EXHIBIT EE – AlarmView Admin. Manual

FCC ID# NMEAVTS1020

DATA CRITICAL

AlarmView™

Wireless Data Network System
Administrator's Manual

The AlarmView™ System is intended for use with Nellcor™ NPB-290, NPB-295, N-395, and N-3000 Pulse Oximeters

AlarmView™ Wireless Data Network System
Administrator's Manual

Table of Contents

Using this Manual

Procedures

As you work through this guide, steps to perform are numbered in sequence. For example:

1. Turn monitor off or disconnect cable from transmitter.

2. Press On/Off button on transmitter.

Warnings

Warnings alert you to potential serious outcomes (including death, injury, or adverse events) to the patient or user.

⚠️ Warnings are identified by this symbol.

Cautions

Cautions alert you to actions or conditions necessary for the safe use of the equipment to prevent damage or malfunction.

◆ Cautions are identified by this symbol.

Notes

Notes provide additional tips or hints to make it easier for you to work with the AlarmView System.

✎ Notes are identified by this symbol.

For Basic Operations

This manual contains information on AlarmView system specifications, system configuration, programming, testing, maintenance, and troubleshooting. Only qualified personnel should service the AlarmView System.

You should also review the *AlarmView™ Wireless Data Networking System User's Guide* carefully to gain a complete understanding of AlarmView System daily operations not covered in this manual*.*

Safety Information

System Warnings

Prescription - Federal (USA) law restricts this device to sale by or on the order of a physician.

Patient Monitoring – The most reliable method of patient monitoring combines close personal surveillance with correct operation of monitoring equipment.

Secondary Patient Monitoring System – The bedside monitor and designated station make up the patient monitoring system. Patient alarm conditions and notifications are primary functions of the patient monitoring system. **It is imperative that patient alarm conditions be monitored at the primary monitor or designated station. The AlarmView System is not intended for use as the primary source for patient alarm notification.**

Explosion Hazard – Do not use the AlarmView System in the presence of flammable anesthetics, skin cleaning agents, disinfectants or gases. Care must be taken when the device is used in oxygen-enriched environments (where room air contains 25% or more oxygen or nitrous oxide).

Electrical Shock – To reduce the risk of electrical shock, do not remove the cover of the AlarmView transmitter. Refer servicing to qualified personnel. Do not spray or spill any liquid on the AlarmView transmitter, power supply, pager, programmer, or any accessories, connectors, switches or openings in the equipment.

Pacemaker Interference – The programmer's speaker may cause interference with some pacemakers when used in close proximity. For patients with pacemakers, do not use the AlarmView programmer near a patient's chest area or place the programmer on a patient's chest.

⚠️ **Radio Frequency (RF) Radiation Safety** – The AlarmView transmitter is designed for use as a mobile device as defined by the Federal Communications Commission (FCC). Do not place the transmitter on a patient's or user's body. Ensure that the transmitter is located at least 20 cm (8 inches) from a patient or user's body. Location of the transmitter closer than 20 cm (8 inches) to a person's body will void the user's FCC authority to operate the equipment.

⚠️ **Transmitter Placement** – Do not place the AlarmView transmitter in any position where it might fall on and potentially harm a patient. Do not lift the transmitter or connected monitor by the interface cable or power cord, as they may become disconnected and cause the transmitter and/or monitor to fall on and potentially harm a patient.

⚠️ **Use During Defibrillation** – The AlarmView transmitter is not electrical shock-proof. When attached to a monitor that is attached to a patient during defibrillation or while an electrosurgical unit is in use, the transmitter may temporarily lose communication with the monitor and/or pages may be delayed.

⚠️ **Transmitter Range** – Users are not notified when the AlarmView pagers are out of range of the AlarmView transmitter. A range test must be performed (as indicated in the *Administrator's Manual*) to determine system boundaries.

⚠️ **System Redundancy** – To provide redundancy, the AlarmView System should consist of at least two pagers. If one pager is not receiving pages for any reason and the alarm is not silenced at the monitor, the second pager will be notified by a reminder page. If redundancy is not possible, caregivers should use extra vigilance in monitoring the patient and use the primary monitoring alarm.

⚠️ **Site Surveys** – Each institution is responsible for surveying existing equipment and ensuring no interference risk exists when introducing additional devices.

⚠️ **Transmission Bands** – Each institution is responsible for continued surveillance of transmission bands in the facility to prevent co-occupation of bands and cross-band interference.

⚠️ **Environment** – Data Critical does not assume responsibility for damage caused to the equipment by improper use or installation.

⚠️ **Home Use** – The AlarmView System is not intended for home use.

⚠️ **IEC Standards** – When connecting the AlarmView transmitter to any monitor, verify proper operation before clinical use. Both the transmitter and the monitor connected to it must be connected to a grounded outlet. Accessory equipment connected to the monitor's data interface must be certified according to IEC Standard 950 for data-processing equipment or IEC Standard 60601-1 for electromedical equipment. All combinations of equipment must be in compliance with IEC Standard 60601-1-1 systems requirements. Anyone who connects additional equipment to the signal input port configures a medical system and is therefore responsible for ensuring that the system complies with the requirements of system standard IEC Standard 60601-1-1 and the electromagnetic compatibility system standard IEC Standard 60601-1-2.

Section 1: AlarmView™ System Overview

⚠️ WARNING: As with all medical equipment, carefully route patient cabling to reduce the possibility of patient entanglement or strangulation.

⚠️ WARNING: Do not use an AlarmView transmitter, pager, or programmer that appears to be damaged.

⚠️ WARNING: The AlarmView wireless data network system is a secondary alarm notification system. The AlarmView System is intended to supplement and not to replace any part of the hospital's device monitoring procedures (including procedures regarding bedside pulse oximeters and responding to bedside oximeter alarms). The delivery of pages cannot be guaranteed or verified. Do not rely on the AlarmView System as the sole source of oximetry alarms.

⚠️ WARNING: An AlarmView System must always consist of at least two pagers, so that if one pager is temporarily not receiving pages (for example, because the batteries are exhausted or the user is out of range) and no one silences the alarm at the monitor, the second pager will be notified via a reminder page.

⚠️ WARNING: To ensure accurate performance and prevent device failure, do not subject the AlarmView System to extreme moisture, such as direct exposure to rain. Such exposure may cause inaccurate performance or device failure. The transmitter, transmitter power supply, programmer and/or pager must be removed from service and returned to Data Critical if they ever become submerged in liquid.

Introduction

The AlarmView System is a complete, secondary patient monitoring system. AlarmView notifies caregivers of patient events using a wireless network that supplements the primary notification system.

AlarmView is intended for use in hospitals and hospital-type facilities, such as surgical centers, subacute centers, special nursing facilities and sleep labs. Hospital use typically includes areas for general care, special procedure, intensive and critical care, and operating rooms. Intended patient population consists of all patients for whose physicians have ordered pulse oximetry monitoring.

AlarmView consists of the following three basic components:

- Transmitter
- Pager
- Programmer

At each bedside, a transmitter connects to the data port on the patient monitor. The transmitter detects alarms identified by the monitor, and sends the information to one or more text pagers worn by caregivers within 10 seconds for single alarms. Multiple alarms are sent within approximately 60 seconds.

The pager is worn by the caregiver responsible for the patient. It receives Alarm Pages in the form of text messages from the transmitter and displays immediate information about the patient and type of alarm. If an alarm condition continues or is not silenced at the monitor, a Reminder Page is sent once to all pagers in the care unit.

The programmer is a handheld computing device running the Microsoft® Windows® CE Operating System. Proprietary AlarmView software used to configure the AlarmView System is pre-installed in the programmer.

◆ The AlarmView pager coverage is limited and designed to cover a care unit. Operating range from the AlarmView transmitter to pager is approximately 150 feet with no intervening structures (walls, columns, doors, floors, etc.). Coverage is not long range. Exact coverage area will be determined during initial installation, and you can re-examine the coverage area at any time by performing a Transmitter Range Test (as indicated in Section 5: Testing and Periodic Maintenance).
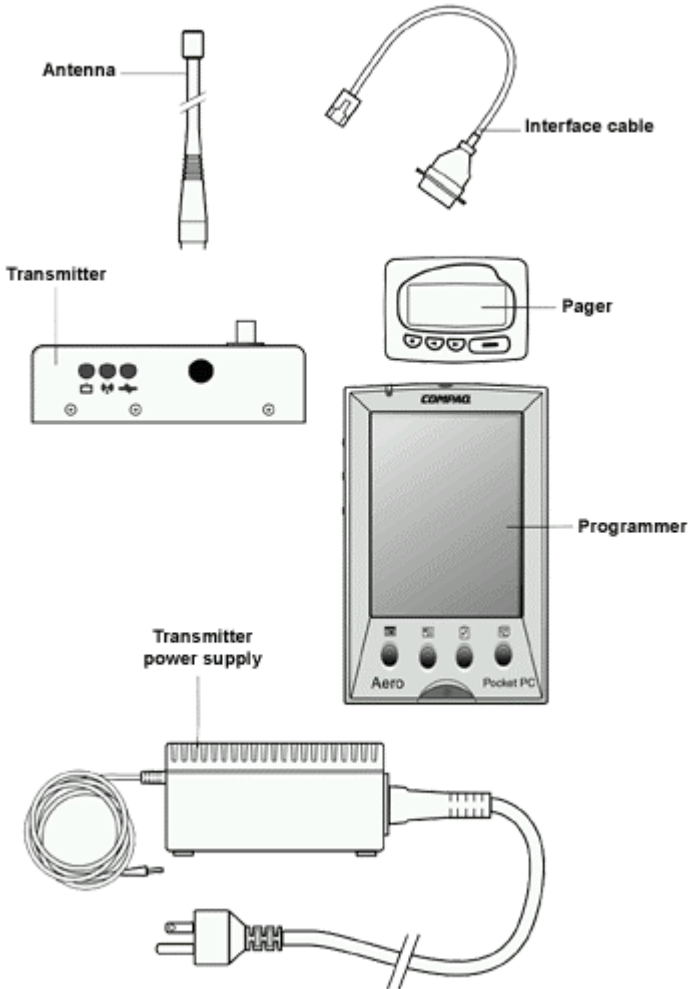
AlarmView™ Wireless Data Network Components

An AlarmView System includes up to 24 transmitters (one for each bedside oximetry monitor), up to 12 pagers, and one programmer. All transmitters and pagers within one system operate on the same radio frequency and baud rate. Pages will not be received if the pager is out of range. The system communicates as indicated in the functional diagram below:
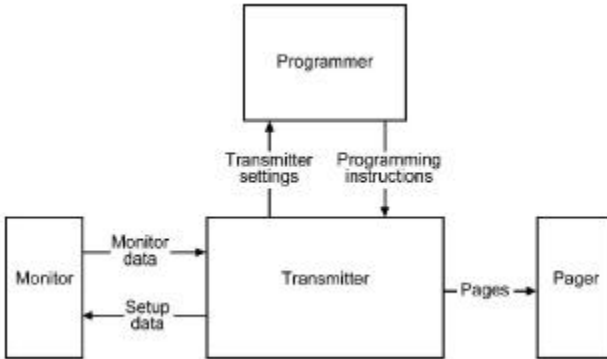
AlarmView™ System Functional Diagram

List of Components

An AlarmView System consists of the following components:

- Transmitter (up to 24)
- Antenna (1 per transmitter, to 24)
- Interface Cable (1 per transmitter, to 24)
- Transmitter Power Supply (1 per transmitter, to 24)
- Hospital-grade AC Power Cord (1 per transmitter, to 24)
- Programmer (1)
- Rechargeable Battery Pack for Programmer (1) (pre-installed)
- AC Adapter Cord (1)
- Pager with Holster (up to 12)
- AlarmView System User's Guide
- AlarmView System Administrator's Manual (this manual)

System Features

Transmitter

The AlarmView transmitter interfaces with stand-alone patient monitors. Alarm settings and parameters are entered in the monitor – the transmitter itself does not screen or select alarms.

When the monitor goes into alarm, the transmitter detects the alarm from the monitor, then transmits that alarm to an assigned pager or pagers. The alarm is transmitted as a text message to the pager(s). Data relayed includes patient bed number, alarm type, and parameter values.

All transmitters and pagers in an AlarmView System operate on the same defined frequency and baud rate.

◆ The antenna must be connected to the transmitter before the transmitter is turned on. Turning the transmitter on without the antenna connected may damage the transmitter. Do not disconnect the antenna while the transmitter is turned on.

⚠ The AlarmView transmitter is designed for use as a mobile device as defined by the Federal Communications Commission (FCC). Do not place the transmitter on a patient's or user's body. Ensure that the transmitter is located at least 20 cm (8 inches) from a patient or user's body. Location of the transmitter closer than 20 cm (8 inches) to a person's body will void the user's FCC authority to operate the equipment.

Top Panel
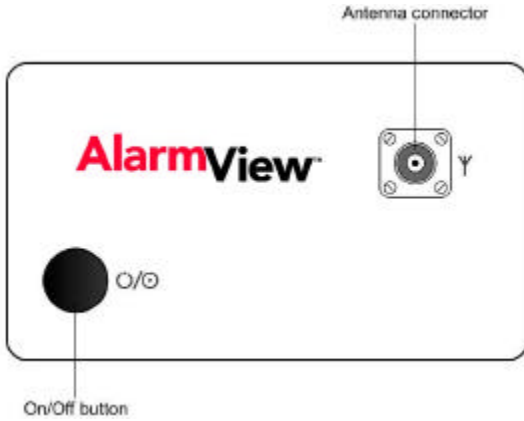
Transmitter Top View

On/Off button turns the transmitter on and off. It is also used to initiate Test Pages, and to select All Pagers from the transmitter (refer to *Section 5: Testing and Periodic Maintenance* for an explanation of Test Pages and *Section 4: Install Program* for an explanation of selecting All Pagers).

Front Panel

Transmitter Front View

AC Indicator

Off   Transmitter is not connected to AC power.

Green   Transmitter is connected to AC power and the battery is charging.

Transmitting Indicator

Off   Transmitter is not attempting to transmit.

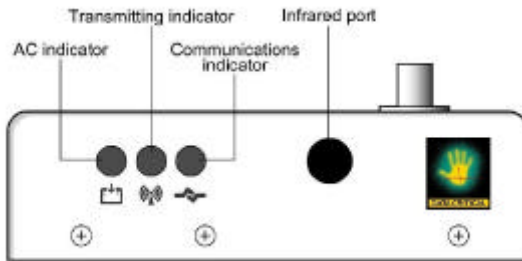Amber   Transmitter is attempting to transmit, but cannot due to interference (for example another transmitter is transmitting at the same frequency and in the same vicinity).

Green   Transmitter is transmitting a page.

◆   If the Transmitting Indicator remains green for more than two (2) seconds, the transmitter is malfunctioning and should be taken out of service. Contact Data Critical for repair or replacement.

◆   If the Transmitting Indicator remains amber for more than ten (10) seconds, it may be an indication of interfering transmissions in the vicinity. Contact the appropriate personnel at your facility for an assessment.

Communications Indicator

Off Transmitter is turned off.

Amber   Transmitter is turned on, but is either not connected to monitor, *or* is unable to communicate with monitor.

Green   Transmitter is turned on and is communicating with the monitor.

Rear Panel
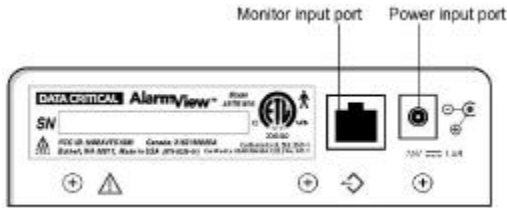
Transmitter Rear View

Monitor Input and **Power Input** ports.

⚠ WARNING: In the USA, do not connect the AlarmView transmitter to an electrical outlet controlled by a wall switch, because AC power may accidentally turned off.

⚠ WARNING: To ensure patient safety, do not place the AlarmView transmitter in any position that might cause it to fall on the patient.

⚠ WARNING: Do not lift the monitor by the sensor cable or power cord, because the cable or cord could disconnect from the monitor, causing the monitor to drop on the patient.

Programmer

The AlarmView Programmer is a handheld computing device, or personal digital assistant (PDA), that is used to setup and change the configuration of the AlarmView transmitter. Data is exchanged between the transmitter and the programmer via Infrared (IrDA) ports on both the programmer and transmitter.

◆ The programmer is to be used for the AlarmView System only. Programming that is not used for the AlarmView System has been disabled. Do not attempt to load, enable, or use other software with the programmer, as it may corrupt or damage system software.

Below is a picture of a typical programmer. Your programmer may differ slightly from the one shown here.
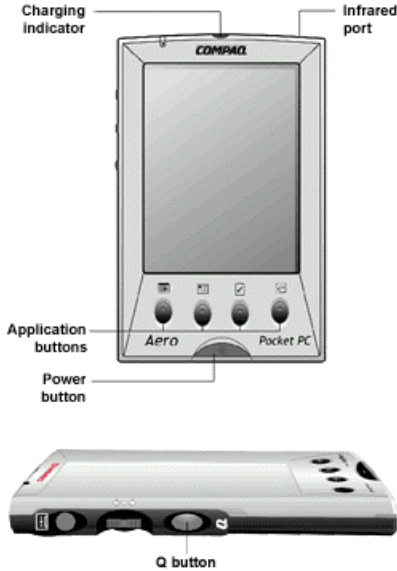
Programmer Front & Side Views

Pager

The AlarmView pager is worn by caregivers assigned to monitor patients. It is intended as an additional means of receiving patient alarm information.

Within seconds of detecting an alarm identified by the oximetry monitor, the transmitter sends an Initial Alarm Page to its assigned pager(s) only. Each transmitter can be programmed to send the Initial Alarm Page to one pager, two pagers, or all pagers.

Information communicated includes bed number, alarm type, and parameter values, such as blood oxygenation (SPO2), pulse rate, or heart rate that is outside alarm limits.

If the alarm condition continues or has not been silenced at the monitor, the transmitter will follow up with a Reminder Page sent *once* to all pagers in the system.

Pagers are identified in the system using a Cap Code. Cap codes are 7-digit numbers unique to each pager. The seven (7) digits correspond to the last seven digits of the pager's serial number (located on the back of the pager). If the serial number is less than seven digits, then add zeros in front.

For example, if a pager's serial number is 45678, its cap code is 0045678.

Because basic pager operations vary in different models, functions such as turning pager on/off, setting tone or vibrate, contrast, backlight, and replacing batteries are not covered here. Refer to *Appendix A: Basic Pager Functions* in the *AlarmView System User's Guide*.

◆ Replace pager batteries weekly. If pager batteries are low or depleted, the pager's range may be reduced or the pager may not correctly receive pages.

Alarm Pages

◆ The pager must be turned on to receive pages. Do not turn the pager off at any time when being used for alarm notification. Doing so may result in failure to receive notice of a patient alarm.

Alarm pages are prioritized for four (4) event levels (4=immediate, 3=high, 2=medium, 1=low).

The transmitter will send alarm pages to the pager in a format similar to the following example.

```
Bed: 1234

Low Sat

SPO2: 83%

PR: 70 bpm
```

The first line displays the bed number of the patient being monitored. The second line of the message will display the type of alarm. The third and fourth lines display the SpO2 percentage and pulse rate readings at the time of the alarm.

If the page is sent from a transmitter attached to a Nellcor N-3000 monitor with ECG and/or respiration capabilities, the last line of the message will display the pulse rate, heart rate, if available, or respiration parameter that is outside alarm limits.

The following is a picture of a typical pager. Pager may differ slightly from the one shown here.
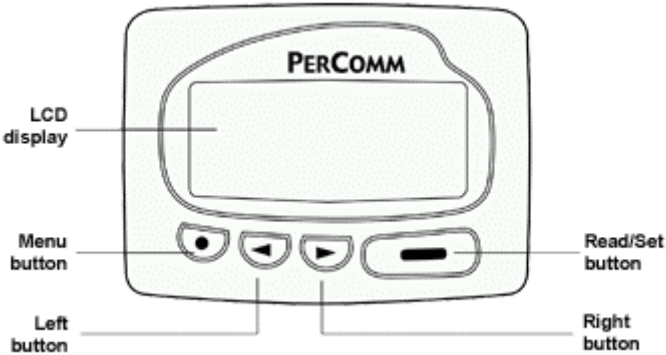
AlarmView™ Pager

Section 2: System Specifications

Each hospital or healthcare facility can use up to six (6) sets of AlarmView Systems, with 24 transmitters each, each set operating on its own channel.

AlarmView System

Parameter	Setting
Single Alarm Response Time	Up to 10 seconds
Multiple Alarm Response Time	Up to 60 seconds*

*Only valid for five (5) simultaneous alarms.

Programmer

Parameter	Setting
Operating System	Microsoft® Windows® CE
Batteries (main)	1 rechargeable battery pack
Rechargeable Battery Life	300 to 500 charge/discharge cycles
Batteries (backup)	1 3V coin battery included (CR2032)
Battery Operation	Program up to 24 transmitters, 3 times a day for 1 week
Number of Beds	Maximum 48
Number of Transmitters	Maximum 24
Number of Pagers	Maximum 12
FCC Compliant	FCC Part 15

Transmitter

Parameter	Setting
Physical Dimensions	5.25" x 1.5" x 3" (13.3 x 3.8 x 7.6 cm)
Battery Life	2 years of normal operation
Battery Operation	Approximately 45 minutes
Output Power	400 mW nominal 555 mW maximum
Frequency Range	450 MHz to 466 MHz
Typical Range (no intervening structures)	Approx. 150 ft (46 m)
Input Voltage	+15V DC, 1.5 amps
Antenna Terminal Designed Impedance	50 ohms
Temperature Range (normal operation)	32°F to 113°F (0°C to 45°C) at 5% to 95% RH, non-condensing
Temperature Range (storage)	-4°F to 140°F (-20°C to 60°C) at 5% to 95% RH, non-condensing
Altitude (normal operation)	0 ft to 10,000 ft (0 m to 3,048 m)
Mechanical Shock	IEC 68-2-27
Water Resistance (transmitter, not power supply)	IEC 529 Class IPXI
Radiated Immunity (radio-frequency electromagnetic fields)	Up to 3V/meter from 80 MHz to 1 GHz
Conducted Immunity (conducted-frequency electromagnetic energy)	MIL-STD-461D CSI14 Level 3
FCC Compliant	FCC Part 90

Pager (Percomm)

Parameter	Setting
Notification Tone	Audible Tone (8 sec) or Vibration (6 sec)
Received Data	POCSAG encoded
Battery	1 AAA standard alkaline
Battery Operation	2 weeks normal operation
Frequency Range	450 MHz to 466 MHz
Temperature Range (normal operation)	32°F to 113°F (0°C to 45°C) at 5% RH to 95% RH, non-condensing
Temperature Range (storage)	-4°F to 140°F (-20°C to 60°C) at 5% RH to 95% RH, non-condensing
Altitude (normal operation)	0 ft to 10,000 ft (0 m to 3,048 m)
Water Resistance	IEC 529 Class IPXI
FCC Compliant	FCC Part 15

Section 3: Installation

Setting Up Transmitter

Before first use of a transmitter or transmitters in a care unit, perform a Transmitter Range Test (Per *Section 5: Testing & Periodic Maintenance, "Transmitter Range Test: Survey Paging"*). This will establish the limits of unit coverage.

Connect Antenna

1. Connect antenna to the top of the transmitter. For best transmission, antenna must be pointing up.

Antenna connector
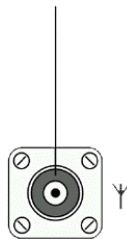
◆   Range will be limited if antenna is not vertical.

⚠   The transmitter is designed for use as a mobile device as defined by the Federal Communications Commission (FCC). Do not place the transmitter on a patient's or user's body. Ensure that the transmitter is located at least 20 cm (8 inches) from a patient or user's body. Location of the transmitter closer than 20 cm (8 inches) to a person's body will void the user's FCC authority to operate the equipment.

Connect to AC Power

1. Connect the power supply cord to the power input port on the rear panel of the transmitter.

Power input port
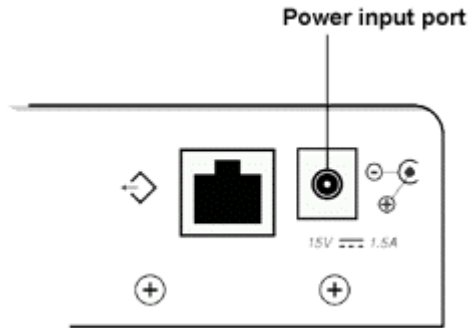
2. Plug the AC power cord into the other end of the power supply. Only use the hospital-grade power cord provided by Data Critical.

3. Plug the AC power cord into a properly grounded AC outlet.

Transmitter Power Supply
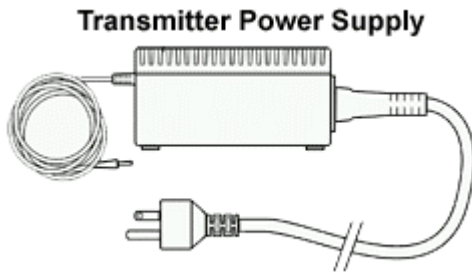
Power Supply with Hospital-grade AC Power Cord

◆ Although the transmitter can operate on its internal backup battery for a short period of time (up to 45 minutes under normal operation), always use AC power when possible.

Connect to Monitor

1. Connect the modular RJ-45 plug end of the interface cable to the input port on rear panel of transmitter.

Monitor input port

Monitor Input Port
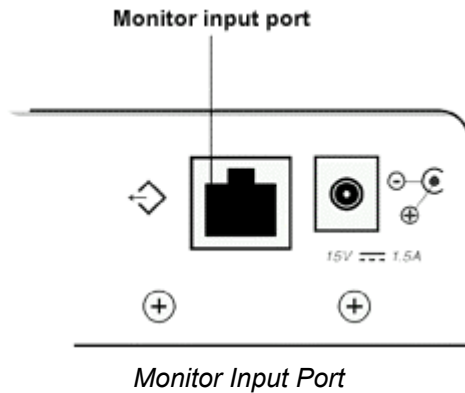
2. Connect the other end of the Data Critical interface cable to the data port on the rear of monitor.

    A Data Critical serial cable with a 15-pin (Male DB15) connector is required to connect to NPB-290, NPB-295, and N-395 monitors. A Data Critical serial cable with a 7-pin (male 7 pin DIN) connector is required to connect to N-3000 monitor.
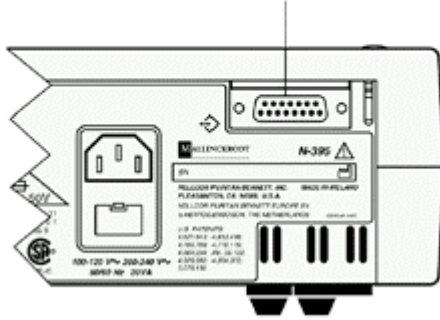
NPB-290, NPB-295, and N-395 Monitor Data Port
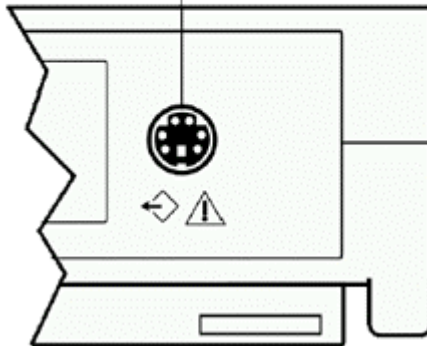
N-3000 Monitor Data Port

◆ A monitor that is not connected to AC power or operating on battery will not communicate with the AlarmView transmitter. The monitor's data port is disabled when not connected to AC power. AlarmView System will transmit "Comm Fail" in this case. The only exception is the Nellcor N-395 monitor which continues to communicate with the transmitter while operating on battery power.

◆ Outlets used for the system should be on the hospital emergency circuit so that they are energized at all times.

Transmitter Placement

1. Place transmitter on top of or beside the pulse oximeter it is being used with.

To minimize the possibility of the transmitter creating interference with the monitor, place the transmitter at the rear of the monitor. For best results with N-395 monitors, place the transmitter to the right-rear of the monitor.
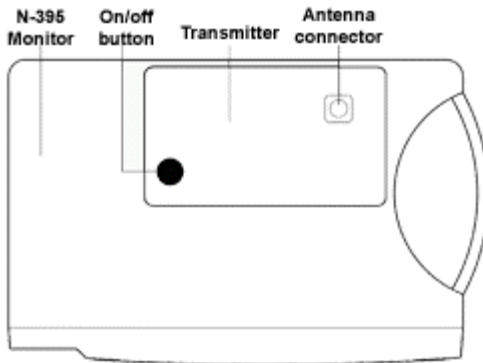
Preferred N-395 Transmitter Placement

Turning Transmitter On

◆ The antenna must be connected to the transmitter before the transmitter is turned on. Turning the transmitter on without the antenna connected may damage the transmitter. Do not disconnect the antenna while the transmitter is turned on.

1. Check oximetry monitor to ensure it is plugged in (not operating on battery), functioning properly, and that alarm settings are appropriate.

2. Press **On/Off** button on top of transmitter.

   Indicators will flash on and off while transmitter performs a Power-On Self Test (POST) to check its function.
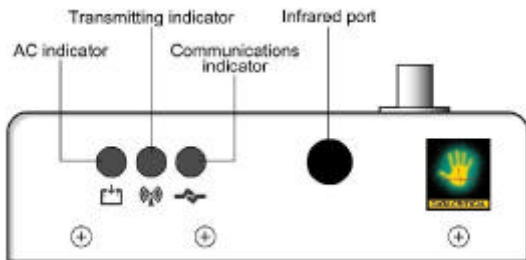
Transmitter LED Indicators

POST Light Sequence

Stage	Stage Indication	Test	Failure Indication
1	Green Transmitting LED	Transmitter program flash memory check	Simultaneous flashing of Tx and Mode LEDs
2	Green Communications LED	External SRAM	Simultaneous flashing of Tx and Mode LEDs
3	Amber	Operation of	Simultaneous flashing

	Transmitting LED	IrDA UART	of Tx and Mode LEDs
4	Amber Communications LED	RF board synch lock	Alternate flashing of 1 Tx and 1 Mode LED
5	Amber Communications LED	Tx ID flash read	Alternate flashing of 2 Tx and 2 Mode LEDs
6	Amber Communications LED	Setup flash read	Alternate flashing of 3 Tx and 3 Mode LEDs

◆ Stage 6 Failure is an indication of hardware failure, even if transmitter seems to recover (only exception is when installer has programmed new software into transmitter). In case of a Stage 6 failure, all programming will be lost, and data will need to be reprogrammed into transmitter.

3. The Communications LED is solid green when transmitter has established communication with monitor.

The Transmitting LED will flash green, and transmitter will send a Comm OK Page to the assigned pager(s) to confirm communication between the transmitter and monitor. The message will display:

> Bed: 1234
>
> Comm OK
>
> All Pagers*

*Last line All Pagers will be replaced with "Pager 1234" if one pager is assigned to transmitter, and "Pager 1234 5678" if two pagers are assigned. The 4 digits correspond to the last 4 digits of the assigned pager(s) cap code.

4. Verify that a page is sent to the assigned pager(s) and that the bed number is correct.

The transmitter will now send pages to the assigned pager(s) whenever it detects alarms identified by the monitor.

Turning Transmitter Off

The transmitter can be turned off only when it is not communicating with the monitor. To turn the transmitter off:

1. Turn monitor off or disconnect interface cable from transmitter or monitor. Mode LED will be amber.

2. Press **On/Off** button. Mode LED will be Off.

If you disable communications between the transmitter and the monitor and do not turn off the transmitter, the transmitter will send Communication Failure pages to the assigned pagers at periodic intervals for up to one hour.

Operating Transmitter On Battery Power

The transmitter has an internal, rechargeable backup battery. It can operate on battery power for approximately 45 minutes (under normal operation) if it becomes disconnected from AC power.

The battery will automatically recharge when connected to AC power. Solid green AC LED indicates that the transmitter is connected to power, and that the internal battery is recharging. A fully discharged battery takes approximately 17 hours to return to full charge. The transmitter can be used while it is recharging.

Section 4: Install Program

Using The Install Program

For basic operations of the AlarmView programmer – including On/Off, adjusting contrast, backlight, setting date/time, and recharging or replacing main and backup batteries – refer to *Appendix B: Basic Programmer Functions in the AlarmView System User's Guide*.

◆ Recharge the main battery pack often. Ensure that the programmer has at least charged main batteries or a charged backup battery installed at all times, or programming and data in the programmer will be lost.

Proprietary AlarmView System Manager (SysMgr) software will be installed and running when you receive the programmer.

This section explains how to operate the AlarmView Install Program.

For all programming functions, use the stylus to tap the appropriate spot on the screen to perform the desired action.

◆ Use the stylus that came with the programmer or other stylus designed specifically for use with a handheld computer. Use of other pointed items such as pens and pencils may damage the programmer screen.

Tap the **Start** button (lower left corner of screen) to access the AlarmView Install Program to view and change system configuration and parameters.

Tap the **Keyboard** button (lower middle of screen) to open and close the keyboard on your screen. The keyboard will usually appear automatically when it is needed for programming.

Tap the **Exit** button $\boxed{<}$ (in upper left corner of screen) to return to SysMgr Main Screen from submenus.

Tap the **Scroll** buttons $\boxed{◀|▶}$ to move left and right to make tabs visible in submenus.

Tap **Down Arrow** to reveal pull-down menu choices.

Changing System Parameters

AlarmView System parameters are set and transmitters are configured to your specific site during initial system installation.

Only qualified personnel should use the AlarmView Install Program software to view and change system configuration and parameters that cannot be changed with the SysMgr program.

The Install Program has five main screens: **Password, Alarms**, **Pagers**, **Monitors**, and **Sys Inf** (system information), which are used to change the following parameters.

- Default program password (DCC)
- Bed Numbers (up to 48)
- Pager Cap Codes (up to 12)
- Alarm Pager Destinations (1, 2, or all pagers)
- Bed Number and Pager Assignments
- Transmission Frequency (MHz) and Baud Rate (bps)
- Global Pager Cap Code
- Reminder Page Delay Interval
- Survey Page Interval and Duration

🖉
Some of the above can also be accessed and changed through the SysMgr main program.

Changing System Password

1. Turn on programmer. Programmer will display SysMgr software main screen.
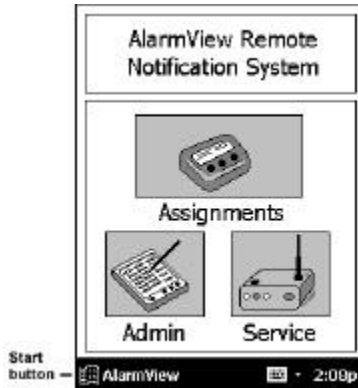
Start Button

2. Tap the **Start** button and tap **AlarmView Install Program** to select. Password screen with be displayed.
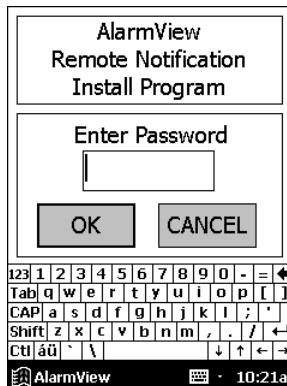
Password Screen

3. Tap the **Keyboard** button to reveal the **Change Password** button.
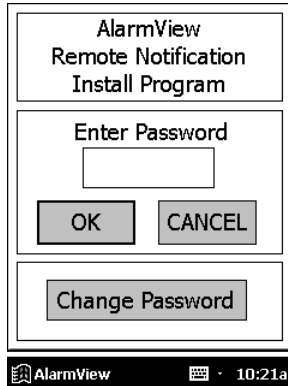
Change Password Screen

4. Tap the **Change Password** button. The Enter Current Password screen will be displayed.
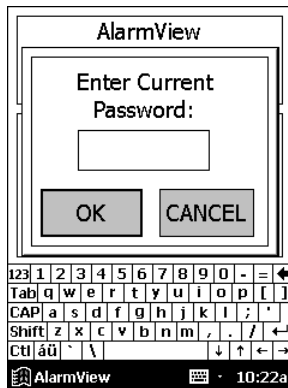
Enter Current Password Screen

5. Enter your current password using the keyboard and tap **OK**.
    The factory default password is "DCC" (not case sensitive).
    The Enter New Password screen will be displayed.
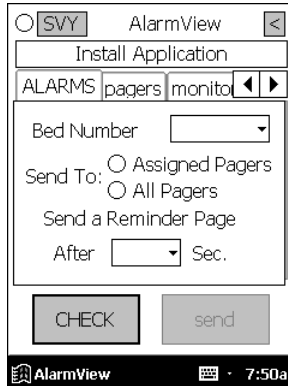
Enter New Password Screen

6. Enter your new password using keyboard and tap **OK**.

The programmer is ready to respond to the new password.

Changing Individual Transmitter Assignments

Transmitter assignments will change as transmitters and
monitors are moved to different beds, as transmitters are moved
to different monitors in the care unit, as pagers are changed, and
as caregivers are assigned to different patients.

To view and change configuration of a transmitter, first retrieve
the current parameters from the transmitter.

Retrieving Transmitter Data

To check current transmitter values:

1. Tap the **Start** Button and tap AlarmView Install Program. The Install program password screen will be displayed.
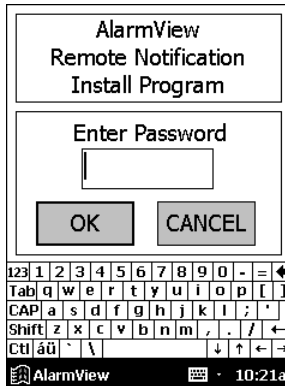
Password Screen

2. Enter your password and tap **OK**. The Alarms screen is displayed.
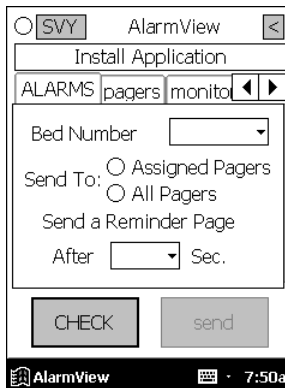
Install Program Alarms Screen

> If you tap cancel, or tap OK without entering the correct password, the programmer returns to SysMgr.

3. Turn transmitter on.

4. Aim the infrared port on programmer directly at the infrared port on the front of the transmitter and tap the **CHECK** button.
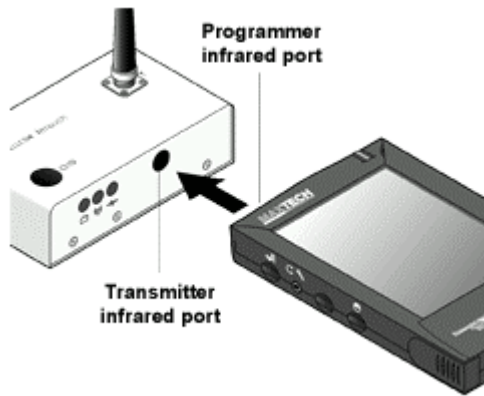
Aligning Infrared Ports

> The programmer must be within four (4) feet (1.2 meters) of the transmitter and the infrared ports must be aimed directly at each other.

5. When retrieval of transmitter data is successful, the programmer will display "Transmitter Data Loaded" status message and values will be displayed in data fields.
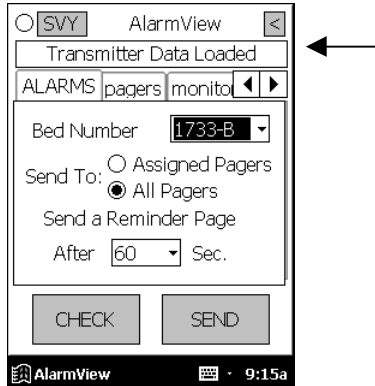
Transmitter Data Loaded Status Message

Changing Bed Number Assignment

After successfully retrieving transmitter data, current values will appear in appropriate fields. One bed number is assigned to each transmitter. To change the bed number assigned to a transmitter:

1. From Alarms screen, double-tap current bed number in bed number field.

2. Tap the **Keyboard** button and enter new bed number using keyboard characters.

OR

3. Tap the **Down Arrow** in bed number field to show a pull-down menu listing current bed numbers. Continue to tap the Down Arrow to scroll through the list.

4. Tap to select desired bed number from pull-down menu.

Changing Pager Assignments

One, two, or All Pagers can be assigned to each transmitter. **All Pagers** will enable the transmitter to transmit to all of the pagers in the AlarmView system.

To change alarm destination and pagers assigned to a transmitter:

1. From Alarms screen, tap button for **Assigned Pager** or **All Pagers**.

2. Tap the **Pagers** tab to move to pager selection screen.
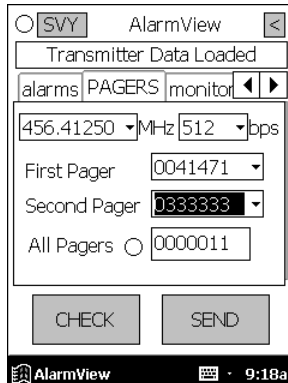
Pager Selection Screen

3. Tap the **Down Arrow** in the First Pager field and tap to select the cap code for the desired pager. Only the last four (4) digits of the pager number will be displayed.

4. If another pager is desired, tap the **Down Arrow** in the Second pager field and select the cap code for the desired pager.

5. If all pagers is warranted, tap the button for **All Pagers**.

> 📝 You can choose the All Pagers option from the Alarm screen or the Pagers screen.

Assigning All Pagers from Transmitter

The All Pagers option can also be selected from the transmitter without using the programmer. The transmitter should be on, but not communicating with a monitor.

1. Turn transmitter on, but turn monitor off or disconnect interface cable. Mode LED should be amber.

2. Turn on at least two pagers in system.

3. Press and hold transmitter **On/Off** button until an All Pagers confirmation message is received at pagers (approximately 5 seconds).

> Bed: 1234
>
> Programming OK
>
> All Pagers

Programming New Data into Transmitter

Bed number and pager assignment changes made in the previous steps should now be programmed into the transmitter.

> 📝 Once data has been retrieved for a transmitter, it is easiest to change all values for that transmitter before sending changes back to transmitter.

1. Aim the infrared port on the programmer directly at the infrared port on the front of the transmitter and tap the **SEND** button. Programmer will display "Sending Program Data" status message.
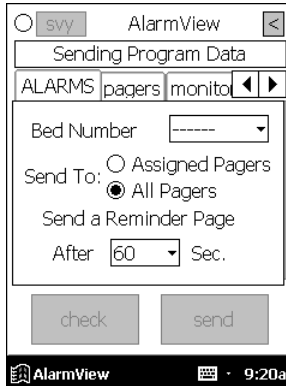
Sending Program Data Status Message

2. When the transmitter has been successfully programmed, the programmer will display a "Programming Successful" status message.
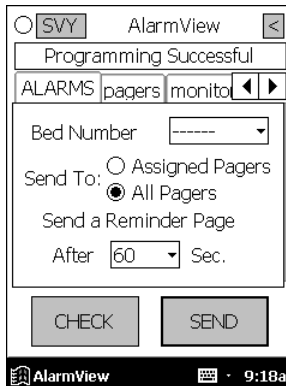
Programming Successful Status Message

3.   Tap **Exit** button (< in upper right corner) to return to SysMgr.

Changing Survey Page Configuration

Prior to its first use in a care unit, the effective range and coverage area of each transmitter should be tested by conducting a paging survey to ensure that the transmitter and pagers are performing as needed.

The programmer can be used to set the time between pages and the total number of pages to be sent for performing survey paging (the default in 100 pages, sent every 15 seconds).

To set interval between pages and total number of pages:

1.   Tap the **Start** button and tap the **AlarmView Install** Program.

2.   Enter your password. The Alarms screen will be displayed.

3.   Tap the **Monitor** tab to display the Monitor Configuration screen.
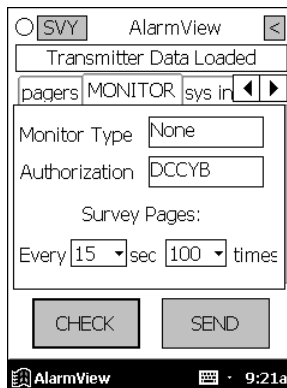
Monitor Configuration Screen

> ✏️ Monitor Type and Authorization fields are read-only values set at initial installation. You will not need to edit these values.

4. To change survey page time intervals, tap the **Down Arrow** in the **sec** (seconds) field. Tap to select desired time interval from the pull-down menu.

5. To change the total number of survey pages, tap the **Down Arrow** in the **times** field. Tap to select the desired number of pages from the pull-down menu.

6. Program survey page configuration into the transmitter. Turn the transmitter on and aim the infrared port on the programmer directly at the infrared port on the front of the transmitter and tap the **SEND** button. The programmer will display a "Sending Program Data" status message.

7. Wait for receipt of a "Programming OK" status message, then tap **Exit** button to return to SysMgr.

The complete Survey Paging procedure is detailed in *Section 5: Testing and Periodic Maintenance, "Transmitter Range Test,"* in this manual.

Changing Global System Parameters

An AlarmView System is defined by a common frequency, baud rate, and a global cap code. All transmitters and pagers within an AlarmView System must have the same frequency (MHz), baud rate (bps), and global cap code. Each pager has two addresses: the unique cap code and the global cap code. The global cap code is common to all pagers within the AlarmView System.

The Reminder Page Delay Interval is intended to be set to the same value for all transmitters in the system.

Changing Frequency, Baud Rate, and Global Cap Code

1. Tap the **Start** button and tap the **AlarmView Install** Program.

2. Enter your password. The Alarms screen will be displayed.

3. Tap the Pagers tab to enter the Pager configuration screen.
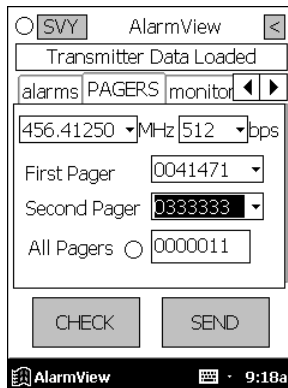
Pager Configuration Screen

4. Turn on any transmitter in the system, and aim the programmer's infrared port directly at the infrared port on the front of the transmitter.

5. Tap **CHECK** to retrieve the current system configuration parameters.

6. a. To change the sending frequency, tap the **Down Arrow** in the **MHz** field. The Sending frequency is the frequency transmitted from the transmitter to the pager.

    b. To change the baud rate, tap the **Down Arrow** in the **bps** field. This programs the transmitter's baud rate to match the pager's receiving baud rate.

c. To change the Global Cap Code, tap the **All Pagers** label, then OK, and use the keyboard to type in a new Global Cap Code.

7. Aim the programmer's infrared port directly at the infrared port on the front of the transmitter and tap **SEND** to program the configuration changes into the transmitter.

8. Repeat programming for every transmitter in the system.

9. Tap **Exit** to return to SysMgr.

Changing Reminder Page Interval

If the alarm condition continues or is not silenced at the monitor, a Reminder Page is sent to all pagers in the system. To change the delay interval for the reminder page:

1. From SysMgr, tap the **Start** button and tap Install Program.

2. Enter your password. The Alarms screen will be displayed.
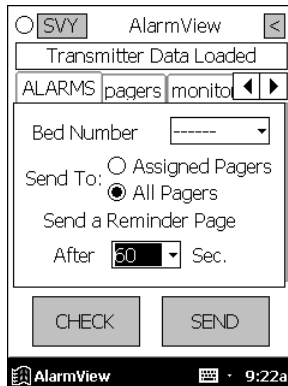
Alarms Screen Reminder Page Interval

3. To send a reminder page after a certain interval, tap the **Down Arrow** in the **Sec**. field.

4. Tap to select the desired time interval from the pull-down menu.

5. Aim the programmer's infrared port directly at the infrared port on the front of the transmitter and tap **SEND** to program configuration changes into the transmitter. A "Programming OK" message will be sent to the pager(s) assigned to the transmitter.

6. Repeat programming for every transmitter in system.

7. Tap the **Exit** button to return to SysMgr.

Section 5: Testing and Periodic Maintenance

All tests described in this section can be performed without disassembling the units in the AlarmView System. Tests should be conducted prior to initial installation, when adding a new unit to the system, and before returning equipment to service after repairs or routine maintenance.

> ◆ If any component of the system fails to perform as specified, do not return it to use. Contact Data Critical Corporation regarding repair or replacement of the equipment.

Testing System Safety

AlarmView safety tests meet the standards of, and are to be performed in accordance with, CAN/CSA-C22.2 No. 601.1 and UL 2601-1, Medical Electrical Equipment – Part 1: General Requirements for Safety, for instruments classified as Class 1 and Type B.

> ✎ Equipment Needed is a Safety Analyzer that must meet , CAN/CSA-C22.2 No. 601.1 and UL 2601-1 specifications.

Earth Leakage Current

This test is in compliance with UL 2601-1 (earth leakage current). The applied voltage is 120 volts, 60 Hz for UL 2601-1 and CSA 601.1. Make all measurements with power switch in both the On and Off positions.

1. Connect the AlarmView transmitter power supply AC plug to the electrical analyzer as recommended by the analyzer operating instructions.

2. Connect the AlarmView transmitter power supply DC plug to the transmitter DC input connector.

3. Do *not* connect the equipotential terminal on the analyzer to any metal on the transmitter.

4. Connect the analyzer to accessible bare metal on the transmitter (e.g. the antenna connector).

5. Analyzer leakage indication must not exceed the values listed below.

Earth Leakage Current Limits

AC Polarity	Neutral Wire (L2)	Leakage Current
Normal	Closed	300 µA
Reversed	Closed	300 µA
Reversed*	Open	1000 µA
Normal	Open	1000 µA

* With AC polarity reversed and neutral wire (L2) open, the line wire (L1) is actually open.

Testing System Performance

Communications Page

Each time a transmitter is turned on, or re-establishes communication with a monitor after having lost communication, the transmitter will automatically send a communications page (Comm OK Page) to all pager(s) assigned to the transmitter.

After setting up transmitter (connecting it to power and to a monitor), to send a Comm OK Page test:

1. Check monitor to ensure it is on and functioning properly.

2. Press **On/Off** button on top of transmitter.

Indicators will flash on and off while transmitter performs a Power-On Self Test (POST) to check its function.

Mode LED is solid green when transmitter has established communication with the monitor.

Tx LED will flash green, and the transmitter will send a Comm OK Page to assigned pager(s) to confirm communication between transmitter and monitor. The message will display:

> Bed: 1234
>
> Comm OK
>
> All Pagers*

*Last line All Pagers with be replaced with "Pager 1234" if one pager is assigned to transmitter, and "Pager 1234 5678." The 4 digits correspond to the last 4 digits of the assigned pager(s) cap code.

3. Verify that the page is sent to the assigned pager(s) and that the bed number is correct.

The transmitter will now send pages to the assigned pager(s) whenever it detects alarms identified by the monitor.

Test Page

You should test the AlarmView System setup by conducting a Test Page when any changes affecting the system have occurred. To perform a Test Page, the transmitter must be on and communicating with the monitor.

To send a Test Page:

1. Press the **On/Off** button to turn the transmitter on. Check to ensure that the transmitter is communicating with the monitor (both **AC Indicator** and **Communications Indicator** on transmitter are green).

2. Turn on the pager(s) assigned to the transmitter.

3. To send a Test Page, press and release the **On/Off** button again.

    All pagers assigned to the transmitter will display the following page (if a patient is not connected to the sensor, dashes will be displayed for SpO2 and pulse rate):

    > Bed: 1234
    >
    > Test Page
    >
    > SPO2: 83%
    >
    > PR: 70 bpm*

* For the Nellcor N-3000 monitor, the last line of the test page will display heart rate (HR).

Transmitter Range Test (Survey Paging)

Survey Paging is used to determine the area of coverage of your system. A Range Test (Survey Paging) will be performed at the time of initial system installation. Survey Paging should be conducted prior to the first use of a transmitter added to a system, or when a transmitter has been moved to a new care unit.

When the transmitter is placed in Test Range mode, it will send frequent pages from the transmitter to the assigned pager(s). Frequency of sent pages and the total number of Survey Pages can be set according to the

procedure in *Section 4: Programming*, "*Changing Survey Page Configuration*" of this manual.

As Survey Pages are sent, personnel with assigned pager(s) will walk around the coverage area of the care unit to ensure that all pages are received.

> ◆ Because transmitters and pagers in one system operate on a single, defined frequency, you should NOT exchange pagers or transmitters from different systems.

To perform Survey Paging for a transmitter, transmitters should be turned on, but *not* communicating with monitors. You will need at least one transmitter and one pager.

To conduct a transmitter Range Test (Survey Paging):

1. Ensure that transmitter is connected to power and turned on, but not communicating with a monitor.

2. On the programmer, from the SysMgr main screen, tap **Service** to enter service program. The **Controls** tab will be displayed.

3. To start Survey Paging, aim programmer's infrared port directly at the port on the front of transmitter and tap the **Test Range** button. The programmer will display a "Survey Command Sent" status message and Survey Paging will begin.

4. Turn on the pager(s) assigned to transmitter. Qualified personnel should be ready to walk the dimensions of the care unit. If you use more than one pager, keep them at least 12" apart to avoid interference.

5. The transmitter will transmit a series of consecutively numbered pages (1, 2, 3, 4, etc.). Assigned pagers will receive the following message for each numbered page:

> Bed: 1234
>
> Survey Page #xxx*

* XXX is the number of the Survey Page in the sequence.

6. Walk slowly around the unit, observing the sequentially numbered pages. Pay special attention to elevator banks, columns, metal doors, double doors, and areas with plaster construction. Areas of no coverage or out of range conditions will be identified by missing Survey Page numbers in the sequence. A corrupt, partial or incomplete page is the same as a missing page.

7. To stop the transmitter before all Survey Pages are sent, press and release the **On/Off** button on the transmitter once.

If any areas of no coverage are defined, communicate their location to clinical staff.

AlarmView is intended to cover most care units, not entire floors or entire facilities. Typical range for the AlarmView System with no intervening structures is 150 feet.

Contact Data Critical Corporation if areas of no coverage present a problem in functioning of care unit.

Periodic Maintenance

Batteries

Transmitter

At least every two (2) years, the transmitter's internal battery should be tested. To check transmitter battery performance:

1. Turn on the transmitter.
2. Make sure the transmitter's external power supply is disconnected.
3. Program the transmitter to send to one pagers.
4. From the SysMgr / Service, start the Range Test (Survey Paging).
5. Wait until a TX Battery Low / Shutting Down page is received.
6. If more than 50 Range Test (Survey Paging) pages are received without the transmitter shutting down, the battery is OK.
7. If the transmitter has shut down before 50 Range Test (Survey Paging) pages are received, recharge the transmitter for 17 hours and repeat #1-#5 above. If the transmitter then shuts down before 20 pages are received, the battery needs to be replaced. Return the transmitter to Data Critical.

Programmer

To recharge programmer main battery pack and replace programmer backup battery, refer to *Appendix B: Basic Programmer Functions in AlarmView System User's Guide*.

◆ If the main battery warning message is displayed, recharge the main battery as soon as possible. If both the backup battery and main batteries are depleted programmer software and data will be lost.

Pager

To replace pager batteries, refer to *Appendix A: Basic Pager Functions in AlarmView System User's Guide.*

Cleaning Procedures

When necessary, clean only the outer casing of the transmitter with a soft cloth, damp with a non-abrasive, commercial cleaner or 70% alcohol solution in water. Lightly wipe surfaces of transmitter.

Use a clean cloth designed for lenses to clean the pager and programmer screens. Use a damp cloth to dust their casings, and wipe dry immediately.

<div style="border:1px solid">

◆ Do not spray, pour, or spill liquids on any part of the AlarmView System components. Do not submerge any of the components in liquids.

If fluids are spilled in the equipment, take the equipment out of service for at least 24 hours. Check operation of equipment before returning to service.

</div>

Inspection and Testing

At least every two (2) years, inspect the transmitter, pagers, cables, and programmer for mechanical and functional damage. Inspect safety labels to ensure they are legible.

If any system components appear to be damaged, or subjected to potential damage (such as being dropped or exposed to liquids), qualified personnel should test the system using the procedures in this manual.

Service

Do not remove the transmitter cover – there are no serviceable items inside. If any item or component of the AlarmView System requires repair or service, contact Data Critical.

Section 6: Troubleshooting

Error Messages

For common system problems, an AlarmView transmitter may send error messages to the pager(s) assigned to it. Below is a table of the System Error Pages, along with probable causes, and recommended corrective actions.

System Error Pages

Message	Possible Cause	Corrective Action
Low Tx Battery/Connect AC Power to Transmitter Transmitter's battery is running low (connect transmitter to AC power as soon as possible).	Transmitter is not connected to AC power.	Connect transmitter to power.
Tx Battery Low/Shutting Down Transmitter operating on battery power has depleted battery charge and will shut down immediately.	Transmitter is not connected to AC power.	Connect transmitter to power.

Comm Failure Retrying Communication has been lost between transmitter and monitor, the transmitter is attempting to reestablish communication.	Communications between transmitter and monitor have failed. Monitor is turned off or operating on battery power and transmitter is still on.	Check serial cable and cable connections between transmitter and monitor. Reconnect or replace cable as required. Connect monitor to AC power. Check monitor performance.
Comm Failure/Shutting Down Transmitter has not been able to communicate with the monitor for about an hour and is shutting down.	Communications between transmitter and monitor have failed. Monitor is turned off or operating on battery power and transmitter is still on.	Check serial cable and cable connections between transmitter and monitor. Reconnect or replace cable as required. Connect monitor to AC power. Check monitor performance.

The programmer may also display error messages related to its function. Below is a table of Programmer Error Messages, along with probable causes, and recommended corrective actions.

Programmer Error Messages

Message	Possible Cause	Corrective Action
Failed to Connect Programmer was unable to retrieve or send information to/from transmitter.	Programmer infrared port not aligned with transmitter infrared port. Transmitter turned off. Programmer batteries are low. Transmitter defective. Programmer defective.	Re-align ports and try again. Turn on transmitter. Recharge programmer batteries. Contact Data Critical regarding repair and/or replacement of transmitter or programmer.
Please be sure the transmitter is turned on, the IR port is pointed directly at the transmitter, at a distance less than 4 ft. (1.2 m) and try again.	Programmer infrared port not aligned with transmitter infrared port. Transmitter turned off. Programmer batteries are low. Transmitter defective. Programmer defective.	Re-align ports and try again. Turn on transmitter. Recharge programmer batteries. Contact Data Critical regarding repair and/or replacement of transmitter or programmer.

Programming Failed Programmer was unable to send programming changes to transmitter.	Interference or ambient light noise. Programmer batteries are low. Transmitter defective. Programmer defective.	Re-align ports and try again. Recharge programmer batteries. Contact Data Critical regarding repair and/or replacement of transmitter or programmer.
Unable to Access Port Probably in Use	Programmer error.	Reboot programmer by inserting stylus in the reset button located on the back on the programmer. Contact Data Critical regarding repair and/or replacement of programmer.
You must select or get a bed number and one or more pagers	Programmer SEND button was pressed before selecting a bed number or pager numbers.	Follow procedure to select bed and/or pager numbers and tap SEND again.

Battery and Power Troubleshooting

Message	Possible Cause	Corrective Action
Low Tx Battery/Connect AC Power to Transmitter Meaning: Transmitter's battery is running low (connect transmitter to AC power as soon as possible)	Transmitter is not connected to AC power.	Connect transmitter to power.
Tx Battery Low/Shutting Down Meaning: Transmitter operating on battery power has depleted battery charge and will shut down immediately.	Transmitter is not connected to AC power.	Connect transmitter to power.
Comm Failure/Retrying Meaning: Communication has been lost between transmitter and monitor, the transmitter is attempting to reestablish communication.	Communications between transmitter and monitor have failed. Monitor is turned off or operating on battery power and transmitter is still on.	Check serial cable and cable connections between transmitter and monitor. Reconnect or replace cable as required. Connect monitor to AC power. Check monitor performance.

| Comm Failure/Shutting Down

Meaning: Transmitter has not been able to communicate with the monitor for about an hour and is shutting down. | Communications between transmitter and monitor have failed.

Monitor is turned off or operating on battery power and transmitter is still on. | Check serial cable and cable connections between transmitter and monitor.

Reconnect or replace cable as required.

Connect monitor to AC power.

Check monitor performance. |

General Troubleshooting

Message	Possible Cause	Corrective Action
Failed to Connect Meaning: Programmer was unable to retrieve or send information to/from transmitter.	Programmer infrared port not aligned with transmitter infrared port or too far away from transmitter. Transmitter turned off. Programmer batteries are low. Transmitter defective. Programmer defective.	Re-align ports, ensure the distance between the transmitter and the programmer is less than 4' (1.2 m) and try again. Turn on transmitter. Recharge programmer batteries. Contact Data Critical regarding repair and/or replacement of transmitter or programmer.

Please be sure the transmitter is turned on, the IR port is pointed directly at the transmitter, at a distance less than 4 ft. (1.2 m) and try again.	Programmer infrared port not aligned with transmitter infrared port or too far away from transmitter. Transmitter turned off. Programmer batteries are low. Transmitter defective. Programmer defective.	Re-align ports, ensure the distance between the transmitter and the programmer is less than 4' (1.2 m) and try again. Turn on transmitter. Recharge programmer batteries. Contact Data Critical regarding repair and/or replacement of transmitter or programmer.
Programming Failed Meaning: Programmer was unable to send programming changes to transmitter.	Programmer infrared port not aligned with transmitter infrared port or too far away from transmitter. Interference or ambient light noise. Programmer batteries are low. Transmitter defective. Programmer defective.	Re-align ports, ensure the distance between the transmitter and the programmer is less than 4' (1.2 m) and try again. Recharge programmer batteries. Contact Data Critical regarding repair and/or replacement of transmitter or programmer.

Unable to Access Port Probably in Use	Programmer error.	Reboot programmer by inserting stylus in the reset button located on the back on the programmer (see appendix X). Contact Data Critical regarding repair and/or replacement of programmer.
You must select or get a bed number and one or more pagers	Programmer SEND button was pressed before selecting a bed number or pager numbers.	Follow procedure to select bed and/or pager numbers and tap SEND again.

Missing pages

Indication	Possible Cause	Corrective Action
"Programming OK" page was not received at the assigned pager(s) after programming the transmitter.	The pager is incorrectly assigned to the transmitter. The pager's battery is too low or depleted. The pager is not turned on. Pager defective. Transmitter Defective.	Follow procedure to select bed and/or pager numbers, ensure that the correct pager is selected. Replace pager's battery. Turn on pager. Contact Data Critical Corp. regarding repair and/or replacement of transmitter or pager.

"Comm OK" page was not received at the assigned pager(s) after communication has been established between transmitter and monitor.	The pager is incorrectly assigned to the transmitter. The pager's battery is too low or depleted. The pager is not turned on. Pager defective. Transmitter Defective.	Follow procedure to select bed and/or pager numbers, ensure that the correct pager is selected. Replace pager's battery. Turn on pager. Contact Data Critical Corp. regarding repair and/or replacement of transmitter or pager.
Pages are occasionally not received at the pager or the received pages are "garbled".	The pager's battery is too low or depleted. The pager is not turned on. The pager is out of the tramsmitter's range, i.e. outside the system boundaries. Pager defective.	Replace pager's battery. Turn on pager. Ensure that all user's are aware of the boundaries of the system. Perform a range test to define the boundaries of the system. Contact Data Critical Corp. regarding repair and/or replacement of pager.

Transmitter or system failure

Indication	Possible Cause	Corrective Action
The transmitter's transmission and communication LED's are flashing amber.	Transmitter failure. (Please refer to section POST for detailed failure description.)	Contact Data Critical Corp. regarding repair and/or replacement of transmitter.
The transmitter's transmission LED is amber for long periods of time.	RF interference.	Perform a site survey as described in "Initial Installation". Increase distance between transmitter and possibly interfering equipment. Contact Data Critical Corp tech support.
The transmitter's transmission LED is green for more than 2 seconds.	Transmitter failure.	Turn off transmitter and Contact Data Critical Corp. regarding repair and/or replacement of transmitter.
The transmitter can't be turned off.	If the transmitter is communicating with a monitoring device, and the the communications LED is green, then the transmitter is functioning properly. If the communications LED is amber, then the transmitter is malfunctioning.	Disconnect the transmitter from the monitoring device, or turn off the monitoring device. When the communications LED turns amber, turn off the transmitter. Unplug the transmitter's power supply. Contact Data Critical Corp. regarding repair and/or replacement of transmitter.

If you are unable to resolve system problems using the previous guides, contact Data Critical Corp. Technical Support for assistance.

Getting System Information

When speaking to a Data Critical representative, it may be necessary to access transmitter system information to troubleshoot problems. To obtain this information:

1. Turn on the Programmer.
2. From SysMgr tap the **Start** Button and tap Install Program. The Install Program password screen will be displayed.
3. Enter your password and tap **OK**. The Alarms screen is displayed.
4. Tap the right scroll button to make the **SYS INF** tab visible.
5. Tap the **SYS INF** tab.
6. Turn the transmitter on.
7. Aim the infrared port on the programmer directly at the infrared port on the front of the transmitter and tap the **CHECK** button.

When retrieval of transmitter data is successful, the programmer will display "Transmitter Data Loaded" status message.
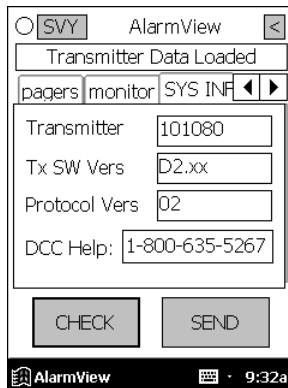
System Information Screen

Determining Programmer Software Version

When speaking to a Data Critical representative, it may be necessary to refer to your programmer software version to troubleshoot problems. To obtain this information:

1. Turn on the programmer.

2. Tap the **About** button (About screen reads AlarmView Wireless Data Notification System at the top of screen). The About screen will display:
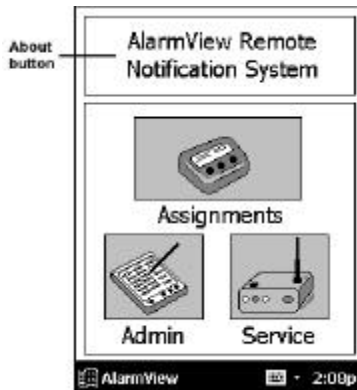
About Button

a. The programmer software version number is on the bottom line of the screen.
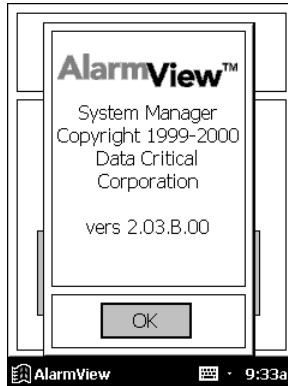
About Screen

3. Click **OK** to exit and return to SysMgr.

Repairing and Replacing Parts

If it is necessary to return an AlarmView System component to Data Critical for repair, contact Technical Services for shipping instructions.

Replacement parts are shown in the following table:

Replacement Parts

Item No.	Description
1	AlarmView Transmitter
2	7" Transmitter Antenna
3a	Transmitter serial cable, with 15-pin adapter for Nellcor NPB-290, NPB-295, and N-395
3b	Transmitter serial Cable, with 7-pin adapter for Nellcor N-3000
4	AlarmView Pager

5	AlarmView Programmer
6	Transmitter Power Supply and Hospital-grade AC power cord
7	AlarmView System User's Guide
8	AlarmView Administrator's Manual (this manual)

AlarmView System Replacement Parts

Electromagnetic Interference (EMI)

The AlarmView transmitter has been tested and found to comply with the limits for medical devices to the FDA guidance for electromagnetic compatibility (EMC). These limits are designed to provide reasonable protection against harmful interference in a typical medical installation.

> ◆ It is possible that high levels of radio frequency or conducted frequency electromagnetic interference due to close proximity or strength of source may result in performance disruption of transmitter.

> ⚠ The transmitter is designed for use as a mobile device as defined by the Federal Communications Commission (FCC). Do not place the transmitter on a patient's or user's body. Ensure that the transmitter is located at least 20 cm (8 inches) from a patient or user's body. Location of the transmitter closer than 20 cm (8 inches) to a person's body will void the user's FCC authority to operate the equipment.

The Nellcor NPB-290, NPB-295, N-395, and N-3000 pulse oximetry monitors are not designed for use in environments in which the pulse can be obscured by EMI. Interference may cause measurements that seem inappropriate or monitor may not seem to operate correctly. The AlarmView System may generate alarms or error messages during these conditions.

The AlarmView System generates, uses, and can radiate radio-frequency energy and – if not installed and operated according to these instructions – may cause interference with other devices in vicinity.

Evidence of disruption may include erratic readings, amber Tx LED, equipment ceasing to operate, or other incorrect functioning. If this occurs, survey the site to determine the source of disruption, and take the following actions to eliminate the source(s):

1. Turn equipment in vicinity off and on to isolate disruptive equipment.

2. Relocate or re-orient interfering equipment.

3. Increase distance between interfering equipment and this equipment.

4. Manage use of frequencies close to AlarmView System frequencies.

5. Remove devices that are highly susceptible to EMI.

6. Lower power from internal sources within facility control (such as paging systems).

7. Labeling will not eliminate interference with devices susceptible to EMI.

8. Educate clinical staff to recognize potential EMI-related problems.

9. Eliminate or reduce EMI with technical solutions (such as shielding).

10. Restrict use of personal communicators (cell phones, computers) in areas with devices susceptible to EMI.

11. Share relevant EMI information with others, particularly when evaluating new equipment purchases which may generate EMI.

12. Purchase critical care equipment that complies with IEC 601-1-2 EMC Standards (3V/meter EMI immunity, limit interference level to 0.0014 V/meter).

Use the following chart to estimate protective distance:

Power of Transmitter:	1 V/m	2 V/m	3 V/m
.400 W	12.1 ft	5.9 ft	3.9 ft
.400 W	3.7 m	1.8 m	1.2 m

The chart above reflects an estimated protective distance for those devices that are not listed on Data Critical's compatibility list. Contact Data Critical Corporation if additional assistance is needed to identify or resolve EMI conflicts.

Technical Support

For technical advice, service, or information concerning any equipment in your AlarmView™ System, call Data Critical Technical Support toll free at 1-877-DCC-STAT (1-877-322-7828).

Appendix A: Default Settings

Transmitter

Parameter	Setting
Global Cap Code	0000031
Reminder Interval	60 seconds
Survey Page Interval	15 seconds
Survey Page Duration	100 pages
Paging Baud Rate	512 bps
Bed Number	- - - -

Pager

Parameter	Setting
Display	4 Lines
Notification Mode	Audible
Frequency	On Back Label of Pager

Appendix B: Initial Installation Procedure

INITIAL INSTALLATION PROCEDURE

This procedure should be performed upon initial installation of an AlarmView System into a care unit.

Setup

1. Unpack the equipment to be installed in the care unit.

2. Determine the furthest limits of the care unit based on physical distances.

Frequency Verification

The object of this activity is to use the transmitter's carrier detect ability to determine if other sources of potential RF noise exist on the selected frequency.

1. Program the AlarmView transmitters to the desired frequency assigned to the care unit. (See *Section 4: Programming*.)

2. Program the appropriate pager baud rate into the AlarmView transmitters. (See *Section 4: Programming*.)

3. Program the All Pagers cap code into the AlarmView transmitter if different than 0000031. (See *Section 4: Programming*.)

4. Program Survey Page mode for 150 pages at an interval of 120 seconds. (See *Section 5: Testing and Periodic Maintenance*.)

5. Place several AlarmView transmitters throughout the care unit.

6. One by one, perform steps #7 and #8.

7. Turn on a transmitter and activate Survey Paging. (See *Section 5: Testing and Periodic Maintenance*.)

8. Observe the Transmitting Indicator LED.

      a. This LED will be green when transmitting a survey page (approximately every 120 seconds) and will remain lit for approximately 2 seconds.

      b. This LED will go amber when the transmitter detects another signal on this selected frequency.

      c. Be sure to account for any other AlarmView transmitters that may be sending pages.

9. Turn off the transmitter.

10. The Transmitting Indicator LED should remain dark and not detect significant RF interference.

11. Proceed to the Range Test using the selected frequency.

Range Test

The purpose of this activity is to determine any areas of no coverage and ensure that AlarmView transmitters can detect each other.

1. Place an AlarmView transmitter at the furthest extent of one end of the care unit.

2. Program the transmitter to transmit 150 survey pages every 10 seconds. (See *Section 5: Testing and Periodic Maintenance*.)

3. Walk slowly around the care unit with an assigned pager to determine any areas of no reception. Multiple pagers must be separated from each other by 12 inches to eliminate interference between pagers.

      a. During the walk, observe the sequentially numbered survey pages from #1 up to #150(or until the care unit has been sufficiently covered).

      b.   Locate any areas where one of the numbered pages is not received on the pager. That is an indication of an area of no reception.

      c.   If any suspected areas of no reception are found, walk slowly until the exact extents of the areas of no reception are discovered.

      d.   Walk into all rooms of the care unit.

      e.   Pay attention to:
- Elevator banks
- Columns
- Double doors
- Metal doors
- Plaster construction

4. A corrupt page, partial page, or incomplete page is the same as a missing page.

5. Repeat steps #1 and #4 with another transmitter at another furthest extent of the care unit.

6. Make sure both transmitters are sending survey pages at 20-second intervals for 150 pages. Initiate survey page mode for both transmitters at the same time.

7. Verify that each transmitter can detect the transmission from the other transmitter.

   This is determined when the first transmitter sends a Survey Page and the second transmitter's Transmitting Indicator LED turns amber, indicating that it can detect the first transmitter. This should be seen at the same interval as programmed into the transmitter in the previous step.

An easy way to verify that the amber LED is from a valid transmitter is to use a pager. Compare the receipt of a page from the first transmitter with the amber LED on the second transmitter. These

should correspond in time although they may not be exactly simultaneous.)

An amber LED that does not correspond to a survey page from the first transmitter may indicate interference.

If the second transmitter does not detect the first transmitter's pages, the test fails. It is possible for the pager to receive the page but the second transmitter does not detect the page from the first transmitter. This is still a failure.

8. If areas of no reception are not discovered and the transmitters can detect each other's transmissions, the range test is complete.

9. If the extents of the coverage exceed the care unit, only the care unit's physical limits will be supported by Data Critical.

10. Communicate the extents of tested coverage and any detected areas of no reception to the clinical staff both verbally and in written form.

Programmer Set Up

The purpose of this activity is to set up the programmer with the specific room numbers in the care unit and add the pagers that will be used.

1. Make a list of all patient beds in the care unit.

2. Verify with the charge nurse that the list is representative of how the clinical staff reference the bed numbers. (For example, in a semi private room, do they reference the beds as Room 501 A and 501 B, or Room 501-1 and 501-2?)

3. Enter the entire list of beds, up to 48 beds, in the AlarmView programmer. (See *Section 4: Programming*.)

4. Enter the cap codes of all the pagers to be installed in the care unit, up to 12 pagers, into the AlarmView programmer. (See *Section 4: Programming*.)

Transmitter Setup

The purpose of this activity is to set up each transmitter in the system.

For each transmitter in the system, perform the following steps:

1. Turn on the transmitter.

2. With the programmer, use the AlarmView Install program. Begin by pressing CHECK.

3. Program the appropriate frequency, baud rate, and common cap code into the transmitter. Press the SEND button.

4. Set the Reminder Time Interval according to the care unit's policy. If no policy is established, suggest to the nurse manager that it be set to 2 minutes. Press the SEND button.

5. Set the Range Test (Survey Page) to transmit at 15-seconds intervals for 100 pages. Press the SEND button.

6. Use the CHECK button to verify that all the above values were properly received by the transmitter.

Setup Verification

The purpose of this activity is to ensure that all transmitters are correctly transmitting to all the pagers and the programmer is properly setup.

The following steps verify that the Programmer and Pagers have the correct Common Cap Code.

1. Turn on one transmitter and all the pagers.

2. With the programmer, use the AlarmView SysMgr program and go to the ASSIGNMENTS screen.

3. Select any BED NUMBER and select ALL PAGERS. Press the SEND button to program the transmitter.

4. Verify that all the pagers received a "Programming OK / All Pagers" message.

    If one of the pagers does not receive a page, that pager's common cap code may be incorrect. If none of the pagers receive the page, either the programmer or the pagers may have an incorrect common cap code.

The following steps verify that the Programmer and the Pagers have the correct individual cap code.

5. With the programmer, select any BED NUMBER and select an individual pager. Press the SEND button to program the transmitter.

6. Verify that the selected pager received a "Programming OK / xxxx" message where 'xxxx' corresponds to the last 4 digits of the pager's serial number.

7. Repeat steps #5 and #6 for each pager in the care unit.

    If one of the pagers does not receive a page, either the programmer has the wrong cap code entered or that pager's individual cap code may be incorrect.

The following steps verify that each Transmitter is working properly.

8. For each transmitter in the system, program it to any of the pagers and bed numbers.

9. Verify that the selected pager received a "Programming OK / xxxx" message where 'xxxx' corresponds to the last 4 digits of the pager's serial number.

10. Repeat steps #8 and #9 for each transmitter in the care unit.

    If one of the pagers does not receive the page, the transmitter may not be working or may be incorrectly programmed.

11. Turn off all transmitter, pagers, and the programmer.

Final Steps

The purpose of this activity is to ensure that all transmitters are correctly transmitting to all the pagers.

1. Plug in each AlarmView transmitter to AC power for 17 hours to ensure the batteries are fully charged before placing the AlarmView transmitters into service.

Select the location the clinical staff will store the AlarmView programmer when not in use. Plug in the AC power cable at that location and instruct the clinical staff to plug in the programmer when it is not in use.

Appendix C: Restoring the Programmer's Software

RESTORING ALARMVIEW PROGRAMMER SOFTWARE

The AlarmView programmer ships from the factory with a memory card installed that has a backup of the AlarmView software.

The following procedure will restore the software to the factory default state:

If both the main and the backup batteries of the Compaq programmer have become depleted or have been removed simultaneously, the Intouch software may not appear when both batteries are reinstalled. Use the following procedure to restore the Intouch program:

1. If the programmer is not already on, press the Power button to turn it on.
2. Press the Q button on the side of the programmer.
3. Select "QUtilities." (Your menu may look somewhat different than the one illustrated below.)
4. Click on the CF Backup tab.
5. Click on the Restore button to access the restore program.
6. Click on the Start button to initiate the restore process.
7. A message asks you if you are sure you want to continue. Click Yes.
8. A warning box appears, reminding you not to try to use the device or remove the flash card while the programmer is being restored. Click on "OK."
9. A status bar reporting the activity until the function is complete (the status bar may stay on 99% for several minutes). When the process is complete, a message appears telling you to press the Reset button to resume operation. Click on "OK."
10. Press the Left-most application button to display the Intouch 3-button screen.

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