CADD®-Lynx

Remote Monitoring System

For use with CADD-Legacy® PLUS Ambulatory Infusion Pumps. Not compatible with CADD-Legacy® PCA, CADD-Legacy® 1, CADD-Micro®, CADD-Prizm®, or CADD® pumps.

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Introduction

The CADD®-Lynx Remote Monitoring System is used to monitor alarms and the volume of medication delivered by one or more CADD-Legacy® PLUS ambulatory infusion pumps in a laboratory environment.

NOTE:

- ***THIS SYSTEM IS NOT INTENDED FOR HUMAN USE. This system is designed specifically for use in animal research laboratories. Not intended for veterinary use.***
- *This guide pertains only to the use of the CADD®-Lynx Remote Monitoring System. For detailed instructions, specifications, warnings, warranty, and additional information on operating CADD-Legacy® pumps, or using the accessories mentioned in this guide, refer to the* ***Operator's Manual*** *or* ***Instructions for Use*** *supplied with each product.*
- *This equipment has been tested and found to comply with the limits for a Class A digital device, peruant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.*

WARNING:

- **Do not use the CADD®-Lynx Remote Monitoring System if it becomes damaged or broken, if wires become exposed due to wear, or if connectors are bent or damaged in any way. Shock or other hazard may result, and could cause death or serious injury.**
- **Do not expose the CADD®-Lynx Remote Monitoring System to rain or direct spray, or immerse in water or other liquids. Shock or other hazard may result, and could cause death or serious injury.**

CAUTION:

- **Do not use an extension cord to provide power to the AC Adapter.**
- **Do not place cables where they may be subject to damage.**
- **Do not immerse the CADD®-Lynx Remote Monitoring System components in liquid. Clean only with a damp cloth.**
- **Do not use the CADD®-Lynx Remote Monitoring System with any device or pump not previously specified. Use only products or components that are recommended by SIMS Deltec, Inc.**
- **During use, the AC Adapter can become warm; this is normal. However, if the AC Adapter feels hot to the touch, this may indicate that it is damaged. Remove the AC Adapter from the AC wall outlet and have it replaced.**
- **Changes or modifications not expressly approved by SIMS Deltec, Inc. could void the user's authority to operate the equipment.**

Equipment and Software Requirements

To setup a CADD®-Lynx Remote Monitoring System, the following equipment is required:

- CADD-Legacy® PLUS Ambulatory Infusion Pump, Model 6500
- One CADD®-Lynx Transmitter for each CADD-Legacy® pump to be monitored
- One CADD®-Lynx Pouch for each CADD-Legacy® pump to be monitored (optional)
- Two CADD®-Lynx Receivers for up to 40 transmitters. Additional receivers may be required, depending on radio frequency (RF) reception characteristics of the room in which monitoring takes place.
- Pentium 200 or faster Personal Computer (PC) with the following specifications:
  - Hard drive with at least 20 MB available (additional hard drive space will be required for data files)
  - 32 MB RAM
  - CD-ROM drive
  - Windows 95 or newer
  - Mouse or other pointing device
  - At least one available RS232 port

- Modem if paging function is to be used
- Sound card and speakers

- CADD®-Lynx Remote Monitoring System Software
- At least one CADD-Legacy® AC Adapter for every set of three receivers connected to a separate RS232 port of the monitoring PC
- RS232 cables. The number and length of cables will vary depending on the particular installation.

NOTE: *Cables can be purchased at any computer equipment supplier. Deltec does not supply RS232 cables.*

Installing CADD®-Lynx Receivers

Two CADD®-Lynx Receivers are required for every 40 CADD®-Lynx Transmitters. The transmitters must be installed within range of a receiver, no more than 50 feet from the receiver. Depending on the Radio Frequency (RF) characteristics of the room in which monitoring takes place, additional receivers may be required to ensure that all RF messages can be received. Deltec recommends that at least two receivers be installed in every room. You will need a power drill and 3/16" drill bit to mount the receivers.

Selecting locations for CADD®-Lynx Receivers

Choose a location in the room which: is within range of the transmitters; is close to a working power outlet; allows the RS232 cables to be conveniently routed from the receiver to the PC running the monitoring program; is as free from moisture as possible. The first receiver (Receiver-1) will be connected to AC power and the monitoring PC. Additional receivers will be mounted opposite Receiver-1, and that location should also provide space for routing RS232 cables, and be as free of moisture as possible.

Mounting and Connecting CADD®-Lynx Receivers

1. Using the holes in the mounting bracket as a guide, drill two one-inch deep holes. Insert the anchors into the drilled holes and push completely in. Insert the two screws provided into the anchors and screw in loosely; do not fully tighten the screws at this point. Place the mounting bracket over the screws, and slide down so the screws fit into the elongated slots at the

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top of the screw holes. Fully tighten screws. See Figure ❶, page 16.

2. Run an RS232 cable from an available RS232 port on the monitoring PC to the OUT (toward the computer) Port on the receiver. Connect the CADD-Legacy® AC Adapter to the receiver. This receiver is now Receiver-1.

   NOTE: *In order for the system to work, the AC Adapter must be connected to Receiver-1.*

3. Install the second receiver in a location close to the transmitters being monitored, but opposite from Receiver-1, as instructed in step 1.

4. Run an RS232 cable from the IN (from AUX. receivers) port of Receiver-1 to the OUT port of the second receiver See Figure ❷, page 17. The second receiver does not require an AC adapter as Receiver-1 powers it through the RS232 cable.

   NOTE: *If the room to be monitored is large or has poor RF transmission characteristics, additional receivers may be required.*

If needed, use the same process to install an additional receiver. The third receiver will be connected to the second receiver via an RS232 cable in a "daisy-chain" fashion, i.e., RS232 cable runs from the IN (from AUX. receivers) port of the second receiver to the OUT (toward the computer) port of the third receiver. Do not install more than three receivers in a chain from a single AC adapter. If additional receivers are needed, configure a second chain of receivers, connected to a second AC adapter. Connect the OUT port from the first receiver in the second chain to the IN port of the last receiver in the first chain.

To setup a second monitoring room, use the same procedure, except connect the first receiver in the second room to the second open RS232 port on the monitoring PC. See Figure ❸, page 18.

A single PC with four open RS232 ports can be used to monitor four rooms set up as described above.

Installing the CADD®-Lynx Monitoring Software

1. Insert the CD-ROM in the CD-ROM Drive.
2. Click the Windows **Start** button and select **Run.**
3. In the open box, type "d:\setup" (or replace "d" with the appropriate letter for the CD-ROM on your system).
4. Click OK.
5. Follow the instructions on the screen.

Configuring the Software

Configuring the software means designating which RS232 ports have receivers attached and, if used, which port has a modem attached.

To configure the monitoring application for receivers:

1. Run the program and Select "Setup" and "Serial Ports" from the menu bar.
2. For each set of receivers connected to the monitoring PC, select a Port (A, B, C, or D) and the appropriate

RS232 port number (1-16). After selecting a port number the program will give the status of the port and the number of receivers that are connected to the port.

See the program's Help files for additional information.

To configure the monitoring application for the modem:

1. Run the program and Select "Setup" and "Serial Ports" from the menu bar.
2. Select the modem's RS232 port.

See the program's Help files for additional information.

Setting Up a CADD-Legacy® Pump and Transmitter

1. Program the CADD-Legacy® pump to the desired delivery parameters as instructed in the Operator's Manual supplied with the pump.
2. Without turning the pump off, connect a CADD®-Lynx Transmitter to the pump. (See Figure ❹, page 20) After a short delay, the pump will sound a series of beeps.

   NOTE: *If the beeps do not sound when the pump and transmitter are connected, the pump and transmitter are not communicating and no RF messages will be sent. See the troubleshooting section for help.*

   Once connected, the pump will no longer sound audible alarms (except in the case of depleted battery or system error). In all other respects the CADD-Legacy® pump will operate normally.
3. If desired, use a CADD®-Lynx Pouch to securely house the pump and CADD®-Lynx Transmitter prior to installing them on the animal subject.

Instructions for the Pouch

The CADD®-Lynx Pouch is designed to securely hold a CADD-Legacy® pump with an attached 50- or 100-ml Medication Cassette Reservoir, and CADD®-Lynx Transmitter.

Prepare the Pump

Before using the pouch, program the pump and attach a 50- or 100-ml Medication Cassette Reservoir. Prime the fluid path and connect the tubing to the access device.

CAUTION: Remove all air bubbles from the Medication Cassette Reservoir and tubing before connecting to an access device.

Placing the Components into the Pouch

See Figure ❹, page 20

1. Put the transmitter in the small pocket inside the pouch with the device label facing up. Secure with the VELCRO® strap.
2. Plug the cable from the transmitter into the pump.
3. Put the pump face down in the pouch so the display shows through the plastic window.
4. Use the VELCRO® strap inside the pouch to hold the pump and attached Medication Cassette Reservoir in place. Loop the strap under the bottom of the

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Medication Cassette Reservoir and secure it to the VELCRO® strip inside the pouch. Be careful not to kink the tubing.

5. Route the tubing through the gap at the end of the zipper and zip the pouch shut.
6. Release the clamps and start the pump. You may access the pump's keys through the plastic window.

Securing the pouch

To secure the pouch, use the strap provided to hang the pouch from a pole, or place the pouch in a saddlebag (not provided by SIMS Deltec, Inc.). (Figure ❺, page 22)

WARNING:

If the pump is dropped or hit, the battery door or tabs may break. Do not use the pump if the battery door or tabs are damaged because the batteries will not be properly secured; this may result in loss of power, nondelivery of drug, and, depending on the type of drug being administered, death or serious injury to the animal. If power is lost while the pump is running, an alarm will sound.

Prior to placing the pump in the pouch, make sure that the cassette is attached properly. An improperly attached or detached cassette could result in unregulated gravity infusion of medication from the fluid container or a reflux of blood, which could result in death or serious injury to the animal.

Troubleshooting

1. If no beeps sound when a transmitter is connected to a CADD-Legacy® pump
   - ➢ Verify that the pump is powered up.
   - ➢ Try a second transmitter. If beeps sound when the second transmitter is attached, the first transmitter may be damaged.

Cleaning the System

CAUTION:

- **Do not immerse the system in cleaning fluid or water. Do not allow solution to soak into the system or enter the connectors. Moisture build-up inside the pump may damage the pump.**
- **Do not clean the system components with acetone, other plastic solvents, or abrasive cleaners, as damage to the components may occur.**

Routinely clean the system components to keep them free of dirt, liquids, and foreign objects.

Use any of the following solutions to clean the system components:

- ➢ Soap solution
- ➢ Benzalkonium Chloride concentrate (0.13%)
- ➢ Glutaral Concentrate, USP (2%)
- ➢ 10 % solution of household bleach (one part household bleach to nine parts water)
- ➢ Alcohol, USP (93%)

- Isopropyl Alcohol, USP (99%)
- Chlorohexidine (70%)
- PDI — Super Sani-Cloth®
- Mada Medical — MadaCide

1. Dampen a soft, lint-free cloth with cleaning solution and wipe the exterior surface of the system component. ***Do not allow the solution to soak into the system component.***
2. Wipe the entire surface dry with another soft, lint-free cloth. Allow the system component to dry completely before use.

Specifications (nominal)

Transmitter Specifications

Size	9.2 cm × 5.8 cm × 2.7 cm *[3.6 in. × 2.3 in. × 1.1 in.]* excluding input cable
Weight	71 g *[2.5 oz.]*
Transmit Frequency	418 MHz
Power Source	Direct connect to CADD-Legacy® Infusion Pump Accessory Jack
Operating Temperature	2°C to 40°C *[35°F to 104°F]*
Storage Temperature	-20°C to 60°C *[-4°F to 140°F]*
Humidity	not less than 20% or greater than 90% relative humidity

Receiver Specifications

Size	16.5 cm × 10.9 cm × 6.4 cm *[6.5 in. × 4.3 in. × 2.5 in.]* including mounting bracket, excluding antenna
Weight	415 g *[14.6 oz.]*
Receiver Frequency	418 MHz

Power Source	8 volts, 0.1A (use only CADD-Legacy® AC Adapters, supplied by SIMS Deltec, Inc.)
Antenna Length	17.8 cm *[7 in.]*
Operating Temperature	2°C to 40°C *[35°F to 104°F]*
Storage Temperature	-20°C to 60°C *[-4°F to 140°F]*
Humidity	not less than 20% or greater than 90% relative humidity

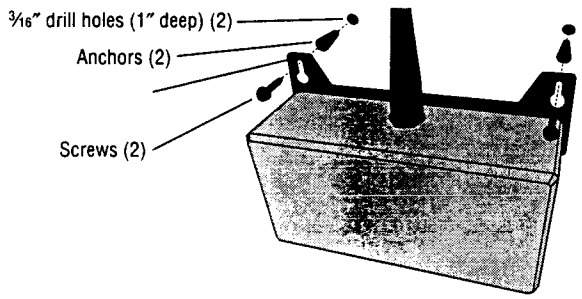
Development Standard

47 CFR 15 - Radio Frequency Devices.

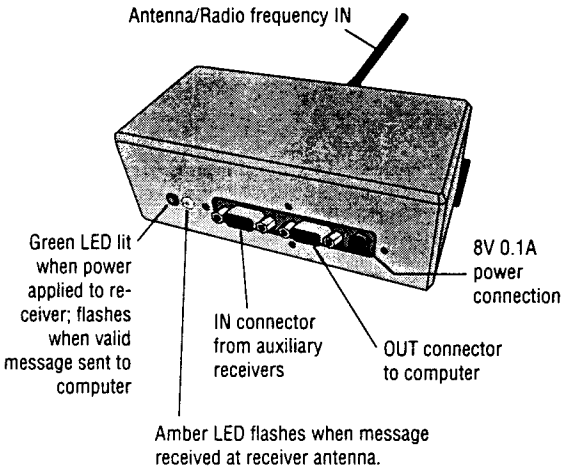
Definition of Symbols

REF	Reorder number
LOT	Lot number
SN	Serial number
⚠	Attention. Consult accompanying documents.
	Date of Manufacture

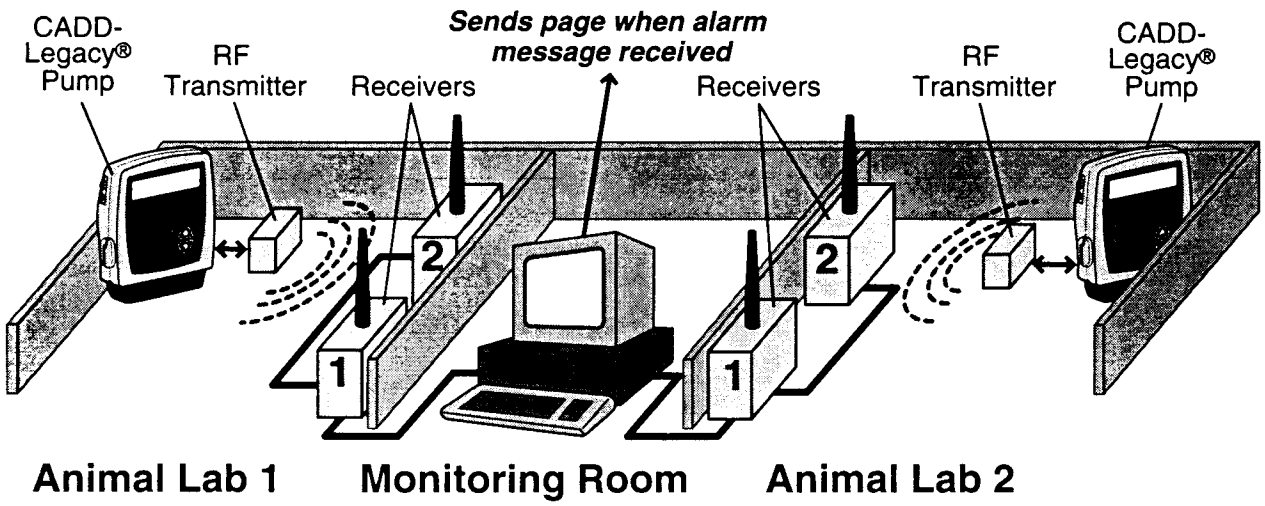
❶ Mounting the Receiver



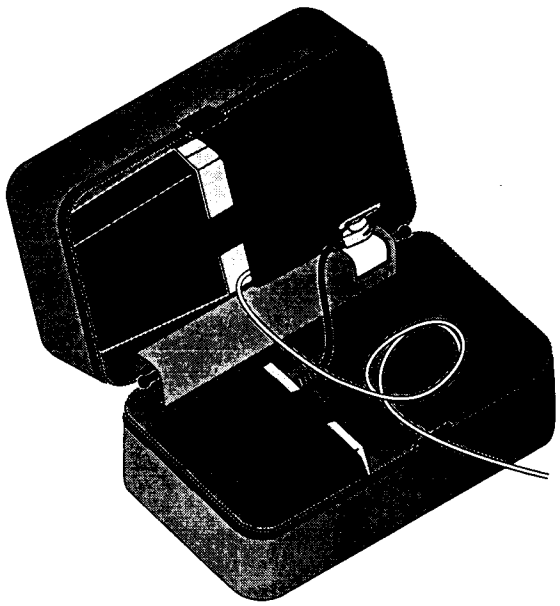
❷ CADD®-Lynx Receiver

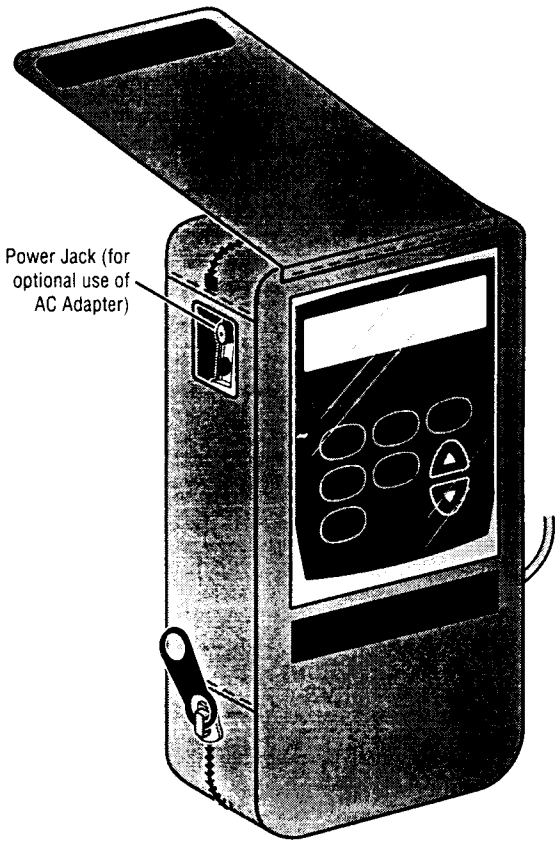


❸ CADD®-Lynx Remote Monitoring System



❹ Connecting CADD®-Lynx transmitter to pump and inserting into pouch





❺ Securing CADD®-Lynx Pouch

Placed in pocket of animal vest