SECTION 4
Basic Operation

Getting Started

UNPACKING

CAUTION: PRODUCT DAMAGE MAY OCCUR UNLESS PROPER CARE IS EXERCISED DURING UNPACKING AND INSTALLATION. DO NOT USE THE PLUM A+ IF IT APPEARS DAMAGED IN ANY WAY. THE BATTERY MAY NOT BE CHARGED UPON RECEIPT.

Inspect the Plum A+ packaging for possible shipping damage. If damage is found, contact the delivery company immediately.

Use care when unpacking the infuser. Retain the packing slip and save all packing material in case the infuser is damaged or fails the infuser self-test and has to be returned to Hospira.

Inspect thoroughly for damage.

CAUTION: IF THE PLUM A+ APPEARS TO BE DAMAGED, CONTACT HOSPIRA, INC.

To set up, connect the AC (mains) cord to a properly grounded receptacle, unless temporary battery operation is desired.

NOTE: Use AC (mains) power whenever possible. Store the infuser connected to AC (mains) to confirm a fully charged battery for emergencies.

NOTE: If the quality of the earth grounding source is in doubt, use battery power.

CAUTION: THE PLUM A+ SYSTEM IS DESIGNED TO OPERATE NORMALLY IN THE PRESENCE OF MOST ENCOUNTERED ELECTROMAGNETIC INTERFERENCE (EMI) CONDITIONS. IN THE EVENT OF EXTREME LEVELS OF INTERFERENCE, SUCH AS ENCOUNTERED NEXT TO AN ELECTROSURGICAL GENERATOR, CELLULAR TELEPHONES, OR 2-WAY RADIOS, IT IS POSSIBLE THAT THE NORMAL OPERATION OF A SENSOR OR MICROCOMPUTER MIGHT
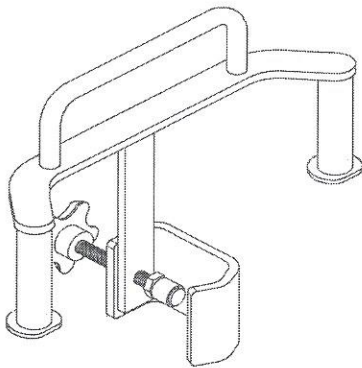
BE DISRUPTED. OPERATION OF THE INFUSER UNDER THESE CONDITIONS SHOULD BE AVOIDED.

TANDEM CARRIER INSTRUCTIONS

NOTE: The Plum A+3 is NOT to be used with the tandem carrier. It is only to be used with the Plum A+ and other single-channel devices.

The Plum A+ may be safely and conveniently mounted on an IV stand or on a tandem carrier mounted on an IV stand.

Always mount the tandem carrier (List# 12270-01) to the pole before attaching the infuser(s) to the tandem carrier.

Make sure tandem carrier clamp is attached firmly to pole.

Make sure infusers are firmly attached to tandem carrier.

This section details the Plum A+ instrument setup procedures.

SYSTEM SELF-TESTS

The infuser performs a suite of System Self-Tests when power is applied to confirm readiness for use.

Failure during the Self-Tests is reported as a Malfunction Condition.

CAUTION: DO NOT PLACE THE PLUM A+ IN SERVICE IF IT FAILS THE SYSTEM SELF-TESTS.

Connect the AC power (mains) cord to an AC power receptacle, then confirm that the Charging/Line indicator illuminates (above the [ON/OFF] key on the front panel).

A systematic self-testing of the processing, delivery, and safety systems is performed whenever the Plum A+ is turned on, to verify readiness for operation.

NOTE: If the quality of the earth grounding source is in doubt, use battery power.

Press the [ON/OFF] key to turn the power on. Check screen display and listen for a beep to indicate the audio is working. Wait for the self-tests to complete. If successful, put a fully primed macro cassette into the cassette door and close the door. See *Loading Cassette* in *Section 3* for details of correct procedure.

When the Charging/Line indicator is off and the battery symbol on the display is flashing, this indicates that the Plum A+ is operating on low battery power and should be recharged.

CAUTION: WHEN THE BATTERY IS REMOVED FROM THE PLUM A+, DO NOT OPERATE ON PATIENTS. USE OF A PROPERLY MAINTAINED AND CHARGED BATTERY HELPS CONFIRM PROPER OPERATION.

To confirm battery is fully charged, connect the Plum A+ to AC (mains) power for a minimum of six hours while in the OFF mode.

If an alarm occurs during the power on self-test, identify the alarm message, then take corrective action (see *Section 7, Alarms and Troubleshooting*).

Turn infuser OFF, then back ON. If the self-test alarm recurs, remove the infuser from service and contact the local Hospira representative.

The infuser performs a suite of System Self-Tests when power is applied to confirm readiness for use.

Failure during the Self-Tests is reported as a Malfunction Condition.

DATA RETENTION

Delivery program settings and programming option selections are retained in non-volatile memory. If the Plum A+ has been turned off for longer than four hours, all delivery settings are cleared and programming option selections are restored to their default selections for next use.

Power On

1 Press (ON/OFF) to Power On the Plum A+ and the System Self-Tests Screen is displayed.

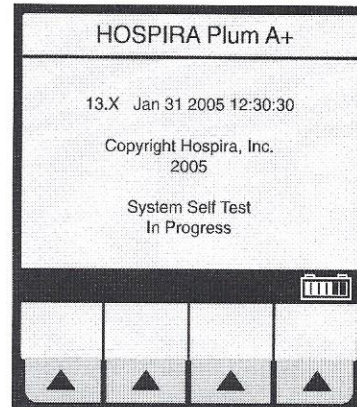After self-testing successfully completes, the display will proceed to the next screen.

Programming the infuser may begin during the cassette check phase of the start-up testing.

```
            HOSPIRA Plum A+

       13.X   Jan 31 2005 12:30:30

         Copyright Hospira, Inc.
                  2005

           System Self Test
             In Progress
                                 [IIII]

     ▲      ▲      ▲      ▲
```

```
**SCREENS SHOWN IN THIS MANUAL
ARE EXAMPLES ONLY AND DON'T
NECESSARILY REFLECT ACTUAL
CLINICAL PRACTICE**
```

NOTE: If battery is missing or defective, a "Battery not installed" message with a "Continue without battery" prompt will appear (AC power only).
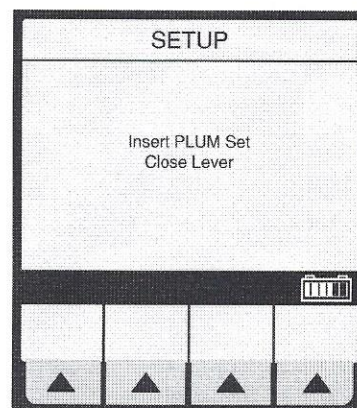
CAUTION: WHEN THE BATTERY IS REMOVED FROM THE PLUM A+, DO NOT OPERATE ON PATIENTS. USE OF A PROPERLY MAINTAINED AND CHARGED BATTERY HELPS CONFIRM PROPER OPERATION.

2 To set up the Plum A+, insert selected Plum Set and close cassette holder door lever.

NOTE: If cassette is already inserted, this screen is skipped.
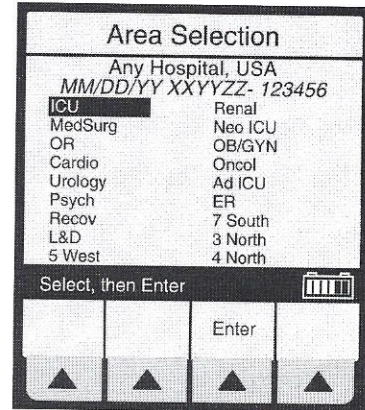If Infuser ID Entry screen appears, consult your hospital's biomed personnel.

```
               SETUP



             Insert PLUM Set
              Close Lever

                                 [IIII]

     ▲      ▲      ▲      ▲
```

The Area Selection screen will appear if your system has been programmed with the Hospira

MedNet accessory. Use 🔘 to choose. If only one CCA has been entered, it becomes the default and this screen is skipped.

Area Selection
Any Hospital, USA
MM/DD/YY XXYYZZ- 123456

ICU	Renal
MedSurg	Neo ICU
OR	OB/GYN
Cardio	Oncol
Urology	Ad ICU
Psych	ER
Recov	7 South
L&D	3 North
5 West	4 North

Select, then Enter

		Enter	
▲	▲	▲	▲

NOTE: To change the CCA while infusing, *see page 6-12, Changing CCA While Infusing.*

If not using MedNet, the display will go straight to the "Clear Settings?" option.

Example of Clear Settings Screen

A	SETUP	B

Clear Settings?

Yes clears ALL settings

Yes			No
▲	▲	▲	▲

3 The on-screen message "Clear Settings?" may appear. Select ▲ *[Yes]* to clear all settings.

Clear ALL settings when changing patients or multiple programming parameters.
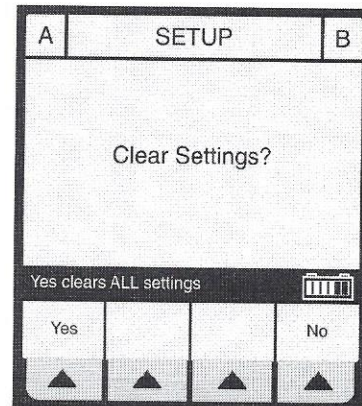
NOTE: This clears all delivery parameters, such as Rate and VTBI on both lines, as well as setting items, such as the KVO and Nurse Callback options, to their default values.

NOTE: If no settings currently exist or all settings are zero, this screen will be bypassed.

Simple Delivery

Example of MedNet Main Delivery Screen (with cleared settings). The selected area is displayed at the bottom.

> **SCREENS SHOWN IN THIS MANUAL ARE EXAMPLES ONLY AND DON'T NECESSARILY REFLECT CURRENT ACTUAL PRACTICE**
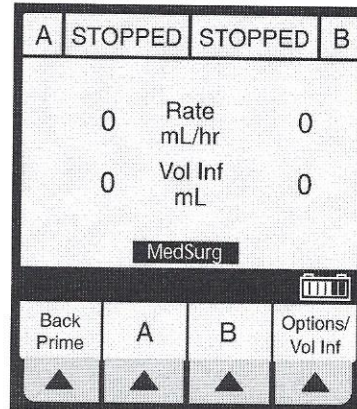
NOTE: For clarity, whole number font sizes will appear larger than fractional number font sizes (numbers on the right-side of the decimal).
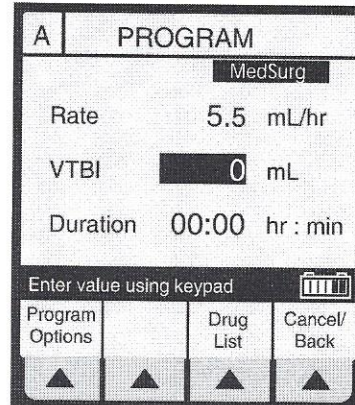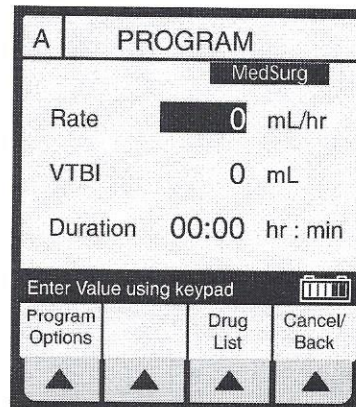
1 To Program a delivery rate, select ▲ *[A]*.

2 To enter delivery rate, use numeric keypad.

3 Use (SELECT) to move down to the VTBI field.

4 To enter VTBI amount, use keypad.

NOTE: While the VTBI is being entered, the duration is automatically computed. If the computed value is greater than 99:59, dashes (- -) appear in place of hours.
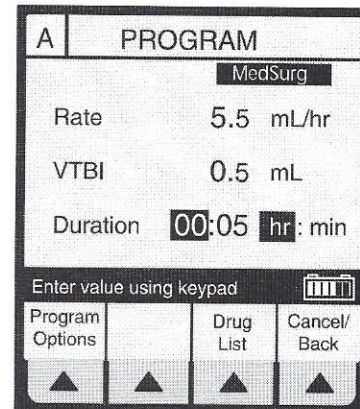
5 Use (SELECT) to move down to the DURATION field.

If auto-calculated Duration is acceptable, skip to step 9.

6 Use keypad to change/enter the hours part of duration if desired.

NOTE: When all parameters are displayed, changing any one parameter will result in other parameters automatically being computed. To understand the Automatic Calculation feature, *see Examples of Automatic Calculation on page 6-10.*

A	PROGRAM
	MedSurg
Rate	5.5 mL/hr
VTBI	0.5 mL
Duration	00:05 hr : min
Enter value using keypad	
Program Options	Drug List	Cancel/Back

7 Use (SELECT) to move from hours to minutes.

NOTE: The maximum hours allowed is 99 and the maximum minutes is 59.

8 Use keypad to enter minutes.

9 Press (START).

CAUTION: VERIFY **ALL VALUES** BEFORE STARTING INFUSION.

Program Confirmation screen will appear. If correct, press ▲ *[Yes]* to begin infusion.

A	PROGRAM
	MedSurg
	Delivery will be:
Drug	No Drug Selected
Rate	5.5 mL/hr
VTBI	0.5 mL
	Confirm Program?
Yes	No
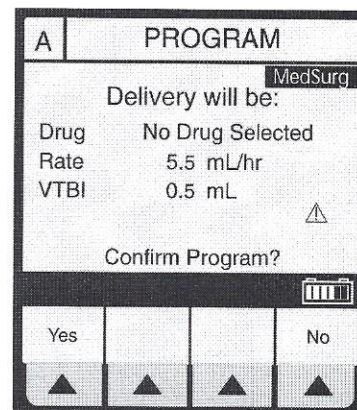
Example of Main Delivery
Screen just after being
programmed and started.

NOTE: The Line A Fluid Flow
Indicator also will flash to indicate
pumping.

NOTE: VTBI (volume *to be* infused)
values over 100 mL are displayed
truncated. This means that the
number displayed *rounds-down* to the last whole number (e.g.,
105.7 would be displayed as 105). An example would be the
Programming or Pumping screens.

NOTE: VI (volume infused) values over 100 mL are displayed
rounded. This means that the number displayed rounds-off to
the *nearest* number (e.g., 105.7 would be displayed as 106, but
105.3 would be displayed as 105). An example would be the
Program Options screen.

Titration

1   Select Line ▲ *[A]* (or ▲ *[B]*) at
the Main Delivery Screen.
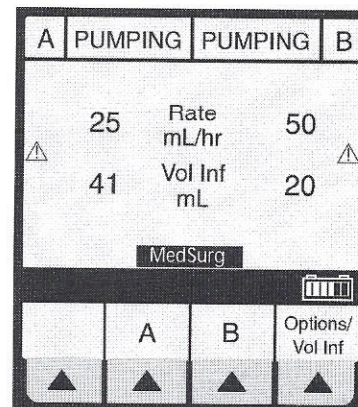
2 Enter the desired Rate using the keypad.

NOTE: When Rate is changed, the duration is automatically recomputed using the current VTBI. To understand the Automatic Calculation feature, *see Examples of Automatic Calculation on page 6-10.*

```
┌─────────────────────────────┐
│ A │   PROGRAM               │
│                  ┌─────────┐│
│                  │ MedSurg ││
│                  └─────────┘│
│  Rate        █15█  mL/hr    │
│                             │
│  VTBI         50   mL       │
│                             │
│  Duration   03:20  hr : min │
│                             │
├─────────────────────────────┤
│ Enter Value using keypad  ▥ │
│ Program        Drug  Cancel/│
│ Options        List  Back   │
│   ▲       ▲     ▲      ▲    │
└─────────────────────────────┘
```

3 Press (**START**).

CAUTION: VERIFY **ALL VALUES** BEFORE STARTING INFUSION.

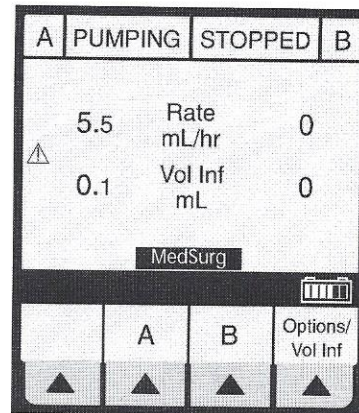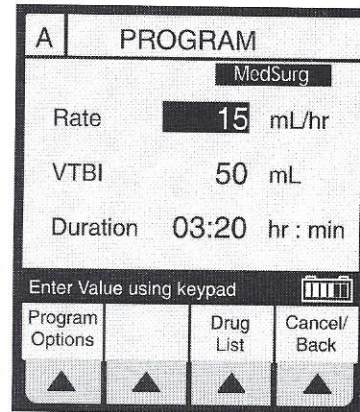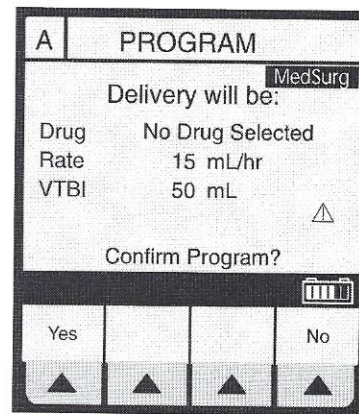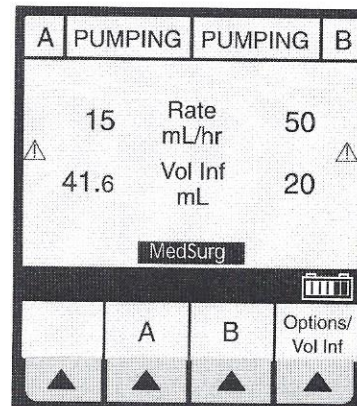Program Confirmation screen will appear. If correct, press ▲ *[Yes]* to begin infusion.

NOTE: During Titration, infuser continues to deliver at previous parameters until new program is confirmed.

```
┌─────────────────────────────┐
│ A │   PROGRAM               │
│     Delivery will be: ┌─────┐│
│                  │MedSurg││
│  Drug     No Drug Selected  │
│  Rate        15 mL/hr       │
│  VTBI        50 mL          │
│                        ⚠    │
│      Confirm Program?       │
│                        ▥    │
│  Yes                     No │
│   ▲     ▲     ▲      ▲      │
└─────────────────────────────┘
```

Example of Main Delivery Screen after being titrated.

NOTE: Volume Infused is an incrementing value which is cleared in ▲ *[Options/Vol Inf]*.

The following 3 screens are examples of changed values.

```
┌─────────────────────────────┐
│ A │ PUMPING │ PUMPING │ B   │
│                             │
│        15    Rate    50     │
│ ⚠           mL/hr       ⚠   │
│       41.6  Vol Inf  20     │
│              mL             │
│               ┌─────────┐   │
│               │ MedSurg │   │
│               └─────────┘ ▥ │
│          A      B    Options/│
│                       Vol Inf│
│    ▲     ▲      ▲      ▲    │
└─────────────────────────────┘
```

Example of changed rate.

4 From the Main Delivery Screen, select ▲ *[A]*.

5 Use keypad to change the RATE value.

```
┌─────────────────────────────┐
│ A │    PROGRAM              │
│                  MedSurg     │
│   Rate         15  mL/hr     │
│                              │
│   VTBI         50  mL        │
│                              │
│   Duration   03:20  hr : min │
│                              │
│ Enter Value using keypad  ▭▭▭▭│
│ Program          Drug  Cancel/│
│ Options          List   Back  │
│   ▲      ▲      ▲      ▲      │
└─────────────────────────────┘
```

NOTE: The display time is only accurate to ± one minute. As shown in this example, the delivery shows 3 hours and 20 minutes (not 3 minutes and 20 seconds).

6 Press (**START**) .

Program Confirmation screen will appear. If correct, press ▲ *[Yes]* to begin infusion.

NOTE: [START] accepts the change. Delivery is changed to the new RATE and DURATION and display returns to Main Delivery Screen.

Example of Changed VTBI value.

7 Use (**SELECT**) to highlight the VTBI field.

8 Use the keypad to change the VTBI value.

```
┌─────────────────────────────┐
│ A │    PROGRAM              │
│                  MedSurg     │
│   Rate         15  mL/hr     │
│                              │
│   VTBI        100  mL        │
│                              │
│   Duration   06:40  hr : min │
│                              │
│ Enter Value using keypad  ▭▭▭▭│
│ Program          Drug  Cancel/│
│ Options          List   Back  │
│   ▲      ▲      ▲      ▲      │
└─────────────────────────────┘
```

NOTE: When the VTBI is changed, the Duration is recomputed with respect to the current Rate. To understand the Automatic

Calculation feature, *see Examples of Automatic Calculation on page 6-10.*

9 Press (**START**).

Program Confirmation screen will appear. If correct, press ▲ *[Yes]* to begin infusion.

NOTE: [START] accepts the change. Delivery is changed to the new VTBI and DURATION and the display brings up the Confirmation screen before returning to the Main Delivery Screen.

Example of changed DURATION field.

10 Use (**SELECT**) to highlight the Duration field, then use the keypad to change its value.

NOTE: When DURATION is changed, RATE is automatically recomputed using the current VTBI value. To understand the Automatic Calculation feature, *see Examples of Automatic Calculation on page 6-10.*

A	PROGRAM	
		MedSurg
Rate	150	mL/hr
VTBI	100	mL
Duration	00:40	hr : min

Enter Value using keypad

Program Options		Drug List	Cancel/ Back
▲	▲	▲	▲

11 Press (**START**).

CAUTION: VERIFY **ALL VALUES** BEFORE STARTING INFUSION.

Program Confirmation screen will appear. If correct, press ▲ *[Yes]* to begin infusion.