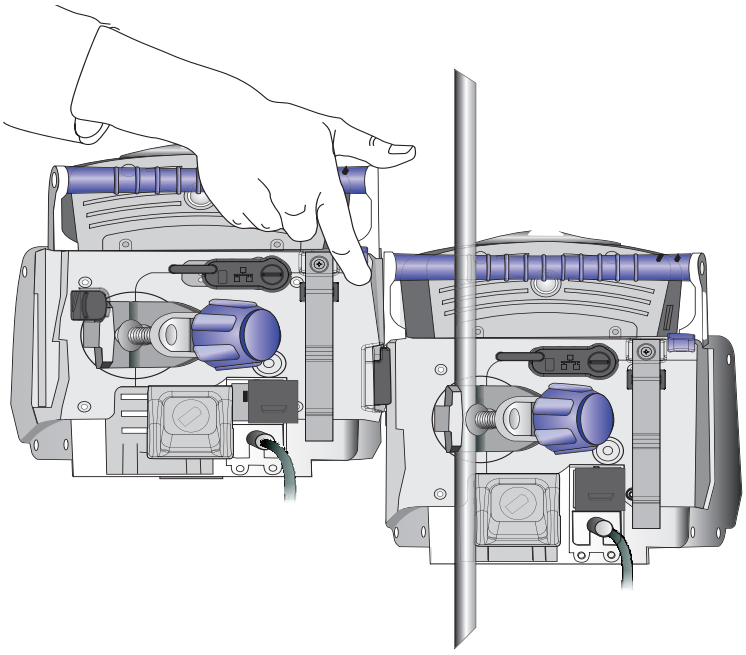
7. When attaching a two infuser array to an I.V. pole, attach the one-channel to the I.V. pole to maintain stability.

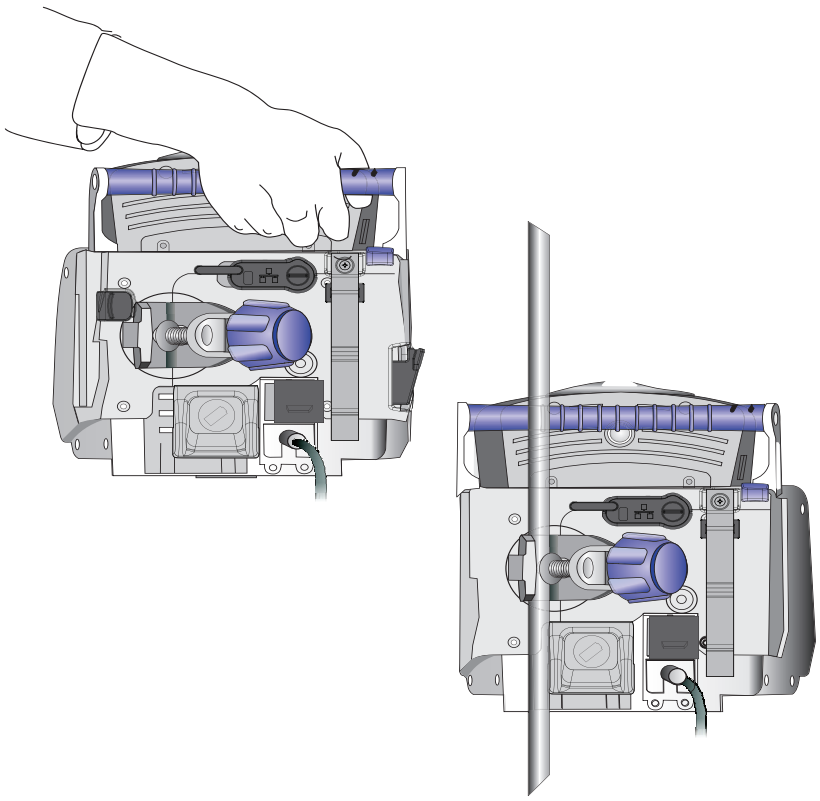
Detaching Connected Infusers

To Detach One Infuser from a Second Infuser:

1. Unplug the infuser from the AC power source.
2. Ensure the administration set is disconnected from the patient before detaching.
3. The infuser can be detached in either of the following methods:
   The infuser not attached to the IV pole can be detached.
   - Grasp and hold the infuser by the handle. Pull up on the purple release lever and slide the infuser up until it is disconnected from the primary infuser.







or

- Pull the black release lever to the right, and slide the infuser up until it is disconnected from the primary infuser.

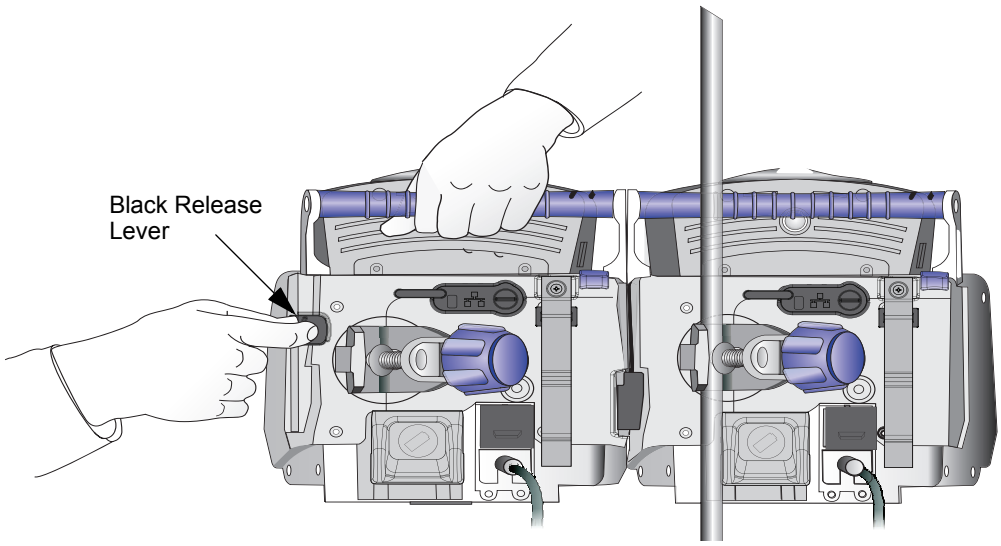


Figure 48: Grasping the Infuser

Administration Sets

Hospira administration sets are sterile (when in sealed packaging), disposable, and designed for one-time use only. Fluid pathways and surfaces beneath unopened protective covers are sterile and nonpyrogenic in intact packaging marked sterile as shown in Figure 49.

Figure 49: Label Indicating Sterile Parts and Pathways

See “Appendix C: Accessories, Administration Sets, and Components” on page 211 for a complete list of compatible Hospira administration sets for the use with the SYMBIQ™ Infusion System.

WARNING: When infusing at low delivery rates (5.0 mL/hr or less), use thick-walled microbore sets to reduce the amount of the fluid bolus that may be delivered when a distal line occlusion is released.

CAUTION: Administration sets should be changed per CDC guidelines or hospital policy. Ensure administration sets are properly discarded per CDC or hospital guidelines.

CAUTION: A typical Hospira SYMBIQ™ Lifecare administration set is shown below:

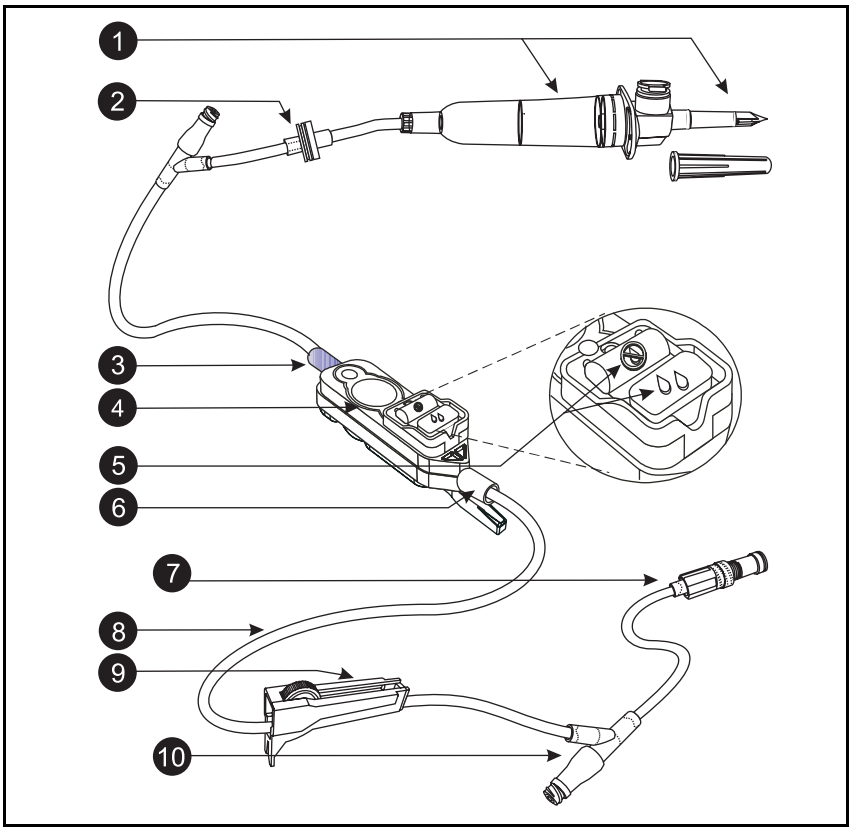


Table 10: Item Number and Corresponding Feature

1	Piercing Pin with drip chamber
2	BackCheck Valve
3	Proximal End of cassette
4	Cassette
5	Flow Stop (open / closed)

6	Distal End of cassette
7	Option-Lok®
8	Tubing
9	CAIR™ Roller Clamp
10	Y-site with CLAVE®

Preparing Administration Sets

Before attempting to prepare and assemble administration sets, understand the components and proper preparation and assembly techniques. **To prevent contamination, use aseptic techniques with all fluid-path connections. Remove protective coverings as administration set assembly progresses.**

WARNING: DO NOT use medications incompatible with silicone rubber or PVC plastic or medications not stable under infusion conditions.

WARNING: Always prime the administration set to remove air from the cassette, tubing, and injection sites prior to connecting to the patient. Always disconnect the administration set from the patient prior to priming or purging.

WARNING: Arrange tubing, cords, and cables to minimize the risk of patient strangulation or entanglement.

CAUTION: USE ONLY Hospira SYMBIQ™ administration sets with the SYMBIQ™ Infusion System. Use of unauthorized sets may result in injury to the patient or damage to the infuser. Gemstar® administration sets are not compatible with the SYMBIQ™ Infusion System.

CAUTION: When priming is complete and the cassette flow stop is closed, ensure no fluid flows at the distal end of the administration set. If fluid flow is observed, DO NOT use the administration set.

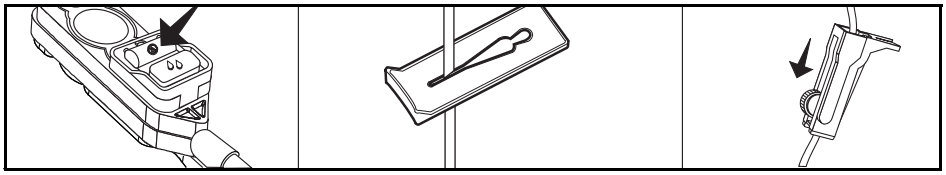
Fluid Container Compatibility

Fluid containers compatible with the SYMBIQ™ Infusion System include:

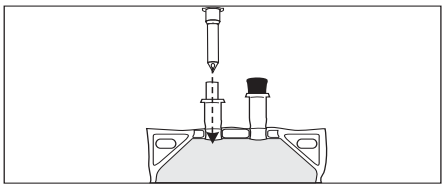
- Dual-chamber parenteral flexible container (NutriMix®)
- Large-volume parenteral flexible containers including premixed
- Large-volume parenteral glass containers including premixed and nutritional that use a vented set
- Part-fill parenteral flexible plastic containers including ADD-Vantage®
- Part-fill parenteral glass containers that use a vented set
- Ready-to-hang enteral solution containers

To prepare an administration set for infusion:

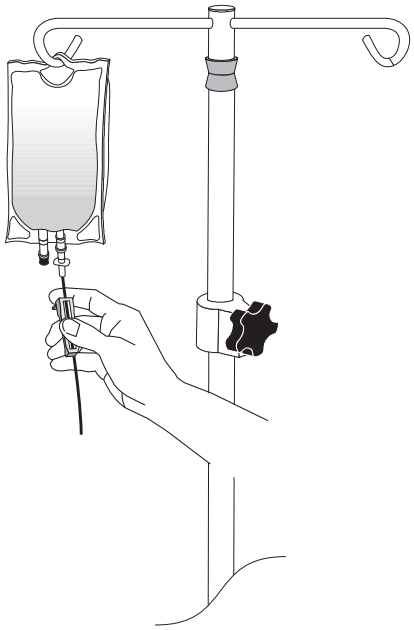
1. Ensure the cassette flow stop, tubing slide clamp, and CAIR roller clamp are closed.



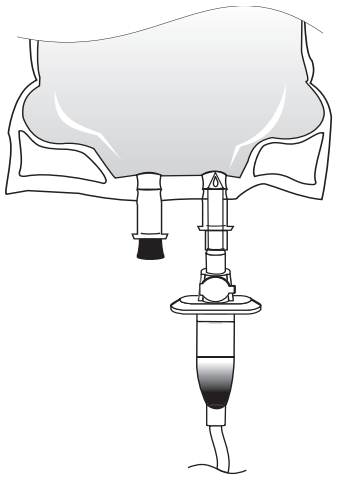
2. Insert the piercing pin into the fluid container outlet with a twisting motion.



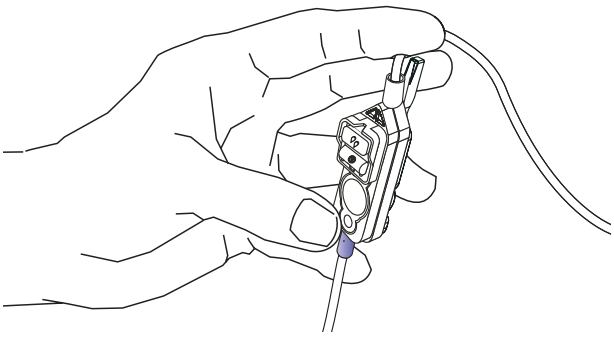
3. Hang the fluid container on an I.V. pole.



4. Fill the drip chamber one-third full or to the score mark if applicable; DO NOT completely fill the drip chamber.

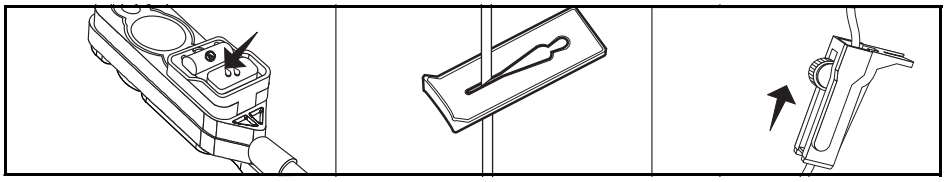


5. Invert the cassette and all the proximal Y site (if applicable) approximately 45º.



Note: *When inverting cassette, purple plastic collar should be on the bottom.*

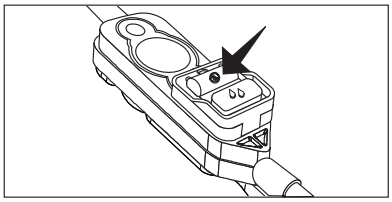
6. Open the cassette flow stop, tubing slide clamp, and CAIR roller clamp.



Note: *Tap the Y site and cassette while holding in an inverted position to expel any residual air.*

7. Return the cassette and the Y sites (if applicable) to the upright position. Continue priming until fluid fills the tubing.

8. Close the cassette flow stop and CAIR roller clamp.



CAUTION: Before using a CLAVE® connector, ensure administration set and fluid compatibility. Do not use needles to access the CLAVE® connector.

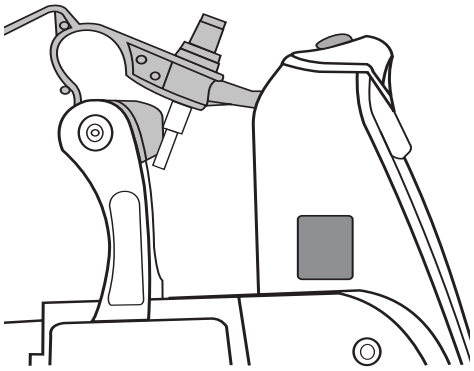
To prepare an administration set with a syringe holder adapter:

1. For syringe delivery, use the appropriate Hospira Administration Set with syringe holder adapter, listed in Appendix C.

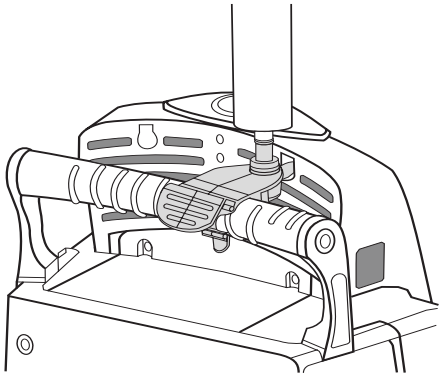
   Note: *Refer to the SYMBIQ™ administration sets labels for information regarding use with different flow rates.*

2. Locate the screw hole on the back of LCD display near the handle.

3. Insert the ball tip of the syringe holder into the screw hole.



4. Fit the rounded-end of the syringe holder into the adapter hole on the back of the infuser.



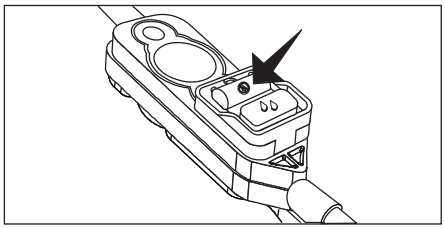
CAUTION: Use a vented syringe adapter to assure accurate delivery and reduce the risk of an occurrence of proximal occlusion.

5. Snap the syringe holder in place on the infuser handle.

6. Attach a luer locking syringe container into the top of the syringe holder adapter.

CAUTION: The syringe size must be between 1 mL and 60 mL. DO NOT use syringes larger than 60 mL with the syringe holder adapter.

7. Ensure the cassette flow stop, tubing slide clamp, and CAIR roller clamp are open.



8. Ensure the syringe administration set is fully primed before attaching it to a patient.

Note: *Prime a syringe administration set using the priming instructions* "To power prime a cassette:" on page 128.

To Check LED and Speaker Function

The infuser provides the following features used to check the function of the LEDs and speaker that provide status and alarm indication. Refer to "Settings" on page 28 for more details.

To check channel LEDs:

1. Press the **on/off** button
2. The Channel LEDs will flash green, yellow, then red.

To check the AC LED:

1. Press the **on/off** button.
2. AC LED lights.

To check the audio speaker:

1. Press the **on/off** button
2. Select **Settings**.
3. Select **Sound Volume**.
4. Push each of the buttons in the **Test Alarm** area to sound the Low Urgency, Medium Urgency, and High Urgency alarm tones.
5. The audio speaker also sounds when any valid or invalid key is pressed on the touch screen.

Loading an Administration Set

The infuser prevents free flow delivery by automatically closing the flow stop when the cassette carriage is closed. An audible alarm and touchscreen message occurs if the cassette is improperly loaded.

WARNING: When an administration set is loaded, a small amount of fluid is expelled each time the cassette carriage is opened or closed. If potent medications are being used, disconnect the administration set from the patient to prevent over medicating the patient.

CAUTION: DO NOT push the cassette carriage closed. Use the LOAD/EJECT button to open and close the cassette carriage.

CAUTION: DO NOT operate or store a SYMBIQ™ Infusion System with the cassette carriage opened. To avoid damaging the cassette carriage, keep it securely closed while the infuser is not in use.

To load a cassette:

1. Prime administration set prior to loading. Ensure infuser is powered on.
2. During power-on self-test, carriage door opens and closes.
3. Locate and press **LOAD/EJECT** on the front of the infuser. The cassette carriage opens.

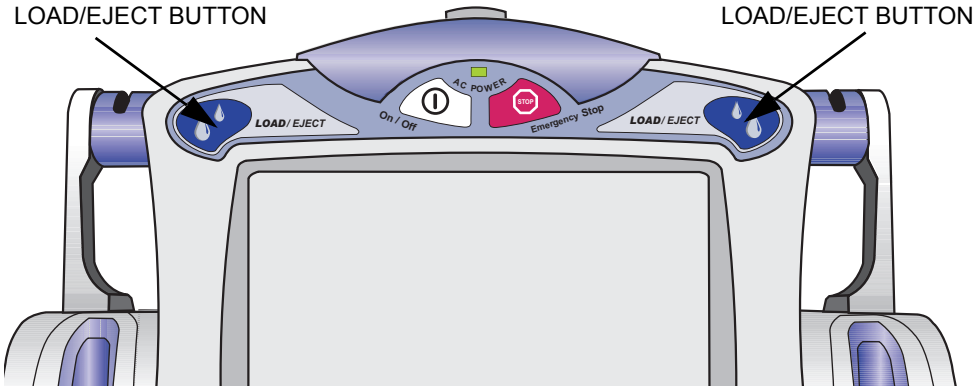
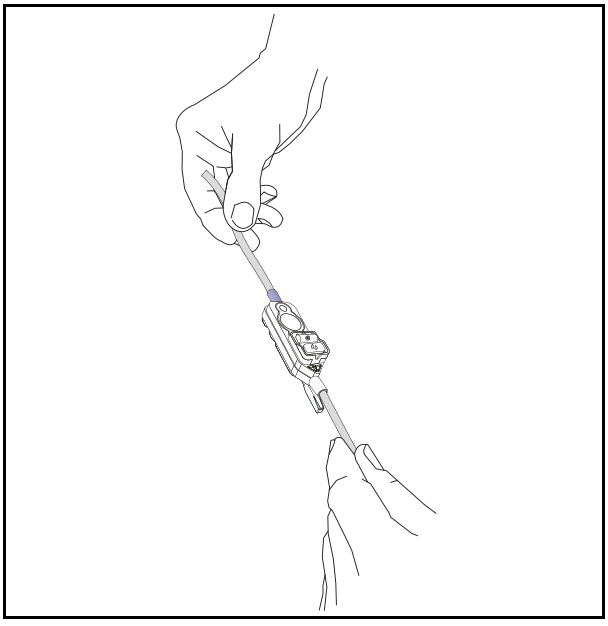


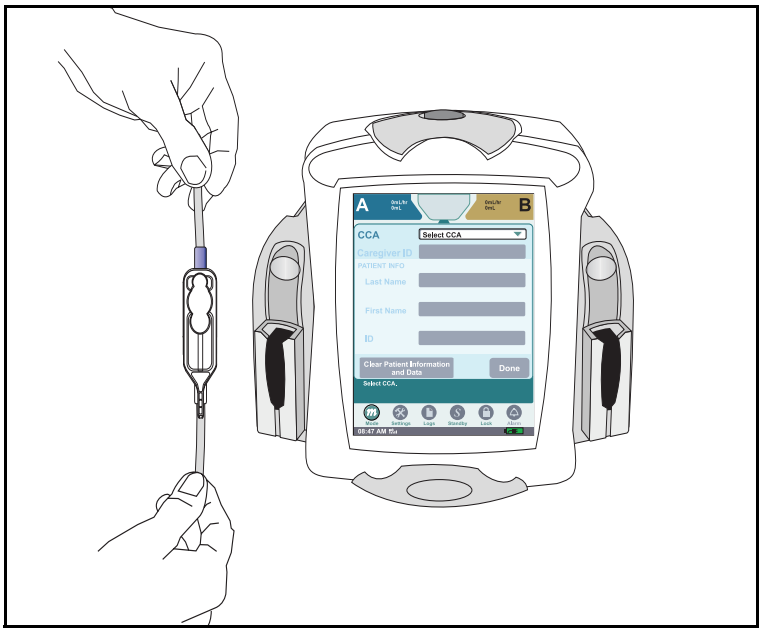
Figure 50: LOAD/EJECT Button

WARNING: ALWAYS prime the administration set to remove air from the cassette, tubing, and injection sites prior to connecting to the patient. ALWAYS disconnect the administration set from the patient prior to priming or purging.

4. Grasp the tubing above and below the cassette.



5. Position the cassette with the white flow stop facing the infuser and the purple collar positioned at the top of the cassette carriage.



Note: *Prior to loading a cassette, close the flow stop.*

Note: *The carriage door closes in approximately ten seconds. Press* **LOAD/EJECT button** *to open door.*

6. Slide the cassette into the cassette carriage. Ensure the cassette is seated at the bottom of the carriage and the tubing is aligned vertically.

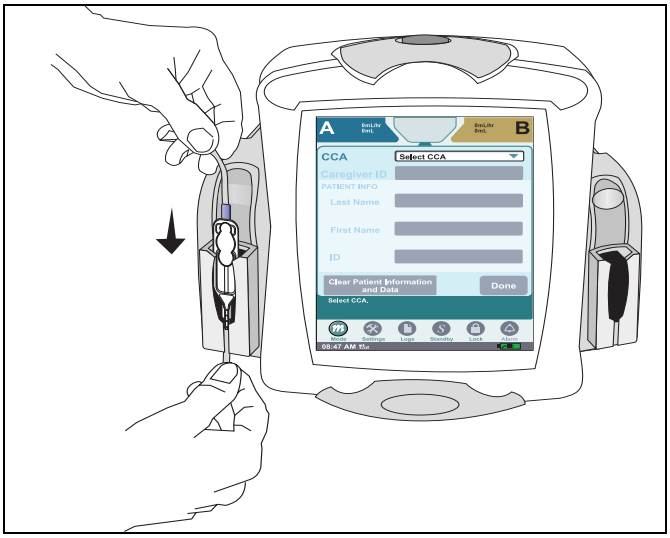


Figure 51: Sliding the Cassette into the Cassette Carriage

Note: *When loading a cassette, the channel LED is lit flashing green while the cassette carriage opens and closes.*

7. Once the cassette is properly seated at the bottom of the carriage, the cassette carriage closes automatically in approximately ten seconds or the user presses **LOAD/EJECT**.

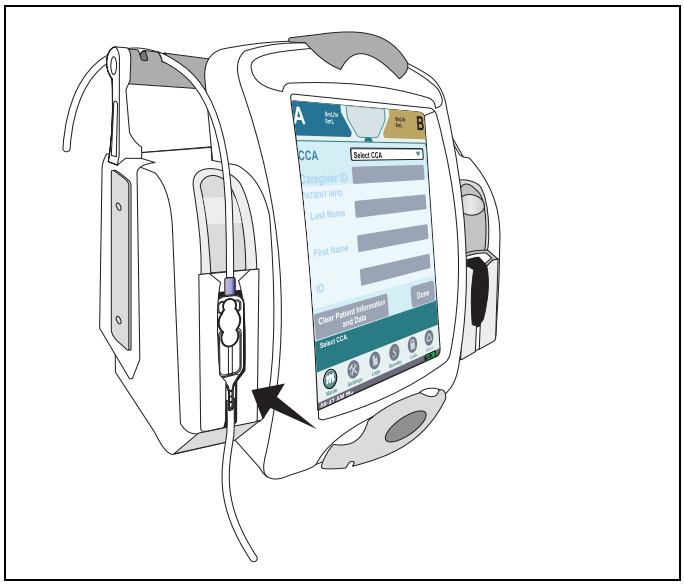


Figure 52: Carriage Closed

8. Secure administration set tubing into proximal (upper) tubing guides on handle. Allow a little slack between guide and the cassette to reduce the risk of proximal occlusion alarms.

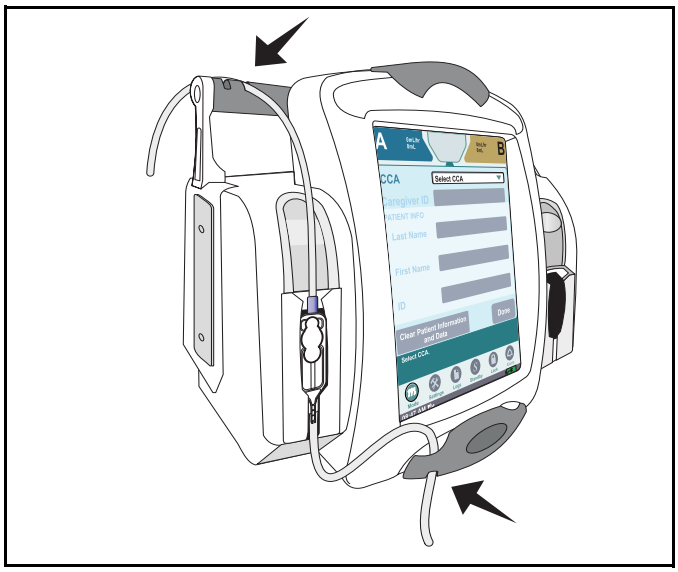


Figure 53: Tube Retainer Guides

9. Secure tubing into distal (lower) tubing guides. Allow a little slack between cassette and the guide to reduce the risk of distal occlusion alarms.

Note: *Open CAIR roller clamp, verify no drops are flowing in drip chamber.*

Removing a Cassette

CAUTION: DO NOT push the cassette carriage closed. Use the LOAD/EJECT button to open and close the cassette carriage.

CAUTION: DO NOT operate or store a SYMBIQ™ Infusion System with the cassette carriage opened. To avoid damaging the cassette carriage, keep it securely closed while the infuser is not in use.

To remove a cassette from the carriage:

1. **Prior to powering down**, ensure the infuser is in **Stop** mode. Close the CAIR roller clamp and/or slide clamp prior to removing administration set from infuser. Press **LOAD/EJECT** to open the cassette carriage.

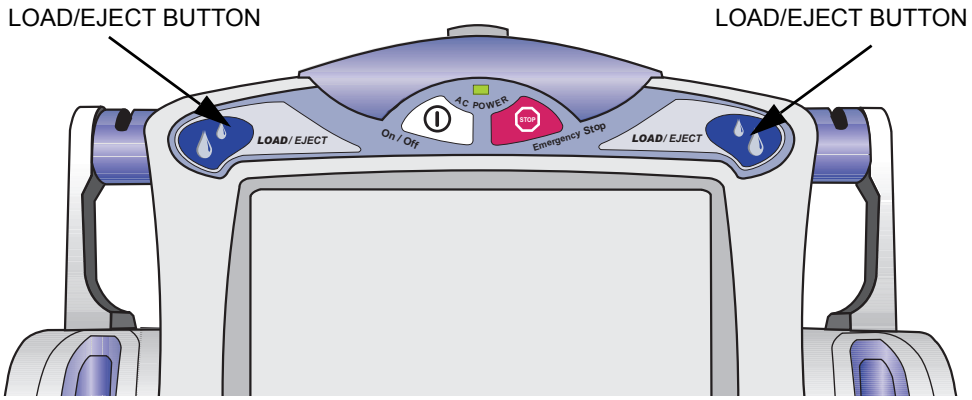


Figure 54: LOAD/EJECT Button

2. Grasp the tubing above and below the cassette. Slide the cassette upward out of the cassette carriage.

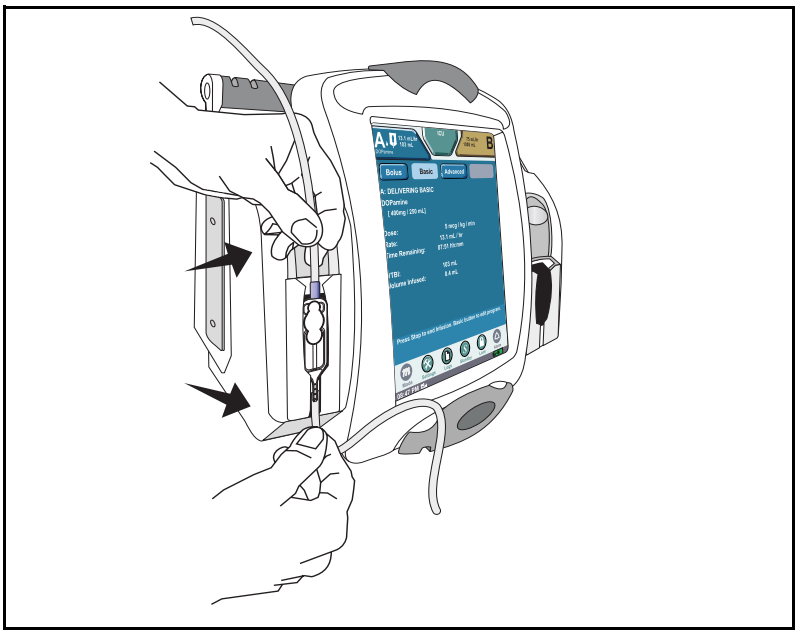


Figure 55: Removing Cassette From Infuser

3. Close the cassette carriage by pressing the **LOAD/EJECT button** or the cassette carriage will close automatically in approximately 10 seconds.

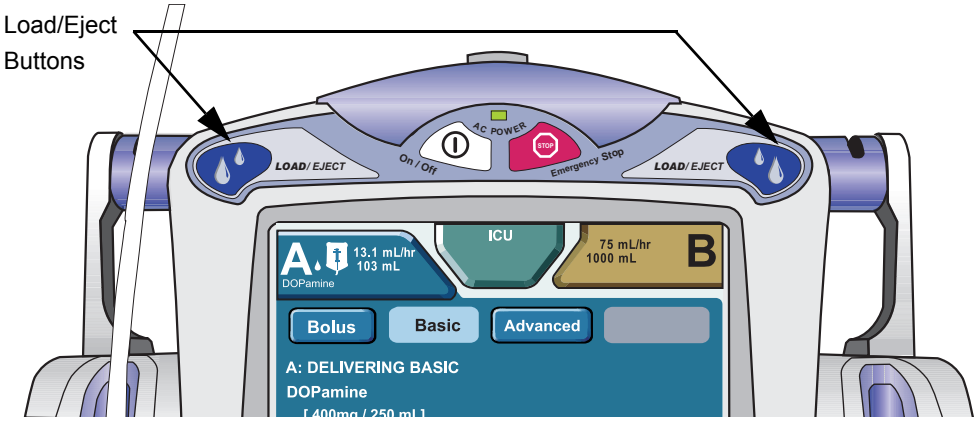


Figure 56: LOAD/EJECT Button

4. Press and hold the **On/Off button** for one second to power down. Discard the administration set and fluid container per CDC, hospital, or healthcare provider guidelines.

Ejecting a Cassette in an Emergency

In an emergency (for example, a complete power failure) the cassette can be manually ejected from the cassette carriage. This should be done only in an emergency. If a cassette is manually ejected, remove the infuser from service immediately. The Check Cassette alarm activates whenever a cassette is manually ejected. With the Check Cassette alarm active, the user cannot program, start, or resume a therapy.

CAUTION: Manually ejecting a cassette renders that channel incapable of infusing until it is reset by Biomed.

To manually eject a cassette from the carriage:

1. Locate the Cassette Eject Lever on the underside of the infuser.

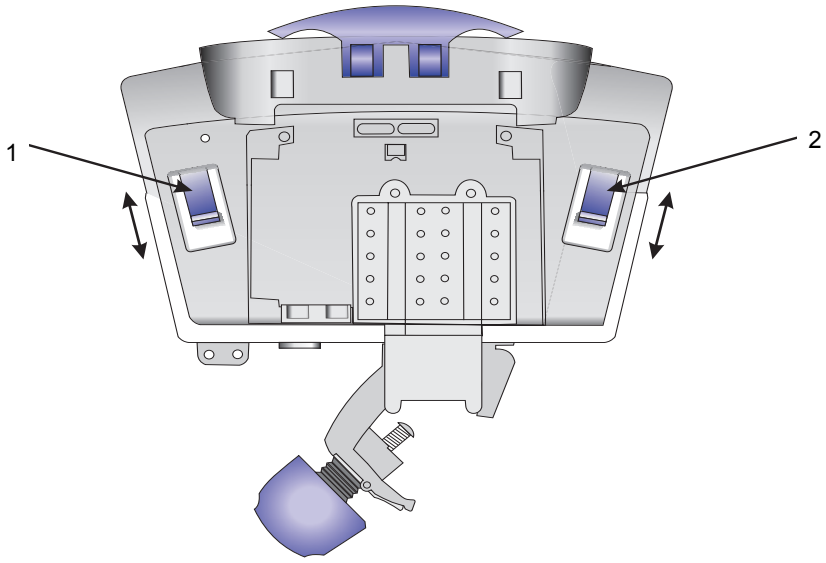
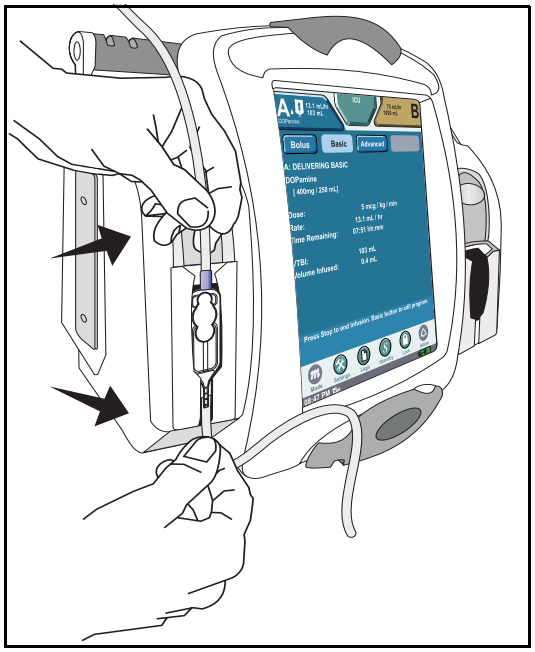


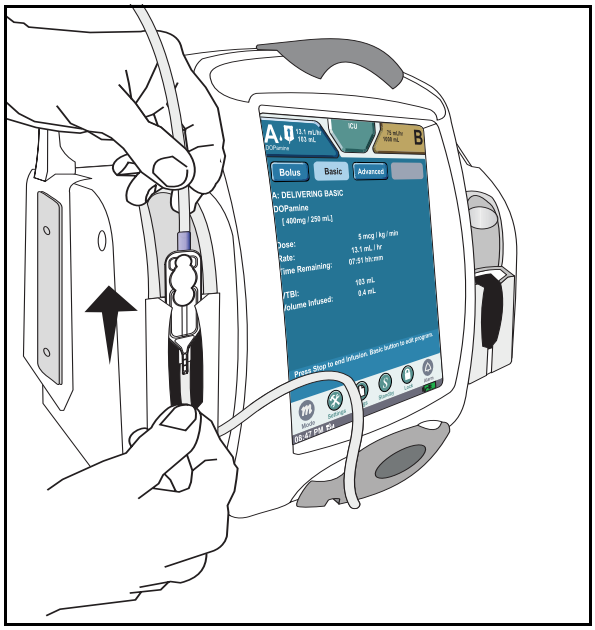
Figure 57: Cassette Eject Lever

2. Pull the Cassette Eject Lever toward the front of the infuser to open the cassette carriage. The Check Cassette alarm activates.
3. Remove the tubing from the tube retainer guides on the front of the infuser and on the infuser handle.

4. Grasp the tubing above and below the cassette.



5. Slide the cassette out of the cassette carriage.



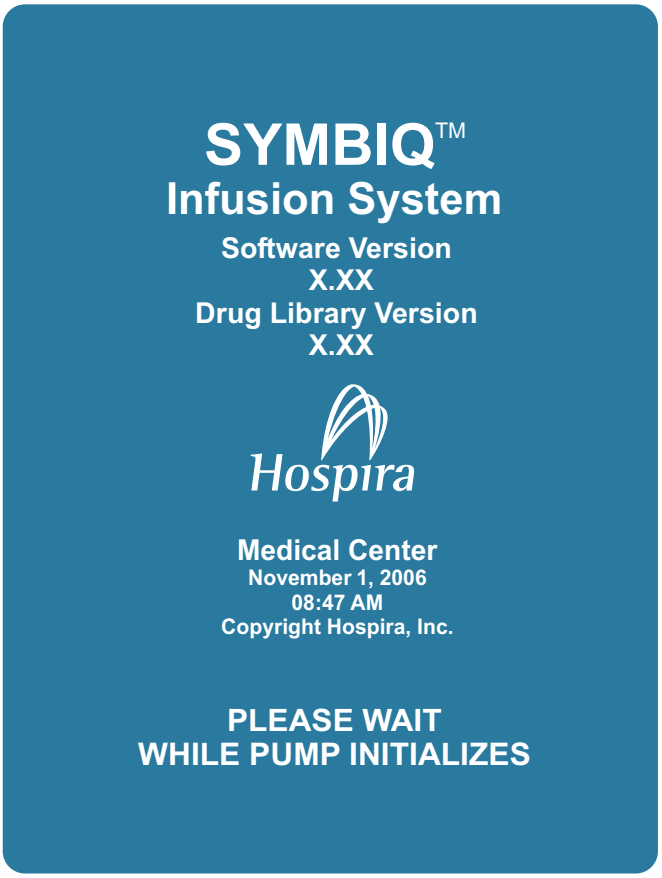
6. Contact Biomed to reset the channel.

Chapter 5: Program (Basic) Therapy

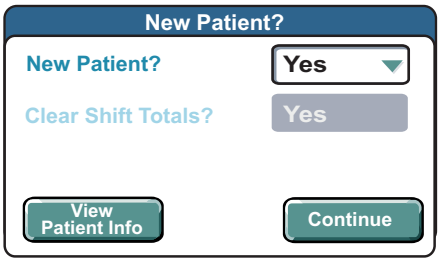
Programming a Basic Therapy

Entering a Program (Basic):

1. Press the **On/Off button** to power on and load administration set. The **STARTUP SCREEN** displays.



2. The New Patient dialog box displays (unless the infuser has been powered off for more than five hours).



3. The **New Patient** dialog box defaults to **Yes**. Press **Continue** to clear previous program parameters, settings, shift and program totals in the **PATIENT INFORMATION SCREEN**.

4. To retain previous program parameters and settings:
Press the **New Patient** field and select **No.** Press **Continue** to display the **PATIENT INFORMATION SCREEN**.

5. On the **PATIENT INFORMATION SCREEN**, press the **CCA** (Clinical Care Area) field and select from the list of available CCAs.

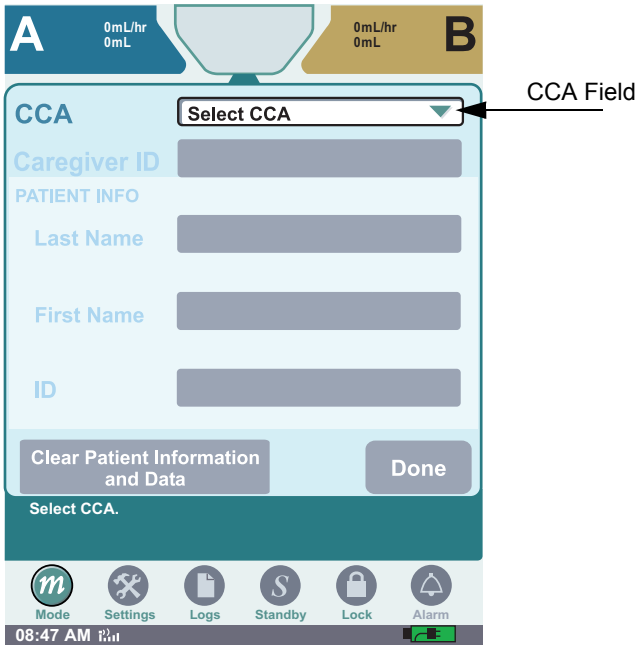


Figure 58: Blank Patient Information Screen

Note: *Prior to programming a therapy a CCA must be selected.The CCA field is the only field that must be selected before* ***Done*** *becomes available and programming can proceed.*

Note: *If no CCAs have been downloaded to the infuser, the default CCA selection will be* ***No CCA****. If one or more CCAs have been downloaded to the infuser, the default CCA selection will be* ***Select CCA****.*

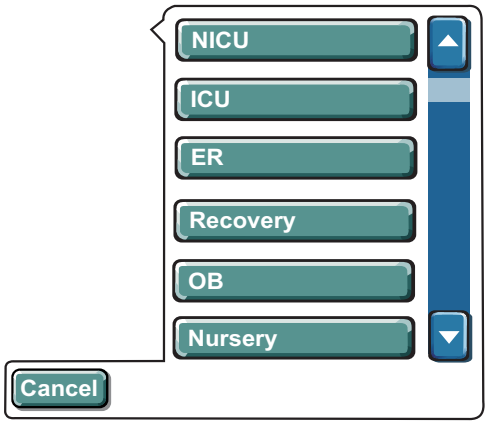


Figure 59: Sample List of Available CCAs

6. Some CCAs may have restricted access and require a passcode (if enabled by facility)

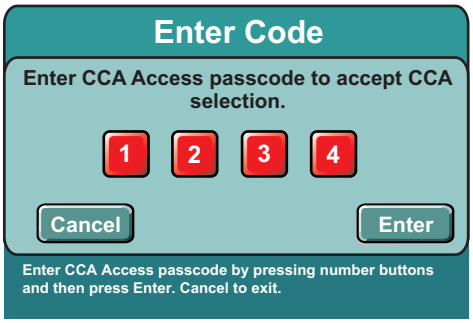


Figure 60: Enter Code Dialog Box for CCA Access

Note: *Entering an invalid passcode activates the Invalid Passcode system message. Entering an invalid passcode a fourth time closes the Enter Code dialog box and displays the* **PATIENT INFORMATION SCREEN** *without changing the CCA.*

7. Patient and/or caregiver information are optional and can be bypassed by pressing **Done**.

8. To enter patient and/or caregiver information, press the following fields in any order:
   - **Caregiver ID**
   - **Patient Info**
   - **Last Name**
   - **First Name**
   - **ID**

   Other touchscreen alpha/numeric keypad buttons have the following functions:
   - **Cancel** displays the **PATIENT INFORMATION SCREEN** without saving entries
   - **Clear** restores default field values
   - **Enter** accepts entries and displays the **PATIENT INFORMATION SCREEN**

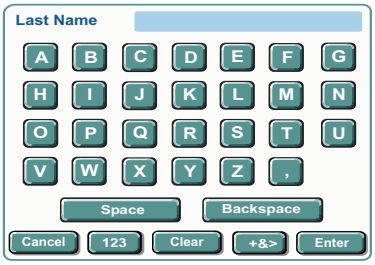


Figure 61: Patient Information Screens for Last Name Entry

Note: *To navigate between alpha, numeric, and symbol screens, press* ***123****,* ***ABC*** *or* ***+&>*** *buttons to reach the respective screens.*

9. On the **PATIENT INFORMATION SCREEN**, press **Clear Information and Data** to remove all patient values entered, or press **Done** to exit **PATIENT INFORMATION SCREEN** and begin programming.
   - CCA
   - current caregiver ID
   - shift totals
   - program totals
   - current program
   - visibility of all logs in Clinical mode

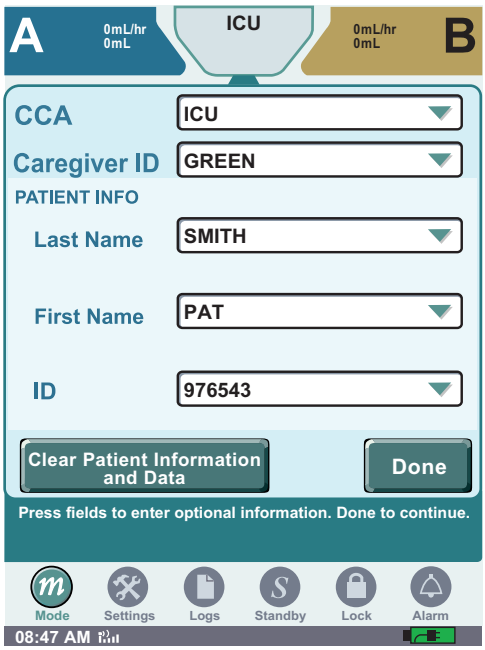


Figure 62: Patient Information Screen

10. Press Basic from the **Channel Level Therapy buttons** and **Select Infusion** field.

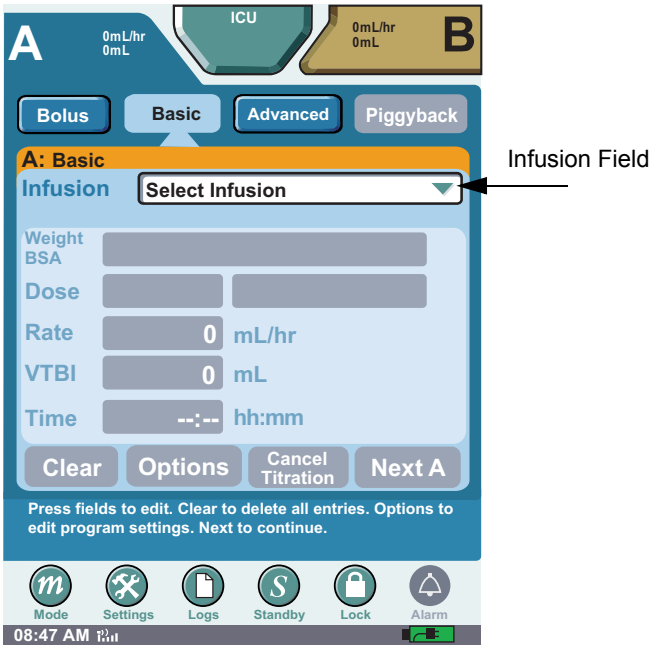


Figure 63: Basic Programming Screen (Blank)

11. Select the desired medication on the **Infusion Selection** drop-down list.

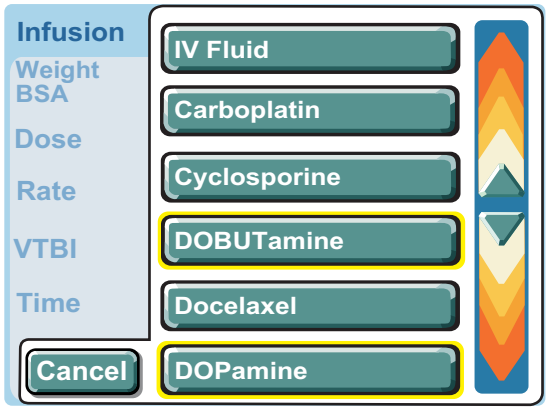


Figure 64: Infusion Selection Drop-Down List

Note: *Medications appear in the order determined by your facility.*

12. If the selected medication has multiple concentrations, a drop-down list appears. Select the desired concentration from the drop-down list.

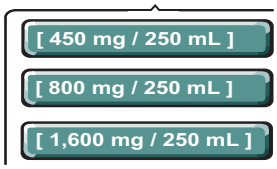
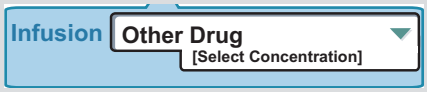


Figure 65: Concentration Drop-Down List

Specifying Medication Concentration

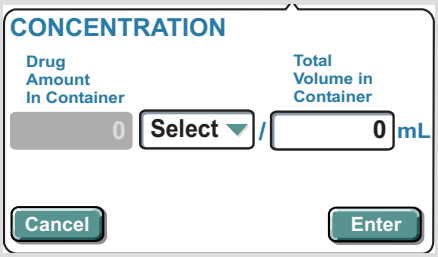
To program a medication concentration not available from the drop-down list, complete the following steps:

1. From the **Select Infusion** drop-down list, press the **Infusion** field and select **Other Drug**.



2. On the **Concentration** drop-down list, press to enter concentration.

3. On the **Concentration** dialog box, press the **Select** drop-down field to display and select a Medication Unit. Select **Drug Amount in Container** and **Total Volume in Container** field and enter desired values.



Note: If the selected medication has a maximum medication amount defined in the CCA, the infuser ensures the medication amount entered does not exceed the defined maximum medication amount.

4. Press **Select** to select dose calculation delivery from available list. Then enter **Dose** and **VTBI**.

5. When finished, press **Enter** to return to the **BASIC PROGRAM SCREEN**. To return to the **BASIC PROGRAM SCREEN** without saving concentration entries, press **Cancel**.

13. Press the Weight BSA field and **Enter Weight** using the numeric keypad. Press Enter to accept the patient parameters. The English equivalent measurement is automatically displayed.

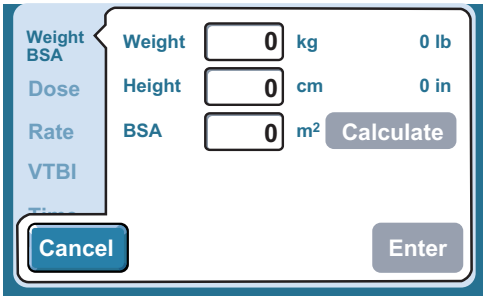


Figure 66: Dose Calculation Screen

Note: *The BSA may be directly entered, or enter the patient weight and height then press* **calculate** *to automatically calculate BSA. If the weight field BSA is gray when programming medications, the patients weight is not needed as part of the calculation.*

On a two- channel infuser, if a different weight is entered on the second channel, a pop-up window appears indicating a patient parameter change.

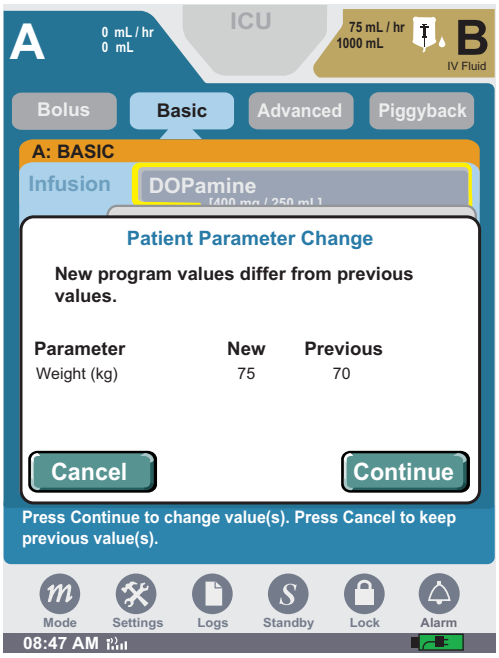


Figure 67: Patient Parameter Change Screen

Press continue to retain the entered value. Press cancel to go to the Basic Screen to change the value.

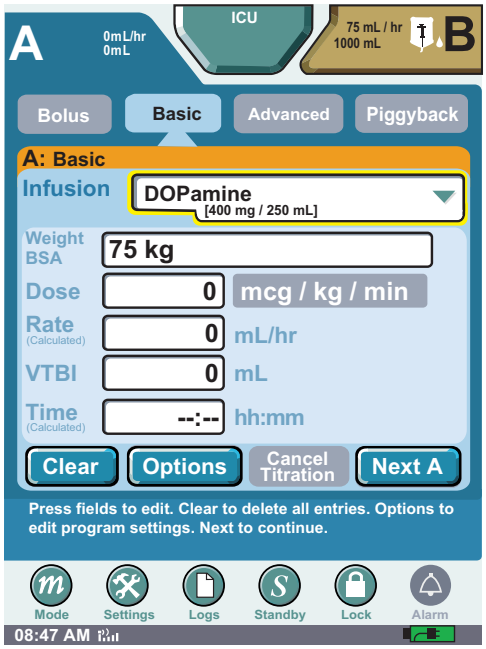


Figure 68: Dose Calculation Dialog Box

14. Press the **Dose** field and enter the dose using the numeric keypad. Then press **Enter** to accept the dose. The rate is automatically calculated and appears in the rate field.
    - Press the **Rate** field and enter the rate using the numeric key pad if the medication is delivered in mL/hr.

Note: *Entering the Rate first automatically calculates the Dose.*

Note: *If dosing units are not predefined, the user must enter the dosing units during the program sequence.*

15. Press **VTBI** field (Volume to be infused) and enter the amount of fluid to be delivered. Time is automatically calculated. Press **Enter** to accept VTBI.

    Note: *By Entering two of the three programming parameters (Rate, VTBI, or Time) automatically calculates the third.*

16. To enter Time—if required—press **Time** field. Select **hours** (hh) or **minutes** (mm). Enter time period using numeric keypad. Press **Enter**.

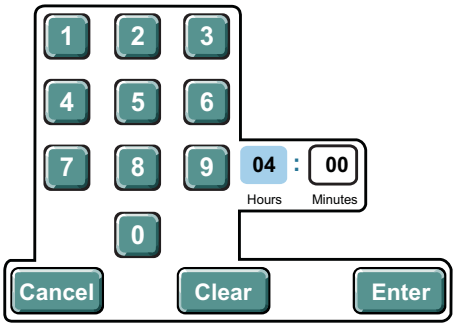


Figure 69: Time Touchscreen Numeric Keypad

Note: *Entering the time first automatically calculates the VTBI.*

17. Press **Next A.** Verify that the displayed values on **CONFIRM PROGRAM SCREEN** match the source container and physician's order. Again press **Next A.**

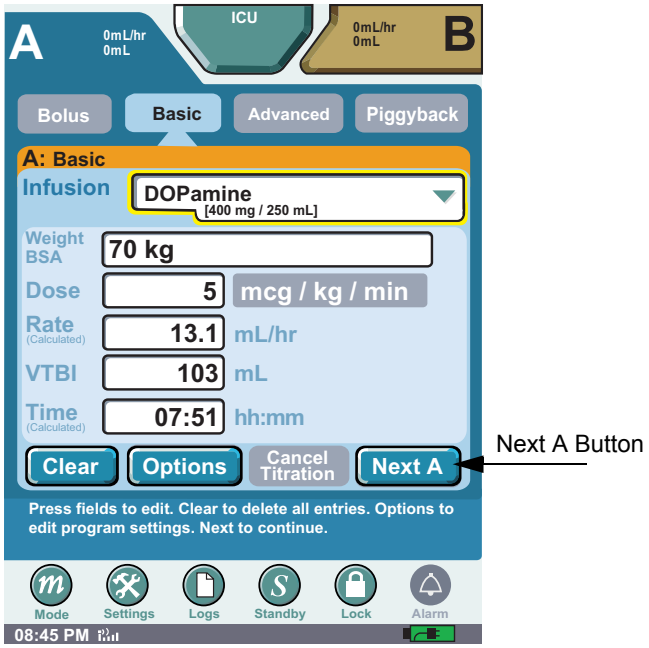


Figure 70: Basic Programming Screen (Filled)

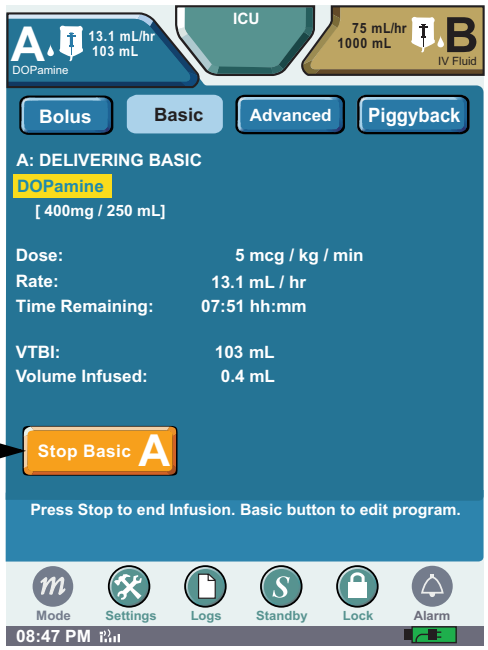
18. Verify that the displayed values on **CONFIRM PROGRAM SCREEN** match the source container and physician's order. Press **Start Basic A** to begin the infusion after confirming program.

Start Basic A Button

Figure 71: Confirm Program Screen

Note: *Verify flow from primary container and green channel LED infusing indicator is illuminated.*

19. The therapy begins and the **DELIVERING PROGRAM SCREEN** displays. To stop the infusion, press **Stop Basic A**.



Stop Basic A Button

Figure 72: Stop Basic A Button

The Display transitions to the **FAR VIEWING SCREEN** after approximately 20 seconds, or transition to the **FAR VIEWING SCREEN** by touching the screen above the Help Text.

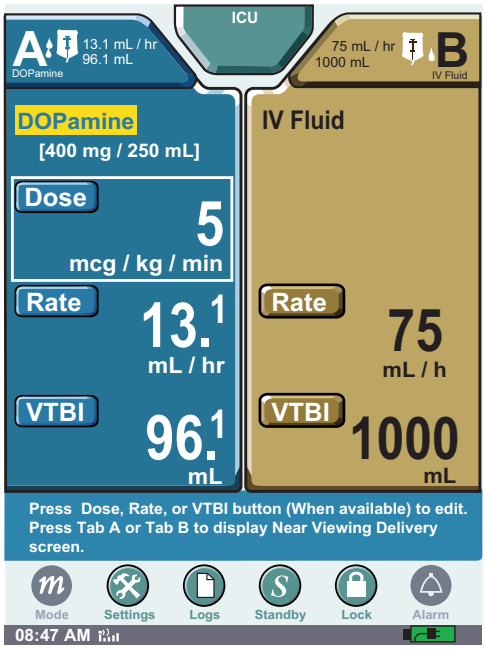


Figure 73: Far View Screen

20. If **FAR VIEWING SCREEN** is displayed, touch the screen to return to the **NEAR VIEWING SCREEN** to access the **Stop Basic A button**.

End of Infusion

The SYMBIQ™ Infusion System activates an alarm at the end of an infusion.

When KVO has been selected, the **End Of Infusion** (KVO) alarm activates (see Figure 74a). When the VTBI completes, the infusion continues at the selected KVO rate.

The **End of Infusion** alarm (see Figure 74b below) activates when the VTBI completes and the infuser stops.

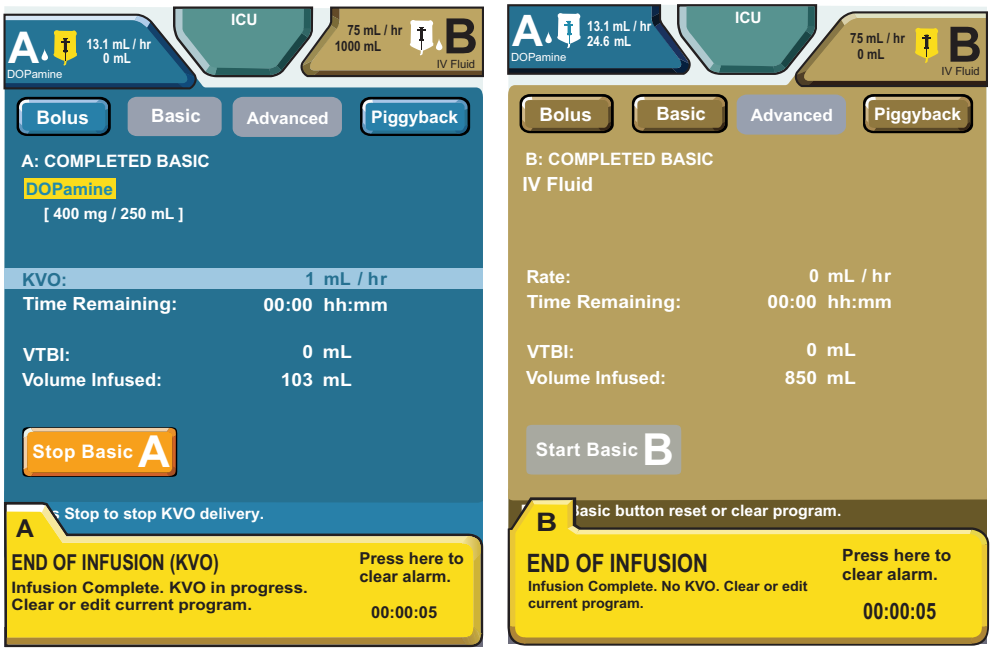


Figure 74: (a) End of Infusion (KVO) and (b) End Of Infusion Alarm Tabs

When the VTBI completes, press the **Stop Basic A button** to enter a new VTBI. See "Chapter 9: Program Options" on page 127 on how to select the End of Infusion option.

Note: *Prior to VTBI reaching zero, the user may enter additional VTBI without stopping infusion. If the VTBI reaches zero and KVO starts, the infusion must be stopped and reprogrammed.*

Titrating an Infusion

The dose, rate, time, and VTBI can be titrated for the selected therapy. Titrating a therapy requires confirmation; if changes are not confirmed or cancelled, a Callback alarm activates. Bolus, Basic, and Piggyback therapies may be titrated during delivery. Multistep therapy may only be titrated while the infusion is stopped. Intermittent may not be titrated.

To titrate a Basic infusion:

1. From the **FAR VIEW SCREEN**, press the **Dose Button**.

Note: *Rate and VTBI are titrated using the same process.*

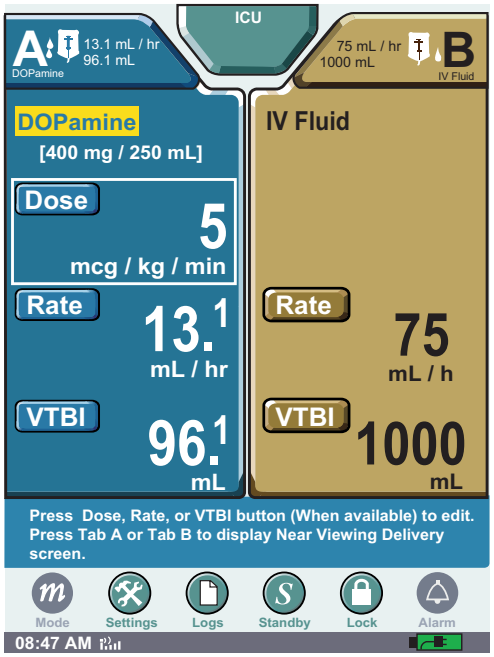


Figure 75: Far View Screen

2. The Dose field opens, and the new value is entered using the numeric keypad. Press **Enter** to accept the new value.

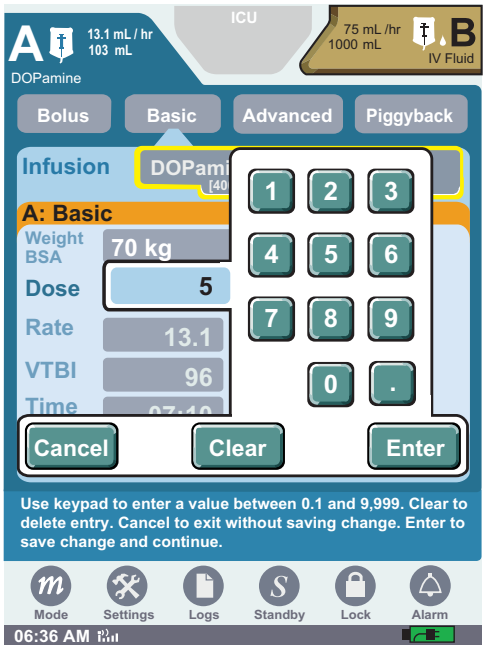
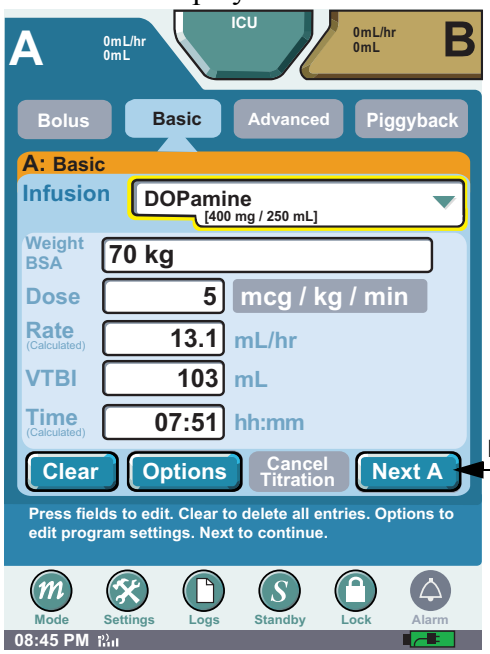


Figure 76: Titrating Dose

3. Press **Next A** in the **PROGRAM SCREEN** to display the **CONFIRMATION SCREEN**.



Next A Button

Figure 77: Delivery Screen

4. Verify that the displayed values are appropriate, and press **Start Titration A** to begin infusion.

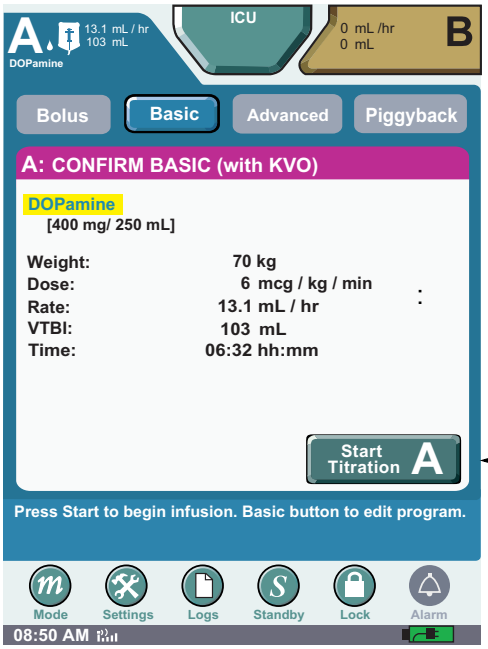


Figure 78: Confirm Basic Screen

Note: *The Infuser continues to infuse at the previous rate until* **Start Titration A** *is pressed.*

NOTES:

Chapter 6: Piggyback

Overview

The piggyback function on the SYMBIQ™ Infuser allows it to deliver fluid from a secondary container at a rate and volume independent of the Basic infusion. When the Piggyback VTBI (volume to be infused) is complete, the Basic infusion automatically resumes at the primary Basic rate. The infusion Complete Callback option can be selected to notify when the piggyback infusion completes.

Piggyback deliveries are only allowed with a Basic program. A Piggyback infusion cannot be programmed with an Advance therapy, or Bolus infusion.

Program a Basic infusion prior to programming a Piggyback infusion.

WARNING: When delivering a Piggyback infusion, use only a SYMBIQ™ primary administration set with a backcheck valve.

When using the piggyback feature verify:

- The medication in the secondary container is compatible with the medication in the primary container.
- The secondary administration set is connected to the upper Y-site using aseptic technique on the primary administration set.
- The interruption of the primary infusion is clinically appropriate for the duration of the piggyback infusion.

To program a piggyback delivery, the user must first program and confirm a Basic therapy for the channel the user intends to use for the piggyback delivery.

Setting the Basic rate greater than the secondary rate results in a more rapid delivery of any residual secondary medication remaining in the line and the cassette.

WARNING: When using the infuser for secondary deliveries (piggybacking), ensure the fluids being infused are both chemically and physically compatible.

WARNING: For piggyback deliveries from a secondary container, ensure the secondary container is hung higher than the primary container.

Piggyback with the SYMBIQ™ Infuser requires a SYMBIQ™ Pump Set with a proximal Y-site backcheck valve and a secondary piggyback set with an extension hook. See “Appendix C: Accessories, Administration Sets, and Components” on page 211 for list numbers. **The secondary container must be placed higher than the primary container**. Refer to the instructions included with the piggyback pump set for more information.

Preparing for Secondary Delivery (Piggyback)

1. Ensure a primary piggyback pump set with a proximal Y-site backcheck valve is in use. Lower the primary container using the hanger provided with the piggyback set. Ensure the hanger is fully extended, as shown in Figure 79 below.

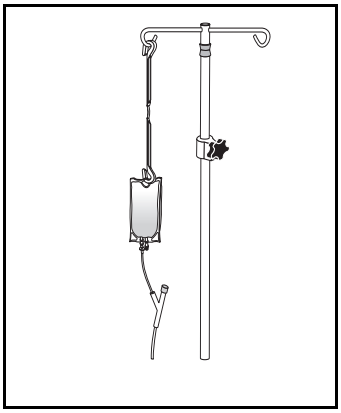


Figure 79: Primary Piggyback Pump

2. Suspend the secondary container higher than the primary. Prime the secondary set according to the instructions included with the set.

   Note: *When using a secondary container, ensure the bottom of the secondary container is at least 9 inches above the fluid level in the primary container. Use additional extension hooks if necessary.*

3. Attach the piggyback administration set to upper Y-site using aseptic technique.

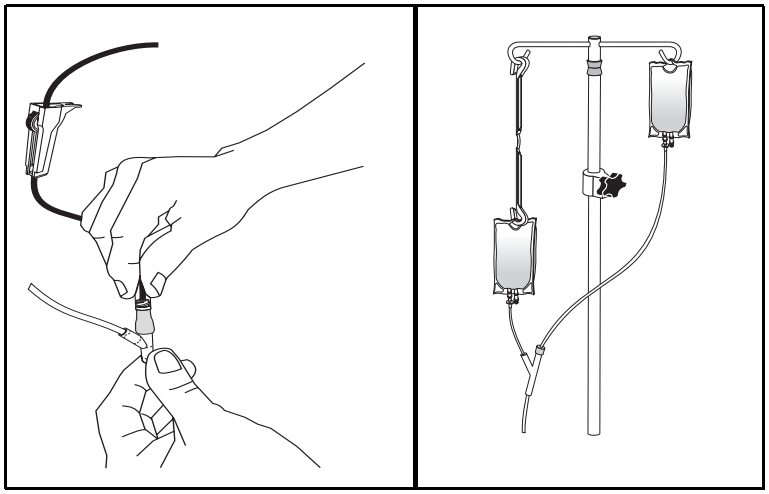


Figure 80: Attaching Piggyback to Y-Site

Note: *If using a rotating luer device, first push and twist luer slip into CLAVE until tight, then lock down the rotating collar. This ensures a secure connection and optimal flow rates.*

4. Suspend the secondary container from the I.V. pole.

CAUTION: Before using a CLAVE® connector, ensure the administration set and fluid compatibility. Do not use needles to access the CLAVE® connector.

To program a piggyback delivery:

Only medications designated by the facility may be delivered by Piggyback. If a facility determines a medication should not be interrupted, the **Piggyback button** may be disabled in the drug library.

Note: *The* **Piggyback button** *is unavailable until a primary infusion is programmed on the selected channel.*

1. Press **Piggyback** on the **NEAR VIEWING SCREEN**.

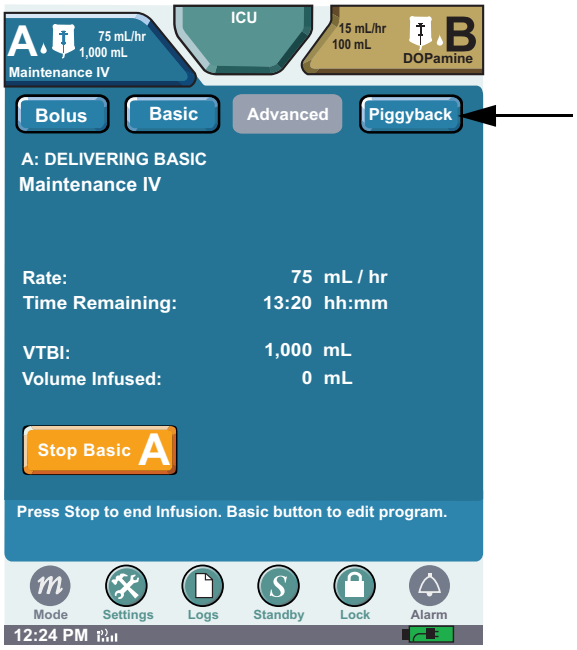


Figure 81: Delivering Program Screen

2. Press the **Infusion** field and select the desired medication from the drop-down list. Use the scroll bar to locate desired medication.

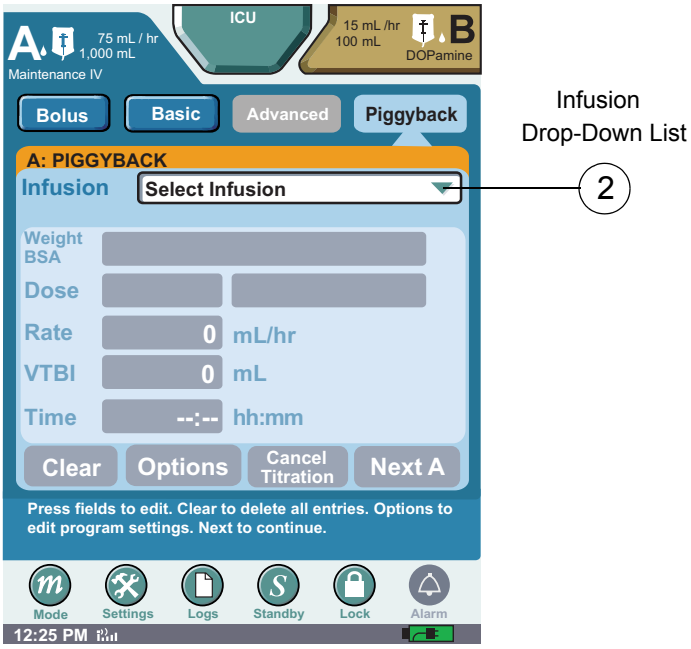


Figure 82: Piggyback Program Screen

Note: *If dosing units are not predefined, the user must enter the dosing units during the program sequence.* See "Programming a Basic Therapy" on page 77 *for additional information.*

3. Select **Rate** field and enter desired rate using numeric keypad. Press **Enter** to accept.

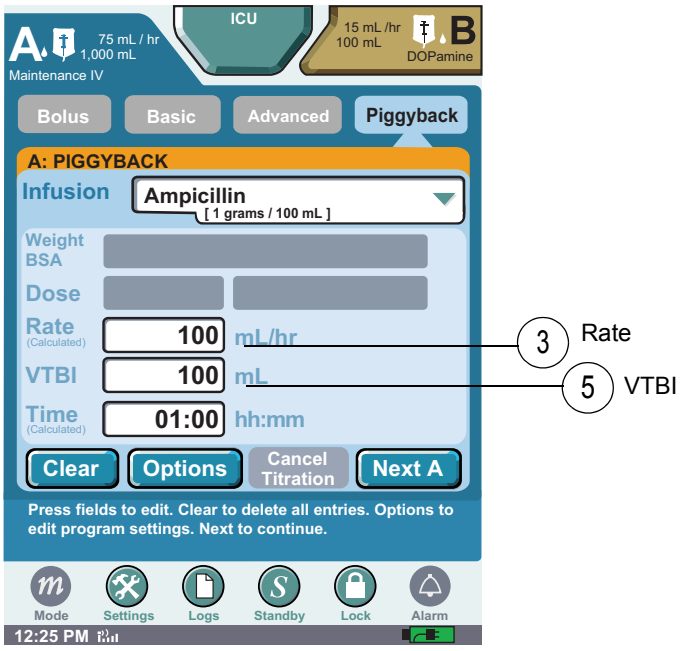


Figure 83: Completed Piggyback Program Screen

4. To enter Time—if required—press **Time** field. Select **hours** (hh) or **minutes** (mm). Enter time period using numeric keypad. Press **Enter**.

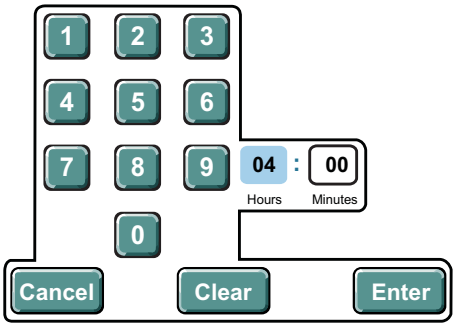


Figure 84: Time Touchscreen Numeric Keypad

Note: *Entering the time first automatically calculates the VTBI.*

5. Select **VTBI** field and enter the desired volume to be infused using numeric keypad. Press **Enter** to accept.

   Other program-level buttons on the **PIGGYBACK PROGRAMMING SCREEN** have the following functions:

   - **Clear** restores default field values
   - **Options** displays the **OPTIONS SCREEN**
   - **Next A** displays **STOP MODE SCREEN** or **DELIVERY MODE SCREEN**

6. Press **Next A** to advance to the Confirm **PIGGYBACK SCREEN**. A **pop-up reminder** states, "Hang the secondary container higher than the Primary container. Open Secondary slide clamp." Press **OK** to indicate correct container position and that the slide clamp is open on the secondary administration set. Verify programmed information matches label on piggyback container and physician's order.

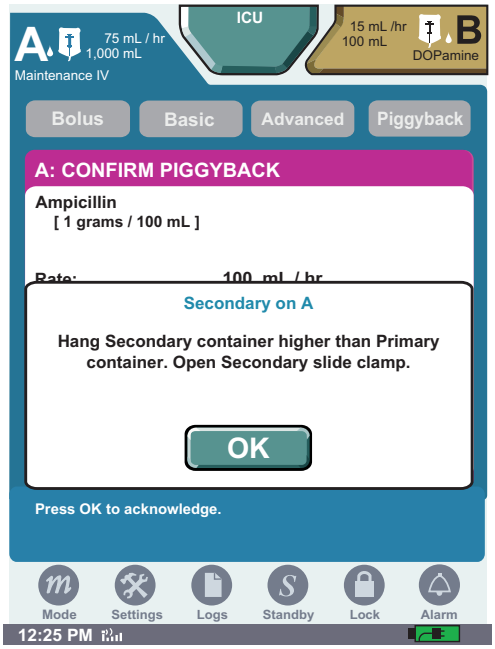


Figure 85: Confirm Piggyback Screen

7. Press the **Start Piggyback button** to begin a secondary infusion. Ensure the piggyback is infusing by verifying the following: drops are flowing from the piggyback container, the green channel LED is lit, and the piggyback icon is visible on the display tab.

CAUTION: Programming a Piggyback VTBI less than the actual container volume results in the remaining volume being delivered at the primary rate after the completion of the Piggyback Program

Chapter 7: Bolus

Overview

This chapter describes programing bolus deliveries and select program options for a therapy.

Bolus

Use the Bolus option to program a delivery from a primary or secondary container. Only medications designated by the facility may be delivered by Bolus. Only medication designated by the facility can be delivered via a secondary container.

Primary container:

- A Bolus may be programmed from a primary container.
- If a Bolus is programmed from a primary container without an underlying Basic program, a Basic program may not be entered until the Bolus program is complete.
- If a Basic program is delivering, and a Bolus is programmed to deliver from the primary container, the VTBI programmed for the Bolus on that channel is subtracted from the underlying primary VTBI for that same channel.

Secondary container:

- If a Bolus from a secondary container is confirmed, a Basic or Multistep therapy can not be programmed until the Bolus is complete.

Note: *Bolus may not be selected if a Piggyback, Intermittent or Interchannel Sequencing has been entered.*

To program a Bolus from a primary container:

1. Press the **Bolus button** to display the **BOLUS SETUP SCREEN.**

2. Press the **Infusion** field to select medication and concentration (if necessary) delivered from the primary container. The **When Bolus Completes** field remains unavailable or grayed out.

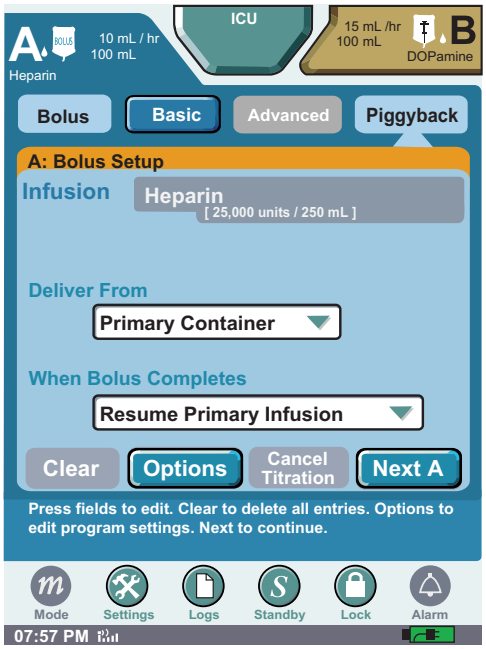


Figure 86: Bolus Setup Screen for Primary Container

Note: *If dosing units are not predefined, the user must enter the dosing units during the program sequence.* See "Programming a Basic Therapy" on page 77 *for additional information.*

3. Press **Next A**.
4. Complete the programming steps.
5. Press **Next A** to display Confirm **BOLUS SCREEN**.
6. Review the program parameters. Press **Start Bolus** to begin infusion.

To program a Bolus from a secondary container:

1. Press **Bolus** to display the **BOLUS SETUP SCREEN.**
2. Press **Select Infusion** field to select medication and concentration (if necessary).

3. Press **Deliver From** field and select Secondary Container from drop down list.

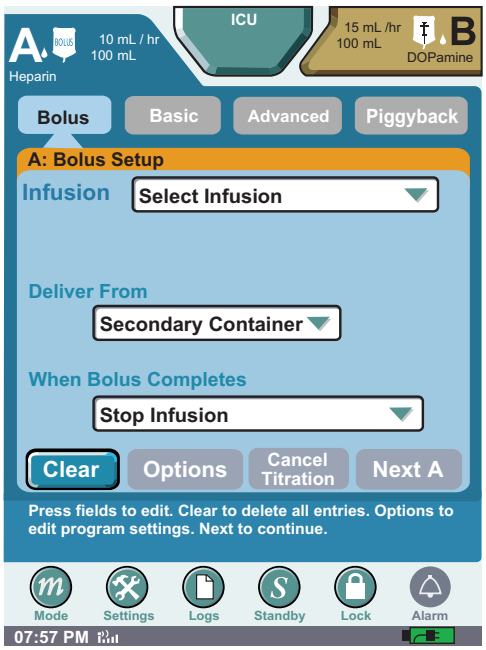


Figure 87: Bolus Setup Screen for Secondary Container

4. Press **When Bolus Completes** and select either the **Resume Primary Infusion** or **Stop Infusion** fields**.** Press **Next A** to display the **BOLUS PROGRAMMING SCREEN**.

   Note: If **Bolus Calculation** is required based on dosing parameters enter patient weight, height, and BSA, if required. VTBI will be calculated. Press **Enter** to accept Bolus amount. Press **Time** and enter time period using numeric keypad. Rate will be calculated. (Entering rate will calculate time period.) Press **Enter** to accept time period.***The lowest displayed time increment is 1 minute. Infusion is delivered in the calculated time.***

5. Press **Next A**.

6. Complete the programming steps.

7. Press **Next A** to display **CONFIRM BOLUS SCREEN**.

   Note: *If delivering a bolus from a secondary container, pressing* **Next A** *activates the Secondary Container system message.*

8. Review the program parameters. Press **Start Bolus A** to begin infusion.

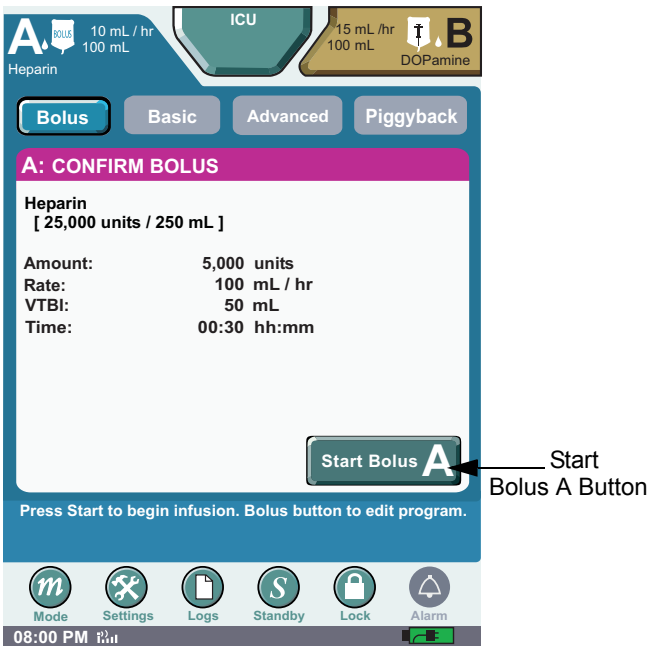


Figure 88: Confirm Bolus Screen

9. The **DELIVERING BOLUS SCREEN** displays. To stop the therapy press **Stop Bolus**.

To Clear the Bolus:

1. Touch the screen to display the **NEAR VIEW SCREEN** and Press **Stop Bolus A**.

Figure 89: Delivering Bolus Screen

2. Press **Basic, Advanced or Bolus,** and a **CLEAR BOLUS** pop-up appears. Then press **Continue** to clear all programmed Bolus values and transition to the chosen therapy. Pressing **Cancel** returns to the Bolus program.

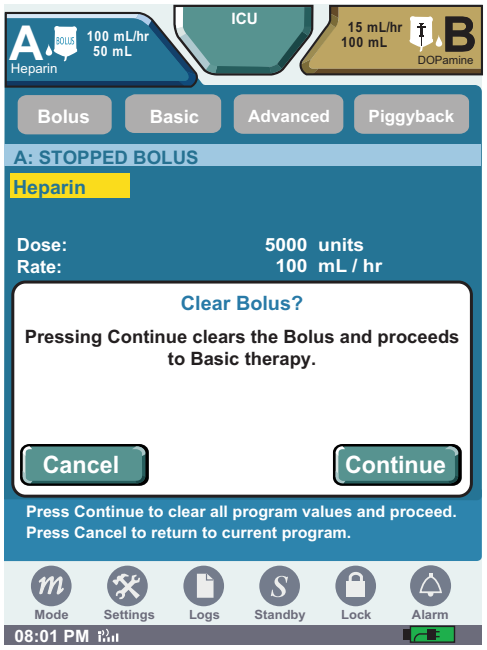


Figure 90: Bolus Clear Screen

NOTES:

Chapter 8: Advanced Therapies

Overview

Use the Advanced therapies option to deliver more complex infusions to a patient. Selecting from Multistep, Intermittent, and Interchannel Sequencing therapies.

Multistep Therapy

1. Press **Advanced** to display the **ADVANCED THERAPY SELECTION SCREEN**.
2. Press **Multistep** to display the **MULTISTEP SETUP SCREEN**.

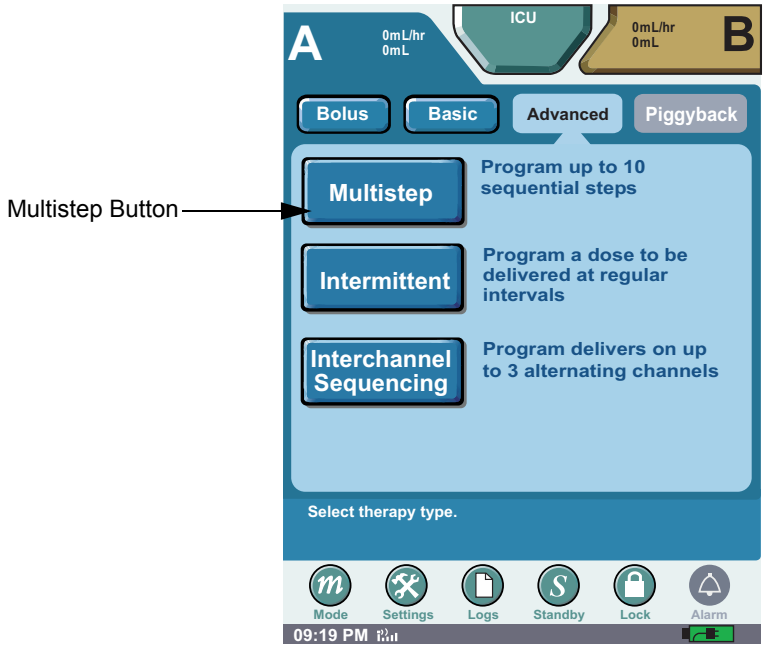


Figure 91: Multistep Therapy Selection Screen

3. Press the **Infusion** field and select a medication and medication concentration if required.

Figure 92: Multistep Setup Screen

4. Press **Number of Steps** field. Select the number of steps. Select up to 10 steps.

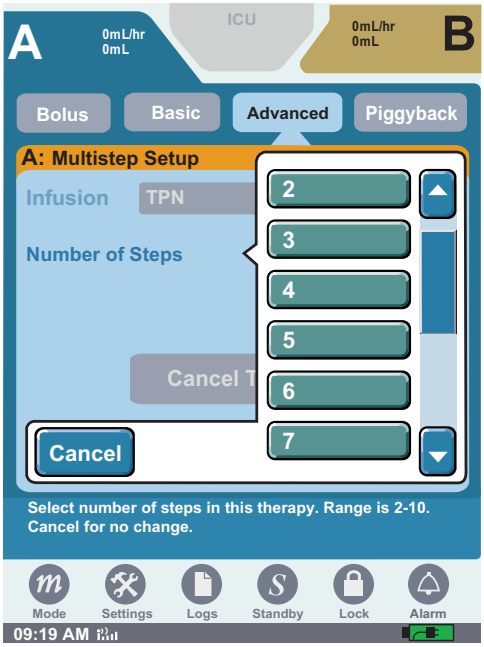


Figure 93: Number of Steps Selection Drop-Down List

The definition of a step is the interval between the beginning of a given step and the beginning of the next step.

5. Press **Next A** to display step 1 of the **MULTISTEP SETUP SCREEN**.

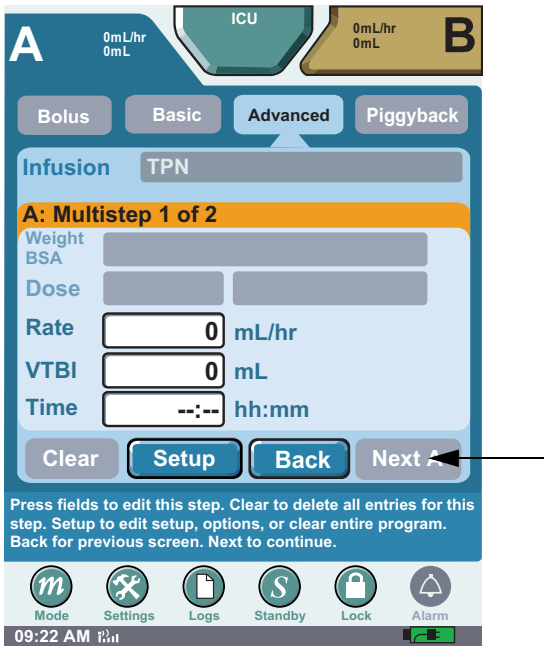


Figure 94: Multistep Setup Screen

6. Press the Weight BSA field and **Enter Weight** using the numeric keypad. Press Enter to accept the patient parameters. The English equivalent measurement is automatically displayed. The weight BSA is gray when programming medications that do not require the patients weight as part of the dose calculation.

Note: *The BSA can be directly entered, or enter the patient weight and height then press* **Calculate** *to automatically calculate BSA.*

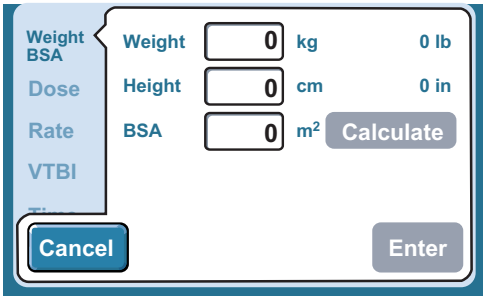


Figure 95: Dose Calculation Screen

7. Press the **Dose** field and enter the dose using the numeric keypad. Then press **Enter** to accept the dose. The rate is automatically calculated and appears in the rate field.
   - Press the **Rate** field and enter the rate using the numeric key pad if the medication is delivered in mL/hr.

Note: *Entering the Rate first automatically calculates the Dose.*

Note: *If dosing units are not predefined, the user must enter the dosing units during the program sequence.* See "Programming a Basic Therapy" on page 77 *for additional information.*

8. Press **VTBI** field (Volume to be infused) and enter the amount of fluid to be delivered. Time is automatically calculated. Press **Enter** to accept VTBI.

Figure 96: Multistep 1 of X Screen

9. To enter Time—if required—press **Time** field. Select **hours** (hh) or **minutes** (mm). Enter time period using numeric keypad. Press **Enter**.

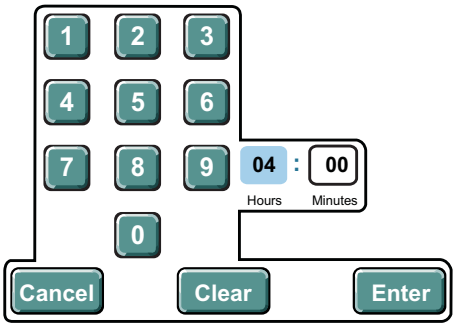


Figure 97: Time Touchscreen Numeric Keypad

Note: *Entering the time first automatically calculates the VTBI.*

10. Press **Next A** to display the **MULTISTEP 2 OF X PROGRAMMING SCREEN**.

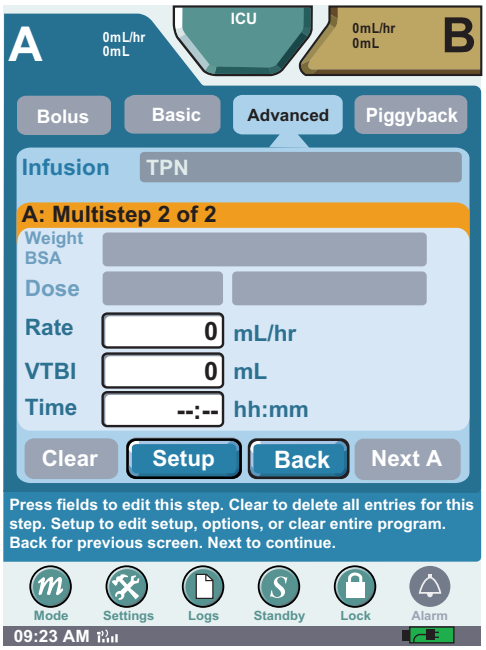


Figure 98: Multistep Y of X Programming Screens

Program-level buttons on the screen have the following functions:

- **Setup** displays the **MULTISTEP SETUP SCREEN**
- **Back** returns to previous screen

Note: *Press* **Setup** *to advance screen to access* **Clear All button.** ***Clear All*** *deletes entire Multistep program. To navigate one screen at a time, press* **Back** *or* **Next A.** ***Setup*** *returns to the beginning of the programming sequence.*

11. Repeat previous steps to program any additional steps.

12. Press **Next A** after the last step to display the **MULTISTEP SUMMARY SCREEN**.

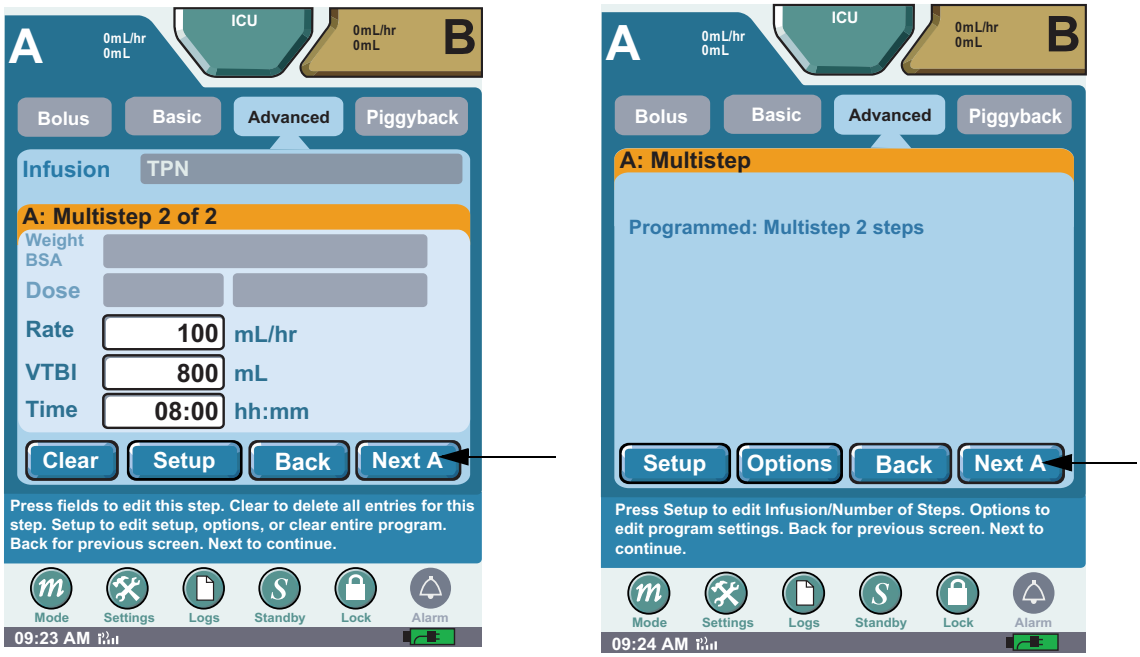


Figure 99: Multistep Programming Completed and Multistep Summary Screen

13. Press **Next A** on the **MULTISTEP SUMMARY SCREEN** to advance to the **CONFIRM MULTISTEP SCREEN**.

14. Press the horizontal scroll bar to view each step in the therapy.

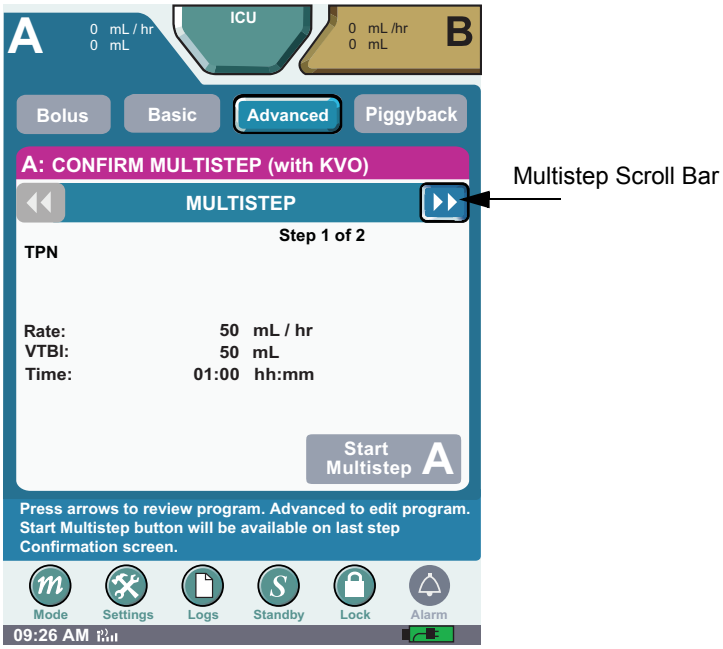


Figure 100: Multistep Scroll Bar

15. Scroll through and review each step of a Multistep therapy before starting the therapy. The **Start Multistep A button** is unavailable until each step of a Multistep therapy is reviewed.

16. Press **Start Multistep A** to begin the therapy.

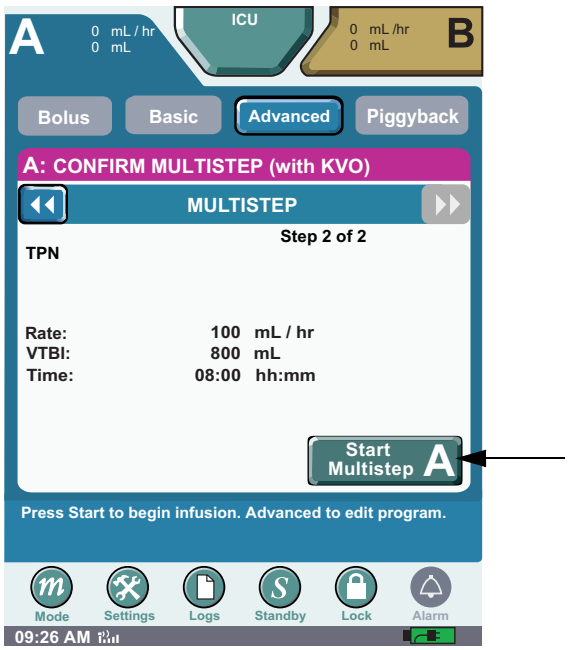


Figure 101: Start Multistep Button

17. The therapy begins and the **DELIVERING MULTISTEP 1 OF X SCREEN** displays (where X is the total number of steps). When complete, the next multistep's screen appears. To stop the therapy, press **Stop Multistep A**.

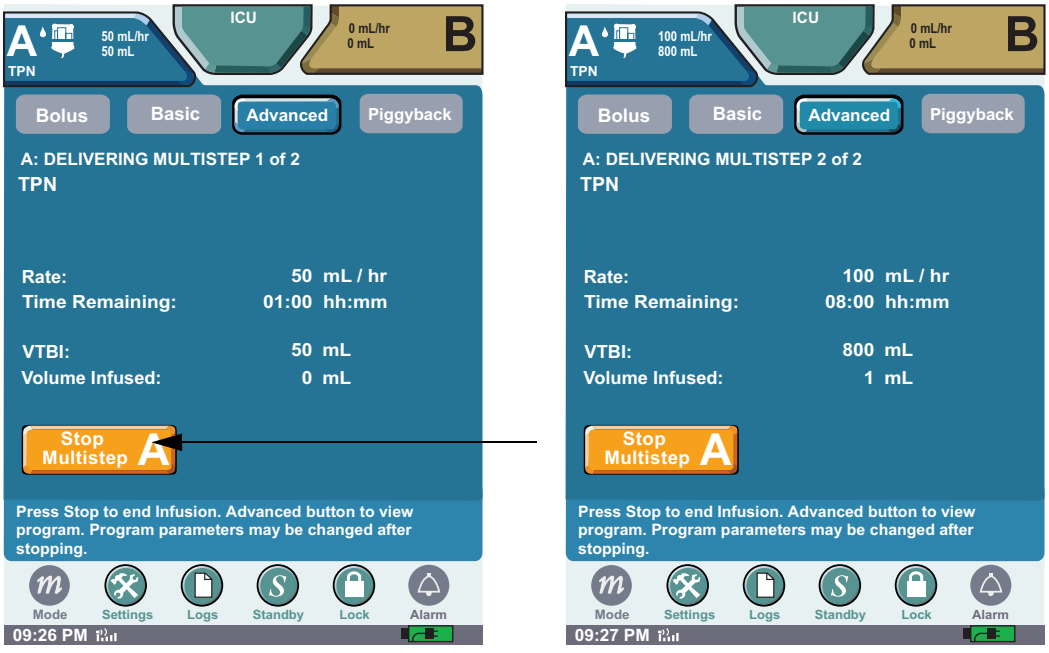


Figure 102: Delivering Multistep 1 of X Screen and Delivering Multistep Y of X Screen

18. When the Multistep program completes and the VTBI is delivered, **COMPLETED MULTISTEP** displays on the status line of the **DELIVERING SCREEN**.

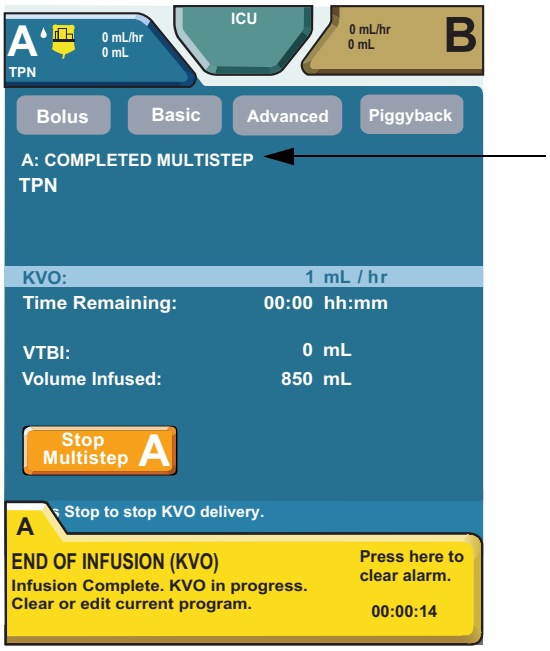


Figure 103: Completed Multistep Screen

Intermittent Therapy

An Intermittent therapy delivers at regular intervals (on and off cycles) for the entire therapy. Select from between 1 and 20 deliveries in intervals that the user specifies. Once an Intermittent program is confirmed, no changes are allowed to the program parameters.

To program an Intermittent therapy:

1. Press **Advanced** to display the **ADVANCED THERAPY SELECTION SCREEN**.

2. Press **Intermittent** to display the **INTERMITTENT SETUP SCREEN**.

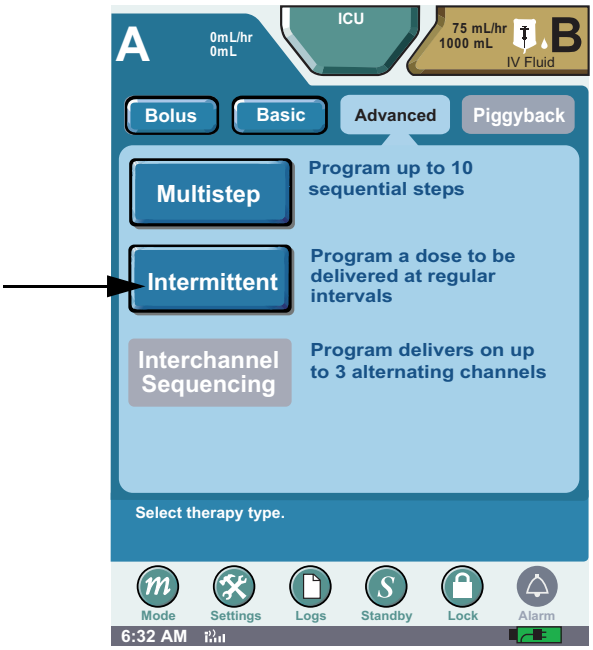


Figure 104: Intermittent Therapy Selection Screen

3. Press **Select Infusion** field.

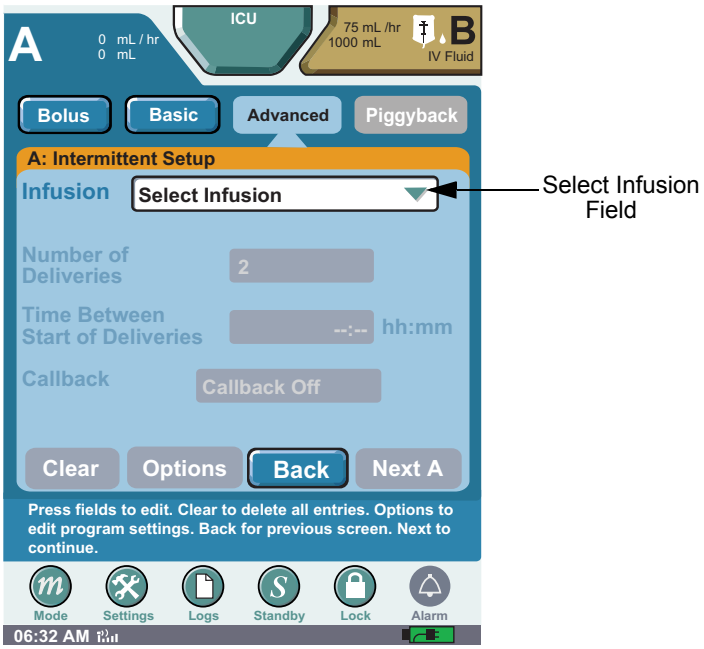


Figure 105: Intermittent Setup 1 of 2 Screen

4. Select a medication and medication concentration.

Note: *If dosing units are not predefined, the user must enter the dosing units during the program sequence.* See "Programming a Basic Therapy" on page 77 *for additional information.*

5. Press the **Number of Deliveries** field. Select number of cycles to deliver. Enter up to 20 cycles.

Figure 106: Number of Deliveries Screens

6. Press the **Time Between Start of Deliveries** field to enter the duration between the start time of sequential delivery cycles. Use the touchscreen numeric keypad to enter **Time**. Press **Enter**.

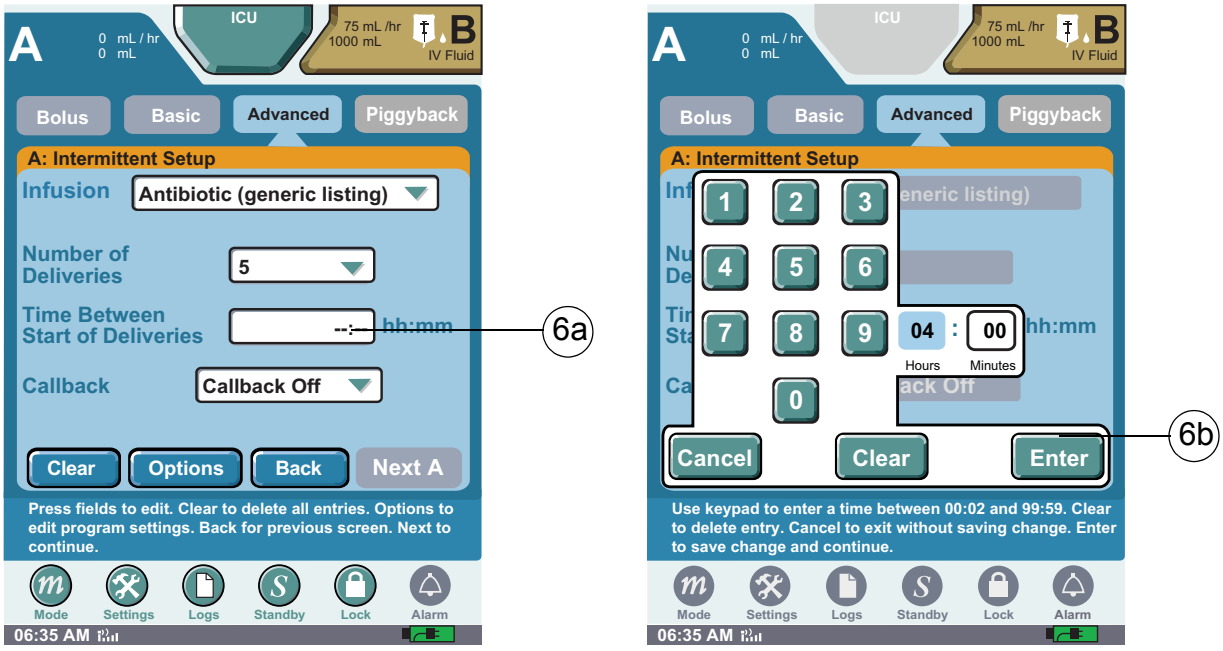


Figure 107: Intermittent Setup Screens

7. Press the **Callback** field to select callback alarm time parameters. Available callback time options are 15 minutes, 30 minutes, 45 minutes, 1 hour, 2 hours, and 3 hours.

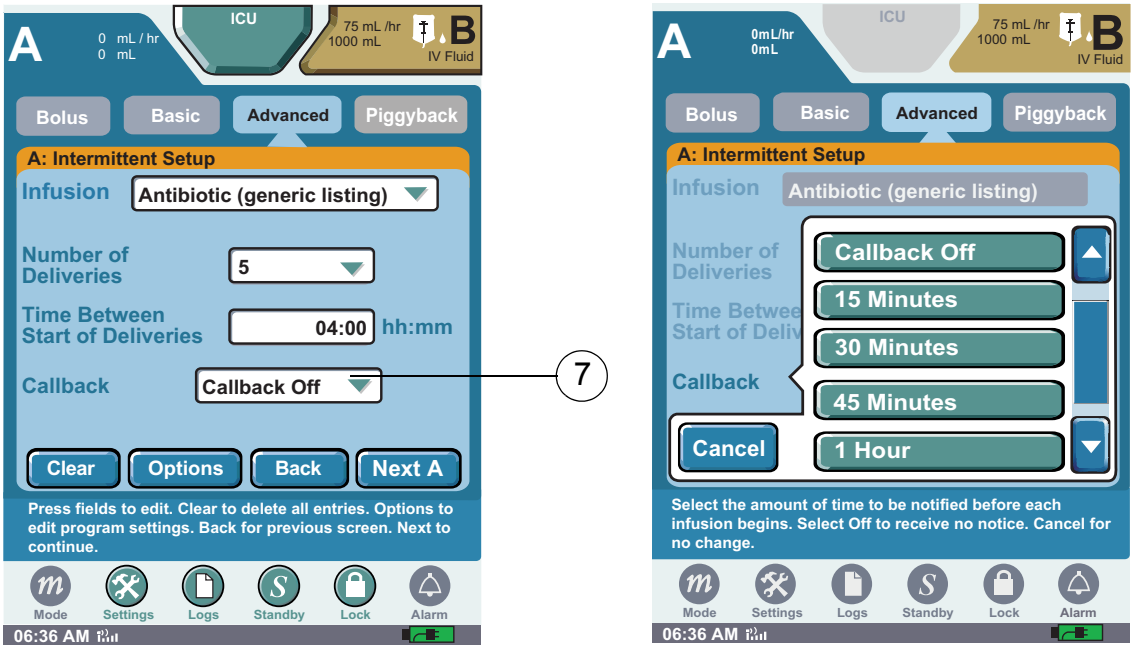


Figure 108: Intermittent Screen and Callback Screen

Note: *Specifying a callback parameter activates a callback alarm prior to the start of the next cycle. For example, selecting 15 minutes activates a callback alarm 15 minutes prior to delivering the next scheduled cycle.*

8. Press **Next A** to display the **INTERMITTENT PROGRAMMING SCREEN**. Press the Weight BSA field and **Enter Weight** using the numeric keypad. Press Enter to accept the patient parameters. The English equivalent measurement is automatically displayed. The weight BSA is gray when programming medications that do not require the patients weight as part of the dose calculation.

Note: *The BSA can be directly entered, or enter the patient weight and height then press* **Calculate** *to automatically calculate BSA.*

9. If applicable, press the **Dose** field and enter the dose using the numeric keypad. Then press **Enter** to accept the dose. The rate is automatically calculated and appears in the rate field.
   - Press the **Rate** field and enter using the numeric keypad if the medication is delivered in mL/hr.

Note: *Entering the Rate first automatically calculates the Dose.*

Note: *If dosing units are not predefined, the user must enter the dosing units during the program sequence.* See "Programming a Basic Therapy" on page 77 *for additional information.*

10. Press the rate field and enter the rate using the numeric keypad. Press **Enter** to accept the rate.

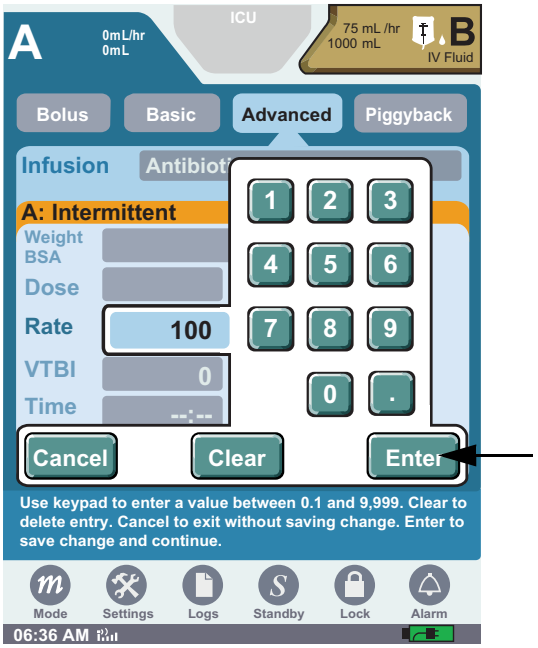


Figure 109: Intermittent Dose Calculation Screen

11. Press **VTBI** field (Volume to be infused) and enter the amount of fluid to be delivered. Time is automatically calculated.

Note: *Entering the time first automatically calculates the VTBI.*

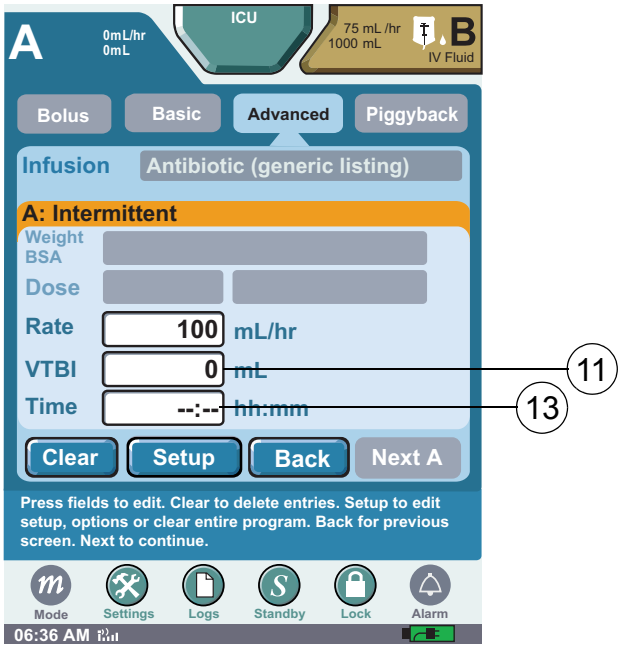


Figure 110: Intermittent Programming Screen

12. Press **Enter** to accept VTBI.

13. To enter Time—if required, press **Time** field. Select **hours** (hh) or **minutes** (mm). Enter time period using numeric keypad. Press **Enter**.

    - If available, program-level buttons have the following functions:
    - **Clear** restores default field values for current screen
    - **Setup** displays the **INTERMITTENT SETUP SCREEN**. The **Clear All button** is now available, and it deletes the entire Intermittent program

14. **Back** displays the **INTERMITTENT SETUP SCREEN**

15. When finished entering parameters on the **INTERMITTENT PROGRAMMING SCREEN**, press **Next A** to display the **CONFIRM INTERMITTENT SCREEN**.

    Note: *User may enter KVO rate for continuous delivery between Intermittent cycles. See "Chapter 9: Program Options" for more detail.*

16. Review the therapy parameters, and then press **Start Intermittent**.

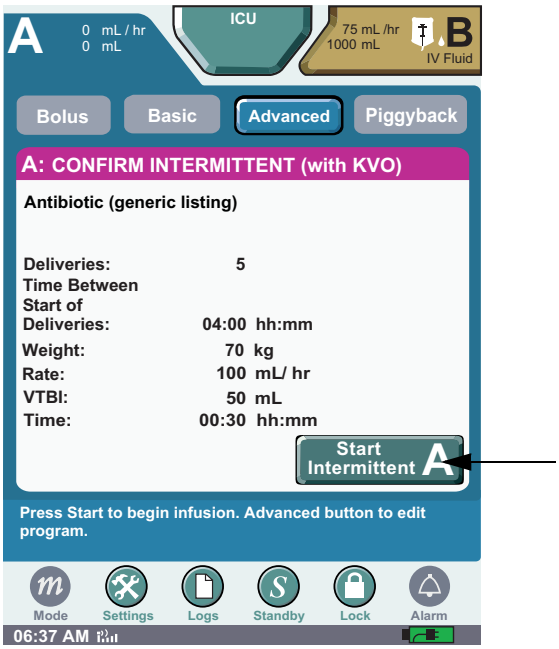


Figure 111: Confirm Intermittent Screen

17. The therapy begins and the **DELIVERING SCREEN** displays **DELIVERING INTERMITTENT DELIVERY X OF Y** (where Y is the total number of programmed intervals) on the status line. To stop the therapy, press **Stop Intermittent A**.

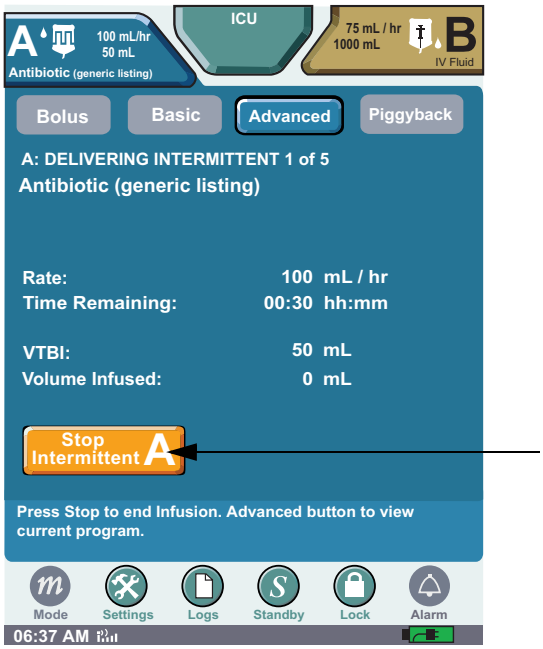


Figure 112: Delivering Intermittent Screen X of Y

Note: *Between phases of an Intermittent therapy,* ***Waiting For Intermittent X of Y*** *displays on the status line. Each additional phase of an Intermittent therapy updates the status. line with* ***Delivering Intermittent X of Y****. Between phases of delivery, medication continues to infuse at KVO rate.*

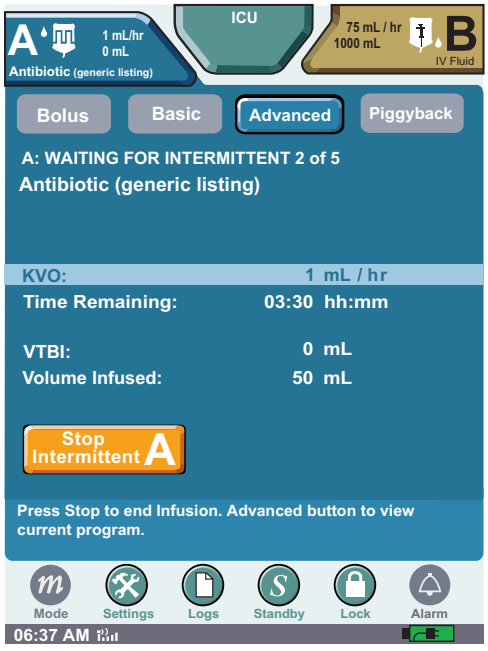


Figure 113: Waiting for Intermittent X of Y Screen

18. When the Intermittent program completes and the VTBI is delivered, **COMPLETED INTERMITTENT** displays on the status line of the **DELIVERING SCREEN**.

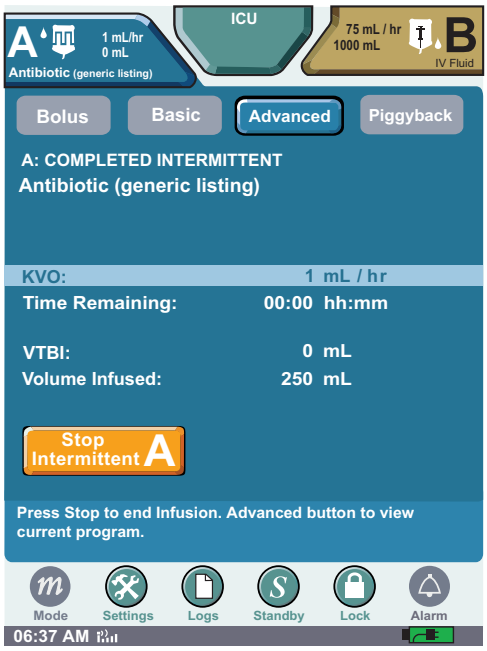


Figure 114: Completed Intermittent Screen

Interchannel Sequencing Therapy

Interchannel Sequencing therapy allows for the sequential delivery of infusions on Channel A and Channel B. The **Interchannel Sequencing button** only displays on a 2-channel device, and does not apply to Intermittent and Multistep therapies. Up-to three sequential deliveries can be programmed.

The Infuser allows you to eject a non-delivering channel cassette during an interchannel sequencing therapy. (For example, in a ABA sequence, while the first A is delivering, the cassette on B can be ejected.)

Note: *Interchannel Sequencing only applies to the two-channel infuser.*

To program an Interchannel Sequencing therapy:

1. Press **Advanced** to display the **ADVANCED THERAPY SELECTION SCREEN**.
2. Press the **Interchannel Sequencing button** to display the **INTERCHANNEL SEQUENCING INTRODUCTION SCREEN**.

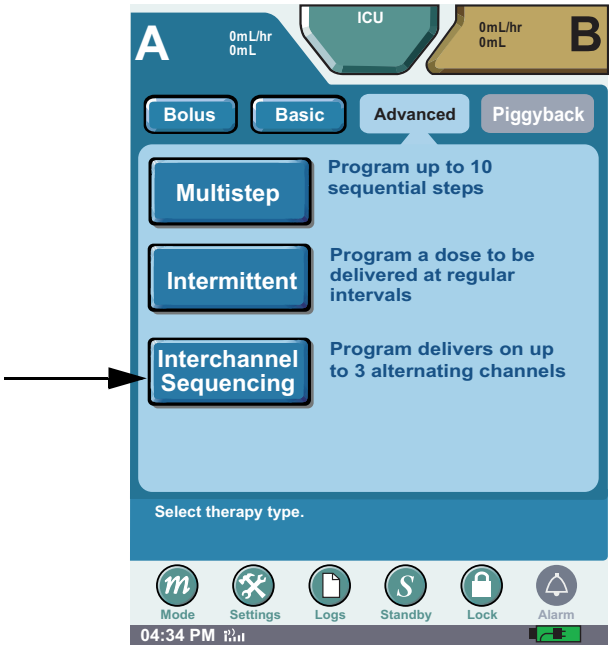


Figure 115: Interchannel Sequencing Selection Screen

3. Press **Next A** to display **INTERCHANNEL SEQUENCE SET-UP SCREEN**:

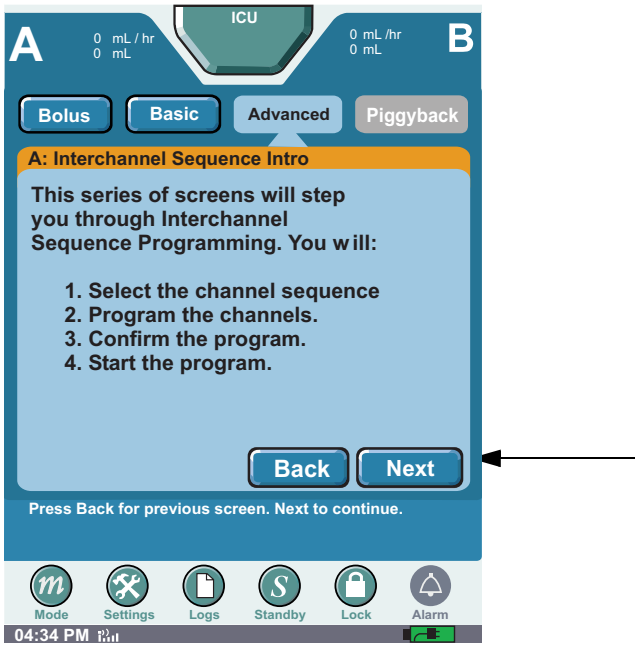


Figure 116: Interchannel Sequence Set-up Screen 1

4. Press the **Deliver first** field.

Figure 117: Interchannel Sequence Set-up Screen 2

5. Select the channel to delivers first.

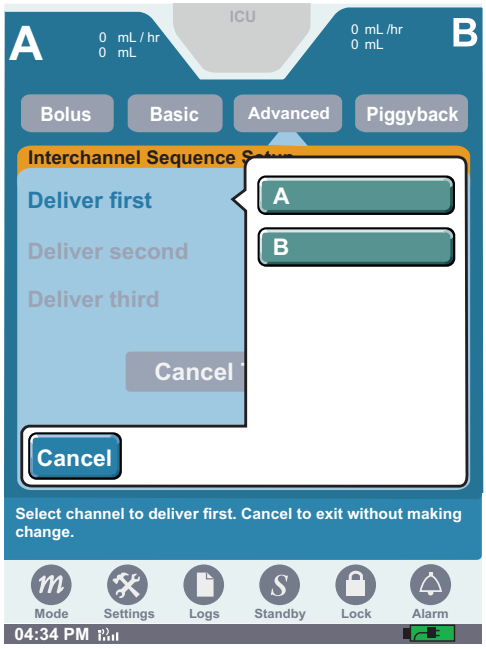


Figure 118: Interchannel Sequence Set-up Screen 3

6. Press the **Deliver second** field to select the channel that will be second in the delivery sequence, then press **NEXT** to continue.

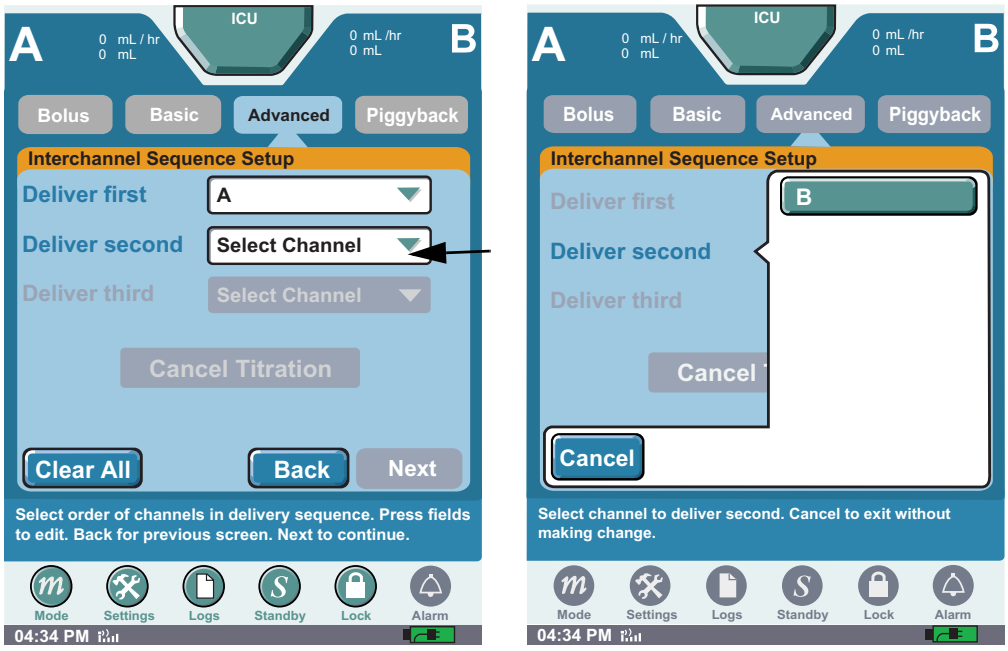


Figure 119: Interchannel Sequence Set-up Screens 4 and 5

Note: *Continue the same programing sequence if a third delivery is required.*

7. Program the first step (Channel A). See “Programming a Basic Therapy” on page 77 for additional information.

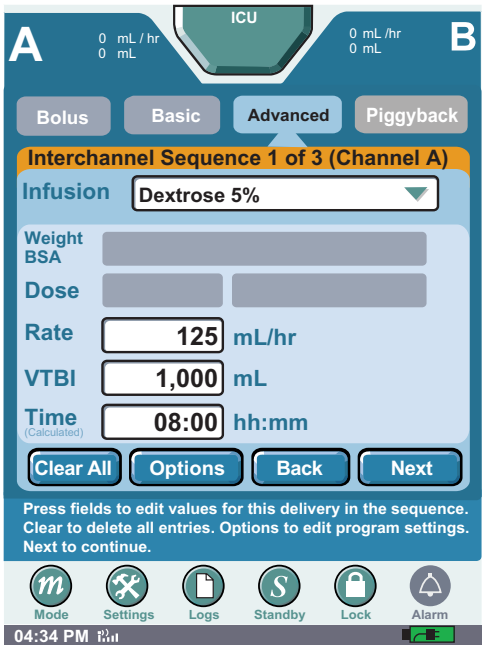


Figure 120: Interchannel Sequence Programming Screen 1

Note: *If dosing units are not predefined, the user must enter the dosing units during the program sequence.* See “Programming a Basic Therapy” on page 77 *for additional information.*

8. Program Sequence 2.

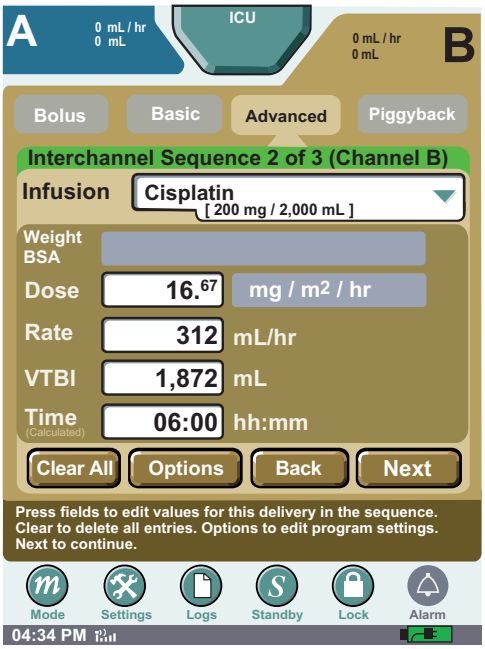


Figure 121: Interchannel Sequence Programming Screen 2

9. To program more steps repeat the above instructions.

10. Press **Next.** Verify that the displayed values on **CONFIRM PROGRAM SCREEN** match the source container and physician's order. Press the horizontal scroll bar to confirm the Interchannel Sequence program.

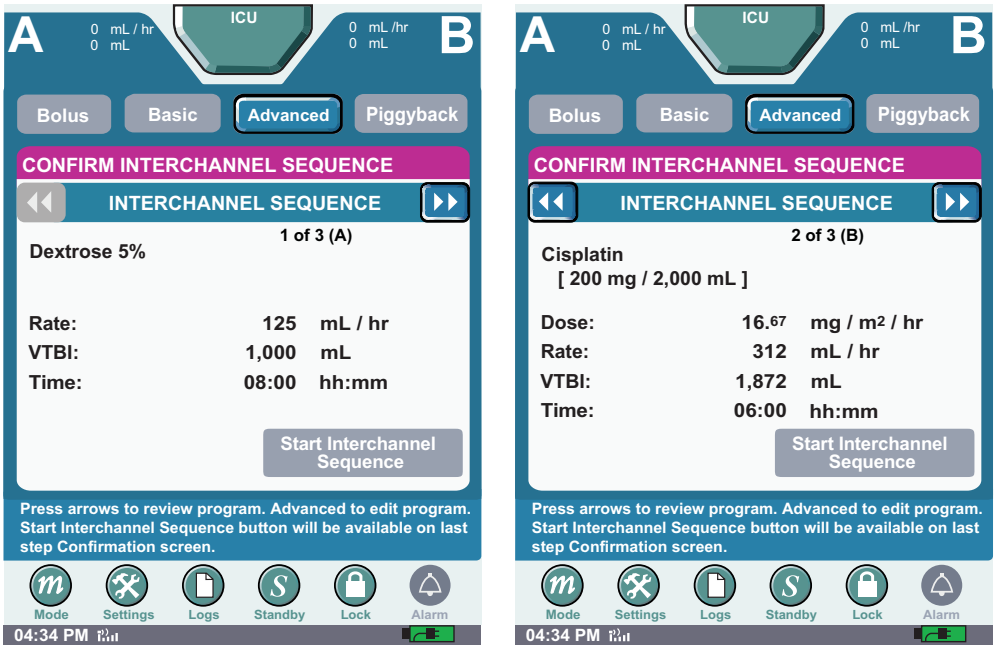


Figure 122: Interchannel Sequence Confirmation Screens

Note: *Scroll through and review each delivery for Interchannel Sequence before starting therapy. The* **Start Interchannel Sequence button** *is unavailable until each Interchannel Sequence delivery is reviewed.*

11. Press **Start Interchannel Sequence** to begin infusion:

Figure 123: Start Interchannel Sequence

12. The therapy begins with the first channel programmed, and NEXT DELIVERY 2 of 2 displays on the second channel to deliver. Channel B starts infusing after Channel A completes.

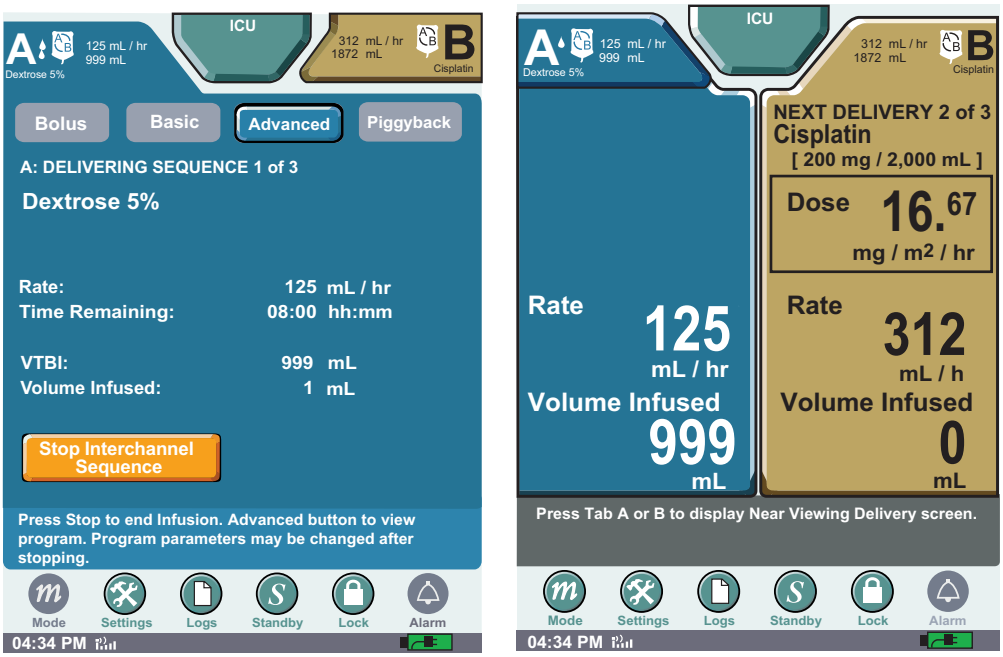


Figure 124: Near and Far Viewing Screen

When the first sequence is complete and the VTBI has been delivered, the screen displays completed delivery. See Figure 125: "Interchannel Sequence Completed Delivery Screen" ,

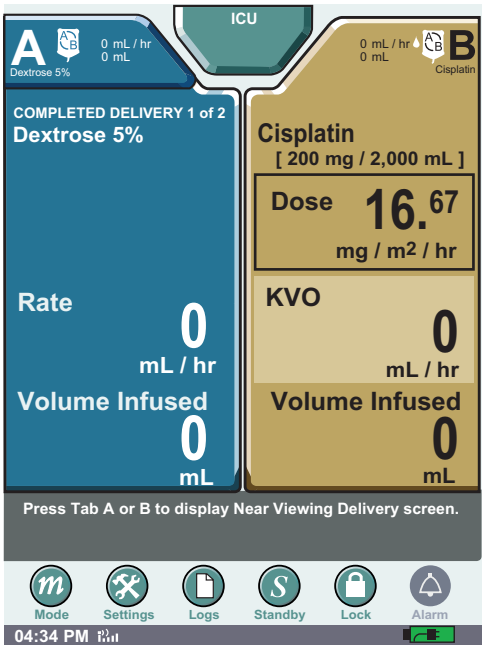


Figure 125: Interchannel Sequence Completed Delivery Screen

NOTES:

Chapter 9: Program Options

The Options function allows the selection of additional functions and alarms. The **Options button** is available from any therapy programming screen once an infusion has been selected. Press **Options** to access Options selection menu. Press up or down arrows on scroll bar to view available options. Press selectable fields to change an option.

- Changes to Options settings will revert to default settings when a new program is entered.
- Changes to Options may be entered during the program, or when the infuser is stopped. Selected fields can be changed during delivery.
- To change Options, press the appropriate program button, and select **Options**.

Power Priming

Power priming may be used to prime or remove air from an administration set. In general, the time required to power prime an administration set is

- 72 seconds for a 72" microbore set
- 3 minutes for a 72" macrobore set

Note: *Refer to the SYMBIQ™ administration sets labels for information regarding use with different flow rates.*

WARNING: Always prime the administration set to remove air from the cassette, tubing, and injection sites prior to connecting to the patient. Always disconnect the administration set from the patient prior to priming or purging.

To power prime a cassette:

1. On the **PROGRAM SCREEN**, select the infusion. Then, press the **Options button** to display the **OPTIONS SCREEN**.

Figure 126: Programming Screen

2. On the **OPTIONS SCREEN**, press **Select Amount** in the Power Prime field.

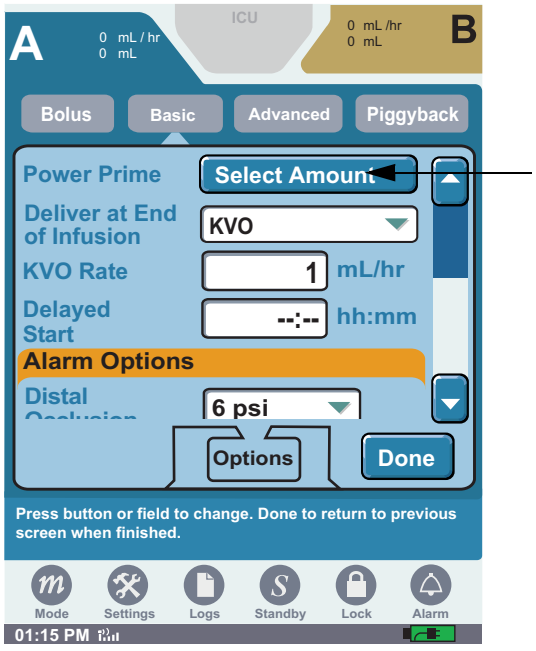


Figure 127: Options Screen

3. The Disconnect Tubing message reminds the user to disconnect the administration set from the patient. Press **OK** to display the **POWER PRIME SCREEN**.

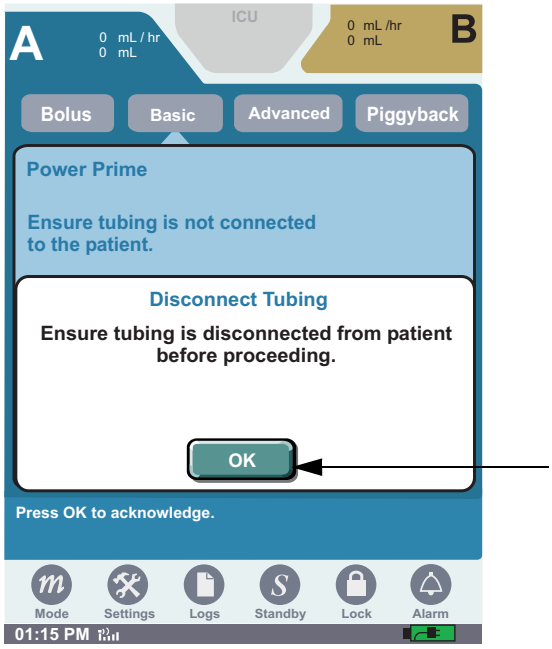


Figure 128: Disconnect Tubing System Message

4. On the **POWER PRIME SCREEN**, select one of these three priming options:
   - Prime 1 mL
   - Prime 3 mL
   - Prime 5 mL

Note: *The power prime rate is 250 mL/hour.*

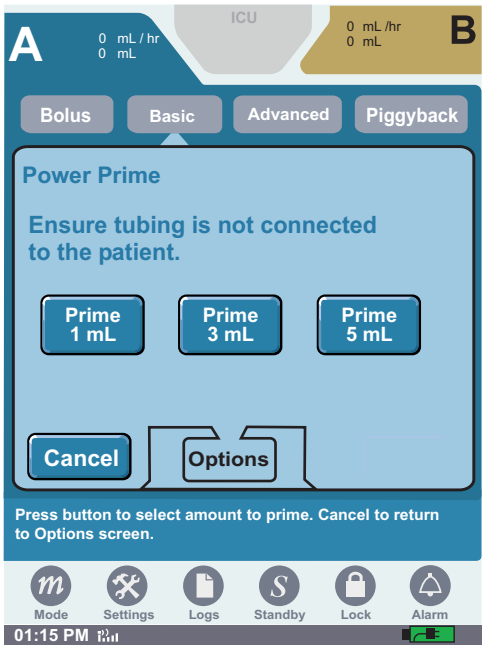


Figure 129: Power Prime Screen

5. The **POWER PRIME PROGRESS SCREEN** displays the cumulative amount of fluid primed measured in mL. To cancel priming, press **Cancel**.

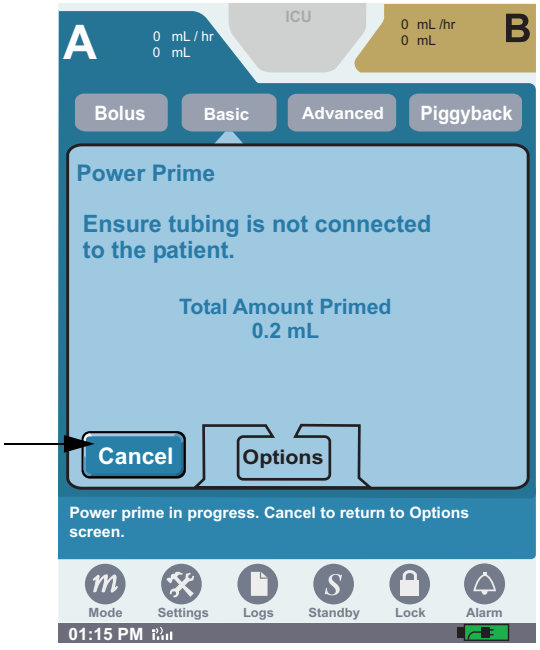


Figure 130: Power Prime Progress Screen

Note: *50 mL is the maximum total primed value allowed. If primed to 50 mL, the priming will stop and the total primed will display for 5 seconds. The infuser will then return to the* **OPTIONS SCREEN**.

When priming finishes, press **Cancel** to return to the **OPTIONS SCREEN**. See Figure 127: "Options Screen" on page 128. Priming is complete when a steady drip of fluid is observed at the end of administration set. Repeat Power Prime as often as necessary to obtain a steady drip at the end of the administration set.

6. On the **OPTIONS SCREEN**, press **Done** to return to the **PROGRAMMING SCREEN**. The power priming process is complete; continue entering program parameters as desired.

If an occlusion occurs during power priming, priming stops and the infuser reverts to the **POWER PRIME SCREEN**. Clear the occlusion and select one of the power prime options to restart priming.

Note: *The infuser must be stopped to use the Power Prime function.*

Deliver at End of Infusion

From the **PROGRAM SCREEN** press the **Options button** and press **Deliver at End of Infusion.** Then select **None**, **KVO**, or **Continue Rate**.

- Select **KVO** to change to KVO rate at end of infusion.
- Select **Continue Rate** to deliver programmed therapy rate at end of infusion.
- Select **None** for no delivery at end of infusion.

Press **Done** to accept change and exit **Options** menu.

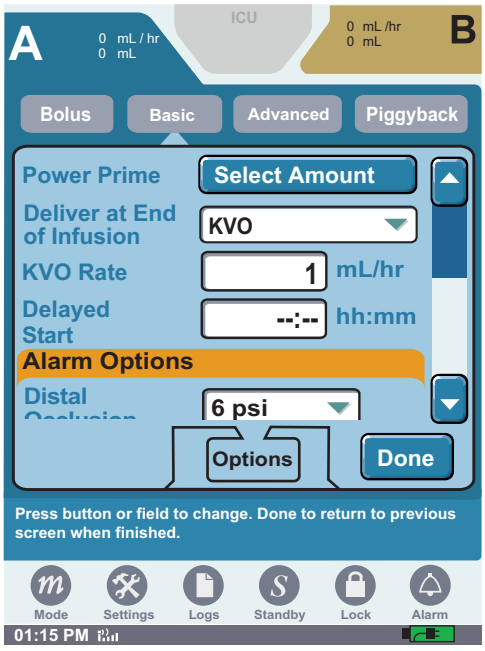


Figure 131: Options Screens

KVO Rate

To change the KVO rate, select KVO from the **Deliver at End of Infusion** drop-down list. Press **KVO Rate** and enter the rate using the numeric keypad. Press **Done** to accept the change, and exit the Options menu.

Note: *If Deliver at End of Infusion is set to KVO, the infuser will deliver the defined KVO rate unless the KVO rate is greater than the programmed rate. In this case, the programmed rate will continue to be delivered.*

Delayed Start

You can delay the start of a programmed therapy (from one minute up to 12 hours) with the Delayed Start programming option. If allowed for the current program and enabled in the selected CCA or Default Drug Library (DDL), Delayed Start is available for Basic and the Advanced Therapies of Intermittent and Multistep. Once a therapy is started on a channel, Delayed Start is not available on that channel. You cannot select **Delayed Start** for a channel with an active alarm until the alarm is cleared. The infuser must be stopped to use the Delayed Start function.

To program a Delayed Start:

1. From the **PROGRAM SCREEN**, press **Options**. Then, press the **Delayed Start** field. Use numeric keypad to enter time period. Press **Done** to accept the change and exit the Options menu.

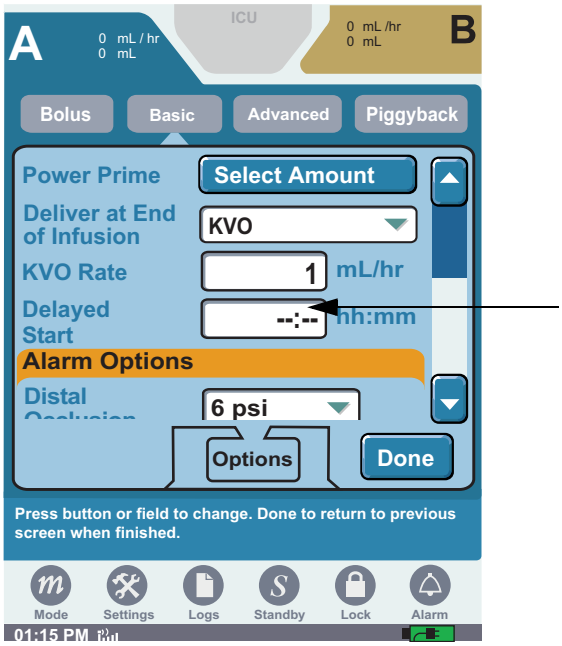


Figure 132: Options Screen

2. Press **Next A** on the **PROGRAMMING SCREEN** to display the **CONFIRM DELAYED START SCREEN**.

Figure 133: Confirm Delayed Start Screen

3. Review the program parameters; then, press the **Delayed Start button** to begin countdown.
4. The infuser starts therapy when the delayed start countdown reaches zero.
5. If you want to start the therapy before the delayed start time elapses, press **Cancel Delayed Start**

Alarm Options

This section describes the Symbiq Alarms.

Distal Occlusion

To select the Distal Occlusion alarm:

1. From the **PROGRAM SCREEN** or the Delivering Screen, press **Options**.Then, use the vertical scroll bar to scroll down to the Alarm Options section, and then select the **Distal Occlusion** field.

   Note: *The unit of measure is either psi or mmHg as configured in the Drug Library from the facility's respective CCA.*

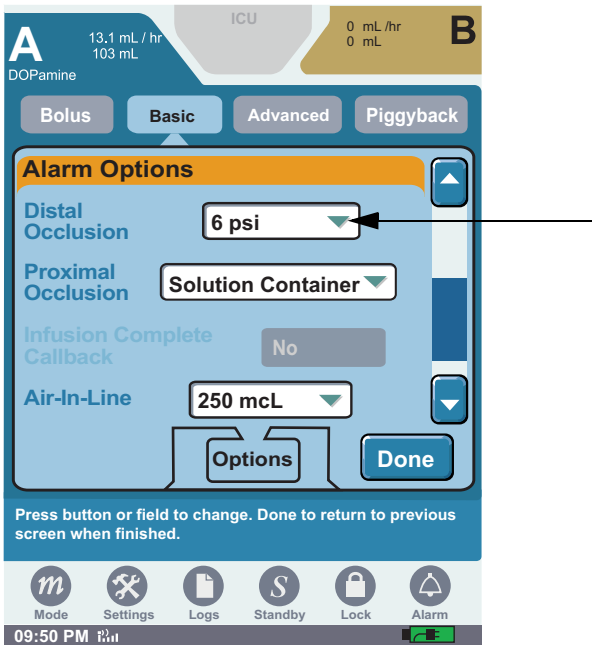


Figure 134: Options Screen

2. Select the desired Distal Occlusion setting.

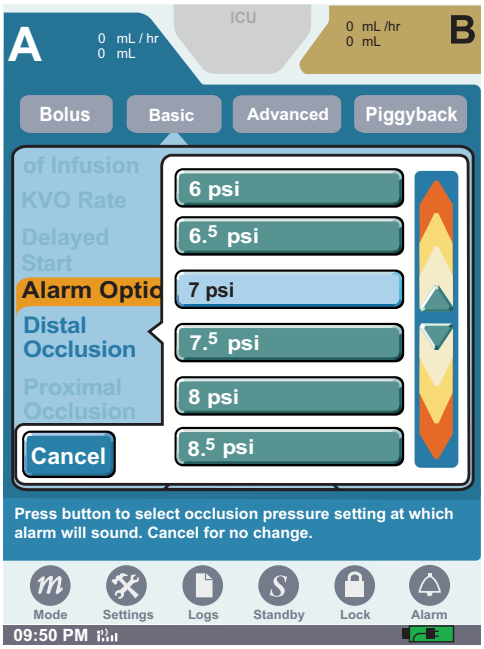


Figure 135: Distal Occlusion Setting Drop-Down List

3. Press **Yes** to change the Distal Occlusion setting. Press **No** to return to the psi settings list without saving changes.

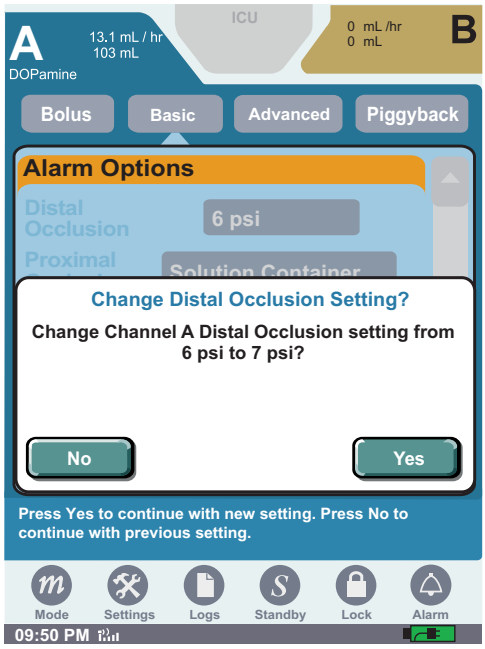


Figure 136: Change Distal Occlusion Setting Message Box

4. Press **Done** to return to the **PROGRAMMING SCREEN**.

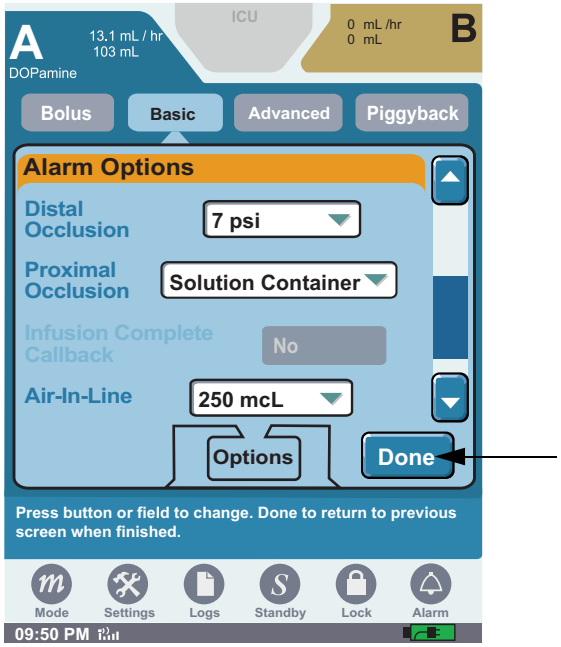


Figure 137: Options Screen After Setting Change

Proximal Occlusion

To select the Proximal Occlusion alarm:

1. Use the vertical scroll bar to scroll down to the Alarm Options section, and then select the **Proximal Occlusion** field.

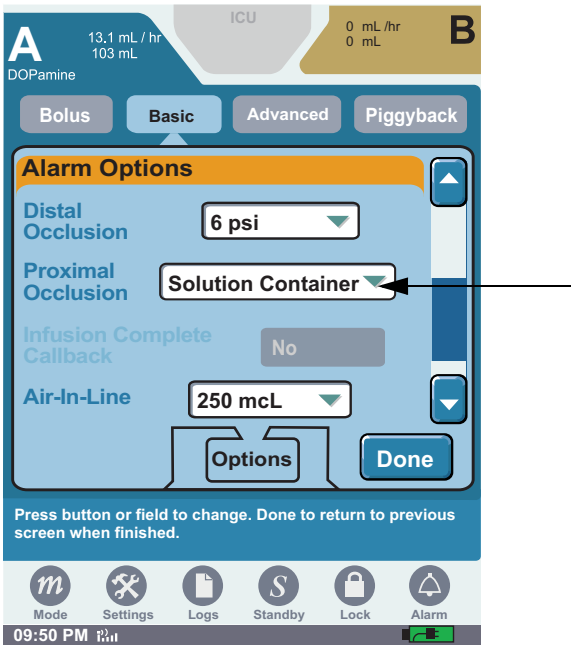


Figure 138: Options Screen

2. Select Solution Container or Syringe.

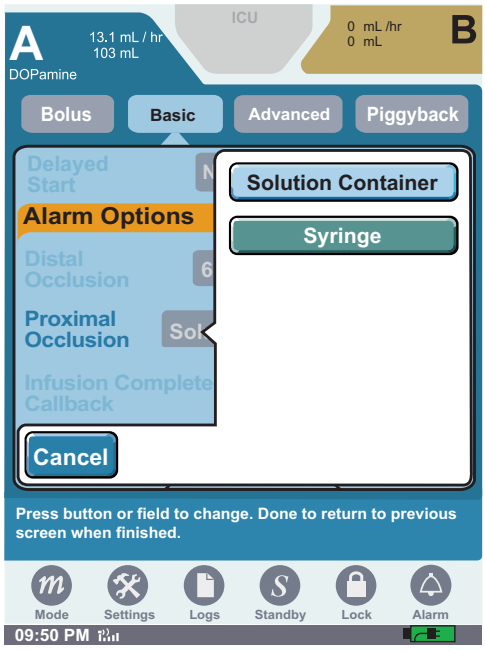


Figure 139: Proximal Occlusion Setting Drop-Down List

CAUTION: Incorrect selection of proximal occlusion setting may result in a delayed proximal occlusion alarm and under delivery.

3. Press **Yes** to change the Proximal Occlusion Setting. Press **No** to return to the Proximal Occlusion Settings list without saving changes.

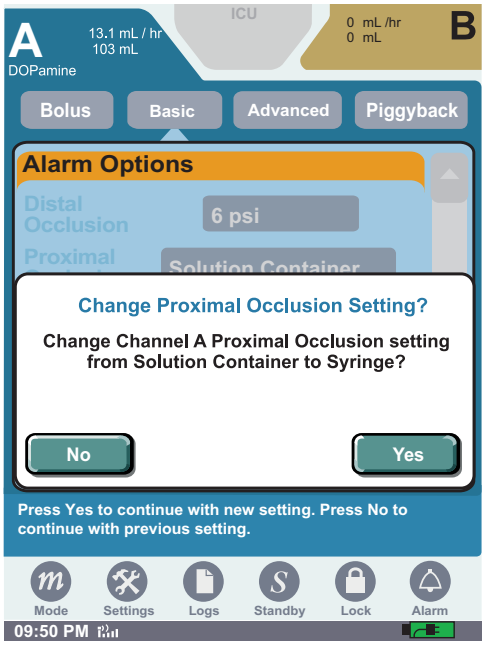


Figure 140: Change Proximal Occlusion Setting Message Box

4. Press **Done** to return to the **PROGRAMMING SCREEN**.

Infusion Complete Callback

To select the Infusion Complete Callback alarm:

1. Use the vertical scroll bar to scroll down to the Alarm Options section, and press the **Infusion Complete Callback** field. The infuser must be stopped to use this function.

   Note: *This option is only available for Bolus, Piggyback, and Multistep therapies.*

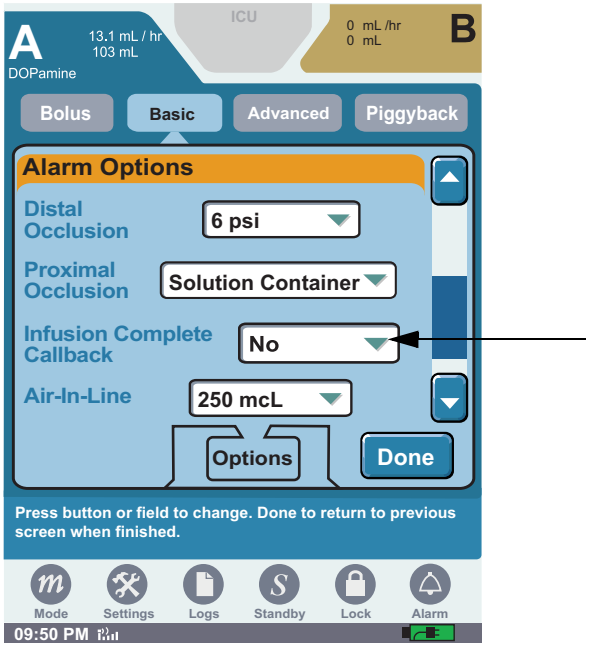


Figure 141: Options Screen

2. Select **Yes** or **No**.

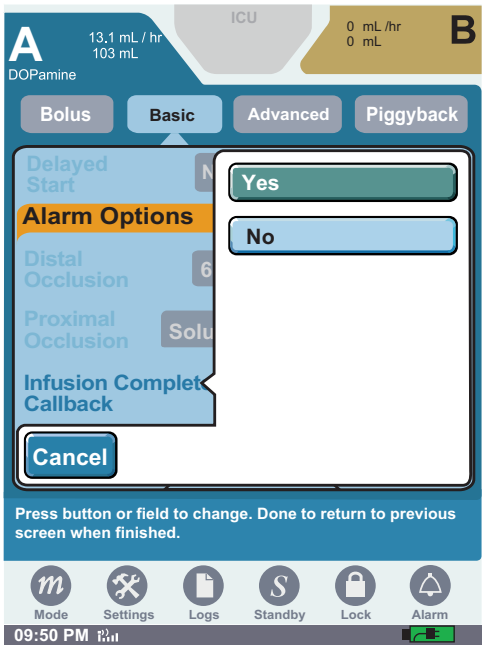


Figure 142: Infusion Complete Callback Drop-Down List

3. Press **Yes** to change the Infusion Complete Callback setting. Press **No** to return to the Infusion Complete Callback settings list without saving changes.

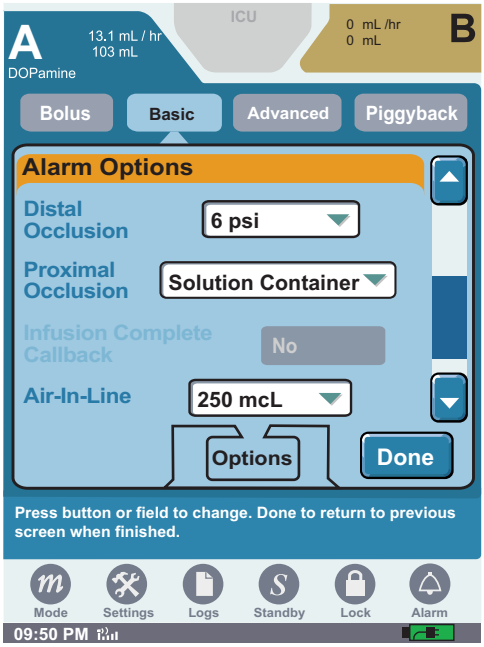


Figure 143: Change Infusion Complete Callback Message Box

4. Press **Done** to return to the **PROGRAMMING SCREEN**.

Note: *If selecting the Infusion Complete Callback alarm for a Multistep therapy, the alarm activates at the end of each step in the therapy.*

Air-In-Line

To select the Air-In-Line alarm setting:

1. Use the vertical scroll bar to scroll down to the Alarm Options section. Press the **Air-In-Line** field to display the Air-In-Line settings list

2. Select the desired Air-in-Line setting.

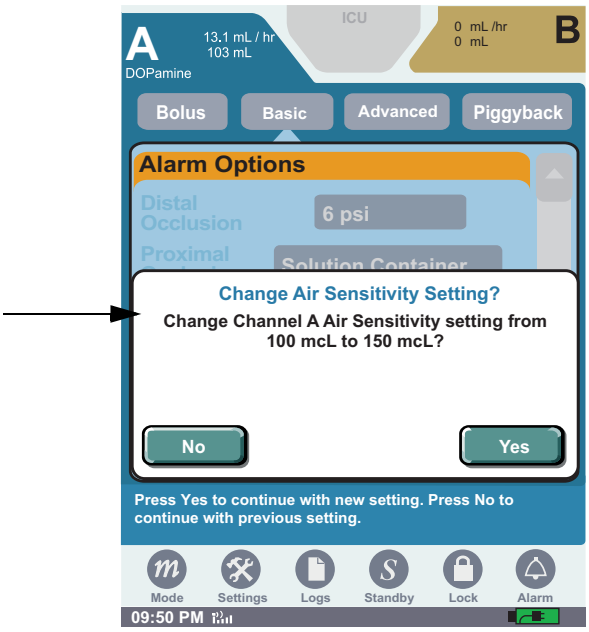


Figure 144: Air -in-Line Settings Screen

3. Press **Yes** to accept the air-in-line setting. Press **No** to return to the mcL settings list without saving changes.

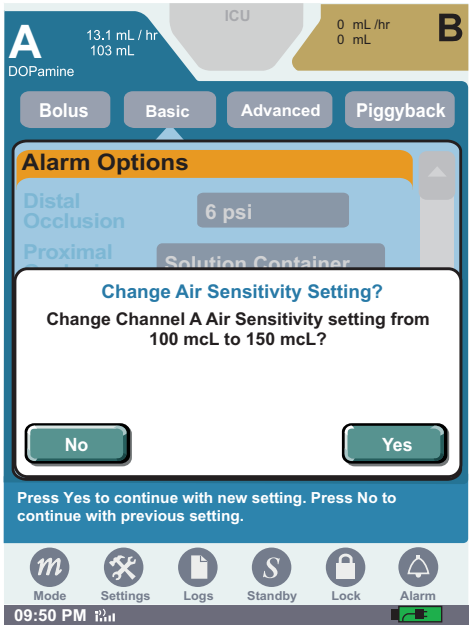


Figure 145: Change Air Sensitivity Message Screen

4. Press **Done** to return to the **PROGRAMMING SCREEN**.

Nearing End Of Infusion

The Nearing End of Infusion alarm (Figure 146) activates when the VTBI is near completion. This alarm notifies you that the infusion is nearing completion. The alarm displays 10, 20, or 30 minutes prior to end of infusion. A medium urgency alarm sounds until silenced. The Nearing End of Infusion Alarm is available for Basic and all of the Advanced Therapies.

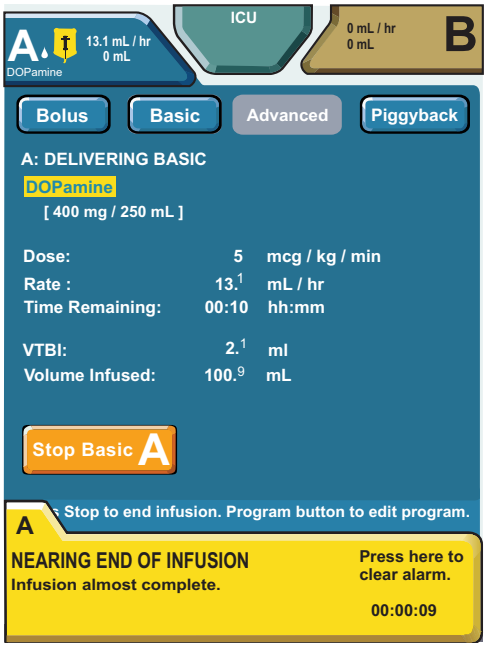


Figure 146: Nearing End of Infusion

To select the Nearing End Of Infusion alarm:

1. Use the vertical scroll bar to scroll down to the Alarm Options section. Press the **Nearing End Of Infusion** field to display the drop-down menu.

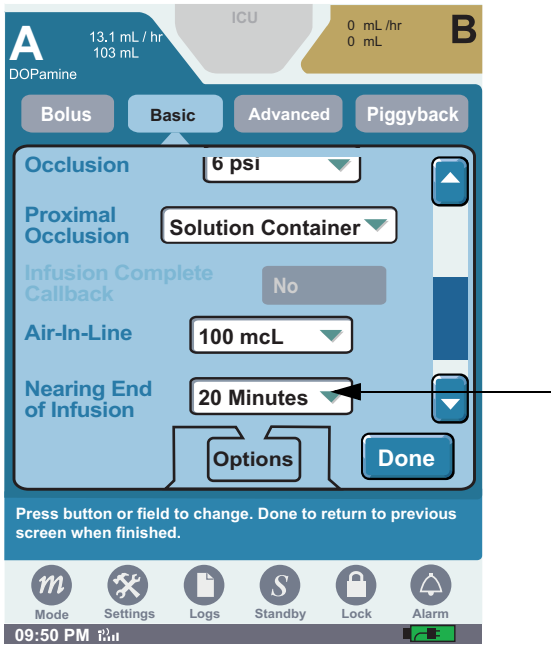


Figure 147: Options Screen

2. Select the desired setting.

Figure 148: Nearing End of Infusion Alarm Setting Drop-Down List

3. The screen returns to the **OPTIONS SCREEN**. Press **Done** to return to the **PROGRAMMING SCREEN**.

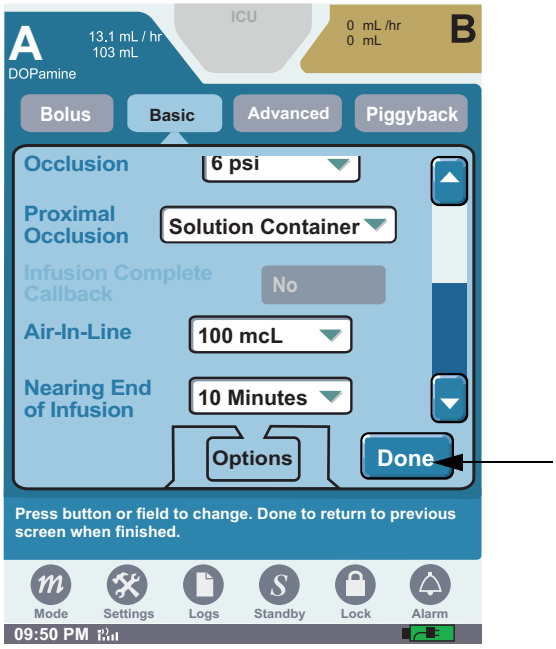


Figure 149: Options Screen

Chapter 10: Alarm and System Messages

Alarm

There are three types of alarms: invalid keypress, operational, and malfunction.

- **Invalid Keypress**—an alert tone that sounds when an invalid entry is touched; for example, a double keypress.
- **Operational alarms**—are active based on program selections or when other delivery issues occur.
- **Malfunction alarms**—activate when mechanical or software issues occur that require the infuser be removed from service and examined by authorized service personnel (Biomed).

Operational alarm conditions are defined as low, medium, and high urgencies. All Malfunction alarms are high urgency. Operational and Malfunction alarms are logged in the alarm log.

If an alarm occurs in Delivery mode, or if a malfunction occurs, the Nurse Call relay activates.

During an active alarm, an alarm tab displays on the screen until the alarm is resolved and/or cleared. Pressing the alarm tab displays additional information to assist in resolving the alarm. Malfunction alarms remain active until the infuser is powered off.

For more information on alarm messages, causes, and remedies, see "Appendix B: Alarm Messages and Troubleshooting" on page 199.

Note: *In conditions when standard alarms may not sound, a backup buzzer indicates a need for immediate attention.*

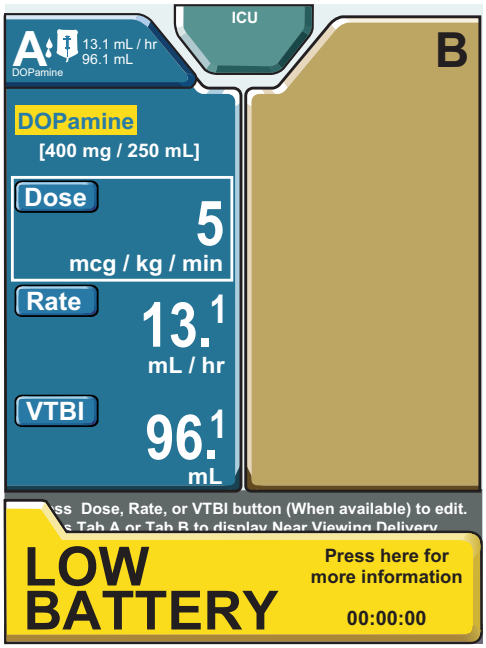
Note: *If the Backup Buzzer sounds when the pump is OFF, the pump should be returned to biomed for service.*

Note: *If the backup buzzer sounds due to a depleted battery condition, then the user should connect the device to AC (mains) power or replace with a charged battery. To silence the alarm, press* **On/Off button** *after connecting to power or replacing battery as described.*

Alarm Appearance

The **Far Viewing Alarm** overlay displays the alarm name and elapsed time of the alarm. Touching **Far Viewing Alarm** overlay displays **Near Viewing Alarm**.

Far View



Near View

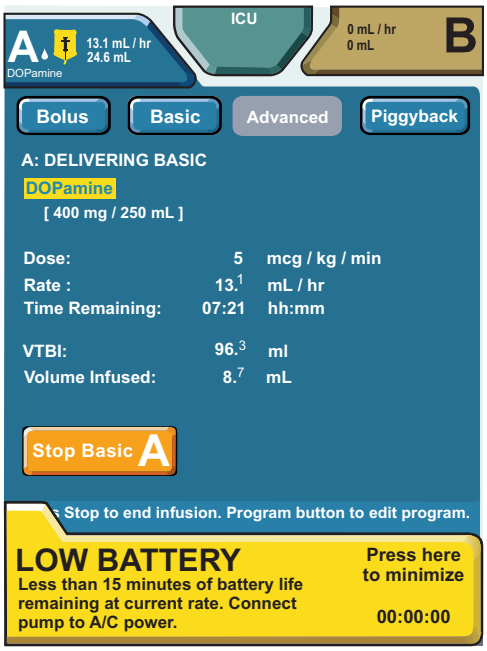


Figure 150: Far and Near Viewing Device-Level Alarm Display

A Near Viewing Alarm displays like the one shown in Figure 151. This alarm display contains information about the alarm name, the reason for the alarm, a suggested remedy for the alarm, and elapsed time of the alarm (if enabled).

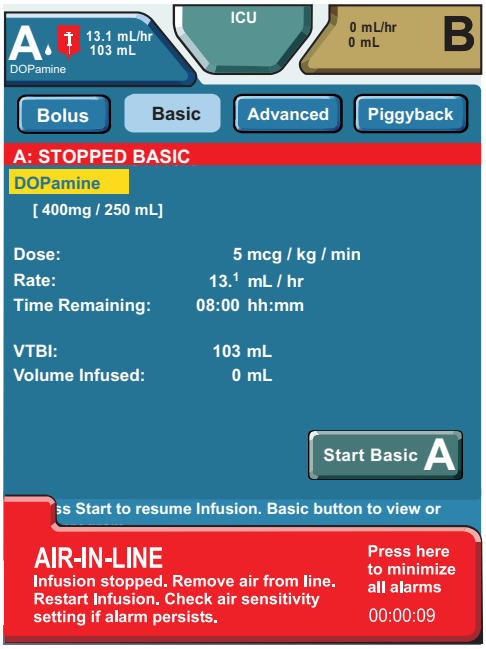


Figure 151: Near Viewing Alarm Display

Minimized Alarm Tabs

Active alarms may be minimized when acknowledged by the user. This occurs when the user presses the detailed alarm message tab; then, the infuser level **Alarm button** changes to the respective alarm color. To restore an alarm display to full size, press the **Alarm button**.

Figure 152: Low Battery Alarm button

Alarm Urgency

The SYMBIQ™ Infusion System has four distinct levels of alarms outlined in Table 11. Each alarm level includes an alarm message, a distinct audible tone, and a detailed troubleshooting tab.

The troubleshooting tab at the bottom of the screen contains a full description of the alarm condition. The troubleshooting tab contains remedies or checklists information to assist in resolving the alarm. For a two-channel infuser, the alarm message indicates the alarm state of the channel. Multiple, simultaneous alarms display in order from highest to lowest priority. During an alarm, the channel LEDs and bag icons take on the alarm's color treatment and flashing behavior.

Should alarms occur simultaneously on different channels, pressing the Channel Tab will automatically navigate to the corresponding alarming channel.

When simultaneous alarms of equal urgency or priority occur on different channels, the left channel supersedes the right channel.

Table 11: Alarm Conditions and Criteria

Alarm Urgency	Alarm Sound	Alarm Tab Color	Channel LED Color	Criteria for Alarm
N/A	Single sound of three notes	N/A	N/A	Invalid press or double-key effect occurs.
Low	Single two-note melody	Solid yellow	Solid yellow if alarm is delivery-related	Condition which does not require immediate attention or resolution.
Medium	Single three-note melody	Flashing yellow	Flashing yellow if alarm is delivery-related	Condition which, if not resolved promptly, could result in an escalation to a Warning alarm.
High	Repeating 10-note melody	Flashing red	Flashing red if alarm is delivery-related	Condition which disrupts a therapy and/or requires immediate attention.

Alarm Silencing

Audible alarms may be silenced for a two-minute interval. Pressing the **SILENCE button** silences the alarm and Nurse Call Relay (if enabled) for two minutes without affecting the touchscreen alarm message. Pressing **SILENCE** during a two-minute silence period resets the alarm silence period

Note: *All operational alarms may be silenced except the Depleted Battery alarm and the Power Loss alarm.*

To silence an audible alarm:

1. Press and release the **SILENCE button** on the top of the infuser.

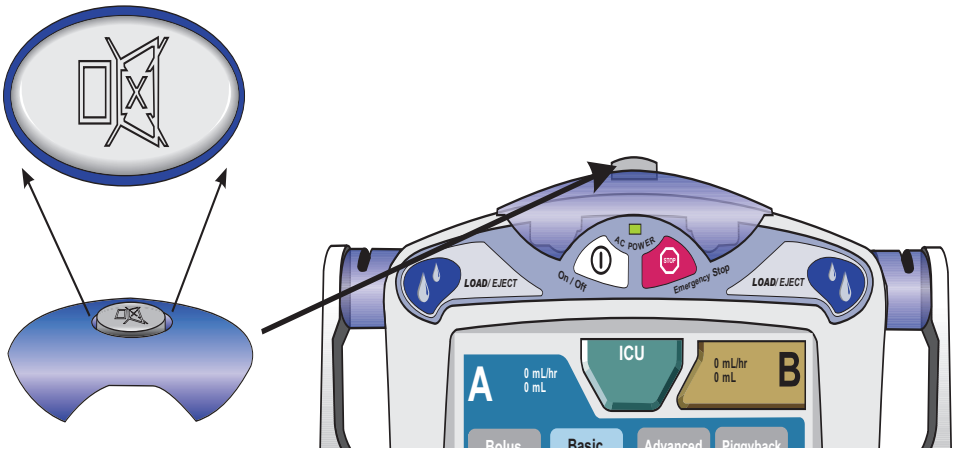


Figure 153: Infuser SILENCE Button

Multiple Alarms

The SYMBIQ™ Infusion System can display up to six active alarms simultaneously by layering the alarm overlays from highest priority (i.e., the top or visible tab) to lowest priority. Pressing the alarm tab of a lower-priority alarm will display the associated alarm overlay. Should multiple alarms occur, the highest priority alarm features both audible and visual alerts.

If more than one alarm occurs, resolving or minimizing the highest-priority alarm overlay, displays the next highest alarm overlay. For a two-channel infuser, Channel A supersedes Channel B when simultaneous alarms of equal urgency occur on different channels. Each alarm tab is marked with the appropriate channel as illustrated in Figure 154.

The alarm tabs are channel specific. Pressing the alarm tab automatically navigates to the corresponding channel with the alarm.

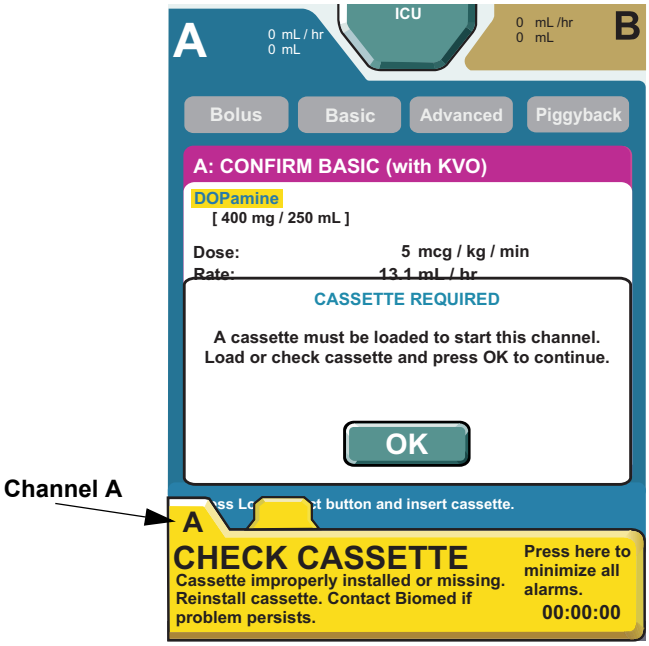


Figure 154: Infuser Screen with Multiple Alarm Tabs

System Messages

System messages provide feedback about infuser status when powered on and when input requires confirmation. System messages also provide feedback when programming a therapy. For example, violating either a hospital defined rule set or a field range activates a system message that alerts the user to the problem.

The **Invalid Key Press** tone sounds whenever a system message activates. Until acknowledged, system messages display while the infuser operates in violation of a defined rule set or field range limit.

Types of system messages include:

- Information or decision point messages
- Outside of Soft Limits
- Outside of Hard Limits
- Invalid Entry

For more information on system messages, causes, and remedies, see “Appendix A: System Messages and Troubleshooting” on page 189.

Program Resulting in an Outside Soft Limits Message

If the values entered result in either a higher or lower than the pre-defined limits, an alarm tone sounds and a pop-up **OUTSIDE LIMITS** is displayed.

Press **Edit** to return to the **PROGRAMMING SCREEN**. Re-enter the programmed value and continue programming.

If the clinical decision is to bypass the limit message, press **Override** and proceed with programming. When finished programming, verify the programmed information on the **Confirm PROGRAM SCREEN** and press **Start** to begin the infusion. The icons will appear in the tab on the top left corner of the screen indicating the value is either lower or higher than the pre-defined rule set.

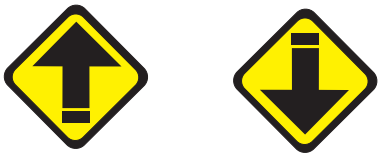


Figure 155: Upper and Lower Soft Limit icons

Exceeded Soft Limits Message

The Outside of Soft Limits system message activates when selected medication values exceed Drug Library-defined soft limits but DO NOT exceed hard limits.

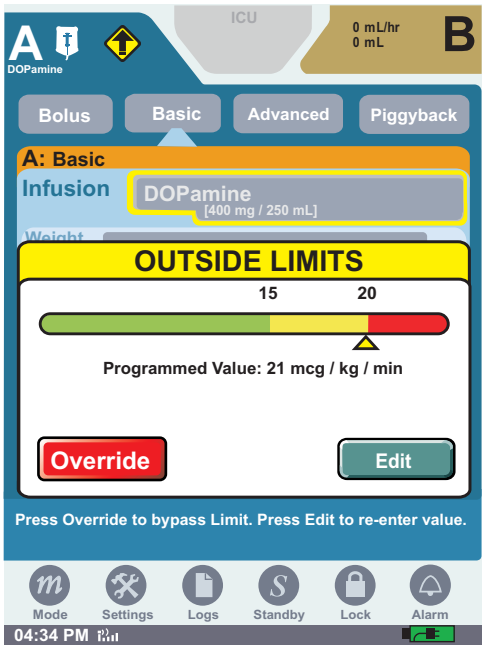


Figure 156: Outside of Soft Limits System Message

When an attempt is made to enter a program value that exceeds the predefined soft limits, the event is recorded to both the Event Log and the Rule Set Override Log.

To address a soft alert:

1. To change an exceeded limits press **Edit** to return to the **PROGRAMMING SCREEN** and re-enter the medication value.
2. If available, press **Override** to accept the limit and proceed to the next programming step.

When a program is delivering Outside of Soft Limits, an Exceeded Soft Limit icon appears.

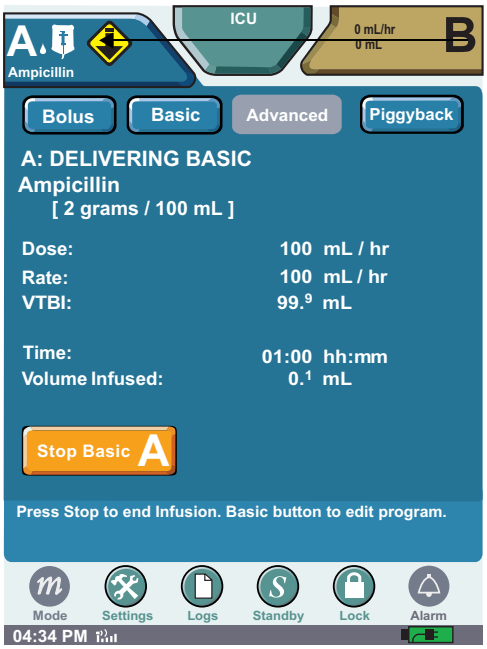


Figure 157: Delivering Screen with Exceeded Lower Soft Limit Icon

Program Resulting in an Outside Hard Limit Message

The **Outside Hard Limits** message notifies you when the selected value exceeds the pre-defined value. An alarm will sound and a pop-up **Outside Limits Message** appears. A facility hard limit cannot be overridden.

Press **Edit** to return to **PROGRAMMING SCREEN** and re-enter programmed value and continue programming.

Note: *Based on a facilities policy selected CCAs may be able to override a hard limit if a valid passcode is entered.*

To override a hard limit:

Hard limits cannot be overridden unless a facility enables selected CCAs, or selected personnel are authorized to override the hard limit by entering a passcode determined by the facility.

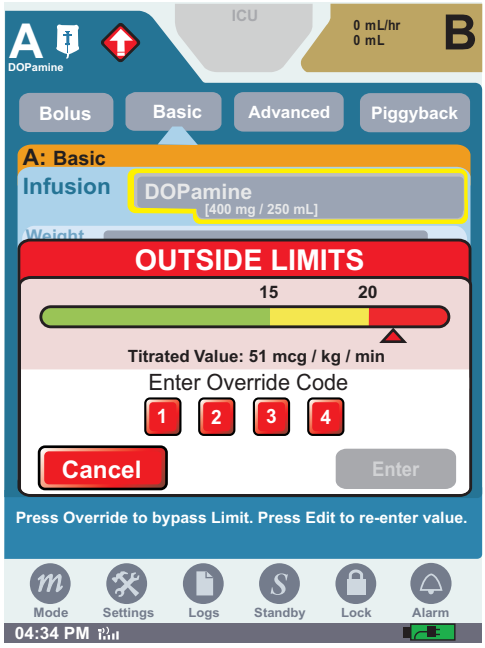


Figure 158: Override Code Screen

If no valid override passcode is defined for the current CCA, the Invalid Passcode system message activates.

Exceeded Hard Limits Message

The **Outside of Hard Limits** system message activates when a medication value exceeds a hard limit for that medication. An **OUTSIDE OF HARD LIMITS MESSAGE SCREEN** for a value that exceeds a lower hard limit is shown in Figure 159.

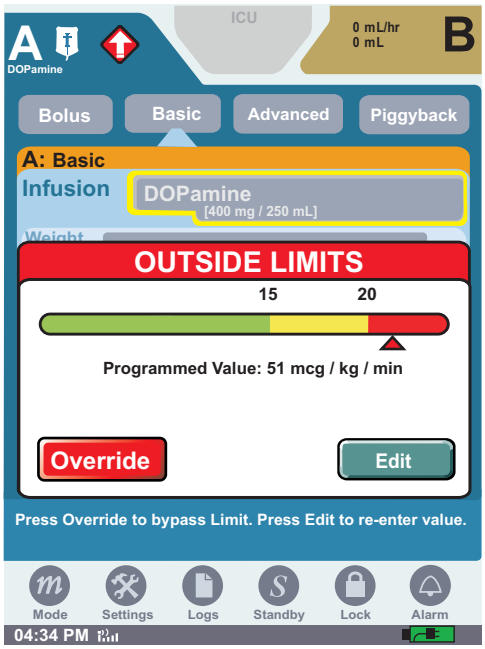


Figure 159: Outside of Hard Limits System Message

When entering a program value that exceeds the hard limit, the event is recorded to both the Event Log and the Rule Set Override Log.

Invalid Entry

An **Invalid Entry System Message** is displayed when you enter a value that exceeds infuser system limits (Figure 160). For example, entering a patient weight of 1000 kgs in the Patient Weight field when the acceptable patient weight range is between 1 and 999 kgs activates the Invalid Entry system message.

Pressing **Clear** on the **Invalid Entry** system message, and then entering a valid value in an active field removes the Invalid Entry system message from the touchscreen. Pressing **Cancel** on the Invalid Entry system message closes the numeric keypad without saving changes. Invalid Entry are recorded to the Event Log.

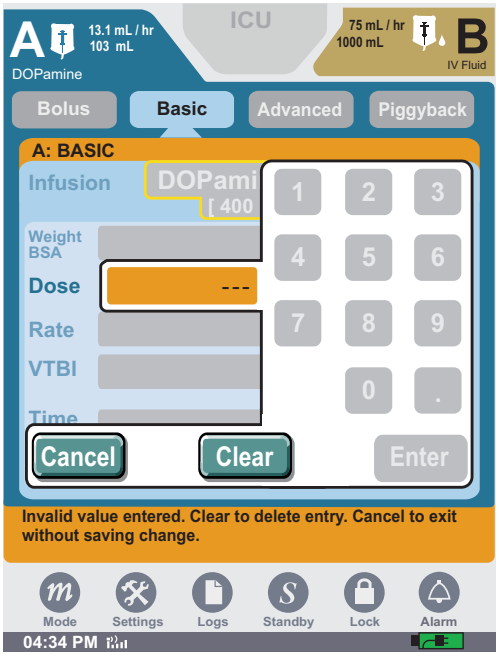


Figure 160: Invalid Entry System Message

NOTES:

Chapter 11: Stored Data

The SYMBIQ™ Infusion System collects and stores data which is available for on-screen viewing. Types of data stored by the infuser and viewable in Clinical mode are:

- **Patient Information**—Last Name, First Name, ID, Caregiver ID, and CCA (Clinical Care Area, if defined for a hospital or institution)
- **Shift Totals**—date and time shift totals were cleared, combined total volume infused for all medications, and medication information for medications infused including:
- **Logs**—three types of logs are available for viewing:
  - *Event Log*—programming data, limit overrides, out-of-limit attempts, changes to settings, warnings, alarms, malfunctions, and power events
  - *Alarm Log*—malfunction and operational alarms
  - *Rule Set Alert Override Log*—all out-of-limit alerts, and overrides
- **Current Program**—parameters of current or most recent program including medication name and concentration, dose, rate, VTBI, duration of therapy, and alarm settings
- **Default Drug Library (DDL)**—factory-installed drug library with at least 99 medications and the manufacturer's recommended default units of measure and concentration

Patient Information

Use the **PATIENT INFORMATION SCREEN** shown in Figure 161 to enter patient name & ID, and caregiver ID.

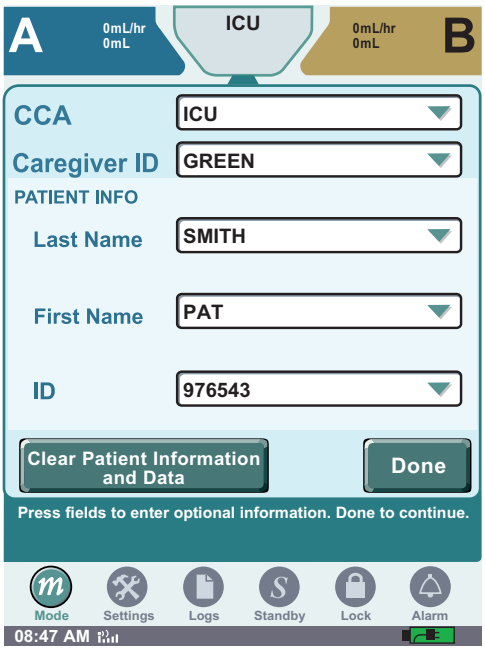


Figure 161: Patient Information Screen

The **Patient Information button** at the top of the touchscreen displays on all subsequent programming and delivery screens. This button contains the CCA name, patient name, and patient ID. The **Patient Information button** only displays patient information if configured to do so in the selected CCA.

Clinical Care Areas

Using Hospira MedNet® Meds™ software, your hospital or institution can define up to 40 different CCAs. Each CCA can have up to 400 medications to choose from including "Other Drug."

When the user selects a CCA, the infuser uses that CCA's configuration and medication definition settings for all subsequent therapies until a different CCA is selected. When CCAs have been downloaded to the infuser, the user must either confirm the current CCA or select a new one each time the infuser is powered on.

Note: *Selection of a CCA is required. All other fields are optional.*

CCA selection and entering Patient Information:

At initial power on, the Patient Information Screen is displayed.

1. On the **PATIENT INFORMATION SCREEN**, press the **CCA** field to select a CCA. Select the desired **CCA** from the CCA selection list.

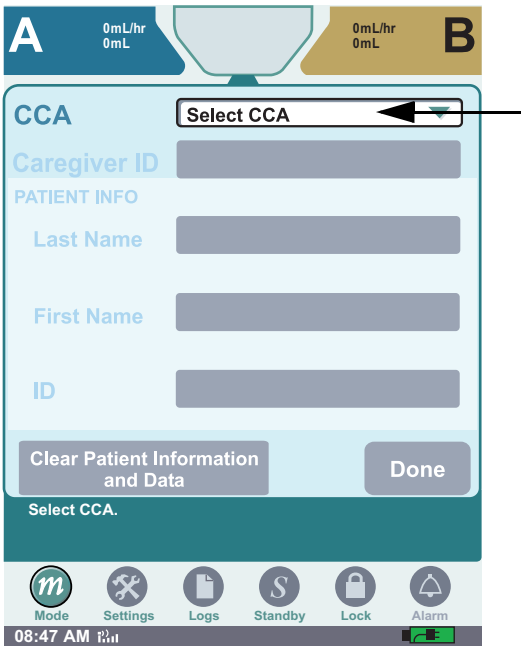


Figure 162: Patient Information Screen

Note: *If no CCAs have been downloaded to the infuser, the default CCA selection will be* ***No CCA****. If one or more CCAs have been downloaded to the infuser, the default CCA field will be* ***Select CCA****.*

2. The facility may restrict access to a CCA by requiring a passcode. In this case, enter the **CCA Access passcode** on the **Enter Code** dialog box, if required.

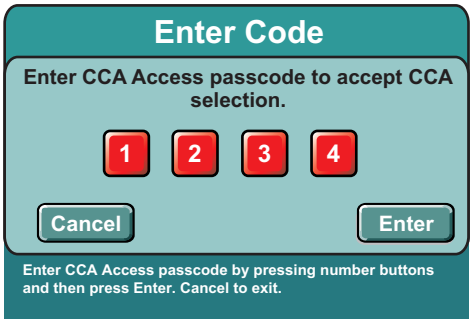


Figure 163: Enter Code Dialog Box for CCA Access

Note: *Entering an invalid passcode three consecutive times activates the* ***Invalid Passcode*** *system message for each attempt. Entering an invalid passcode a fourth time closes the* ***Enter Code*** *dialog box and displays the* **PATIENT INFORMATION SCREEN** *without changing the CCA.*

3. Press the **Caregiver ID** field. Use the touchscreen keypad to enter an ID up to 15 characters long, and then press **Enter**.

4. On the **PATIENT INFORMATION SCREEN**, press **Done** to display the **BASIC PROGRAM SCREEN.**

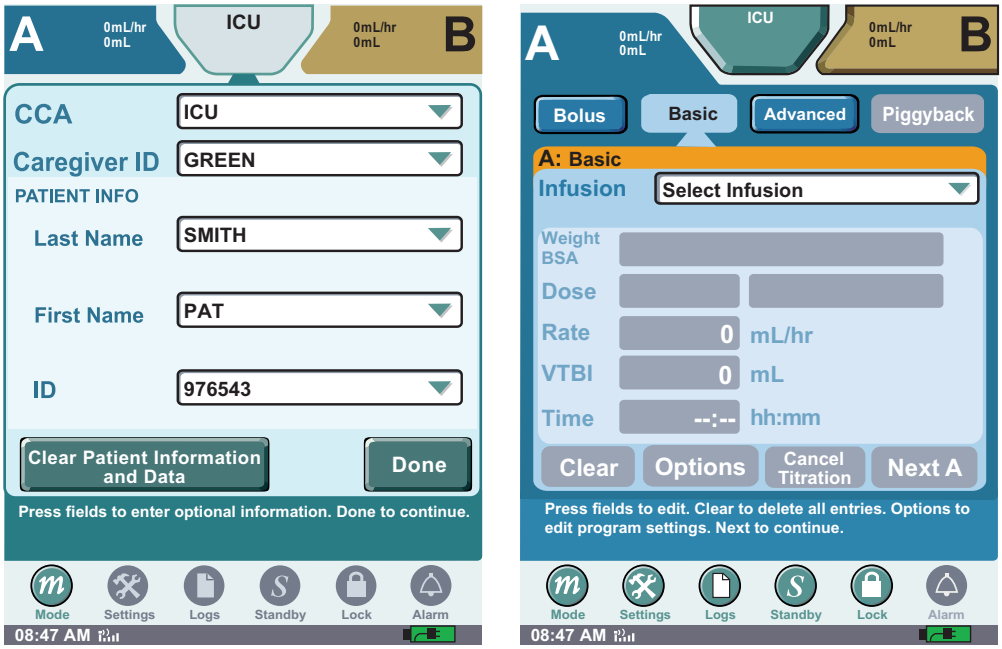


Figure 164: Patient Information and Basic Programming Screens

Note: *Pressing* **Clear Patient Information and Data button** *clears current patient information, shift totals, program totals, the current program, and all logs visible in Clinical mode.*

If no keys are pressed for 30 seconds, the **PATIENT INFORMATION SCREEN** *reverts to the screen from which it was accessed. Any values changed by pressing* **Enter** *on the* **PATIENT INFORMATION SCREEN** *are retained.*

Note: **Clear Patient Information and Data button** *only displays if infuser is not in Delivery Mode and a CCA has been selected.*

Changing CCAs

The user can change a CCA any time the infuser is powered on. When the user changes a CCA, the **Change CCA system message** activates requiring confirmation. The **Change CCA system message** only activates when the user changes a previously selected CCA; it does not activate when the user initially selects a CCA.

After confirming the CCA change, press **Done** on the **PATIENT INFORMATION SCREEN** to return to the prior screen and update **Patient Information button** display, if necessary.

While a primary infusion is delivering under the old CCA rule sets, any secondary infusions (bolus or piggyback) programmed on the same line also deliver under the old CCA rule sets.

Note: *If a channel operates under the previous CCA after a CCA change, the channel shall be anchored to the previous CCA as long as the channel has an infusion confirmed and is not stopped with the VTBI equal to zero.*

These anchored states include: started, stopped, in Standby, in Delayed Start, in infusion complete with KVO started; and confirmed but not started.

1. Press the **Patient Information button** at the top of any screen.

2. Select the CCA field on the **PATIENT INFORMATION SCREEN**.
3. Select a CCA from the list of those available; scroll if necessary.
4. Press **YES** to confirm the change.
5. If required, enter your CCA Access Passcode.
6. Press **DONE** on **PATIENT INFORMATION SCREEN**.

Shift Totals Data

The **SHIFT TOTALS SCREEN** shown in Figure 165 displays the following:

- Date and time shift totals were cleared
- Combined total volume infused during a shift

Figure 165: Shift Totals Screen

Clearing Shift Totals

Entering new patient information on the **PATIENT INFORMATION SCREEN** clears shift totals and causes the infuser to:

- Update the shift cleared date and time to the current date and time
- Log the cleared values to the Event Log
- Reset values to zero

To clear the Shift Total Logs:

1. Press **Logs** at the bottom of the touchscreen to display the **LOGS MENU SCREEN**.
2. From the **LOGS MENU SCREEN**, press **Shift Totals** to display the **LOGS SHIFT TOTALS SCREEN**.
3. Press **Clear Shift Totals** to clear the shift totals or press **Exit** to return to the **LOGS SCREEN**.
4. Press **Exit** to return to the programming screen.

Note: *If no keys are pressed for two consecutive minutes, the* **LOGS MENU SCREEN** *reverts to the previous screen.*

Event Log

The Event Log records infuser events including infusion programs, limit overrides, out-of-limit alerts, changes to settings, power events, and operational alarms, and malfunctions. Figure 166 illustrates the **EVENT LOG SCREEN**. The infuser stores up to 6,600 entries in the Event Log.

Figure 166: Event Log Screen

Entering new patient information on the **PATIENT INFORMATION SCREEN** clears the Event Log viewable in Clinical mode.

To view the Event Log:

1. Press **Logs** at the bottom of the touchscreen to display the **LOGS MENU SCREEN**.
2. From the **LOGS MENU SCREEN**, press **Logs**, and then press **Event Log** to display the **EVENT LOG SCREEN**.
3. On the **EVENT LOG SCREEN**, press the vertical scroll bar on the right of the touchscreen to scroll through the log.

   Note: *The most recent event recorded displays as the top entry in the Event Log.*
4. To scroll to the first record of the log, press **Beginning of Log**. Press **End of Log** to scroll to the last record of the log.
5. On the **EVENT LOG SCREEN**, press **Exit** to return to the **LOGS MENU SCREEN**.

   Note: *If no keys are pressed for two consecutive minutes, the* **LOGS MENU SCREEN** *reverts to the screen from which the* **Logs button** *was selected.*

Alarm Log

The Alarm Log (Figure 167) is a filtered view of the Event Log. Every operational alarm, and malfunction is recorded in the Alarm Log. Each entry includes the associated time, date, and description of the alarm event.

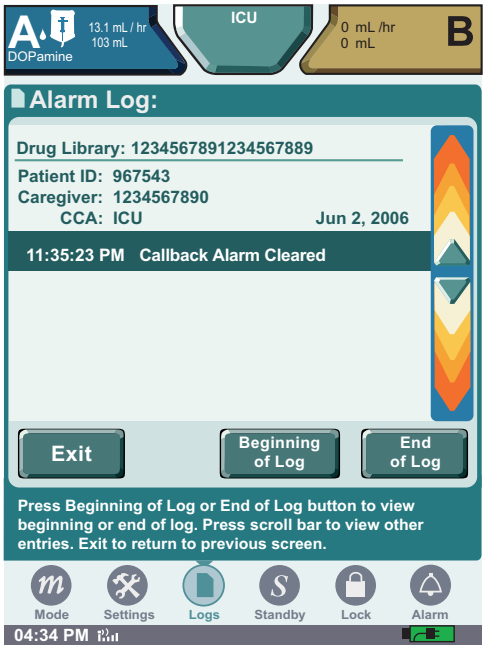


Figure 167: Alarm Log Screen

Entering new patient information on the **PATIENT INFORMATION SCREEN** clears the Alarm Log viewable in Clinical mode.

To view the Alarm Log:

1. Press **Logs** at the bottom of the touchscreen to display the **LOGS MENU SCREEN**.
2. From the **LOGS MENU SCREEN**, press **Logs**, and then press **Alarm Log** to display the **ALARM LOG SCREEN**.
3. On the **ALARM LOG SCREEN**, press the vertical scroll bar on the right of the touchscreen to scroll through the log.

   Note: *The most recent alarm recorded displays as the first entry in the Alarm Log.*
4. To scroll to the first record of the log, press **Beginning of Log**. Press **End of Log** to scroll to the last record of the log.
5. On the **ALARM LOG SCREEN**, press **Exit** to return to the **LOGS MENU SCREEN**.

   Note: *If no keys are pressed for two consecutive minutes, the* **LOGS MENU SCREEN** *reverts to the screen from which the* **Logs button** *was selected.*

   Note: *Invalid key presses are not logged in the alarm log.*

Rule Set Alert Override Log

Attempts to override CCA Rule Sets are recorded to the Rule Set Alert Override Log. Out-of-limit alerts, and rule set overrides are recorded and stored as illustrated in Figure 168. The infuser stores up to 2,000 entries in the Rule Set Alert Override Log.

Figure 168: Rule Set Alert Override Log Screen

Anytime new patient information is entered on the **PATIENT INFORMATION SCREEN**, the **Rule Set Alert Override** Log viewable in Clinical mode is cleared.

To view the Rule Set Alert Override Log:

1. Press **Logs** at the bottom of the touchscreen to display the **LOGS MENU SCREEN**.
2. From the **LOGS MENU SCREEN**, press **Logs**, and then press **Rule Set Override Log** to display the **RULE SET ALERT OVERRIDE LOG SCREEN**.
3. On the **RULE SET ALERT OVERRIDE LOG SCREEN**, press the vertical scroll bar on the right of the touchscreen to scroll through the log.

   Note: *The most recent rule set alert override event recorded displays as the first entry in the Rule Set Alert Override Log.*

4. To scroll to the first record of the log, press **Beginning of Log**. Press **End of Log** to scroll to the last record of the log.
5. On the **RULE SET ALERT OVERRIDE LOG SCREEN**, press **Exit** to return to the **LOGS MENU SCREEN**.

   Note: *If no keys are pressed for two consecutive minutes, the* **LOGS MENU SCREEN** *reverts to the screen from which the* **Logs button** *was selected.*

Default Drug Library

The SYMBIQ™ Infusion System has a factory-installed Default Drug Library (DDL) used to program therapies. The DDL is set up as a single CCA drug library and uses the defined CCA defaults for all medication settings. To help differentiate sound-alike or look-alike medication names, the DDL uses TALL-man lettering (Figure 169).

Figure 169: Infusion Field Drop-Down List with DDL Medication Names

The DDL is active and available for use until a new drug library is downloaded to the infuser using Hospira MedNet® Meds™ software. Once a new drug library is successfully downloaded, it replaces the DDL as the active drug library.

Medications in the DDL have neither hard limits nor soft limits. Hard limits and soft limits are specified by each facility using Hospira MedNet® Meds™ software. For a list of medications available in the DDL, see “Appendix E: Default Drug Library (DDL)” on page 221.

High-Risk Medications

Your facility can designate certain medications as high-risk medications. High-risk medications display on the infuser touchscreen highlighted in yellow as shown in Figure 170.

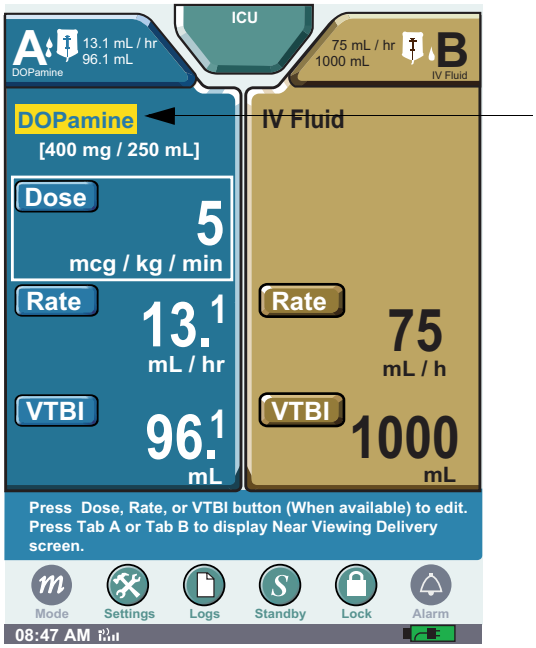


Figure 170: Far Viewing Delivery Screen with High-Risk Medication Infusing

Table 12 describes other touchscreen elements that display high-risk medications highlighted in yellow.

Table 12: Touchscreen Elements with High-Risk Medications Highlighted

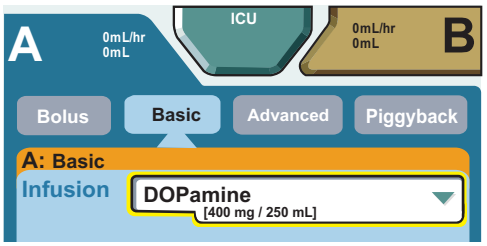
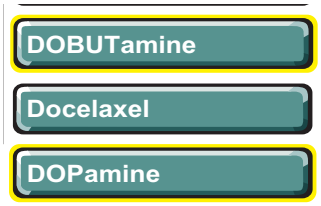
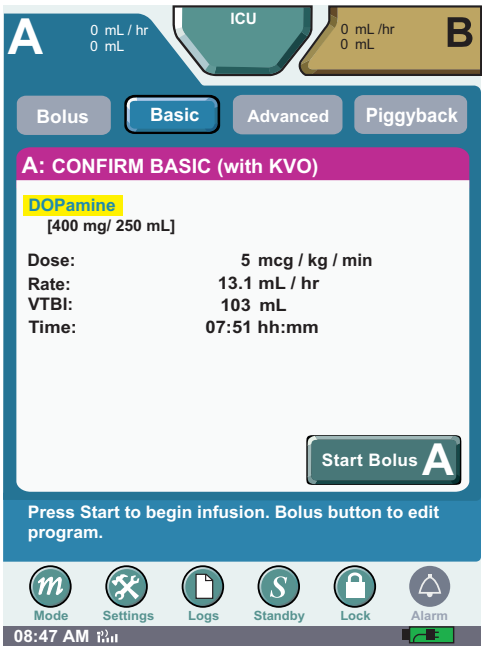
Element Highlighted	Touchscreen Location
Near Viewing Delivery screen with high-risk medication infusing	
Infusion field displaying a high-risk medication	

Table 12: Touchscreen Elements with High-Risk Medications Highlighted

Element Highlighted	Touchscreen Location
High-risk medication in Infusion Selection drop-down list	
Confirmation screen	

Updating Drug Library

1. If a new Drug Library is available, the **NEW DRUG LIBRARY INSTALL SCREEN** will be displayed.

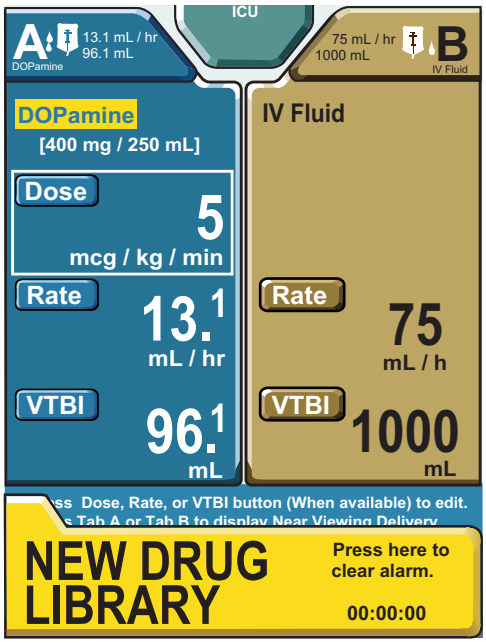
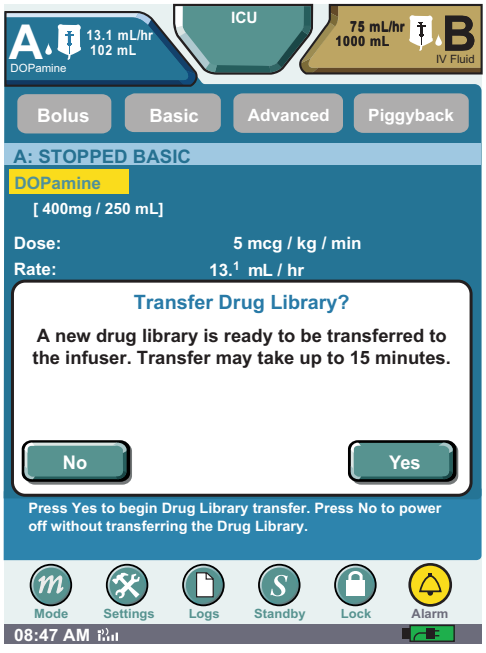


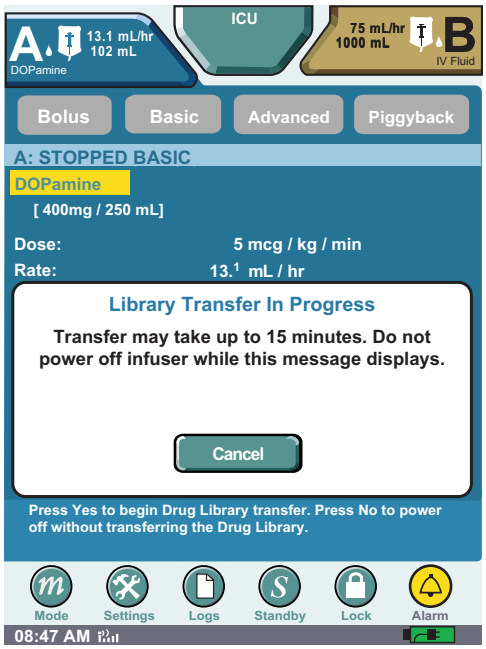
Figure 171: Drug Library Install Screen

2. You can continue to use the infuser. After powering off the infuser, the **TRANSFER DRUG LIBRARY SCREEN** appears.



3. Select **No** to skip the installation and continue using the current library.
Select **Yes** to begin the installation.

4. The library **TRANSFER IN PROGRESS SCREEN** appears. The infuser will power off automatically after the library transfer is completed.



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Chapter 12: Cleaning, Maintenance, and Storage

This chapter describes how to clean, store, and service the SYMBIQ™ Infusion System. This chapter also describes battery maintenance and battery disposal.

Cleaning the Infuser

To ensure the SYMBIQ™ Infusion System functions properly, practice the cleaning guidelines in this chapter. Establish a routine schedule for cleaning the infuser. Before cleaning the infuser the user should:

- Power down the infuser using the **On/Off button**
- Disconnect the infuser from AC (mains) power

The exposed surfaces of the SYMBIQ™ Infusion System may be cleaned with a lint-free cloth moistened with one of the cleaning solutions recommended in Table 13 or with mild, nonabrasive soapy water. Use a small, non-abrasive brush to aid in cleaning the cassette carriage.

Table 13: Cleaning Solutions for use on the SYMBIQ™ Infusion System

Cleaning Solution	Manufacturer	Preparation
Coverage™ HB	Steris Corporation, a division of Calgon Vestal Laboratories	Per manufacturer's recommendation
Dispatch®	Caltech Industries	Per manufacturer's recommendation
Manu-Klenz®	Calgon Vestal Laboratories	Per manufacturer's recommendation
Precise®	Caltech Industries	Per manufacturer's recommendation
Vesphene IIse	Calgon Vestal Laboratories	Per manufacturer's recommendation
Formula C	Diversey Corporation	Per manufacturer's recommendation
Household liquid bleach (5.25 sodium hypochlorite)	Various manufacturers	Use per hospital procedures; DO NOT exceed one part bleach to ten parts water
Sporicidin	Sporicidin International	Per manufacturer's recommendation

Cleaning Cautions

Avoid damaging the SYMBIQ™ Infusion System by following these cleaning cautions:

CAUTION: To avoid mechanical or electronic damage, DO NOT immerse the SYMBIQ™ Infusion System in fluids or cleaning solutions. DO NOT spray cleaning solutions in or near infuser openings. DO NOT allow cleaning solutions to saturate the air-in-line detectors or enter the infuser when cleaning the air-in-line detectors.

USE ONLY the recommended cleaning solutions and follow the manufacturer's recommendations. Using cleaning solutions not recommended by Hospira may result in product damage. The disinfecting properties of cleaning solutions vary; consult the manufacturer for specific information.

NEVER use sharp objects such as fingernails, paper clips, or needles to clean any part of the infuser.

DO NOT sterilize by heat, steam, ethylene oxide (ETO), or radiation.

Do not use abrasive scrub pads or brushes on the LCD touch screen as it may become scratched or damaged. Use only soft cloths or sponges.

Cleaning Lock

To lockout the touch screen and prevent inadvertent program changes, an easy wipe-down can be done during the operation of the device by activating Cleaning Lock in back of the infuser.

The Cleaning Lock deactivates the infuser touchscreen and prevents inadvertent key presses while off-screen buttons remain enabled. Pressing **Emergency Stop** deactivates the cleaning lock as do active alarm conditions. In addition, the Cleaning Lock can be configured to deactivate after a user-specified period of time.

The Cleaning Lock can also be deactivated by pressing either **LOAD/EJECT** or **On/Off**.

Note: *If a cassette carriage is opened while the cleaning lock is active, the termination of the cleaning lock (by pressing the* **Cleaning Lock button** *or by cleaning lock expiration) will affect the cassette carriage. The carriage will close after six seconds upon deactivation of* ***Cleaning Lock****.*

To activate the cleaning lock:

1. Locate the cleaning lock button on the rear of the infuser.

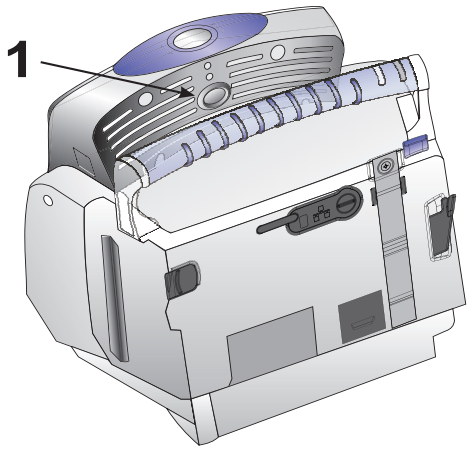


Figure 172: Cleaning Lock Location

2. Press and hold the cleaning lock button for one second, and then release it. The **Cleaning Lock Active** system message appears on the front of the screen.

To deactivate the cleaning lock:

1. Locate the cleaning lock button on the rear of the infuser.
2. Press cleaning lock button and release.

Battery Maintenance

CAUTION: Before connecting a patient to the infuser, ensure the infuser has a fully charged battery installed for continuous infuser operation.

The SYMBIQ™ Infusion System is designed to use battery power for emergency backup and temporary portable operation. Both one and two-channel infusers deliver four hours of operation at 125 mL/hr with the LCD backlighting set to the Power Saving mode on a fully charged battery.

The battery recharges whenever the infuser is connected to AC (mains) power. With the infuser powered off and connected to an AC power source, the battery takes six hours to recharge. Battery recharge takes longer if the infuser is powered on. In general, the more often the battery is partially discharged and then recharged, the sooner it will need to be replaced. Consult a qualified biomedical technician for battery replacement if necessary.

CAUTION: Disconnect the AC power line prior to opening the unit or changing the battery.

To maintain maximum battery charge and to prolong battery life, connect the infuser to AC (mains) power whenever possible.

Battery Disposal

DO NOT discard the infuser's used lithium ion battery pack with regular trash. Instead, dispose of it in an environmentally sound and approved manner. Contact your local waste management company for information on environmentally sound ways of collecting, disposing, and recycling used batteries.

Storage

To prolong the life of the SYMBIQ™ Infusion System, take the following storage precautions:

- Store away from excessive heat (more than 60° C), cold (less than -20° C), and humidity (outside 10% to 90% range)
- Store connected to AC (mains) power

Infuser Maintenance and Service

All maintenance, service, or adjustments to the SYMBIQ™ Infusion System should be referred to qualified technical personnel. A technical service manual may be ordered from your local Hospira sales representative.

Product Handling and Disposal

DO NOT discard the infuser's administration set with regular trash. Instead, follow hospital procedures for disposing and handling of infuser's administration set.

Please comply with local disposal and recycling regulations as appropriate for disposable of batteries, rechargeable battery packs, medical electronic components, and infusion sets.

Chapter 13: Product Specifications

Physical Specifications	
One-channel infuser dimensions:	Width: 9.9 inches Height: 10.2 inches Depth: 8.6 inches Depth with Pole Clamp: 13.0 inches Weight: 10.7 pounds
Two-channel infuser dimensions:	Width: 11 inches Height: 10.9 inches Depth: 8.6 inches Depth with Pole Clamp: 13.0 inches Weight: 12.1 pounds
Casing:	High-impact plastic
Electrical Specifications	
Power frequency:	Between 50 Hz and 60 Hz
Fuses:	T1.6A/250VAC
AC power rating:	100-240 VAC, 100 VA MAX,
Power cord:	Hospital-grade AC cord approximately 10 feet in length with a hospital-grade plug at one end. The power cord is to be used for (AC) mains disconnection.
Rear infuser AC power outlet:	Located on the back of the infuser; accommodates one additional SYMBIQ™ Infusion System only
Electrical safety:	The SYMBIQ™ Infuser has been assessed and complies with the following standards: • IEC 60601-1 (1988) Second Edition with Amendments No. 1 (1991), No. 2 (1995) • UL 60601-1 • CSA C22.2 No.601.1 • IEC/EN 60601-1-2 (2001) • IEC/EN 60601-2-24 (1998)
Battery Specifications	
Battery:	Rechargeable lithium ion 10.8 volts. Battery model Anam AP4014-BT. Contact Hospira for replacement batteries.
Battery life:	Both one and two-channel infusers deliver four hours of operation at 125 mL/hr with the LCD backlighting set to the Power Saving mode on a fully charged battery.
Battery gauge:	Located on the **INFUSER SCREEN**, the gauge indicates the amount of battery life remaining
Battery recharge:	Recharging a depleted battery requires 6 hours or less when infuser is off. Battery automatically recharges while infuser operates on AC power

External Interfaces	
External communication ports:	1 Ethernet port 1 Nurse callback port To maintain safety of the infusion pump, the Ethernet connection is to be connected only to equipment that complies with IEC/UL 60950.
Nurse callback jack:	Standard 1/4 inch phone jack
Nurse call relay:	Industry standard type 1 Form C Reed relay NURSE-CALL alarm is factory set for Normally-Open (NO) Contact the Technical Services Center to make an internal adjustment to change the device from Normally-Open (NO) to Normally Closed (NC) system. Circuitry Ratings: Voltage-30 VDC Max Current- 0.25 Amps Max Contact Rating- 3 Watts Max
Wireless Connectivity	
Transceiver band:	2.412-2.462 GHz, 5.18-5.24 GHz, 5.26-5.32 GHz, 5.5-5.7 GHz, 5.725-5.825 GHz,ISM band
Wireless certification:	FCC Part 15C, 15E, Industry Canada
Communications standard:	IEEE 802.11 a/b/g
Input Device/Keypad	
Off-screen:	Off-screen buttons including **LOAD/EJECT**, **On/Off**, **SILENCE**, **Emergency Stop**
Touchscreen keypad:	Thin film transistor (TFT) touchscreen keys
LCD Display	
Display size:	8.4 inch diagonal color display
Viewable angles:	Minimum side angle: 45º ± 5º Vertical angle: 60º ± 5º
Display adjustments:	User-adjustable brightness control and Power Saving mode Computer-controlled backlight brightness level
LED Display	
External power LED:	Indicates when infuser is on AC power and when charging the battery
Infuser Alarms	
Channel LED:	LED color indicates infuser alarm states: **Solid red**—Malfunction alarm **Flashing red**—High urgency **Flashing yellow**—Medium urgency **Solid yellow**—Low urgency Solid red—Latched alarm
Infuser Alarms	
Alarm tones:	Initial alarm tone (except Latched alarm) sounds at a user-defined level. Alarm tone reverts to maximum level if no user action is taken within time configured for the CCA.

	Audible tone range is minimum of 45 dB(A) to a maximum of 65 dB(A) or more
Safety Features	
Power-on diagnostics:	Checks all critical infuser components and data at power-on; any component failure is reported and logged as a Malfunction alarm
Background diagnostics:	Checks and monitors all critical infuser components and data while powered-on; any component failure is reported and logged as a Malfunction alarm. Component failure during an infusion stops delivery on the appropriate channel.
Memory Protection	
Non-volatile memory:	Stores data and logs for at least one year after power is removed from the infuser
Date and Time Settings	
Time of day clock:	Displays time of day in either 12-hour or 24-hour formats
Temperature Parameters	
Ambient Operating temperature range:	5°C to 40°C
Storage temperature range:	-20°C to 60°C
Relative humidity:	Operational range of 10% to 90% non-condensing
Barometric pressure range:	Operational range from 0 to 10,000 feet
Surface temperature:	Maximum of 50° C
Delivery Rate	
Delivery range:	Between 0.1 to 1000 mL/hr

KVO Specification	
KVO rate:	Between 0.1 and 20 mL/hr programmed in 0.1 mL increments; default is 1.0 mL/hr
Hemolysis	
Blood and blood products:	During the pumping of red blood cells, the increase in %hemolysis is less than 2%.
Occlusion Settings	
Distal occlusion:	User specified range in either psi (from 1 to 15 in increments of 0.5) or mmHg (from 50 to 775 in increments of 25)
Proximal occlusion:	-5 psi/250 mmHg
Air sensitivity settings:	User-specified bubble size threshold levels: • 50 mcL • 100 mcL • 150 mcL • 250 mcL • 500 mcL Single bubble automatic threshold of 250 mcL. Cumulative bubble automatic threshold setting of < 1mL/15 minutes.
Maximum Time for Activation of Occlusion Alarm and Bolus on Release:	See the following table for specifications.

Rate	1 mL/hr			25 mL/hr		
Occlusion Alarm Limit Setting	**1 psig**	**8 psig**	**15 psig**	**1 psig**	**8 psig**	**15 psig**
Typical Time to Alarm (seconds):	34	258	486	4	34	68
Maximum Time to Alarm (seconds):	56	297	544	12	44	80
Typical Bolus Volume (mL:	<0.01	<0.06	<0.10	<0.03	0.22	0.43
Maximum Bolus Volume (mL):	0.01	0.06	0.1	0.07	0.27	0.5

Flow Rate Accuracy

The flow rate accuracy of the SYMBIQ™ Infusion System is ± 5% with 95% confidence under these conditions:

Table 14: Standard Environmental Conditions and Specifications

Condition	Specification
Ambient and fluid temperature:	22° C ± 5° C
Back pressure:	+ or -1 psig
Filling head height:	18 inches of water (± 4 inches)
IV fluid:	Sterile water or D20W.
Delivery rate range:	0.1 to 1000 mL/hr
Administration set conditions:	No air trapped in tubing. SYMBIQ™ administration sets used for testing were Macrobore List Number 16019-04-01 and Microbore List Number 16002-04-01. Administration sets may be used up to 72 hours.

WARNING: Rate accuracy can be affected by variations of fluid viscosity, fluid temperature, head height, back pressure or any combination. Additional factors that may influence rate accuracy are administration set configuration and the duration of time the administration set is utilized.

Flow Continuity

At low flow rates (between 0.1 and 1.0 mL/hr) with microbore and macrobore tubing, the no-flow period does not exceed 20 seconds and the bolus volume released does not exceed 2 microliters.

Trumpet Curves

Trumpet curve graphs show representative maximum and minimum percent flow rate deviation from the programmed rate over observation intervals of 2, 5, 11, 19, and 31 minutes. The graphs plot the mean delivery rate error (typical) for the 2nd hour, 72nd hour, and 96th hour as a straight line. Flow rate graphics plot flow rates at 30 second intervals for the first 2 hours, 72nd hour, and 96th hour of delivery. This information was developed in accordance with IEC 60601-2-24: 1998, Sub-Clause 50.102. Refer to this standard for detailed information.

Sample Trumpet Curve

On the trumpet curve graph sample shown in Figure 173, find the 5 minute interval (A) at the horizontal axis and read the corresponding points (B) and (C) on the vertical axis. The values are approximately +2.8% and -0.5%.

This means at the rate of 25 mL/hr, the average maximum flow rate fluctuation for any 5 minute time interval during the 2nd hour of operation was within the limits of +2.8% and -0.5% from the nominal rate. The average delivery rate error over the entire 2nd hour was +1.6% (D). For other time intervals, look at other points at the horizontal axis to determine the corresponding limits

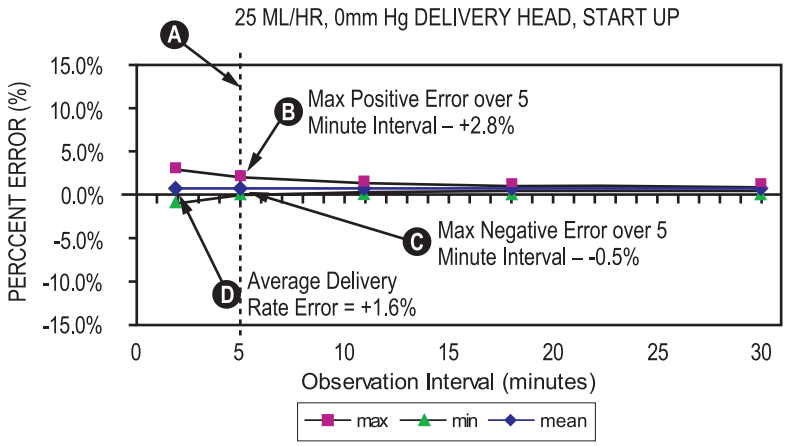


Figure 173: Sample Trumpet Curve

A trained professional can use the resulting graphs to select an infuser with the appropriate startup and flow characteristics to suit the clinical application.

To illustrate how trumpet curves are used, consider the maximum and minimum deviations at the 5 minute average interval. The upper curve provides the maximum expected delivery rate error over a 5-minute interval, the lower curve provides the minimum expected delivery rate error over a 5-minute interval. For example, Dopamine administered at 5 mcg/kg/ min. At 5 minutes, the average medication delivery error would be within the range of +2.8% and -0.5% of the expected nominal rate.

Flow Effects For Varying Delivery Conditions

Backpressure Variation Effects

When delivering at 25 mL/hr and at the backpressures shown below, the SYMBIQ™ Infusion System exhibits a long-term delivery offset as compared to delivery at 0 psig backpressure. The typical offsets are as shown below:

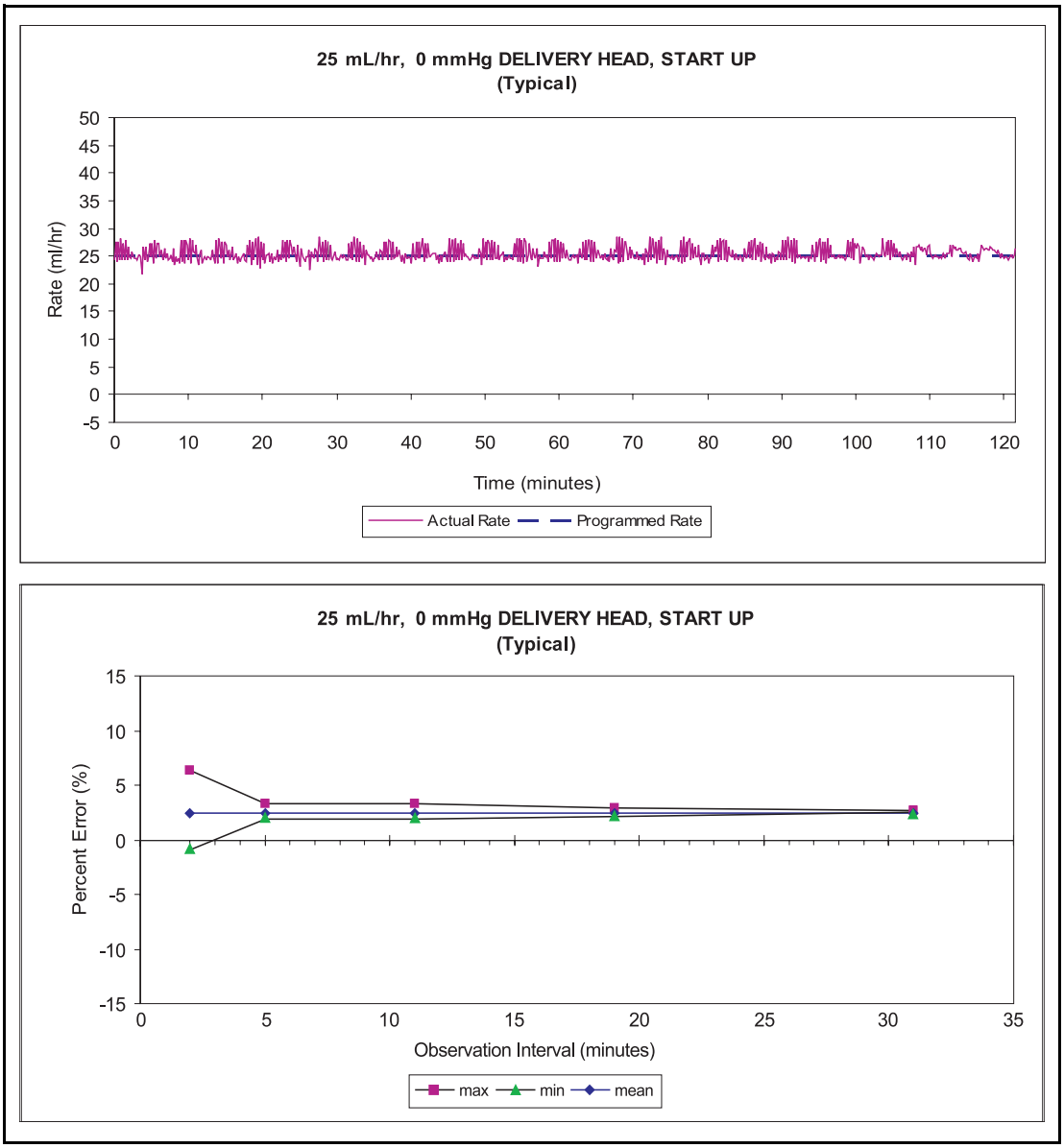
Backpressure (psig)	***Offset***
+2	***-2.4%***
-2	***+0.1%***

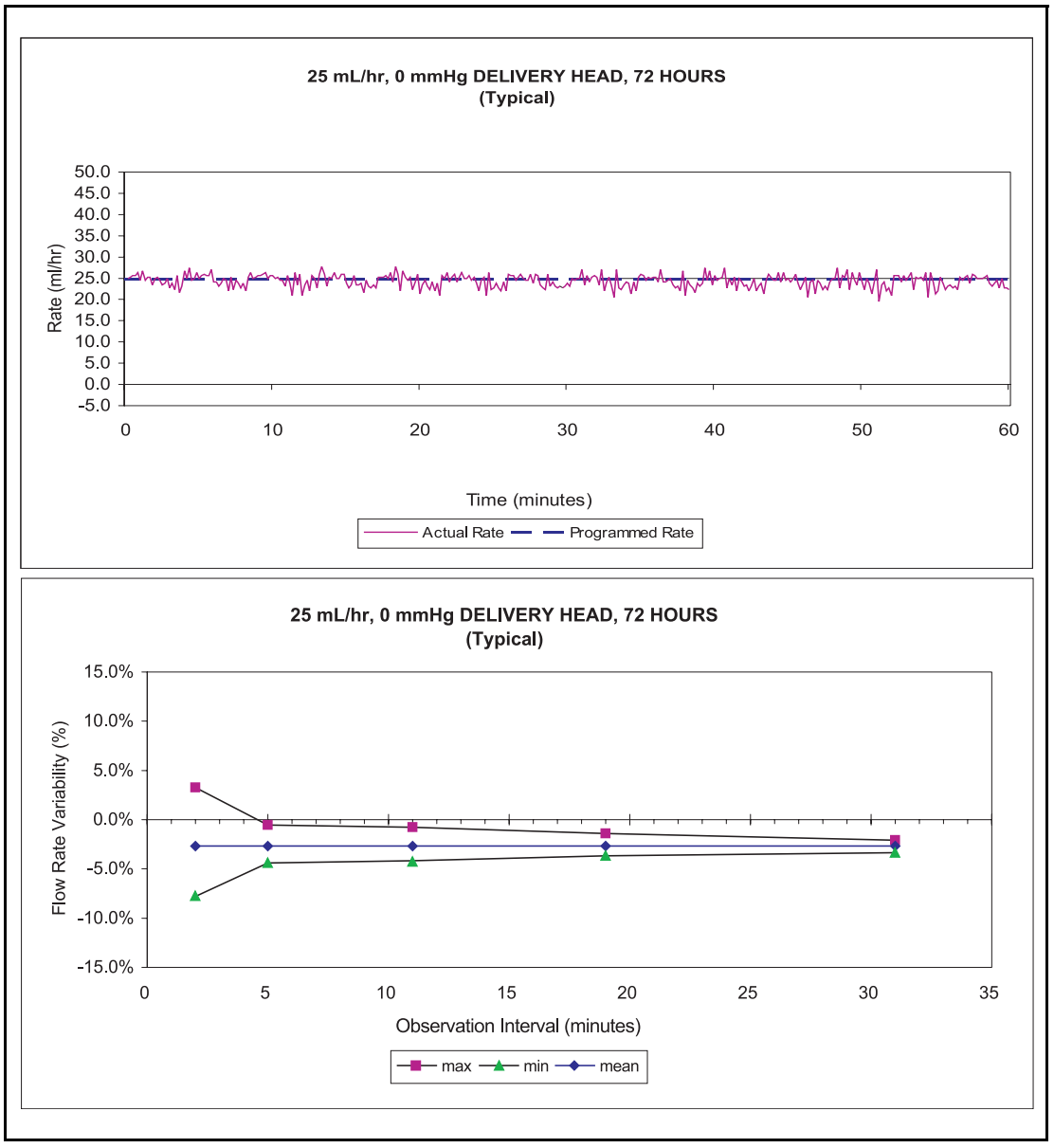
The maximum and minimum points on the trumpet curve typically track the mean long-term delivery error, therefore, there is no significant change in short-term variations under these pressure conditions.

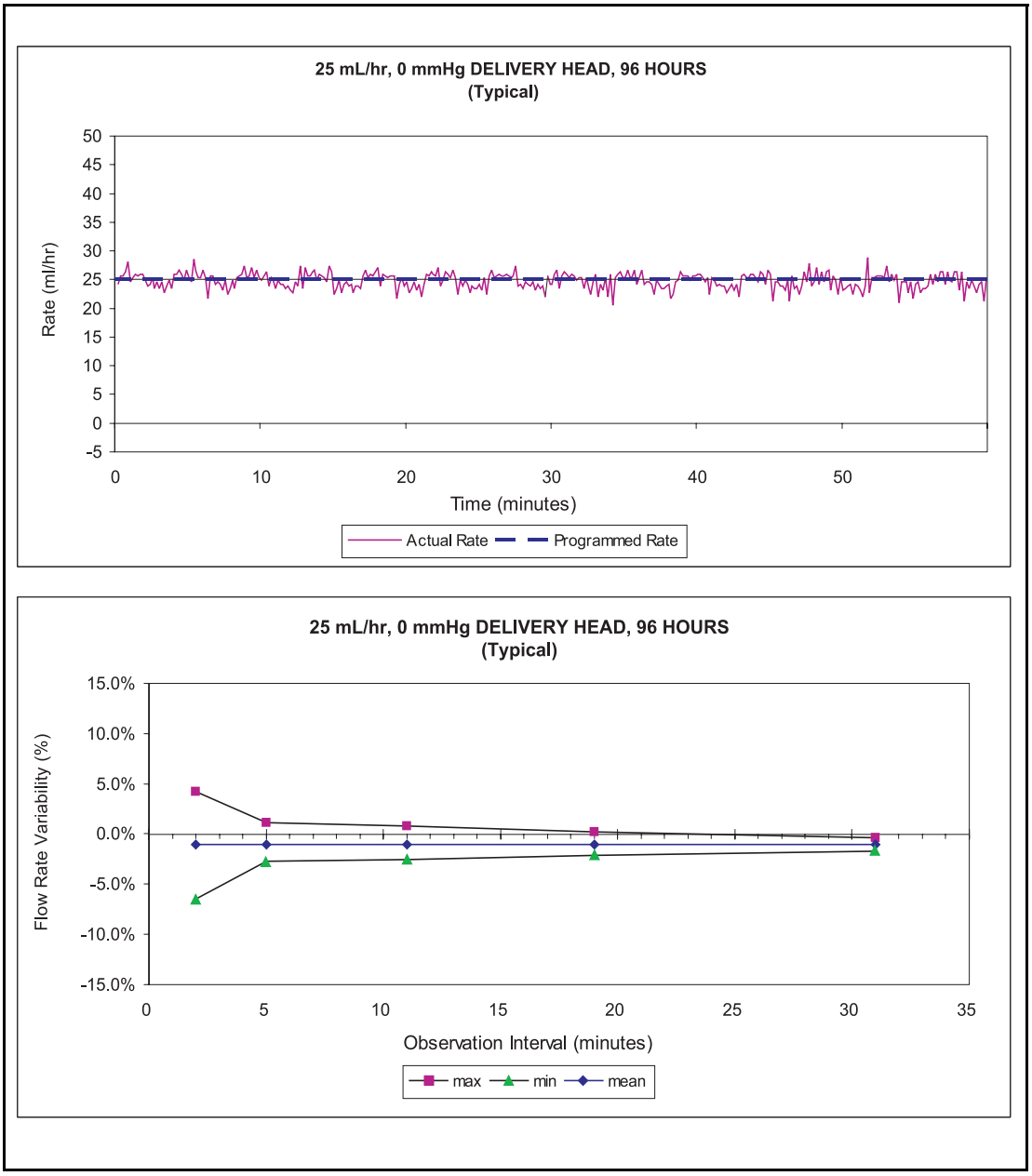
Negative Container Height Effects

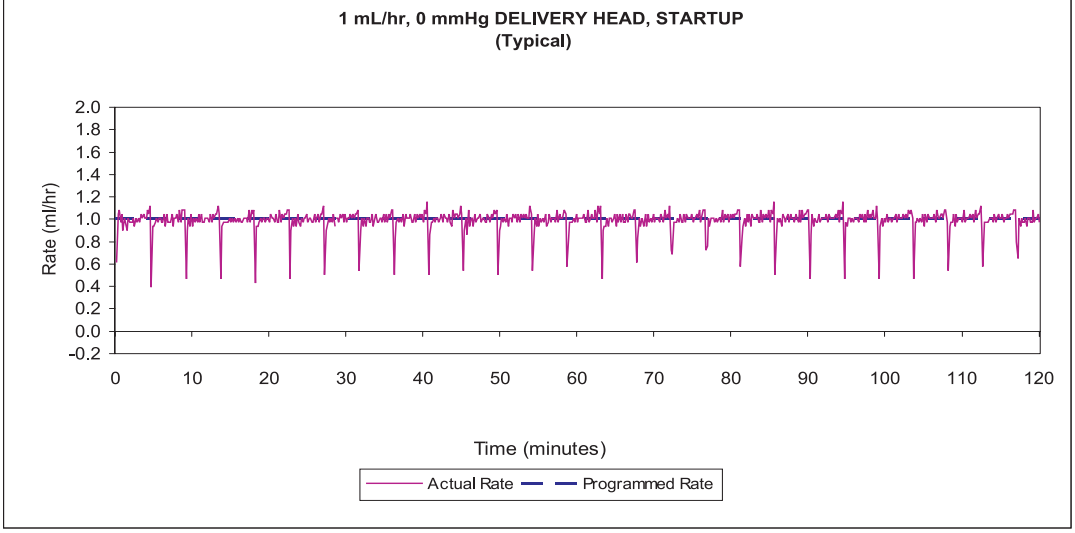
When delivering at 25 mL/hr with a Filling Head of -20” inches, the SYMBIQ™ Infusion System exhibits a long-term delivery offset as compared to the standard filling head conditions defined in Table 14. The typical offset is -6.7%.

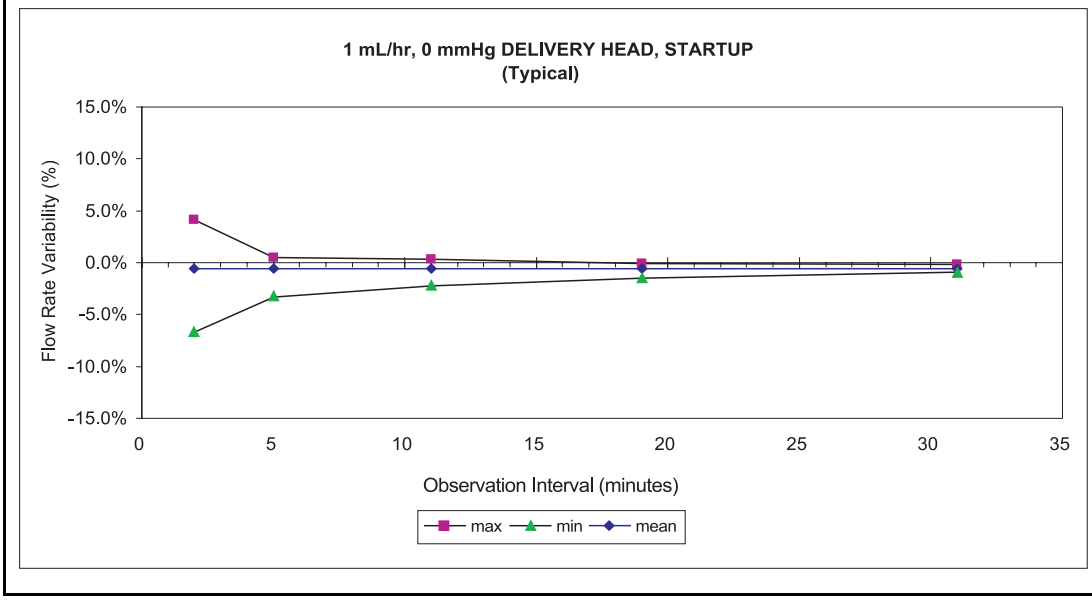
The maximum and minimum points on the trumpet curve typically track the mean long-term delivery error, therefore, there is no significant change in short-term variations under negative head height conditions.


25 mL/hr, 0 mmHg DELIVERY HEAD, START UP
(Typical)
Rate (ml/hr)
50
45
40
35
30
25
20
15
10
5
0
-5
0
10
20
30
40
50
60
70
80
90
100
110
120
Time (minutes)
Actual Rate
Programmed Rate
25 mL/hr, 0 mmHg DELIVERY HEAD, START UP
(Typical)
Percent Error (%)
15
10
5
0
-5
-10
-15
0
5
10
15
20
25
30
35
Observation Interval (minutes)
max
min
mean


25 mL/hr, 0 mmHg DELIVERY HEAD, 72 HOURS
(Typical)
Rate (ml/hr)
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
0
10
20
30
40
50
60
Time (minutes)
Actual Rate
Programmed Rate
25 mL/hr, 0 mmHg DELIVERY HEAD, 72 HOURS
(Typical)
Flow Rate Variability (%)
15.0%
10.0%
5.0%
0.0%
-5.0%
-10.0%
-15.0%
0
5
10
15
20
25
30
35
Observation Interval (minutes)
max
min
mean

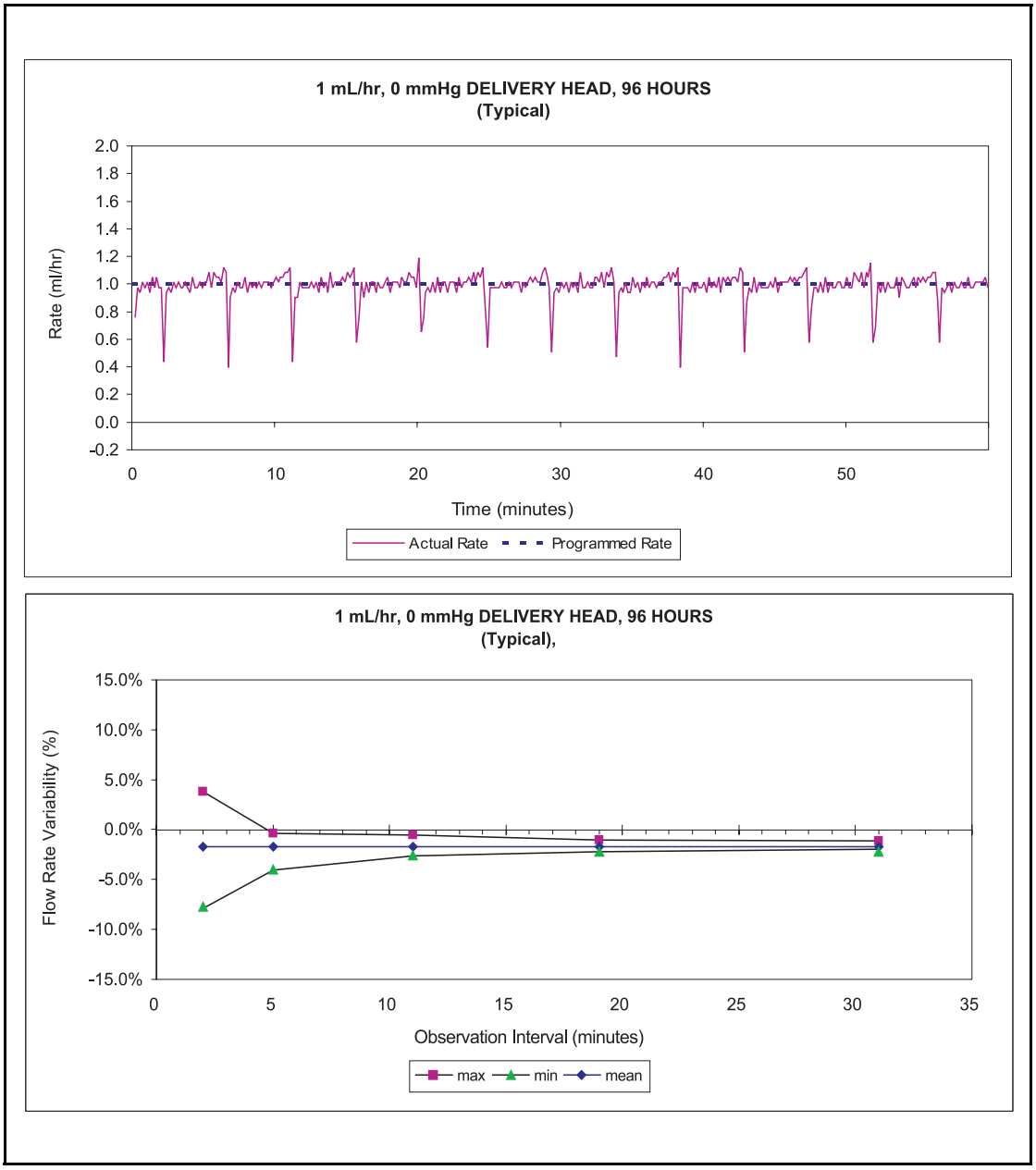

25 mL/hr, 0 mmHg DELIVERY HEAD, 96 HOURS
(Typical)
Rate (ml/hr)
50
45
40
35
30
25
20
15
10
5
0
-5
0
10
20
30
40
50
Time (minutes)
Actual Rate
Programmed Rate
25 mL/hr, 0 mmHg DELIVERY HEAD, 96 HOURS
(Typical)
Flow Rate Variability (%)
15.0%
10.0%
5.0%
0.0%
-5.0%
-10.0%
-15.0%
0
5
10
15
20
25
30
35
Observation Interval (minutes)
max
min
mean


1 mL/hr, 0 mmHg DELIVERY HEAD, STARTUP
(Typical)
Rate (ml/hr)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
0
10
20
30
40
50
60
70
80
90
100
110
120
Time (minutes)
Actual Rate
Programmed Rate


1 mL/hr, 0 mmHg DELIVERY HEAD, STARTUP
(Typical)
Flow Rate Variability (%)
15.0%
10.0%
5.0%
0.0%
-5.0%
-10.0%
-15.0%
0
5
10
15
20
25
30
35
Observation Interval (minutes)
max
min
mean


1 mL/hr, 0 mmHg DELIVERY HEAD, 72 HOURS
(Typical)
Rate (ml/hr)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
0
10
20
30
40
50
60
Time (minutes)
Actual Rate
Programmed Rate


1 mL/hr, 0 mmHg DELIVERY HEAD, 72 HOURS
(Typical)
Flow Rate Variability (%)
15.0%
10.0%
5.0%
0.0%
-5.0%
-10.0%
-15.0%
0
5
10
15
20
25
30
35
Observation Interval (minutes)
max
min
mean


1 mL/hr, 0 mmHg DELIVERY HEAD, 96 HOURS
(Typical)
Rate (ml/hr)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
0
10
20
30
40
50
Time (minutes)
Actual Rate
Programmed Rate
1 mL/hr, 0 mmHg DELIVERY HEAD, 96 HOURS
(Typical),
Flow Rate Variability (%)
15.0%
10.0%
5.0%
0.0%
-5.0%
-10.0%
-15.0%
0
5
10
15
20
25
30
35
Observation Interval (minutes)
max
min
mean

Wireless LAN Module

Device Name:	Hospira MedNet 802.11 a/b/g Wireless (Upgrade) Module
Standards:	IEEE 802.11 a/b/g
Transmit Power:	802.11 b/g- 17 dBm 802.11 a- 16 dBm
Antenna:	Integrated surface mount antenna
Certifications:	Part 15.247, 15.407 IC RSS-210, RSS-102 FCC ID: STJ-80411396001 IC: 5627A- 80411396 Model: CUSTOM DWL-AG132

Appendix A: System Messages and Troubleshooting

Appendix A outlines system messages generated by the SYMBIQ™ Infusion System, the cause of the message, how the message text displays, and steps to remedy the condition.

On-Screen Text	System Message	Message Cause	Steps to Remedy Alarm
Battery Depleted No Power if A/C Fails.	Battery Depleted	Powering on an infuser with a battery not having sufficient charge to power the device if AC power is disconnected.	Press **OK** to acknowledge. Plug in device to AC power.
Bolus In Progress (Bolus) **Piggyback In Progress** (Piggyback) Delivery will start when Bolus delivery is complete. (Bolus) Delivery will start when Piggyback delivery is complete. (Piggyback)	Delivery Will Start When Bolus/ Piggyback Completes	Pressing **Start** for a Basic or Advanced therapy Confirmation or **STOP MODE SCREEN** while a piggyback delivery is in progress on that channel or while a bolus that is set to "Resume Primary When Complete" is in progress on that channel.	Press **OK** to acknowledge.
Bolus In Progress Primary infusion can be started by clinician when bolus completes.	Delivery Can Be Started When Bolus Completes	Pressing **Start** on the primary **CONFIRMATION SCREEN** or **STOP MODE SCREEN** while a bolus is infusing that is set to stop when infusion complete.	Press **OK** to acknowledge.
BSA Out of Range Calculated BSA is Out of Range. BSA value has been cleared.	BSA Calculated Value Out of Range (invalid value based on updated Height, Weight or pressing **Calculate button**)	The user enters a parameter on the Weight-BSA-Height Pop-up that results in a calculated rate outside of the acceptable range.	Press **OK** Removes System Message from the display, clears the BSA and returns user to the Weight-BSA-Height Pop-up
Calculated Rate Out of Range The calculated rate is outside the accepted range. Verify program parameters.	Calculated Rate Out of Range	The user enters a parameter on the Dose Calc Complex Pop-up that results in a calculated rate outside of the acceptable range.	Press **OK** to acknowledge.
Calculated VTBI Out of Range The calculated VTBI is outside the accepted range. Verify program parameters.	Calculated VTBI Out of Range	The user enters a parameter on the Dose Calc Complex Pop-up that results in a calculated VTBI outside of the acceptable range.	Press **OK** to acknowledge.
Cancel Delayed Start? Programming Standby will cancel the Delayed Start.	Standby when Delayed Start is Selected	Selecting **Standby** when Delayed Start is already programmed.	Press **Continue** to cancel the Delayed Start and program Standby. Press **Cancel** to maintain current Delayed Start setting.

On-Screen Text	System Message	Message Cause	Steps to Remedy Alarm
Cancel Standby? Programming a Delayed Start will cancel Standby.	Delayed Start when Standby is Selected	Selecting Delayed Start option when Standby already programmed.	Press **Continue** to cancel Standby and program a Delayed Start. Press **Cancel** to maintain current Standby setting.
Cassette Eject Not Allowed (Clinical Mode): Channel delivery or power priming must be stopped or Delayed Start must be canceled before cassette can be ejected. (Biomed and Service Mode): Procedure must complete before cassette can be ejected.	Cassette Eject Not Allowed	Pressing **LOAD/EJECT** when the associated channel is delivering an infusion in Clinical Mode. OR Pressing **LOAD/EJECT** while the associated channel is running an infusion test or a calibration in Biomed or Service Mode. OR Pressing **Load/Eject button** while the associated channel is power priming (mechanism is moving). OR Pressing **Load/Eject button** while the associated channel is in Delayed Start.	(Clinical Mode - Delivery Mode) Press **Stop** to stop delivery. **Load/Eject** to eject the cassette after delivery is stopped. (Clinical Mode - Power Priming) Press **Cancel** to stop power priming. **Load/Eject** to eject the cassette after power priming is stopped. (Clinical Mode - Delayed Start) **Cancel Delayed Start**. **Load/Eject** to eject the cassette after Delayed Start is canceled. (Biomed and Service Mode) None.
CASSETTE REQUIRED A cassette must be loaded to program this channel. Load cassette and press **OK** to continue.	Casette Required	**PROGRAMMING SCREEN** is displaying, the ability to program without a cassette is configured off, the cassette for the associated channel is missing or improperly installed, and the user touches a program parameter field.	Press **Load/Eject button** and insert cassette.
CASSETTE REQUIRED A cassette must be loaded to start this channel. Load or check cassette and press **OK** to continue.	Verify Cassette	The **CONFIRMATION SCREEN** is displaying, the ability to program without a cassette is configured on or off, the cassette for the associated channel is missing or improperly installed, and the user presses the **Start button**.	Press **Load/Eject button** and insert cassette.
Change Air Sensitivity Setting? Change Channel <channel id> Air Sensitivity setting from <old value> to <new value>	Change Air Sensitivity Setting	Selecting an Air-In-Line Sensitivity setting that differs from the current setting and then exiting the screen for that setting.	Press **Yes** to continue with new setting. Press **No** to continue with previous setting.
Change CCA? Change CCA from <old CCA name> to <new CCA name>? Changing the CCA will clear any partially programmed channels.	Change CCA	Changing the current CCA by selecting a CCA from the CCA Selection drop-down list. ***Note:*** *Once a CCA has been selected (i.e., the CCA field is displaying a CCA name, not "Select CCA"), this message will display each time a CCA is selected from the drop-down list.*	Press **Yes** to change CCA. Press **No** to retain current CCA.
Change Distal Occlusion Setting? Change Channel <channel id>Distal Occlusion setting from <old value> to <new value>?	Change Distal Occlusion Setting	Selecting a Distal Occlusion setting that differs from the current setting and then exiting the screen for that setting.	Press **Yes** to continue with new setting. Press **No** to continue with previous setting.

On-Screen Text	System Message	Message Cause	Steps to Remedy Alarm
Change Proximal Occlusion Setting? Change Channel <channel id> Proximal Occlusion setting from <old value> to <new value>?	Change Proximal Occlusion Setting	Selecting a Proximal Occlusion setting that differs from the current setting and then exiting the screen for that setting.	Press **Yes** to continue with new setting. Press **No** to continue with previous setting.
Check BSA Change to height/weight may affect BSA. Check BSA value.	Check BSA Entered Value	Changing height or weight values after the BSA value has been entered.	Press **OK** to acknowledge.
Check BSA BSA will be recalculated using the BSA formula. New BSA is <calculated BSA value>.	BSA Calculated Value Affected (Valid value)	Changing height or weight values after the BSA value has been calculated and the new calculated BSA is a valid value.	Press **OK** to acknowledge.
Cleaning Lock Active. (if no cassette doors are open): Press **Cleaning Lock** button on the back of the infuser to unlock. (if one or more cassette doors are open): Ensure tubing is disconnected from patient before proceeding. Press **Cleaning Lock** button on the back of the infuser to unlock.	Cleaning Lock Active	Activating the Cleaning Lock.	Cleaning Lock will automatically deactivate <user defined time (e.g., 3 minutes)> from activation.
Clear All Settings and Data? Clearing the current patient information will also clear the CCA, caregiver ID, shift totals, program totals, medication amount totals, current program and logs.	Clear All Settings and Data	Pressing **Clear Patient Information and Data button** on the **PATIENT INFORMATION SCREEN**.	Press **Cancel** to exit without clearing. Press **Confirm** to clear all settings and data.
Clear Program? Continuing will result in loss of current program information.	Clear Program	Pressing **Clear All** on the first programming screen of an advanced therapy or **Clear** on the **BASIC PROGRAM PROGRAMMING SCREEN**.	Press **Continue** to clear all programmed values and proceed. Press **Cancel** to return to current program.
Delete Information? Delete <information to be deleted> Information to be deleted text: **SHIFT TOTALS SCREEN**: Shift Totals **BIOMED: OPERATION TEST SELECTION MENU SCREEN**: "all program, patient and totals data" **SERVICE LOGS MENU SCREEN**: contents of all logs	Delete Information	Pressing **CLEAR SHIFT TOTALS** on the **SHIFT TOTALS SCREEN** in Clinical Mode OR Pressing **Select Test button** on the **BIOMED: OPERATION TEST SELECTION SCREEN** in Biomed Mode OR Pressing **Clear All** on the Service: **LOGS MENU SCREEN** in Service Mode.	Press **Yes** to delete information. Clears Shift Totals and displays **SHIFT TOTALS SCREEN**. Press **No** to cancel. Retains information and removes the system message from the display. Displays screen from which the system message was accessed.
Disconnect Tubing Ensure tubing is disconnected from patient before proceeding.	Ensure Tubing is Disconnected from Patient	Pressing **Power Prime** on the **PROGRAM OPTIONS SCREEN**.	Press **OK** to acknowledge.

On-Screen Text	System Message	Message Cause	Steps to Remedy Alarm
Door open. Unable to power down. One or more cassette doors are open. Close door(s) and press the **On/Off button** again.	Unable to Power Down With Door Open	Pressing **Power** hard key when at least one cassette carriage is not closed (cassette present) or not in storage (cassette not present).	Press **OK** to acknowledge. Press **Force Shutdown** to power down with the door open.
Drug Duplication <Drug Name> is already in use.	Drug Name Duplication	Selecting the same drug (excluding “Other Drug”) for more than one program. ***Note:*** *On single-channel device, this applies to a bolus from secondary or piggyback dose. Bolus from primary, by default, uses the same medication.On a dual-channel device, this applies to a bolus from secondary or piggyback on the current line or any program on the other line.*	Press **Continue** to complete program with duplicate Drug Name. Press **Cancel** to Clear Duplicate Drug.
Drug Library Transfer Error <Library Name> transfer halted due to error. Infuser will power off within 30 seconds. Contact Biomed.	Library Transfer Error	An error occurs during a library transfer from the CE to the Infuser in progress causing the transfer to halt.	None
Exceeds VTBI Bolus volume exceeds Volume Remaining in primary delivery.	Exceeds VTBI	Pressing **Start Bolus** after programming a bolus from the primary container on a channel with an underlying primary delivery already confirmed and the bolus VTBI exceeds the primary delivery VTBI. OR Pressing **Enter** on any screen on the **BOLUS PRIMARY CONTAINER PROGRAMMING SCREEN** that causes the Bolus VTBI to be greater than the remaining primary VTBI on a channel with an underlying primary delivery already confirmed. ***Note:*** *Values on the programming screen will not change - user will have to modify the parameter they want to correct the situation before proceeding.*	Enter valid value or clear Bolus program and increase primary VTBI.
Infuser is initializing Start may be pressed when initialization is complete.	Infuser Initializing	Pressing the **Start button** while the infuser is initializing.	Press **OK** to acknowledge.

On-Screen Text	System Message	Message Cause	Steps to Remedy Alarm
Invalid Time Between Start of Deliveries The entered Time Between Start of Deliveries is less than or equal to the Dose time. If you continue, all Intermittent Dose values will be cleared.	Intermittent Invalid Time Between Start of Deliveries	In an Intermittent Program, the user programs a Dose and then backs up, changes the Time Between Start of Deliveries to a value less than or equal to the current Dose Time and presses **Enter** on the Time Between Start of Deliveries Numeric Keypad Pop-up.	Left (Cancel): Removes the system message from the screen, displays the **INTERMITTENT SETUP SCREEN** and reverts the changed Time Between Start of Deliveries value back to its previous value. Right (Continue): Removes the system message from the display, displays the Intermittent **SETUP SCREEN**, accepts the new value and clears the Intermittent Dose values (Dose, Rate, VTBI and Time).
Library Transfer Complete <Library Name> transfer complete. Infuser will power off within 30 seconds.	Library Transfer Complete	A library transfer from the CE to the Infuser completes.	None
Library Transfer Failed Last drug library transfer failed. Default Drug Library without rule sets has been installed. Contact Biomed before using this device	Library Transfer Failed	The Infuser is powered on after a failed drug library transfer. *Note: Pop-up will display over the* **PATIENT INFORMATION SCREEN**.	Press **OK** to acknowledge.
Library Transfer In Progress Transfer may take up to15 minutes. **DO NOT POWER OFF INFUSER WHILE THIS MESSAGE DISPLAYS**.	Library Transfer in Progress	A library transfer from the CE to the Infuser starts and is in progress.	Press **Cancel** to halt library transfer and power Infuser off.
Malfunction A malfunction occurred that might not have displayed. See the logs for additional information. All patient and therapy information has been cleared. Contact Biomed.	Malfunction Occurred	The infuser is powered on after a malfunction occurred during the last power up which may not display.	Press **OK** to acknowledge.
Multiple CCAs (single- channel): Channel A: <CCA name Channel A is operating under> (dual-channel): Channel A: <CCA name Channel A is operating under> Channel B: <CCA name is operating under>	Multiple CCAs	Programming one or more channels under the current CCA and pressing **Yes** on the Change CCA system message when no CCA passcode is required OR Programming one or more channels under the current CCA and pressing **Enter** on the CCA Access Passcode Pop-up after entering a valid CCA access code.	Therapies in progress will continue operating under the prior CCA rule sets. New therapies will operate under the new CCA rule sets. Press **OK** to acknowledge.

On-Screen Text	System Message	Message Cause	Steps to Remedy Alarm
Multiple CCAs Channel <channel ID> is operating under <Old CCA> rule set until program in progress is complete.	Old CCA Reminder	Pressing **any Program level button** to change the current program on a channel while that channel is operating under an old CCA after a CCA change. *Note: If the* **Advanced button** *is pressed and the* **ADVANCED THERAPY SCREEN** *appears the Old CCA Reminder system message will not appear until the Advanced therapy is selected.*	Press **OK**. Removes System Message from the display.
New Library Activated <Library Name> activated.	New Library Activated	Powering on the infuser after a successful library transfer and activation.	Press **OK** to acknowledge.
No Backup Battery In the event of A/C power loss, infusion will stop.	No Battery Backup (detected at Power On)	No battery is detected when the infuser is powered on.	Press **OK** to acknowledge.
No Dose/Amount or Rate Limits There are no rule sets applied to the Dose, Bolus Amount or Rate values.	No Dose/ Amount or Rate Limits - Informational	A 3-D channel has been pressed and a No Dose/Amount or Rate Limits condition exists.	Press **OK** to acknowledge.
Non-Operational Interchannel Sequence Cleared Interchannel Sequence Cleared due to non-operational channel.	Non-Operational Interchannel Sequence Cleared	One or both channels of Interchannel Sequence become non-operational prior to program conformation.	Press **OK** to acknowledge.
Operation Test Due Return Infuser to Biomed for Operation Test as soon as possible.	Operation Test Due	The infuser is powered down, “Operation Test Notify When Test is Due” device setting is set to **Yes** and the “Reminder Test is Due” setting is reached. ***Note:*** *Activation of the Operation Test Due System Message will be based on the current Date of the infuser.* ***Note:*** *Once the “Reminder Test is Due” setting has been reached, this system message will display (if not pre-empted by another system message that shuts the system down) each time the infuser is powered down until the Operation Test is completely run.*	Press **OK** to acknowledge.

On-Screen Text	System Message	Message Cause	Steps to Remedy Alarm
Outside Limits (Information will vary.)	Outside of Hard Limits	Pressing **Enter** on a Numeric Entry Keypad causes an entered or calculated value on the current programming screen to be outside of a user-specified hard limit and at least one override passcode has been defined for the current CCA. ***Note:*** *For Lower VTBI limit checking, the infuser must add the current Volume Infused value with the newly entered/calculated VTBI value and compare that total against the Lower VTBI limit to determine whether or not the lower limit has been violated.*	Press **Override** to bypass Limit. Press **Edit** to re-enter value.
Outside Limits (Information will vary.)	Outside of Soft Limits	Pressing **Enter** on a Numeric Entry Keypad causes an entered or calculated value on the current programming screen to be outside of a user-specified soft limit, but that value does not violate a hard limit. ***Note:*** *For Lower VTBI limit checking, the infuser must add the current Volume Infused value with the newly entered/calculated VTBI value and compare that total against the Lower VTBI limit to determine whether or not the lower limit has been violated.*	Press **Override** to bypass Limit. Press **Edit** to re-enter value.
Outside Limits (Information will vary.) ***Note:*** *If the value that exceeds the hard limit is a calculated value, the Hard Limit Outside of Limits System Message shall be displayed with "(Calculated Value)" instead of "(Programmed Value)".*	Outside of Hard Limits - Informational	Pressing a 3-D channel tab when an Outside of Hard Limits condition exists. OR Exceeding a hard limit but no hard limit override passcodes are defined.	Press **OK** to acknowledge.
Outside Limits (Information will vary.) ***Note:*** *If value that exceeds soft limit is a calculated value, Soft Limit Outside of Limits System Message shall be displayed with <Calculated Value> instead of <Programmed Value>.*	Outside of Soft Limits - Informational	Pressing a 3-D channel tab when an Outside of Soft Limits condition exists.	Press **OK** to acknowledge.
Outside Limits Enter Override Code.	Hard Limit Override	Pressing **Override** on the Outside of Hard Limits system message.	Enter override code by pressing number buttons and then press **Enter**. **Cancel** to exit.

On-Screen Text	System Message	Message Cause	Steps to Remedy Alarm
Power Off Unavailable (Clinical Mode): "Infuser cannot be powered down while one or more channels are in Delivery Mode, Delayed Start or power priming. Stop delivery or power priming, or cancel Delayed Start on all channels to power down." (Biomed and Service Mode during test or calibration): "Procedure must complete before infuser can be powered off." (While a software download is in progress): "The infuser cannot be powered down while a software download is in progress. The infuser will power down automatically when the download is complete." DETAIL (While system is re initializing) "Infuser cannot be powered down while system is re initializing."	Power Off Unavailable	The user attempts to turn the Infuser off while one or more channels are in Delivery Mode in Clinical Mode OR The user attempts to turn the Infuser off while it is running an infusion test or a calibration. OR The user attempts to turn the Infuser off while a power prime is in progress. OR The user attempts to turn the Infuser off while one or more channels is in Delayed Start. OR The user attempts to turn the Infuser off while a software download is in progress. OR The user attempts to turn the Infuser off while the device is being re initialized.	(Clinical Mode) "Press OK to acknowledge." (Biomed and Service Mode other than when downloading software) None (Biomed Mode or Service Mode while software is downloading) "Press OK to acknowledge."
Program Cleared Channel <channel id> was in standby for 24 hours. Standby has been canceled and program has been cleared. Pop-up displays over **BASIC PROGRAMMING SCREEN**.	Program Cleared	24 hours has elapsed since channel was put in Standby.	Press **OK** to acknowledge.
Program Data Will Be Deleted Program Data in eliminated steps will be lost.	Program Data Will Be Deleted	Reducing the number of steps in a Multistep program, and the deleted steps contain programmed data.	Press **Continue** to proceed with change and clear associated program data. Press **Cancel** to undo change.

On-Screen Text	System Message	Message Cause	Steps to Remedy Alarm
Program is Being Cleared Programs on Channel <channel ID> will now operate within the <New CCA> rule set.	Program is Being Cleared	Accessing a Programming Mode in the **STOP MODE SCREEN** after the End of Infusion Alarm has occurred (whether or not the alarm overlay was touched) and the program is operating under the old CCA after a CCA change OR Accessing a Programming Mode for the first time, for a program: • after a power cycle less than 5 hours • occurring after End of Infusion alarm (whether or not the alarm overlay was touched) • not cleared at power on, and • operating under old CCA after a CCA change OR A pending CCA is invoked for a channel.	Press **OK** to acknowledge.
Recondition Battery Battery needs servicing. Contact Biomed.	Recondition Battery	Infuser battery needs reconditioning (Conditioning Cycle Request detected at power on).	Press **OK** to acknowledge.
Resume Primary Selected Any remaining volume in secondary container will deliver at primary rate.	Resume Primary after Secondary	Programming a bolus from secondary and setting *When Bolus Completes to Resume Primary.*	Press **OK** to acknowledge.
Secondary Line Maximum Rate Entered or calculated rate must be 500 mL/hr. or less for a secondary line. If desired delivery rate is above 500 mL/hr., reprogram using a primary line.	Secondary Line Maximum Rate	Pressing **Enter** on a programming screen whose entry results in a Rate value greater than 500 mL/hr. OR Entering a rate value greater than 500 mL/hr in the Rate Numeric Keypad.	Press **OK** to acknowledge.
Secondary on <channel ID> Hang Secondary container higher than Primary container. Open Secondary slide clamp. ***Note:*** *This pop-up displays over the* **CONFIRMATION SCREEN**.	Secondary Confirmation	Pressing **Next** on the Piggyback or **BOLUS PROGRAMMING SCREEN** to access the **CONFIRMATION SCREEN**.	Press **OK** to acknowledge.
Transfer Drug Library A new drug library is ready to be transferred to the Infuser. Transfer may take up to 15 minutes.	Transfer Drug Library?	Pressing **On/Off** when the infuser is in Clinical mode and a library is ready to be transferred from the CE to the infuser.	Press **Yes** to begin Drug Library transfer. Press **No** to power off without transferring the Drug Library.

On-Screen Text	System Message	Message Cause	Steps to Remedy Alarm
Unable to Download Device Software (HMSS disconnected): HMSS is not connected. Ensure connection exists and press **Start** again. (Active software version is not obtainable): Active device software version is not obtainable.	Unable to Download Device Software	User presses **Start** on the **BIOMED: DEVICE SOFTWARE DOWNLOAD SCREEN** and the HMSS is not connected or the active software version is not obtainable.	None
Use Same Program for Channel <channel ID> Press **Yes** to use the same program values that were used for the first delivery in this sequence.	Use First Program Parameters	Pressing **Next** on the second program screen of a 3-part Interchannel Sequence where the third delivery is on the same channel as the first delivery.	Press **Yes** to automatically enter values used in first program screen. Press **No** to enter new values.
CASSETTE REQUIRED A cassette must be loaded to start this channel. Load or check cassette and press **OK** to continue.	Verify Cassette	The **CONFIRMATION SCREEN** is displaying, the ability to program without a cassette is configured on or off, the cassette for the associated channel is missing or improperly installed, and the user presses the **Start button**.	Press **Load/Eject button** and insert cassette.
Cleared Interchannel Sequence Interchannel Sequence cleared due to non-operational channel.	Non-Operational Interchannel Sequence Cleared	One or both channels of an Interchannel Sequence become non-operational prior to program confirmation.	Press **OK** to acknowledge.

Appendix B: Alarm Messages and Troubleshooting

Appendix B outlines alarm messages generated by the SYMBIQ™ Infusion System, the cause of the alarm, how the alarm text displays, steps to remedy the alarm, and the alarm urgency.

On-Screen Text	Alarm Message	Alarm Cause	Steps to Remedy	Alarm Urgency
ACCUMULATED AIR-IN-LINE Infusion stopped. Remove air from line, if present. Restart infusion. Check container and fluid path if alarm persists. Press here to minimize all alarms.	Air-in-Line	An amount of air, greater than or equal to the current air sensitivity setting, is detected in the line distal to the cassette while the device is infusing. OR An amount of accumulated air over 15 minutes exceeds the 15 minute threshold. *Note: If both thresholds are violated at the same time, the single-bubble messages will display.*	Restart the infusion to clear the alarm. Clear the current program to clear the alarm. Press the alarm window to minimize the alarm. Press the **1 mL**, **3 mL**, or **5 mL** button on the **Power Prime screen** to clear the alarm.	High
AIR-IN-LINE [Single Bubble] Infusion stopped. Remove air from line. Restart infusion. Check air sensitivity setting if alarm persists. Press here to minimize all alarms.	Air-in-Line	An amount of air, greater than or equal to the current air sensitivity setting, is detected in the line distal to the cassette while the device is infusing. OR An amount of accumulated air over 15 minutes exceeds the 15 minute threshold. *Note: If both thresholds are violated at the same time, the single-bubble messages will display.*	Restart the infusion to clear the alarm. Clear the current program to clear the alarm. Press the alarm window to minimize the alarm. Press the **1 mL**, **3 mL**, or **5 mL** button on the Power Prime screen to clear the alarm.	High
BOLUS COMPLETE *(Bolus)* **PIGGYBACK COMPLETE** *(Piggyback)* Unable to resume primary infusion. Enter or Start delivery. Press here to clear alarm.	Infusion Complete (No Primary)	A Bolus is set to Resume Primary or a Piggyback is programmed and there is no primary programmed when the Piggyback or Bolus completes.	Press alarm window to clear the alarm. Clear associated program to clear the alarm. Confirm a new piggyback dose to clear a Piggyback Infusion Complete (No Primary) alarm. Confirm a new bolus dose to clear a Bolus Infusion Complete (No Primary) alarm.	Medium

On-Screen Text	Alarm Message	Alarm Cause	Steps to Remedy	Alarm Urgency
BOLUS COMPLETE *(Bolus)* **PIGGYBACK COMPLETE** *(Piggyback)* **STEP <n> COMPLETE** *(Multistep)* Stop Infusion or Callback requested by caregiver. None Press here to clear alarm.	Infusion Complete	Setting the Infusion Complete Callback Option for Piggyback, Bolus or Multistep, and the Piggyback, Bolus or any Multistep step 1 through *n-1*, respectively, completes. OR Callback Option is set to **Yes** because Stop Infusion during Bolus programming was selected.	Press alarm window to clear the alarm. Clear associated program to clear the alarm. Confirm a new piggyback dose to clear a Piggyback Infusion Complete alarm. Confirm a new bolus dose to clear a Bolus Infusion Complete alarm. Activate Multistep Step *n* Infusion Complete alarm to clear a Multistep *n-1* Infusion Complete alarm.	Medium

On-Screen Text	Alarm Message	Alarm Cause	Steps to Remedy	Alarm Urgency
CALLBACK Waiting for user input. None Press here to clear alarm.	Callback	The infuser has been waiting for a user keypress on a pop-up for more than the time configured for the current CCA, or the DDL, if being used. OR The Infuser has been waiting for a user keypress on a pop-up for more than the time configured for the current CCA, or the DDL, if being used. OR The Infuser has been waiting for a user keypress on the Patient Information screen with no CCA selected for 2 minutes ± 2 seconds. OR One or more channels are Active and waiting for input OR One or more channels are Idle and waiting for input OR All channels on a device are idle. OR End of Infusion alarm has been cleared, no supplemental infusion is running on the channel, primary infusion has not been cleared for the channel, a new infusion has not started for the channel, channel is still in End of Infusion state and 2 minutes have elapsed since the alarm was cleared (state of other channel is irrelevant) OR Infusion Complete alarm (with or without an underlying primary) has been cleared on a dual channel, 2 minutes have elapsed and the channel is still in Infusion Complete state. *Note: A single channel Infuser will have a callback.* Notes: On a dual-channel, the Callback alarm will only sound for an idle channel if both channels are idle. An Idle channel is one that does not have an active therapy. *A channel has an active therapy if the user has pressed the start button or placed the channel in Delayed Start or Standby. The therapy is active until the therapy ends or is stopped. Specific cases include, No KVO therapies are inactive when the VTBI reaches zero; KVO therapies are inactive when the user stops the therapy during KVO after VTBI reaches zero; A channel in Standby becomes inactive when Standby expires after 24 hours.* *An Infuser can be waiting for input on a Programming (including Options), Setup, Confirmation screen or the Advanced Therapy Selection screen.*	Press alarm window to clear alarm for that channel. Any key press in an active area of the touchscreen will reset the Callback Alarm timers (channel and device) but will not reset existing alarms.	Medium
Pump Idle "Waiting for user input." “Press here to clear alarm”	Pump Idle"	If both channels on a dual channel Infuser are clear and waiting to be programmed, and neither channel is in Standby, and no activity has been detected for 2 minutes.	Touching the alarm overlay clears the alarm.	Medium

On-Screen Text	Alarm Message	Alarm Cause	Steps to Remedy	Alarm Urgency
CHECK CASSETTE *Alarm occurred in Delivery Mode—* Infusion stopped. *Alarm occurred outside of Delivery Mode —* Cassette improperly installed or missing. Reinstall cassette. Contact Biomed if problem persists. Press here to minimize all alarms.	Check Cassette	The user attempts to access Delivery Mode for the channel and the cassette is determined to be improperly installed or missing for the channel. OR User attempts to load cassette and the linear pixel array indicates there is a problem. OR Sensors indicate that the cassette is no longer properly loaded while the channel is in Delivery Mode. OR The user manually ejects the cassette. OR During an Interchannel Sequence delivery, the Infuser attempts to start a delivery on a channel and the cassette is determined to be improperly installed or missing for that channel.	Properly install the cassette to clear the alarm. Close the cassette door with no cassette present to clear the alarm. Press the alarm window to minimize the alarm.	*Infuser in Delivery mode:* High *Infuser not in Delivery mode:* Medium
CHECK FLOWSTOP *Caused by distal pressure flowstop problem* Cassette flowstop may not be closed. Close clamp and ensure flowstop is closed. Replace set if problem persists. Press here to clear alarm.	Check Flowstop	Distal pressure derivative flowstop problem is set for a channel because the door is opening with distal pressure indicating possible flowstop open.	Touch alarm screen to clear the alarm.	High
CHECK FLOWSTOP *Caused by cassette problem* Cassette flowstop may not be closed. Close clamp, open door, and ensure flowstop is closed. Replace set if problem persists. Press here to minimize all alarms.	Check Flowstop	Cassette problem is set for a channel (door is closed with high pressure indicating possible debris present).	Open the door to clear the alarm. Press the alarm window to minimize the alarm.	High
DEPLETED BATTERY ANALYSIS 5 minutes or less remaining battery life. Connect pump to AC power. Press here to minimize all alarms. See List	Depleted Battery	The battery has 5 minutes or less remaining battery life at the current infusion rate, and the battery is currently the last power source. *Note: When battery life is exhausted the pump will shut down and the backup buzzer will sound.*	Connect pump to AC power using the AC power cord. Press the alarm window to minimize the alarm.	High

On-Screen Text	Alarm Message	Alarm Cause	Steps to Remedy	Alarm Urgency
DISTAL OCCLUSION (Active Alarm) Delivery stopped. Clear occlusion below pump. Restart delivery. If not priming, check occlusion sensitivity setting if alarm persists. Press here to minimize all alarms.	Distal Occlusion	The distal pressure is greater than the selected pressure level and the channel is in Delivery mode. OR The distal pressure is greater than 10 psi and the infuser is power priming.	If distal pressure becomes less than 50% of the selected pressure level for three seconds within 60 seconds of detection, alarm auto-clears and becomes latched, Distal Alarm Auto-Clears counter increments by 1, and delivery resumes—if the channel has not exceeded the allowed number of auto clears. Stop Mode—Pressing **Start** clears the alarm. ***Note**: If Occlusion still exists, a new instance of the alarm will activate.* Priming—Press **Cancel**, **1 mL**, **3 mL** or **5 mL** button on Power Prime screen to clear the alarm. Press the active alarm window to minimize the alarm. Press the latched alarm window to clear the alarm. Change the Distal Occlusion threshold setting to a new threshold greater than the current measured pressure to clear the alarm.	High

On-Screen Text	Alarm Message	Alarm Cause	Steps to Remedy	Alarm Urgency
DISTAL OCCLUSION (Latched Alarm) Delivery was interrupted during distal occlusion. None Press here to clear alarm.	Distal Occlusion	The distal pressure is greater than the selected pressure level and the channel is in Delivery mode. OR The distal pressure is greater than 10 psi and the infuser is power priming.	If distal pressure becomes less than 50% of the selected pressure level for three seconds within 60 seconds of detection, alarm auto-clears and becomes latched, Distal Alarm Auto-Clears counter increments by 1, and delivery resumes—if the channel has not exceeded the allowed number of auto clears. Stop Mode—Pressing Start clears the alarm. ***Note**: If Occlusion still exists, a new instance of the alarm will activate.* Priming—Press **Cancel**, **1 mL**, **3 mL** or **5 mL** button on Power Prime screen to clear the alarm. Press the active alarm window to minimize the alarm. Press the latched alarm window to clear the alarm. Change the Distal Occlusion threshold setting to a new threshold greater than the current measured pressure to clear the alarm.	High
EMERGENCY STOP **Emergency Stop button** pressed. Infusion(s) stopped. None Press here to clear alarm.	Emergency Stop	**Emergency Stop** off-screen button has been activated during infusion.	Press alarm window or restart channel to clear alarm.	High

On-Screen Text	Alarm Message	Alarm Cause	Steps to Remedy	Alarm Urgency
END OF INFUSION (KVO) (*KVO is delivering)* Infusion Complete. KVO in progress. **Clear** or edit current program. Press here to clear alarm.	End of Infusion	*Basic Program* - Programmed VTBI delivery completes. OR *Multistep/Intermittent*—Last Step/Dose delivery completes. OR Interchannel Sequence - Programmed VTBI for any ICS segment delivery is complete	Press alarm window to clear alarm. The start of an Interchannel Sequence delivery on a channel clears an existing Interchannel Sequence delivery End of Infusion alarm on that channel. (for example, an ABA sequence is programmed. The first A delivery completes and an End of Infusion alarm activates for that channel. The B delivery begins and has no effect on the A End of Infusion alarm. The B delivery completes and the second A delivery begins. The second A delivery clears the first A End of Infusion alarm but has no effect on the B End of Infusion alarm.)	Medium
END OF INFUSION (*KVO is not delivering)* Infusion Complete. No KVO. **Clear** or edit current program. Press here to clear alarm.	End of Infusion	*Basic Program* - Programmed VTBI delivery completes. OR *Multistep/Intermittent*—Last Step/Dose delivery completes. OR Interchannel Sequence - Programmed VTBI for any ICS segment delivery is complete	Press alarm window to clear alarm. The start of an Interchannel Sequence delivery on a channel clears an existing Interchannel Sequence delivery End of Infusion alarm on that channel. (for example, an ABA sequence is programmed. The first A delivery completes and an End of Infusion alarm activates for that channel. The B delivery begins and has no effect on the A End of Infusion alarm. The B delivery completes and the second A delivery begins. The second A delivery clears the first A End of Infusion alarm but has no effect on the B End of Infusion alarm.)	Medium

On-Screen Text	Alarm Message	Alarm Cause	Steps to Remedy	Alarm Urgency
INTERMITTENT CALLBACK Selected callback time has been reached. None Press here to clear alarm.	Intermittent Callback	The selected callback time before an Intermittent Dose is less than or equal to the programmed Time Between Start of Deliveries and the callback time is reached for any dose (regardless of whether the infuser is in Programming Mode, Delivery Mode or Stop Mode). OR The selected callback time before an Intermittent Dose is greater than the programmed Time Between Start of Deliveries and any dose but the last dose begins delivery. OR Whether a callback time or **Off** is selected for the Intermittent Callback option, the infuser is in **Stop** or **Programming** mode and the start time for the next dose is reached.	Press the alarm window to clear the alarm for that channel. Activate an End of Infusion alarm for an Intermittent program to clear an active Intermittent Callback alarm for that program. Activate an Intermittent Callback alarm for Dose n clears the Intermittent Callback alarm for Dose n-1 for the same program. (i.e., Intermittent Callback Alarm for Dose 3 clears the Intermittent Callback Alarm for Dose 2).	Medium
LOW BATTERY Less than <30, 15, 5> minutes of battery life remaining at current rate. Connect pump to AC power. Press here to minimize all alarms.	Low Battery	The battery has <= 30 minutes but > 15 minutes of delivery left at the current infusion rate and battery power is the last power source. OR The battery has <= 15 minutes but > 5 minutes of delivery left at the current infusion rate and battery power is the last power source.	Infuser detects AC power to clear the alarm. Onset of a higher-priority Low Battery alarm clears a lower-priority Low Battery alarm. Onset of the Depleted Battery alarm clears the Low Battery alarm. Touching the alarm overlay body minimizes the alarm.	*30 minutes:* Low *15 minutes*: Medium

On-Screen Text	Alarm Message	Alarm Cause	Steps to Remedy	Alarm Urgency
NEARING END OF INFUSION Infusion almost complete. None. Press here to clear alarm.	Nearing End of Infusion	The total time remaining on a primary infusion transitions from being greater than the user-defined Nearing End of Infusion alarm setting to being less than or equal to that setting. OR A bolus or piggyback delivery completes and the infuser transitions back to a primary infusion that has a total time remaining which is less than or equal to the user-defined Nearing End of Infusion alarm setting. OR The total time remaining on a primary infusion is less than the Nearing End of Infusion setting on a therapy start or restart. *Note: Once a Nearing End of Infusion alarm has been cleared, it will only recur if one of these triggers occurs again.*	Press alarm window to clear the alarm. Press **Start** after titrating the associated program to clear the alarm. Change the Nearing End of Infusion alarm setting so a Nearing End of Infusion condition no longer exists clears the alarm when **Done** is pressed on the Options screen. Starting a piggyback or bolus dose clears an active Nearing End of Infusion alarm on the same channel. Activate an End of Infusion alarm for a channel to clear an active Nearing End of Infusion alarm for the same channel.	Low
NEW DRUG LIBRARY New library available. Accepting library will clear current patient, programs and totals. When safe, power off Infuser to accept. Press here to minimize all alarms.	New Drug Library	The infuser is currently powered on and a library is ready in the CE for transfer to the infuser. OR At power on, a library is ready in the CE to transfer to the infuser.	Successfully transfer the library to the infuser to clear the alarm. Press the alarm window to minimize the alarm.	Low
None (no message can be displayed).	Depleted Battery Shutdown	A depleted battery is detected and the infuser is operating on battery power.	None (no messages can be displayed - a total loss of power.)	High
None (no message can be displayed).	Power Loss	The infuser is powered by AC only and the power level drops below the level required to operate the infuser.	None (no messages can be displayed - a total loss of power.)	High

On-Screen Text	Alarm Message	Alarm Cause	Steps to Remedy	Alarm Urgency
PROXIMAL OCCLUSION (Latched Alarm) Delivery was interrupted during proximal occlusion. None Press here to clear alarm.	Proximal Occlusion	The proximal pressure is less than or equal to the selected pressure level and the channel is in Delivery mode. OR The proximal pressure is less than -7 psi and the channel is power priming.	If proximal pressure becomes greater than 50% of the selected pressure level within 60 seconds of detection, alarm auto-clears and becomes latched, Proximal Alarm Auto-Clear counter increments by 1, and delivery resumes—if the channel has not exceeded the allowed number of auto clears. Stop Mode—press **Start** to clear the alarm. ***Note**: If Occlusion still exists, a new instance of the alarm will activate.* Priming—Press **Cancel**, **1 mL**, **3 mL** or **5 mL** button on Power Prime screen to clear the alarm. Change the Proximal Occlusion threshold setting for the affected channel to a new threshold less than the current measured pressure to clear the alarm. Clearing a program clears a proximal occlusion alarm caused by that program.	High

On-Screen Text	Alarm Message	Alarm Cause	Steps to Remedy	Alarm Urgency
PROXIMAL OCCLUSION (Active Alarm) Delivery stopped. Clear occlusion above pump. Restart delivery. If not priming, check occlusion sensitivity setting if alarm persists. Press here to minimize all alarms.	Proximal Occlusion	The proximal pressure is less than or equal to the selected pressure level and the channel is in Delivery mode. OR The proximal pressure is less than -7 psi and the channel is power priming.	If proximal pressure becomes greater than 50% of the selected pressure level within 60 seconds of detection, alarm auto-clears and becomes latched, Proximal Alarm Auto-Clear counter increments by 1, and delivery resumes—if the channel has not exceeded the allowed number of auto clears. Stop Mode—press **Start** to clear the alarm. ***Note**: If Occlusion still exists, a new instance of the alarm will activate.* Priming—Press **Cancel**, **1 mL**, **3 mL** or **5 mL** button on Power Prime screen to clear the alarm. Change the Proximal Occlusion threshold setting for the affected channel to a new threshold less than the current measured pressure to clear the alarm. Clearing a program clears a proximal occlusion alarm caused by that program.	High
REINTIALIZING SYSTEM The system is re initializing PLEASE WAIT Press here to minimize	Reinstall-izing System	The device detects the flash memory is not formatted. OR The device forces the formatting of the flash due to a software download.	Touch alarm overlay body to minimize the alarm.	High

On-Screen Text	Alarm Message	Alarm Cause	Steps to Remedy	Alarm Urgency
RESTART REQUIRED The infuser needs to be restarted. Please restart the infuser. Press here to minimize	Restart Required	The flash memory has completed formatting.	Touch alarm overlay body to minimize the alarm.	High
SERVICE BATTERY Connect to AC power. Battery should be replaced. In the event of power loss, infusion will stop.	Service Battery	Battery shorted OR SMBus error/Battery Communication error OR Battery open OR Battery missing OR Battery will not charge OR Battery under-voltage OR Battery Service warning.	Replace Battery to clear alarm. Press alarm window to minimize the alarm. *Note: When operating on battery power in a high temperature environment, the battery temperature may exceed the recommended charging temperature. This will cause a service battery warning when switching to AC power to charge the battery. Battery charging will begin automatically when the battery has cooled sufficiently.*	Low

Appendix C: Accessories, Administration Sets, and Components

Appendix C outlines the list number and description of accessories, administration sets, and components available for use with the SYMBIQ™ Infusion System. For a current up-to-date list, contact the Hospira sales representative.

List Number	Item Description
39001-04-01	Standard I.V. Pole
11868-04-01	PlumXL3M I.V. Minipole
11986-04-48	Vented Syringe Adapter
16000-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump Set, Convertible Pin, 106 Inch, Piggyback with Backcheck Valve, 2 CLAVE Ports, Distal Microbore Tubing and OPTION-LOK, Microdrip, Non-DEHP
16001-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump Set, Convertible Pin, 105 Inch with CLAVE Port and OPTION-LOK
16002-04-01	LATEX-FREE SYMBIQ™ Pump Set, Yellow Striped Tubing, Convertible Pin, 108.5 Inch with Distal Microbore tubing and OPTION-LOK
16003-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump 150mL Burette Set, Convertible Pin, 117 Inch with 3 CLAVE Ports, 0.2 Micron Filter and OPTION-LOK, Soluset, Non-DEHP
16004-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump 50mL Burette Set, Convertible Pin, 104 Inch with 3 CLAVE Ports, Distal Microbore Tubing and OPTION-LOK, Microdrip Soluset, Non-DEHP
16005-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump Set, Convertible Pin, 105 Inch with CLAVE Port and OPTION-LOK, Non-DEHP
16006-04-01	LifeShield LATEX-FREE HEMA SYMBIQ™ Pump Blood Set, Nonvented, 110 Inch with 210 Micron Filter, CLAVE Port and OPTION-LOK
16007-04-01	LifeShield LATEX-FREE Hemoset SYMBIQ™ Pump 100mL Burette Set, Nonvented, 104 Inch with CLAVE Port, 170 Micron Filter and OPTION-LOK, non-DEHP
16008-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump Set, Convertible Pin, 106 Inch, Piggyback with Backcheck Valve, 2 CLAVE Ports and OPTION-LOK
16009-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump 50mL Burette Set, Convertible Pin, 100 Inch with 2 CLAVE Ports, 0.2 Micron Filter, Distal Microbore Tubing and OPTION-LOK, Microdrip Soluset, Non-DEHP
16010-04-01	LATEX-FREE SYMBIQ™ Nitroglycerin Pump Set, Convertible Pin, 108.5 Inch with Polyethylene-Lined Tubing and OPTION-LOK
16011-04-01	LifeShield LATEX-FREE SYMBIQ™ Nutritional Pump Set, Convertible Pin, 104 Inch with 1.2 Micron Filter, CLAVE Port and OPTION-LOK, Non-DEHP
16013-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump Set, Convertible Pin, 104.5 Inch, Piggyback with Polyethylene-Lined Tubing, Backcheck Valve, 2 CLAVE Ports, 0.2 Micron Filter and OPTION-LOK

List Number	Item Description
16014-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump 150mL Burette Set, Convertible Pin, 124.5 Inch with 3 CLAVE Ports, Distal Microbore Tubing and OPTION-LOK, Microdrip Soluset, Non-DEHP
16015-04-01	Latex-Free SYMBIQ™ Pump Enteral Set, 99 Inch with 40 mm Screw Cap, Non-DEHP
16016-04-01	Latex-Free SYMBIQ™ Pump Enteral Set, 102 Inch with Integral Container, Non-DEHP
16017-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump 150mL Burette Set, Convertible Pin, 115 Inch with 3 CLAVE Ports and OPTION-LOK, Soluset, Non-DEHP
16018-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump 150mL Burette Set, Convertible Pin, 138 Inch with 4 CLAVE Ports, 0.2 Micron Filter, Distal Microbore Tubing and OPTION-LOK, Microdrip Soluset, Non-DEHP
16019-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump Set, Convertible Pin, 106 Inch, Piggyback with Backcheck Valve, 2 CLAVE Ports and OPTION-LOK, Non-DEHP
16020-04-01	LifeShield LATEX-FREE HEMA SYMBIQ™ Pump Y-Type Blood Set, Nonvented, 122 Inch with 210 Micron Filter, CLAVE Port and OPTION-LOK
16021-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump Set, Convertible Pin, 106 Inch, Piggyback with Backcheck Valve, 3 CLAVE Ports and OPTION-LOK, Non-DEHP
16022-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump Set, Convertible Pin, 104 Inch, Piggyback with Backcheck Valve, 2 CLAVE Ports, 0.2 Micron Filter and OPTION-LOK, Non-DEHP
16023-04-01	LifeShield LATEX-FREE SYMBIQ™ Syringe Microbore Pump Set, 83 Inch with Syringe Holder, 2 CLAVE Ports and OPTION-LOK, Non-DEHP
16024-04-01	LifeShield LATEX-FREE SYMBIQ™ Pump Set, Convertible Pin, 105 Inch, Orange Polyethylene-Lined Light Resistant Tubing, CLAVE Port, Distal Microbore Tubing and OPTION-LOK
16025-04-01	LATEX-FREE SYMBIQ™ Nitroglycerin Pump Set, Convertible Pin, 108 Inch with Polyethylene-Lined Tubing and OPTION-LOK, Microdrip
***444-11454**	SYMBIQ™ Tips Cards
***430-11348**	SYMBIQ™ System Operating Manual

*Contact Customer Support for current version of the Symbiq Tips Cards and System Operating Manual.

Appendix D: Glossary

Term	Definition
3-D Tab	The channel identifier tab (see Figure 1 on page 15) displays in 3-D when an Exceeded Drug Limits Icon and/or No Dose/Amount or Rate Limits Icon displays on the channel tab.
AC	Alternating Current.
active screen	A selected programming screen or a programming screen in use.
administration set	The sterile, disposable assembly with flexible tubing that connects to a source fluid container for input to the cassette carriage and to some output device for administration to the patient.
air sensitivity	The amount of air detected in which the Air-In-Line alarm activates.
air-eliminating filter	Used to reduce the risk of infusing air.
air-in-line	Air in the fluid path.
Air-In-Line alarm	Alarm that occurs if sensors detect the present measured amount of air in the fluid path.
alarm	Visual and/or audible warning from an infuser indicating a condition requiring attention, e.g., Air-In-Line alarm.
alarm analysis message	Basic descriptions of the cause of the alarm displayed on the infuser touchscreen.
alarm auto-reset condition	Condition under which an alarm clears without user intervention.
alarm base message	Short description of an alarm that appears on the infuser touchscreen.
alarm remedy message	Helpful hints and suggestions for fixing an alarm condition that display on the infuser touchscreen.
alarm system response	Any special action other than the alarm annunciation that must be taken in response to an alarm.
alarm urgency/ priority	Level of alarm related to an LED/alarm tab color and behavior. There are three priorities—low, medium, and high.
allowed range	The minimum and maximum allowable values for a therapy.
audible alarm	An alarm that can be heard.
backcheck valve	Prevents fluid from backing up in part of an administration set.
backpressure	Resistance to fluid flow on the distal or output portion of the administration set, usually expressed in PSIG.
backup power source	An alternate source of power should the main power source fail.
Basic mode	Operational mode during which therapy parameters are selected.
Biomed mode	The non-delivery or service mode of infuser operation that allows authorized personnel, typically institution technicians (Biomeds), access to delivery parameter limits and display default settings.

Term	Definition
bolus	A single, uninterrupted, discrete volume of fluid delivered over a discrete period of time.
BSA	Body Surface Area, a value calculated by the infuser. BSA=0.007184 x Height $(cm)^{0.725}$ x Weight $(kg)^{0.425}$.
callback alarm	An alarm indicating additional action is required before an infuser can continue its program.
cancel	To stop or nullify a previously intended action.
cassette	A Hospira cassette that contains the actual pumping chamber with inlet and outlet valves and a flow stop. It also contains access ports to diaphragms for proximal and distal line pressure sensing.
cassette carriage	The cassette is loaded in the infuser via an automatic door.
cassette loaded	A cassette placed in the carriage and the carriage is closed.
Caution:	A caution appears in front of a procedure or statement. It contains information that could prevent irreversible product damage or hardware failure. Neglecting to pay attention to a caution could result in serious patient or user injury.
Caution (medium alarm urgency)	An alarm which requires prompt user response, and if not responded to promptly, could result in an escalation of the alarm to the Warning urgency.
change a program	Adjust the values/selections of the current program.
Channel B	The right channel on a two-channel infuser or the channel to the immediate right of Channel A when two infusers are connected.
clamp (noun)	Device used to restrict flow in the line.
clamp (verb)	To block off or restrict flow in the line.
clear history	A function that clears the log files on an infuser.
Clinical Care Area (CCA)	A subset of a drug library for use in an area or patient population of the hospital, as defined by an authorized user. A CCA can have up to 400 specific medications plus “Fluid Only” and “Other Drug.” The hospital may create up to 40 CCAs and 16,000 specific medications in a drug library.
clinical mode	General use mode where an infuser can be programmed and medication can be delivered.
clock type	There are two clock types available: 12-hour and 24-hour.
cold boot	When the power is first applied to the infuser processor. It occurs when an infuser is off and the AC power is applied, or during battery operation when On/Off is pressed.
concentration	Consists of medication amount (in nanograms, micrograms [mcg], milligrams [mg], grams, milliequivalents [mEq], units [USP Units]), or diluent (volume in milliliters [mL]).
continue rate	An option used to provide fluid delivery at the current fluid delivery rate when the VTBI reaches zero.
contraindications	Conditions under which an infuser should not be used.
Default Drug Library (DDL)	A drug library with at least 99 medications including the manufacturer’s package insert recommended default units of measure and default unit of concentration. Also includes “Fluid Only” and “Other Drug.”

Term	Definition
Delivery mode	The operational mode during which fluid delivery occurs.
delivery rate	The speed at which the fluid is delivered, e.g., 125 mL/hr.
delivery type	Method of infusing: Multistep, Basic therapies, Intermittent, Bolus.
diluent (volume) or amount	The volume of fluid used with the diluent unit (e.g., 250 mL).
distal	In relation to the casette, this refers to the tubing leaving the cassette going to the patient.
distal end	End closest to patient.
distal occlusion	Blockage between the infuser and the patient.
dose frequency	The rate or interval in which medication is given.
dose limit	A restriction of fluid deliveries limited by dose units.
dose rate	Delivery rate times medication concentration.
dose/dose amount	A specified volume or amount of medication.
dosing units	Dose Rate units that may be selected; for example, mcg/kg/min, mcg/kg/hr, mcg/min, mcg/hr, mg/min, mg/hr, mg/kg/hr, units/min, units/hr, grams/hr, ng/kg/min, units/kg/hr, mUn/min, mEq/hr.
download	Transfer of data from a computer to an infuser.
drip chamber	Apparatus for visualizing/monitoring fluid flow in the administration set.
drop-down box	An element of the infuser touchscreen. Pressing the down arrow of this element displays additional items.
drug library	A customized library containing medication entries available for use with the SYMBIQ™ Infusion System. Medication entries include the Medication Name/Medication Amount/Medication Unit/Diluent Amount/Diluent Unit/Dosing units, Medication class, and Hard/Soft Limits.
duration	Period of time used to deliver a VTBI at an existing delivery rate or as set by the user.
Ethylene Oxide (ETO)	Method of sterilization.
Event Log	A record that indicates what and when a specific event occurred. The Event Log includes but is not limited to programming, limit overrides, out-of-limits attempts, setting changes, warnings, alarms, malfunctions, and power events.
external power source	Any external power source like an AC mains.
FHH	Filling Head Height. The gravity-induced proximal line pressure due to fluid height in source container above the distal line output level.
flow rate	The resulting rate of fluid flow (see delivery rate and dose rate).
flow stop	A device on the administration set cassette that toggles to start and stop fluid flow through the tube.
hard limit	The upper and/or lower dose limits for the selected medication and selected CCA that cannot be overridden. Defined by the hospital for each medication in its drug library. The hard limits for a particular medication may vary across different CCAs.

Term	Definition
Help Text area	Area on the touchscreen that provides context-sensitive information during programming steps and alarm conditions.
HIS	Hospital Information System.
Hospira MedNet® Server Suite	Application software used to define and download drug libraries and stored data between the application and infusers.
hospital formulary	Proprietary list of all medications used by the hospital.
inactive screen	A programming screen that has been programmed but is not currently selected.
infuser settings	Adjustable settings, e.g., distal occlusion pressure limits, air sensor sensitivity, real-time clock, and audible alarm volume.
intermittent	To give a specified dose amount of medication at regular intervals, e.g., every 4 hours.
isopropyl alcohol	A disinfectant not to be used to clean the SYMBIQ™ Infusion System.
I.V. pole	A pole that an infusion bag and an infuser are attached.
key	Buttons on the keypad or touchscreen.
KVO (Keep Vein Open)	Minimal delivery rate intended to provide sufficient fluid flow to prevent or reduce the potential for clotting at the IV infusion site. The KVO rate is the lesser of 1 mL/hr or the actual delivery rate.
LED	Light-Emitting Diode.
low flow continuity	Relative measure of uninterrupted infusion delivery at low rates.
malfunction	Alarm indication that a software or hardware failure has occurred (e.g., motor over-current.) These conditions usually require repair.
medication amount	The mass or quantity of the medication premixed with a diluent to express the concentration for the channel being programmed.
minimized alarm	An active alarm that has been acknowledged and is accessible by touching the minimized **alarm button**.
mL/hr only	A type of delivery expressed as volume divided by hour.
non-vented administration sets	For use with flexible containers. Not recommended for use with glass containers that are not vented by some other means.
occlusion	Blockage, may be caused by a kink in administration set tubing.
off-screen key	A key located on the infuser casing.
Options button	Button that provides access to the Options menu.
override	The user acknowledges a hard or soft limit violation prompt, and then proceeds with a program containing a parameter that falls outside the hospital-defined hard or soft limits.
PAV	Pressure Activated Valve.
parenteral	Any route other than the GI tract by which drugs, nutrients, or other solutions may enter the body, for example IV, IM, or subcutaneously.
piercing pin	Sharp plastic pin on an administration set that pierces the container.
piggyback	Infusion option that allows the delivery of a secondary container on the same channel.

Term	Definition
pole clamp	Device used to connect an infuser to an I.V. pole.
power LED	Indicates an infuser is powered by AC mains when LED lit continuously. Indicates an infuser is powered by batteries when LED is off. Indicates an infuser is powered by AC Mains and battery is charging when LED is flashing.
power priming	Used to prime or remove air from an administration set found in Options menu.
Power Saving mode	Low power state utilized when no keys have been pressed for a specified time period.
power sources	Energy source an infuser draws power from like rechargeable batteries or AC mains.
power off (verb)	Turning off infuser allow the internal processors to shut off.
pressure	The measured fluid pressure for the proximal line or the distal line when a fully primed administration set is loaded into an infuser with the cassette carriage closed.
prime	To remove all air from the cassette, tubing, and injection site prior to connecting the infuser to the patient.
program (noun)	A set of coded instructions for delivering fluids.
program (verb)	Defining or entering coded instructions for delivering fluids.
programmable ranges	The minimum and maximum allowable values for a therapy.
proximal	In relation to the cassette, it refers to the tubing entering the cassette coming from the container.
proximal occlusion	Blockage between an infuser and the fluid container.
psi	Pounds per square inch.
purge	Clear out or purge air from the tubing. Same as prime.
PVC plastic	Polyvinyl Chloride plastic.
rate	The infusion speed expressed in mL/hr.
rate titration	Changing the rate while an infuser is infusing.
remote access	Connecting to an infuser using a computer via wireless connectivity.
rounding	Process of making a fractional amount displayed on the screen.
rule sets	User-defined rules relating to the drug library including minimum and maximum dose, maximum rate and maximum VTBI for each medication, and maximum patient weight.
RxRules	Hospira's drug library editor.
secondary container	A container connected to the primary line to infuse additional fluid or medication used in piggyback.
Service mode	The mode accessible only to Hospira personnel.
settings	Parameters such as program settings, infuser settings, or configuration settings.
set up (verb)	To make an infuser ready for use.
shift totals	Totals for a shift.

Term	Definition
silence the alarm	To silence an infuser alarm in 2 minute intervals, press **SILENCE**.
slide clamp	An apparatus in an administration set that can be opened or closed to restrict or allow fluid delivery.
soft limit	The upper and lower dose limits for the selected medication and selected CCA. Soft limits can be overridden. Defined by the hospital for each medication in its drug library, the soft limits for a particular medication may vary across CCAs. If a given medication has a hard limit, its soft limits, if any, must equal or fall within its hard limits.
standard conditions	Conditions the defined infuser accuracy.
standby	A delivery program state that resembles a Delayed Start of 24 hours for a channel in all respects except a status display of Standby instead of Delayed.
stop mode	Operating mode an infuser enters when the programmed therapy is complete, and during certain alarm conditions.
Stop Basic button	Stops an infusion.
stop time	A specific time to stop a program.
subcutaneous	A route of delivery just beneath the dermal skin layer.
syringe	A device for withdrawing, injecting, or instilling fluids.
system message—advisory	A visual message indicating infuser status.
system message—prompt	While entering a program, a visual warning that informs the user of the violation of a hospital-defined rule set or a field range, e.g., a dose limit for a specific medication.
system setup	The process of preparing an infuser for use.
TALL-Man lettering	TALL-Man lettering uses upper case letters to help differentiate sound-alike or look-alike medication names. Default Drug Library medication names are displayed in TALL-Man lettering where appropriate.
therapy	A type of program that can be entered into an infuser. Available therapies include Basic Program,Taper, Multistep, Intermittent, and Interchannel Sequencing.
touchscreen key	Any key rendered on the touchscreen to facilitate interaction with an infuser.
units	A medication amount (without a quantity of mass referent) adopted as the USP standard of measure for use in a concentration.
unlock	No cleaning or program locks are active.
volume totals	Section of event history that stores volumes delivered from either the fluid container or a specified time.
VTBI	Volume To Be Infused.
Warning!	A warning message contains special safety emphasis and must be observed at all times. Failure to observe a warning message is potentially life threatening.
Warning (high alarm urgency)	An alarm condition which requires immediate operator response. For example, an infusion delivery disruption or a severely low battery.
weight	The parameter entry required with dosing units that include kg.

Term	Definition
weight dosed	A type of therapy that uses a calculated dose amount based on the patient's weight.
y-sites	A port on the administration set tubing to inject medications via a syringe.

NOTES:

Appendix E: Default Drug Library (DDL)

Medication Name
Fluid Only
Other Drug
Abciximab
Acyclovir
Albumin
Aldesleukin
Alfentanil
Alteplase (rt-PA)
Amikacin
Aminocaproic acid
Aminophylline
Amiodarone
Amphotericin B
Ampicillin-Sulbactam
Atracurium
Azithromycin
Bleomycin
Bretylium
Carboplatin
Cefazolin
Cefepime
CefoPERAZONE
CefoTAXIME
CefoTETAN
CefoXITIN
CeftAZIDime
CeftIZOXime
Ceftriaxone
Cefuroxime
Cimetidine
Ciprofloxacin
Cisplatin
Clindamycin
Cotrimoxazole
Cyclophosphamide
Cyclosporine
Cytarabine
Dexmedetomidine HCl
Diltiazem
DOBUTamine
Docetaxel
DOPamine

Medication Name
DOXOrubicin
Epinephrine
Epoprostenol
Eptifibatide
Erythromycin
Esmolol
Etomidate
Etoposide
Famotidine
Fentanyl
Fluconazole
Fluid Only
Flumazenil
Fluorouracil
Furosemide
Gatifloxacin
Gentamicin
Heparin
Hetastarch/NaCl
Hextend
Hydromorphone
Ifosfamide
Imipenem-Cilastatin
Immune Globulin IV
Insulin
Isoproterenol HCl
Labetalol
Lepirudin
Leucovorin
Levofloxacin
Lidocaine
Lorazepam
Magnesium Infusion
Mannitol
Mesna
MethoHEXITAL
MethoTREXATE
Methylprednisolone
Metoclopramide
Metronidazole
Midazolam
Milrinone

Medication Name
Morphine
Nafcillin
Naloxone
NitroGLYCERIN
NitroPRUSSIDE
Norepinephrine
Ofloxacin
Ondansetron
Other Drug
Oxacillin
Oxytocin
Paclitaxel
Pancuronium
Pantoprazole
Penicillin
Pentobarbital
Phenylephrine
Piperacillin-Tazobactam
Potassium Infusion
Procainamide
Propofol
Ranitidine
STREPTOkinase
Teniposide
Theophylline
Ticarcillin-Clavulanate
Tirofiban
Tobramycin
UROkinase
Vancomycin
Vecuronium
Verapamil
VinCRIStine

NOTES:

Appendix F: Units of Measure

The following dose units are available to be programmed based upon the facilities requirements. The SYMBIQ™ Infusion System uses the following units of measure:

Parameter	Therapy/Delivery Type	Unit Of Measure
Dosing Units (grams)	• Basic Program • Intermittent • Multistep • Taper [not implemented] • Piggyback	(grams family) mL/hr, mL/kg/hr mcg/min, mcg/hr, mcg/day, mcg/kg/min, mcg/kg/hr, mcg/kg/day, mcg/m2/min, mcg/m2/hr, mcg/m2/day mg/min, mg/hr, mg/day, mg/kg/min, mg/kg/hr, mg/kg/day, mg/m2/min,, mg/m2/hr, mg/m2/day grams/min, grams/hr, grams/day, grams/kg/hr, grams/kg/day, grams/m2/hr, grams/m2/day, nanog/min, nanog/hr, nanog/day, nanog/kg/min, nanog/kg/hr, nanog/kg/day, nanog/m2/min, nanog/m2/hr, nanog/m2/day
Dosing Units (units family)	• Basic Program • Intermittent • Multistep • Taper [not implemented] • Piggyback	(units family) mL/hr milliUnits/min, milliUnits/hr, milliUnits/day, milliUnits/kg/min, milliUnits/kg/hr, milliUnits/kg/day, milliUnits/m2/min, milliUnits/m2/hr, milliUnits/m2/day units/min, units/hr, units/day, units/kg/min, units/kg/hr, units/kg/day, units/m2/min, units/m2/hr, units/m2/day Million Units/hr
Dosing Units (mEq)	• Basic Program • Intermittent • Multistep • Taper [not implemented] • Piggyback	(mEq) mL/hr mEq/min, mEq/hr, mEq/day, mEq/kg/min, mEq/kg/hr, mEq/kg/day, mEq/m2/min, mEq/m2/hr, mEq/m2/day

Parameter	Therapy/Delivery Type	Unit Of Measure
Dosing Units (mmol)	• Basic Program • Intermittent • Multistep • Taper [not implemented] • Piggyback	(mmol) mL/hr mmol/min, mmol/hr
Bolus Dose Units (grams family)	Bolus	(grams family) mL, mL/kg mcg, mcg/kg, mcg/m2 mg, mg/kg, mg/m2 grams, grams/kg, grams/m2 nanog, nanog/kg, nanog/m2
Bolus Dose Units (units family)	Bolus	(units family) mL milliUnits, milliUnits/kg, milliUnits/m2 units, units/kg, units/m2 Million Units
Bolus Dose Units (mEq)	Bolus	(mEq) mL mEq, mEq/kg, mEq/m2
Bolus Dose Units (mmol)	Bolus	(mmol) mL mmol

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SYMBIQ™ Infusion System Warranty

Subject to the terms and conditions herein, Hospira Worldwide, Inc. (hereinafter referred to as Hospira) warrants that (a) the product shall conform to Hospira's standard specifications and be free from defects in material and workmanship under normal use and service for a period of one year after purchase, and (b) the replaceable battery shall be free from defects in material and workmanship under normal use and service for a period of 90 days after purchase. HOSPIRA MAKES NO OTHER WARRANTIES REGARDING THE PRODUCT, EXPRESS OR IMPLIED AND SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Purchaser's exclusive remedy shall be, at Hospira's option, the repair or replacement of the product. In no event shall Hospira's liability arising out of any cause whatsoever (whether such cause be based in contract, negligence, strict liability, other tort, or otherwise) exceed the price of such product, and in no event shall Hospira be liable for incidental, consequential, or special damages or losses or for lost business, revenues, or profits. Warranty product returned to Hospira must be properly packaged and sent freight prepaid.

The foregoing warranty shall be void in the event the product has been misused, damaged, altered, or used other than in accordance with product manuals so as, in Hospira's judgment, to affect its stability or reliability, or in the event the serial number or lot number has been altered, effaced, or removed.

The foregoing warranty shall also be void in the event any person, including the purchaser, performs or attempts to perform any major repair or other service on the product without having been trained by an authorized representative of Hospira and using Hospira documentation and approved spare parts. For purposes of the preceding sentence, “repair or other service” means any repair or service other than the replacement of accessory items such as batteries and detachable mains power cords.

In providing any parts for repair or service of the product, Hospira shall have no responsibility or liability for the actions or inactions of the person performing such repair or service, regardless of whether such person has been trained to perform such repair or service. It is understood and acknowledged that any person other than a Hospira representative performing repair or service is not an authorized agent of Hospira.

Hospira, SYMBIQ™ and Hospira MedNet® Server Suite are trademarks of Hospira.

The SYMBIQ™ Infusion System uses components and technologies protected by U. S. Patent Numbers USD500326, USD515205, US5989222, US5191795, US5462256, US5586868, US5816779, US5681285. Other patents pending.

WARNING: Possible explosion hazard exists if used in the presence of flammable anesthetics.

The SYMBIQ™ Infusion System complies with the limits for a Class B digital device established by FCC Rules, Part 15.

Attention, consult accompanying documents.

The SYMBIQ™ Infusion System is Wide Fidelity (WiFi) enabled and complies with the IEEE 802.11 a/b/g communications standard.

Type CF

The SYMBIQ™ Infusion System provides an adequate degree of protection against electrical shock and is suitable for application to a patient.
Class 1, Internally Powered
Type CF Applied Part

Equipment not suitable for use in the presence of flammable mixtures.

UL 60601-1
CSA 601.1
C US

IEC 60601-1
IEC 60601-2-24

The “C” and “US” indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This “US” indicator includes products eligible to bear the “NRTL” indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.

IPX1

Protected against dripping water.

The SYMBIQ™ Infusion System complies with UL60601-1 with respect to Protective Earthing (ground).

EN-2

The SYMBIQ™ Infuser has been assessed and complies with the following standard: IEC/EN 60601-1-2 (2001)