110V and **220V**
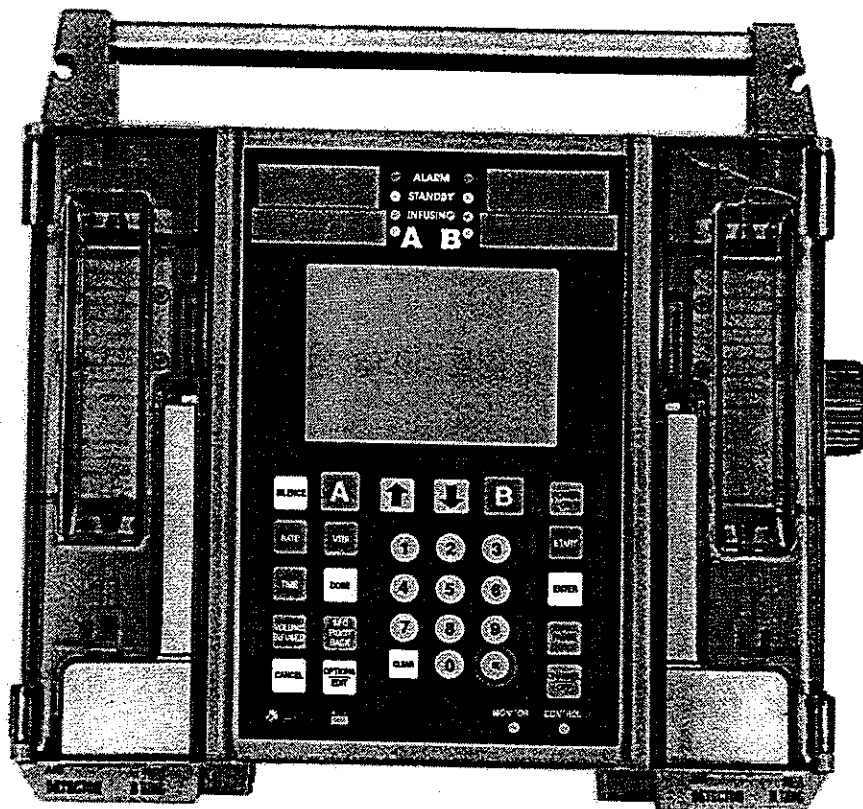

imed® Gemini PC-2TX®
## VOLUMETRIC INFUSION PUMP/CONTROLLER
MAINTENANCE MANUAL

WARNINGS, CAUTIONS AND NOTICES

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

USE ONLY HOSPITAL GRADE POWER SUPPLY CORD 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.
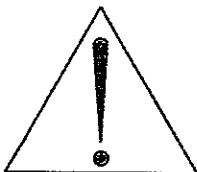
WARNING: TO PREVENT UNRESTRICTED FLOW, CLOSE CLAMP WHEN FLO-STOP IS OPEN.
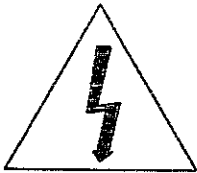
CAUTION: TO REDUCE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER OR BACK. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.
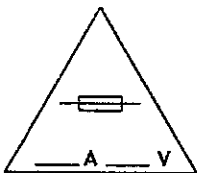
WARNING: REPLACE FUSE AS MARKED.

CAUTION: BEFORE CONNECTING "REFER TO MANUAL"

NOTE

TO MAXIMIZE THE SERVICE LIFE OF THE INSTALLED BATTERY, IT IS RECOMMENDED THAT THIS INSTRUMENT BE STORED AND OPERATED IN AN ENVIRONMENT THAT IS TEMPERATURE CONTROLLED BETWEEN 68°F (20°C) AND 77°F (25°C).

WARNING

IN THE EVENT THE INSTRUMENT IS DROPPED AT ANY TIME, IT MUST BE CHECKED BY A BIOMEDICAL TECHNICIAN PRIOR TO USE FOR PATIENT CARE.

WARNING: TO PREVENT UNRESTRICTED FLOW, CLOSE ROLLER
CLAMP WHEN FLO-STOP® IS OPEN.

CAUTION: REFER TO MANUAL

TYPE CF (Equipment useable for direct cardiac applications)

CLASS 1

ALTERNATING CURRENT

REPLACE FUSE ONLY WITH SAME TYPE AND RATING

EQUIPOTENTIAL GROUND POINT: IF THE INTEGRITY OF THE
EQUIPOTENTIAL EARTH CONNECTION OR HOSPITAL EARTH
SYSTEM IS IN QUESTION, OPERATE THE INSTRUMENT USING
INTERNAL BATTERY POWER.

IPX1   DRIP PROOF

> **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.

> **CAUTION**
>
> Only systems that have been qualified to IEC 601-1 standards
> should be connected to the PC-2TX's Nurse Call connector and the
> connection should ONLY be performed by qualified personnel.

NOTICE

Product design and/or specifications are subject to change without notice. The information contained in this manual is current as of the date of issue.

This publication contains ALARIS Medical Systems™ proprietary data provided solely for the use of technical personnel in repairing IMED® Gemini infusion pump/controllers.

None of the information contained herein may be duplicated nor may it be utilized in any manner other than for the repair and maintenance of IMED® Gemini infusion pump/controllers and the component parts thereof. Any unauthorized use of the information contained herein may subject the user to substantial liability.

PREFACE

This manual contains operation and maintenance instructions for the IMED® GEMINI PC-2TX® series of Volumetric Infusion Pumps/Controllers ("PC-2TX"). The information provided herein is intended for use by technical personnel responsible for servicing these products. The material is divided into seven sections and is presented as follows: Section 1 - Description; Section 2 - Preparation for Use; Section 3 - Operation; Section 4 - Principles of Operation; Section 5 - Maintenance; Section 6 - Illustrated Parts Breakdown; Section 7 - Calibration and Preventative Maintenance.

Additional copies of this manual may be obtained by contacting your nearest ALARIS Medical Customer Service Department.

This manual P/N 143648 supersedes PC-2TX Maintenance Manual, Part No. 1325-9201-00, 1325-9208-00, and 141881.

The features of the 220V model of the PC-2TX have been incorporated into this manual. Text or graphics that are related exclusively to the 220V model are identified with a **220V** symbol.

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PC-2TX

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Figure 1-1. IMED® GEMINI PC-2TX® Volumetric Infusion Pump/Controller

SECTION 1 - DESCRIPTION

1.1 INTRODUCTION

This section includes general operating characteristics, physical description and operating specifications for all versions of the IMED® GEMINI PC-2TX® Volumetric Infusion Pump/Controller ("PC-2TX").

1.2 OPERATING CHARACTERISTICS

The GEMINI Model PC-2TX is a two channel volumetric infusion pump/controller used in the administration of intravascular drugs and fluids. Both channels are capable of independent operation in either the Pump or Controller delivery mode. The pumping mechanism employs linear peristaltic action. The peristaltic action is provided by a series of 12 cam-actuated fingers that sequentially collapse then release, in a ripple-like action, the soft pumping segment of a GEMINI administration set. This action produces a positive pressure at the outlet side and a vacuum on the inlet side of the pump, thereby delivering a continuous flow of infusion solutions reliably, accurately and with a high degree of safety.

The two channel configuration enables a variety of infusion techniques including independent primary, simultaneous primary and sequential secondary. Independent and simultaneous primary infusions can deliver either a specified volume or the entire contents ("ALL") of a solution container. Use of the ALL setting requires installation and connection of an Empty Container Detector (ECD) which is available as an optional accessory. Sequential secondary (piggyback) infusions with independently defined delivery parameters, for both the primary and secondary solutions, can be provided on each channel.

Operational control of the PC-2TX is affected through the control and indicator panel on the front of the instrument and the Audio Control switch on the rear of the instrument. Basic operating instructions are printed on the right side of the instrument case. Functional control is provided by a 16 bit micro-processor with a stored program that includes a Maintenance mode to monitor instrument performance, an audio/visual alarm subsystem to alert operators to abnormal conditions and redundancy checks to confirm system accuracy.

1.3 OPERATING CONDITIONS

The PC-2TX can be operated independently (Normal Operation) or as a computer controlled device (Computer Operation). Normal operation includes the Controller and Pump modes plus a Maintenance mode. Computer operation includes Monitor and Computer Control modes.

NORMAL OPERATION

SYSTEM OPTIONS
The systems option mode allows the operator to:
- Adjust contrast of the LCD display
- Set the Time of Day clock
- Enable Anesthesia Mode
- Set up Computer Control
- Check System Configuration

The System Configuration screen displays the current status of the following selectable features:

NOTES

To enter the Configuration Setup mode: press and hold the "OPTIONS/EDIT" switch at power up.

Bold face type indicates factory default settings.

- Clock Setup: **Military** or AM/PM

- Factory Set: Factory default settings **YES** or NO
- Maximum Rate: Max usable rate 1-**999** mL/hr
- C2 Port: Baud 300, 600, 1200, 2400, 4800, **9600**, 19200; (Data Frame is set to N81); Serial No. XXXX.
- Aux Port: No Port
- PCS Mode: **P** or C or S Channel delivery mode selection plus mode lock/unlock

PC-2TX

- Delayed Start: **Enabled** or Disabled
- Drug Calc: **Enabled** or Disabled
- Multidose: **Enabled** or Disabled
- Dose Display: **Fixed** or Temp
- Battery Mode: Disabled Normal **High**
- Key Audio: **Enabled** or Disabled
- Alarm Audio: **Profile 1**, 2 or 3
- Switch(over) Audio: **Enabled** or Disabled
- Tamper Mode: Enabled or **Disabled**
- Language: **English**
- Anesth. Mode: Enabled or **Disabled**
- Comp. Ctrl.: **Enabled** or Disabled
- Dynamic Press: **Enabled** or Disabled
- Press. Trend: **Enabled** or Disabled
- Vol. Time Inf: **Enabled** or Disabled
- S/W Version: SCX.XX.XX.X
- MC Version: X.XX
- C2S/N: XXXX
- CRC: XXXX/Checksum: XXXX

CONTROLLER MODE

In the CONTROLLER mode, the PC-2TX is pro-grammed to control the infusion of a specific volume of IV solution. The instrument senses and responds to patient-side pressure and container height in a manner similar to a gravity infusion. The instrument's pressure sensor measures the hydrostatic pressure from the bottle and compares that pressure against distal tubing in-line pressure. When in-line pressure exceeds pump input pressure, an occlusion condition exists and an alarm is initiated. Actual delivery pressure is directly proportional to container height; increasing container height raises and decreasing the height reduces occlusion pressure. Controller mode occlusion pressure tolerance is ±12 (30.5cm) inches from the bottle height. Transient surges in patient-side pressure of <60 seconds duration will produce a LOW FLOW condition which stops the infusion while the pressure is above the occlusion threshold. Pressure transients above the occlusion threshold >60 seconds duration or cumulative time required to compensate for volumetric deficiency caused by periods of Low Flow in excess of 30 minutes will cause an occlusion alarm.

PUMP MODE

In the PUMP mode of operation, the instrument employs a preset occlusion pressure limit of 10 ±2 psi (69 ±14 kPa) predicated on a nominal container height of 24 inches (61 cm) and a delivery rate >30 mL/hr. For delivery rates <30 mL/hr, the occlusion

pressure is rate dependent to ensure timely detection of occlusion conditions. Any transient distal in-line pressure above this limit will generate a patient-side occlusion alarm.

Software Releases through 3.9.9.4
The PC-2TX, when operating in the Pump Mode, can be locked into a rate-independent (10 psi) occlusion pressure mode. This mode will result in significantly increased time-to-occlusion for rates <30 mL/hr.

Software Release 4.10.14.0 and Subsequent
A Selectable (S) pressure mode allows an occlusion pressure to be selected between 0.5 psi (25 mmHg) and 10 psi (517 mmHg) in 25 mmHg increments. A high occlusion pressure selection coupled with a slow infusion rate will result in an increase in time-to-occlusion.

MAINTENANCE MODE

The maintenance mode is intended solely for use by biomedical technicians to perform servicing and maintenance actions and **must never be used when the PC-2TX is connected to a patient**. The maintenance mode provides biomedical service personnel access to the closed loop maintenance test routines and operating history logs.

Maintenance mode menu includes:
- S/C board test and displays
- M/C board test and displays
- Press [off] to exit

The S/C board test and display sub-menu includes an Error Log display with a 100 entry register.

COMPUTER OPERATION

MONITOR MODE

The Monitor mode allows a host computer to monitor infusion status and instrument performance. Monitor mode is enabled when a host computer is connected to the PC-2TX through the Communications Data Port and the Monitor indicator is illuminated.

COMPUTER CONTROL

The Computer Control mode allows an infusion, once set up, to be controlled and monitored by a host computer installation.

1.4 USER INTERFACE

Instrument control and operation is accomplished through the 30 keypad controls, the central information display and the independent channel information displays. Infusion parameters are programmed into the instrument using the appropriate keypad controls. Rate and Volume-to-be-Infused (VTBI) are input separately for each channel. Rate and VTBI for secondary infusions (piggyback) are also programmable, independent of the primary infusion parameters, for each channel. Visual Prompt and Advisory messages with accompanying audio alerts are provided to assist operators in setting up the instrument for operation. Infusion completions, alarm conditions and software-detected malfunctions are signaled by both audio and visual alerts; hardware-detected malfunctions are signaled by an audio warning. Delayed Start, Multidosing and Drug Calculation infusions, when these features are enabled, are programmed via the Channel Options menu.

The rear panel of the PC-2TX is configured with an ECD connection for each channel, a connector to accept a Nurse Call line, and a standard RS-232-C communications data port for interfacing with a host computer.

IMED® GEMINI Series disposable administration sets are required for use with the GEMINI family of Infusion Pump/Controllers.

1.5 PHYSICAL DESCRIPTION

The PC-2TX instrument has the following physical characteristics:

Height: 10.8 inches (27.4 cm)
Width: 11.8 inches (30.0 cm) with pole clamp
Depth: 7.3 inches (18.5 cm) with pole clamp
Weight: ≈18 pounds (8.2 kg) including power cord

The PC-2TX instrument consists of two major assemblies: the front and rear cases.

FRONT CASE

The front case consists of a metalized, high-impact, injection molded, plastic case/insert which houses and supports: the pumping chamber access doors, the peristaltic pumping mechanisms, pressure transducers (strain beams), Air-in-line, Slide clamp

and Flo-Stop detectors, keypad, the channel and central displays, the display CCA, logic CCA and motor control CCA.

REAR CASE

The rear case assembly consists of a die-cast aluminum shell which mounts and supports internally: the battery, transformer harness assembly, audio oscillator, power supply CCA and communication harness assembly. The exterior of the rear case supports the pole clamp, power entry module, ECD storage, power cord retention strap, power cord retention bracket and the equipotential grounding point on the 220V model.

1.6 PRODUCT HISTORY

The initial release of the GEMINI PC-2TX® Infusion Pump/Controller was in April 1994. Since that time a number of changes have occurred. Refer to Table 1-1 for product history.

1.7 OPERATING SPECIFICATIONS

The PC-2TX Operating Specifications are subordinated into Operating Requirements and Performance Specifications which are delineated in Tables 1-2 and 1-3 respectively.

1.8 ACCESSORIES

The accessories approved for use with the PC-2TX are listed in Table 1-4.

Table 1-1. Product History

Model	History
1325A	• Initial release of product Software version 3.9.9.4. • ADDED TX Feature set - Volume/time dosing, Selectable output pressure, Dynamic Pressure Readout, Pressure Trending (History), 7 segment display checking added with Software version 4.10.14.0.
1325B	• Rate display test enabled, Audio Failure "Pop-up box", added with Software version 5.10.18.4.
1325C	• Incorporated Corrective Drug Application with Software version 7.05.05.0.
1325D	• Software versions 7.05.05.0 and earlier, will not recognize a year entry beyond 1999 in the Clock Entry menu. Introduced Software version 1.85.

The current PC-2TX System Configuration may be viewed by pressing Options/Edit key to bring up the Systems Options Menu, then pressing #5 Keypress, to access the System Configuration listing.

Revision Matrix:

Revision #	PC-2TX 3.9.9.4, 4.2.8.0, 4.5.24.0, 4.10.14.0, 4.12.9.0, 5.1.18.0, 5.2.4.0	PC-2TX 5.10.18.4	PC-2TX 7.05.05.0	PC-2TX 1.85	PC-2TX 1.86
1325A	X				
1325B		X			
1325BX (220V)		X			
1325C			X		
1325CX (220V)			X		
1325D				X	
1326AX (220V)		X	X		
1326BX (220V)					X

Revision "A" - Initial Revision
Revision "B" - Software Upgrade for Units to enhance operation.
Revision "C" - Software Upgrade to correct a specific drug calculation concentration for the drug Esmolol (Brevibloc), to be incorrectly displayed.
Revision "D" - Mandatory Upgrade to incorporate with Software Revision 1.85, or 1.86.

Note[1]: 1325/1326x = a number associated with a particular model, and software version, i.e., 1325A could be 3.9.9.4 or 5.10.18.4 etc.

Note[2]: All PC-2TX's have a Maintenance or Diagnostic Mode. To access this mode: hold in the Audio Control switch on the panel and then press Power On.keypress.

CAUTION: The "Fractional" and "Integer" Pumping Mechanisms are not interchangeable.

Table 1-2. Operating Requirements

Parameter	Specification
Power Required:	**110V:** 90-132 VAC, current draw 0.1 Amps nominal (.36 Amps max), 10 Watts, fused at 0.4 A, 50-60 Hz, 3 wire, Single φ
	220V: 220-240 VAC, 0.15 Amps nominal, fused at 200mA, 50/60 Hz, 3 wire, Single φ
Rated Input Power: **220V**	10 VA
Electrical Leakage:	Less than 100 microamps
Electrical Shock Protection:	Class 2, Internally powered equipment
Level of Protection against Electrical Shock:	Type CF equipment
Level of Protection against fluid ingress:	IPX1
Battery:	Sealed lead-acid, 6 VDC, 12 Amp-Hr
Battery Recharge: Instrument Off or Operating:	New batteries will recharge to 90% of capacity in 8 hours and will return to a fully charged condition within 16 hours. For maximum battery life, battery should be fully recharged after each discharge.
Nurse Call System Power Limitations:	Maximum recommended Voltage/Current 24 VDC/500 mA
Operating Temperature Range:	40°F (5°C) to 104°F (40°C)
Operating Humidity Range:	0% to 95% Relative Humidity, non-condensing
Storage Temperature:	-40°F (-40°C) to 158°F (70° C)
Storage Humidity:	0% to 95% Relative Humidity, non-condensing at 35°C

Table 1-3. Performance Specifications

Parameter	Specification
Operating Principle:	Linear Peristaltic
Mode of Operation:	Continuous

PC-2TX

Operating Range:
  Pump and Controller modes:
    Rate:

0.1 - 999 mL/hr in 0.1 mL/hr increments to 99.9 mL/hr and 1 ml/hr increments from 1 to 999 mL/hr
(Controller mode maximum recommended rate is 500 mL/hr)

    Volume-to-be-Infused (VTBI):

0.1 - 9999 mL in 0.1 mL increments to 999.9 mL and 1 mL increments from 1 to 9999 mL.

NOTE

Fractional VTBI values cannot be used with rate values ≥100 mL/hr.

    Keep Vein Open (KVO) Rate:

1 mL/hr for delivery rates ≥1 mL/hr, or set delivery rate if <1.0 mL/hr

Occlusion Pressure -

  Controller Mode:

container height (±12" or ±30.5 cm)

  Pump Mode:

10 ±2 psi (69±14 kPa) (at delivery Rates below 30 mL/hr occlusion pressure is flow rate dependent to ensure rapid response to occlusion conditions). The "10 psi mode" can be invoked during SYSTEM CONFIGURATION thereby setting occlusion pressure to 10±2 psi (69±kPa) for all rates. (NOTE: Time to occlusion at rates <30 mL/hr will be significantly increased).

  Selectable Mode:

25-517 mmHg (0.5-10.0 psi) in 25 mmHg (0.5 psi) increments.

Air-In-Line Detection:

Ultrasonic

Secondary (Piggyback):

Dual rate programmable

Nurse Call Feature:

Activates an externally powered system in the event of an Alarm, Malfunction or selected Advisories

Communications Data Port:

EIA Standard RS-232-C. Requires standard 9 pin subminiature D connector

Channel Display Indicators:
  ALARM:
  STANDBY:

Red LED - flashes during alarm condition
Amber LED - illuminates when channel is programmed for a delayed start and awaiting start time

  INFUSING:

Green LED - flashes when channel is actively infusing

Battery Operation:

With a new, fully charged battery, approximately 7.5 hours with two channels operating at 125 mL/hr. Minimum recommended run time is 4 hours.

NOTES

To maximize battery life, recharge battery for 10 hours between consecutive battery operations.

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

Audio Characteristics:
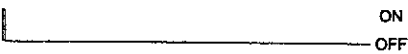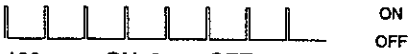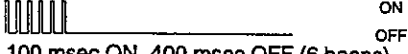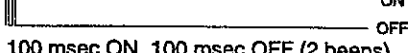
AUDIO TYPE	AUDIO PERIOD	VOLUME VAR/FIXED	SILENCE YES/NO
(1) MALFUNCTION	600 msec ON, 0.5 sec OFF, 600 msec ON, 3 sec OFF...	MAXIMUM 75db FIXED	NO
(2) KEY CLICK	30 msec ON (Once)	VARIABLE	NO
(3) ALARM Profile 1	500 msec ON, 1500 msec OFF, 500 msec ON, 1500 msec OFF...	VARIABLE	YES
Profile 2	400 msec ON, 1 sec OFF, 100 msec ON, 100 msec OFF...	VARIABLE	YES
Profile 3	400 msec ON, 500 msec OFF, 400 msec ON, 500 msec OFF...	VARIABLE	YES
(4) PROMPT	100 msec ON, 2 sec OFF...	VARIABLE	YES
(5) ADVISORY	100 msec ON, 15 sec OFF...	VARIABLE	YES
(6) CHANGEOVER	100 msec ON, 400 msec OFF (6 beeps)	VARIABLE	YES
(7) ILLEGAL KEY	100 msec ON, 100 msec OFF (2 beeps)	VARIABLE	NO

Figure 1-2. Audio Characteristics

Table 1-4. Accessories

Part No.	Description
1303	Communications Emulator Plug (optional)
3299-100	Calibrated Tubing (optional)
1308	Universal Empty Container Detector (ECD)
20-2370-7	Syringe Holder

SECTION 2 - PREPARATION FOR USE

2.1 INTRODUCTION

This procedure contains information relative to the initial inspection and pre-operational checkout of the IMED® GEMINI PC-2TX® Volumetric Infusion Pump/Controller ("PC-2TX"). These procedures include a mechanical inspection, electrical inspection, pre-operational battery charge and a performance check to ensure that the instrument operates properly and has not been damaged during shipment or storage.

2.2 PRE-OPERATIONAL MECHANICAL INSPECTION

The PC-2TX has undergone thorough production control and quality assurance testing prior to shipment from the factory. The shipping container has been designed to protect the instrument against damage under normal shipping conditions; nevertheless, internal physical and/or electronic component damage could have occurred without leaving a visible signature. Therefore, it is recommended that the following inspection procedure be performed upon receipt of the instrument at the user's facility.

1. Carefully remove the PC-2TX from the shipping container. (Save the shipping material for reuse in the event the instrument must be returned to the factory for service or repair).

2. Inspect the exterior case, front and rear, for holes, cracks, scratches, spalling, broken or damaged controls, missing components and/or screws.

3. Inspect the green tinted windows covering the channel information displays and the screen covering the LCD for scratches or cracks.

4. Ensure the pumping chamber access doors fit flush with the case at the top, bottom, and sides.

5. Check the door handle/cam locks for ease of operation and flush fit with door when latched.

6. Inspect the pumping mechanism seals for damage and to ensure they are properly attached to the front case.

7. Inspect the Air-in-line sensors and Flo-Stop® recesses for damage or obstructions.

8. Install an approved IMED GEMINI administration set to ensure the Flo-Stop® assembly seats correctly and the door closes and latches properly.

9. Inspect the power cord for damage, bent prongs or deformed connector.

10. Exercise the pole clamp mechanism to ensure freedom of movement.

11. Check the Equipotential grounding point for damage and security. **220V**

NOTE

In the event the PC-2TX shows evidence of shipping damage, notify the carrier's agent immediately. Do not return a damaged instrument to the factory before the carrier's agent has authorized repairs. Contact ALARIS Medical for authorization to return the instrument for repair regardless of liability for repair costs.

2.3 OPERATIONAL PERFORMANCE CHECK

Prior to the first operational use and following any routine maintenance or servicing of the PC-2TX, it is strongly recommended that an abbreviated operational performance check be performed. The operational performance check consists of two phases; a Pre-operational Electrical Inspection to check the electrical integrity of the instrument for compliance with regulatory agency requirements and an operational performance test to verify pump/controller performance.

HANDLE — STRAIN RELIEF
— UPPER TUBING FITMENT
— DOOR
PUMPING MECHANISM — PLATEN
— DOOR HANDLE LOCK
DOOR LATCH — MAGNET (DOOR SENSOR)
STRAIN BEAM — DOOR HANDLE
FLO-STOP® RECESS — SLIDE CLAMP SEAR
AIR-IN-LINE DETECTOR

FRONT

ECD STORAGE FIXTURE
POLE CLAMP — AUDIO OSCILLATOR
— RS-232-C DATA PORT CONNECTOR
— AUDIO/TAMPER RESISTANT CONTROL
ECD CONNECTOR CHANNEL B — ECD CONNECTOR CHANNEL A
NURSE CALL CONNECTOR — FUSE HOLDER
— POWER CORD STRAP
— EQUIPOTENTIAL GROUNDING POINT 220V
— AC POWER CONNECTOR

REAR

Figure 2-1. PC-2TX Front and Rear Panel Operating Features

2.3.1 Pre-operational Check Battery Charge

The batteries are in a fully charged condition upon completion of the post manufacturing quality assurance inspection. However, since considerable time could elapse between manufacture and first use, a pre-operational battery charge is recommended. Connect the AC power cord to a suitable AC outlet and allow the battery to charge for 24 hours.

2.3.2 Pre-operational Electrical Inspection

The pre-operational electrical inspection includes an electrical leakage test and a ground continuity check.

CAUTION

Some of these tests are inherently hazardous. Safeguards for personnel and property should be employed when conducting such tests. Tests should only be performed by qualified personnel.

2.3.2.1 Electrical Leakage Test

Perform an electrical leakage current measurement in compliance with Underwriters Laboratories (UL) 544 for Patient Care Equipment and/or Canadian Standards Association (CSA) Standard C22.2 No. 125 for Risk Class 2G Equipment or IEC 601-1. Leakage currents are to be less than 100 microamperes.

2.3.2.2 Electrical Ground Test

Perform an electrical ground impedance measurement in compliance with UL 544 for Patient Care Equipment and/or CSA Standard C22.2 No. 125 for Risk Class 2G Equipment or IEC 601-1. The impedance between the grounding pin on the power cord plug and the grounding point on the rear case should not exceed 100 milliohms.

2.3.3 Abbreviated Operational Performance Test

The following operational performance test is designed to ensure that the PC-2TX's controls and indicators are functioning properly and all pumping mechanisms are in working order.

2.3.3.1 Test Requirements

The following items of laboratory equipment and supplies are required to conduct the operational performance tests:

1. Two (2) IMED GEMINI administrative sets (Reorder # 2210) with upper injection sites.

2. Two (2) IV Solution Containers.

3. Standard IV Pole.

4. 10 mL burette.

5. Open-ended Air-in-line simulator (see Figure 2-2).

6. Digital Pressure gauge, 0-60 psig with stopcock.

7. Safety Analyzer - Dynatech-Nevada Model 231D or equivalent.

8. Air-in-line simulator (see Figure 2-2).

2.3.3.2 Test Procedures

The following tests and associated procedures are presented in a sequence that provides an efficient, qualitative check of instrument operability.

INITIAL SETUP
PC-2TX keypad control locations are shown in Figure 3-1 and are functionally described in Table 3-1.

1. Mount pump on IV pole (leave AC power cord unplugged).

2. Fill IV fluid containers with water and hang on IV pole 24" (61cm) above PC-2TX.

3. Spike and prime administration sets.

4. Press POWER ON Control and check:
   - Verify all LEDs illuminate then extinguish
   - Ensure all segments of the channel rate displays illuminate
   - Ensure the channel information displays show ▓▓▓▓▓▓ then extinguish
   - A single audio prompt sounds
   - The channel A rate display shows "- - - -"
   - Check the Central display for the IMED logo pattern, followed by the setup screen shown below:

PC-2TX

imed

A ⊠⊠⊠⊠⊠ ⊠⊠⊠⊠⊠ ⊠⊠⊠⊠⊠ ⊠⊠⊠⊠⊠ ⊠⊠⊠⊠⊠

B ⊠⊠⊠⊠⊠ ⊠⊠⊠⊠⊠ ⊠⊠⊠⊠⊠ ⊠⊠⊠⊠⊠ ⊠⊠⊠⊠⊠
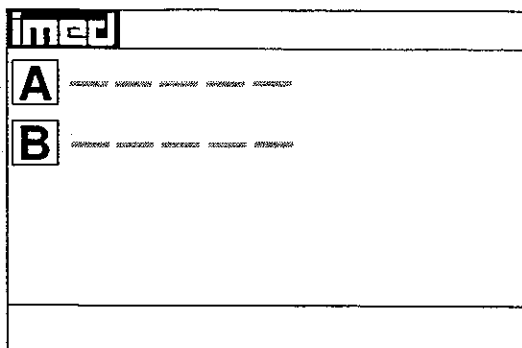
7. Press ⬛ to select the Systems Options menu, then press ❺ to select System Configuration.

8. Use the ⬆ ⬇ controls to toggle through the system configuration display to determine options available and the status of each option.

9. Press ⬛ twice to return to the Setup screen shown above.

CHARGING INDICATION

1. Connect AC Power cord to a 120 VAC or 220V power source, as appropriate, and check:
   - AC Power Indicator - Illuminates.

2. Unplug AC Power cord from the AC power source and check:
   - AC Power Indicator - extinguishes.

3. Press ⬛; following instrument initialization:
   - Battery Operation indicator - flashes.

4. Reconnect AC Power cord to the the instrument.
   - AC Power indicator - illuminates
   - Battery Operation indicator - extinguishes.

PUMP MODE TEST

NOTE
The following procedures are described for channel A and are applicable to both PC-2TX channels.

1. Open the channel A access door and check:
   - The pumping mechanism "homes", i.e.

pump mechanism rotates to a position where the #11 finger is fully extended.

2. Install a prepared GEMINI set in channel A and close the door. Ensure the fluid level in the container is 24" (61 cm) above the height of the strain beam.

3. Connect the distal end of the tubing set to the 10 mL burette.

4. Press ⬛ and check the Infusion Setup screen:

A   Infusion Setup

RATE ─── ─── ───

VTBI ─── ─── ─── ───

> Enter Rate Value
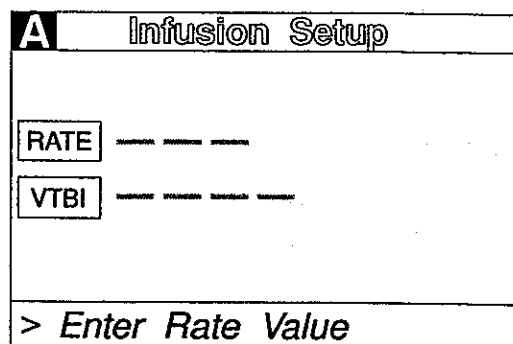
   - Press ⬛, followed by ❹ then use ⬆ ⬇ controls to select Pump mode
   - Press ⬛ to confirm selection
   - Press ⬛ to exit channel options
   - Press ⬛, then use the numeric data entry controls to input a rate parameter of 125 mL/hr
   - Press ⬛, then use the numeric data entry controls to input a VTBI parameter of 5 mL
   - Press ⬛, while the volume infused presentation is displaying, press ⬛ to "0" the channel A primary, secondary and total volume infused.

5. Record the fluid level in the burette (there must be sufficient capacity in the burette to accept 5 mL of fluid).

6. Press ⬛ and observe:
   - "125" displays in the Channel Information rate display
   - INFUSING indicator - flashes
   - "5 mL" displays for channel A in the Central Information display.

7. When audio alert sounds and "INFUSION COMPLETE-KVO" scrolls, immediately press **A** followed by **PAUSE** and check:
   - Rate display shows "1"
   - "STANDBY" indicator - flashes
   - "INFUSING" indicator - extinguishes
   - VTBI value in Central display shows "0 mL".

8. Press **VOLUME INFUSED** and check:
   - PRI volume infused shows 5.0.

9. Record the fluid level in the burette; then compare that value from the initial reading in step 5. The difference should be between 4.75 and 5.25 mL.

10. Repeat steps 1 through 9 for channel B.

OUTPUT PRESSURE TEST

1. Connect the distal end of the tubing set to the pressure gauge.

2. Reset the channel A VTBI to 25 mL.

3. Press **START** and observe:
   - Pumping mechanism stops
   - Audio Alarm sounds
   - ALARM indicator - flashes
   - "OCCLUDED-PATIENT SIDE" scrolls continuously.
   - Central Information displays shows ALARM for channel A

4. Record pressure gauge reading on the data sheet immediately following alarm (reading must be between 8 and 12 psi or 414 and 620 mmHg).

5. Press **SILENCE** to silence the audio, then press **A** followed by **PAUSE**.

6. Turn the stopcock on the pressure gauge to relieve the pressure.

7. Repeat steps 1 through 6 for channel B.

8. When both channels have been tested, press **A** or **B** as appropriate, then **CHANNEL OFF** to power down the channel.

MAXIMUM PRESSURE TEST

1. Initialize instrument in the Maintenance Mode.

2. Press **2** to select M/C Board Tests and Displays.

3. Press **1** to select maximum pressure test.

4. Press **A** to select channel A.

5. Press **START** and allow the pump to operate for at least 30 seconds and wait until the peak pressure stabilizes.

6. Record the highest pressure reading obtained. **Resultant pressure must be ≥17 psi (879 mmHg).**

7. Press **CANCEL** twice to return to the Maintenance Mode screen.

8. Turn stopcock on the pressure gauge to relieve the pressure.

9. Press **CANCEL** twice, then **3** to power down the instrument.

AIR IN LINE TEST

1. Open the channel A access door and remove the administration set.

2. Install the pumping segment of the AIL simulator into the channel A pumping mechanism, then press the tubing into the AIL detector.

3. Push the slide clamp in (the instrument will auto power on in Alarm mode).

4. Use the AIL simulator plunger to raise the fluid level to the top of the slide clamp fitment.

5. Close the door.

6. Select the channel to be tested, set the rate to 125 mL/hr and VTBI to 50 mL and press **START**.

7. Use the AIL simulator plunger to draw the fluid level below the AIL detector.

PC-2TX

8. Verify that within 2 seconds the PC-2TX goes into AIL alarm:
   - Pumping stops
   - Operating LED indicator stops flashing
   - Alarm audio sounds
   - Alarm LED flashes
   - Channel Information display scrolls "AIR IN LINE"
     - Central Information display shows "ALARM" for appropriate channel.

9. Select the test channel and press ![CHANNEL OFF] to power down or ![PAUSE] to set up the other channel for test.

If further quantitative testing is required to comply with hospital protocol for acceptance/qualification of new equipment, refer to the Comprehensive Operational Test Procedures described in Section 5 of this manual.
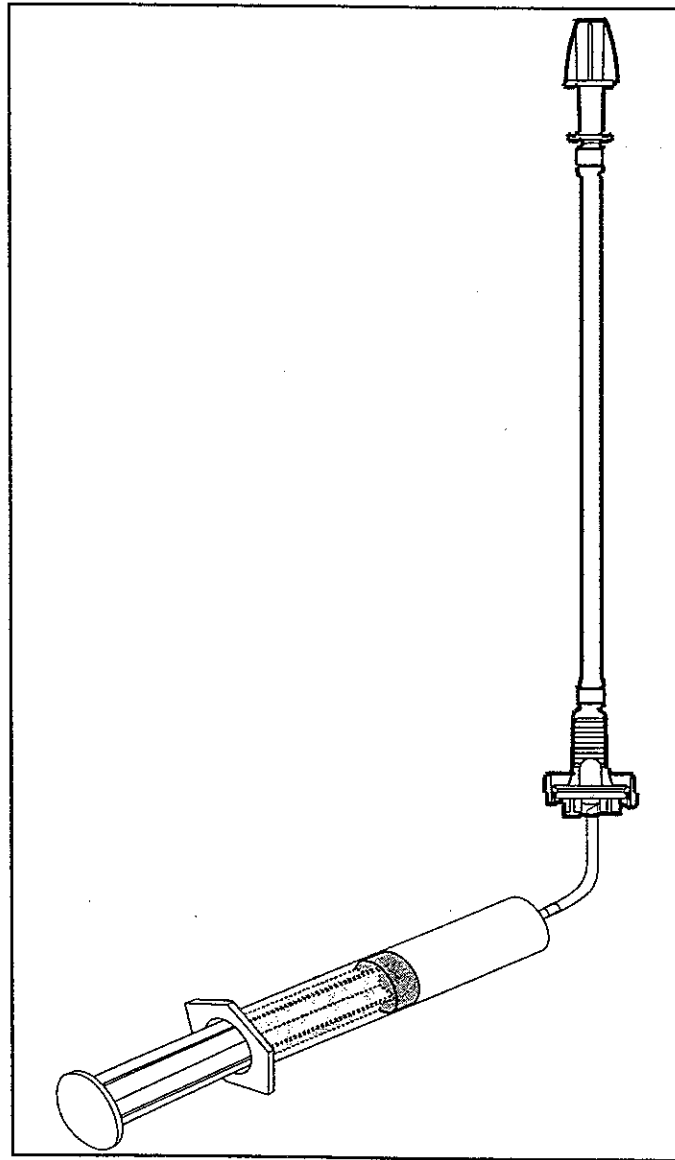
Figure 2-2. Air-In-Line Simulator

PC-2TX TEST DATA SHEET

Instrument Serial No._____ Software Version _____

Date _____ Technician _____

Test No.	Description	Reference	Record Result	Pass/Fail
1	Electrical Leakage Test	2.3.2.1	_____	Pass___/Fail___
2	Electrical Ground Test	2.3.2.2	_____	Pass___/Fail___
3	Initialization (INITIAL SETUP)	2.3.3.2	_____	Pass___/Fail___
4	Charging indication	2.3.3.2	_____	Pass___/Fail___
5	Pump Mode Test	2.3.3.2	_____	Pass___/Fail___ Ch A
			_____	Pass___/Fail___ Ch B
			_____	Pass___/Fail___ Ch C
			_____	Pass___/Fail___ Ch D
	Output Pressure Test	2.3.3.2	_____	Pass___/Fail___ Ch A
			_____	Pass___/Fail___ Ch B
			_____	Pass___/Fail___ Ch C
			_____	Pass___/Fail___ Ch D
	Maximum Pressure Test	2.3.3.2	_____	Pass___/Fail___ Ch A
			_____	Pass___/Fail___ Ch B
			_____	Pass___/Fail___ Ch C
			_____	Pass___/Fail___ Ch D
	Air-In-Line Test	2.3.3.2	_____	Pass___/Fail___ Ch A
			_____	Pass___/Fail___ Ch B
			_____	Pass___/Fail___ Ch C
			_____	Pass___/Fail___ Ch D

Figure 2-3. PC-2TX Abbreviated Test Data Sheet

SECTION 3 - OPERATION

3.1 INTRODUCTION

This section describes the recommended procedures for operation of the IMED® GEMINI PC-2TX® Volumetric Infusion Pump/Controller ("PC-2TX") with software release 5.10.18.4. For operating procedures for instruments with earlier software releases, refer to the Operator's Manual (Directions For Use) provided with the instrument. The information is intended to provide maintenance technicians with a basic understanding of instrument operation including the audio alerts and visual displays.

NOTE

Although the PC-2TX is built and tested to exacting specifications, it is not intended to replace the role of medical personnel in the supervision of IV infusions. The user is urged to exercise vigilance in the utilization of the PC-2TX.

3.2 CONTROLS AND INDICATORS

The controls and indicators used to set up and operate the PC-2TX are illustrated in Figure 3-1 with the functional descriptions listed in Table 3-1.

PC-2TX
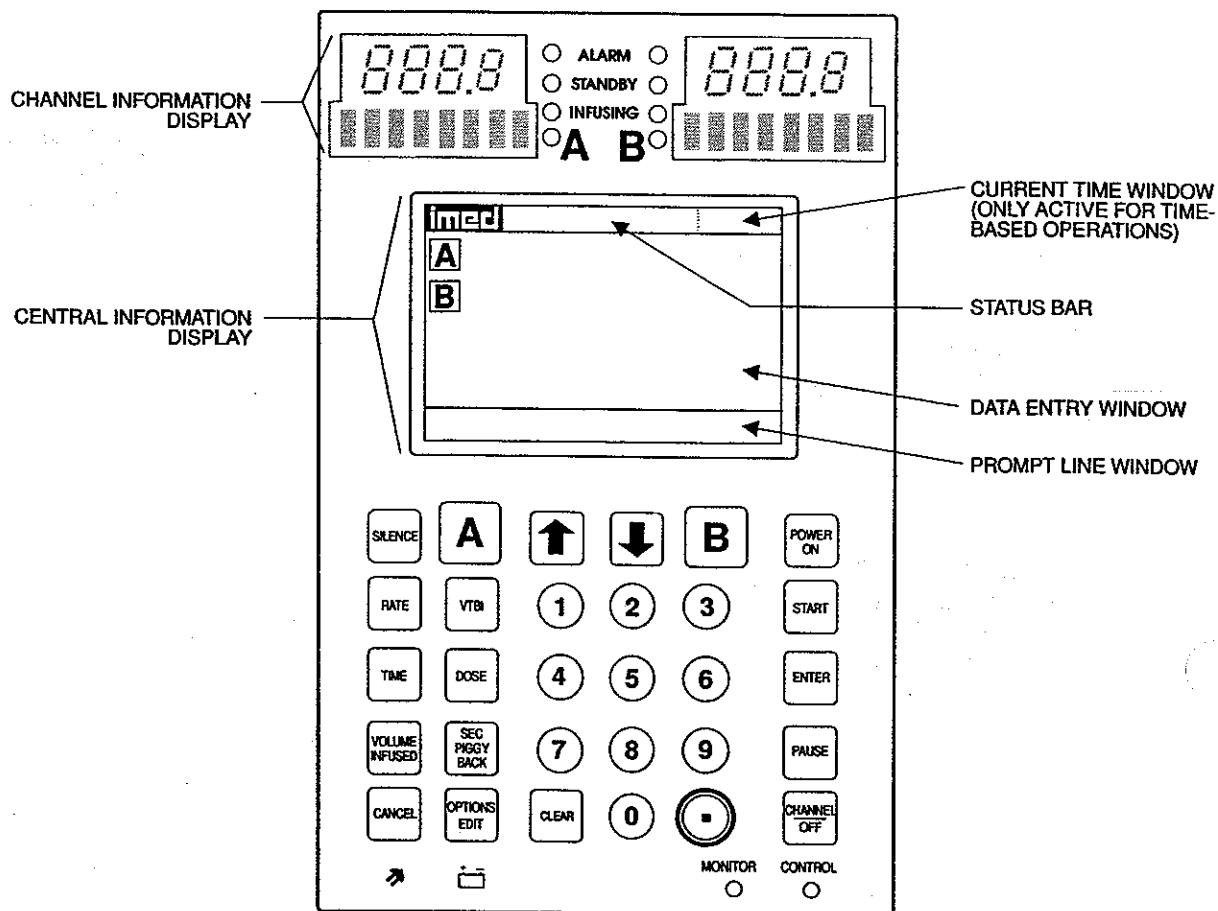
Figure 3-1. PC-2TX Front Panel Controls and Indicators

Table 3-1. 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), current time of day and other operating parameters during operation of the instrument. During set up procedures, provides display for data entry, editing, confirmation and display of prompts, advisories and alarm conditions. During battery operation, approximate battery run time will display in the prompt/battery run time window. The display backlight will extinguish 2 minutes after the last keypress.

Keypad

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

PAUSE
when pressed during an infusion, the infusion for the selected channel is stopped. (After ≈2 minutes, the "PRESS START" visual and audio prompt begins.)

CHANNEL OFF
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 the other running channel to power off the PC-2TX. When pressed during a software-detected system malfunction, it powers off the PC-2TX.

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

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

0 to **9**
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.

TIME
when pressed, allows entry of time-related data inputs for delayed start and multidose infusions.

CLEAR 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.

SILENCE 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.

POWER ON 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.

START when pressed, starts the infusion on the selected channel.

ENTER 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.

VOLUME INFUSED when pressed, will cause primary, secondary and total volume infused and secondary volume infused to display for both channels. With a channel selected, pressing will display primary, secondary and total volume infused and enable primary, secondary and total volume infused registers for clearing.

SEC PIGGY BACK when pressed, allows the entry of secondary infusion parameters on the selected channel.

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

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

CANCEL when pressed, discontinues the current programming sequence and returns the Central Information display to the previous display screen.

AUDIO/PANEL LOCK 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.

3.3 OPERATING CONDITIONS

The PC-2TX is configured for independent (Normal Operation) or as a computer controlled device (Computer Operation). Normal operation includes two patient care delivery modes - Pump and Controller. A Maintenance Mode is also provided to allow biomedical personnel to troubleshoot and service the instrument. Computer operation encompasses a Monitor and Computer Control mode. Operating procedures for both normal and computer controlled operation are described in detail in paragraphs 3.3.1 and 3.3.2 respectively. Maintenance Mode capability and operation is addressed in paragraph 5.3.2 of Section 5 of this manual.

The PC-2TX utilizes a Systems Configuration Mode to enable biomedical and other trained personnel to enable specific PC-2TX operating features. Procedures for utilizing the System Configuration Mode are discussed in Section 3.3.1.2.

3.3.1 Normal Operation

The instrument's two channels are identical in all respects. A common keypad is used for programming and control. Individual channel select controls serve to interconnect the keypad with a specific channel for setting up specific infusion programs, inputting infusion parameters, starting, pausing and/or stopping instrument operation. The following procedural steps are applicable to both channels.

The Tamper-resistant feature is enabled in the System Configuation Mode and actuated with the Audio Control switch to lock out all the keypad controls except VOLUME INFUSED and SEC/PIGGYBACK which permit monitoring infusion progress, viewing infusion parameters and CLEAR/SILENCE to clear audio alerts when permitted.

3.3.1.1 Pump Controller and Selectable Modes

The decision to use the PC-2TX's Pump or Controller delivery mode for specific IV infusions resides with the patient's attending medical personnel. The instrument's occlusion parameters are predicated on the delivery mode selected and the positioning of the IV solution container to provide a nominal head height of 24 inches (61 cm). With a 24 inch (61 cm) pressure head height and the instrument operating in the Controller mode, an occlusion will be sensed when the distal tubing in-line pressure exceeds bottle height pressure ±12 inches (±30.5 cm) of bottle height. In the Pump mode, occlusion pressure is pre-set to 10±2 psi (69±14 kPa) for rates >30 mL/hr. At rates <30 mL/hr,

occlusion pressure is rate dependent to ensure timely occlusion detection. Within the Systems Configuration mode, the PUMP mode occlusion pressure can be locked to 10 psi (69 kPa) for all rates. This selection will effect both channels and will significantly extend time to occlusion for rate <30 mL/hr.

3.3.1.2 System Configuration

To enable the System Configuration mode press and hold the OPTIONS/EDIT control, then press POWER ON. System Configuration screen 1 of 5 will display. The 🔼 🔽 controls are utilized to toggle between screens 1 through 5. The numeric keys are used to access a specific feature on the active screen. The selectable options are listed numerically by screen (default values are in bold print):

Clock Setup: **Military** AM/PM
- Use 🔼 🔽 controls to select
- Press ENTER to confirm
- Use numeric controls to enter date mm/dd/yy
- Press ENTER to confirm
- Use numeric controls to enter time; if in AM/PM mode, use 🔼 🔽 to select
- Press CANCEL to exit

Factory Set: **Yes** No
- Use 🔼 🔽 to select Yes or No
- Press ENTER to Confirm

Maximum Rate: **999mL/hr** 0-999mL/hr
- Use numeric controls to enter maximum rate
- Press ENTER to confirm and exit

C2 Port:
Baud Rate: 300, 600, 1200, 2400, 4800, **9600**, 19200
- Use 🔼 🔽 to select baud rate
- Press ENTER to confirm
Data Frame: **N81** (Parity, Data bits and Stop bit) Factory set
Serial No.:
- Use numeric controls to enter Serial Number
- Press ENTER to confirm and exit

Comp. Ctrl.: **Enabled** Disabled
- Use 🔼 🔽 to select
- Press ENTER to confirm

P/C/S Mode: **P,P** Pump or Controller or Selectable
- Use 🔼 🔽 controls to select then press ENTER for each channel
PC Mode Setup: **Unlocked** Locked
  - Use 🔼 🔽 to select
  - Press ENTER to confirm and exit

Delay Start: **Enabled** Disabled
- Use 🔼 🔽 to select
- Press ENTER to confirm and exit

Drug Calc: **Enabled** Disabled
- Use 🔼 🔽 to select

PC-2TX

- Press ENTER to confirm and exit

Multidose: **Enabled** Disabled
- Use ⬆ ⬇ to select
- Press ENTER to confirm and exit

Dose Display: **Fixed** Temp
- Use ⬆ ⬇ to select
- Press ENTER to confirm and exit

Battery Mode: Disabled Normal **High**
- Use ⬆ ⬇ to select
- Press ENTER to confirm and exit

Key Audio: **Enabled** Disabled
- Use ⬆ ⬇ to select
- Press ENTER to confirm and exit

Alarm Audio: **Profile 1** Profile 2 Profile 3
- Use ⬆ ⬇ to select
- Press ENTER to confirm and exit

Switch Audio: **Enabled** Disabled
- Use ⬆ ⬇ to select
- Press ENTER to confirm and exit

Tamper Mode: **Enabled** Disabled
- Use ⬆ ⬇ to select
- Press ENTER to confirm and exit

Language: **English** (Only selection currently available)

Anesth. Mode: Enabled **Disabled**
- Use ⬆ ⬇ to select
- Press ENTER to confirm and exit

Aux. Port: No Port (Not currently enabled)

Press OFF to exit System Configuration Setup mode.

3.3.1.3 Independent Setup and Operating Procedures

The detailed procedures necessary to set up and operate the PC-2TX on any channel are described in the following section.

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.

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

2. Press [POWER ON].

   NOTE

   - If the following screen displays, remove the instrument from service

A
CHANNEL MALFUNCTION
REMOVE IV SET IMMEDIATELY.
A MALFUNCTION HAS BEEN DETECTED ON THIS CHANNEL. THIS INFUSION HAS BEEN STOPPED.
> Press [CHANNEL OFF]
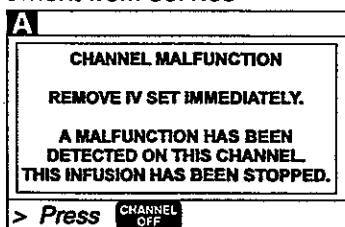
   - An audio tone sounds once.

   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.

   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:

med
A — — — — —
B — — — — —

3. Open the GEMINI administration set package, remove set, and close the roller clamp. **Refer to the Directions For Use provided on the set packaging.**
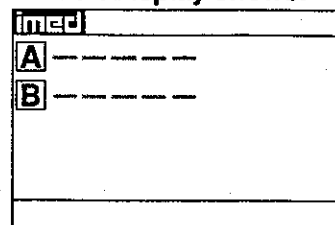
ACTION/PROMPT | DISPLAY RESPONSE

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 2/3 full.

6. Open the roller clamp slowly to prime the tubing and clear air from the injection sites and tubing fitments.

7. Close the roller clamp.

8. Open the door. Install the administration set pumping chamber by properly positioning the upper fitment into the upper fitment recess, and then inserting the Flo-Stop® fitment into the Flo-Stop recess below the pump mechanism, with the arrow pointing into the pump.

9. **Press the tubing into the Air-In-Line detector.**

10. Close the door and open the roller clamp.

11. Press **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:

```
┌─────────────────────────────┐
│ A      Infusion  Setup      │
│                             │
│                             │
│ ┌──────┐                    │
│ │ RATE │  --- --- ---       │
│ ├──────┤                    │
│ │ VTBI │  --- --- --- ---   │
│ └──────┘                    │
│                             │
│ > Enter  Rate  Value        │
└─────────────────────────────┘
```

12. Set the rate and VTBI.
    a. Press **RATE**:
       - After 3 seconds "> *Enter RATE Value*" displays
       - After 12 seconds audio prompt - sounds

Central Information Display:

```
┌─────────────────────────────┐
│ A      Infusion  Setup      │
│                             │
│                             │
│ ┌──────┐                    │
│ │ RATE │  _ _ 0 ml          │
│ ├──────┤                    │
│ │ VTBI │  --- --- --- ---   │
│ └──────┘                    │
│                             │
│ > Enter Rate Value          │
└─────────────────────────────┘
```

    b. Use numeric data entry controls to enter rate parameter

- New rate value displays

PC-2TX

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

Central Information Display:

A Infusion Setup
RATE **125** ml/hr
VTBI _ _ _ **0** ml
> *Press* START

- New VTBI value displays

d. Use numeric data entry controls to enter VTBI parameter
  - After 3 seconds "> *Press* START " displays

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

14. Press ▓.

NOTES

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

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

Channel Information Display:
- INFUSION indicator - flashes
- Rate display - Rate value displays

Central Information Display:

Infus
A VTBI = 500 ml
B _ _ _ _ _

During infusion:

NOTE

Various Advisories, Alarms, and Malfunctions may be displayed. Refer to the CHANNEL AND 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

ACTION/PROMPT   DISPLAY RESPONSE

Central Information Display:

imed
A KVO
B — — — — —

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 IMED.
   - 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.

   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.

   Central Information Display shows:

imed
A — — — — —
B — — — — —

3. Prime and load the Gemini 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 "- - - -"

   Central Information Display:

A Infusion Setup
RATE   — — —
VTBI   — — — —
DURATION — —:— —
> *Enter Rate Value*

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5. Set the VTBI and duration

   a. Press [VTBI]:
  - After 3 seconds "> *Enter VTBI Value*" displays
  - After 12 seconds audio prompt - sounds

Central Information Display:

```
┌─────────────────────────────────┐
│ A    Infusion Setup             │
│                                  │
│  ┌──────┐                        │
│  │ RATE │ ──── ──── ────         │
│  └──────┘                        │
│  ┌──────┐                        │
│  │ VTBI │ ____ 0 ml              │
│  └──────┘                        │
│  ┌──────────┐                    │
│  │ DURATION │ ──── ──── ──── ──── │
│  └──────────┘                    │
│                                  │
│ > Enter  VTBI  Value             │
└─────────────────────────────────┘
```

   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:

```
┌─────────────────────────────────┐
│ A    Infusion Setup             │
│                                  │
│  ┌──────┐                        │
│  │ RATE │   125 ml/hr            │
│  └──────┘                        │
│  ┌──────┐                        │
│  │ VTBI │   1000 ml              │
│  └──────┘                        │
│  ┌──────────┐                    │
│  │ Duration │   8:00 hh:mm       │
│  └──────────┘                    │
│                                  │
│ > Enter  Rate  Value             │
└─────────────────────────────────┘
```

   d. Use numeric data entry controls to enter duration parameter
  - As duration parameters are entered, the rate value displays
  - After 3 seconds "> *Press* [START]" displays

- New duration value displays
- Calculated rate value displays

NOTE

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."

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:

```
┌─────────────────────────────────┐
│ imed                            │
│ A  VTBI = 1000 ml               │
│ B  ──── ──── ──── ────          │
│                                  │
│                                  │
│                                  │
└─────────────────────────────────┘
```

ACTION/PROMPT	DISPLAY RESPONSE

During infusion:

NOTE

Various Advisories, Alarms, and Malfunctions may be displayed. Refer to the CHANNEL AND 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:

```
imed
A KVO
B — —— —— —— ——
```

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:

```
imed  System Options
[1] Display Contrast
[2] Time-of-Day
[3] Anesthesia Mode
[4] Computer Control
[5] System Configuration
> Press |CANCEL| to Exit
```

2. Press ❶ :

Central Information Display:

```
imed  Display Contrast
imed—imed—imed—imed
imed—imed—imed—imed
imed—imed—imed—imed
> Use |↑||↓|  to Adjust
```

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

PC-2TX

ACTION/PROMPT	DISPLAY RESPONSE

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* [CANCEL]" displays
   - After 12 seconds audio prompt - sounds

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

Central Information Display:

```
┌─────────────────────────────────┐
│ [A]    Infusion  Setup          │
│                                 │
│  [RATE]  125 ml/hr              │
│  [VTBI]  500 ml                 │
│                                 │
│ > Press [START]                 │
└─────────────────────────────────┘
```

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:

```
┌─────────────────────────────────┐
│ [A]    Infusion  Setup          │
│                                 │
│  [RATE]  125 ml/hr              │
│  [VTBI]  500 ml                 │
│                                 │
│ > Press [START]                 │
└─────────────────────────────────┘
```

- Channel indicator - flashes

ACTION/PROMPT	DISPLAY RESPONSE

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:

```
┌─────────────────────────┐
│ imed                    │
│                         │
│   Powering  down  in... │
│           3             │
│        second(s)        │
│                         │
└─────────────────────────┘
```
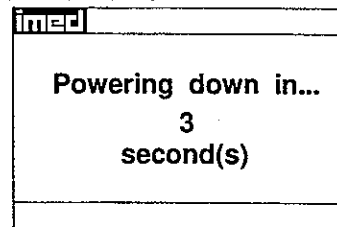
- Time value decrements from 3 to 1, then the PC-2TX powers down

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:

```
┌─────────────────────────┐
│ A    Infusion  Setup    │
│                         │
│ RATE  125 ml/hr         │
│ VTBI  500 ml            │
│                         │
│ > Press START           │
└─────────────────────────┘
```
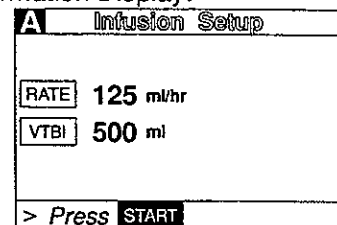
2. Press **RATE** or **VTBI**.
   - After 3 seconds "> Press START " displays
   - After 12 seconds audio prompt - sounds

Central Information Display:

```
┌─────────────────────────┐
│ A    Infusion  Setup    │
│                         │
│ RATE  125 ml/hr         │
│ VTBI  500 ml            │
│                         │
│ > Press START           │
└─────────────────────────┘
```

3. Use the numeric data entry controls to change rate or VTBI. The [up] [down] 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

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4. Press [START].

Channel Information Display:
- New rate value displays

Central Information Display:
- Returns to active infusion screen

NOTES

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.

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 the other channel by selecting that channel, taking appropriate action and then pressing START. To return to the interrupted infusion setup, reselect the channel, press ENTER to continue the programming sequence or press CANCEL to return to the original operating parameters.

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

NOTE

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

ACTION/PROMPT	DISPLAY RESPONSE

To Change the Pressure Limit Mode (PCS Mode control unlocked)

1. Press **A** or **B** to select channel.

Channel Information Display:
- Channel indicator - illuminates

Central Information Display:
- Infusion Setup screen displays

2. 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:

```
A  Chan Options          1 of 2
 1  Delayed Start
 2  Drug Calculation Setup
 3  Pressure History
 4  Pressure Limits - P
 5  Stop Infusion
> Press 1-5 or ⬆ or Cancel
```

3. Press **4**.

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

Channel Information Display:
NO CHANGE

Central Information Display:

```
A    Pressure Limit

   Controller
   Pump                   ⬆⬇
   Selectable

> Press [ENTER] to Confirm
```

4. Use ⬆ ⬇ to select "Pump", "Controller" or "Selectable."
   - After 3 seconds "> *Press Enter to Confirm*" displays

Channel Information Display:
NO CHANGE

Central Information Display:
- When option is selected, option screen is entered.

NOTE

If selectable pressure mode is chosen, press [ENTER] and then use ⬆ ⬇ controls to select the desired patient side occlusion pressure limit (between 25 and 517 mmHg in 25 mmHg increments), then press [ENTER] to confirm.

5. Press **ENTER**.

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

Channel Information Display:
NO CHANGE

Central Information Display:
- Channel Options screen displays

6. Press **CANCEL**.

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

Channel Information Display:
NO CHANGE

Central Information Display:
- Infusion Setup screen displays

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To View Pressure History for Selected Channel

NOTE

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

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 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:

```
A  Chan Options        1 of 2
 1  Delayed  Start
 2  Drug  Calculation  Setup
 3  Pressure  History
 4  Press. Limits: 350 mmHg
 5  Stop  Infusion
> Press  1-5 or ⬆ or  Cancel
```

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:

```
A  Pressure  History
500
mmHg
400
300
200
100
  0                          25
 -2       Time (Hrs)     Now
> Press CANCEL to  Exit
```

4. Press CANCEL.
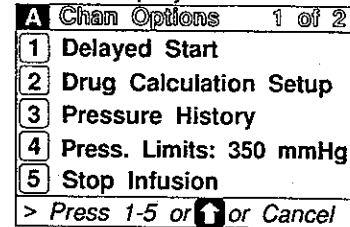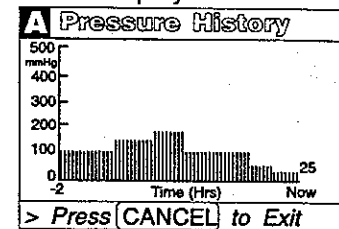
Channel Information Display:
- Channel indicator - illuminates
Central Information Display
- Returns to active infusion screen

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 a fractional rate if set rate is <1.0 mL/hr
- "INFUSION COMPLETE-KVO" or "EMPTY CONTAINER-KVO" scrolls

ACTION/PROMPT   DISPLAY RESPONSE

Central Information Display:

```
┌─────────────────────────────┐
│ A    Infusion Setup         │
│                             │
│ ┌────┐                      │
│ │RATE│ 125 ml/hr            │
│ ┌────┐                      │
│ │VTBI│ 0 ml                 │
│                             │
│ > Enter VTBI Value          │
└─────────────────────────────┘
```

2. Press [VTBI].

Channel Information Display:
                            NO CHANGE
Central Information Display:

```
┌─────────────────────────────┐
│ A    Infusion Setup         │
│                             │
│ ┌────┐                      │
│ │RATE│ 125 ml/hr            │
│ ████                        │
│ VTBI  _ _ _ _ 0 ml          │
│                             │
│ > Enter VTBI Value          │
└─────────────────────────────┘
```

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

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Central Information Display:

```
imed  Volume Infused *
      [PRI]    [SEC]    TOTAL
 [A] 351.1  +  25.0   =376.1
 [B]  0.0   +   0.0   =0.0
```

* Example Values

To Clear 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:

```
imed  Volume Infused
      [PRI]    [SEC]    TOTAL
 [A] 351.1  +  25.0   =376.1
 [B]  0.0   +   0.0   =0.0
```

2. Press [CLEAR].

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

Channel Information Display:
NO CHANGE
Central Information Display:

```
imed  Volume Infused
      [PRI]    [SEC]    TOTAL
 [A]                    No
       Clear  VI  for   Yes
 [B]  all  Channels?  [↑][↓]

 > Select  Option/Cancel
```

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
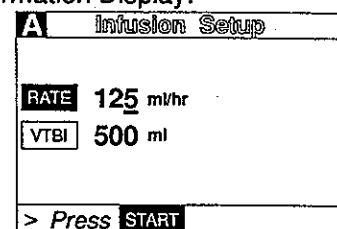   - After 12 seconds audio prompt - sounds

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

<u>ACTION/PROMPT</u>

<u>DISPLAY RESPONSE</u>

2. Press [VOLUME INFUSED].

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

```
┌─────────────────────────────┐
│ A Volume Infused            │
│                             │
│  ┌───┐                      │
│  │PRI│     351.1 ml         │
│  ├───┤                      │
│  │SEC│      25.0 ml         │
│  └───┘    ──────            │
│  TOTAL    376.1 ml          │
│                             │
└─────────────────────────────┘
```

- After 10 seconds the Infusion Setup screen re-displays

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:

```
┌─────────────────────────────┐
│ A Volume Infused            │
│                             │
│  ┌───┐                      │
│  │PRI│     351.1 ml         │
│  ├───┤                      │
│  │SEC│      25.0 ml         │
│  └───┘    ──────            │
│  TOTAL    376.1 ml          │
│                             │
└─────────────────────────────┘
```

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

Channel Information Display:
NO CHANGE
Central Information Display:

```
┌─────────────────────────────┐
│ A Volume Infused            │
│                             │
│  ┌───┐                      │
│  │PRI│      0.0 ml          │
│  ├───┤                      │
│  │SEC│      0.0 ml          │
│  └───┘    ──────            │
│  TOTAL     0.0 ml           │
│                             │
└─────────────────────────────┘
```

- After 10 seconds the Infusion Setup screen re-displays

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

Channel Information Display:
- Channel indicator - extinguishes

Central Information Display:
- Returns to active infusion screen

To Set Up Secondary (Piggyback) Infusion With Dual Rates

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

2. Open the ALARIS Medical GEMINI 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 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:

```
┌─────────────────────────────────┐
│ A    Infusion Setup             │
│         ┌─────┐      ┌─────┐     │
│         │ PRI │      │ SEC │     │
│         └─────┘      └─────┘     │
│ ┌────┐                           │
│ │RATE│   125      _ _ 0  ml/hr   │
│ └────┘                           │
│ ┌────┐                           │
│ │VTBI│   500     _ _ _ _ _  ml   │
│ └────┘                           │
│                                  │
│ > Enter Rate Value              │
└─────────────────────────────────┘
```

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

ACTION/PROMPT	DISPLAY RESPONSE

11. Press [VTBI].

- 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 [ENTER] to confirm.

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

Channel Information Display:
NO CHANGE
Central Information Display:

```
┌─────────────────────────────────┐
│ A     Infusion Setup            │
│           ┌───┐      ┌───┐       │
│           │PRI│      │SEC│       │
│           └───┘      └───┘       │
│  RATE     125        100  ml/hr  │
│  ┌────┐                          │
│  │VTBI│   500      _ _50_  ml     │
│  └────┘                          │
│                                  │
│ > Press START                    │
└─────────────────────────────────┘
```

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 [START].

Channel Information Display:
- Channel indicator - extinguishes
- Secondary rate - displays
- "SECONDARY" message scrolls
Central Information Display:

```
┌─────────────────────────────────┐
│ imed                            │
│ A  VTBI =  50 ml          SEC    │
│ B  ── ── ── ── ──               │
│                                  │
│                                  │
│                                  │
└─────────────────────────────────┘
```

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:

```
┌─────────────────────────────────┐
│ imed                            │
│ A  VTBI =  500 ml         PRI    │
│ B  ── ── ── ── ──               │
│                                  │
│                                  │
│                                  │
└─────────────────────────────────┘
```

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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 IMED 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

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:

   ```
   ┌────────────────────────────┐
   │ A   Infusion Setup         │
   │         ┌─────┐    ┌─────┐  │
   │         │ PRI │    │ SEC │  │
   │ ┌────┐                     │
   │ │RATE│   125    ─ ─ ─ ─ ml/hr│
   │ ┌────┐                     │
   │ │VTBI│   500    ─ ─ ─ ─ ml │
   │ Duration  ─ ─ ─ ─          │
   │ > Enter  Rate  Value       │
   └────────────────────────────┘
   ```

5. Press **VTBI**.

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

   Channel Information Display
   NO CHANGE
   Central Information Display

   ```
   ┌────────────────────────────┐
   │ A   Infusion Setup         │
   │         ┌─────┐    ┌─────┐  │
   │         │ PRI │    │ SEC │  │
   │ RATE    125    ─ ─ ─ ─ ml/hr│
   │ ┌────┐                     │
   │ │VTBI│   500        0  ml  │
   │ Duration  ─ ─ ─ ─          │
   │ > Enter  VTBI  Value       │
   └────────────────────────────┘
   ```

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

ACTION/PROMPT	DISPLAY RESPONSE

ACTION/PROMPT

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

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].

During Infusion:

NOTE

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

Upon Completion of the Secondary infusion:
   - Switchover audio alert (6 beeps) - sounds (unless disabled in System Configuration)

NOTE

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

DISPLAY RESPONSE

Channel Information Display:
       NO CHANGE
Central Information Display:

A	Infusion Setup		
	PRI	SEC	
RATE	125	100	ml/hr
VTBI	500	50	ml
Duration		__ __:30	hh:mm
> Press START			

Channel Information Display:
   - Channel Indicator - extinguishes
   - Secondary rate - displays
   - "SECONDARY" message scrolls
Central Information Display:

Imed		
A	VTBI = 50 ml	SEC
B	--- --- --- --- ---	

Channel Information Display:
   - INFUSING indicator - flashes
   - Secondary rate - displays
Central Information Display:
   - VTBI (Secondary) - decrements

Channel Information Display:
   - Primary rate displays
   - Message screen clears
Central Information Display:

Imed		
A	VTBI = 500 ml	PRI
B	--- --- --- --- ---	

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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:

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

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

Channel Information Display:
                    NO CHANGE
Central Information Display:

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

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

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

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 Enter to Confirm*" displays
   - After 12 seconds audio prompt - sounds

Channel Information Display:
                    NO CHANGE
Central Information Display:
- New primary VTBI value displays

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:

A	Infusion Setup	
	PRI	SEC
RATE	120	100 ml/hr
VTBI	1000	50 ml
> *Press* START		

ACTION/PROMPT	DISPLAY RESPONSE

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:

```
┌─────────────────────────────┐
│ A    Infusion Setup          │
│          ┌─────┐   ┌─────┐   │
│          │ PRI │   │ SEC │   │
│  ┌─────┐                     │
│  │RATE │   125     100  ml/hr│
│  ┌─────┐                     │
│  │VTBI │   500      50  ml   │
│                              │
│  > Press START               │
└─────────────────────────────┘
```

3. Close Secondary clamp.

4. Press START .

Channel Information Display:
                    NO CHANGE
Central Information Display:

```
┌─────────────────────────────┐
│ A    Infusion Setup          │
│          ┌─────┐   ┌─────┐   │
│          │ PRI │   │ SEC │   │
│  ┌──┐  ┌──────────┐ No       │
│  │RAT│ │Switchover│ Yes  l/hr│
│  ┌──┐ │to Primary?│┌──┐┌──┐  │
│  │VTB│ └──────────┘│↑ ││↓ │ml│
│                    └──┘└──┘  │
│  > Press START               │
└─────────────────────────────┘
```

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

Channel Information Display:
- Rate changes to Primary value
- Channel indicator - extinguishes

Central Information Display:
- Primary active infusion screen displays

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To Change the Time of Day

1. Press **OPTIONS EDIT**.

Channel Information Display:
NO CHANGE
Central Information Display:

```
imed System Options
[1] Display Contrast
[2] Time-of-Day
[3] Anesthesia Mode
[4] Computer Control
[5] System Configuration
> Press CANCEL to Exit
```

2. Press **2**.

   • After 12 seconds audio prompt – sounds

   NOTE

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

Central Information Display:

```
imed Time

       Time-of-Day


TIME:    1 0 0 0 hrs
```

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

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 disposable
   administration set as previously described.

ACTION/PROMPT	DISPLAY RESPONSE

2. Press 🅐 or 🅑 to select channel

- "*Enter Rate Value*" displays after 3 seconds.
- After 12 seconds audio prompt - sounds

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

Central Information Display:
- Infusion Setup screen displays

3. Press 🔲.

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

Channel Information Display:
                    NO CHANGE
Central Information Display:

```
┌─────────────────────────────┐
│ A  Chan Options      1 of 2  │
│ [1] Delayed  Start           │
│ [2] Drug  Calculation  Setup │
│ [3] Pressure  History        │
│ [4] Pressure  Limits - P     │
│ [5] Stop  Infusion           │
│ > Press 1-5 or⬆or  Cancel    │
└─────────────────────────────┘
```

4. Press 🔟.

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

Channel Information Display:
                    NO CHANGE
Central Information Display:

```
┌─────────────────────────────┐
│ A  Delayed         1154 hrs  │
│ ┌─────┐                      │
│ │RATE │         0 ml/hr      │
│ └─────┘                      │
│ ┌─────┐                      │
│ │VTBI │      — — — —         │
│ └─────┘                      │
│ ┌─────┐                      │
│ │START│      — — — —         │
│ │TIME │                      │
│ └─────┘                      │
│ Callback  Alert?       No    │
│ > Enter  Rate  Value         │
└─────────────────────────────┘
```

NOTE

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

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

Enter the correct Time of Day and press 🔳.

```
┌─────────────────────────┐
│  Confirm  Current  Time │
│       1154  hrs         │
│  Press ENTER to confirm.│
│  Press OPTIONS to edit. │
└─────────────────────────┘
```

```
┌─────────────────────────┐
│  Current  Time          │
│   1154  hrs             │
└─────────────────────────┘
```

NOTE

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

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ACTION/PROMPT	DISPLAY RESPONSE

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

```
┌─────────────────────────────┐
│ A  Delayed          1154 hrs │
│ ┌──────┐                     │
│ │ RATE │         0 ml/hr     │
│ └──────┘                     │
│ ┌──────┐                     │
│ │ VTBI │    ---- ---- ----   │
│ └──────┘                     │
│ Duration   ---- ---- ----    │
│ ┌──────┐                     │
│ │START │    ---- ---- ----   │
│ │TIME  │                     │
│ └──────┘                     │
│ Callback Alert?       No     │
├─────────────────────────────┤
│ > Enter  Rate  Value         │
└─────────────────────────────┘
```

5. Press [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:
• 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:

```
┌─────────────────────────────┐
│ A  Delayed          1154 hrs │
│ ┌──────┐                     │
│ │ RATE │      50 ml/hr       │
│ └──────┘                     │
│ ┌──────┐                     │
│ │ VTBI │     250 ml          │
│ └──────┘                     │
│ ┌──────┐                     │
│ │START │    __ __ __ hrs     │
│ │TIME  │                     │
│ └──────┘                     │
│ Callback Alert?      No      │
├─────────────────────────────┤
│ > Enter Start Time           │
└─────────────────────────────┘
```

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

ACTION/PROMPT	DISPLAY RESPONSE

11. Press 🔳 to change Callback Alert option.

- Use ⬆ or ⬇ to select "Yes" (No is default setting) then press 🔳 to confirm.
- After 3 seconds "> *Press* START " displays.
- After 12 seconds audio prompt - sounds.

NOTE

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

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

13. Press 🔳 .

Channel Information Display:
           NO CHANGE
Central Information Display:

```
┌─────────────────────────────────┐
│ A  Delayed            1154 hrs   │
│ ┌──────┐                         │
│ │ RATE │   50 ml/hr              │
│ └──────┘                         │
│ ┌──────┐                    ┌──┐ │
│ │ VTBI │   250 ml           │No│ │
│ └──────┘              ┌──┐  └──┘ │
│ ┌───────┐  1200 hr    │No│  Yes  │
│ │ START │             └──┘       │
│ │ TIME  │                        │
│ └───────┘                        │
│ Callback Alert?   >>>   ⬆ ⬇     │
│ > Press START                    │
└─────────────────────────────────┘
```

Channel Information Display:
- Rate display shows "- - - -"
- STANDBY indicator - illuminates
- Channel indicator - extinguishes
Central Information Display:

```
┌─────────────────────────────────┐
│ imed                  1154 hrs   │
│ A Start = 1200  hrs              │
│ B VTBI = 500   ml                │
│                                  │
│                                  │
│                                  │
└─────────────────────────────────┘
```

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:

```
┌─────────────────────────────────┐
│ imed                  1600 hrs   │
│ A COMPLETE                       │
│ B — — — — —                      │
│                                  │
│                                  │
│                                  │
└─────────────────────────────────┘
```

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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. No KVO (Keep Vein Open) infusion precedes or follows completion of the primary infusion in a Delayed Start Secondary infusion.

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

2. Press **A** or **B** to select channel.

   - "*Enter Rate Value*" displays after 3 seconds.
   - 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:

   ```
   ┌──────────────────────────────┐
   │ A Chan Options  1 of 2       │
   │ 1 Delayed Start              │
   │ 2 Drug Calculation Setup     │
   │ 3 Pressure History           │
   │ 4 Pressure Limits - P        │
   │ 5 Stop Infusion              │
   │ > Press 1-5 or ⬆ or Cancel   │
   └──────────────────────────────┘
   ```

4. Press **1**.

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

   Channel Information Display:
   NO CHANGE
   Central Information Display:

   ```
   ┌──────────────────────────────┐
   │ A  Delayed         1430 hrs  │
   │ RATE            0 ml/hr       │
   │ VTBI     ----  ----  ----     │
   │ START                         │
   │ TIME     ----  ----  ----     │
   │ Callback Alert?      No       │
   │ > Enter Rate Value            │
   └──────────────────────────────┘
   ```

NOTE

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

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

Enter the correct Time of Day and press [ENTER].

```
┌────────────────────────┐
│  Confirm Current Time  │
│      1430 hrs          │
│  Press ENTER to confirm.│
│  Press OPTIONS to edit. │
└────────────────────────┘
```

```
┌──────────────┐
│ Current Time │
│  1430 hrs    │
└──────────────┘
```

<u>ACTION/PROMPT</u>   <u>DISPLAY RESPONSE</u>

NOTE

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

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

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 ▣.
   - 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:

```
┌─────────────────────────────────┐
│ A  Delayed           1430 hrs   │
│ ┌──────┐                        │
│ │ RATE │    125 ml/hr           │
│ ├──────┤                        │
│ │ VTBI │    500 ml              │
│ ├──────┤                        │
│ │START │    __ __ __ hrs        │
│ │TIME  │                        │
│ ├──────────────────────────────┤
│ Callback Alert?      No         │
│ > Enter Start Time              │
└─────────────────────────────────┘
```

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

Channel Information Display:
         NO CHANGE
Central Information Display:

```
┌─────────────────────────────────┐
│ A  Delay SEC         1430 hrs   │
│           ┌─────┐    ┌─────┐     │
│           │ PRI │    │ SEC │     │
│ ┌──────┐  └─────┘    └─────┘     │
│ │ RATE │   125       __ __ 0 ml/hr│
│ ├──────┤                         │
│ │ VTBI │   500       __ __ __ ml │
│ ├──────┤                         │
│ │START │             __ __ __ hrs│
│ │TIME  │                         │
│ ├──────────────────────────────┤
│ > Enter Rate Value              │
└─────────────────────────────────┘
```

NOTE

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

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

```
┌─────────────────────────────────┐
│ A  Delay SEC         1430 hrs   │
│        ┌─────┐      ┌─────┐      │
│        │ PRI │      │ SEC │      │
│ ┌─────┐└─────┘      └─────┘      │
│ │RATE │  125          _ _ 0 ml/hr│
│ └─────┘                          │
│ ┌─────┐  500         _ _ _ _ ml  │
│ │VTBI │                          │
│ └─────┘                          │
│ Duration                         │
│ ┌─────┐                          │
│ │START│              _ _ _ _ hrs │
│ │TIME │                          │
├─────────────────────────────────┤
│ > Enter Rate Value               │
└─────────────────────────────────┘
```

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

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

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

Channel Information Display:
          NO CHANGE
Central Information Display:
- VTBI is highlighted

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

Channel Information Display:
          NO CHANGE
Central Information Display:

```
┌─────────────────────────────────┐
│ A  Delay SEC         1430 hrs   │
│        ┌─────┐      ┌─────┐      │
│        │ PRI │      │ SEC │      │
│ ┌─────┐└─────┘      └─────┘      │
│ │RATE │  125         100   ml/hr │
│ └─────┘                          │
│ ┌─────┐  500          50   ml    │
│ │VTBI │                          │
│ └─────┘                          │
│ ┌─────┐                          │
│ │START│              _ _ _ _ hrs │
│ │TIME │                          │
├─────────────────────────────────┤
│ > Enter Start Time               │
└─────────────────────────────────┘
```

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:

```
┌─────────────────────────────────┐
│ A  Delay SEC         1430 hrs   │
│        ┌─────┐      ┌─────┐      │
│        │ PRI │      │ SEC │      │
│ ┌─────┐└─────┘      └─────┘      │
│ │RATE │  125         100   ml/hr │
│ └─────┘                          │
│ ┌─────┐  500          50   ml    │
│ │VTBI │                          │
│ └─────┘                          │
│ ┌─────┐                          │
│ │START│              _ _ _ _ hrs │
│ │TIME │                          │
├─────────────────────────────────┤
│ > Enter Start Time               │
└─────────────────────────────────┘
```

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:

```
┌─────────────────────────────────┐
│ A  Delay SEC         1430 hrs   │
│        ┌─────┐      ┌─────┐      │
│        │ PRI │      │ SEC │      │
│ ┌─────┐└─────┘      └─────┘      │
│ │RATE │  125         100   ml/hr │
│ └─────┘                          │
│ ┌─────┐  500          50   ml    │
│ │VTBI │                          │
│ └─────┘                          │
│ ┌─────┐                          │
│ │START│              1500  hrs   │
│ │TIME │                          │
├─────────────────────────────────┤
│ > Press  START                   │
└─────────────────────────────────┘
```

15. Press **START**.

Channel Information Display:
- Rate display shows "- - - -"
- STANDBY indicator illuminates
- Channel indicator - extinguishes

Central Information Display:

imed		
A Start = 1500 hrs		SEC
B — — — — —		

When START TIME = Current time
- Secondary 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:

imed		
A VTBI = 500 ml		PRI
B — — — — —		

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.

To Set Up a Multidose Infusion

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 disposable administration set as previously described.

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| 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/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:

```
A Chan Options  1 of 2
1 Delayed Start
2 Drug Calculation Setup
3 Pressure History
4 Pressure Limits - P
5 Stop Infusion
> Press 1-5 or ⬆ or Cancel
```

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

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

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

Channel Information Display:
NO CHANGE

Central Information Display:

```
A    Multidose      1754 hrs
Rate            _ _ 0 ml/hr
VTBI/Dose:     _ _ _ _
Interval:      _ _
# Doses:       _ _
Start At:      _ _ _ _
> Enter Rate Value
```

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

```
Current Time
1754 hrs
```

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/EDIT. The following pop-up display appears:

Enter the correct Time of Day and press ENTER .

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ACTION/PROMPT	DISPLAY RESPONSE

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

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:

```
┌─────────────────────────────┐
│ A   Multidose       1754 hrs │
├─────────────────────────────┤
│ Rate:        100 ml/hr       │
│ VTBI/Dose:  _ _ _  0 ml      │
│ Interval:    __ __           │
│ # Doses:     __ __           │
│ Start At:    __ __ __ __     │
├─────────────────────────────┤
│ > Enter VTBI Value           │
└─────────────────────────────┘
```

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:

```
┌─────────────────────────────┐
│ A   Multidose       1754 hrs │
├─────────────────────────────┤
│ Rate:        100 ml/hr       │
│ VTBI/Dose:   50 ml           │
│ Interval:    every_0 hrs     │
│ # Doses:     __ __           │
│ Start At:    __ __ __ __     │
├─────────────────────────────┤
│ > Enter Dose Interval        │
└─────────────────────────────┘
```

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

Channel Information Display:
                    NO CHANGE
Central Information Display:
- Dose Interval displays

PC-2TX

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:

A   Multidose   1754 ʰʳˢ
Rate: **100** ᵐˡ/ʰʳ
VTBI/Dose: **50** ᵐˡ
Interval: **6** ʰʳˢ
 # Doses: **_0 doses**
Start At: ⎯⎯ ⎯⎯ ⎯⎯
> *Enter Number of Doses*

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:

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

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
- An audio prompt sounds after 12 seconds

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.

15. Press [ENTER].
- After 3 seconds"> *Press* START" displays
- After 12 seconds audio prompt - sounds

NOTE

To edit the multidose infusion parameters, press [RATE] 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.

Channel Information Display:
                    NO CHANGE
Central Information Display:

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

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ACTION/PROMPT	DISPLAY RESPONSE

DISPLAY RESPONSE

Central Information Display:

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

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

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

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, if the other channel is operating; or the 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 disposable 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

ACTION/PROMPT	DISPLAY RESPONSE

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:

```
┌─────────────────────────────┐
│ imed               1800 hrs │
│                             │
│ ★  A DOSE1= 2000 hrs        │
│ ★★ B VTBI=     25 ml        │
│                             │
│                             │
└─────────────────────────────┘
        ★ 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
- To review the selected multidose infusion, press **A** or **B** to call up the selected channel multidose status summary screen.

Central Information Display:

```
┌─────────────────────────────┐
│ A   Multidose      2230 hrs │
│ Rate= 100 ml/hr             │
│ VTBI= 50 ml                 │
│ Every 6 hrs x 4 doses       │
│ Doses completed= 1          │
│ Dose 2 Starts 0200 hrs      │
│ > Press  START              │
└─────────────────────────────┘
```

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

ACTION/PROMPT	DISPLAY RESPONSE

3. Press 🔲.

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

Channel Information Display:
<div align="center">NO CHANGE</div>
Central Information Display:

```
Ⓐ Chan Options  1 of 2
⒈ Delayed Start
⒉ Drug Calculation Setup
⒊ Pressure History
⒋ Pressure Limits - P
⒌ Stop Infusion
> Press 1-5 or ⬆ or Cancel
```

4. Press ②.

- After 3 seconds "> *Enter Drug Amount*" displays
- After 12 seconds audio prompt - sounds

Channel Information Display:
<div align="center">NO CHANGE</div>
Central Information Display:

```
Ⓐ Drug Calculation
Amount:    _ _ _ _0    mcg
Diluent:   _ _ _ _     mg
Weight:    _ _ _       gram
Time Unit: _ _ _ _     units
[Conc] _ _ _ _ _ _     ⬆⬇
> Enter Drug Amount
```

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:
<div align="center">NO CHANGE</div>
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:
<div align="center">NO CHANGE</div>
Central Information Display:

```
Ⓐ Drug Calculation
Amount:  400 mg
Diluent:    _ _ _0 ml
Weight:   _ _ _
Time Unit: _ _ _ _
[Conc] _ _ _ _ _ _
> Enter Diluent Volume
```

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:
<div align="center">NO CHANGE</div>
Central Information Display:
- Diluent Volume displays

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ACTION/PROMPT

DISPLAY RESPONSE

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

Channel Information Display:
NO CHANGE
Central Information Display:

```
[A] Drug Calculation
Amount:   400 mg
Diluent:   250 ml        ┌─────┐
Weight:  > > > > >        │ No  │
                          │ Yes │
Time Unit: — — — —        │[↑][↓]│
[Conc] 1600 mcg/ml        └─────┘
> Dose based on Pt Wt?
```

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 ▣ to confirm weight for both channels.

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

Channel Information Display:
NO CHANGE
Central Information Display:

```
[A] Drug Calculation
Amount:   400 mg
Diluent:   250 ml        ┌─────┐
Weight:   80 kg           │ Min │
                          │ Hour│
Time Unit: > > > > >       │[↑][↓]│
[Conc] 1600 mcg/ml        └─────┘
> Select Time Units
```

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

ACTION/PROMPT	DISPLAY RESPONSE

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

Channel Information Display:
NO CHANGE
Central Information Display:

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

NOTE

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

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

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

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

Channel Information Display:
NO CHANGE
Central Information Display:

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

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ACTION/PROMPT	DISPLAY RESPONSE

ACTION/PROMPT

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

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

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

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

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

19. Press **START**.

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.

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

DISPLAY RESPONSE

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

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

Channel Information Display:
NO CHANGE
Central Information Display:
- VTBI and 0 ml are highlighted

Channel Information Display:
NO CHANGE
Central Information Display:

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

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

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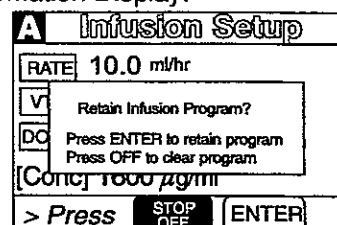- Drug Calculation Infusion Setup screen displays

ACTION/PROMPT	DISPLAY RESPONSE

2. Press 🔲.

Channel Information Display:
- Rate display - blanks
- INFUSING indicator - extinguishes

Central Information Display:

```
┌─────────────────────────────┐
│ A   Infusion Setup          │
├─────────────────────────────┤
│ RATE  10.0 ml/hr            │
│ V┌─────────────────────────┐│
│  │ Retain Infusion Program?││
│ DO│ Press ENTER to retain program ││
│  │ Press OFF to clear program ││
│ [Conc] 1000 µg/ml          │
│ > Press  STOP   [ENTER]     │
│          OFF                │
└─────────────────────────────┘
```

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

Channel Information Display:
- Channel displays - blank

Central Information Display:
- Active Infusion screen displays, if the other channel is operating; or Powerdown screen displays

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) may require adjustment of the infusion rate. Use accepted hospital procedure which may involve changing IV tubing or repriming existing tubing when drug concentration is changed.

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

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

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

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

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

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Changing Channel Selection Before Completing Programming

NOTE

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

```
Channel A or B's program has been changed.

        Press ENTER to complete confirm
                      or
        Press CANCEL to clean program
```

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 █, then ⓪ or █ to clear the VTBI value.

5. Press ❶, to select "ALL" or program a specific VTBI using the numeric data entry controls.

Central Information Display:

```
┌─────────────────────────────┐
│ A    Infusion Setup          │
│                              │
│  RATE  125 ml/hr             │
│                              │
│  VTBI   ALL                  │
│                              │
│ > Press  START               │
└─────────────────────────────┘
```

6. Press █.

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.

1. Power on the PC-2TX as previously described.

2. Press [OPTIONS/EDIT].

Central Information Display:

```
imed  System Options
[1] Display Contrast
[2] Time-of-Day
[3] Anesthesia Mode
[4] Computer Control
[5] System Configuration
> Press | CANCEL | to Exit
```

NOTE

If "Anesthesia Mode" is displayed in half-tone on the Systems Options display, Anesthesia mode has not been enabled. Contact biomedical engineering to enable feature.

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

Central Information Display:

```
imed  Sys Config Edit
Anesthesia Mode            [No]
Silences audio prompting    Yes
during the PAUSE mode      [↑][↓]
and decreases the number
of steps to confirm and
restart an infusion.
Automatically cancelled
when pump is unplugged.
> Press [ENTER] to confirm
```

4. Use [↑] [↓] to select the "Yes" option.
   - "> 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.

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

Central Information Display:
* Selected channel display reverts to unprogrammed 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.
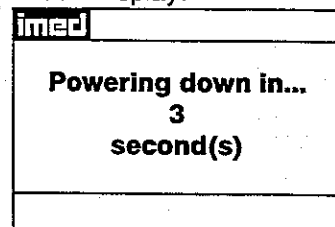
Central Information Display:

```
┌─────────────────────────┐
│ imed                    │
├─────────────────────────┤
│                         │
│   Powering down in...   │
│           3             │
│       second(s)         │
│                         │
├─────────────────────────┤
│                         │
└─────────────────────────┘
```

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

3.3.1.4 Monitor or Computer Control Setup and Operating Procedures

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 this manual. The procedures for setting the computer communication parameters for the host computer are provided in the ALARIS Medical C2 Communications Protocal 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 this 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 MONITOR indicator illuminates.
   the RS-232-C communications DATA PORT
   connector on the rear panel.

To Change PC-2TX Operating Condition from MONITOR to Independent
1. Disconnect the communication interface cable   The MONITOR indicator extinguishes.
   from the RS-232-C communications DATA
   PORT connector on the rear panel.

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

1. Press [OPTIONS/EDIT].   Central Information Display:

> **imed System Options**
> 1 **Display Contrast**
> 2 **Time-of-Day**
> 3 **Anesthesia Mode**
> 4 **Computer Control**
> 5 **System Configuration**
> *> Press* | CANCEL | *to Exit*

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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:

```
imcd  Sys Config Edit
                              No
                              Yes
                              ⬆⬇
Computer Control
Enable remote computer
control of the pump.

> Select Option/Cancel
```

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 INFUSED] [OPTIONS EDIT] [CANCEL] [CHANNEL OFF] controls

Central Information Display:

```
imcd  Computer Control
A VTBI =   416  ml
B — — — — — —
```

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:

```
imcd  Computer Control
A VTBI = 416 ml
B -        No
     Exit Computer   Yes
     Control Mode?
                     ⬆⬇
> Select Option/Cancel
```

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:

```
imcd
A VTBI =   416  ml
B — — — — —

> Select Option/Cancel
```

   - MONITOR indicator - illuminates

ACTION/PROMPT	DISPLAY RESPONSE

To Power Off the PC-2TX in MONITOR Operation

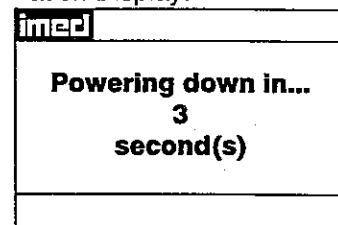1. Press **A** or **B** as appropriate.

2. Press **CHANNEL OFF**.

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

Central Information Display:
- Selected channel display reverts to unprogrammed 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:

```
┌─────────────────────────┐
│ imed                    │
│                         │
│   Powering down in...   │
│           3             │
│       second(s)         │
│                         │
│                         │
└─────────────────────────┘
```

- 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.
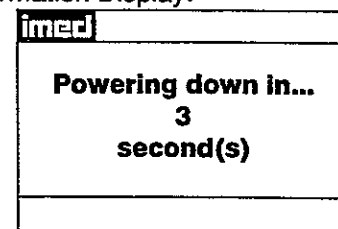
3. Press **CHANNEL OFF**.

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

Central Information Display:
- Selected channel display reverts to unprogrammed 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:

```
┌─────────────────────────┐
│ imed                    │
│                         │
│   Powering down in...   │
│           3             │
│       second(s)         │
│                         │
│                         │
└─────────────────────────┘
```

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

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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 C2 Communications Protocol Programmer's Guide.

3.4 CHANNEL, CENTRAL INFORMATION DISPLAYS AND ALARM RESPONSE PROCEDURES

In the normal operating mode four types of visual displays are presented to the operator: prompts, advisories, alarms and malfunctions. These messages may be scrolled or flashed on the Channel Information message display or presented statically in conjunction with the specific Central Information Display screens.

Table 3-2 lists the Message Displays presented by the PC-2TX, identifies the meaning and defines the recommended operator response.

Table 3-2. Visual Message Displays

ADVISORIES

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 two 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.	Replace IV container, turn off PC-2TX, or set up a new infusion.
	ECD plugged into PC-2TX, but not attached to drip chamber.	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 sensed, remaining battery operational life is limited.	Connect AC power cord to outlet; 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.
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 battery checked.

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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 battery checked.
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.
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 equalling 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 P/C 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.
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 ≈2 minutes by pressing the SILENCE control.

Prompt	Meaning	Response
Select Option/Cancel Audio: prompt Visual: continuous display	The OPTIONS/EDIT key was pressed.	Select the appropriate System or Channel option. Press CANCEL to exit menu.
24 Hour Limit Exceeded Audio: prompt Visual: continuous display for 3 seconds	A combination of Time Interval and Number of Doses that would exceed the maximum allowable 24 hour Multidose infusion was entered.	Re-enter an appropriate combination of Time Interval and Number of Doses to result in a total duration of 24 hours or less.
Enter Rate Value Audio: prompt Visual: continuous display	Begins following press of POWER ON and CHANNEL SELECT controls, or if START control is pressed with rate set to "0".	Press RATE control and enter rate.
Enter VTBI Value Audio: prompt Visual: continuous display	Begins following press of VTBI control, or if START control is pressed with VTBI set to "0".	Press VTBI control and enter VTBI.
Press START Audio: prompt Visual: continuous display	Begins approximately 3 seconds after last press of data entry controls if neither parameter is zero, or approximately 12 seconds after an alarm is cleared, or approximately 2 minutes after PAUSE is pressed.	Press START control.
Select Channel Audio: prompt Visual: continuous display	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: prompt 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.
Enter Dose Interval Audio: prompt Visual: continuous display	Part of multidosing infusion set up sequence.	Enter the desired dose interval (range 1-24 hours).
Enter Duration Audio: prompt Visual: continuous display	Begins after entering VTBI in a Volume/Time infusion	Enter the desired duration of the infusion.
Dose Interval too Short Audio: prompt Visual: continuous scroll for 3 seconds	A multidose interval was entered that the pump could not infuse based on the Rate and VTBI/dose setting.	Enter appropriate interval Rate and VTBI/dose setting.

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Prompt	Meaning	Response
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".
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 which result in an infusion rate that is out of range have been entered.	Enter appropriate flow rate parameters.
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.
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 cancel out.
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.

Prompt	Meaning	Response
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.
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 (military time) was entered.	Enter an hour value ≤23 hours (military) or ≤11 hours (AM/PM).
P/C Mode Locked Audio: illegal key Visual: continuous display for 3 seconds	Channel Option #4 was selected when the P/C Mode was locked.	If P/C Mode change is desired, refer to Section 3.3.1.2 for System Configuration mode operation.
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 a delayed start or multidose infusion is 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 disabled option is required, refer to Section 3.3.1.2 for System Configuration mode operation.
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 display 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, 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.

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Prompt	Meaning	Response
Invalid Rate 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.
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.
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.	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 set up a Secondary infusion while the Primary infusion was in KVO.	Reset the Primary rate and VTBI values within the normal operating range.
>24 hour 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 CHANNEL OFF deletes the program.	Press ENTER retains the program; pressing CHANNEL 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 stops 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 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 seconds	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.)
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.

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Alarm	Meaning	Response
"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: • Low Battery flashes alternately on Channels A and B message displays Central Display: BATTERY DISCHARGED ALL CHANNELS PAUSED PLUG IN TO RESUME OR PRESS OFF TO POWER DOWN	Low battery voltage detected. Infusions on both channels stop.	Connect AC power cord to power source. Press CHANNEL OFF control to turn off the PC-2TX. Press POWER ON, press CHANNEL SELECT, reenter rate and VTBI. Press START to resume the infusion(s).

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:	A software-detected malfunction has occurred. Depending on the type of malfunction, infusion stops on the affected channel or both channels.	Connect AC power cord to power source. Press channel OFF control to turn off the affected channel(s). Press POWER ON, press CHANNEL SELECT, reenter rate and VTBI, and press START to resume the infusion(s).

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"

Malfunction	Meaning	Response
CHANNEL MALFUNCTION Audio: malfunction Visual: Channel Display: • Rate displays flash "- - - -" • ALARM and STANDBY indicators flash Central Display: CHANNEL MALFUNCTION REMOVE IV SET IMMEDIATELY. A MALFUNCTION HAS BEEN DETECTED ON THIS CHANNEL. THIS INFUSION HAS BEEN STOPPED.	A software-detected malfunction has occurred on the indicated channel. Infusion on affected channel stops.	Immediately, remove IV set(s) and press CHANNEL OFF to silence alarm. Infusion(s) on non-affected channels may be continued pending availability of a fully operational pump. Central Display: • "ERROR XXX" displays for appropriate channel.

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Malfunction	Meaning	Response
RATE DISPLAY FAILURE Audio: malfunction Visual: Channel Display: • Rate(s) flash • "Rate Display Error - Rate = xxx" scrolls Central Display: A Rate Display failure has been detected. Infusion(s) will continue as programmed. Service pump as soon as possible. (Press ENTER to continue)	Software has detected a malfunction in one or more of the rate displays. Infusions on both currently operating channels continue.	Replace with operable unit as soon as possible. Press OFF to power down the PC-2TX.
AUDIO FAILURE Audio: malfunction Visual: Channel Display: • Audio Failure Central Display: AUDIO FAILURE A PROBLEM HAS BEEN DETECTED WITH THE PUMP'S AUDIO. TAKE PUMP OUT OF SERVICE (Press ENTER to continue)	Software has detected a malfunction of the audio system. Infusions on both currently operating channels continue.	Replace with operable unit as soon as possible. Press OFF to power down the PC-2TX.
(HARDWARE-DETECTED MALFUNCTION) Audio: malfunction Visual: none	A hardware-detected malfunction has occurred. Infusion on both channels stop.	Ensure that the AC power cord is connected to an external power source. Press POWER ON or OFF control to reset the audio and turn off electrical power to the PC-2TX. (If audio persists, press POWER ON, then SILENCE. Perform normal power off procedures and replace PC-2TX with operable unit.)

3.5 AUDIO ALERT SYSTEM

The PC-2TX is programmed to produce eight distinct audio alerts.

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
alarm	three selectable profiles (selectable in System Configuration) **Profile 1** - 500msec ON, 1500msec OFF, 500msec ON, 1500msec OFF... **Profile 2** - 50msec ON, 50msec OFF, 400msec ON, 1sec OFF... **Profile 3** - 400msec ON, 500msec OFF, 400msec ON, 500msec OFF...	variable volume; can be silenced
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

3.6 NURSE CALL FEATURE

The PC-2TX incorporates a Nurse Call feature that will activate an externally powered nurse call system when the instrument initiates any of the following conditions:

Alarms:	All
Malfunctions:	All
Prompts:	PRESS START
Advisories:	INFUSION COMPLETE-KVO, EMPTY CONTAINER-KVO, LOW BATTERY and REPLACE BATTERY