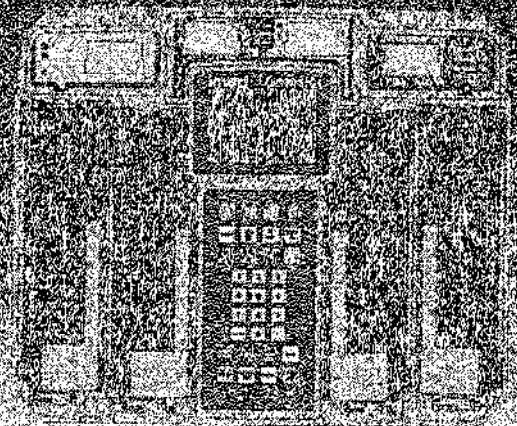


Directions For Use



IMED® Gemini® PC-4®
VOLUMETRIC INFUSION PUMP/CONTROLLER

WARNING AND CAUTION NOTICES:

CAUTION: FEDERAL (U.S.A.) LAW RESTRICTS THIS DEVICE TO SALE BY OR ON THE ORDER OF A PHYSICIAN.

USE ONLY HOSPITAL GRADE PLUG TO INSURE PROPER GROUNDING. GROUNDING RELIABILITY CAN ONLY BE ACHIEVED BY CONNECTION TO A RECEPTACLE MARKED "HOSPITAL GRADE".

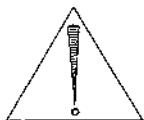
DANGER: EXPLOSION HAZARD, DO NOT USE IN THE PRESENCE OF FLAMMABLE ANESTHETICS.

WARNING

TO PREVENT UNRESTRICTED FLOW, CLOSE OR ADJUST ROLLER CLAMP WHEN FLO-STOP® DEVICE MECHANISM IS OPEN. CLOSE ROLLER CLAMP BEFORE OPENING DOOR.



CAUTION: ELECTRIC SHOCK HAZARD, DO NOT REMOVE COVER OR BACK. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



CAUTION: REFER TO MAINTENANCE MANUAL.



WARNING: REPLACE FUSE AS MARKED.

CAUTION: THE SELECTION, TESTING, AND USE OF HOST COMPUTER HARDWARE AND SOFTWARE, IN CONJUNCTION WITH THE PC-4 IS STRICTLY THE RESPONSIBILITY OF THE PURCHASER.

WARNING

IF THE PC-4 IS DROPPED OR SEVERELY JARRED, AT ANY TIME THE INSTRUMENT SHOULD BE IMMEDIATELY TAKEN OUT OF SERVICE AND INSPECTED BY QUALIFIED SERVICE PERSONNEL PRIOR TO USE.

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Other US and Foreign Patents Issued and Pending.

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INTRODUCTION

The IMED® GEMINI PC-4® is a four channel volumetric infusion pump and controller which provides accurate and automatic infusion of intravascular drugs, fluids, whole blood and packed red blood cells. The four channels are independent, and the PC-4 may be operated as any combination of pump and/or controller.



Secondary (or piggyback) fluid may also be automatically infused at delivery rates and volumes independent of the primary infusion parameters, with automatic changeover to the primary infusion parameters when the secondary infusion is complete and when using a check valve administration set.

The PC-4 can be set to run in three different operating conditions:

- INDEPENDENT Operation - the PC-4 operates as a stand-alone instrument, with no computer interface.
- MONITOR Operation - the PC-4 controls the infusion and a host computer monitors instrument operation.
- COMPUTER CONTROL Operation - the PC-4 is under the control of a host computer, which sets the infusion parameters and monitors PC-4 operation.

To enhance safety and ease of operation, the PC-4 provides operator prompts and advisories, a full range of alarms, and malfunction visual and audio alerts. Also provided is a tamper-resistant option which enables the user to lock out the front panel once infusion parameters have been entered and the infusion started.

The GEMINI PC-4 utilizes peristaltic action in both the pump and controller modes. When the PC-4 is operated in the controller mode, it senses the pressure created by the height of the fluid container and uses that pressure as the occlusion pressure limit. In the pump mode, the occlusion pressure limit is preset at approximately 10 psi for rates above 30 mL/hr. For rates 30 mL/hr and below, the occlusion pressure is rate-dependent to ensure rapid response to occlusions. The PC-4 may be locked into a rate-independent pump mode occlusion pressure of 10 psi, if desired. However, this will result in significantly increased time to occlusion at rates below 30 mL/hr. The selectable pressure limit mode allows the user to set the occlusion pressure limit for each channel in increments of 25mm Hg up to the maximum occlusion pressure.

The infusion rate is selectable from 0.1 mL/hr to 999 mL/hr, and the volume to be infused (VTBI) from 0.1 mL to 9999 mL. The Rate Titration feature allows the selected channel's rate to be increased or decreased 1 mL/hr or 0.1 mL/hr (if a fractional rate is displayed) with each single control press. Greater rate changes can be achieved by pressing and holding the   controls until the desired rate is attained. Rates between 0.1 and 99.9 mL/hr may be selected in tenths of a milliliter increments. VTBI's between 0.1 and 999.9 mL may be selected in tenths of a milliliter increments if the rate is also in tenths. Using the System Configuration mode, the Biomedical Engineering Department can configure the maximum allowable flow rate.

If not disabled in the System Configuration, the Gemini PC-4 allows the following advanced programming options on each channel:

Volume/Time allows the user to program a volume to be infused (VTBI) and a duration (infusion time). The flow rate is calculated based upon the volume and time inputs.

Delayed Start allows the user to pre-program an infusion to begin up to 23 hours 59 minutes later. The infusion starting time is based upon a real time clock incorporated within the instrument. The user may also specify a call-back audio alert upon completion of the delayed start infusion.

Multidosing allows the user to pre-program 1-24 infusions with the same rate and volume to be infused (VTBI) over a 1-24 hour period. Between doses, the channel is in a standby (not pumping) mode. In addition, the user may choose to delay the start of the first dose by up to 8 hours.

Drug Calculations allows the user to enter either:

- the **desired drug dose** and the PC-4 calculates the correct flow rate to achieve the desired drug dose,
- or
- the **desired flow rate** and the PC-4 calculates the corresponding drug dose

The PC-4 utilizes the following parameters entered by the user during the drug calculations setup procedure to calculate the rate and dose:

- Drug amount - amount of drug in the IV container (gram, mg, mcg, or units)
- Diluent volume - Volume of fluid used as the drug diluent (ml)
- Patient weight - Weight of the patient (kg), this is an optional parameter and is not needed unless the drug dose is normalized for patient weight
- Time units - the time base for all calculations (min or hour).

The above parameters are used to calculate drug dose and flow rate parameters as follows:

- Drug concentration = Drug amount ÷ Diluent volume (ml)
- Flow rate = Drug dose ÷ Drug concentration (normalized for patient weight if specified by entering a patient weight)
- Drug dose = Flow rate x Drug concentration (normalized for patient weight if specified by entering a patient weight).

Occlusion Pressure Selection allows the user to choose between pump (automatic pressure setting), controller and selectable (user determined) pressure settings in the System Configuration - PCS Mode.

Dynamic Pressure Display	allows the user to observe in-line operating pressure sensed by the instrument.
Pressure History	allows the user to display previous 2 hours of average pressure measurements displayed in 2 minute intervals.

The PC-4 uses a wide variety of ALARIS Medical GEMINI® disposable administration sets. Primary sets are used for separate, independent primary infusions and for stand-alone gravity administration. Secondary infusions are possible using GEMINI check valve sets and appropriate Secondary sets. GEMINI disposable sets utilize a unique clamping device, the Flo-Stop® mechanism, to prevent inadvertent free flow when a set is removed from the PC-4.

The PC-4 has been designed to interface with optional accessory equipment, including an empty container detector (ECD) and a Nurse Call system. When an ECD is attached to the drip chamber of the primary administration set, the PC-4 can infuse the entire contents of the fluid container. The Nurse Call feature, when connected, activates an externally powered nurse call system whenever the PC-4 initiates any alarm, malfunction, the "PRESS START" prompt, "INFUSION COMPLETE - KVO", "EMPTY CONTAINER - KVO" or "LOW BATTERY" advisories.

NOTES

Although the PC-4 is built and tested to exacting specifications, it is not intended to replace the supervision of IV infusions by medical personnel. The user should become thoroughly familiar with features and operation of the PC-4 and exercise vigilance in its utilization.

ALARIS Medical Systems™ has available a PC-4 Maintenance Manual which includes circuit diagrams, component parts lists and descriptions, calibration and test procedures, and other technical information to assist qualified service personnel in repair and maintenance of the instrument's repairable components. Maintenance procedures are intended to be performed only by qualified personnel.

INSTALLATION PROCEDURES

The PC-4 has been thoroughly inspected before shipment from the factory to insure its mechanical and electrical integrity. However, handling in transit may cause visible or hidden damage. Therefore, prior to initial use, the PC-4 should be inspected at the user's facility.

Remove the unit from the shipping container and inspect it carefully for damage. Check that the doors operate freely. Check to ensure the urethane seals covering the pumping mechanisms are not cut or torn. Check the pole clamp for freedom of operation. Check the power cord for nicks and bent prongs on the connector. Check the AC power entry module for contamination. Check for any loose parts.

NOTE

If the instrument shows evidence of damage in transit, notify carrier's agent immediately. Do not return damaged equipment to the factory before the carrier's agent has authorized repairs.

Contact ALARIS Medical Systems for authorization to return equipment for repair, whether damage or malfunction is the responsibility of the carrier, or of ALARIS Medical Systems.

Performance Check

Refer to the PC-4 Maintenance Manual.

Battery Charge

The PC-4 is shipped with the batteries in a charged condition. However, since a considerable time period could elapse between shipment from the factory and initial use of the unit, perform a pre-operational battery charge. Connect the power cord to a 110 Volt receptacle. Allow the battery to charge for 24 hours. Whenever possible, leave the power cord connected to an external AC power source while operating.

New, fully charged batteries will provide approximately 4 hours of operation with all four channels infusing primary infusions at 125 mL/hr before a "BATTERY DISCHARGED" message displays. New batteries will recharge to 90% of capacity in \approx 10 hours with the instrument operating or off and will return to a fully charged condition within 18 hours.



NOTE


Failure to fully recharge the battery between consecutive battery operations will reduce battery life.

RS-232 Connection/Computer Interface

Refer to the PC-4 Maintenance Manual and to the ALARIS Medical Systems C2 Communications Protocol Programmer's Guide.

SYSTEM CONFIGURATION

The current PC-4 System Configuration may be viewed by pressing  to bring up the System Options Menu, then pressing , to access the System Configuration listing.

Use the  control to exit the System Configuration and System Options modes. The Biomedical Engineering Department should select or enable/disable specific system features based on hospital protocol and patient care requirements.

SYSTEM CONFIGURATION OPTIONS

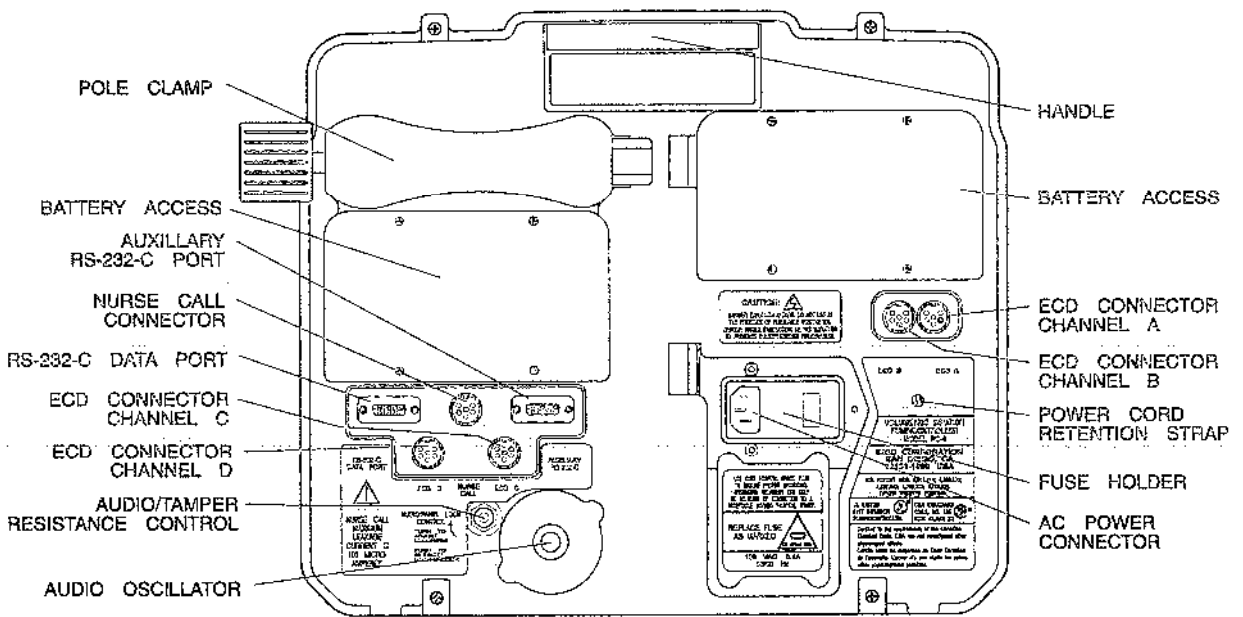
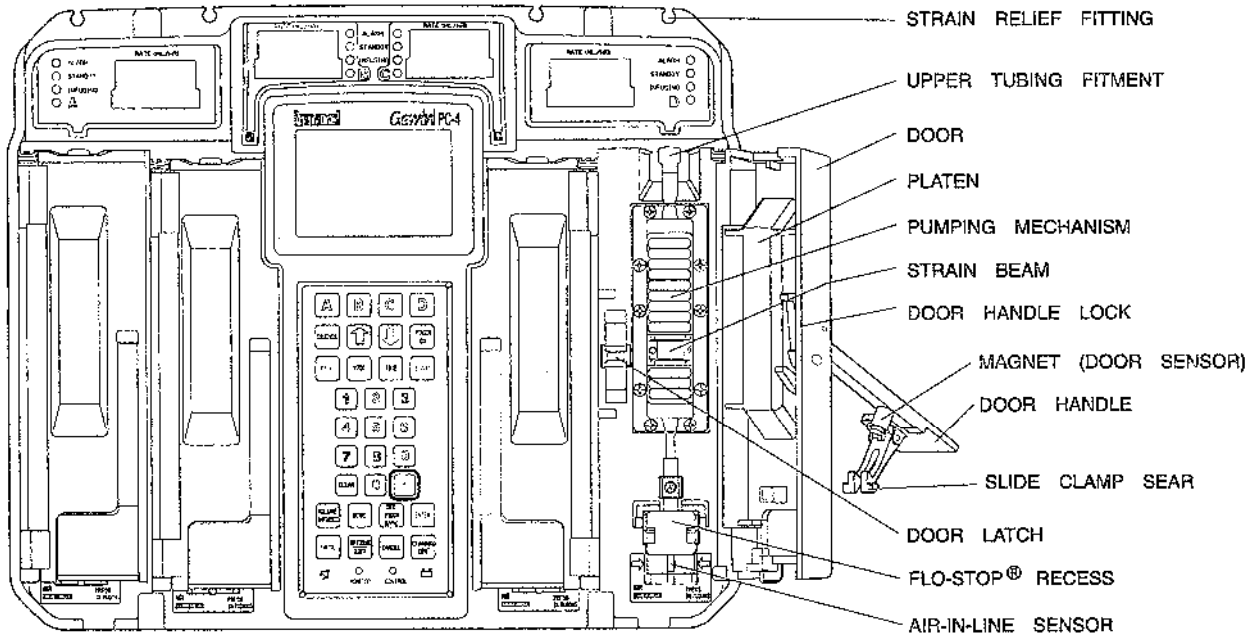
"Clock Setup:", "Factory Set:", "Maximum Rate:", "C2 Port:", "Aux Port:", "PCS Mode:", "Delay Start:", "Drug Calc:", "Multidose:", "Dose Display:", "Key Audio:", "Alarm Audio:", "Switch Audio:", "Tamper Mode:", "Language:", "Anesthesia Mode:", "Computer Control:", "Software Version:", "C2 Serial Number:", "Dynamic Press:", "Press History:", "Vol Time Inf:" and "Battery Mode:".

NOTE

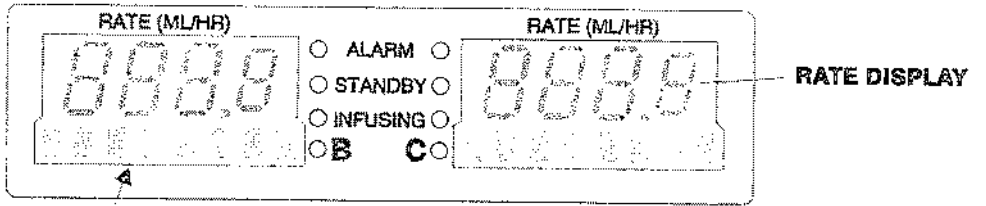
Prior to use, the user must determine whether the instrument configuration is appropriate for the prescribed infusion therapy.

For additional information on the System Configuration mode, direct inquiries to the Biomedical Engineering Department, or other personnel trained to set up specialized instrument configurations in the System Configuration mode.

OPERATING FEATURES

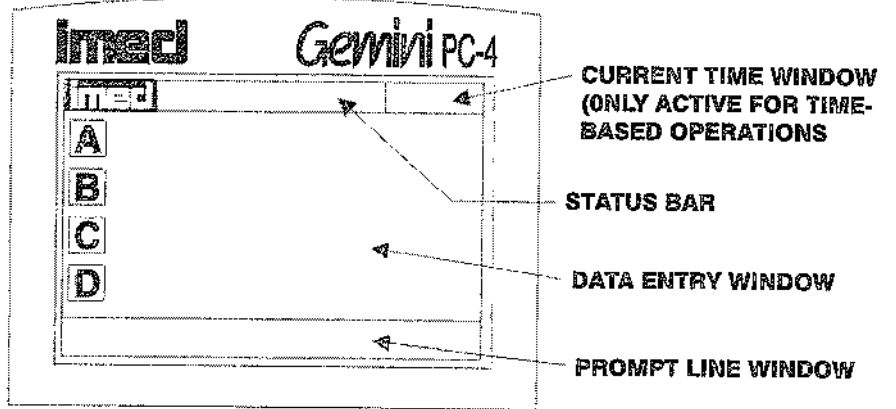


FRONT PANEL CONTROLS AND INDICATORS

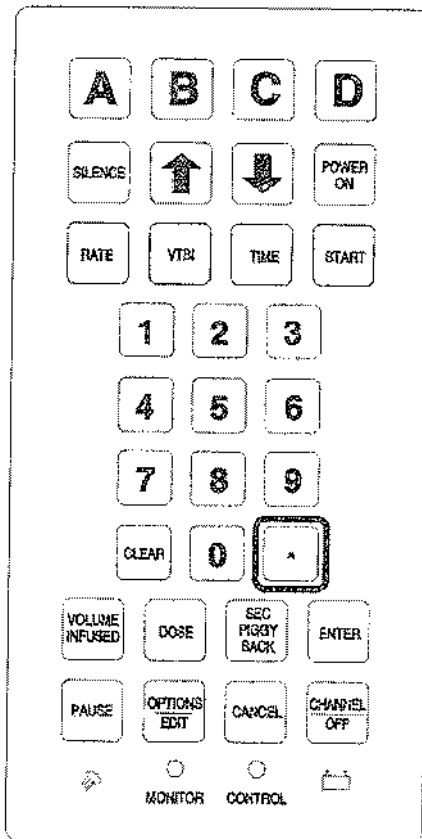


TYPICAL CHANNEL DISPLAY

CHANNEL INFORMATION DISPLAY



CENTRAL INFORMATION DISPLAY



KEYPAD

DESCRIPTION OF CONTROLS AND INDICATORS

Channel Information (Alarm/Status) Display - Channel A,B,C, or D displays various advisories, alarms, and malfunctions. (Refer to CHANNEL, CENTRAL INFORMATION DISPLAY AND ALARM RESPONSE PROCEDURES section of this manual for specific response procedures.)

RATE display - Channel A,B,C, or D - displays primary and secondary rate infusion parameters.

Channel Select A,B,C, or D indicators - when illuminated, indicate that the corresponding channel is selected for infusion parameter entry and infusion setup.

Standby Indicator - illuminates when the channel is programmed for a future start time.

Alarm Indicator - illuminates when the channel is in an alarm or infusion complete condition.

Infusing Indicator - flashes when the channel is actively infusing.

Central Information Display - displays VTBI (volume-to-be-infused), dynamic pressure, current time of day and other operating parameters during operation of the instrument. Utilized during set up procedures for data entry, editing, confirmation and display of prompts, advisories and alarm conditions. During battery operation, display backlight will extinguish \approx 2 minutes after the last key press and relight upon next key press.



controls - when pressed once, selects the corresponding channel for infusion parameter entry and infusion setup.



when pressed during an infusion, the infusion for the selected channel is stopped. (After \approx 2 minutes, the "PRESS START" visual and audio prompt begins unless operating in Anesthesia mode.)



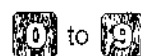
when pressed, stops the infusion for the selected channel, deselects the selected channel, and if only that channel had been infusing, powers off the PC-4. Repeat for all other running channels to power off the PC-4. When pressed during a software-detected system malfunction, powers off the PC-4.



when pressed, allows the rate infusion parameter on the selected channel to be changed using the appropriate data entry controls.



when pressed, allows the Volume to be Infused parameter on the selected channel to be changed using the appropriate data entry controls.



data entry controls - when pressed, allows sequential entry of Rate, VTBI and other numerical operating parameters.



when pressed, inserts a decimal point in numeric data.

DESCRIPTION OF CONTROLS AND INDICATORS (continued)



when pressed, allows entry of Start Time for delayed start and multidose infusions, as well as Duration when volume/time infusion option is enabled.



when pressed, clears the currently selected infusion parameter setting to "0". When pressed following a press of the Volume Infused control, clears the total primary and secondary volume infused displays for the selected channel or all channels.



when pressed during an alarm, silences the audio for ≈2 minutes.



when pressed, will increase or decrease the rate parameter with each keypress or will scroll up or down when pressed and held. Also used to select options in infusion setup sequences and to adjust contrast on the central information display through the options menu.



when pressed, applies electrical power to PC-4. If pressed during a hardware malfunction, silences audio alarm and turns off electrical power to all circuits.



when pressed, starts the infusion on the selected channel.



when pressed following data entry in the central information display, confirms the entry and allows entry of data for the next step of the programming sequence.



indicator - when flashing, indicates the PC-4 is operating on battery power.



indicator - when illuminated, indicates the PC-4 is connected to an external power source.



when pressed, will cause primary, secondary and total volume infused and secondary volume infused to display for all channels.



when pressed, allows the entry of secondary infusion parameters on the selected channel. If pressed during a secondary infusion, allows the user to toggle between viewing primary and secondary parameters.



when pressed, allows the entry of a medication dose in the drug calculation mode.



when pressed, allows access to the available system or channel options and editing functions.



when pressed, discontinues the current programming sequence and returns the central information display to the previous display screen.

AUDIO/TAMPER-RESISTANT CONTROL (on rear panel) - when rotated, varies the audio volume; when pressed and held for 3 seconds with the tamper-resistant feature enabled, will lock out all of the keypad controls except VOLUME INFUSED, SEC/PIGGYBACK and SILENCE. A repeat 3 second press will unlock the keypad controls. Tamper-Resistant mode must be enabled in Systems Configuration.


ABBREVIATED SETUP AND OPERATING PROCEDURES

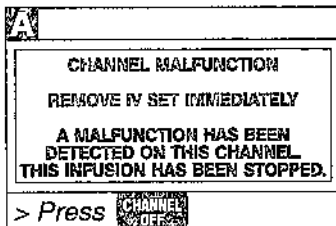
Introduction

The abbreviated procedures necessary to set up, start, and operate the PC-4 are described in the following sections.

These procedures are provided for use by personnel already trained and familiar with the setup and operation of the PC-4. Refer to Setup and Operating procedures for detailed instructions.


To Set Up a Primary Infusion on Any Channel








1. Connect PC-4 to external AC power source.
2. Press .
 - If following screen displays, remove instrument from service









NOTE

During initialization, ensure the following occur:






- All LEDs illuminate for 3 seconds
- Rate displays show "888.8" then extinguish except channel A which shows "- - - -".
- Message displays illuminate  then extinguish.
- Central display screen displays IMED logos. (If display appears abnormal, remove pump from service.)

3. Remove set from package and close roller clamp.
4. Insert the set spike into the prepared fluid container and hang the container a minimum of 24 inches above the PC-4.
5. Fill the drip chamber approximately 2/3 full.
6. Open roller clamp and prime set to remove all air.
7. Close roller clamp.
8. Open door and install the administration set upper fitment first, then the Flo-Stop[®] mechanism.
9. *Press tubing into Air-In-Line detector.*
10. Close door and open roller clamp.
11. Select channel, press  ... .
12. Press ; to change rate, use numeric data entry or   controls.
13. Press ; to change VTBI, use numeric data entry controls.
14. Attach set to patient's vascular access device.
15. Press .

To Set Up a Primary Infusion with Volume/Time Infusion Option Enabled

1. Connect PC-4 to external AC power source.
2. Press .
3. Prime and load tubing as previously described.
4. Select channel, press  ... .
5. Press ; to change VTBI, use numeric data entry controls.
6. Press ; to change duration, use numeric data entry controls.
7. Attach set to patient's vascular access device.
8. Press .

To Change Display Contrast (SYSTEM OPTION)

1. Press .
2. Select Option #1, Display Contrast.
3. Use   controls to adjust the display for optimum viewing.
4. Press  to confirm contrast adjustment.
5. Press  to return to normal operation.








To Pause an Infusion

1. Select channel, press  ... .
2. Press .
3. Press  to resume infusion.








To Stop a Primary Infusion

1. Select channel, press  ... .
2. Press .










To Change Rate or VTBI During Primary Infusion

1. Select channel, press  ... .
2. Press  to change rate.
3. Use numeric data entry or   controls to change rate.
4. Press  to change VTBI.
5. Use numeric data entry controls to change VTBI.
6. Press .





To Titrate Rate

1. Select channel, press  ... .
2. Press  or  to change the rate parameter in 1 or 0.1 mL/hr increments
or
Press and hold the  or  control to scroll to a new rate parameter.
3. Press .

To Change the Pressure Limit (PCS Mode Control Unlocked)

1. Select channel, press  ... .
2. Press  control.
3. Select Option #4, Pressure Limit.
4. Select Pump, Controller or Selectable mode by using the  or  controls. (If Selectable is chosen, use the  or  controls to set occlusion pressure.)
5. Press .
6. Press  to exit the channel options screen.

To View Pressure History for Selected Channel

1. Select channel, press  ... .
2. Press  control.
3. Select Option #3, Pressure History.
4. Press  to exit.

To Restart an Infusion Following an "INFUSION COMPLETE - KVO" Advisory

1. Select channel, press
2. Press to change VTBI.
3. Use numeric data entry controls to change VTBI.
4. Refill drip chamber, if necessary.
5. Press control to change rate, if necessary.
6. Use numeric data entry or controls to change rate.
7. Press .

To View Primary, Secondary and Total Volume Infused Values for All Channels Simultaneously

1. Press .

To Clear Primary, Secondary and Total Volume Infused Values for All Channels Simultaneously

1. Press .
2. Press .
3. Use controls to select YES.
4. Press .

To View Primary, Secondary and Total Volume Infused on Selected Channel

1. Select channel, press
2. Press .

To Clear Primary, Secondary and Total Volume Infused on Selected Channel

1. Select channel, press
2. Press .
3. Press .

To Set Up Secondary (Piggyback) Infusion With Dual Rates

1. Set up Primary infusion (using check valve set) as previously described.
2. Remove Secondary set from package and close roller clamp.
3. Insert set spike into prepared fluid container and hang the Secondary container a minimum of 24 inches above the PC-4.
4. Fill drip chamber approximately 2/3 full.
5. Attach Secondary set needle, if needed.
6. Open Secondary clamp and prime set. Close clamp.
7. Attach the Secondary set to the upper injection site on Primary set.
8. Lower the Primary container using the hanger provided in the Secondary set package.
9. Select channel, press
10. Press .
11. The rate field will automatically be selected.
12. Use numeric data entry or controls to change Secondary rate.
13. Press .
14. Use numeric data entry controls to change Secondary VTBI.
15. Open clamp on the Secondary set.
16. Press .

To Set Up Secondary (Piggyback) Infusion With Dual Rates and the Volume/Time Infusion Option Enabled

1. Set up Primary infusion (using check valve set) as previously described.
2. Set up the Secondary set as previously described.
3. Select channel, press **A** ... **D**.
4. Press **SEC PIGGY BACK**.
5. Press **VTBI**.
6. Use numeric data entry controls to change Secondary VTBI.
7. Press **TIME**.
8. Use numeric data entry controls to change Secondary duration.
9. Open clamp on the Secondary set.
10. Press **START**.

To Change Primary Infusion Parameters During a Secondary Infusion

1. Select channel, press **A** ... **D**.
2. Press **SEC PIGGY BACK**.
3. Press **RATE** to change Primary rate.
4. Use numeric data entry or **↑** **↓** controls to change Primary rate.
5. Press **VTBI** to change Primary VTBI.
6. Use numeric data entry controls to change Primary VTBI.
7. Press **SEC PIGGY BACK**.
8. Press **START**.

To Stop a Secondary Infusion and Return to Primary Infusion

1. Select channel, press **A** ... **D**.
2. Press **SEC PIGGY BACK**.
3. Close Secondary clamp.
4. Press **START**.
5. Select the "Yes" option.
6. Press **START**.

To Change Current Time of Day (SYSTEM OPTION)

1. Press **OPTIONS EDIT** control.
2. Select Option #2, Time-of-day.
3. Enter the correct time of day.
4. If in AM/PM time, select either AM or PM by using the **↑** or **↓** controls.
5. Press **START**.

To Set Up a Delayed Start Infusion

1. Prime and load the primary administration set as previously described.
2. Select channel, press **A** ... **D**.
3. Press **OPTIONS EDIT** control.
4. Select Option #1, Delayed Start.
5. Confirm Current Time is correct.
6. Press **RATE**; to change rate, use numeric data entry or **↑** **↓** controls.
7. Press **VTBI**; to change VTBI, use numeric data entry controls.
8. Press **TIME**; to enter Start Time, use numeric data entry controls.
9. Select either AM or PM (if required) by using the **↑** or **↓** controls.
10. Press **ENTER** to confirm start time entry.
11. Select a Callback alert by using the **↑** or **↓** controls to select "YES" or "NO".
12. Press **ENTER**.
13. Attach set to patient's vascular access device.
14. Confirm the correct entry of all dosing parameters and press **START**.

To Set Up a Delayed Start Secondary Infusion

1. Prime and load the primary administration set as previously described.
2. Select channel, press **A**...**D**.
3. Press **DELAYED START** control.
4. Select Option #1, Delayed Start.
5. Confirm Current Time is correct.
6. Press **RATE**; to change rate, use numeric data entry or **↑** **↓** controls.
7. Press **VTBI**; to change VTBI, use numeric data entry controls.
8. Press **SEC PIGGY BACK**.
9. Press **RATE**.
10. Use numeric data entry or **↑** **↓** controls to change secondary rate.
11. Press **VTBI**.
12. Use numeric data entry controls to change secondary VTBI.
13. Press **START**; confirm that the current time is correct (if required); use numeric data entry controls to set Start Time.
14. Select either AM or PM (if required) by using the **↑** or **↓** controls.
15. Open clamp on the Secondary set.
16. Confirm the correct entry of all dosing parameters and press **START**.

To Use Drug Calculation

1. Prime and load the primary administration set as previously described.
2. Select channel, press **A**...**D**.
3. Press **DELAYED START** control.
4. Select Option #2, Drug Calculation Setup.
5. Enter Drug Amount.
6. Select the appropriate unit of measure by using the **↑** or **↓** controls.
7. Press **ENTER**.
8. Enter the appropriate Diluent Volume.
9. Press **ENTER**.
10. Select either the "YES" or "NO" for dosing based on patient weight by using the **↑** or **↓** controls. (If "NO" is selected, go to Step 14.)
11. Press **ENTER**.
12. Enter the patient weight in kilograms (kg).
13. Press **ENTER**.
14. Select drug dosing time base (min or hours) using the **↑** or **↓** controls.
15. Confirm the correct drug dosing units and press **ENTER**. (Drug dosing units may be edited by pressing **EDIT DRUG DOSING UNITS**.)
16. Set the Rate or Dose.
 - a. Press **RATE** control, then enter the desired flow rate.
or
 - b. Press **DOSE** control, then enter the desired drug dose.
17. Press **VTBI**.
18. Enter the desired VTBI.
19. Attach set to patient's vascular access device.
20. Press **START**.

To Set Up a Multidose Infusion

1. Prime and load the primary administration set as previously described.
2. Select channel, press **A**...**D**.
3. Press **OPTIONS EDIT** control.
4. Use the **↑** **↓** controls to move to screen 2 of the Channel Options display, then select Option #1, Multidose.
5. Confirm current time.
6. Enter the desired rate.
7. Press **ENTER**.
8. Enter the desired VTBI/Dose.
9. Press **ENTER**.
10. Enter the desired Dose Interval.
11. Press **ENTER**.
12. Enter the desired number of doses.
13. Press **ENTER**.
14. Enter the desired start time for the first dose.
15. Select either AM or PM (if required) by using the **↑** or **↓** controls.
16. Attach set to patient's vascular access device.
17. Confirm the correct entry of all dosing parameters and press **START**.

To Power Off The PC-4

1. Select channel, press **A**...**D**.
2. Press **CHANNEL OFF**.
3. Repeat sequence for other channels, if infusing.

NOTE

If a Multidose or Drug Calculation infusion has been programmed, a pop-up menu will appear, prior to powering down, requesting a "save" or "clear" decision.

Press **ENTER** to save or **CHANNEL OFF** to clear the programmed infusion.

INDEPENDENT SETUP AND OPERATING PROCEDURES


Introduction

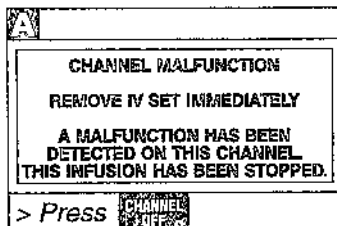
The detailed procedures necessary to set up and operate the PC-4 on any channel in the independent operating condition are described in the following section. Procedures for computer operation are described in the "MONITOR OR COMPUTER CONTROL SETUP AND OPERATING PROCEDURES" section of this manual.

ACTION/PROMPT

DISPLAY RESPONSE

To Set Up a Primary Infusion

1. Connect the PC-4 to an external AC power source using the power cord supplied by ALARIS Medical Systems.
2. Press .
 - If the following screen displays, remove the instrument from service.



- An audio tone sounds once.

NOTE

If displays appear abnormal, remove pump from service.

NOTE


If CHANNEL SELECT A,B,C or D control is not pressed within two minutes of pressing POWER ON, the PC-4 will automatically power down.

- AC Power indicator - illuminates
- Battery operation indicator - extinguishes

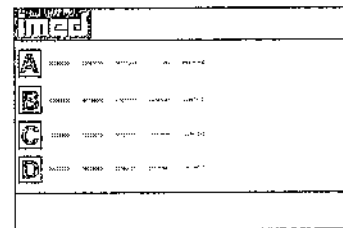
NOTE

During initialization, ensure the following occur:

Channel Information Display:

- All LEDs illuminate for 3 seconds.
- Rate displays show "888.8" then extinguish, except channel A which shows "_____".
- Message displays illuminate  then extinguish.

Central Information Display shows:




3. Open the administration set package, remove set, and close the roller clamp. Refer to the Directions For Use provided with set packaging.
4. Insert the set spike into the prepared fluid container following accepted hospital procedure and hang the container a minimum of 24 inches above the PC-4.
5. Fill the drip chamber approximately 2/3 full.
6. Open the roller clamp slowly to prime the tubing and clear air from the injection sites and tubing fitments.

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

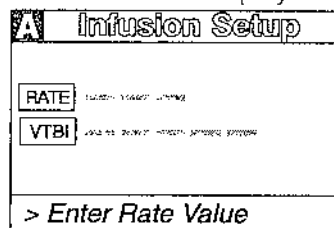
7. Close the roller clamp.
8. Open the door. Install the administration set pumping chamber by properly positioning the upper fitment into the upper fitment recess, and then inserting the Flo-Stop® fitment into the Flo-Stop recess below the pump mechanism, with the arrow pointing into the pump.
9. **Press the tubing into the Air-In-Line detector.**
10. Close the door and open the roller clamp.
11. Press :
 - After 3 seconds "> Enter Rate Value" displays
 - After 12 seconds audio prompt - sounds



- Pump mechanism homes.

Channel Information Display:

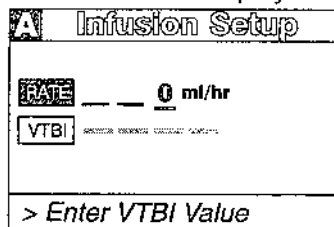
- Channel indicator - illuminates
- Rate display shows "----"

Central Information Display:



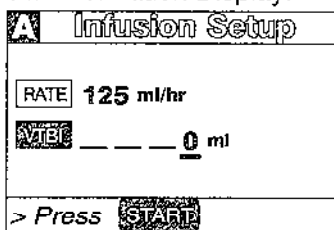
12. Set the rate and VTBI
 - a. Press :
 - After 3 seconds "> Enter VTBI Value" displays
 - After 12 seconds audio prompt - sounds
 - b. Use numeric data entry controls to enter rate parameter
 - c. Press :
 - After 3 seconds "> Enter VTBI Value" displays
 - After 12 seconds audio prompt - sounds

Central Information Display:



- New rate value displays



Central Information Display:



INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT




DISPLAY RESPONSE

- d. Use numeric data entry controls to enter VTBI parameter
 - After 3 seconds "> Press  displays
13. Attach the set to the patient's vascular access device following accepted hospital procedure.
14. Press .

- New VTBI value displays

NOTES

Immediate air-in-line alarm after initial setup and operation may indicate that the administration set is not properly installed in the Air-in-Line detector.

If enabled in System Configuration, the tamper-resistant feature may be initiated at this point. Press and hold the AUDIO control (rear panel) for 3 seconds until an audio tone sounds. The front panel is now locked out, and "PANEL/KEYPAD LOCKED" will display for 3 seconds. The only controls that are operable are ,  and  (for viewing only). The infusion may not be altered in any way until the tamper-resistant feature is canceled by repeating the 3 second AUDIO control press.

During infusion:

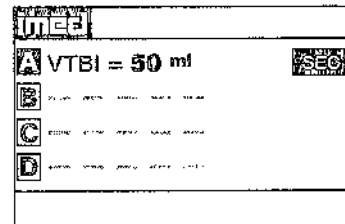
NOTE

Various Advisories, Alarms, and Malfunctions may be displayed. Refer to the CHANNEL, CENTRAL INFORMATION DISPLAY AND ALARM RESPONSE PROCEDURES section in this manual for an explanation and appropriate response.

Channel Information Display:

- INFUSION indicator - flashes
- Rate display - Rate value displays

Central Information Display:



Channel Information Display:

- INFUSING indicator - flashes

Central Information Display:

- VTBI value - decrements

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

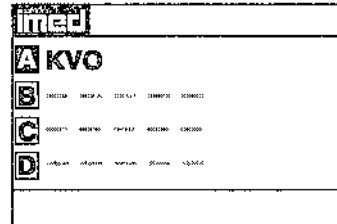
Upon completion of the infusion:

- Audio prompt sounds.


Channel Information Display:

- "INFUSION COMPLETE - KVO" scrolls
- Rate display - shows 1 or set rate if <1.0 mL/hr
- ALARM indicator - flashes

Central Information Display:




To Set Up a Primary Infusion with Volume/Time Option Enabled

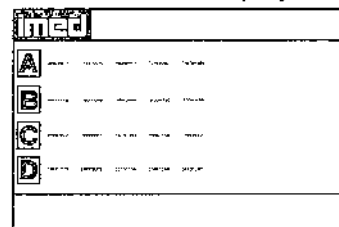
1. Connect the PC-4 to an external AC power source using the power cord supplied by ALARIS Medical Systems.
2. Press .
 - An audio tone sounds once.

- AC Power indicator - illuminates
- Battery operation indicator - extinguishes

Channel Information Display


- All LEDs illuminate for 3 seconds
- Rate displays show "888.8" then extinguish, except channel A which shows "- - - -"
- Message displays illuminate  then extinguish.

Central Information Display shows:



NOTE

If CHANNEL SELECT A, B, C or D control is not pressed within two minutes of pressing POWER ON, the PC-4 will automatically power down.

3. Prime and load the administration set as previously described under: **To Set up a Primary Infusion.**
4. Press :
 - After 3 seconds "> Enter Rate Value" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:

- Channel indicator - illuminates
- Rate display shows "- - - -"

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)


ACTION/PROMPT

DISPLAY RESPONSE

Central Information Display:

A Infusion Setup	
RATE	ml/hr
VTBI	ml
Duration	hh:mm
> Enter Rate Value	

5. Set the VTBI and duration

a. Press :

- After 3 seconds "> Enter VTBI Value" displays
- After 12 seconds audio prompt - sounds

Central Information Display:

A Infusion Setup	
RATE	ml/hr
VTBI	0 ml
Duration	hh:mm
> Enter VTBI Value	

b. Use numeric data entry controls to enter VTBI parameter

- New VTBI value displays


c. Press  or .

- After 3 seconds "> Enter Rate Value" displays
- After 12 seconds audio prompt - sounds

Central Information Display

A Infusion Setup	
RATE	125 ml/hr
VTBI	1000 ml
Duration	3:00 hh:mm
> Enter Rate Value	

d. Use numeric data entry controls to enter duration parameter.

- As Duration parameters are entered, the rate value displays
- After 3 seconds "> Press 

- New duration value displays
- Calculated rate value displays


NOTES

It is acceptable to enter either a rate and VTBI or a VTBI and duration. If a rate and VTBI are entered that result in a duration of less than 1 minute, the duration will display as "<1 minute".

The rate calculation resulting from a Volume/Time parameter input is rounded to the nearest whole number for rates >20 mL/hr.

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

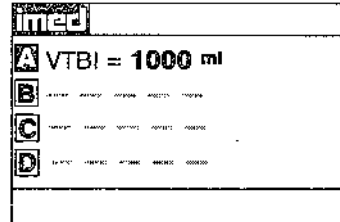
6. Attach the set to the patient's vascular access device following accepted hospital procedure.
7. Press .

DISPLAY RESPONSE

Channel Information Display:

- INFUSION indicator - flashes
- Rate display - Rate value displays

Central Information Display:



During infusion:

NOTE

Various Advisories, Alarms, and Malfunctions may be displayed. Refer to the **CHANNEL, CENTRAL INFORMATION DISPLAY AND ALARM RESPONSE PROCEDURES** section in this manual for an explanation and appropriate response.

Channel Information Display:

- INFUSING indicator - flashes

Central Information Display:

- VTBI value - decrements

Upon completion of the infusion:

- Audio prompt sounds.

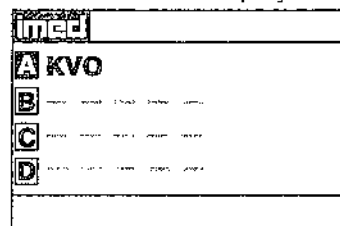
Channel Information Display:

- "INFUSION COMPLETE - KVO" scrolls

- Rate display - shows "1" or set rate if <1.0 mL/hr

- ALARM indicator - flashes

Central Information Display:



INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

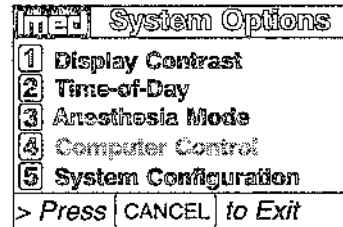
ACTION/PROMPT

DISPLAY RESPONSE

To Adjust Central Information Display Contrast

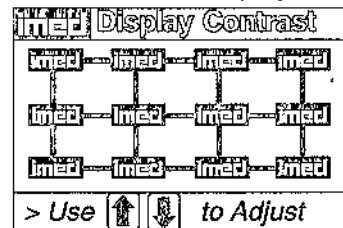
1. Press (do not select channel first).
 - After 3 seconds "> Press **CANCEL** to Exit" displays

Central Information Display:



2. Press .

Central Information Display:



3. Use the controls to adjust the contrast of the central display.
 - After 3 seconds "> Press **ENTER** to confirm" displays

Central Information Display:

- Display contrast increases with each press of and decreases with each press of .

4. Press .

Central information Display:

- Returns to System Options screen

5. Press to return to initial screen.

Central Information Display:

- Returns to initial screen

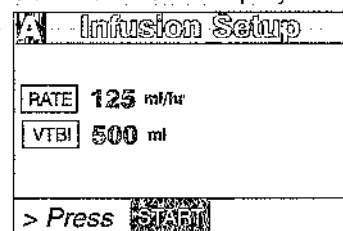
To Pause an Infusion

1. Press ... to select channel.
 - After 3 seconds "> Press **START**" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:




- Channel indicator - illuminates
- INFUSING indicator - flashes

Central Information Display:






INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

2. Press 
 - After 3 seconds "> Press  "
 - After 12 seconds audio prompt - sounds. In Anesthesia mode, audio is disabled.
3. Press  to resume the infusion.

To Stop a Primary Infusion

1. Press  ...  to select channel.
 - After 3 seconds "> Press  "
 - After 12 seconds audio prompt - sounds

2. Press .

NOTE

If only one channel is in use, the PC-4 will automatically power down.

DISPLAY RESPONSE

Channel Information Display:

- INFUSING indicator - extinguishes
- STANDBY indicator - flashes
- "PAUSE" advisory scrolls.

Central Information Display:
NO CHANGE

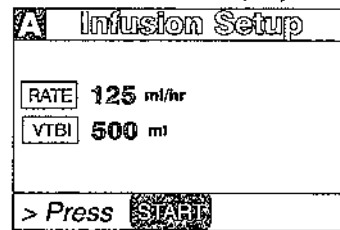
Channel Information Display:

- STANDBY indicator - extinguishes
 - INFUSING indicator - flashes
 - Message display - blanks
- Central Information Display:
- Returns to infusing screen

Channel Information Display:

- Channel indicator - illuminates

Central Information Display:



- Channel indicator - flashes

Channel Information Display:

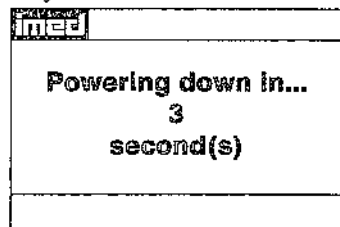
- INFUSING indicator - extinguishes
- Channel indicator - extinguishes
- Rate display - blanks

Central Information Display:

- Selected channel display - extinguishes

or

- if only one channel active:



- Time value decrements from 3 to 1, then the PC-4 powers down

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

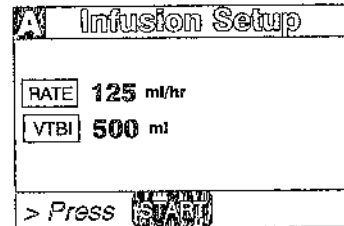
DISPLAY RESPONSE

To Change Rate or VTBI During Primary Infusion

1. Press **A**...**D** to select channel.
 - After 3 seconds "> Press **START**" displays
 - After 12 seconds audio prompt - sounds

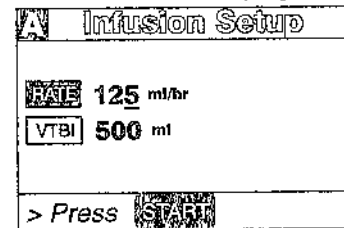
Channel Information Display:
• Channel indicator - illuminates

Central Information Display:



2. Press **RATE** or **VTBI**.
 - After 3 seconds "> Press **START**" displays
 - After 12 seconds audio prompt - sounds

Central Information Display:



3. Use the numeric data entry controls to change rate or VTBI. The **←** **→** controls can also be used to change rate.
 - After 3 seconds "> Press **START**" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:

NO CHANGE

Central Information Display:

- Rate or VTBI parameter changes to new value

4. Press **START**.

Channel Information Display:

- New rate value displays

Central Information Display:

- Returns to active infusion screen

NOTE

If new rate and/or VTBI parameters have been selected, but not confirmed by pressing **START** or **PAUSE**; the currently confirmed parameters can be recalled by pressing **Rate (VTBI)**, then pressing the **CANCEL** control.

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

If the Volume/Time infusion option has been enabled, the duration parameter may also be changed as described above for Rate and VTBI.

NOTE

An infusion setup sequence may be interrupted to respond to a situation on another channel by selecting the other channel, taking appropriate action and then pressing START. To return to the interrupted infusion setup, re-select the channel, press ENTER to continue the programming sequence or press CANCEL to return to the original operating parameters.

- Programming on channel X has not been completed
- Press ENTER to complete/confirm
- Press CANCEL to clear program

To Titrate RATE



1. Press **A**...**D** to select channel.

Channel Information Display:

- Channel indicator - illuminates

Central Information Display:

- Infusion Setup screen displays

2. Use  control to increase or  control to decrease the rate parameter in 1 or 0.1 mL/hr increments

Channel Information Display:

NO CHANGE


Central Information Display:

- Rate graphic is highlighted
- New rate value is displayed

or
Press and hold the  or  control to scroll to a new rate parameter

- After 3 seconds "> Press **START**" displays

- After 12 seconds audio prompt - sounds

3. Press .

Channel Information Display:

- New rate value displays

Central Information Display:

- Returns to active infusion screen

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

To Change the Pressure Limit Mode (PCS Mode Control Unlocked)


NOTE

There are three operating pressure limits that can be enabled: the Pump mode (P) which automatically sets the occlusion pressure based on the rate of infusion, the Controller mode (C) which senses the gravity pressure and adjusts the occlusion detection to this measurement and the Selectable (S) mode which allows the operator to set the occlusion detection pressure from 25 to 517 mmHg (0.5 to 10 psi). During operation in the P and S pressure modes, the dynamic pressure detected at the pump is displayed for each channel. To ensure accuracy of this measurement, set the height of the IV fluid 24 inches above the mid-point of the instrument.

1. Press ... to select channel.

Channel Information Display:



- Channel indicator - illuminates
- Central Information Display:
- Infusion Setup screen displays

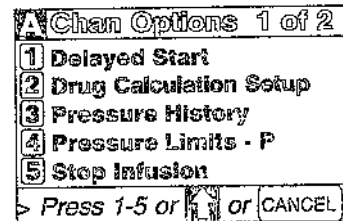
2. Press .


Channel Information Display:

NO CHANGE

Central Information Display:

- After 3 seconds "> Press 1-5 or  or  displays
- After 12 seconds audio prompt - sounds


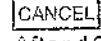


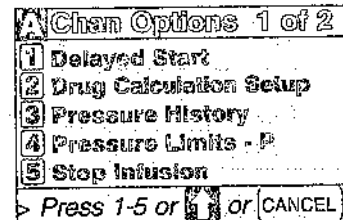
3. Press .



Channel Information Display:

NO CHANGE

Central Information Display:

- After 3 seconds "> Press 1-5 or  or  displays
- After 12 seconds audio prompt - sounds



4. Use   to select "Pump", "Controller" or "Selectable".

Channel Information Display:

NO CHANGE

Central Information Display:

- After 3 seconds "> Press Enter to confirm" displays





- When option is selected, option screen is entered.


INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)



ACTION/PROMPT

DISPLAY RESPONSE

NOTE

If Selectable Pressure mode is chosen, press  and then use   controls to select the desired patient side occlusion pressure limit (between 25 and 517 mmHg in 25 mmHg increments), then press  to confirm.


5. Press .


- After 3 seconds "> Press 1-5 or  or " displays
- After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE

Central Information Display:

- Channel Options screen displays

6. Press .

- If PCS Mode is changed during an active infusion, press  to resume infusion.

Channel Information Display:
NO CHANGE

Central Information Display:


- Infusion Setup screen displays

To View Pressure History for Selected Channel

NOTE

The pressure history screen provides the previous 2 hours of average operating pressure. Each vertical line represents a 2 minute average. The ← on the right side represents the occlusion pressure set point. A "+" in the upper portion of the screen indicates one or more occlusion alarms occurred during the 2 minute history period. The number in the right margin is the current pressure readout in mmHg. The history display is reset when the channel is turned off.

1. Press ... to select channel.


- After 3 seconds "> Press " displays
- After 12 seconds audio prompt - sounds



Channel Information Display:

- Channel indicator - illuminates

Central Information Display:

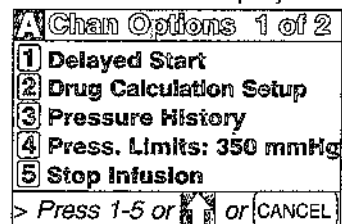
- Infusion Setup screen displays

2. Press .

- After 3 seconds "> Press 1-5 or  or " displays
- After 12 seconds audio prompt - sounds


Channel Information Display:
NO CHANGE

Central Information Display:



INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

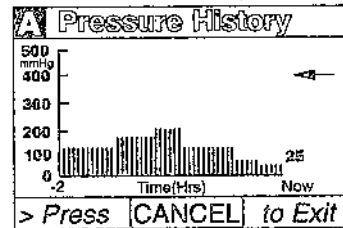
3. Press .
 - After 3 seconds "> Press **CANCEL** to Exit" displays
 - After 12 seconds audio prompt - sounds


DISPLAY RESPONSE

Channel Information Display:

NO CHANGE

Central Information Display:



4. Press .



Channel Information Display:

- Channel indicator - illuminates

Central Information Display:

- Returns to active infusion screen

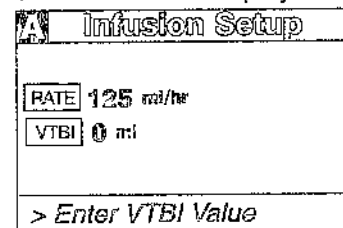
To Restart an Infusion Following an "INFUSION COMPLETE - KVO" or "EMPTY CONTAINER - KVO" Advisory


1. Press ... to select channel.
 - After 3 seconds "> Enter VTBI Value" displays

Channel Information Display:

- Rate display - shows "1" or set rate if <1.0 mL/hr
- "INFUSION COMPLETE - KVO" or "EMPTY CONTAINER - KVO" scrolls

Central Information Display:

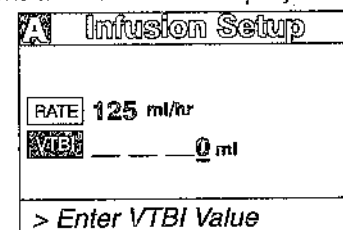


2. Press .

Channel Information Display:


NO CHANGE

Central Information Display:



INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

3. Use the numeric data entry controls to set a new VTBI.
4. Replace solution container and refill drip chamber, if necessary.
5. Change rate, if necessary.
6. Press .

DISPLAY RESPONSE

Channel Information Display:
NO CHANGE

Central Information Display:
• New VTBI displays

Channel Information Display:

- Set rate displays
- INFUSING indicator - flashes
- Message display - blanks


Central Information Display:

- Returns to active infusion screen

NOTE

If the Volume/Time infusion option has been enabled, the duration parameter may also be changed as described above for Rate and VTBI.

To View Primary, Secondary and Total Volume Infused for all Channels Simultaneously

1. Press .
 - Active channel indicators are highlighted


Channel Information Display:
NO CHANGE

Central Information Display:

Volume Infused			
	PRI	SEC	Total
A	351.1	+ 25.0	=376.1
B	0.0	+ 0.0	=0.0
C	0.0	+ 0.0	=0.0
D	0.0	+ 0.0	=0.0

* Example Values

To Clear Primary, Secondary and Total Volume Infused for all Channels Simultaneously

1. Press .
 - Active channel indicators are highlighted

Channel Information Display:
NO CHANGE


Central Information Display:

Volume Infused			
	PRI	SEC	Total
A	351.1	+ 25.0	=376.1
B	0.0	+ 0.0	=0.0
C	0.0	+ 0.0	=0.0
D	0.0	+ 0.0	=0.0

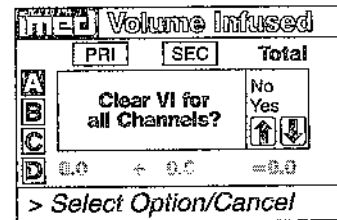
INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)



ACTION/PROMPT

DISPLAY RESPONSE


2. Press .
 - After 3 seconds "> Select Option/Cancel" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE
Central Information Display:





3. Use   to select "Yes".
 - After 3 seconds "> Press ENTER to confirm" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE
Central Information Display:
• Selected option is highlighted


4. Press .

Channel Information Display:
NO CHANGE
Central Information Display:
• Returns to active infusion screen

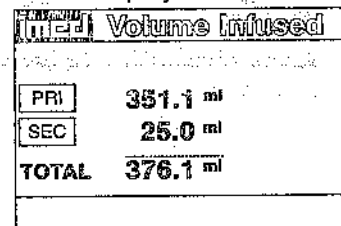
To View Primary, Secondary and Total Volume Infused on Selected Channel

1. Press ...  to select channel.
 - After 3 seconds "> Press START" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
• Channel indicator - illuminates
Central Information Display:
• Infusion Setup screen displays

2. Press .

Channel Information Display:
NO CHANGE
Central Information Display:
• Channel specific volume infused screen displays for 10 seconds:



Volume Infused	
PRI	351.1 ml
SEC	25.0 ml
TOTAL	376.1 ml

- After 10 seconds the Infusion Setup screen re-displays

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

3. Press **START** or **CANCEL** to deselect channel.

To Clear Primary, Secondary and Total Volume Infused on Selected Channel

1. Press **A** ... **D** to select channel.
 - After 3 seconds "> Press **START**" displays
 - After 12 seconds audio prompt - sounds
2. Press **VOLUME INFUSED**.

3. Press **CLEAR** while the Volume Infused screen is displaying to clear all Values to "0".

4. Press **START** or **CANCEL** to deselect channel.

DISPLAY RESPONSE

- Channel Information Display:
- Channel indicator - extinguishes
- Central Information Display:
- Returns to active infusion screen

- Channel Information Display:
- Channel indicator - illuminates
- Central Information Display:
- Infusion Setup screen displays

- Channel Information Display:
- NO CHANGE
- Central Information Display:
- Channel specific volume infused screen displays for 10 seconds:

med Volume Infused	
PRI	351.1 ml
SEC	25.0 ml
TOTAL	376.1 ml

- Channel Information Display:
- NO CHANGE
- Central Information Display:

med Volume Infused	
PRI	0.0 ml
SEC	0.0 ml
TOTAL	0.0 ml

- After 10 seconds the Infusion Setup screen re-displays
- Channel Information Display:
- Channel indicator - extinguishes
- Central Information Display:
- Returns to active infusion screen

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)



ACTION/PROMPT

DISPLAY RESPONSE

To Set Up Secondary (Piggyback) Infusion With Dual Rates

NOTE

The PC-4 will only allow Secondary infusion rate and VTBI parameters in the same delivery modes (PUMP/CONTROLLER) and numerical values (fractions versus integer) as the Primary rate and VTBI infusion parameters.

1. Set up and start the Primary infusion (using a check valve administration set) as previously described.
 - The Secondary infusion may be set up prior to or after starting a Primary infusion.
2. Open the Secondary administration set package, remove set, and close clamp.
3. Insert the set spike into the prepared fluid container and hang the Secondary container following accepted hospital procedure.
4. Fill the drip chamber $\approx 2/3$ full.
5. Open the Secondary clamp and prime the set. Close clamp.
6. Attach the Secondary set to the upper injection site on the Primary set.
7. Lower the Primary fluid container using the hanger provided with the Secondary set.
8. Press   to select channel.


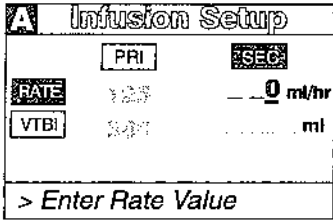





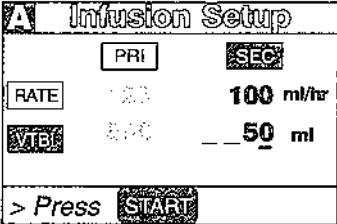

Channel Information Display:

- Channel indicator - illuminates
- INFUSING indicator - continues flashing

Central Information Display:

- Infusion Setup screen displays

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

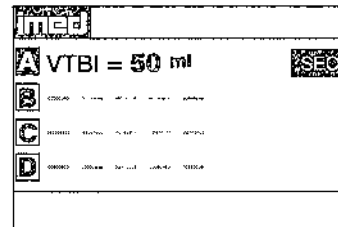
ACTION/PROMPT	DISPLAY RESPONSE
<p>9. Press .</p> <ul style="list-style-type: none"> • After 3 seconds "> Enter Rate Value" displays • Rate parameter is automatically selected 	<p>Channel Information Display: NO CHANGE</p> <p>Central Information Display:</p> 
<p>10. Use numeric data entry or   controls to enter or change rate value.</p> <ul style="list-style-type: none"> • After 3 seconds ">Enter VTBI Value" displays • After 12 seconds audio prompt - sounds 	<p>Channel Information Display: NO CHANGE</p> <p>Central Information Display:</p> <ul style="list-style-type: none"> • New rate value displays
<p>11. Press .</p> <ul style="list-style-type: none"> • After 3 seconds "> Enter VTBI Value" displays • After 12 seconds audio prompt - sounds 	<p>Channel Information Display: NO CHANGE</p> <p>Central Information Display:</p> <ul style="list-style-type: none"> • Last programmed secondary VTBI value displays
<p>12. Use numeric data entry controls to enter or change VTBI value, then press  to confirm.</p> <ul style="list-style-type: none"> • After 3 seconds "> Press  • After 12 seconds audio prompt - sounds 	<p>Channel Information Display: NO CHANGE</p> <p>Central Information Display:</p> 
<p style="text-align: center;">NOTE</p> <p>Verify that the Secondary VTBI does not exceed the contents of the Secondary fluid container.</p>	
<p>13. Open clamp on the Secondary set.</p>	
<p>14. Press .</p>	<p>Channel Information Display:</p> <ul style="list-style-type: none"> • Channel indicator - extinguishes • Secondary rate - displays • "SECONDARY" message scrolls

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

Central Information Display:



During Infusion:

NOTE

Various Advisories, Alarms, and Malfunctions may be displayed. Refer to the CHANNEL, CENTRAL INFORMATION DISPLAY AND ALARM RESPONSE PROCEDURES section in this manual for an explanation and appropriate response.

Upon Completion of the Secondary infusion:

- Switchover audio alert (6 beeps) - sounds (unless disabled in System Configuration)

NOTE

Actual changeover from the Secondary to the Primary IV solution is accomplished independently of pump/controller operation and occurs when the fluid level in the Secondary container drops to the same level as the fluid level in the Primary fluid container.

Channel Information Display:

- INFUSING indicator - flashes
- Secondary rate - displays

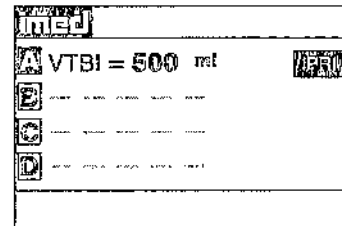
Central Information Display:

- VTBI (Secondary) - decrements

Channel Information Display:

- Primary rate displays
- Message screen clears

Central Information Display:



To Set Up Secondary (Piggyback) Infusion With Dual Rates and Volume/Time Infusion Option Enabled

1. Set up and start the Primary infusion (using a check valve administration set) as previously described.
 - The Secondary infusion may be set up prior to or after starting a Primary infusion.
2. Set up the Secondary administration set as previously described.

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

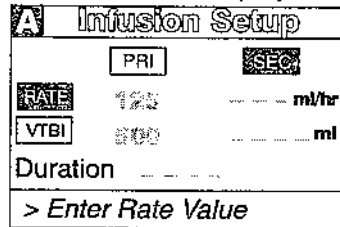
3. Press **A**...**D** to select channel.

Channel Information Display:
 • Channel indicator - illuminates
 • INFUSING indicator - continues flashing
 Central Information Display:
 • Infusion Setup screen displays

4. Press **SEC PIGGY BACK**.
 • After 3 seconds "> Enter Rate Value" displays
 • After 12 seconds audio prompt - sounds

Channel Information Display:
 NO CHANGE

Central Information Display:

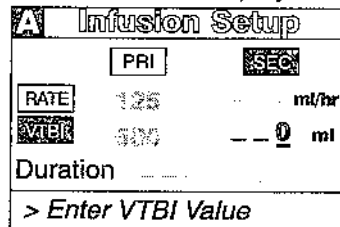


5. Press **VTBI**.
 • After 3 seconds "> Enter VTBI Value" displays
 • After 12 seconds audio prompt - sounds

Channel Information Display:

NO CHANGE

Central Information Display:



6. Use numeric data entry controls to enter or change VTBI value.
 • After 12 seconds audio prompt - sounds

Channel Information Display:

NO CHANGE

Central Information Display:

• New VTBI value displays

7. Press **TIME** or **ENTER**.
 • After 3 seconds "> Press **START**" displays
 • After 12 seconds audio prompt - sounds

Channel Information Display:

NO CHANGE

Central Information Display:

• Last programmed duration displays

8. Use numeric data entry controls to enter or change duration.
 • Rate value is calculated and displayed
 • After 3 seconds "> Press **START**" displays
 • After 12 seconds audio prompt - sounds

Channel Information Display:

NO CHANGE

INDEPENDENT SETUP AND OPERATING PROCEDURE (continued)

ACTION/PROMPT


DISPLAY RESPONSE

NOTES

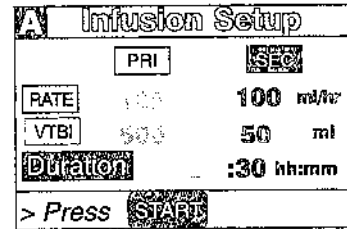
Verify that the Secondary VTBI does not exceed the contents of the Secondary fluid container.

It is acceptable to enter either a VTBI/Duration or a Rate/VTBI as the Secondary infusion parameters when the Volume/Time infusion option is enabled.

9. Open clamp on the Secondary set.

10. Press .

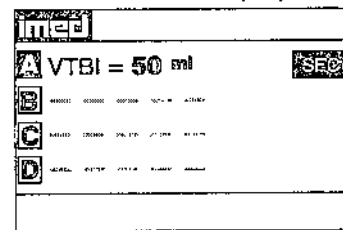
Central Information Display:



Channel Information Display:

- Channel Indicator - extinguishes
- Secondary rate - displays
- "SECONDARY" message scrolls

Central Information Display:



During Infusion:

NOTE

Various Advisories, Alarms, and Malfunctions may be displayed. Refer to the CHANNEL, CENTRAL INFORMATION DISPLAY AND ALARM RESPONSE PROCEDURES section in this manual for an explanation and appropriate response.

Channel Information Display:

- INFUSING indicator - flashes
- Secondary rate - displays

Central Information Display:

- VTBI (Secondary) - decrements

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

Upon Completion of the Secondary Infusion:

- Switchover audio alert (6 beeps) - sounds (unless disabled in System Configuration)

Channel Information Display:

- Primary rate displays
- Message screen clears

Central Information Display:

NOTE

Actual changeover from the Secondary to the Primary IV solution is accomplished independently of pump/controller operation and occurs when the fluid level in the Secondary container drops to the same level as the fluid level in the Primary fluid container.

med	
A	VTBI = 500 ml
B	
C	
D	

To Change Primary Infusion Parameters During Secondary Infusion

1. Press **A**...**D** to select channel.
 - After 3 seconds "> Press **START**" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:

- Channel indicator - illuminates

Central Information Display:

A Infusion Setup	
	PRI SEC
RATE	125 100 ml/hr
VTBI	500 50 ml
> Press START	



2. Press **SEC**.
 - After 3 seconds "> Press **START**" displays

Channel Information Display:

NO CHANGE

Central Information Display:

A Infusion Setup	
	PRI SEC
RATE	125 100 ml/hr
VTBI	500 50 ml
> Press START	

3. Use numeric data entry or   controls to change primary rate value.

Channel Information Display:

NO CHANGE


Central Information Display:


- New primary rate value displays



INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

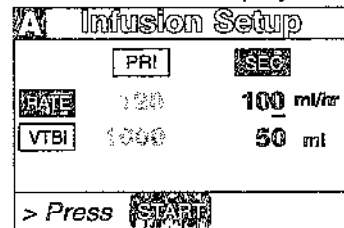
4. Press  to change primary VTBI.


5. Use numeric data entry controls to change primary VTBI.
 - After 3 seconds "> Press " displays
 - After 12 seconds audio prompt - sounds

6. Press .
 - After 3 seconds "> Press " displays
 - After 12 seconds audio prompt - sounds

- Channel Information Display:
NO CHANGE
- Central Information Display:
- Cursor displays under VTBI value
 - VTBI is highlighted
- Channel Information Display:
NO CHANGE
- Central Information Display:
- New primary VTBI value displays




- Channel Information Display:
NO CHANGE
- Central Information Display:





7. Press .

- Channel Information Display:
- Channel indicator - extinguishes
- Central Information Display:
- Active Secondary Infusion screen displays

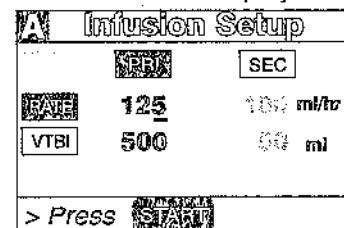
To Stop a Secondary Infusion and Return to the Primary Infusion

1. Press ... to select channel.
 - After 3 seconds "> Press " displays
 - After 12 seconds audio prompt - sounds

2. Press .
 - After 3 seconds "> Press " displays

- Channel Information Display:
- Channel indicator - illuminates
- Central Information Display:
- Secondary Infusion Setup screen displays


- Channel Information Display:
NO CHANGE
- Central Information Display:






INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

3. Close Secondary clamp.


4. Press .


5. Use  or  to select "Yes" option.

6. Press .

- The secondary infusion stops and the primary infusion starts.
- The audio tone sounds six times (unless the primary switchover alert is disabled).

To Change the Time of Day

1. Press .

2. Press .

- After 12 seconds audio prompt - sounds

NOTE

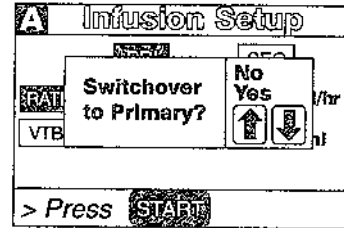
If a Delayed Start or Multidose is active, "> Delay Mode is Active" will display and Time-of-Day display screen cannot be accessed.

DISPLAY RESPONSE

Channel Information Display:

NO CHANGE

Central Information Display:



Central Information Display:

- "Yes" option is highlighted

Channel Information Display:

- Rate changes to Primary value
- Channel indicator - extinguishes

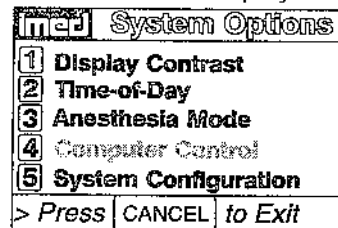
Central Information Display:

- Primary active infusion screen displays

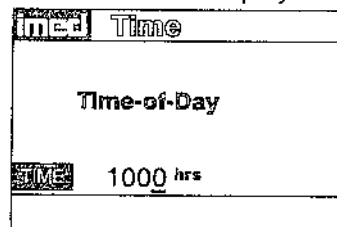
Channel Information Display:

NO CHANGE





Central Information Display:



Central Information Display:









INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

<u>ACTION/PROMPT</u>	<u>DISPLAY RESPONSE</u>
<p>3. Use numeric data entry controls to enter the new time.</p>	<p>Central Information Display:</p> <ul style="list-style-type: none"> • New time displays
<p>4. Use  or  to select AM or PM, if clock is in the AM/PM mode.</p>	
<p>5. Press  to confirm.</p>	<p>Channel Information Display: NO CHANGE</p> <p>Central Information Display:</p> <ul style="list-style-type: none"> • System Options screen displays
<p>6. Press .</p>	<p>Channel Information Display: NO CHANGE</p> <p>Central Information Display:</p> <ul style="list-style-type: none"> • Infusion setup or active screen displays

To Set Up a Delayed Start Infusion


NOTE

Since by definition, a Delayed Start infusion will not be infusing for a programmed period of time, it is assumed that another infusing IV line will keep the vein open until the delayed start infusion begins. No KVO (Keep Vein Open) infusion precedes or follows a Delayed Start program.

<p>1. Prime and load the primary administration set as previously described.</p>	
<p>2. Press ... to select channel.</p> <ul style="list-style-type: none"> • After 3 seconds "Enter Rate Value" displays. • After 12 seconds audio prompt - sounds 	<p>Channel Information Display:</p> <ul style="list-style-type: none"> • Channel indicator - illuminates • RATE display shows "- - - -". <p>Central Information Display:</p> <ul style="list-style-type: none"> • Infusion Setup screen displays
<p>3. Press .</p> <ul style="list-style-type: none"> • After 3 seconds "> Press 1-5 or  or  displays • After 12 seconds audio prompt - sounds 	<p>Channel Information Display: NO CHANGE</p> <p>Central Information Display:</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>A Chan Options 1 of 2</p> <p>1 Delayed Start</p> <p>2 Drug Calculation Setup</p> <p>3 Pressure History</p> <p>4 Pressure Limits - P</p> <p>5 Stop Infusion</p> <p>> Press 1-5 or  or CANCEL</p> </div>

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

4. Press .
- After 3 seconds "Enter Rate Value" displays
 - After 12 seconds audio prompt - sounds



DISPLAY RESPONSE

Channel Information Display:
NO CHANGE
Central Information Display:

A	Delayed	1154 hrs
RATE		0 ml/hr
VTBI		
START TIME		
Callback Alert?		No
> Enter Rate Value		

NOTE

If this is the first Delayed Start (or Multidose) Setup following POWER ON, the following pop-up display appears:

If the time displayed in the upper right corner of the display is correct, press  to continue. If the time displayed is incorrect press . The following pop-up display appears:

Enter the correct Time of Day and press .

Confirm Current Time
1154 hrs
Press ENTER to confirm.
Press OPTIONS to edit.


Current Time
1154 hrs

NOTE

If the Volume/Time Infusion option is enabled, the Delayed Start Infusion setup screen will include a "Duration" parameter that will display between the VTBI and START TIME lines as shown below:

The duration parameter is calculated based upon the Rate and VTBI inputs. A duration value can not be entered directly in the Delayed Start mode.

A	Delayed	1154 hrs
RATE		0 ml/hr
VTBI		
Duration		
START TIME		
Callback Alert?		No
> Enter Rate Value		

5. Press .
- After 3 seconds "> Enter Rate Value" displays
 - After 12 seconds audio prompt - sounds













Channel Information Display:
NO CHANGE
Central Information Display:

- RATE is highlighted
- Last entered rate or "0" displays

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

6. Use numeric data entry or   controls to input or change rate value.
 - After 3 seconds "> Enter VTBI Value" displays
 - After 12 seconds audio prompt - sounds
7. Press .
 - After 3 seconds "> Enter VTBI Value" displays
 - After 12 seconds audio prompt - sounds
8. Use numeric data entry controls to input or change VTBI value.
 - After 3 seconds "> Enter Start Time" displays
 - After 12 seconds audio prompt - sounds
9. Press .
 - After 3 seconds "> Enter Start Time" displays
 - After 12 seconds audio prompt - sounds
10. Use numeric data entry controls to enter start time (use   to select AM or PM, if required). Maximum delay is 23 hours 59 minutes from current time.
 - After 3 seconds "> Press  to confirm" displays
 - After 12 seconds audio prompt - sounds
11. Press  to change Callback Alert option.
 - Use  or  to select "Yes" (No is default setting) then press  to confirm.
 - After 3 seconds "> Press "
 - After 12 seconds audio prompt - sounds.

Channel Information Display:
NO CHANGE

Central Information Display:
• New rate value displays

Channel Information Display:
NO CHANGE



Central Information Display:
• VTBI is highlighted
• Last VTBI value or "0" displays

Channel Information Display:
NO CHANGE

Central Information Display:
• New VTBI value displays

Channel Information Display:
NO CHANGE

Central Information Display:






	Delayed	1154 hrs
RATE	50 ml/hr	
VTBI	250 ml	
		hrs
Callback Alert?	No	
> Enter Start Time		

Channel Information Display:
NO CHANGE

Central Information Display:
• New Start Time displays

Channel Information Display:
NO CHANGE

Central Information Display:

	Delayed	1154 hrs
RATE	50 ml/hr	
VTBI	250 ml	
	1200 hr	
Callback Alert?	>>>	 
> Press 		


INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

NOTE

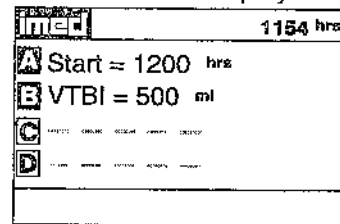
Callback is an audio alert sounding at completion of a Delayed Start Infusion.

12. Attach the set to the patient's vascular access device following accepted hospital procedure.
13. Press .

Channel Information Display:

- Rate display shows "----"
- STANDBY indicator - illuminates
- Channel indicator - extinguishes

Central Information Display:



When START TIME = Current time

- Infusion Starts

Channel Information Display:

- Programmed rate displays
- INFUSING indicator - flashes

Central Information Display:

- Active infusion screen displays including Time-of-Day display
- VTBI decrements

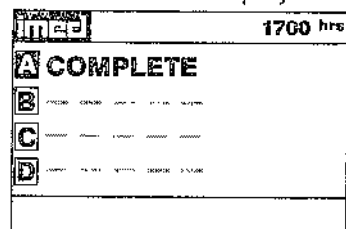
When the infusion is complete

- Infusion Stops (No KVO)
- If Callback Alert was selected, an audio alert sounds

Channel Information Display:

- Channel indicator - extinguishes
- Rate display - blanks
- "DELAYED START COMPLETE" scrolls

Central Information Display:



INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)



ACTION/PROMPT



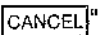
DISPLAY RESPONSE


To Set Up a Delayed Start Secondary Infusion

Since by definition, a Delayed Start Infusion will not be infusing for a programmed period of time, it is assumed that another infusing IV line will keep the vein open until the delayed start infusion begins. In a Delayed Start Secondary Infusion, no KVO (Keep Vein Open) infusion precedes or follows completion of the primary infusion.

1. Prime and load the Secondary administration set as previously described.

2. Press ... to select channel.
 - After 3 seconds "Enter Rate Value" displays
 - After 12 seconds audio prompt - sounds

3. Press .
 - After 3 seconds "> Press 1-5 or  or " displays
 - After 12 seconds audio prompt - sounds

4. Press .
 - After 3 seconds "> Enter Rate Value" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:

- Channel indicator - illuminates
- RATE display shows "- - - -".

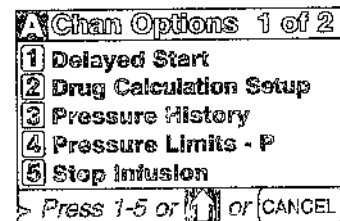
Central Information Display:

- Infusion Setup screen displays

Channel Information Display:

NO CHANGE

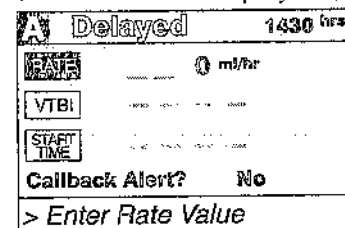
Central Information Display:



Channel Information Display:

NO CHANGE

Central Information Display:



INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)


ACTION/PROMPT

DISPLAY RESPONSE

NOTE


If this is the first Delayed Start (or Multidose) Setup following POWER ON, the following pop-up display appears:

Confirm Current Time 1430 hrs Press ENTER to confirm. Press OPTIONS to edit.
--



If the time displayed in the upper right corner of the display is correct, press  to continue. If the time displayed is





incorrect press . The following pop-up display appears:

Current Time 1430 hrs

Enter the correct Time of Day and press .

NOTE

A Delayed Start Secondary Infusion may also be programmed by entering the Primary infusion parameters, press  and enter the Secondary parameters then press  and select Option #1 to select Delayed Start Secondary.

5. Press .
 - After 3 seconds "> Enter Rate Value" displays
 - After 12 seconds audio prompt - sounds
6. Use numeric data entry or   controls to input or change rate value.
 - After 3 seconds "> Enter VTBI Value" displays
 - After 12 seconds audio prompt - sounds
7. Press .
 - After 3 seconds "> Enter VTBI Value" displays
 - After 12 seconds audio prompt - sounds
8. Use numeric data entry controls to input or change VTBI value.
 - After 3 seconds "> Enter Start Time" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE
Central Information Display:

- RATE is highlighted
- Last entered rate or "0" displays





Channel Information Display:
NO CHANGE
Central Information Display:

- New rate value displays

Channel Information Display:
NO CHANGE
Central Information Display:

- VTBI is highlighted
- Last VTBI value or "0" displays


Channel Information Display:
NO CHANGE
Central Information Display:

 Delayed	1430 hrs
 RATE	125 ml/hr
 VTBI	500 ml
 START TIME	__ __ __ __ hrs
Callback Alert?	No
> Enter Start Time	

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

9. Press .
- After 3 seconds "> Enter Rate Value" displays
 - After 12 seconds audio prompt - sounds
 - The Rate field is highlighted

Channel Information Display:
NO CHANGE

Central Information Display:



A Delay SEC		1430 hrs
PRI	SEC	
RATE	125	0 ml/hr
VTBI	500	ml
START TIME	hrs	
> Enter Rate Value		

NOTE

If the Volume/Time Infusion option is enabled, the Delayed Start Secondary set up screen will include a "Duration" parameter displayed between VTBI and START TIME as shown below:

The duration parameter is calculated based upon rate and VTBI parameter inputs. A duration value cannot be entered directly in the Delayed Start Secondary mode.


A Delay SEC		1430 hrs
PRI	SEC	
RATE	125	0 ml/hr
VTBI	500	ml
Duration		
START TIME	hrs	
> Enter Rate Value		

10. Use numeric data entry or   controls to enter Secondary rate value.
- After 3 seconds "> Enter VTBI Value" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE

Central Information Display:

- New Secondary rate displays

11. Press .
- After 3 seconds "> Enter VTBI Value" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE

Central Information Display:

- VTBI is highlighted

12. Use numeric data entry controls to enter Secondary VTBI value.
- After 3 seconds "> Enter Start Time" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE

Central Information Display:

A Delay SEC		1430 hrs
PRI	SEC	
RATE	125	100 ml/hr
VTBI	500	50 ml
START TIME	hrs	
> Enter Start Time		

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

13. Press **TIME** or **ENTER** control.
- After 3 seconds "> Enter Start Time" displays
 - After 12 seconds audio prompt - sounds

14. Use numeric data entry controls to enter Start Time (Use **↑** **↓** to select AM or PM, if appropriate).

- After 3 seconds "> Press **START**" displays
- After 12 seconds audio prompt - sounds

15. Press **START**.

When START TIME = Current time

- Infusion Starts

DISPLAY RESPONSE

Channel Information Display:
NO CHANGE

Central Information Display:

A	Delay SEC	1430 hrs
	PRI	SEC
RATE	125	100 ml/hr
VTBI	500	50 ml
START TIME		hrs
> Enter Start Time		

Channel Information Display:
NO CHANGE

Central Information Display:

A	Delay SEC	1430 hrs
	PRI	SEC
RATE	125	100 ml/hr
VTBI	500	50 ml
START TIME		1500 hrs
> Press START		

Channel Information Display:

- Rate display shows "- - -"
- STANDBY indicator illuminates
- Channel indicator - extinguishes

Central Information Display:

med	1430 hrs
A	Start = 1500 hrs
B	
C	
D	

Channel Information Display:

- Programmed rate displays
- INFUSING indicator - flashes

Central Information Display:

- Active infusion screen displays including Time-of-Day display
- Secondary VTBI decrements

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

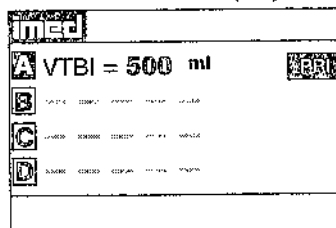
When the Secondary Infusion is Complete

- Switchover audio (6 beeps) sounds (unless disabled in System Configuration)
- Primary infusion begins

Channel Information Display:

- Primary rate displays
- Message screen clears

Central Information Display:



To Set Up a Multidose Infusion

WARNING

The Multidose feature is to be used only by personnel properly trained in using multidose containers. Caution labels which clearly differentiate single dose and Multidose containers must be utilized. Single dose piggyback systems employing check valve sets are not designed for use with Multidose containers.

NOTE

Since by definition, a Multidose infusion will not be infusing for a programmed period of time, it is assumed that another infusing IV line will keep the vein open until the beginning of the first dose and between subsequent doses. No KVO (Keep Vein Open) infusion precedes or follows a Multidose infusion program.

1. Prime and load the primary administration set as previously described.
2. Press **A**...**D** to select channel.
 - After 3 seconds "Enter Rate Value" displays
 - After 12 seconds audio prompt - sounds
3. Press **ENTER**.
 - After 3 seconds "> Press 1-5 or **ENTER** or **CANCEL**" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:

- Channel indicator - illuminates
- RATE display shows "----"

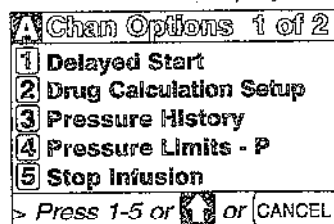
Central Information Display:

- Infusion Setup screen displays

Channel Information display:





NO CHANGE


Central Information Display:



INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT


4. Use   to select screen 2 of 2 of the Channel Options display.
- After 3 seconds "> Press 1-5 or  or " displays
 - After 12 seconds audio prompt - sounds

5. Press .
- After 3 seconds "> Enter Rate Value" displays
 - After 12 seconds audio prompt - sounds


NOTE




If this is the first Multidose (or Delayed Start) Setup following POWER ON, the following pop-up display appears:

If the time displayed in the upper right corner of the display is correct, press

 to continue. If the time displayed is



incorrect press . The following pop-up display appears:

Enter the correct Time of Day and press .

6. Use numeric data entry or   controls to enter the rate at which each dose is to be infused.
- After 3 seconds "> Press  to confirm" displays
 - After 12 seconds audio prompt - sounds

DISPLAY RESPONSE

Channel Information Display:
NO CHANGE
Central Information Display:

A	Chan Options 2 of 2
1	Multidose
2	-----
3	-----
4	-----
5	Stop Infusion
> Press 1-5 or  or 	

Channel Information Display:
NO CHANGE
Central Information Display:

A	Multidose	1754 hrs
Rate:	-----	0 ml/hr
VTBI/Dose:	<small>ENTER TO CHANGE</small>	
Interval:	<small>ENTER TO CHANGE</small>	
# Doses:	<small>ENTER TO CHANGE</small>	
Start At:	<small>ENTER TO CHANGE</small>	
> Enter Rate Value		

Confirm Current Time
1754 hrs
Press ENTER to confirm.
Press OPTIONS to edit.

Current Time
1754 hrs

Channel Information Display:
NO CHANGE
Central Information Display:

- Rate displays

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)


ACTION/PROMPT

DISPLAY RESPONSE

7. Press  or .
- After 3 seconds "> Enter VTBI Value" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE
Central Information Display:

A	Multidose	1754 hrs
Rate: 100 ml/hr		
VTBI/Dose: 0 ml		
Interval: <small>10:00 00:00</small>		
# Doses: <small>10:00 00:00</small>		
Start At: <small>10:00 00:00 00:00 00:00</small>		
> Enter VTBI Value		


8. Use numeric data entry controls to enter the VTBI/Dose for each dose to be infused.
- After 3 seconds "> Press  to confirm" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE
Central Information Display:

- VTBI/Dose displays


NOTE

When an Empty Container Detector (ECD) is connected to the channel, a dialog box questions if last DOSE is to be delivered until container is empty (all).

9. Press .
- After 3 seconds "> Enter Dose Interval" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE
Central Information Display:

A	Multidose	1754 hrs
Rate: 100 ml/hr		
VTBI/Dose: 50 ml		
Interval: every 0 hrs		
# Doses: <small>10:00 00:00</small>		
Start At: <small>10:00 00:00 00:00 00:00</small>		
> Enter Dose Interval		


10. Use numeric data entry controls to enter the Dose Interval (1-24 hours) for each dose to be infused.
- After 3 seconds "> Press  to confirm" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE
Central Information Display:

- Dose Interval displays


INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)


ACTION/PROMPT




11. Press .
- After 3 seconds "> Enter Number of Doses" displays
 - After 12 seconds audio prompt - sounds

NOTE

Maximum allowable Multidose delivery schedule (number of doses times interval) is 24 hours.

12. Use numeric data entry controls to enter the Number of Doses (1-24) to be infused.
- After 3 seconds "> Press  to confirm" displays
 - After 12 seconds audio prompt - sounds

13. Press .
- After 3 seconds "> Enter Start Time" displays
 - After 12 seconds audio prompt - sounds


14. Use numeric data entry controls to enter Start Time (Current time + 8 hours maximum) for initial dose (use  or  to select AM or PM, if required).
- After 3 seconds "> Press  to confirm" displays
 - After 12 seconds audio prompt - sounds

NOTE

To start a Multidose infusion immediately, enter the current time, as the start time.


DISPLAY RESPONSE

Channel Information Display:
NO CHANGE
Central Information Display:

 Multidose	1754 hrs
Rate:	100 ml/hr
VTBI/Dose:	50 ml
Interval:	6 hrs
# Doses:	0 doses
Start At:	1754 hrs
> Enter Number of Doses	

Channel Information Display:
NO CHANGE
Central Information Display:
• Number of Doses displays



Channel Information Display:
NO CHANGE
Central Information Display:

 Multidose	1754 hrs
Rate:	100 ml/hr
VTBI/Dose:	50 ml
Interval:	6 hrs
# Doses:	4 doses
Start At:	_____ hrs
> Enter Start Time	



Channel Information Display:
NO CHANGE
Central Information Display:
• Start Time displays


INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

15. Press .
- After 3 seconds "> Press " displays
 - After 12 seconds audio prompt - sounds

NOTE


To edit the Multidose infusion parameters, press  to return to the top of the Multidose setup screen. Use numeric data entry controls to change highlighted parameter. Use  to move to the next parameter.

16. Attach the set to the patient's vascular access device following accepted hospital procedure.
17. Confirm the dosing parameter entries, then press .

DISPLAY RESPONSE

Channel Information Display:
NO CHANGE

Central Information Display:

A Multidose	1754 hrs
Rate:	100 ml/hr
VTBI/Dose:	50 ml
Interval:	6 hrs
# Doses:	4 doses
Start At:	2000 hrs
> Press 	

Channel Information Display:

IMMEDIATE START OF MULTIDOSE

- INFUSING indicator - flashes
 - Set Rate is displayed
- DELAYED START OF MULTIDOSE
- Channel indicator - extinguishes
 - STANDBY indicator - illuminates
 - Rate display shows "----"

Central Information Display:

A Dose 1	1800 hrs
* A DOSE1 = 2000 hrs	
B	
** C VTBI = 25 ml	
D	

* Delayed start

** Immediate start

When a Multidose infusion is in progress:

- Following completion of a dose infusion, DOSE"X"=(START TIME) displays (where X = number of next dose followed by its scheduled start time)
- The VTBI for an active dose infusion decrements

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

- To review the selected Multidose infusion, press **A**...**D** to call up the selected channel Multidose status summary screen.

When the Multidose infusion is completed:

- The infusion stops (with no KVO).
- Press **A**...**D** to select channel.
 - After 3 seconds "> Press **ENTER** to continue" displays
 - After 12 seconds audio prompt - sounds

- Press **ENTER** to reset and resume same Multidose infusion or press **CHANNEL OFF** to shut down channel.
 - To resume - reset start time

DISPLAY RESPONSE

Central Information Display:

A	Multidose	2230 hrs
Rate= 100 ml/hr		
VTBI= 50 ml		
Every 6 hrs x 4 doses		
Doses completed=1		
Dose 2 Starts 0200 hrs		
> Press START		

Channel Information Display:

- INFUSING indicator - extinguishes
- Rate display - blanks
- "MULTIDOSE COMPLETE" scrolls

Central Information Display:

- "COMPLETE" displays for the appropriate channel

Channel Information Display:

- Channel indicator - illuminates

Central Information Display:

A	Multidose	1600 hrs
Rate= 100 ml/hr		
VTBI= 50 ml		
Every 6 hrs x 4 doses		
Doses completed=4		
MULTIDOSES COMPLETE		
> Press ENTER to continue		

Channel Information Display:

NO CHANGE

Central Information Display:



ENTER Option

- Multidose Infusion Program screen displays

CHANNEL OFF Option

A	Multidose	1600 hrs
Rate: 100 ml/hr		
Retain Infusion Program?		
Press ENTER to retain program		
Press OFF to clear program		
Start At: 2000 hrs		
> Press CHANNEL OFF ENTER		







INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT	DISPLAY RESPONSE
3. Press  to save Multidose Infusion Program or press  to clear program.	Channel Information Display: <ul style="list-style-type: none"> • Channel displays - blank Central Information Display: <ul style="list-style-type: none"> • Active Infusion screen displays for other operating channels or Powerdown screen displays

To Use Drug Calculation

WARNING

The Drug Calculation feature is to be used only by personnel properly trained in the administration of continuously infused medications. Extreme caution should be exercised to insure correct entry of drug calculation infusion parameters. Refer to specific drug product labeling for information concerning appropriate administration techniques and dosages.

1. Prime and load the primary administration set as previously described.
2. Press ... to select channel.
 - After 3 seconds "Enter Rate Value" displays
 - After 12 seconds audio prompt - sounds
3. Press .
 - After 3 seconds "> Press 1-5 or  or " displays
 - After 12 seconds audio prompt - sounds
4. Press .
 - After 3 seconds "> Enter Drug Amount" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:

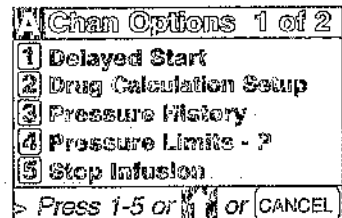
- Channel indicator - illuminates
- RATE display shows " - - - ".

Central Information Display:

- Infusion Setup screen displays

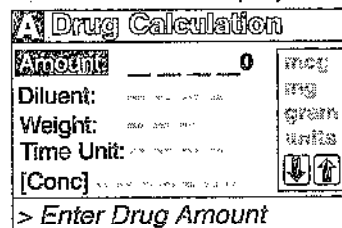
Channel Information Display:
NO CHANGE

Central Information Display:






Channel Information Display:
NO CHANGE


Central Information Display:





INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

5. Use numeric data entry controls to enter the amount of drug added to the IV container.
 - After 3 seconds "> *Select Unit of Measure*" displays
 Use  or  to select a unit of measure (mcg, mg, gram or units)
 - After 3 seconds "> Press  to confirm" displays
 - After 12 seconds audio prompt - sounds

6. Press .
 - After 3 seconds "> *Enter Diluent Volume*" displays
 - After 12 seconds audio prompt - sounds

7. Use numeric data entry controls to enter the Diluent Volume (when originally prepared).
 - After 3 seconds "> Press  to confirm" displays
 - After 12 seconds audio prompt - sounds

8. Press .
 - After 3 seconds "> *Dose based on Pt Wt?*" displays
 - After 12 seconds audio prompt - sounds

DISPLAY RESPONSE



Channel Information Display:
NO CHANGE
Central Information Display:
• Selected Amount displays

Channel Information Display:
NO CHANGE
Central Information Display:

A Drug Calculation	
Amount:	400 mg
Diluent:	0 ml
Weight:	
Time Unit:	
[Conc]	
> <i>Enter Diluent Volume</i>	

Channel Information Display:
NO CHANGE
Central Information Display:
• Diluent Volume displays




Channel Information Display:
NO CHANGE
Central Information Display:

A Drug Calculation	
Amount:	400 mg
Diluent:	250 ml
Weight:	>>>>>
Time Unit:	
[Conc]	1600 mcg/ml
> <i>Dose based on Pt Wt?</i>	
	No Yes  

INDEPENDENT SETUP AND OPERATING PROCEDURE (continued)

ACTION/PROMPT

DISPLAY RESPONSE




9. Use  or  to select Yes or No in response to query "Dose based on Pt Wt?"
- After 3 seconds "> Press  to confirm" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE
Central Information Display:
• Yes or No selection is highlighted



NOTE




Do not enter a patient weight if weight is not used in the calculation. If setting up a second Drug Calculation also using patient weight, changing weight on one channel recalculates dosage (not infusion rate) on the other channels.

When dialog box appears, press  to confirm weight for all channels.




10. Press  to confirm selection.
- If Yes is selected, use numeric data entry controls to enter patient weight in kilograms (kg) and press  to confirm
 - or
 - If No is selected, press  to confirm. (screen will show "Weight: Not used")
 - After 3 seconds "> Select Time Units" displays

Channel Information Display:
NO CHANGE
Central Information Display:



A Drug Calculation	
Amount: 400 mg	
Diluent: 250 ml	
Weight: 80 kg	
Time Unit >>>>>	Min Hour  
[Conc] 1600 mcg/ml	
> Select Time Units	

11. Use  or  to select Min or Hour.
- After 3 seconds "> Press  to confirm" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE
Central Information Display:
• Min or Hour is highlighted

12. Press  to confirm selection.
- After 3 seconds "> Press   displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE
Central Information Display:

A Drug Calculation	
Amount: 400 mg	
Drug will be dosed in:	
mcg/kg/min	
Press ENTER to accept, or Press OPTIONS/EDIT to edit	
[Conc] 1600 mcg/ml	
> Press  	

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)





ACTION/PROMPT



DISPLAY RESPONSE

NOTE

Drug dose units default values are delineated in the following table:

Drug amount entered as:	Drug will be dosed in:	Example:
micrograms	micrograms	500 mcg in 50 ml, Weight = no, Time units = Min [Conc] = 10 mcg/ml Drug dose is mcg/min
milligrams (where concentration is ≤ 10 mg/ml)	micrograms	500 mg in 50 ml, Weight = yes, Time units = Min [Conc] = 10000 mcg/ml Drug dose is mcg/kg/min
milligrams (where concentration is > 10 mg/ml)	milligrams	1000 mg in 50 ml, Weight = yes, Time units = Min [Conc] = 20 mg/ml Drug dose is mg/kg/min
grams	milligrams	2 gm in 250 ml, Weight = no, Time units = Min [Conc] = 8 mg/ml Drug dose is mg/min
units (where concentration is ≥ 1 unit/ml)	units	25000 units in 250 ml, Weight = no, Time units = Hour, [Conc] = 100 units/ml Drug dose is units/hour
units (where concentration is < 1 unit/ml)	milliunits	10 units in 1000 ml, Weight = no, Time units = Min, [Conc] = 10 milliunits/ml Drug dose is milliunits/min

If the default drug dose unit does not meet the requirement for the drug to be infused, press the  control and use the   controls to select an alternate drug dosing unit. Press  to confirm.

13. Press  to confirm the drug calculation dosing parameters or press  to edit drug calculation parameters.
- After 3 seconds "> Enter Rate or Dose" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:

NO CHANGE



Central Information Display:

▲ Infusion Setup	
RATE	0 ml/hr
VTBI	
DOSE	0 mcg/kg/min
[Conc]	1600 mcg/ml
> Enter Rate or Dose	

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT



DISPLAY RESPONSE

14. Press  or .
- If rate, after 3 seconds "> Enter Rate Value" displays
 - or
 - If dose, after 3 seconds "> Enter Dose Value" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE

Central Information Display:


- If rate, RATE and 0 ml/hr are highlighted
- or
- If dose, DOSE and 0^{mcg/kg/min} are highlighted

15. Use numeric data entry or controls to enter either a rate or dose (  can be used to enter rate).
- After 3 seconds "> Enter VTBI Value" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE

Central Information Display:


- Entered Rate value and calculated Dose value are displayed
- or
- Entered Dose value and calculated Rate display

16. Press .
- After 3 seconds "> Enter VTBI Value" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE


Central Information Display:

- VTBI and 0 ml are highlighted

17. Use numeric data entry controls to enter VTBI value.
- After 3 seconds "> Press " displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE

Central Information Display:


Infusion Setup	
RATE	10.0 ml/hr
VTBI	250 ml
DOSE	3.3 mcg/kg/min
[Conc]	1600 mcg/ml
> Press 	

18. Attach the set to the patient's vascular access device following accepted hospital procedure.

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

19. Press .

Channel Information Display:

- Channel indicator - extinguishes
- INFUSING indicator - flashes
- Selected or calculated rate displays
- Selected or calculated dose scrolls

Central Information Display:

- Active infusion screen displays

During the infusion:

- Changes made to the rate result in corresponding changes to the drug dose.
- Changes made to the dose result in corresponding changes to the rate.



Channel Information Display:

- Drug dose continues to scroll (unless drug dose display is set to "Temporary" in System Configuration)

Central Information Display:

- VTBI value decrements

Stopping and Saving a Drug Calculation Infusion:

1. Press ...  to select channel.
 - After 3 seconds "> Enter VTBI Value" displays
 - After 12 seconds audio prompt - sounds

Channel Information Display:

- Channel indicator - illuminates

Central Information Display:

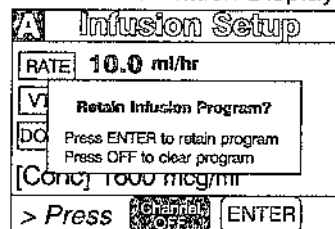
- Drug Calculation Infusion Setup screen displays



2. Press .

Channel Information Display:

- Rate display - blanks
- INFUSING indicator - extinguishes

Central Information Display:



3. Press  to save current Drug Calculation Infusion Program or press  to clear program.

Channel Information Display:

- Channel displays - blank

Central Information Display:

- Active Infusion screen displays, if other channels are operating; or Powerdown screen displays

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

To Edit a Drug Calculation Setup

WARNING

It is the responsibility of the user to adjust infusion rate, if required. Changing drug concentration (e.g. switching to a higher drug concentration) or patient weight may require adjustment of the infusion rate. Use accepted hospital procedure which may involve changing IV tubing or repriming existing tubing when drug concentration is changed.

Editing the setup parameters during a running drug calculation will result in a recalculation of the dosage. Rate will remain as programmed.

If Amount, Diluent or Time Unit parameters are changed, the following dialog box appears:

Drug concentration change recalculates dose. Rate remains as programmed. Adjust Rate/Dose if required. Re-prime line if necessary.
Press Enter to continue

If only weight is changed, the following dialog box appears:




Note: Weight change does not change rate. Dose recalculates based on new weight. Adjust Dose or Rate if required.
Press Enter to continue

Changing Channel Selection Before Completing Programming

NOTE

Prior to completing a program change, it is possible to exit one channel and program another. Upon starting another channel, the previous channel is automatically selected along with a dialog box that alerts the user to complete the program change.

The following dialog box appears:

- Press  to continue or  to discard your previous edit.
- Complete programming and press .

Channel A/B/C/D program has not been completed.
Press ENTER to complete/confirm
or
Press CANCEL to clear program

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

ACTION/PROMPT

DISPLAY RESPONSE

To Infuse Using an Empty Container Detector (ECD)

1. Set up a primary infusion on any channel.
2. Connect an ECD to the appropriate ECD connector on the rear panel of the PC-4.
 - The appropriate channel indicator LED on the ECD will illuminate.
3. Attach the ECD to the drip chamber of the primary set.
4. Press **VTBI**, then **0** or **CLEAR** to clear the VTBI value.
5. Press **1** to select "ALL" or program a specific VTBI using the numeric data entry controls.

Central Information Display:

A	Infusion Setup
RATE	125 ml/hr
VTBI	ALL
> Press START	

6. Press **START**.

When the ECD senses an empty container:

- An audio prompt sounds
- "EMPTY CONTAINER - KVO" scrolls
- RATE display shows "1" or set rate if <1.0
- Channel ALARM indicator - flashes
- Channel INFUSING indicator - continues to flash.

To Select Anesthesia Mode

NOTE


Anesthesia mode is intended for use in the operating room where critical IV infusions are under constant surveillance by Anesthesia personnel. Anesthesia mode allows the user to PAUSE an infusion with no audible prompting or "walkaway" alarms associated with normal PC-4 operation. It also decreases the number of steps required to restart a saved Drug Calculation program. Anesthesia mode must be enabled in the System Configuration in order to be selected.

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)

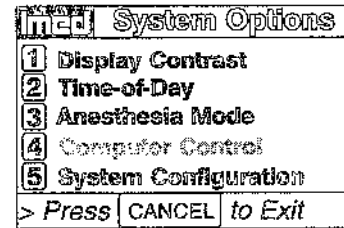
ACTION/PROMPT

DISPLAY RESPONSE

1. Power on the PC-4 as previously described.



2. Press .

Central Information Display:

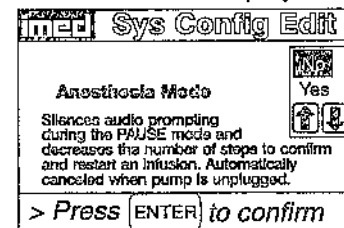





NOTE

If "Anesthesia Mode" is displayed in half-tone on the System Options display, Anesthesia mode has not been enabled and is not available for use.

3. Press .
 - After 3 seconds "> Press  to confirm" displays
 - After 12 seconds audio prompt - sounds


Central Information Display:



4. Use   to select the "Yes" option.
 - After 3 seconds "> Press  to confirm" displays
 - After 12 seconds audio prompt - sounds


Central Information Display:

- "Yes" option is highlighted

5. Press .

Central Information Display:

- System option screen displays

6. Press .

Central Information Display:

- Infusion Setup or Active Infusion screen displays

NOTE

Anesthesia mode is automatically de-selected when the AC power cord is unplugged from AC outlet or the instrument is turned off during battery operation. It can also be de-selected using the procedure described above.

INDEPENDENT SETUP AND OPERATING PROCEDURES (continued)




ACTION/PROMPT

DISPLAY RESPONSE

To Clear Alarms

1. Check the Channel Information Display to determine the type of alarm condition.
2. Refer to the CHANNEL, CENTRAL INFORMATION DISPLAY AND ALARM RESPONSE PROCEDURES section in this manual for the proper procedures for responding to a specific alarm condition.

To Power Off the PC-4

1. Press  ...  as appropriate.
2. Press .
3. Repeat steps 1 and 2 until all channels are stopped.

During the power off sequence:

NOTE

To interrupt the power off sequence, press the PAUSE control prior to the count-down timer in the central information display reaching "1". To resume the infusion, select the appropriate channel, confirm Rate and VTBI, then press START and verify that the channel operating indicator is flashing.

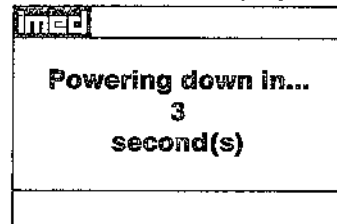
Channel Information Display:

- All displays and indicators for selected channel - extinguish

Central Information Display:

- Selected channel display reverts to un-programmed status.

Central Information Display:



- Time value decrements from 3 to 1, then the PC-4 powers down.

MONITOR OR COMPUTER CONTROL SETUP AND OPERATING PROCEDURES

Introduction

The steps necessary to operate the PC-4 in Monitor or Computer Control Operation are described in the following section.

CAUTION

ONLY equipment that has been qualified to IEC 601-1 standards should be connected to the PC-4's RS-232-C Data Port and the connection should **ONLY** be performed by qualified personnel.

To Establish PC-4/Host Computer Interface

1. Set computer communication parameters.

NOTE

Before the PC-4 can be used in the Monitor or Computer Control Operation conditions, the computer communication parameters must be set by hospital technical personnel, both in the host computer and in the PC-4. Thorough familiarity with independent operation of the PC-4 is a prerequisite for technical personnel responsible for configuring the pump/controller for remote operation. The procedures for setting the computer communication parameters for the PC-4 are provided in the PC-4 Maintenance Manual. The procedures for setting the computer communication parameters for the host computer are provided in the ALARIS Medical Systems C2 Programmer's Guide.

2. Connect the communication interface cable to the RS-232-C communication DATA PORT connector (rear panel) of the PC-4 and to the host computer.

NOTE

Before the PC-4 can be set up for either Monitor or Computer Control Operation, the communication interface cable must be connected to the RS-232-C communication DATA PORT connector on the rear panel of the PC-4. The technical data necessary to interface the host computer interface cable to the PC-4's RS-232-C Communication DATA PORT connector is provided in the PC-4 Maintenance Manual.

When power is then applied to the PC-4's circuits, the MONITOR indicator will illuminate.

ACTION/PROMPT

DISPLAY RESPONSE

To Change PC-4 Operating Condition from Independent to MONITOR


- | | |
|--|------------------------------------|
| <ol style="list-style-type: none">1. Connect the communication interface cable to the RS-232-C communications DATA PORT connector on the rear panel. | The MONITOR indicator illuminates. |
|--|------------------------------------|

To Change PC-4 Operating Condition from MONITOR to Independent

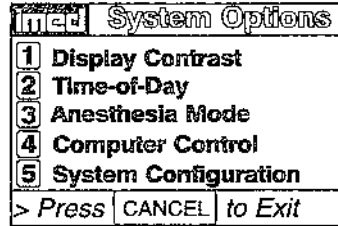
- | | |
|---|-------------------------------------|
| <ol style="list-style-type: none">1. Disconnect the communication interface cable from the RS-232-C communications DATA PORT connector on the rear panel. | The MONITOR indicator extinguishes. |
|---|-------------------------------------|

MONITOR OR COMPUTER CONTROL SETUP AND OPERATING PROCEDURES (continued)

To Change PC-4 Operating Condition from MONITOR to COMPUTER CONTROL


1. Press .

Central Information Display:

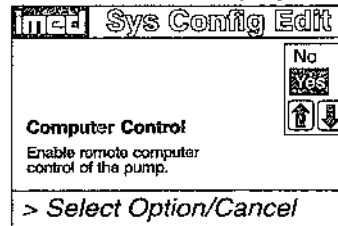




NOTE

If "Computer Control" is displayed in half-tone on the Systems Options display, Computer Control is not enabled and is not available for use.

2. Press .
 - After 3 seconds "> Select Option/Cancel" displays
 - After 12 seconds audio prompt - sounds

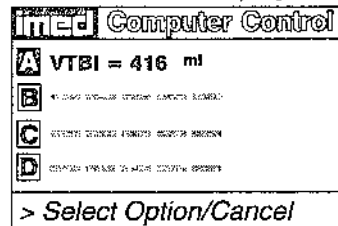
Central Information Display:





3. Select "Yes" using the   controls.

4. Press .
 - **COMPUTER CONTROL** and Computer Control indicator - flash
 - The PC-4 keypad is inoperative, except for the       controls

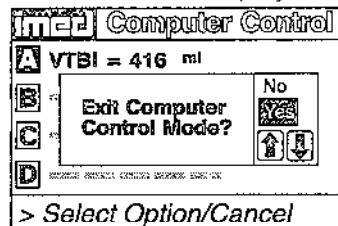
Central Information Display:



To Change PC-4 Operating Condition from COMPUTER CONTROL to MONITOR

1. Press  or .
 - After 3 seconds "> Select Option/Cancel" displays

Central Information Display:



MONITOR OR COMPUTER CONTROL SETUP AND OPERATING PROCEDURES (continued)

2. Select the "Yes" option by using the



controls.

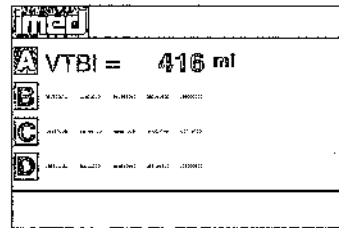
Central Information Display

- "Yes" option is highlighted

3. Press

- Infusions in progress under computer control continue as programmed

Central Information Display:



- MONITOR indicator - illuminates

To Power Off the PC-4 in MONITOR Operation

1. Press ... as appropriate.

2. Press .

Channel information Display:

- All displays and indicators for selected channel - extinguish

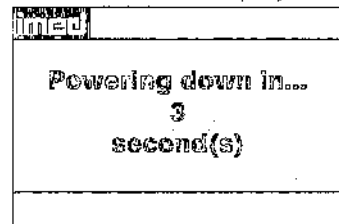
Central Information Display:

- Selected channel display reverts to un-programmed status.

3. Repeat steps 1 and 2 until all channels are stopped.

During the power off sequence:

Central Information Display:



- Time value decrements from 3 to 1, then the PC-4 powers down.

NOTE


To interrupt the power off sequence, press the PAUSE control prior to the count-down timer in the central information display reaching "1". To resume the infusion, select the appropriate channel, confirm Rate and VTBI, then press START and verify that the channel operating indicator is flashing.

To Power Off the PC-4 in COMPUTER CONTROL Operation

1. Repeat procedure listed above under "To Change PC-4 Operation from COMPUTER CONTROL to MONITOR"

2. Press ... as appropriate.

MONITOR OR COMPUTER CONTROL SETUP AND OPERATING PROCEDURES (continued)

3. Press .

Channel Information Display:

- All displays and indicators for selected channel - extinguish

Central Information Display:

- Selected channel display reverts to un-programmed status.

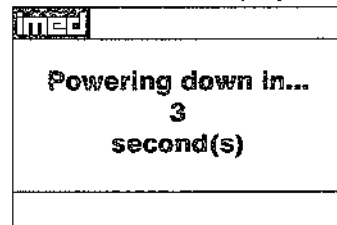
4. Repeat steps 1 and 2 until all channels are stopped.

During the power off sequence:

NOTE

To interrupt the power off sequence, press the PAUSE control prior to the count-down timer in the central information display reaching "1". To resume the infusion, select the appropriate channel, confirm Rate and VTBI, then press START and verify that the channel operating indicator is flashing.

Central Information Display:



- Time value decrements from 3 to 1, then the PC-4 powers down.

The operating procedures listed below are identical for both MONITOR operation and Independent operation. Refer to the Independent Setup section of this manual for the detailed descriptions.

To Set Up a Primary Infusion with the Volume/Time Infusion Option Enabled

To Adjust Central Information Display Contrast

To Pause an Infusion

To Stop a Primary Infusion

To Change Rate or VTBI During Infusion

To Titrate Rate

To Change the Pressure Limits (PCS Mode Control Unlocked)

To Restart an Infusion Following an "INFUSION COMPLETE - KVO" or "EMPTY CONTAINER - KVO" Advisory

To View Primary, Secondary and Total Volume Infused on both Channels Simultaneously

To Clear Primary, Secondary and Total Volume on both Channels Simultaneously

To View Primary, Secondary and Total Volume Infused on Selected Channel

To Clear Primary, Secondary and Total Volume Infused on Selected Channel

To Set Up a Secondary (Piggyback) Infusion with Dual Rates

To Set Up a Secondary (Piggyback) Infusion with Dual Rates and the Volume/Time Infusion Option Enabled

To Change Primary Infusion Parameters During a Secondary Infusion

To Stop a Secondary Infusion and Return to the Primary Infusion

To Change the Time of Day

To Set Up a Delayed Start Infusion

To Set Up a Delayed Start Secondary Infusion

To Set Up a Multidose Infusion

To Use Drug Calculation

To Infuse using an Empty Container Detector (ECD)

To Select Anesthesia Mode

To Clear Alarms

During COMPUTER CONTROL operation, these procedures are performed through the host computer. Appropriate computer control procedures are described in the ALARIS Medical Systems C2 Programmer's Guide.

CHANNEL, CENTRAL INFORMATION DISPLAY AND ALARM RESPONSE PROCEDURES

The Channel and Central Information Displays display four types of information: advisories, prompts, alarms, and malfunctions.

The characteristics of the accompanying audio sounds are as follows:

Type	Sound	Notes
switchover	six short beeps	variable volume; can be silenced and disabled in the SYSTEM CONFIGURATION
prompt	one short beep every two seconds	variable volume; can be silenced
key click	one short beep	fixed minimum volume; cannot be silenced; can be disabled via the SYSTEM CONFIGURATION
illegal keypress	two short beeps	variable volume; cannot be silenced, can be disabled via SYSTEM CONFIGURATION
advisory	one short beep every fifteen seconds	variable volume; can be silenced for ≈2 minutes
alarm	three selectable profiles (selectable in System Configuration)	variable volume; can be silenced for ≈2 minutes
malfunction (software detected)	pairs of long beeps	fixed 75 decibel volume; cannot be silenced
malfunction (hardware detected)	constant audio tone	fixed 75 decibel volume; cannot be silenced

An **ADVISORY** is a sequence of audio and/or visual signals to advise the user of the operating status of the PC-4. The audio may be silenced for approximately 2 minutes by pressing the SILENCE control.

Advisory	Meaning	Response
INFUSION COMPLETE - KVO Audio: prompt Visual: continuous scroll in channel information display	VTBI has been infused; PC-4 is infusing at KVO rate.	Stop channel, or set up new infusion.
EMPTY CONTAINER - KVO Audio: prompt Visual: continuous scroll in channel information display	Empty container detected by ECD before programmed VTBI delivered, or when "ALL" has been used as the VTBI parameter, PC-4 is infusing at KVO rate. ECD plugged into PC-4, but not attached to drip chamber.	Replace IV container, stop channel or set up a new infusion. Attach ECD to drip chamber.
DELAYED START COMPLETE Audio: none, unless callback was selected Visual: continuous scroll in channel information display	The delayed start infusion has been infused.	Stop channel or set up a new infusion.
MULTIDOSE COMPLETE Audio: none Visual: continuous scroll in channel information display	All doses of the multidose infusion have been infused.	Stop channel or set up a new infusion.
LOW BATTERY Audio: prompt Visual: continuous display in central information display	Low battery threshold detected. Remaining battery operational life is limited.	Connect power cord to an external AC power source; alarm will be silenced.
Maintenance Mode Audio: key click Visual: continuous display in central information display	Instrument powered up in the Maintenance mode.	DO NOT USE ON PATIENT. Check with Biomedical Department.
Paused Audio: advisory, then prompt after 2 minutes Visual: continuous display in central information display	PAUSE control has been pressed.	Press START control to resume infusion, or press CHANNEL OFF to stop infusion.
Battery Replacement <div style="border: 1px solid black; padding: 5px;"> Do not use on battery. Operate on AC only. Battery Replacement Required. Contact Biomed. </div>	The pump has detected a battery that is no longer capable of sustaining a charge.	Replace with an operable pump as soon as possible. Send pump to Biomedical Department to have batteries checked.



Advisory	Meaning	Response
Replace Battery Audio: On AC - None On DC - Prompt Visual: continuous display in central information display	The pump has detected a battery that is no longer capable of sustaining a charge.	Replace with an operable pump as soon as possible. Send pump to Biomedical Department to have batteries checked.
PAUSE Audio: advisory, then prompt after 2 minutes Visual: continuous scroll in channel information display	PAUSE control has been pressed.	Press START control to resume infusion, or press CHANNEL OFF to stop infusion.
Panel/Keypad Locked Audio: key click Visual: continuous display for 3 seconds in central information display	Audio control has been pressed and held for 3 seconds to initiate tamper-resistant feature.	None. (Repeat to cancel tamper-resistance).
Panel/Keypad Unlocked Audio: key click Visual: continuous display for 3 seconds	Audio control has been pressed and held for 3 seconds to deactivate tamper-resistant feature.	None. (Repeat to re-initiate tamper-resistance).
LOW FLOW Audio: advisory Visual: continuous scroll in channel information display	Flow has slowed due to back pressure equaling container height in Controller mode. An occlusion alarm will occur within one minute.	Check tubing for restriction, raise container, press START, or change to Pump Delivery mode (if PCS mode control unlocked).
Start = XX:XX Audio: none Visual: continuous display	Delayed start program initiated. XX:XX is the programmed start time.	None. When current time = start time, the infusion will start.
SECONDARY Audio: none Visual: continuous scroll in channel information display	A secondary infusion is in progress on the affected channel.	None. When secondary VTBI = "0", the infusion will revert to the programmed primary parameters.
Dose n = XX:XX Audio: none Visual: continuous display	Multidose infusion is either infusing or in standby. Dose n = the sequential number of the next (if in standby) or currently infusing dose. XX:XX is the programmed start time for the next dose.	None. Infusion will proceed as programmed. Press appropriate channel select to review infusion status.
Anesthesia Mode-Pause Audio: none Visual: continuous scroll in channel information display	PAUSE control was pressed while Anesthesia mode was selected.	Select channel, then press START to resume or press CHANNEL OFF to stop infusion.





Advisory	Meaning	Response
<p>Powering down in X second(s) Audio: prompt Visual: timed display in central information display</p>	<p>The CHANNEL OFF control has been pressed.</p>	<p>None. To stop power down, press any control except POWER ON.</p>

A **PROMPT** is an audio and/or visual signal appearing on the bottom line of the central information display to the user to perform some action. The audio may be silenced for 12 seconds by pressing the SILENCE control.

Prompt	Meaning	Response
Select Option/Cancel Audio: prompt Visual: continuous display	The OPTIONS/EDIT key was pressed.	Select the appropriate System or Channel option. Press CANCEL to exit menu.
24 Hour Limit Exceeded Audio: prompt Visual: continuous display for 3 seconds	A combination of Time Interval and Number of Doses that would exceed the maximum allowable 24 hour Multidose infusion was entered.	Re-enter an appropriate combination of Time Interval and Number of Doses to result in a total duration of 24 hours or less.
Enter Rate Value Audio: prompt Visual: continuous display	Begins following press of POWER ON and CHANNEL SELECT controls, or if START control is pressed with rate set to "0".	Press RATE control and enter rate.
Enter VTBI Value Audio: prompt Visual: continuous display	Begins following press of VTBI control, or if START control is pressed with VTBI set to "0".	Press VTBI control and enter VTBI.
Press START Audio: prompt Visual: continuous display	Begins approximately 3 seconds after last press of data entry controls if neither parameter is zero, or approximately 12 seconds after an alarm is cleared, or approximately 2 minutes after PAUSE is pressed.	Press START control.
Select Channel Audio: none Visual: continuous	Begins when attempt is made to set parameters or start infusion prior to selecting a channel.	Press appropriate CHANNEL SELECT control.
Enter All Parameters Audio: none Visual: continuous display for 3 seconds	The START control was pressed prior to entering valid parameters.	Follow prompts and enter valid parameters for all data entry fields.
Enter Start Time Audio: prompt Visual: continuous display	The TIME control was pressed after entering rate and VTBI parameters.	Press ENTER to confirm the current data entry, and move to the next programming step.

Prompt	Meaning	Response
Enter Duration Audio: prompt Visual: continuous display	Begins after entering VTBI in a volume/time infusion.	Time values will change the rate. Enter the desired duration of the infusion or clear to reprogram.
Enter Dose Interval Audio: prompt Visual: continuous display	Part of multidosing infusion set up sequence.	Enter the desired dose interval (range 1-24 hours).
Dose Interval too Short Audio: prompt Visual: continuous scroll for 3 seconds	A multidose interval was entered that is less than the time required to deliver the programmed dose.	Enter an appropriate dosing interval for the Rate and VTBI/dose setting.
Enter Number of Doses Audio: prompt Visual: continuous display	Part of multidosing infusion set up sequence.	Enter the desired number of doses (range 1-24).
Enter Drug Amount Audio: prompt Visual: continuous display	Part of drug calculation infusion set up sequence.	Enter the amount of drug added to the IV fluid container.
Select Unit of Measure Audio: prompt Visual: continuous display	Part of drug calculation infusion set up sequence.	Select the appropriate units for the drug added to the container (gm, mg, mcg, or units).
Enter Diluent Volume Audio: prompt Visual: continuous display	Part of drug calculation infusion set up sequence.	Enter the volume of the drug container in milliliters.
Dose Based on Pt. Wt? Audio: prompt Visual: continuous display	Part of drug calculation infusion set up sequence.	Select "Yes" or "No" based on whether patient weight is required.
Enter Patient Weight Audio: prompt Visual: continuous display	Part of drug calculation infusion set up sequence.	Enter patient weight in kilograms (kg).
Select Time Units Audio: prompt Visual: continuous display	Part of drug calculation infusion set up sequence.	Select appropriate time interval for drug dosing (minutes or hours).
Enter Rate or Dose Audio: prompt Visual: continuous display	Part of drug calculation infusion set up sequence.	Press RATE and enter infusion rate, or press DOSE and enter the desired drug dosage.
Max Rate Exceeded Audio: illegal key Visual: continuous display	Flow rate parameters result in an infusion rate that exceed the System Configuration's MAX RATE option have been entered.	Enter appropriate flow rate parameters.

Prompt	Meaning	Response
Press Enter to Confirm Audio: prompt Visual: continuous display	The current parameter entry(s) must be confirmed to enable proceeding to the next programming step.	Press ENTER.
Reenter VTBI Value Audio: illegal key Visual: continuous display	A VTBI value of ≥ 1000 mL was entered with a fractional rate value.	Enter a VTBI value < 1000 mL or change rate to a non-fractional value.
Press 1-5 or  or Cancel	The desired option can be selected by pressing the appropriate selection number or pressing  to move to the next menu screen.	Select desired entry or Press CANCEL to exit screen.
Enter Dose Value Audio: prompt Visual: continuous display	Dose control was pressed during a Drug Calculation.	Enter the desired medication dose.
Dose Interval >24 hours Audio: illegal key Visual: continuous display for 3 seconds	During Multidose setup a dose interval > 24 hours was entered.	Enter a dose interval that is < 24 hours.
Dose Interval too Short Audio: illegal key Visual: continuous display for 3 seconds	During a Multidose setup a dose interval was entered that was $<$ dose delivery time.	Enter a dose interval that is \geq VTBI/rate.
Invalid Minute Entry Audio: illegal key Visual: continuous display	During a Delayed Start or Multidose setup, a start time or current time entry > 59 minutes was selected.	Enter a minute time value ≤ 59 minutes.
Invalid Hour Entry Audio: illegal key Visual: continuous display	During a Delayed Start or Multidose setup, a start time or current time of day > 23 (24 hour clock) was entered.	Enter an hour value ≤ 23 hours (military) or ≤ 11 hours (AM/PM).
PCS Mode Locked Audio: illegal key Visual: continuous display for 3 seconds	Channel Option #4 was selected when the PCS Mode was locked.	If PCS Mode change is desired contact Biomedical Department.
Stop Infusion First Audio: illegal key Visual: continuous display	A mode of operation that is incompatible with the current mode of operation was selected from the channel options menu.	Select #5 - stop infusion, to stop the current infusion prior to selecting a different operating mode.

Prompt	Meaning	Response
Confirm Time-of-Day Audio: prompt Visual: continuous display	Appears the first time that the Time control is pressed in Delayed Start or Multidose setup following instrument power up.	Confirm that the time-of-day displayed is correct. If not, enter correct time of day.
Mode Not Available Audio: illegal key Visual: continuous display for 3 seconds	A selection of a disabled or unavailable option was made from the Channel Options menu.	If a disabled option is required, contact Biomedical Department to enable desired option.
Use   to Adjust Audio: none Visual: continuous display	The display contrast option was selected from the Systems Option menu.	Use the  or  controls to adjust the central information display for optimum viewing, then press ENTER.
Max Dose Exceeded Audio: illegal key Visual: continuous display for 3 seconds	In Drug Calculation, a dose that exceeds the displayed limits was entered.	Enter a lower dose or rate value. Verify correct entry of drug amount and diluent volume.
Min Dose Exceeded Audio: illegal key Visual: continuous display for 3 seconds	In Drug Calculation, a dose that is less than the allowable limit was entered.	Enter a higher rate or dose value. Verify correct entry of drug amount and diluent volume.
Invalid Dose Audio: illegal key Visual: continuous display for 3 seconds	In Drug Calculation, the patient weight input was changed so significantly that the dose/rate on another channel would be forced out of allowable range.	Enter an appropriate patient weight value.
Invalid Rate Audio: illegal key Visual: continuous display for 3 seconds	In Drug Calculation, a rate that is less than 0.01 mL/hr was entered.	Enter a higher rate or dose value. Verify correct entry of drug amount and diluent volume.
Check Amount and Diluent Audio: illegal key Visual: continuous display for 3 seconds	In Drug Calculation, a combination of drug amount and diluent volume were entered that resulted in an invalid drug concentration.	Enter appropriate drug amount and diluent volume values.

Prompt	Meaning	Response
Enter Fractional Value Audio: illegal key Visual: continuous display for 3 seconds	During a Secondary infusion setup, a Secondary rate value ≥ 100 mL/hr was entered when the Primary rate was fractional.	Rate value will display zero. Enter a fractional Secondary rate value or change the Primary rate value to a non-fractional value
Delay Mode is Active Audio: illegal key Visual: continuous display for 3 seconds	The Time-of-Day option was selected from the Systems Options menu while a Delayed Start or Multidose infusion was active.	Time-of-Day cannot be changed unless all Delayed Start and Multidose infusions are stopped.
Channel in KVO Audio: none Visual: continuous display for 3 seconds	An attempt was made to setup a Secondary infusion while the Primary infusion was in KVO.	Reset the Primary rate and VTBI values within the normal operating range.
>24 hr Limit Exceeded Audio: illegal key Visual: Continuous display for 3 seconds	A Multidose rate and VTBI/dose that results in an infusion interval >24 hours.	Change rate and/or VTBI values such that the time required for infusion is <24 hours.
Press OFF or ENTER Audio: prompt Visual: Continuous display	A Multidose or Drug Calculation infusion has been turned off. Pressing ENTER retains the infusion program; pressing OFF deletes the program.	Press ENTER retains the program; pressing OFF deletes the program and returns the channel to normal operation.
Delay Exceeds 8 Hours Audio: illegal key Visual: continuous display for 3 seconds	A Start Time >8 hours ahead of current time was selected for a Multidose infusion.	Enter a Start Time 8 hours or less ahead of current time-of-day.
Press CANCEL to Exit Audio: prompt Visual: continuous display	The Systems Options menu was accessed.	Select an option or press CANCEL to return to the main display menu.
Press ENTER to Continue Audio: prompt Visual: continuous display	The channel was selected following a completed Multidose infusion.	To continue the same infusion, press ENTER to gain access to the Multidose infusion setup screen. Enter the desired Start time and press START.

An **ALARM** is an audio and visual signal to the user that a potentially unsafe condition is present. Immediate action is required. The audio may be silenced except during a "FLO-STOP" OPEN/CLOSE DOOR condition for approximately 2 minutes by pressing the SILENCE control.

Alarm	Meaning	Response
<p>CHECK ECD Audio: alarm Visual: continuous scroll, channel alarm indicator flashes</p>	<p>START control pressed with VTBI set to "ALL" and ECD not connected, or ECD has been disconnected during an "ALL" infusion, or ECD has failed. Infusion stops.</p>	<p>Connect or replace ECD, then press START control.</p>
<p>CHECK IV SET Audio: alarm Visual: continuous scroll, channel alarm indicator flashes</p>	<p>Administration set not properly installed. Infusion is not started on affected channel.</p>	<p>Close roller clamp, remove and reinstall administration set, close door, open roller clamp.</p>
<p>DOOR OPEN Audio: alarm Visual: continuous scroll, channel alarm indicator flashes</p>	<p>Door was opened during an infusion. Infusion stops on affected channel.</p>	<p>Close door, press appropriate CHANNEL SELECT control, then press START control.</p>
<p>RESTART CHANNEL Audio: alarm Visual: continuous scroll, channel alarm indicator flashes</p>	<p>Door was opened during an infusion and then closed. Infusion stops on affected channel.</p>	<p>Press the appropriate CHANNEL SELECT control, then press START control.</p>
<p>AIR-IN-LINE Audio: alarm Visual: continuous scroll, channel alarm indicator flashes</p>	<p>Air has been detected in set during an infusion. Infusion stops on affected channel.</p>	<p>Ensure tubing is properly installed in air-in-line detector. If air is present, clear air from administration set. Press appropriate CHANNEL SELECT control, then press START control.</p>
<p>OCCLUSSION-PATIENT SIDE Audio: alarm Visual: continuous scroll, channel alarm indicator flashes</p>	<p>Increased back pressure sensed while infusing in the Pump Delivery mode. Infusion stops on affected channel.</p>	<p>Clear occlusion, press appropriate CHANNEL SELECT control, then press START control.</p>
<p>OCCLUSSION Audio: alarm Visual: continuous scroll, channel alarm indicator flashes</p>	<p>Occlusion is detected on either fluid or patient side while infusing in Controller Delivery mode. Infusion on affected channel stops.</p>	<p>Clear occlusion or raise the fluid container. Press the appropriate CHANNEL SELECT control, then press the START control. (If the occlusion recurs, open and close door. Press CHANNEL SELECT and START control.)</p>

Alarm	Meaning	Response
<p>PARTIAL OCCLUSION-FLUID SIDE Audio: alarm Visual: continuous scroll, channel alarm indicator flashes</p>	<p>Partial upstream occlusion detected while infusing in Pump Delivery mode. Infusion on affected channel stops.</p>	<p>Remove cause of reduced flow in fluid side of administration set, press appropriate CHANNEL SELECT control, then press START control.</p>
<p>OCCLUSION-FLUID SIDE Audio: alarm Visual: continuous scroll, channel alarm indicator flashes</p>	<p>Upstream occlusion sensed while infusing in Pump Delivery mode. Infusion on affected channel stops.</p>	<p>Clear occlusion in fluid side of administration set, press appropriate CHANNEL SELECT control, then press START control.</p>
<p>"FLO-STOP" OPEN/CLOSE DOOR Audio: alarm Visual: continuous scroll, channel alarm indicator flashes</p>	<p>Flo-Stop open (in free-flow position) with door open.</p>	<p>Close roller clamp on set or close door and resume infusion by pressing appropriate CHANNEL SELECT control, then pressing START control. (If alarm occurs when the door is closed, replace PC-4 with operable unit.)</p>
<p>BATTERY DISCHARGED Audio: malfunction Visual: Channel Display: <ul style="list-style-type: none"> • Rate Display flashes " _ _ _ _ " • "PAUSE" scrolls • ALARM and STANDBY indicators flash Central Display:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;">BATTERY DISCHARGED</p> <p style="text-align: center;">ALL CHANNELS PAUSED PLUG IN TO RESUME OR PRESS OFF TO POWER DOWN</p> </div>	<p>Low battery voltage detected. Infusions PAUSE on all currently operating channels.</p>	<p>Connect AC power cord to power source and wait for "PAUSED" to appear in the Central Display. Select each channel and press START to resume the infusion(s), or press the CHANNEL OFF control to power down the PC-4.</p>

A **MALFUNCTION** is a signal to alert the operator that a failure has been detected. Immediate action is required. The audio cannot be silenced without powering off the affected channel(s).

Malfunction	Meaning	Response
<p>SYSTEM MALFUNCTION Audio: malfunction Visual: Channel Display:</p> <ul style="list-style-type: none"> • Rate displays flash "- - -" • Channel ALARM and STANDBY indicators flash <p>Central Display:</p> <p style="text-align: center;">For Battery Operation</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>SYSTEM MALFUNCTION ALL CHANNELS STOPPED PRESS CHANNEL OFF TO POWER OFF CODE NUMBER: "XXX"</p> </div> <p style="text-align: center;">For AC Power Operation</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>SYSTEM MALFUNCTION ALL CHANNELS STOPPED PRESS CHANNEL OFF TO RESET PUMP OR UNPLUG PUMP AND PRESS OFF TO POWER OFF CODE NUMBER: "XXX"</p> </div>	<p>A software-detected malfunction has occurred. Depending on the type of malfunction, infusion stops on the affected channel or all channels.</p>	<p>Press CHANNEL OFF control to turn off the PC-4. Replace with an operational instrument.</p>
<p>CENTRAL DISPLAY FAILURE Audio: malfunction Visual: Channel Display:</p> <ul style="list-style-type: none"> • Previous Infusion rate • Channel ALARM and STANDBY indicators flash <p>Central Display:</p> <ul style="list-style-type: none"> • Displayed data may be corrupted <p>Scrolling Display:</p> <ul style="list-style-type: none"> • Stops scrolling, display data will be fixed 	<p>A software-detected malfunction has occurred on the central display. Infusion stops on all channels.</p>	<p>Press CHANNEL OFF control to turn off the PC-4. Replace with an operational instrument.</p>

Malfunction	Meaning	Response
<p>CHANNEL MALFUNCTION Audio: malfunction Visual: Channel Display:</p> <ul style="list-style-type: none"> • Rate displays flash "- - - -" • ALARM and STANDBY indicators flash <p>Central Display:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;">CHANNEL MALFUNCTION REMOVE IV SET IMMEDIATELY. A MALFUNCTION HAS BEEN DETECTED ON THIS CHANNEL. THIS INFUSION HAS BEEN STOPPED</p> </div>	<p>A software-detected malfunction has occurred on the indicated channel. Infusion on affected channel stops.</p>	<p>Immediately, remove IV set(s) and press CHANNEL OFF to silence alarm. Infusion(s) on non-affected channels may be continued pending availability of a fully operational pump.</p> <p>Central Display:</p> <ul style="list-style-type: none"> • "ERROR XXX" displays for appropriate channel.
<p>RATE DISPLAY FAILURE Audio: malfunction Visual: Channel Display:</p> <ul style="list-style-type: none"> • Rate(s) flash • "Rate Display Error - Rate = xxx" scrolls <p>Central Display:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>A Rate Display failure has been detected. Infusion(s) will continue as programmed. Service pump as soon as possible. (Press ENTER to continue)</p> </div>	<p>Software has detected a malfunction in one or more of the rate displays. Infusions on all currently operating channels continue.</p>	<p>Replace with operable unit as soon as possible. Press CHANNEL OFF to power down the PC-4.</p>
<p>AUDIO FAILURE Audio: malfunction Visual: Channel Display:</p> <ul style="list-style-type: none"> • Audio Failure <p>Central Display:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;">AUDIO FAILURE A PROBLEM HAS BEEN DETECTED WITH THE PUMP'S AUDIO. TAKE PUMP OUT OF SERVICE. (Press ENTER to continue)</p> </div>	<p>Software has detected a malfunction of the audio system. Infusions on all currently operating channels continue.</p>	<p>Replace with operable unit as soon as possible. Press CHANNEL OFF to power down the PC-4.</p>

Malfunction	Meaning	Response
<p>(HARDWARE-DETECTED MALFUNCTION) Audio: malfunction Visual: none</p>	<p>A hardware-detected malfunction has occurred. Infusion on all channels stops.</p>	<p>Ensure that the AC power cord is connected to an external power source. Press POWER ON or CHANNEL OFF control to reset the audio and turn off electrical power to the PC-4. (If audio persists, press POWER ON, then SILENCE. Press CHANNEL OFF to power down. Replace PC-4 with operable unit.)</p>




SPECIFICATIONS

Detailed specifications will be available in the PC-4 Maintenance Manual. ALARIS Medical Systems reserves the right to change specifications without prior notice.

Operating Principle:	Linear peristalsis
Dimensions:	12.0" x 14.75" x 7.5" (30.5cm x 37.5cm x 19.1cm)
Weight:	26.5 lbs. (12.0 kg)
Power Requirements:	90-132 VAC, Current draw 0.1A nominal (0.36A maximum), 10 watts, fused at 0.4A, 50/60 Hz, 3 wire, single phase
Battery Operation:	With new, fully charged batteries, approximately 4 hours with all four channels infusing a primary infusion at 125 mL/hr before a "BATTERY DISCHARGED" message.
Electrical Leakage:	Less than 100 microamps
Rate Selections:	0.1-999 mL/hr

Note: Recommended maximum rate in the Controller Mode is 500 mL/hr.

Volume-To-Be-Infused Selections:	0.1-9999 mL
KVO (Keep Vein Open) Rate:	1 mL/hr if set rate is 1 mL/hr or above; or set rate, if rate is 0.9 mL/hr or below
Occlusion Pressure:	
Controller mode	Container height $\pm 12"$ (± 30 cm)
Pump mode	10 ± 2 psi (517 ± 103 mmHg) for rates above 30 mL/hr. For rates of 30 mL/hr and below, the occlusion pressure will be less than 10 psi, and is rate-dependent.
Selectable mode	25 - 517 mmHg in 25 mmHg increments to 500 mmHg.
Advisories:	INFUSION COMPLETE - KVO, EMPTY CONTAINER - KVO, MULTIDOSE COMPLETE, DELAYED START COMPLETE, LOW BATTERY, Maintenance Mode, Replace Battery, PAUSE, Paused, Powering Down in X Seconds, Panel/Keypad Locked, Panel/Keypad Unlocked, LOW FLOW, START = XX:XX, SECONDARY, DOSE N = XX:XX and ANESTHESIA MODE - PAUSE

Prompts: Select Option/Cancel, 24 Hour Limit Exceeded, Enter Rate Value, Enter VTBI Value, Press START, Select Channel, Enter All Parameters, Enter Start Time, Enter Dose Interval, Enter Duration, Dose Interval Too Short, Enter Number of Doses, Enter Drug Amount, Select Unit of Measure, Enter Diluent Volume, Dose Based on Pt. Wt.?, Enter Patient Weight, Select Time Units, Enter Rate or Dose, Max Rate Exceeded, Press ENTER to Confirm, Press 1-5 or  or Cancel, Re-enter VTBI Value, Enter Dose Value, Dose Interval >24 Hours, Invalid Minute Entry, Invalid Hour Entry, PSC Mode Locked, PRI/SEC Rate Mismatch, Stop Infusion First, Confirm Time-of-Day, Mode Not Available, Use   to Adjust, Max Dose Exceeded, Min Dose Exceeded, Invalid Dose, Invalid Rate, Check Amount and Diluent, Enter Fractional Value, Delay Mode is Active, Channel in KVO, >24 Hr Limit Exceeded, Press OFF or ENTER, Delay Exceeds 8 Hours, Press CANCEL to Exit and Press ENTER to Continue.

Alarms CHECK ECD, CHECK IV SET, DOOR OPEN, RESTART CHANNEL, AIR-IN-LINE, OCCLUSION-PATIENT SIDE, OCCLUSION, PARTIAL OCCLUSION-FLUID SIDE, OCCLUSION-FLUID SIDE, "FLO-STOP" OPEN/CLOSE DOOR and BATTERY DISCHARGED.

Malfunctions System Malfunction, Channel Malfunction, Central Display Failure, Rate Display Failure, Audio Failure and Hardware-Detected Malfunction.

Air-in-line Detection: Ultrasonic

Secondary (Piggyback): Dual rate programmable

Nurse Call Feature: Activates an externally powered system when any alarm, malfunction, PRESS START prompt, or INFUSION COMPLETE - KVO, EMPTY CONTAINER - KVO, or LOW BATTERY advisory is issued by PC-4 software. Requires a DIN plug with 6 pins at 240° (Switchcraft 12GM6M or equivalent) for proper mechanical interface.

RS-232-C Communications Data Port Connector: Electronic Industry Association (EIA) Standard requires a standard 9-pin sub-miniature male mating connector with a standard screwlock backshell with jack screws for proper mechanical interface.

Recommended Environmental Operating and Storage Conditions:

Operating Temperature: +5°C to +40°C

Storage Temperature: -30°C to +70°C

Operating/Storage

Humidity: 0% to 95% Relative at +35°C

CLEANING

IMPORTANT INFORMATION FOR CLEANING YOUR GEMINI INFUSION PUMP

- As with all precision instruments, care and regular maintenance are necessary to ensure safe operation.
- Use only non-staining products recommended for use on plastic materials by their manufacturer, and use them in accordance with their instructions.
- Harsh cleaning materials, improper cleaning procedures, stronger concentrations and/or extended exposures can damage the instrument.
- **DO NOT attempt to sterilize the instrument with Ethylene Oxide gas, heat, steam, radiation, or autoclaving. To do so may damage the pump and void the warranty.**

CLEANING INSTRUCTIONS

CAUTION: DO NOT SPRAY the instrument with any fluids. **DO NOT** immerse or stand the instrument in any fluids. Always unplug the power cord from the external AC power source before cleaning. Place the instrument in an upright position to prevent fluids from entering the bottom vents. Only the external surfaces should be cleaned and disinfected by applying cleaning solution to a cloth then applying to the instrument.

Use a solution of mild soapy water, a 10% solution of household bleach, or isopropyl alcohol. Apply the solution with a soft lint free cloth, soft bristle brush, or cotton swab. Clean the Air-In-Line Detector groove, the elements behind the door, and the ECD's groove (if applicable), with cotton tipped swabs saturated with the solution. Disinfect using a non-staining, fungicidal, bacteriocidal, tuberculocidal solution.

Once the contamination has been removed, a cloth wet with fresh water should be used to rinse the entire pump to dilute and remove all residual cleaning/disinfecting solution. Repeat the process completely using another cloth moistened with fresh water. Following the fresh water rinses, thoroughly dry the instrument with a soft, lint-free cloth.

NOTE

Prior to connecting the power cord, ensure that the AC power connector is clean of any residue and dried thoroughly. Check the cord contacts for contamination; if contaminated, remove residue or replace the power cord.

BATTERY CARE AND MAINTENANCE

The IMED GEMINI PC-4 is equipped with a 12 volt, 12 amp-hour lead acid battery. It is charging whenever the instrument is plugged into a 110 volt AC receptacle. The life expectancy of the battery is dependent on the amount of use, the depth of discharge, and the state of the charge that is maintained. Generally, the battery will have the longest life (recommended replacement ≈two years) if the instrument is plugged in, battery use is infrequent, and depth of discharge is minimal. Heavy use of battery power and insufficient battery charge cycles will significantly decrease the life of the battery.

The battery capacity should be checked at least once every twelve months. Refer to the PC-4 Maintenance Manual for test and replacement procedures

BATTERY REPLACEMENT SHOULD BE CONDUCTED BY QUALIFIED SERVICE PERSONNEL.

The quality of the battery is also a significant factor in determining battery life and runtime. The PC-4 is originally manufactured with a Panasonic LCR12V3.4P sealed lead-acid battery. The battery cannot be repaired and should not be opened. Replace the battery with the same type, size and voltage rating. Use of any other brand may yield poor performance and is not recommended.

Ensure that the battery is installed correctly with the red connector attached to the positive (+) terminal of the battery and the black connector attached to the negative (-) terminal.

Worn out batteries should be recycled by an authorized lead-acid battery recycling center.

NOTES

WARRANTY

ALARIS Medical Systems, Inc. (hereinafter referred to as "ALARIS Medical") warrants that:

- a. Each new IMED GEMINI PC-4 volumetric Infusion Pump/Controller, excluding the battery, is free from defects in material and workmanship under normal use and service for a period of one (1) year from the date of delivery by ALARIS Medical to the original purchaser.
- b. The battery and each new accessory are free from defects in material and workmanship under normal use and service for a period of ninety (90) days from the date of delivery by ALARIS Medical to the original purchaser.

If any product requires service during the applicable warranty period, the purchaser should communicate directly with ALARIS Medical headquarters (San Diego, CA) to determine the appropriate repair facility. Except as provided otherwise in this warranty, repair or replacement will be carried out at ALARIS Medical's expense. The product requiring service should be returned promptly, properly packaged and postage prepaid by purchaser. Loss or damage in return shipment to the repair facility shall be at purchaser's risk.

In no event shall ALARIS Medical be liable for any incidental, indirect or consequential damages in connection with the purchase or use of any ALARIS Medical product. This warranty shall apply solely to the original purchaser. This warranty shall not apply to any subsequent owner or holder of the product. Furthermore, this warranty shall not apply to, and ALARIS Medical shall not be responsible for, any loss or damage arising in connection with the purchase or use of any ALARIS Medical product which has been:

- (a) repaired by anyone other than an authorized ALARIS Medical service representative:
- (b) altered in any way so as to affect, in ALARIS Medical's judgement, the product's stability or reliability:
- (c) subjected to misuse or negligence or accident, or which has had the product's serial or lot number altered, effaced or removed:
or
- (d) improperly maintained or used in any manner other than in accordance with the written instructions furnished by ALARIS Medical.

This warranty is in lieu of all other warranties, express or implied, and of all other obligations or liabilities of ALARIS Medical, and ALARIS Medical does not give or grant, directly or indirectly, the authority to any representative or other person to assume on behalf of ALARIS Medical any other liability in connection with the sale or use of ALARIS Medical products.

ALARIS MEDICAL DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OR MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE OR APPLICATION.

See packing inserts for international warranty, if applicable.

ALARIS MEDICAL SYSTEMS SERVICE CENTER LOCATIONS

For information related to operation and/or servicing of this instrument contact:

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