



NC377 Paging Interface Adapter Installation & Operating Instructions

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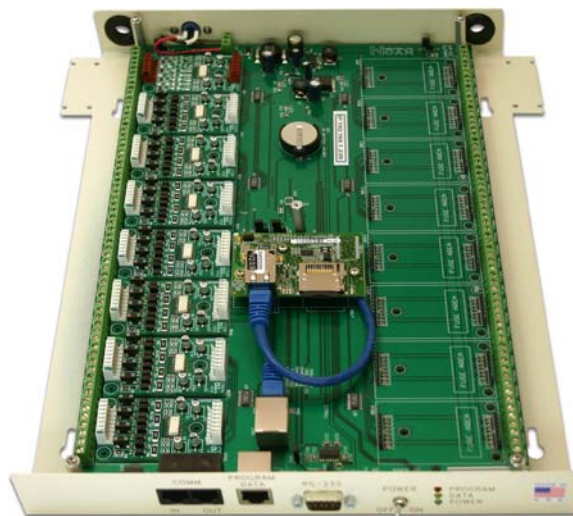
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Figure 1—NC377/32 Paging Interface Adapter



Chapter 1—Introduction

The NC377 Paging Interface Adapter is used with TekTone® NC110, NC150 and NC200 hard-wired nurse call systems to add radio pocket paging. The interface is connected between the nurse call system and the radio pocket pager transmitter. The NC377 Paging Interface Adapter detects calls, determines priority, and then sends information to the NC369 Paging Transmitter. Program call points so that calls are sent to the appropriate pager. Information sent includes call type and room number. The pager stamps the time and date.

About This Manual

This manual is designed to assist with installation of this TekTone® product. Each component of the system is described with step-by-step instructions to facilitate hardware installation and software configuration.



1. Important: Please take all precautions against high voltage shock.
2. Use an ESD wrist strap when working with the SD or Contact Input Cards.
3. Remove power from the unit before SD or input card removal or replacement, and for wire installation.

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1. Important: Please use proper splicing techniques. There will be many splices made to install this unit.
2. Verify proper polarity of input wires (should be +).
3. Use protective eye wear when clipping leads.

Theory of Operation

TekTone® NC110, NC150 and NC200 nurse call systems utilize a lamp select line (wire) to indicate a call on the system. When idle, these lamp select wires show a +24VDC potential, and when a call is placed they show a voltage drop of at least 12VDC. This drop, and whether it remains low or pulses, is used by the interface to determine the call type and priority. The unit will indicate whether it is a routine level call or a priority call.

What's in the Box

- NC377-series Paging Interface Adapter (see *Figure 1*).
- Mounting hardware.
- CA377 **gray** crossover cable with 8P8C connectors.
- CA132 **red** patch cable with 8P8C connectors (used to connect slave to slave).

Features

- Programming via web browser.
- Programmable output protocol.
- Programmable up to 3 shifts.
- Global Pager ID; two available.
- System Health Check and Time Period (2, 5, 15 minutes; 1 or 2 hours).
- 576 total contact inputs.
- Storage: Log all alarms created. All logs stored in files of 24 hours.
- Reports: Database, by Room, Type of Call, and Elapsed Time.
- Approvals: FCC part15, UL® 1069, CSA and RoHS compliant.

Figure 2—NC377 Cable Routing

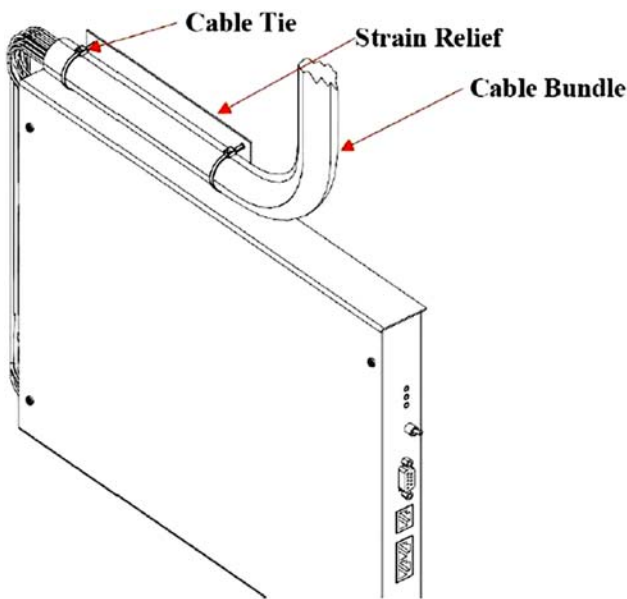


Figure 3—Nurse Call Lamp Select Line Wiring

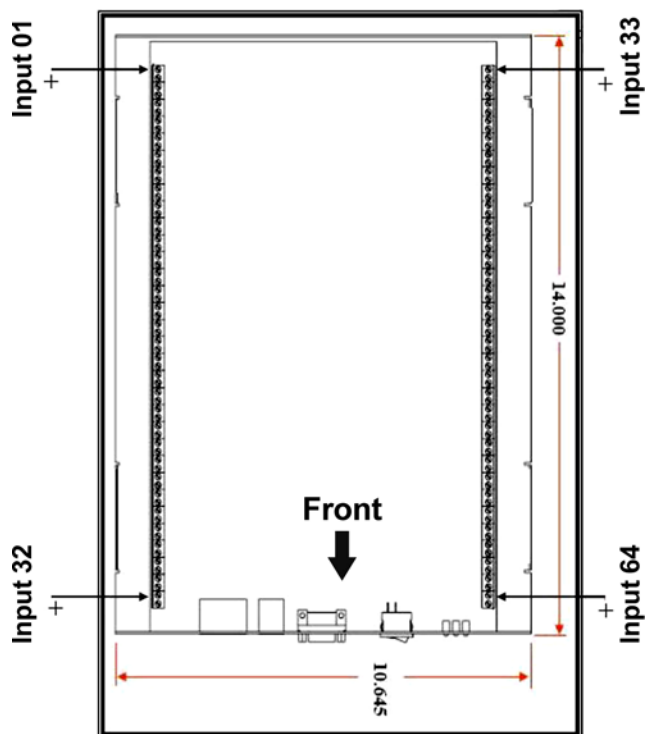
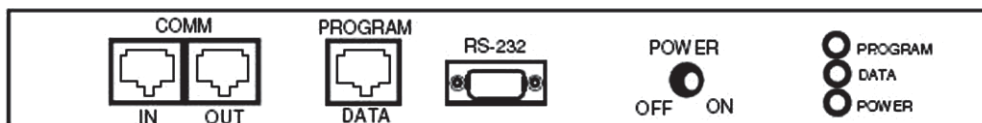


Figure 4—Port Name Drawing, Front



Chapter 2—Installation

Mounting & Cable Routing

Verify that power to the unit is **disconnected** before proceeding.

Please follow these steps. (Note: The terms *zone* and *input* are used interchangeably in this manual and on the programming screens.)

1. Remove the four Phillips-head screws located on top of the NC377 Paging Interface Adapter.
2. Remove the top cover and set aside.
3. Using the hardware supplied, mount the NC377.
4. If the cable you are using has bundled wires, strip the outside covering back 24 inches.
5. Loop the cable in a U shape and attach it to the NC377 using the tie-wraps provided. (See *Figure 2*.)
6. Route the wires through the access holes on the back of the unit.
7. With the front of the unit facing you, inputs 1–32 are on the left and 33–64 are on the right. (See *Figure 3*.)
8. Route your cables so that they do not cross over the board inside the NC377 Paging Interface Adapter.

Nurse Call Wire Connections

Referring to *Figure 3*, route and connect the individual lamp select wires.

1. If all the inputs have a common ground, it is not necessary to attach individual grounds to each input on the terminal block. Simply attach the common ground to terminal number 2(–) and place an internal jumper on the other terminals (negative terminals 2, 4, 6, 8, etc.).
2. Attach the first Lamp Select Wire (positive wire) to terminal 1(+).
3. Continue until all inputs are connected.
4. Replace the top cover and the four Phillips-head screws.

Power Up Sequence

Referring to *Figure 4* and the following steps, connect all the required cables.

1. Connect the power lead to the rear of the unit, and apply power.
2. On the front panel, turn on the power switch. The green power LED indicator will light.
4. Connect the RS232 serial cable from the NC377 Paging Interface Adapter to the paging transmitter's input. (The RS232 cable is provided with the paging transmitter. To build a longer cable or a new cable, see the paging transmitter's manual.)
5. Apply power to the paging transmitter.
6. The NC377 is now ready to be programmed.

Chapter 3—Programming Plan

This section outlines the overall programming plan. Refer to *Chapter 4—Programming* for step-by-step programming instructions. (Note: The terms *zone* and *input* are used interchangeably in this manual and on the programming screens.)

Before use, perform *Global Settings Programming* on each NC377. The NC377 Paging Interface Adapter may be ordered with either 32 or 64 points. Configure each NC377 as either a *master* or a *slave*. There must always be one master, but there may be up to eight slaves.

1. Each NC377 Paging Interface Adapter will be connected separately for the global settings programming. After programming, they will be connected together for system operation.
2. The gray crossover cable is used to connect the PC/laptop to the NC377 for programming.
3. If multiple NC377s will be connected together, program the slaves first. Only these four fields are programmed on the slave units:
 - Host System (TekTone®)
 - Unit ID: Slave
 - Slave #
 - Total Number of Contacts (32 or 64)
4. Label each NC377 with its Slave # or as the Master so it can be identified in the future.
5. Program the master NC377 after all slaves have been programmed. Contact input programming is performed only on the master NC377.
6. Select *TekTone®* as the host system on both masters and slaves.
7. Each NC377 has a maximum capacity of 64 inputs, with a total 576 when all 8 slaves are connected. The contact numbers run in sequence:

Master	1–64
Slave1	65–128
Slave2	129–192
Slave3	193–256
Slave4	257–320
Slave5	321–384
Slave6	385–448
Slave7	449–512
Slave8	513–576

If an NC377 has fewer than 64 inputs connected, program only the inputs that are connected. The contacts can be connected in any order, i.e. 1–16 or 32–48.

After global settings programming is complete, perform *Contact Input Programming* on the master NC377 to program the inputs being used.

Default User Name & Password

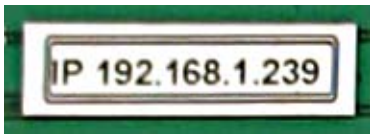
The NC377 is shipped with the following default user name and password:

User Name: comppage
Password: pia3264

TekTone® suggests you keep these defaults. (See *Changing the NC377's User Name & Password* in the Appendix to change the user name and password.)

Logging On, Loading Programming Screen

1. For the PC to communicate with the NC377 Paging Interface Adapter, they must both be on the 192.168.1.____ IP subnet. TekTone® suggests using 192.168.1.235. Temporarily change the IP address of your PC or laptop. (See *Changing a PC's IP Subnet* in the Appendix for instructions.)
2. Connect the PC/laptop to the NC377 using the gray cross-over cable.
3. Apply power to the NC377 Paging Interface Adapter and turn it on; the green power light will light. The NC377 will be operational approximately 40 seconds after power up.
4. Open a browser, such as Internet Explorer, on the PC/ laptop.
5. Locate the NC377 Paging Interface Adapter's IP address on the label attached to its main circuit board.



In the browser's address line, type the IP address, followed by /default.zhtml in lower case letters. (For example, 192.168.1.239/default.zhtml)

6. The Welcome screen will appear (see *Figure 5*). Click on **Configuration Settings**.
7. The Logon screen will appear (see *Figure 6*). Enter the default user name and password:

User Name: comppage
Password: pia3264
8. Click **OK**.
9. The Global Settings screen will appear (see *Figure 7*).

Global Settings Programming

Referring to the *Figure 7*, while logged on to the interface, configure the following:

Date and Time—(Master NC377 only.) The NC377 has an RTC (real time clock). Set the clock to the current time so all logs and reports will reflect the correct date and time.

- Type the date in mm/dd/yyyy format, including slash marks (09/01/2009).
- The NC377 uses a 24-hour clock. Enter all digits, including colons, in hh:mm:ss format (12:15:00).

IP Address—(Do not change.) The address of this NC377.

Host System—Select *TekTone* as the Host Nurse Call System you will connect to this unit. The program will automatically set the correct sample rate for the Slow and Fast pulse rate.

Unit ID—Select the type of unit to be programmed. Each unit must be identified as a Master, or as Slave1–Slave8.

- Master
- Slave 0 (no slaves), or
- Slave1–Slave8

Number of Slaves—(Master NC377 only.) Select the number of slaves (0–8) that will be attached to the master.

Master/Slave Port Setup—(Do not change unless you are directed to by TekTone® Technical Support.) This setting controls the data speed on the RS485 bus. It is factory set.

Protocol—(Master NC377 only.) Select *Scope* when using the TekTone® NC369 Paging Transmitter.

Data Type—(Master NC377 only.) Select *Alphanumeric*.

Baud Rate—(Master NC377 only.) Select 512.

Device to Transmitter Port Setup—(Master NC377 only.) This setting must match the port settings of the paging encoder installed. Select 9600-N-8-1 for the TekTone® NC369 Paging Transmitter.

Total Number of Contacts—Select the number of inputs that are installed in the NC377 being programmed (32 or 64).

Monitoring Pagers—(Master NC377 only.) All alarm notifications will be sent to the Monitoring Pagers (in addition to the Pager IDs assigned to specific alarms in contact input programming). Enter Pager ID and Alert type (A, B or C).

Use this formula to convert the pager's CAP code to its corresponding Pager ID (add leading zeros to make 7 digits):

$$\text{Pager ID} = [(\text{pager's CAP code} \times 8) + 10000].$$

System OK Check—(Master NC377 only.) Select a pager ID and time interval for the system to transmit a *System OK* check-in message. Enter Pager ID, Alert Type and Time Interval. (After the screen has refreshed, the Pager ID's leading zeros will not display; this is normal.)

Shift Schedule—(Master NC377 only.) This option enables automatic shift change paging.

1. Check the Shift Schedule box.
2. Type the start and end times of Shift 1, for example 07:30 to 15:30.
3. Continue for Shift 2 and Shift 3. The end and start times of shifts will overlap. Any call activated within one minute of the overlap will be sent to both shifts' pagers.

4. If Shift 3 does not complete the 24-hour period, the unused time allocated to Shift 3, and any page during that time will be sent to Shift 3 pagers.

Save Database—After selecting all the Global Settings, click **Save Database** to save the programming to memory. Changes are not effective until they are saved to the database.

Figure 5—NC377 Programming Welcome Screen

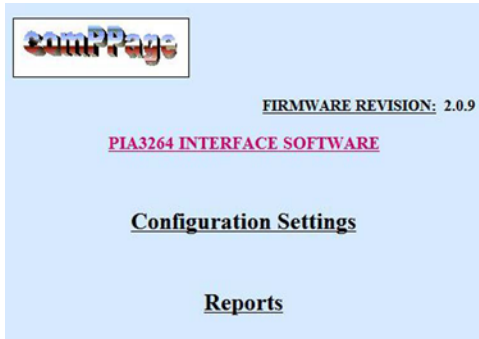


Figure 6—NC377 Programming Log-On Screen

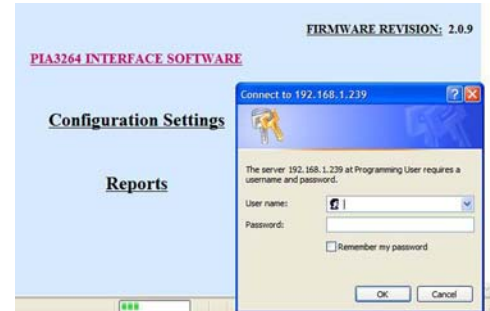


Figure 7—Global Settings Programming Screen

GLOBAL SETTINGS

Date: 02/03/2010 Time: 17:06:48 IP Address: 192.168.1.239 Host System: TekTone

Unit ID: Master Number of Slaves: 0 Master/Slave Port Setup: 57600-N-8-1

Protocol: Scope Data Type: Alphanumeric Baud Rate: 512

Device To Transmitter Port Setup: 9600-N-8-1

Total Number of Contacts: 64

Monitoring Pager:

Pager ID 1: 0013200 Alert Type: None

Pager ID 2: 0013208 Alert Type: None

System OK Check

Pager ID: 0000000 Alert Type: None Interval: 2 m

Shift Schedule : ☐

Shift 1 - 00:00 to 00:00 Shift 2 - 00:00 to 00:00 Shift 3 - 00:00 to 00:00

Save Database **Contact Settings** **Programming Authentication Settings**

Report Authentication Settings

Contact Input Programming

Click on the *Contact Settings* button at the bottom of the Global Settings programming screen. The screen shown in Figure 8 will appear.

Contact inputs must be programmed in order to respond properly. The master NC377 knows which contacts are on the slave and which are on the master.

Example: a master with 64 inputs, and 1 attached slave with 16 inputs used. Using the Contact Input programming screen, program the first 64 contacts with the information for the inputs connected to the master. Program the next 16 contacts (65–80) with the information for the inputs connected to the slave.

Programming Contacts for Elapsed Time Reports

If *Elapsed Time* reports are required, use the room number and bed identifier as part of the *Active*, *Reset*, *Pulse 1* and *Pulse 2* messages. The system will compare the time the input was activated to the time it was reset. It must have some method to determine one input from another. Since the room number and bed identifier will not always be the same as the zone/input number, TekTone® recommends including the room number and bed identifier in all message types.

Programming Contact Inputs

Start with Zone (input) # 1. Include room number and bed identifier in all four message types (marked *).

Input Alert Type—Select *Voltage Alert-Low*.

Room #—Select (1–9999), if applicable. If the nurse call system uses bed identifiers, also select that (A–E).

Active Message*—This message is sent to the pager when the zone/input is activated. (Example: *Room 0123A Routine*.)

Reset Message*—This message is sent to the pager when the zone/input is reset. (Example: *Room 1234B Reset*, *Room 1234B Cancelled*, or *Room 1234B Cleared*.)

Slow Pulsing & Fast Pulsing—You *must* check one or both of these so that the correct message will be sent to the pager when a slow or fast pulse is detected.

Pulse 1 Message*—This message is sent to the pager when Pulse 1 (slow pulse) is activated. (Example: *Room 2345C Emergency*.) You must also check *Slow Pulsing*.

Pulse 2 Message*—This message is sent to the pager when Pulse 2 (fast pulse) is activated. (Example: *Room 3456D Smoke Detector*.) You must also check *Fast Pulsing*.

Figure 8—Contact Input Programming Screen

PIA3264 INTERFACE SOFTWARE

Contact Programming Mode

Input Data For Zone # 1 Room #

Input Configuration : Input Alert Type :

Active Message : Reset Message :

☒ Slow Pulsing ☒ Fast Pulsing

Pulse 1 Message : Pulse 2 Message :

Shift 1 Pager:

Shift 2 Pager:

Shift 3 Pager:

Escalation : ☐

Repeat : Interval : To

[Return to Global Settings Page](#)

Shift 1, Shift 2 and Shift 3 Pagers (Figure 9)

Enter a Pager ID for each of the message types and shifts being used. Each shift has three Pager IDs:

- The Active message is sent to the first Pager ID.
- The Pulse 1 (slow pulse) message is sent to the second (middle) Pager ID.
- The Pulse 2 (fast pulse) message is sent to the third Pager ID.

The *Shift Schedule* checkbox in the Global Settings screen determines which shifts must have Pager IDs assigned:

- If you checked *Shift Schedule* in the Global Settings screen, fill in *Shift 1*, *Shift 2* and *Shift 3 Pagers*.
- If you did not check *Shift Schedule* in the Global Settings screen, fill in *Shift 1 Pager*.

Use this formula to convert the pager's CAP code to its corresponding Pager ID (add leading zeros to make 7 digits): **Pager ID = [(pager's CAP code × 8) + 10000]**

If a shift's message type is not being used, enter 7 zeros as its Pager ID.

Escalation Pagers (Figure 9)—These pagers are sent a call if it is not reset within a certain period of time. Check the box and enter a Pager ID for each of the shifts being used. The first Pager ID is for shift 1, the second Pager ID is for shift 2, and the third Pager ID is for shift 3.

Use this formula to convert the pager's CAP code to its corresponding Pager ID (add leading zeros to make 7 digits): **Pager ID = [(pager's CAP code × 8) + 10000]**

If a shift is not being used, enter 7 zeros as its Pager ID.

Repeat—Choices are 0–5. Do not use the RUR setting (Repeat until Reset), because it cancels escalations.

Interval—Choices are 2, 5, 10, 15, 20 or 30 minutes; and 1 or 2 hours.

Save Zone button—After all the fields have been completed for the zone/input, click the *Save Zone* button at the top right of the screen. Then begin programming the next zone/input.

Simplified Contact Input Programming

Create one zone/input and click *Save Zone*. Then make a copy of that zone/input using *Save to Zone*, and modify just the fields that vary from zone/input to zone/input.

1. In the first field, enter the zone/input number to be copied. In the second field, enter the zone/input number to be created. For example, *Save to Zone 2 to 32* copies all data from zone/input 2 to zone/input 32.
2. Click *Save to Zone*. The screen will refresh and display the newly created zone/input.
3. Make any changes necessary, and click *Save Zone*.

Modifying Contact Inputs—To modify existing zones/inputs:

1. Enter the zone/input number you want to edit in the *Find Zone* box, and click *Find Zone*. The contact programming information for the zone/input you entered will appear.
2. Make any changes necessary, and click *Save Zone*.
3. To modify the next zone/input, click *Next* to display it, make any changes necessary, and click *Save Zone*. Continue until all zones/inputs have been modified.

Print Database Button

The database report is a complete record of all currently programmed zones/inputs on the master and attached slaves. To create it, click the *Print Database* button at the bottom of the Contact Input Programming screen. All the active zones/inputs will be displayed in your web browser. Select *File > Print* in the web browser to print the report.

Finishing up

1. Replace the covers on all NC377 Paging Interface Adapters.
2. Connect the master to the paging transmitter using the serial cable supplied with the paging transmitter. Connect the master and first slave using the gray crossover cable. Connect all slaves together using the red patch cables.
3. Power up all NC377 Paging Interface Adapters.
4. Place calls from rooms to test all zones/inputs.

Figure 9—Assigning Shift & Escalation Pagers

	Active Message Pager	Pulse 1 (Slow) Pager	Pulse 2 (Fast) Pager
Shift 1 Pager:	0000100 None	0000100 None	0000100 None
Shift 2 Pager:	0000000 None	0000000 None	0000000 None
Shift 3 Pager:	0000000 None	0000000 None	0000000 None
Escalation :	<input type="checkbox"/> 0000100 None	0000100 None	0000100 None

Shift 1 Escalation Pager Shift 2 Escalation Pager Shift 3 Escalation Pager

Chapter 5—Reporting

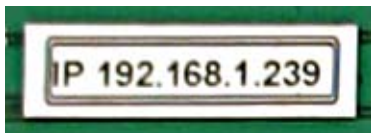
The NC377 can store multiple days of data logs on the 1GB SD card located on the processor board. Copy the logs to a PC periodically. See *SD Card Use* in the Appendix for instructions on copying files. If the card fills up, the oldest log will be overwritten and lost.

A variety of report types can be produced by entering different search parameters. Refer to *Figure 10* while performing the following steps to create a report.

Log On

Log onto the NC377 using the following procedure:

1. For the PC to communicate with the NC377 Paging Interface Adapter, they must both be on the 192.168.1.____ IP subnet. TekTone® suggests using 192.168.1.235. Temporarily change the IP address of your PC or laptop. (See *Changing a PC's IP Subnet* in the Appendix for instructions.)
2. Disconnect the gray crossover cable from the first NC377 slave, and use the cable to connect the PC/laptop to the master NC377. (Reporting is not available from slaves.)
3. Open a browser, such as Internet Explorer, on the PC/laptop.
4. Locate the NC377 Paging Interface Adapter's IP address on the label attached to its main circuit board.



In the browser's address line, type the IP address, followed by /default.zhtml in lower case letters. (For example, 192.168.1.239/default.zhtml)

5. The Welcome screen will appear (see *Figure 5*). Click on **Reports**.
6. The Logon screen will appear (see *Figure 6*). Enter the default user name and password:

User Name: default
Password: pia3264
7. Click **OK**.
8. The Report Options screen will appear (see *Figure 10*).

Report Types

Reports can be created without entering a date, room number or type of call. Because this type of report is very general and includes a large amount of data, it takes a considerable amount of time to produce. Therefore, TekTone® recommends limiting the amount of data in a single report. Here are a few suggested report types:

Room Number & Date—shows a list of all calls placed from a specific room on one date or range of dates (*Figure 11a*).

1. Check the *Date* box and enter the desired *From Date* and *To Dates* for the report.
2. Check the *From Room* box. Type the *From Room* number and bed identifier (if used). Leave the *To Room* blank.
3. Click *View Report*.

Room Number, Date & Call Type—shows a list of calls of a single call type placed from a specific room on one date or range of dates (*Figure 11b*).

1. Check the *Date* box and enter the desired *From Date* and *To Dates* for the report.
2. Check the *From Room* box. Type the *From Room* number and bed identifier (if used). Leave the *To Room* blank.
3. Check the *Type* box. Click on the call type to highlight it (Active, Pulse1 or Pulse2).
4. Click *View Report*.

Figure 10—Report Options Screen

Room Number, Date, Call Type & Elapsed Time—shows a list of calls of a single call type placed from a specific room on one date or range of dates. This report also includes the time elapsed from call placement to call reset (*Figure 11c*).

1. Check the *Date* box and enter the desired *From Date* and *To Dates* for the report.
2. Check the *From Room* box. Type the *From Room* number and bed identifier (if used). Leave the *To Room* blank.
3. Check the *Elapsed Time* box.
4. Check the *Type* box. Click on the call type to highlight it (Active, Pulse1 or Pulse2). Or, leave the *Type* box unchecked to list all call types.
5. Click *View Report*.

Range of Room Numbers & Date—shows a list of all calls placed from a range of rooms on one date or range of dates.

1. Check the *Date* box and enter the desired *From Date* and *To Dates* for the report.
2. Check the *From Room* box. Type the *From Room* number and bed identifier (if used). Type the *To Room* number and bed identifier (if used).
3. Click *View Report*.

Room Number, Date & Shift—shows a list of calls placed from a specific room on one date or range of dates during a single shift.

1. Check the *Date* box and enter the desired *From Date* and *To Dates* for the report.
2. Check the *From Room* box. Type the *From Room* number and bed identifier (if used). Leave the *To Room* blank.
3. Check the *Shift* box. Click on the Shift to highlight it (Shift1, Shift2 or Shift3).
4. Click *View Report*.

Figure 11—Report Examples

Report Date: 12/24/2008
Report Time: 14:27:56
Options: Date Room#

Log Date: 12/23/2008

Room No. 222

Log Time	Pager ID	Message
07:20:00	0300800	Bed Call Room 222
08:13:22	0300800	Bath Call Room 222
08:14:00	0300800	Bed Call Room 222 Reset
08:22:23	0300800	Bath Call Room 222 Reset
10:13:35	0300800	Bed Call Room 222
13:00:45	0300800	Bath Call Room 222

Figure 11a—Room Number & Date

Report Date: 12/22/2008
Report Time: 13:27:00
Options: Date Room# Type

Log Date: 10/20/2008

Room No. 33

Log Time	Pager ID	Message
06:19:00	0301600	Bed Call Room 33
07:12:00	0301600	Bed Call Room 33 Reset
08:45:00	0301600	Bed Call Room 33

Figure 11b—Room Number, Date & Call Type

Report Date: 12/24/2008
Report Time: 14:20:09
Options: Date Room# Elapsed Time Type

Log Date: 12/23/2008

Room No. 66

Log Time	E – Time	Pager ID	Message
12:44:32		0300800	Bed Call Room 66
12:45:16	00:00:44	0300800	Room 66 RESET
13:15:00		0300800	Bed Call Room 66
13:25:00	00:10:00	0300800	Room 66 Reset

Figure 11c—Room Number, Date, Called Type & Elapsed Time

Changing a PC's IP Subnet

1. You must be the administrator on the PC/laptop.
2. On your PC/laptop, select *Start > Control Panel > Network Connections*.
3. Right-click your Local Area Connection and select *Properties*.
4. Click *Internet Protocol (TCP/IP)* and click *Properties*.
5. Select *Use the following IP address* (This will deselect *Obtain an IP address automatically*).
6. To the right of the IP address, enter the new IP address: 192.168.1.235.
7. Press tab. The subnet mask will show as 255.255.255.0.
8. Click *OK* to exit the window.
9. Reboot the PC/laptop if necessary. The PC/laptop can now log onto the NC377.

Changing the NC377's User Name & Password

The NC377's user name and password are alphanumeric with a maximum length of 11 characters and no spaces.

1. Select the *Change Programming Authentication Settings* button at the bottom of the NC377's Global Settings screen.
2. The Change User Name / Password screen will appear.
3. Enter the new user name and password. Then click *Set Programming Authentication Settings*.
4. The new user name and password will take effect the next time you log onto the NC377.
5. Save this information in a secure place. If it is lost, it will be impossible to log onto the NC377.

The same procedure is used to change the Reporting screen's user name and password.

Figure 12—SD Card Maintenance



SD Card Use

Removing the SD Card from the NC377

1. Remove power from the NC377.
2. Remove the four screws holding the top cover on and set the cover and screws aside.
3. Locate the main processor board in the middle of the motherboard.
4. Gently push the card in. It will snap back out, and then you can remove it.

Copying Files from the SD Card

Copying files from the SD card to a PC is for storage only. Do not use a PC to read or modify the files.

1. The PC must have an SD card reader. If the PC does not include one, purchase one locally and connect it to the PC via USB.
2. Insert the SD card in the card reader. Microsoft Windows® will recognize the card as a removable drive and assign it a drive letter.
3. Create a directory on the PC. Then drag and drop the directories from the SD card into the new directory on the PC.

Reinstalling the SD Card into the NC377 (Figure 12)

1. After all directories have been copied, remove the SD card from the PC's SD card reader.
2. Insert the SD card into the holder on the NC377's main processor board with the contacts facing up. Gently push the SD card in until you feel the card click in.
3. Replace the cover and four screws. Apply power to the NC377.

Cables

- To build a crossover cable, wire one end T568A and wire the other end T568B, using 8P8C connectors (see *Figure 13*).
- To build a straight-through cable, wire both ends T568B, using 8P8C connectors (see *Figure 13*).
- Refer to your paging transmitter manual for instructions on building an RS232 cable, if needed.

Troubleshooting

If a master or master-slave configuration is not sending data to the paging transmitter, check the following.

Master's Power LED is on,

Slave's Power & Data LEDs are on solid:

- Check the RS232 cable to the paging transmitter.
- Check that the correct paging protocol is selected in the master's programming.

Slave's Power, Data & Program LEDs are all on:

- Slave(s) are not connected to master.
- Check interconnecting crossover and patch cables.

Master or Slave Power LED is off:

- No 12 VDC input.
- Check AC adapter in rear of slave or master.

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Figure 13—8P8C Cable Terminations

T568B							
1	2	3	4	5	6	7	8
wht/org	orange	wht/grn	Blue	wht/blue	green	wht/brn	brown

T568A							
1	2	3	4	5	6	7	8
wht/grn	green	wht/org	Blue	wht/blue	orange	wht/brn	brown

A Word about ESD (Electrostatic Discharge)

What Is It?

Static electricity is a result of triboelectric charging of two dissimilar non-conductive materials that are rubbed together, such as rubbing your feet on a carpet on a cold winter day or in a dry climate. The resulting charge is detected when you reach out to touch a doorknob or some other metallic object. The resulting discharge may only be startling or, in severe cases, it may even be painful. The actual electrical charge is dependant on the materials being rubbed together, humidity, the rate of separation, and other factors.

What Can It Do?

While this effect may be disturbing to humans, the effect on electronic equipment is often more serious, ranging from operational disruption to actual component damage. These effects result from the high voltages that may be developed. The simple act of walking across a carpet may develop as much as 30,000 volts, and changing a bed sheet may create a charge of 100,000 volts or more. Such voltages readily cause arcing (the spark that can be observed when you grab a doorknob after walking across a carpet, etc.). The arcing is evidence of the discharge path. Due to the high voltage involved, the discharge current can jump to any nearby metallic or non-metallic object. If the discharge is to or through an electronic device, such as the nurse call system, the operation of the device may be affected. If the discharge current passes through internal components, these components may be damaged or their operation degraded.

What Can We Do About It?

The manufacturer of the nurse call equipment has already taken steps to protect the equipment from electrostatic discharge (ESD) effects. Our peripheral equipment has been tested and listed by ULR to withstand discharges of up to 30K volts. However, since the cause is not in the equipment, but in the environment, further measures are required of the installer and the user to achieve complete protection.

What The Installer Can Do

In humid climates or in places where the relative humidity is kept at 65% or greater, there will likely be few problems with ESD. Where problems may occur the following measures can be taken.

- Ground all exposed metal surfaces. Grounding should be to a #16 gauge or larger conductor.
- Install nurse call system wiring in metal conduit. This conduit may be used to ground panels.
- Use shielded cable for nurse call system station-to-station wiring. The use of open conductors invites inductive coupling of discharge currents, which can cause the same problems as direct discharge currents.
- Ground your body before handling system components. This can be done by using a wrist strap, or simply by contacting a grounded metal surface. Use caution to avoid hazardous voltages while grounded.

What The User Can Do

The most common generation of ESD in hospitals is due to changing linen on hospital beds while the patient call cord or pillow speaker is still connected to the nurse call system. The following precautions will help. Remove the call cord or pillow speaker from the bed before changing the linen. It will be necessary for the nursing staff to discharge themselves by contacting a grounded metal object before placing the call cord or pillow speaker back on the bed; otherwise a spark will jump to the nurse call equipment, causing the very damage they are trying to avoid. To avoid a shock while discharging static electricity on the body, hold a metal object, such as a key, and use that object to contact the grounded surface.

This information is provided to make you aware of ESD problems so that precautions may be taken to avoid damage and disruption of system operation.