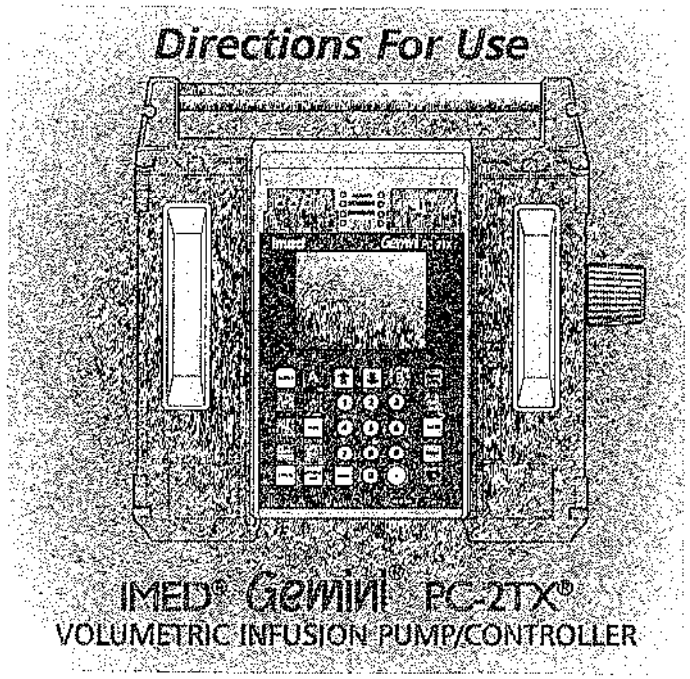
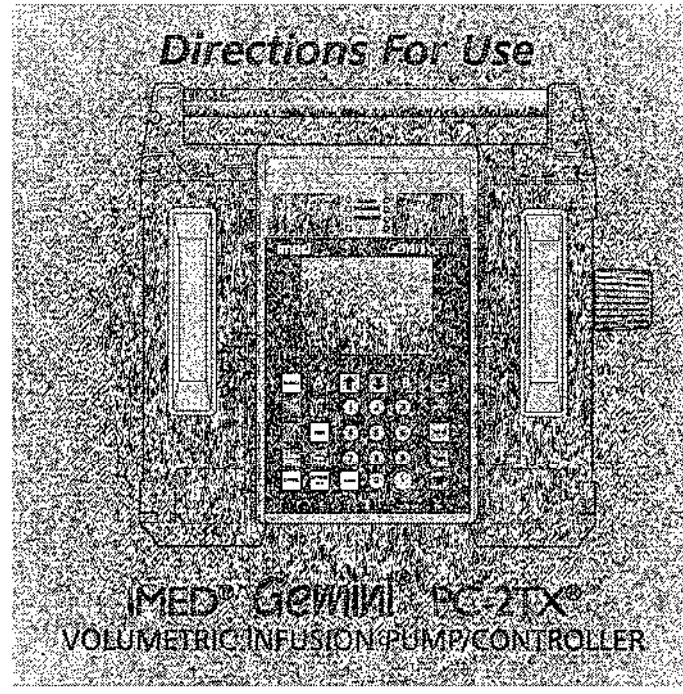
ALARIS™
MEDICAL SYSTEMS

Directions For Use



IMED® Gemini® PC-2TX®
VOLUMETRIC INFUSION PUMP/CONTROLLER

Directions For Use



iMED® Gemini PC-2TX®

VOLUMETRIC INFUSION PUMP/CONTROLLER

WARNING AND CAUTION NOTICES:

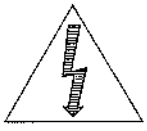
CAUTION: FEDERAL (U.S.A.) LAW RESTRICTS THIS DEVICE TO SALE BY OR ON THE ORDER OF A PHYSICIAN.

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

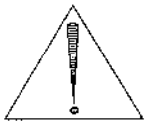
DANGER: EXPLOSION HAZARD, DO NOT USE IN THE PRESENCE OF FLAMMABLE ANESTHETICS.

WARNING

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



CAUTION: ELECTRIC SHOCK HAZARD, DO NOT OPEN INSTRUMENT CASE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL. WHEN CASE IS OPENED, AN ELECTRICAL SHOCK HAZARD EXISTS WHICH CAN RESULT IN SERIOUS INJURY TO PERSONS AND INSTRUMENT COMPONENT DAMAGE.



CAUTION: REFER TO MAINTENANCE MANUAL.

WARNING: REPLACE FUSE AS MARKED.

WARNING

THE PC-2TX IS A POSITIVE PRESSURE DELIVERY SYSTEM CAPABLE OF DEVELOPING POSITIVE FLUID PRESSURES TO OVERCOME WIDELY VARYING RESISTANCES TO FLOW. IT IS NEITHER DESIGNED NOR INTENDED TO DETECT INFILTRATIONS AND WILL NOT ALARM UNDER INFILTRATION CONDITIONS.

CAUTION: *THE SELECTION, TESTING, AND USE OF HOST COMPUTER HARDWARE AND SOFTWARE, IN CONJUNCTION WITH THE PC-2TX IS STRICTLY THE RESPONSIBILITY OF THE PURCHASER.*

EPIDURAL ADMINISTRATION: The pump can be used for epidural administration of anesthetic and analgesic drugs. This application is only appropriate when using analgesics and anesthetics labeled for continuous epidural administration and catheters intended specifically for epidural use. Use only Gemini series sets, **without** a 'Y' connector or injection port, for epidural infusions. The pump's secondary features must **not** be used when the pump is being used for epidural administration of anesthetic and analgesic drugs.

Epidural administration of anesthetic drugs - Use in-dwelling catheters specifically indicated for short-term (96 hours or less) anesthetic epidural drug delivery.

Epidural administration of analgesic drugs - Use in-dwelling catheters specifically indicated for either short-term or long-term analgesic epidural drug delivery.

WARNING

- EPIDURAL ADMINISTRATION OF DRUGS OTHER THAN THOSE INDICATED FOR EPIDURAL USE COULD RESULT IN SERIOUS INJURY TO THE PATIENT.
- IT IS STRONGLY RECOMMENDED THAT THE INFUSION PUMP, SOURCE CONTAINER AND ADMINISTRATION SET USED FOR EPIDURAL DRUG DELIVERY BE CLEARLY DIFFERENTIATED FROM THOSE USED FOR OTHER TYPES OF ADMINISTRATION.

WARNING

THIS PUMP IS DESIGNED TO STOP FLUID FLOW UNDER ALARM CONDITIONS. PERIODIC PATIENT MONITORING MUST BE PERFORMED TO ENSURE THE INFUSION IS PROCEEDING AS EXPECTED.

WARNING

IF THE PC2-TX IS DROPPED OR SEVERELY JARRED, AT ANY TIME, THE INSTRUMENT SHOULD BE 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.

CONTENTS

WARNING AND CAUTION NOTICES
1 INTRODUCTION
4 INSTALLATION PROCEDURES
5 SYSTEM CONFIGURATION
6 OPERATING FEATURES
7 FRONT PANEL CONTROLS AND INDICATORS
8 DESCRIPTION OF CONTROLS AND INDICATORS
10 ABBREVIATED SETUP AND OPERATING PROCEDURES
15 CHANGING THE PRIMARY SOLUTION CONTAINER
15 UNLOADING THE SET
16 INDEPENDENT SETUP AND OPERATING PROCEDURES
16 Introduction
16 To Set Up a Primary Infusion
19 To Set Up a Primary Infusion with Volume/Time Option Enabled
22 To Adjust Central Information Display Contrast
22 To Pause an Infusion
23 To Stop a Primary Infusion
24 To Change Rate or VTBI During Primary Infusion
25 To Titrate RATE
26 To Change the Pressure Limit Mode (PCS Mode Control Unlocked)
27 To View Pressure History for Selected Channel
28 To Restart an Infusion Following an "INFUSION COMPLETE - KVO" or "EMPTY CONTAINER - KVO" Advisory
29 To View Primary, Secondary and Total Volume Infused for both Channels Simultaneously
29 To Clear Primary, Secondary and Total Volume Infused for both Channels Simultaneously
30 To View Primary, Secondary and Total Volume Infused on Selected Channel
31 To Clear Primary, Secondary and Total Volume Infused on Selected Channel
32 To Set Up Secondary (Piggyback) Infusion With Dual Rates
34 To Set Up Secondary (Piggyback) Infusion With Dual Rates and Volume/Time Infusion Option Enabled
37 To Change Primary Infusion Parameters During a Secondary Infusion
38 To Stop a Secondary Infusion and Return to the Primary Infusion
39 To Change the Time of Day
40 To Set Up a Delayed Start Infusion
43 To Set Up a Delayed Start Secondary Infusion
48 To Set Up a Multidose Infusion
54 To Use Drug Calculation
60 To Edit a Drug Calculation Setup
60 Changing Channel Selection Before Completing Programming
61 To Infuse Using an Empty Container Detector (ECD)
61 To Select Anesthesia Mode
63 To Clear Alarms
63 To Power Off the PC-2TX
64 MONITOR OR COMPUTER CONTROL SETUP AND OPERATING PROCEDURES
64 Introduction
64 To Establish PC-2TX/Host Computer Interface

64 To Change PC-2TX Operating Condition from Independent to MONITOR
64 To Change PC-2TX Operating Condition from MONITOR to Independent
65 To Change PC-2TX Operating Condition from MONITOR to COMPUTER CONTROL
65 To Change PC-2TX Operating Condition from COMPUTER CONTROL to MONITOR
66 To Power Off the PC-2TX in MONITOR Operation
66 To Power Off the PC-2TX in COMPUTER CONTROL Operation
68 CHANNEL, CENTRAL INFORMATION DISPLAY AND ALARM RESPONSE PROCEDURES
68 Audio Characteristics
69 Advisory Messages
72 Prompt Messages
77 Alarm Messages
79 Malfunction Alerts
81 SPECIFICATIONS
83 BATTERY CARE AND MAINTENANCE
84 CLEANING
WARRANTY
SERVICE CENTER LOCATIONS

INTRODUCTION

The IMED® GEMINI PC-2TX® is a two channel volumetric infusion pump and controller which provides accurate and automatic infusion of intravascular drugs, fluids, whole blood and packed red blood cells. The two channels are independent, and the PC-2TX 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-2TX can be set to run in three different operating conditions:

- INDEPENDENT Operation - the PC-2TX operates as a stand-alone instrument, with no computer interface.
- MONITOR Operation - the PC-2TX controls the infusion and a host computer monitors instrument operation.
- COMPUTER CONTROL Operation - the PC-2TX is under the control of a host computer, which sets the infusion parameters and monitors PC-2TX operation.

To enhance safety and ease of operation, the PC-2TX 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-2TX utilizes peristaltic action in both the pump, controller and selectable occlusion pressure limit operating modes. When the PC-2TX 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 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. VTBIs 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-2TX 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 a primary or primary/secondary 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-2TX calculates the correct flow rate to achieve the desired drug dose,

or

- the **desired flow rate** and the PC-2TX calculates the corresponding drug dose

The PC-2TX 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-2TX 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-2TX.

The PC-2TX 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-2TX 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-2TX initiates any alarm, malfunction, the "PRESS START" prompt, "INFUSION COMPLETE - KVO", "EMPTY CONTAINER - KVO" or "LOW BATTERY" advisories.

NOTES

Although the PC-2TX 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-2TX and exercise vigilance in its utilization.

ALARIS Medical Systems™ has available a PC-2TX 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-2TX 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-2TX 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-2TX Maintenance Manual.

Battery Charge

The PC-2TX 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 8 hours of operation with one channel infusing at 125 mL/hr before a "BATTERY DISCHARGED" message displays. New batteries will recharge to 90% of capacity in ≈4 hours with the instrument operating or off and will return to a fully charged condition within 10 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-2TX Maintenance Manual and to the ALARIS Medical Systems C2 Communications Programmer's Guide.

SYSTEM CONFIGURATION

The current PC-2TX System Configuration may be viewed by pressing OPTIONS to bring up the System Options Menu, then pressing 5, to access the System Configuration listing. Use the CANCEL 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

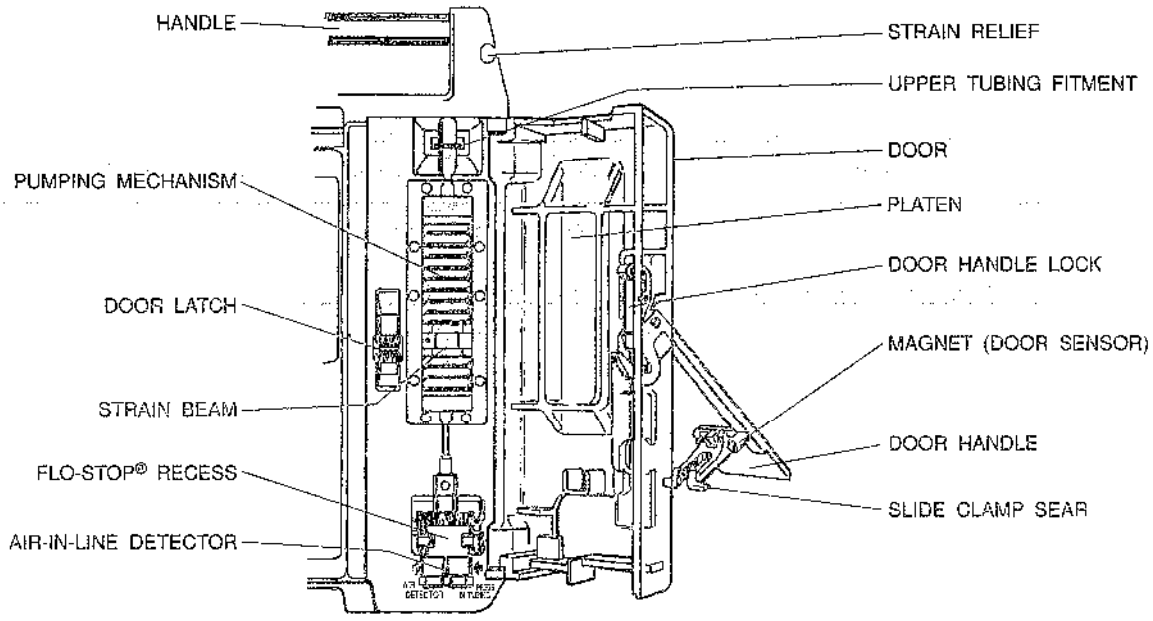
"Clock Setup:", "Factory Set:", "Maximum Rate:", "C2 Port:", "Aux Port:", "PCS Mode:", "Delay Start:", "Drug Calc:", "Multidose:", "Dose Display:", "Key Audio:", "Alarm Audio:", "Switch Audio:", "Tamper Mode:", "Language:", "Anesthesia Mode:", "Computer Control:", "Software Version:", "C2 Serial Number:",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

NOTE

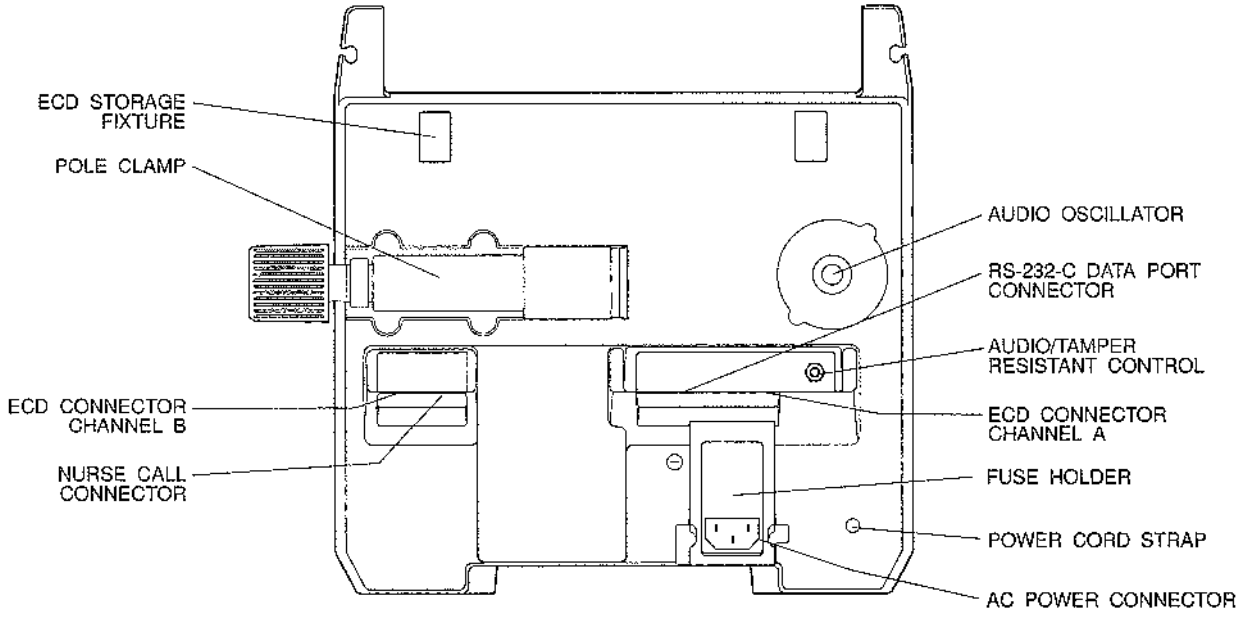
Prior to use, the user must determine whether the instrument configuration is appropriate for the prescribed infusion therapy.

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

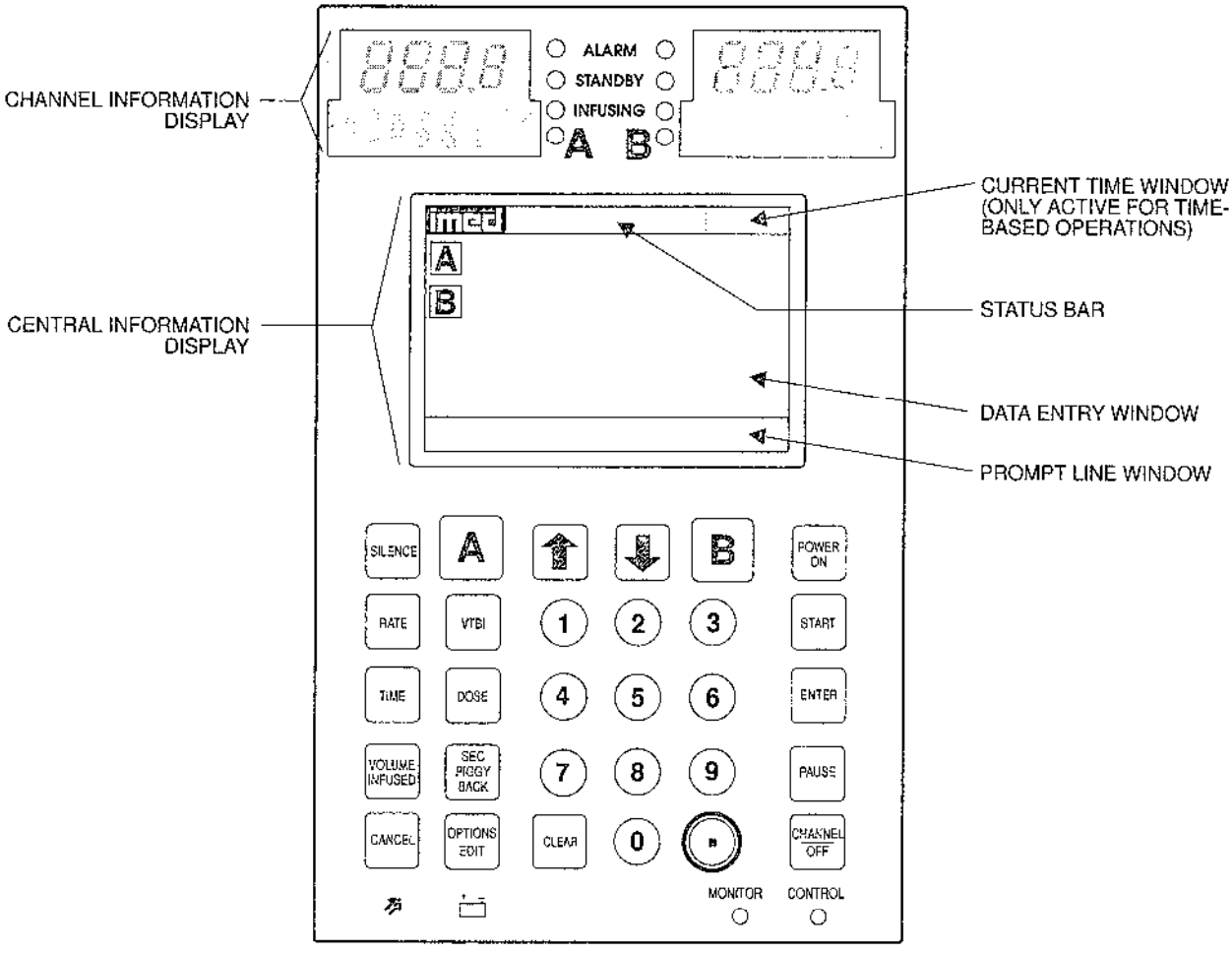


FRONT



REAR

FRONT PANEL CONTROLS AND INDICATORS



DESCRIPTION OF CONTROLS AND INDICATORS

Channel Information (Alarm/Status) Display - Channel A or B 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 or B - displays primary and secondary rate infusion parameters.

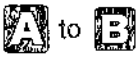
Channel Select A or B indicators - when illuminated, indicate that the corresponding channel is selected for infusion parameter entry and infusion setup.

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 ≈2 minutes after the last key press and relight upon next key press.



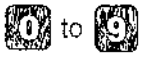
controls - when pressed once, selects the corresponding channel for infusion parameter entry and infusion setup.

when pressed during an infusion, the infusion for the selected channel is stopped. (After ≈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-2TX. Repeat for all other running channels to power off the PC-2TX. When pressed during a software-detected system malfunction, powers off the PC-2TX.

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 both channels.

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

and

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-2TX. 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-2TX is operating on battery power.

indicator - when illuminated, indicates the PC-2TX is connected to an external power source.

when pressed, will cause primary, secondary and total volume infused and secondary volume infused to display for both 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

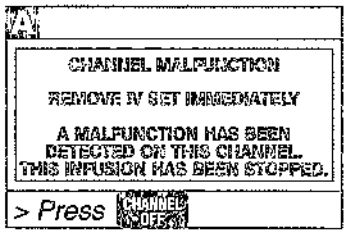
Introduction

The abbreviated procedures necessary to set up, start, and operate the PC-2TX 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-2TX. Refer to Setup and Operating procedures for detailed instructions.

To Set Up a Primary Infusion on Any Channel

1. Connect PC-2TX to external AC power source.
2. Press POWER ON/OFF.
   - If following screen displays, remove instrument from service



NOTE

During initialization, ensure the following occur:

- **All LEDs illuminate.**
- **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-2TX.
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 A or B.
12. Press RATE; to change rate, use numeric data entry or ↑ ↓ controls.
13. Press VTBI; to change VTBI, use numeric data entry controls.
14. Attach set to patient's vascular access device.
15. Press START.

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

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

ABBREVIATED SETUP AND OPERATING PROCEDURES (continued)

To Change Display Contrast (SYSTEM OPTION)

1. Press OPTIONS/EDIT.
2. Select Option #1, display contrast.
3. Use ↑ ↓ controls to adjust the display for optimum viewing.
4. Press ENTER to confirm contrast adjustment.
5. Press CANCEL to return to normal operation.

To Pause an Infusion

1. Select channel, press A or B.
2. Press PAUSE.
3. Press START to resume infusion.

To Stop a Primary Infusion

1. Select channel, press A or B.
2. Press CHANNEL OFF.

To Change Rate or VTBI During Primary Infusion

1. Select channel, press A or B.
2. Press RATE to change rate.
3. Use numeric data entry or ↑ ↓ controls to change rate.
4. Press VTBI to change VTBI.
5. Use numeric data entry controls to change VTBI.
6. Press START.

To Titrate Rate

1. Select channel, press A or B.
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 START.

To Change the Pressure Limit (PCS Mode Control Unlocked)

1. Select channel, press A or B.
2. Press OPTIONS/EDIT 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 ENTER.
6. Press CANCEL to exit the channel options screen.

To View Pressure History for Selected Channel

1. Select channel, press A or B.
2. Press OPTIONS/EDIT control.
3. Select Option #3, Pressure History.
4. Press CANCEL to exit.

ABBREVIATED SETUP AND OPERATING PROCEDURES (continued)

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

1. Select channel, press A or B.
2. Press VTBI to change VTBI.
3. Use numeric data entry controls to change VTBI.
4. Replace fluid container.
5. Refill drip chamber, if necessary.
6. Press RATE control to change rate, if necessary.
7. Use numeric data entry or ↑ ↓ controls to change rate.
8. Press START.

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

1. Press VOLUME INFUSED.

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

1. Press VOLUME INFUSED.
2. Press CLEAR.
3. Use ↑ ↓ controls to select YES.
4. Press ENTER.

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

1. Select channel, press A or B.
2. Press VOLUME INFUSED.

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

1. Select channel, press A or B.
2. Press VOLUME INFUSED.
3. Press CLEAR.

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-2TX.
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 A or B.
10. Press SEC'D PIGGY BACK.
11. The rate field will automatically be selected.
12. Use numeric data entry or ↑ ↓ controls to change Secondary rate.
13. Press VTBI.
14. Use numeric data entry controls to change Secondary VTBI.
15. Open clamp on the Secondary set.
16. Press START.

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 or B.
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 or B.
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 or B.
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 OPTION 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 or B.
3. Press OPTION 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 or B.
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 SECONDARY PIGGYBACK.
9. Press PRIMARY 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 TIME; 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 or B.
3. Press OPTIONS/EDIT 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 OPTIONS/EDIT.)
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 or B.
3. Press OPTIONS 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-2TX

1. Select channel, press A or B.
2. Press CHANNEL OFF.
3. Repeat sequence for other channel, 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.

CHANGING THE PRIMARY SOLUTION CONTAINER

1. Select channel, press A or B.
2. Press PAUSE to stop infusion.
3. Close the roller clamp.
4. Remove the empty solution container.
5. Spike the new container. Ensure the drip chamber is 2/3 full.
6. Press VTBI; to change VTBI, use numeric data entry controls.
7. Open roller clamp.
8. Press START.

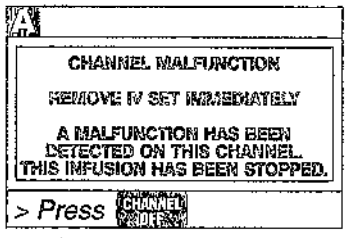
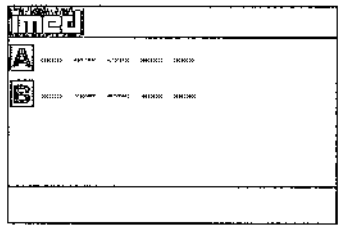
UNLOADING THE SET

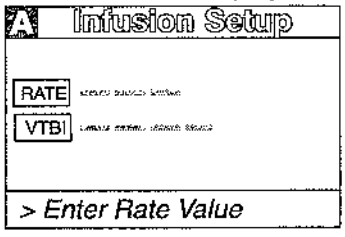
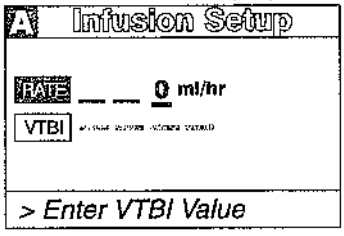
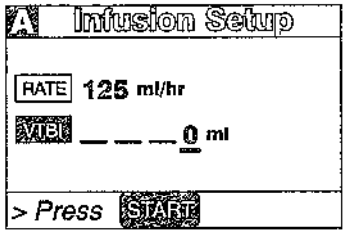
1. Select channel, press A or B.
2. Press PAUSE or CHANNEL OFF to stop infusion.
3. Close the roller clamp.
4. Open the door. The set's Flo-Stop® will automatically close to prevent accidental free-flow.
5. Remove administration set Flo-Stop® first, lift upper fitment vertically from upper fitment recess.
6. Close the door whenever the pump is not in use.

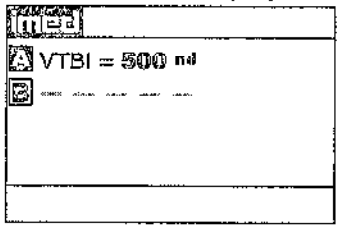
INDEPENDENT SETUP AND OPERATING PROCEDURES

Introduction

The detailed procedures necessary to set up and operate the PC-2TX on either 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-2TX to an external AC power source using the power cord supplied by ALARIS Medical Systems.	◦ AC Power indicator - illuminates ◦ Battery operation indicator - extinguishes
2. Press POWER ON/OFF.	
◦ 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 or B control is not pressed within two minutes of pressing POWER ON, the PC-2TX will automatically power down.**	
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-2TX.	
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.	
	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:** 

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.	• Pump mechanism homes.
9. **Press the tubing into the Air-In-Line detector.**	
10. Close the door and open the roller clamp.	
11. Press A: • 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: 
12. Set the rate and VTBI a. Press RATE: • After 3 seconds "*> Enter VTBI Value*" displays • After 12 seconds audio prompt - sounds	Central Information Display: 
b. Use numeric data entry controls to enter rate parameter	• New rate value displays
c. Press VTBI: • After 3 seconds "*> Enter VTBI Value*" displays • After 12 seconds audio prompt - sounds	Central Information Display: 

ACTION/PROMPT	DISPLAY RESPONSE
d. Use numeric data entry controls to enter VTBI parameter • After 3 seconds "> *Press* START" displays	◦ New VTBI value displays
13. Attach the set to the patient's vascular access device following accepted hospital procedure.	
14. Press START.	Channel Information Display: • INFUSION indicator - flashes • Rate display - Rate value displays Central Information Display: 

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.

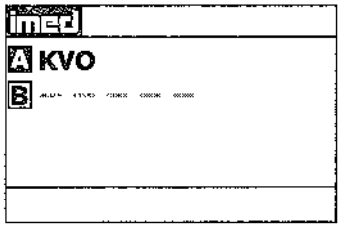
If enabled in System Configuration, the tamper-resistant feature may be initiated at this point. Press and hold the AUDIO control (rear panel) for 3 seconds until an audio tone sounds. The front panel is now locked out, and "PANEL/KEYPAD LOCKED" will display for 3 seconds. The only controls that are operable are SILENCE, SEC PIGGY BACK and VOLUME INFUSED (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:

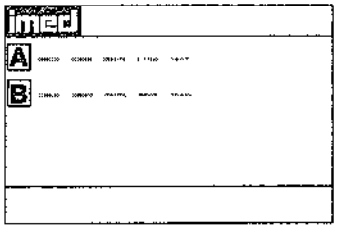
	Channel Information Display: • INFUSING indicator - flashes Central Information Display: ◦ VTBI value - decrements

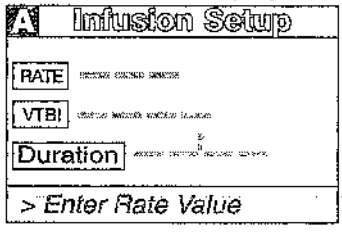
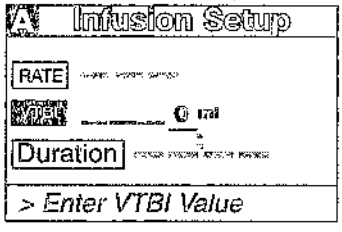
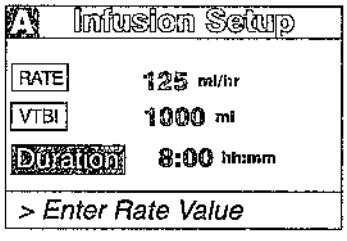
NOTE

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.

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

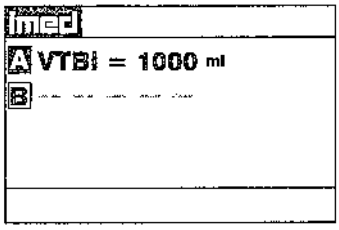
1. Connect the PC-2TX to an external AC power source using the power cord supplied by ALARIS Medical Systems.	• AC Power indicator - illuminates • Battery operation indicator - extinguishes
2. Press POWER ON. • An audio tone sounds once.	Channel Information Display • All LEDs illuminate for 3 seconds • 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 or B control is not pressed within two minutes of pressing POWER ON, the PC-2TX will automatically power down.**	
3. Prime and load the administration set as previously described under: **To Set up a Primary Infusion.**	
4. Press A: • After 3 seconds "> *Enter Rate Value*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: • Channel indicator - illuminates • Rate display shows "- - - -"

ACTION/PROMPT	DISPLAY RESPONSE
	Central Information Display: 
5. Set the VTBI and duration	Central Information Display: 
a. Press VTBI: • After 3 seconds "> *Enter VTBI Value*" displays ◦ After 12 seconds audio prompt - sounds	
b. Use numeric data entry controls to enter VTBI parameter	• New VTBI value displays
c. Press TIME or ENTER. • After 3 seconds "> *Enter Rate Value*" displays ◦ After 12 seconds audio prompt - sounds	Central Information Display 
d. Use numeric data entry controls to enter duration parameter. ◦ As Duration parameters are entered, the rate value displays • After 3 seconds "> *Press* START" displays	◦ 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.

ACTION/PROMPT	DISPLAY RESPONSE
6. Attach the set to the patient's vascular access device following accepted hospital procedure.	
7. Press START.	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

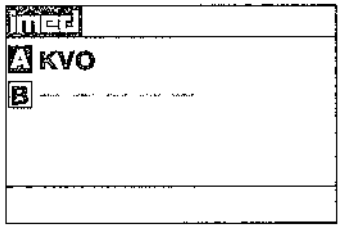
Central Information Display:
- VTBI value - decrements

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:

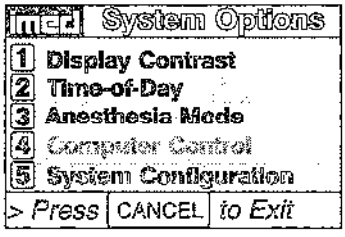


ACTION/PROMPT	DISPLAY RESPONSE

To Adjust Central Information Display Contrast

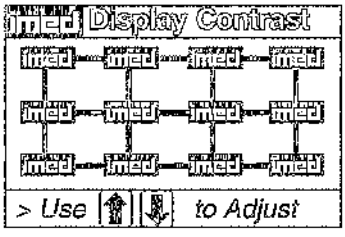
1. Press OPTIONS/EDIT (do not select channel first).
   - After 3 seconds "> *Press* CANCEL *to Exit*" displays

Central Information Display:



2. Press 1.

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 ENTER.

Central Information Display:
- Returns to System Options screen

5. Press CANCEL to return to initial screen.

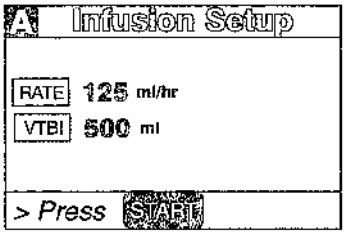
Central Information Display:
- Returns to initial screen

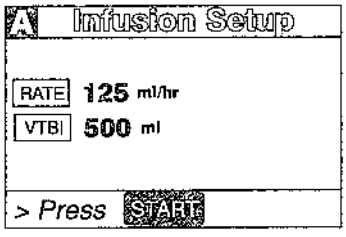
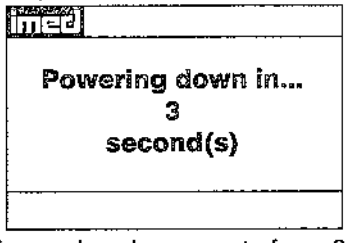
To Pause an Infusion

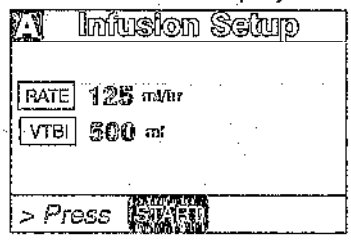
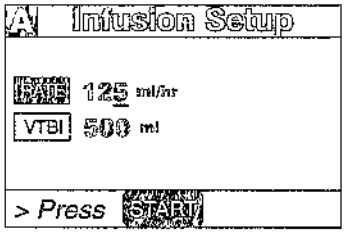
1. Press A or B to select channel.
   - After 3 seconds "> *Press* START" displays
   - After 12 seconds audio prompt - sounds

Channel Information Display:
- Channel indicator - illuminates
- INFUSING indicator - flashes

Central Information Display:



ACTION/PROMPT	DISPLAY RESPONSE
2. Press PAUSE. • After 3 seconds "> *Press* START " displays • After 12 seconds audio prompt - sounds. In Anesthesia mode, audio is disabled.	Channel Information Display: • INFUSING indicator - extinguishes • STANDBY indicator - flashes • "PAUSE" advisory scrolls. Central Information Display: NO CHANGE
3. Press START to resume the infusion.	Channel Information Display: • STANDBY indicator - extinguishes • INFUSING indicator - flashes • Message display - blanks Central Information Display: • Returns to infusing screen
To Stop a Primary Infusion 1. Press A or B to select channel. • After 3 seconds "> *Press* START" displays • After 12 seconds audio prompt - sounds	Channel Information Display: • Channel indicator - illuminates Central Information Display:  • Channel indicator - flashes
2. Press CHANNEL OFF. **NOTE** **If only one channel is in use, the PC-2TX will automatically power down.**	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-2TX powers down

ACTION/PROMPT	DISPLAY RESPONSE
To Change Rate or VTBI During Primary Infusion	
1. Press A or B 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.

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 or B to select channel.

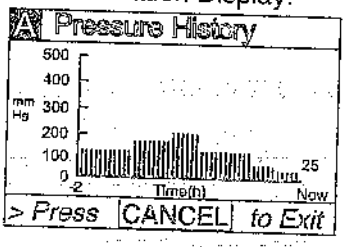
   Channel Information Display:
   • Channel indicator - illuminates
   Central Information Display:
   • Infusion Setup screen displays

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

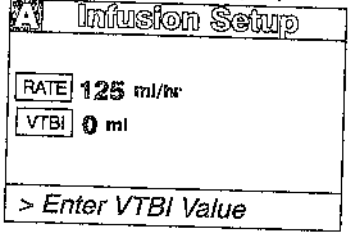
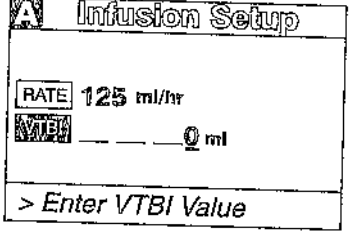
   Channel Information Display:
   NO CHANGE
   Central Information Display:
   • Rate graphic is highlighted
   • New rate value is displayed

3. Press START.

   Channel Information Display:
   • New rate value displays
   Central Information Display:
   • Returns to active infusion screen

ACTION/PROMPT	DISPLAY RESPONSE
3. Press [3]. • After 3 seconds "> *Press* [CANCEL] *to Exit*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 
4. Press [CANCEL].	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 [A] or [B] 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 [VTBI].	Channel Information Display: NO CHANGE Central Information Display: 

ACTION/PROMPT	DISPLAY RESPONSE
3. Use the numeric data entry controls to set a new VTBI.	Channel Information Display: NO CHANGE Central Information Display: • New VTBI displays
4. Replace solution container and refill drip chamber, if necessary.	
5. Change rate, if necessary.	
6. Press START.	Channel Information Display: • Set rate displays • INFUSING indicator - flashes • Message display - blanks Central Information Display: • Returns to active infusion screen

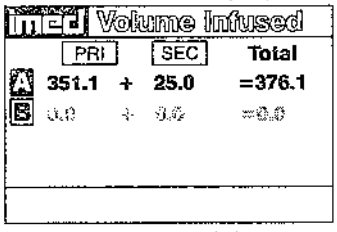
NOTE

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 both Channels Simultaneously

1. Press VOLUME INFUSED.
   - Active channel indicators are highlighted

Channel Information Display:
NO CHANGE
Central Information Display:

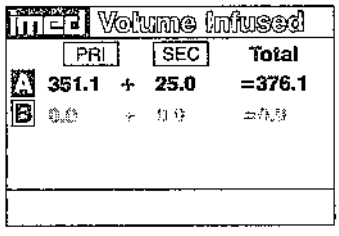


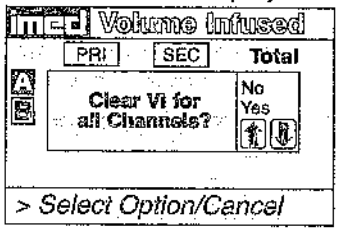
* Example Values

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

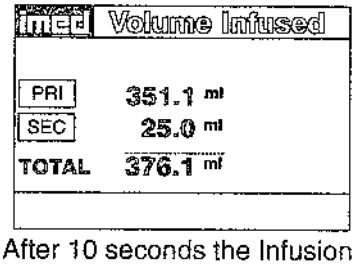
1. Press VOLUME INFUSED.
   - Active channel indicators are highlighted

Channel Information Display:
NO CHANGE
Central Information Display:



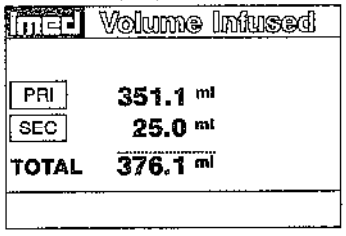
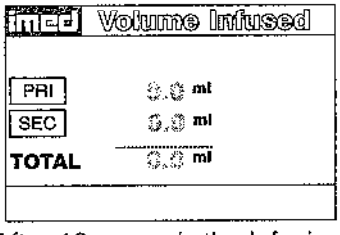
ACTION/PROMPT	DISPLAY RESPONSE
2. Press CLEAR. • After 3 seconds "> *Select Option/Cancel*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 
3. Use ↑ ↓ to select "Yes". • After 3 seconds "> *Press* ENTER *to confirm*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: • Selected option is highlighted
4. Press ENTER.	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 A or B 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 VOLUME INFUSED.	Channel Information Display: NO CHANGE Central Information Display: • Channel specific volume infused screen displays for 10 seconds:  • After 10 seconds the Infusion Setup screen re-displays

ACTION/PROMPT	DISPLAY RESPONSE
3. Press START or CANCEL to deselect channel.	Channel Information Display: • Channel indicator - extinguishes Central Information Display: • Returns to active infusion screen

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

1. Press A or B 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 VOLUME INFUSED.	Channel Information Display: NO CHANGE Central Information Display: • Channel specific volume infused screen displays for 10 seconds: 
3. Press CLEAR while the Volume Infused screen is displaying to clear all Values to "0".	Channel Information Display: NO CHANGE Central Information Display:  • After 10 seconds the Infusion Setup screen re-displays
4. Press START or CANCEL to deselect channel.	Channel Information Display: • Channel indicator - extinguishes Central Information Display: • Returns to active infusion screen

ACTION/PROMPT	DISPLAY RESPONSE

To Set Up Secondary (Piggyback) Infusion With Dual Rates

NOTE

The PC-2TX 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 ≈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 A or B to select channel.

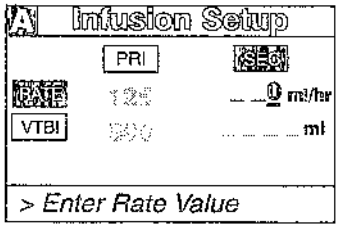
Channel Information Display:
- Channel indicator - illuminates
- INFUSING indicator - continues flashing

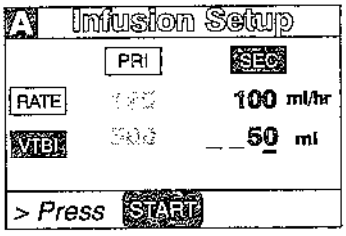
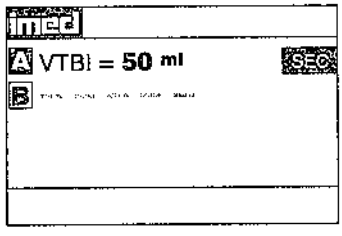
Central Information Display:
- Infusion Setup screen displays

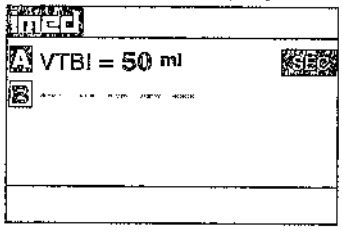
9. Press SEC PIGGY BACK.
   - After 3 seconds "*> Enter Rate Value*" displays
   - Rate parameter is automatically selected

Channel Information Display:
NO CHANGE

Central Information Display:

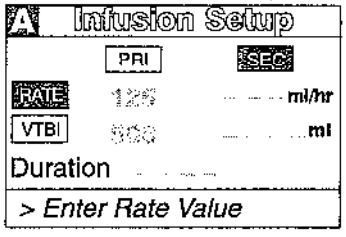
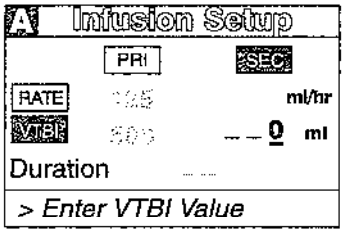
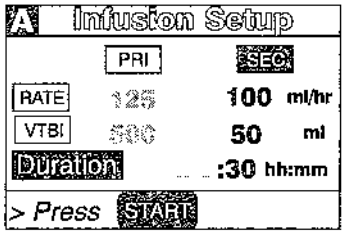


ACTION/PROMPT	DISPLAY RESPONSE
10. Use numeric data entry or controls to enter or change rate value. • After 3 seconds ">*Enter VTBI Value*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: • New rate value displays
11. Press . • After 3 seconds "> *Enter VTBI Value*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: • Last programmed secondary VTBI value displays
12. Use numeric data entry controls to enter or change VTBI value, then press to confirm. • After 3 seconds "> *Press* START" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 
NOTE **Verify that the Secondary VTBI does not exceed the contents of the Secondary fluid container.**	
13. Open clamp on the Secondary set.	
14. Press .	Channel Information Display: • Channel indicator - extinguishes • Secondary rate - displays • "SECONDARY" message scrolls Central Information Display: 

ACTION/PROMPT	DISPLAY RESPONSE
During Infusion:	Channel Information Display: • INFUSING indicator - flashes • Secondary rate - displays Central Information Display: • VTBI (Secondary) - decrements
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)	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.**	

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.	
3. Press A or B to select channel.	Channel Information Display: • Channel indicator - illuminates • INFUSING indicator - continues flashing Central Information Display: • Infusion Setup screen displays

ACTION/PROMPT	DISPLAY RESPONSE
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 Central Information Display: 

ACTION/PROMPT	DISPLAY RESPONSE

NOTES

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

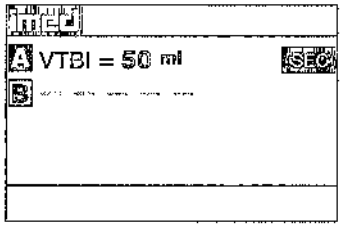
It is acceptable to enter either a VTBI/Duration or a Rate/VTBI as the Secondary infusion parameters when the Volume/Time infusion option is enabled.

9. Open clamp on the Secondary set.

10. Press START.

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

Upon Completion of the Secondary Infusion:

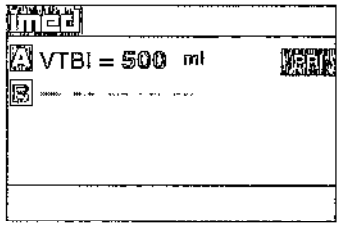
- Switchover audio alert (6 beeps) - sounds (unless disabled in System Configuration)

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:
- Primary rate displays
- Message screen clears

Central Information Display:



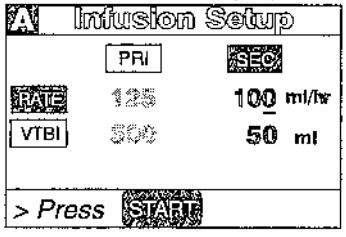
ACTION/PROMPT	DISPLAY RESPONSE

To Change Primary Infusion Parameters During Secondary Infusion

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

Channel Information Display:
- Channel indicator - illuminates

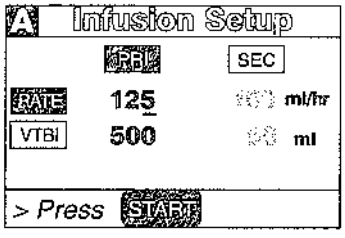
Central Information Display:



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

Channel Information Display:
NO CHANGE

Central Information Display:



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

4. Press VTBI to change primary VTBI.

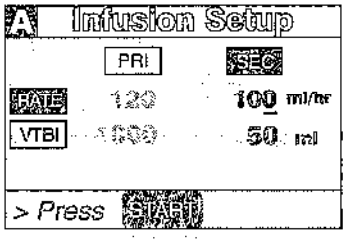
Channel Information Display:
NO CHANGE

Central Information Display:
- Cursor displays under VTBI value
- VTBI is highlighted

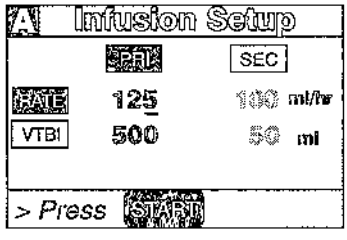
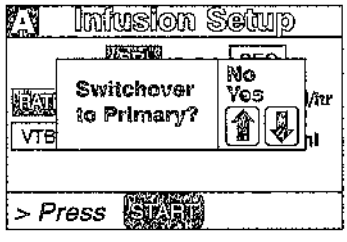
5. Use numeric data entry controls to change primary VTBI.
   - After 3 seconds "> *Press* START" displays
   - After 12 seconds audio prompt - sounds

Channel Information Display:
NO CHANGE

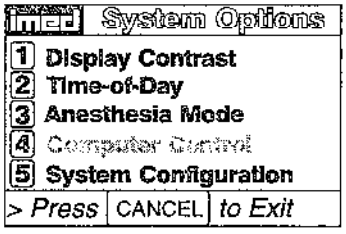
Central Information Display:
- New primary VTBI value displays

ACTION/PROMPT	DISPLAY RESPONSE
6. Press SEC PIGGY BACK. • After 3 seconds "> *Press* START" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 
7. Press START.	Channel Information Display: • Channel indicator - extinguishes Central Information Display: • Active Secondary Infusion screen displays

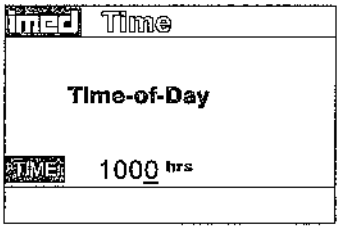
To Stop a Secondary Infusion and Return to the Primary Infusion

1. Press A or B to select channel. • After 3 seconds "> *Press* START" displays • After 12 seconds audio prompt - sounds	Channel Information Display: • Channel indicator - illuminates Central Information Display: • Secondary Infusion Setup screen displays
2. Press SEC PIGGY BACK. • After 3 seconds "> *Press* START" displays	Channel Information Display: NO CHANGE Central Information Display: 
3. Close Secondary clamp.	
4. Press START.	Channel Information Display: NO CHANGE Central Information Display: 

ACTION/PROMPT	DISPLAY RESPONSE
5. Use ↑ or ↓ to select "Yes" option.	Central Information Display: • "Yes" option is highlighted
6. Press START. • The secondary infusion stops and the primary infusion starts. • The audio tone sounds six times (unless the primary switchover alert is disabled).	Channel Information Display: • Rate changes to Primary value • Channel indicator - extinguishes Central Information Display: • Primary active infusion screen displays
To Change the Time of Day 1. Press OPTIONS/EDIT.	Channel Information Display: NO CHANGE Central Information Display:



2. Press 2. • After 12 seconds audio prompt - sounds	Central Information Display:



NOTE **If a Delayed Start or Multidose is active, "> Delay Mode is Active" will display and Time-of-Day display screen can not be accessed.** 3. Use numeric data entry controls to enter the new time.	Central Information Display: • New time displays
4. Use ↑ or ↓ to select AM or PM, if clock is in the AM/PM mode. 5. Press ENTER to confirm.	Channel Information Display: NO CHANGE Central Information Display: • System Options screen displays
6. Press CANCEL.	Channel Information Display: NO CHANGE Central Information Display: • Infusion setup or active screen displays

ACTION/PROMPT	DISPLAY RESPONSE

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.

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

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

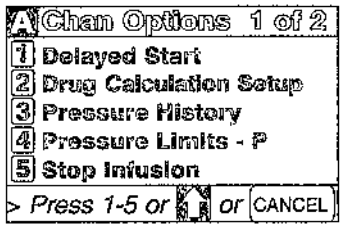
   Channel Information Display:
   - Channel indicator - illuminates
   - RATE display shows "- - - -".

   Central Information Display:
   - Infusion Setup screen displays

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

   Channel Information Display:
   NO CHANGE

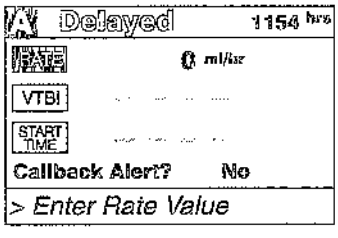
   Central Information Display:



4. Press 1.
   - After 3 seconds "*Enter Rate Value*" displays
   - After 12 seconds audio prompt - sounds

   Channel Information Display:
   NO CHANGE

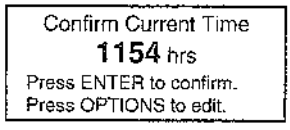
   Central Information Display:



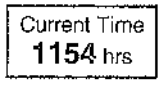
ACTION/PROMPT	DISPLAY RESPONSE

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 ENTER to continue. If the time displayed is incorrect press OPTIONS. The following pop-up display appears:

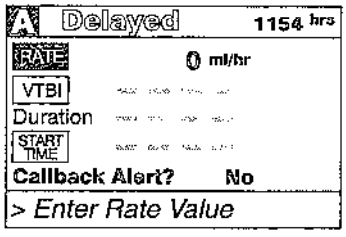


Enter the correct Time of Day and press ENTER.

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.



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

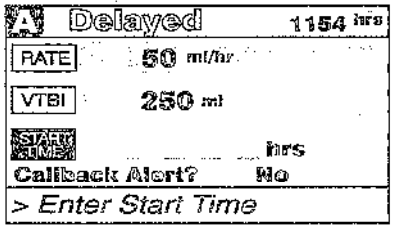
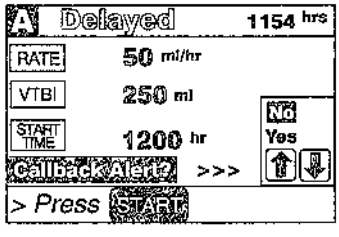
   Channel Information Display:
   NO CHANGE
   Central Information Display:
   - RATE is highlighted
   - Last entered rate or "0" displays

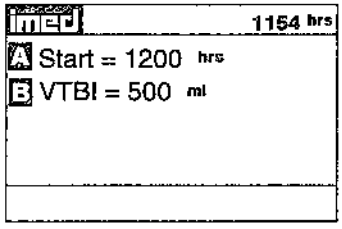
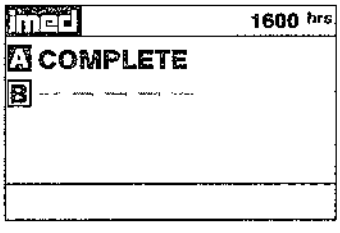
6. Use numeric data entry or controls to input or change rate value.
   - After 3 seconds "> *Enter VTBI Value*" displays
   - After 12 seconds audio prompt - sounds

   Channel Information Display:
   NO CHANGE
   Central Information Display:
   - New rate value displays

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

   Channel Information Display:
   NO CHANGE
   Central Information Display:
   - VTBI is highlighted
   - Last VTBI value or "0" displays

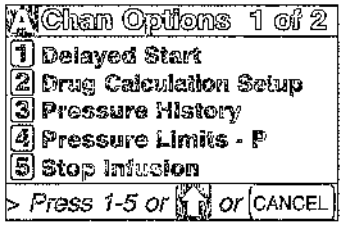
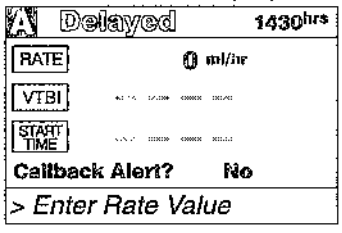
ACTION/PROMPT	DISPLAY RESPONSE
8. Use numeric data entry controls to input or change VTBI value. • After 3 seconds "> *Enter Start Time*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: • New VTBI value displays
9. Press TIME. • After 3 seconds "> *Enter Start Time*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 
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* ENTER *to confirm*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: • New Start Time displays
11. Press ENTER to change Callback Alert option. • Use ↑ or ↓ to select "Yes" (No is default setting) then press ENTER to confirm. • After 3 seconds "> *Press* START" displays. • After 12 seconds audio prompt - sounds.	Channel Information Display: NO CHANGE Central Information Display: 
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.	

ACTION/PROMPT	DISPLAY RESPONSE
13. Press START.	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: 

To Set Up a Delayed Start Secondary Infusion

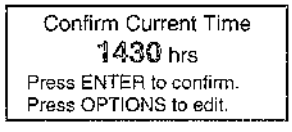
Since by definition, a Delayed Start Infusion will not be infusing for a programmed period of time, it is assumed that another infusing IV line will keep the vein open until the delayed start infusion begins. In a Delayed Start Secondary Infusion, no KVO (Keep Vein Open) infusion precedes or follows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

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

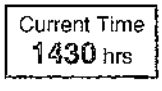
ACTION/PROMPT	DISPLAY RESPONSE
2. Press A or B to select channel. • After 3 seconds "*Enter Rate Value*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: • Channel indicator - illuminates • RATE display shows "- - - -". Central Information Display: • Infusion Setup screen displays
3. Press OPTIONS. • After 3 seconds "> *Press 1-5 or* ↑ *or* CANCEL " displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 
4. Press 1. • After 3 seconds "> *Enter Rate Value*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 

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 ENTER to continue. If the time displayed is incorrect press OPTIONS. The following pop-up display appears:



Enter the correct Time of Day and press ENTER.

ACTION/PROMPT	DISPLAY RESPONSE

NOTE

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

5. Press RATE.
   - 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

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

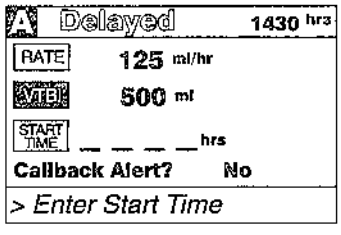
   Channel Information Display: NO CHANGE
   Central Information Display:
   - New rate value displays

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

   Channel Information Display: NO CHANGE
   Central Information Display:
   - VTBI is highlighted
   - Last VTBI value or "0" displays

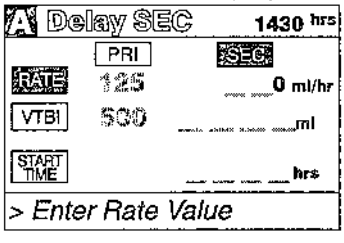
8. Use numeric data entry controls to input or change VTBI value.
   - After 3 seconds "> *Enter Start Time*" displays
   - After 12 seconds audio prompt - sounds

   Channel Information Display: NO CHANGE
   Central Information Display:



9. Press SEC/PIGGY BACK.
   - 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:

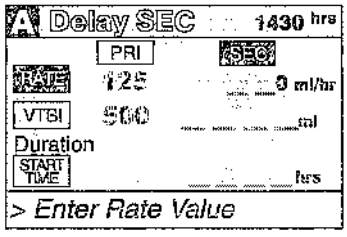


ACTION/PROMPT	DISPLAY RESPONSE

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.



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

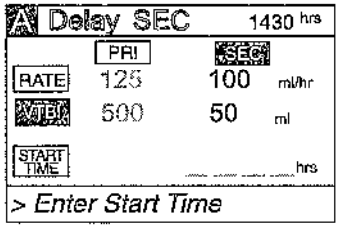
Channel Information Display:
NO CHANGE
Central Information Display:
- New Secondary rate displays

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

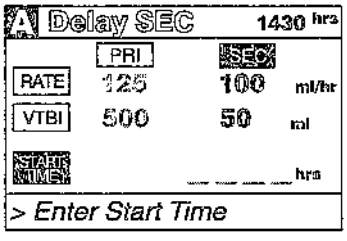
12. Use numeric data entry controls to enter Secondary VTBI value.
    - After 3 seconds "*> Enter Start Time*" displays
    - After 12 seconds audio prompt - sounds

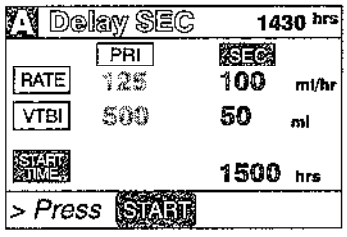
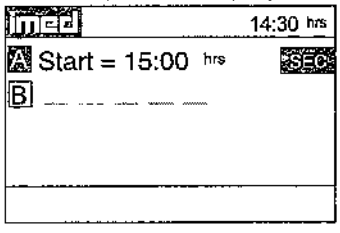
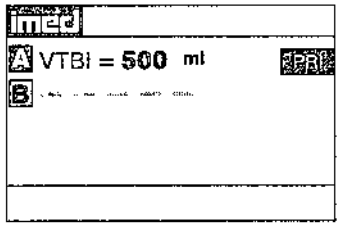
Channel Information Display:
NO CHANGE
Central Information Display:



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

Channel Information Display:
NO CHANGE
Central Information Display:



ACTION/PROMPT	DISPLAY RESPONSE
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	Channel Information Display: NO CHANGE Central Information Display: 
15. Press START.	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 • Secondary VTBI decrements
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: 

ACTION/PROMPT | DISPLAY RESPONSE

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 or B to select channel.
   - After 3 seconds "*Enter Rate Value*" displays
   - After 12 seconds audio prompt - sounds

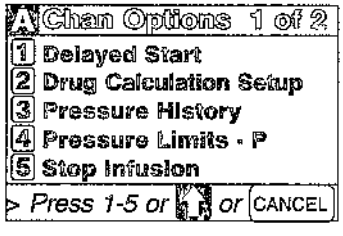
   Channel Information Display:
   - Channel indicator - illuminates
   - RATE display shows "- - - -".

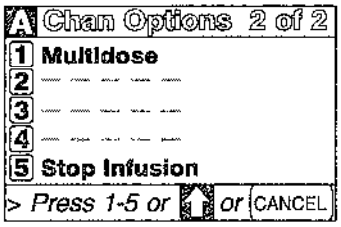
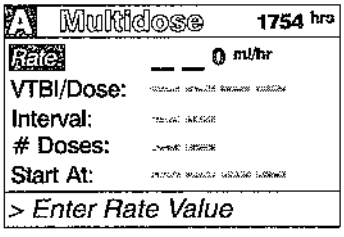
   Central Information Display:
   - Infusion Setup screen displays

3. Press OPTIONS/EDIT.
   - After 3 seconds "> *Press 1-5 or* ↑ *or* CANCEL " displays
   - After 12 seconds audio prompt - sounds

   Channel Information display:
   NO CHANGE

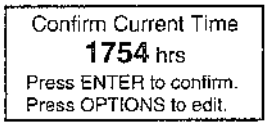
   Central Information Display:



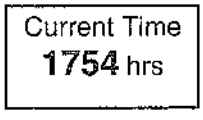
ACTION/PROMPT	DISPLAY RESPONSE
4. Use ↑ ↓ to select screen 2 of 2 of the Channel Options display. • After 3 seconds "> *Press 1-5 or* ↑ *or* [CANCEL]" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 
5. Press 1. • After 3 seconds "> *Enter Rate Value*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 

NOTE

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



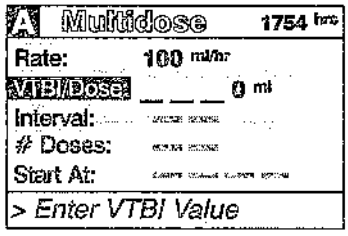
If the time displayed in the upper right corner of the display is correct, press ENTER to continue. If the time displayed is incorrect press OPTIONS. The following pop-up display appears:



Enter the correct Time of Day and press ENTER.

6. Use numeric data entry or ↑ ↓ controls to enter the rate at which each dose is to be infused. • After 3 seconds "> *Press* [ENTER] *to confirm*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: • Rate displays

ACTION/PROMPT	DISPLAY RESPONSE
7. Press ENTER or VTBI. • After 3 seconds "> *Enter VTBI Value*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display:

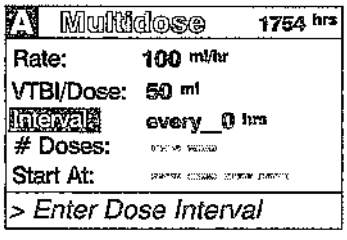


8. Use numeric data entry controls to enter the VTBI/Dose for each dose to be infused. • After 3 seconds "> *Press* ENTER *to confirm*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: • VTBI/Dose displays

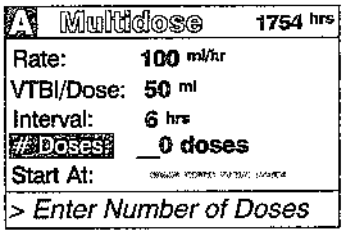
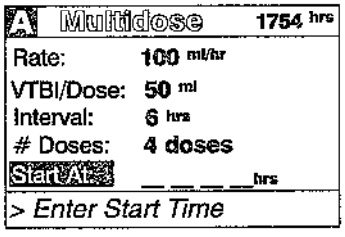
NOTE

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 ENTER. • After 3 seconds "> *Enter Dose Interval*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display:

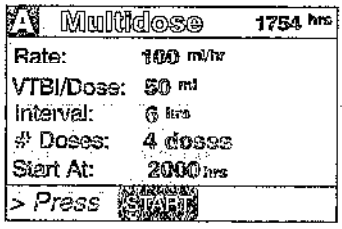
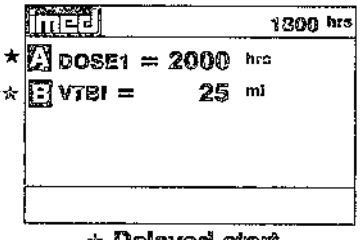


10. Use numeric data entry controls to enter the Dose Interval (1-24 hours) for each dose to be infused. • After 3 seconds "> *Press* ENTER *to confirm*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: • Dose Interval displays

ACTION/PROMPT	DISPLAY RESPONSE
11. Press ENTER. • 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.**	Channel Information Display: NO CHANGE Central Information Display: 
12. Use numeric data entry controls to enter the Number of Doses (1-24) to be infused. • After 3 seconds "> *Press* ENTER *to confirm*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: • Number of Doses displays
13. Press ENTER. • After 3 seconds "> *Enter Start Time*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 
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* ENTER *to confirm*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: • Start Time displays

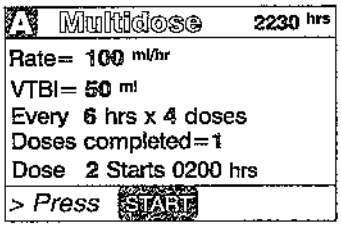
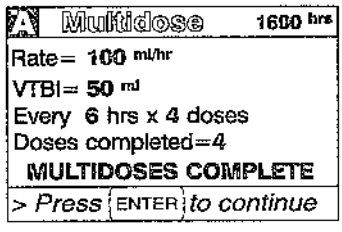
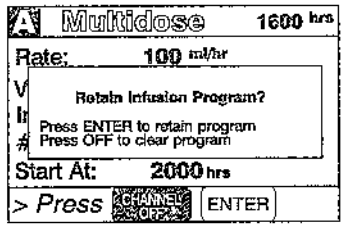
NOTE

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

ACTION/PROMPT	DISPLAY RESPONSE
15. Press ENTER. • After 3 seconds "> *Press* START" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 
NOTE **To edit the Multidose infusion parameters, press ENTER to return to the top of the Multidose setup screen. Use numeric data entry controls to change highlighted parameter. Use ENTER 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 START.	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:  **★ 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

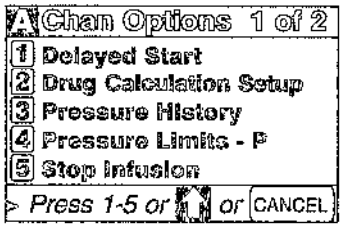
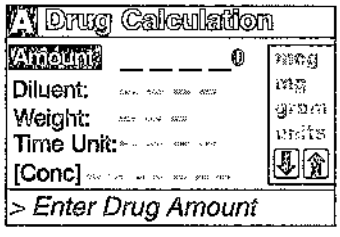
ACTION/PROMPT	DISPLAY RESPONSE
• To review the selected Multidose infusion, press A or B to call up the selected channel Multidose status summary screen.	Central Information Display: 
When the Multidose infusion is completed: • The infusion stops (with no KVO).	Channel Information Display: • INFUSING indicator - extinguishes • Rate display - blanks • "MULTIDOSE COMPLETE" scrolls Central Information Display: • "COMPLETE" displays for the appropriate channel
1. Press A or B to select channel. • After 3 seconds "> *Press* ENTER *to continue*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: • Channel indicator - illuminates Central Information Display: 
2. Press ENTER to reset and resume same Multidose infusion or press CHANNEL OFF to shut down channel. • To resume - reset start time	Channel Information Display: NO CHANGE Central Information Display: ENTER Option • Multidose Infusion Program screen displays CHANNEL OFF Option 

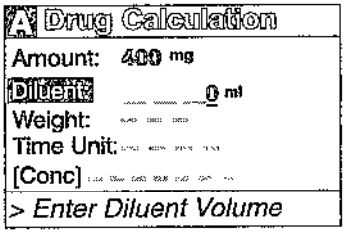
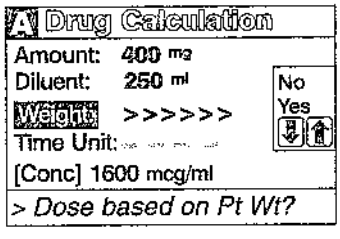
ACTION/PROMPT	DISPLAY RESPONSE
3. Press ENTER to save Multidose Infusion Program or press CHANNEL OFF to clear program.	Channel Information Display: • Channel displays - blank Central Information Display: • Active Infusion screen displays for other operating channel or Powerdown screen displays

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 A or B to select channel. • 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
3. Press OPTIONS SETUP. • After 3 seconds "> *Press 1-5 or* 1 *or* CANCEL" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 
4. Press 2 • After 3 seconds "> *Enter Drug Amount*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 

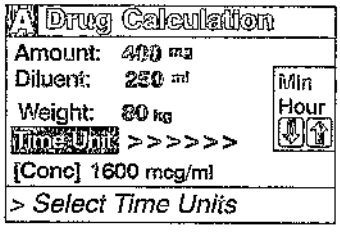
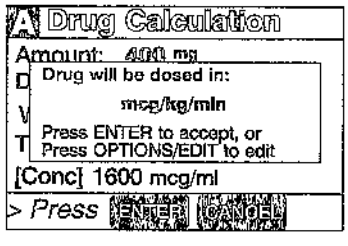
ACTION/PROMPT	DISPLAY RESPONSE
5. Use numeric data entry controls to enter the amount of drug added to the IV container. • After 3 seconds "> *Select Unit of Measure*" displays Use ⇧ or ⇩ to select a unit of measure (mcg, mg, gram or units) • After 3 seconds "> *Press* [ENTER] *to confirm*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: • Selected Amount displays
6. Press ENTER. • After 3 seconds "> *Enter Diluent Volume*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 
7. Use numeric data entry controls to enter the Diluent Volume (when originally prepared). • After 3 seconds "> *Press* [ENTER] *to confirm*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: • Diluent Volume displays
8. Press ENTER. • After 3 seconds "> *Dose based on Pt Wt?*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 

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* ENTER *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 channel.

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

10. Press ENTER to confirm selection. ◦ If Yes is selected, use numeric data entry controls to enter patient weight in kilograms (kg) and press ENTER to confirm **or** • If No is selected, press ENTER to confirm. (screen will show "*Weight: Not used*") ◦ After 3 seconds "> *Select Time Units*" displays	Channel Information Display: NO CHANGE Central Information Display: 
11. Use ↑ or ↓ to select Min or Hour. • After 3 seconds "> *Press* ENTER *to confirm*" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: • Min or Hour is highlighted
12. Press ENTER to confirm selection. ◦ After 3 seconds "> Press ENTER CANCEL" displays ◦ After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 

ACTION/PROMPT DISPLAY RESPONSE

NOTE

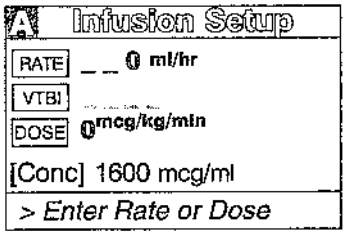
Drug dose units default values are delineated in the following table:

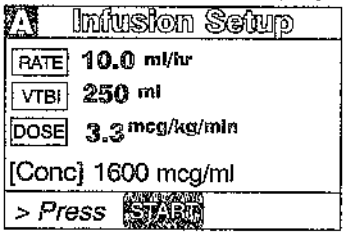
Drug amount entered as:	Drug will be dosed in:	Example:
micrograms	micrograms	500 mcg in 50 ml, Weight = no, Time units = Min [Conc] = 10 mcg/ml Drug dose is mcg/min
milligrams (where concentration is ≤ 10 mg/ml)	micrograms	500 mg in 50 ml, Weight = yes, Time units = Min [Conc] = 10000 mcg/ml Drug dose 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

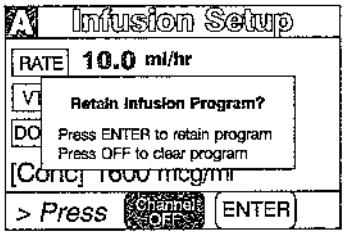
If the default drug dose unit does not meet the requirement for the drug to be infused, press the OPTIONS/EDIT control and use the ↑ ↓ controls to select an alternate drug dosing unit. Press ENTER to confirm.

13. Press ENTER to confirm the drug calculation dosing parameters or press CANCEL 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:



ACTION/PROMPT	DISPLAY RESPONSE
14. Press RATE or DOSE. • 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 VTBI. • 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* START" displays • After 12 seconds audio prompt - sounds	Channel Information Display: NO CHANGE Central Information Display: 
18. Attach the set to the patient's vascular access device following accepted hospital procedure.	

ACTION/PROMPT	DISPLAY RESPONSE
19. Press START.	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 A or B 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 OFF.	Channel Information Display: • Rate display - blanks • INFUSING indicator - extinguishes Central Information Display: 
3. Press ENTER to save current Drug Calculation Infusion Program or press CHANNEL OFF to clear program.	Channel Information Display: • Channel displays - blank Central Information Display: • Active Infusion screen displays, if other channel is operating; or Powerdown screen displays

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 solution, or reprimingexisting 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 ENTER to continue or CANCEL to discard your previous edit.
- Complete programming and press START.

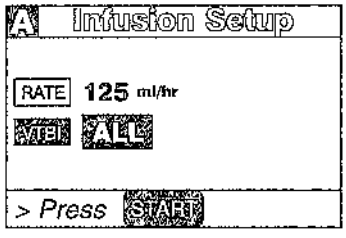
> Channel A or B's program has not been completed.
>
> Press ENTER to complete/confirm
>
> or
>
> Press CANCEL to clear program

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-2TX.
   - 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 ALL to select "ALL" or program a specific VTBI using the numeric data entry controls.

Central Information Display:



6. Press START.

When the ECD senses an empty container:

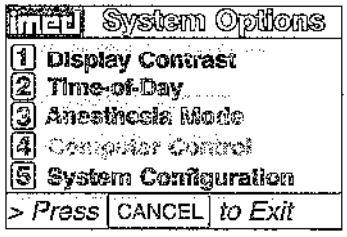
- An audio prompt sounds
- "EMPTY CONTAINER - KVO" scrolls
- RATE display shows "1" or set rate if <1.0
- Channel ALARM indicator - flashes
- Channel INFUSING indicator - continues to flash.

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-2TX 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.

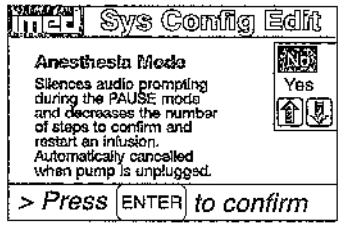
ACTION/PROMPT	DISPLAY RESPONSE
1. Power on the PC-2TX as previously described.	
2. Press OPTIONS/EDIT.	Central Information Display:



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 3. • After 3 seconds "> *Press* ENTER *to confirm*" displays • After 12 seconds audio prompt - sounds	Central Information Display:



4. Use ↑ ↓ to select the "Yes" option. • After 3 seconds "> *Press* ENTER *to confirm*" displays • After 12 seconds audio prompt - sounds	Central Information Display: • "Yes" option is highlighted
5. Press ENTER.	Central Information Display: • System option screen displays
6. Press CANCEL.	Central Information Display: • Infusion Setup or Active Infusion screen displays

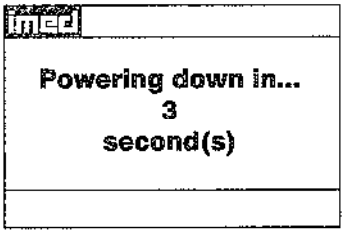
NOTE

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.

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-2TX	
1. Press A or B as appropriate.	
2. Press CHANNEL OFF.	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 both channels are stopped.	
During the power off sequence:	Central Information Display:

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.



- Time value decrements from 3 to 1, then the PC-2TX powers down.

MONITOR OR COMPUTER CONTROL SETUP AND OPERATING PROCEDURES

Introduction

The steps necessary to operate the PC-2TX 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-2TX's RS-232-C Data Port and the connection should ONLY be performed by qualified personnel.

To Establish PC-2TX/Host Computer Interface

1. Set computer communication parameters.

NOTE

Before the PC-2TX 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-2TX. Thorough familiarity with independent operation of the PC-2TX 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-2TX are provided in the PC-2TX 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-2TX and to the host computer.

NOTE

Before the PC-2TX 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-2TX. The technical data necessary to interface the host computer interface cable to the PC-2TX's RS-232-C Communication DATA PORT connector is provided in the PC-2TX Maintenance Manual.

When power is then applied to the PC-2TX's circuits, the MONITOR indicator will illuminate.

ACTION/PROMPT	DISPLAY RESPONSE

To Change PC-2TX Operating Condition from Independent to MONITOR

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-2TX Operating Condition from MONITOR to Independent

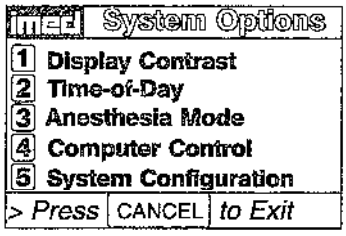
1. Disconnect the communication interface cable from the RS-232-C communications DATA PORT connector on the rear panel.

The MONITOR indicator extinguishes.

To Change PC-2TX Operating Condition from MONITOR to COMPUTER CONTROL

1. Press OPTIONS/EDIT.

Central Information Display:

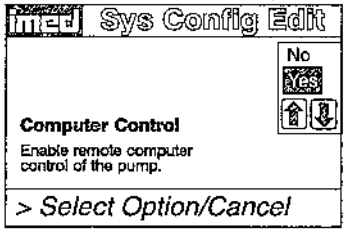


NOTE

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 4.
   - After 3 seconds "*> Select Option/Cancel*" displays
   - After 12 seconds audio prompt - sounds

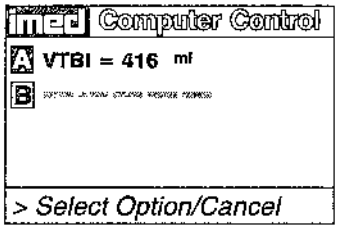
Central Information Display:



3. Select "Yes" using the ↑ ↓ controls.

4. Press ENTER.
   - **COMPUTER CONTROL** and Computer Control indicator - flash
   - The PC-2TX keypad is inoperative, except for the PAUSE SILENCE VOLUME/MUTE OPTIONS/EDIT CANCEL CHANNEL OFF controls

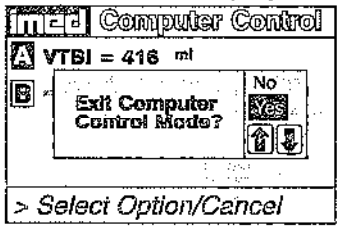
Central Information Display:



To Change PC-2TX Operating Condition from COMPUTER CONTROL to MONITOR

1. Press OPTIONS/EDIT or CANCEL.
   - After 3 seconds "> *Select Option/Cancel*" displays.

Central Information Display:

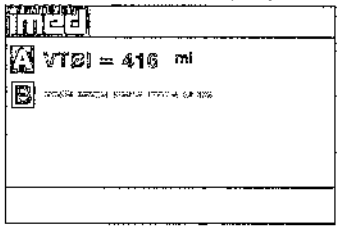


2. Select the "Yes" option by using the ↑ ↓ controls.

Central Information Display
- "Yes" option is highlighted

3. Press ENTER.
   - Infusions in progress under computer control continue as programmed

Central Information Display:



- MONITOR indicator - illuminates

To Power Off the PC-2TX in MONITOR Operation

1. Press A or B as appropriate.

2. Press CHANNEL OFF.

Channel Information Display:
- All displays and indicators for selected channel - extinguish

Central Information Display:
- Selected channel display reverts to un-programmed status.

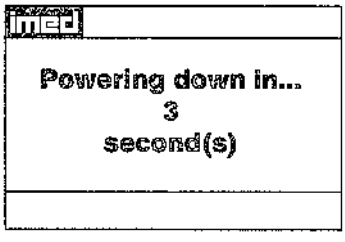
3. Repeat steps 1 and 2 until both channels are stopped.

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-2TX powers down.

To Power Off the PC-2TX in COMPUTER CONTROL Operation

1. Repeat procedure listed above under "To Change PC-2TX Operation from COMPUTER CONTROL to MONITOR"
2. Press A or B as appropriate.
3. Press CHANNEL OFF.

Channel Information Display:
- All displays and indicators for selected channel - extinguish

Central Information Display:
- Selected channel display reverts to un-programmed status.

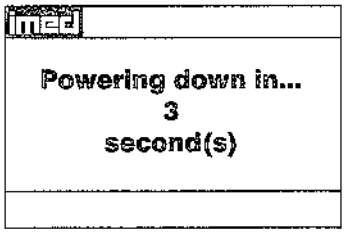
4. Repeat steps 1 and 2 until both channels are stopped.

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-2TX 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-2TX. 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-2TX 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-2TX is infusing at KVO rate. ECD plugged into PC-2TX, 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 Do not use on battery. Operate on AC only. Battery Replacement Required. Contact Biomed.	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
Powering down in X second(s) Audio: prompt Visual: timed display in central information display	The CHANNEL OFF control has been pressed.	None. To stop power down, press any control except POWER ON.

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.	Reenter 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: illegal keypress 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.
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.
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 ≥ 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).
P/C/S 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.

Prompt	Meaning	Response
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.
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
CHECK ECD Audio: alarm Visual: continuous scroll, channel alarm indicator flashes	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.	Connect or replace ECD, then press START control.
CHECK IV SET Audio: alarm Visual: continuous scroll, channel alarm indicator flashes	Administration set not properly installed. Infusion is not started on affected channel.	Close roller clamp, remove and reinstall administration set, close door, open roller clamp.
DOOR OPEN Audio: alarm Visual: continuous scroll, channel alarm indicator flashes	Door was opened during an infusion. Infusion stops on affected channel.	Close door, press appropriate CHANNEL SELECT control, then press START control.
RESTART CHANNEL Audio: alarm Visual: continuous scroll, channel alarm indicator flashes	Door was opened during an infusion and then closed. Infusion stops on affected channel.	Press the appropriate CHANNEL SELECT control, then press START control.
AIR-IN-LINE Audio: alarm Visual: continuous scroll, channel alarm indicator flashes	Air has been detected in set during an infusion. Infusion stops on affected channel.	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.
OCCLUDED-PATIENT SIDE Audio: alarm Visual: continuous scroll, channel alarm indicator flashes	Increased back pressure sensed while infusing in the pump delivery mode. Infusion stops on affected channel.	Clear occlusion, press appropriate CHANNEL SELECT control, then press START control.
OCCLUSION Audio: alarm Visual: continuous scroll, channel alarm indicator flashes	Occlusion is detected on either fluid or patient side while infusing in Controller Delivery mode. Infusion on affected channel stops.	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.)

Alarm	Meaning	Response
PARTIAL OCCLUSION-FLUID SIDE Audio: alarm Visual: continuous scroll, channel alarm indicator flashes	Partial upstream occlusion detected while infusing in Pump Delivery mode. Infusion on affected channel stops.	Remove cause of reduced flow in fluid side of administration set, press appropriate CHANNEL SELECT control, then press START control.
OCCLUSION-FLUID SIDE Audio: alarm Visual: continuous scroll, channel alarm indicator flashes	Upstream occlusion sensed while infusing in pump delivery mode. Infusion on affected channel stops.	Clear occlusion in fluid side of administration set, press appropriate CHANNEL SELECT control, then press START control.
"FLO-STOP" OPEN/ CLOSE DOOR Audio: alarm Visual: continuous scroll, channel alarm indicator flashes	Flo-Stop open (in free-flow position) with door open.	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-2TX with operable unit.)
BATTERY DISCHARGED Audio: malfunction Visual: Channel Display: ◦ Rate Display flashes "_ _ _ _" ◦ "PAUSE" scrolls ◦ ALARM and STANDBY indicators flash Central Display: BATTERY DISCHARGED ALL CHANNELS PAUSED PLUG IN TO RESUME OR PRESS OFF TO POWER DOWN	Low battery voltage detected. Infusions PAUSE on all currently operating channels.	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-2TX.

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
SYSTEM MALFUNCTION Audio: malfunction Visual: Channel Display: • Rate displays flash "- - - -" • Channel ALARM and STANDBY indicators flash Central Display: **For Battery Operation** SYSTEM MALFUNCTION ALL CHANNELS STOPPED PRESS CHANNEL OFF TO POWER OFF CODE NUMBER: "XXX" **For AC Power Operation** SYSTEM MALFUNCTION ALL CHANNELS STOPPED PRESS CHANNEL OFF TO RESET PUMP OR UNPLUG PUMP AND PRESS OFF TO POWER OFF CODE NUMBER: XXX"	A software-detected malfunction has occurred. Depending on the type of malfunction, infusion stops on the affected channel or all channels.	Press CHANNEL OFF control to turn off the PC-2TX. Replace with an operational instrument.
CENTRAL DISPLAY FAILURE Audio: malfunction Visual: Channel Display: • Previous Infusion rate • Channel ALARM and STANDBY indicators flash Central Display: • Displayed data may be corrupted Scrolling Display: • Stops scrolling, display data will be fixed	A software-detected malfunction has occurred on the central display. Infusion stops on all channels.	Press CHANNEL OFF control to turn off the PC-2TX. Replace with an operational instrument.

SPECIFICATIONS

Detailed specifications will be available in the PC-2TX Maintenance Manual. ALARIS Medical Systems reserves the right to change specifications without prior notice.

Operating Principle:	Linear peristalsis
Dimensions:	10.8" x 11.8" x 7.3" (27.4cm x 30.0cm x 18.5cm)
Weight:	18.0 lbs. (8.2 kg)
Power Requirements:	90-132 VAC, Current draw 0.45A nominal, 54 watts, fused at 0.4A, 50/60 Hz, 3 wire, single ⌀
Battery Operation:	With new, fully charged batteries, approximately 8 hours with one channel operating 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 ±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, DELAYED START COMPLETE, MULTIDOSE COMPLETE, LOW BATTERY, Maintenance Mode, 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, Replace Battery, Battery Replacement.

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, P/C/S 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-2TX 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

BATTERY CARE AND MAINTENANCE

The IMED GEMINI PC-2TX is equipped with a 6 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-2TX 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-2TX is originally manufactured with a Panasonic LCR6V12P 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.

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.

NOTES

WARRANTY

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

a. Each new IMED GEMINI PC-2TX volumetric Infusion, 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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