NELLCOR

HOME USE GUIDE

N-395

Pulse Oximeter

Important: Read this manual before using the monitor.

If you need help, call the 24-hour hot line of the home care dealer listed here:

Caution: Federal law (U.S.) restricts this device to sale by or on the order of a physician.

To obtain information about a warranty, if any, for this product, contact Nellcor Technical Service (1.800.NELLCOR) or your local Nellcor representative.

Nellcor Puritan Bennett Inc. is an affiliate of Tyco Healthcare.

Purchase of this instrument confers no express or implied license under any Nellcor Puritan Bennett patent to use the instrument with any sensor that is not manufactured or licensed by Nellcor Puritan Bennett.

Covered by one or more of the following U.S. Patents and foreign equivalents: 4,621,643; 4,653,498; 4,700,708; 4,770,179; 4,869,254; 5,078,136; 5,351,685; and 5,368,026.

IMPORTANT INFORMATION

INTRODUCTION

This manual is for the home caregiver—the person who provides care for a patient being monitored by the N-395 pulse oximetry monitor in the home. As the home caregiver, it is important that you read this entire manual before you use the monitor.

Instructions for using the monitor and important safety information are found in this manual. If you do not understand any part of this information, ask your clinician to explain it to you.

In this manual, the term "clinician" means the trained healthcare professional who is helping you monitoring the patient and using the N-395 monitor in your home. This person may be the doctor or nurse who is treating the patient, or some other trained healthcare professional.

IF YOU NEED HELP

Contact your clinician if you have any questions or concerns about using the N-395 monitor.

If you require assistance in operating the equipment, and are unable to contact the clinician, call the **24-hour hotline** of your medical equipment dealer. Keep the dealer's business card with this manual. That card shows the hotline number.

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FIGURES

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TERMS AND SYMBOLS

OVERVIEW

This section defines special words and phrases that are used in this manual. It also lists symbols that you will see on the monitor, and tells you what those symbols mean.

As you read through the manual, refer back to this section if there is a term used that you do not understand.

If there are any terms you do not understand and they are not listed below, or if you do not understand a definition, contact your clinician and ask him or her to explain it to you.

DEFINITION OF TERMS

%SpO_2 (or oxygen saturation)	A measure of the amount of oxygen actually carried in the patient's blood, compared to the amount that the blood in this patient could carry.
Alarm	A warning made by the monitor when an alarm condition occurs. This warning may be a sound that can vary in tone and speed, or flashing numbers and lights, or both.
Alarm Condition	A situation that causes the monitor to alarm, such as loss-of-pulse or the blood oxygen level falling below the alarm limit setting.

Alarm Limits	The high and low alarm limits for oxygen saturation (%SpO_2 and PULSE RATE values that are set in the monitor. If the patient's oxygen saturation level or pulse rate goes above the high limit or below the low limit set in the monitor, an alarm sounds. (Also, see *Medium Priority Alarm*.)
ALARM SILENCE Reminder	Three beeps that sound at least every 3 minutes.
Beats per minute (BPM)	The number of times per minute that the patient's heart beats.
BLIP Bar	A display on the front of the monitor consisting of ten lines or bars that show the strength of the patient's pulse.
BLIP View	A patient monitoring mode that displays the pulse amplitude indicator (blip bar) and large (or magnified) %SpO_2 and pulse rate values. Also referred to as "magnified view."
Clinician	A trained healthcare professional who is helping with the use of the N-395 monitor in the home. The clinician may be a doctor or nurse who is treating your patient, or some other trained healthcare professional.
Factory Default Settings	Settings for various parameters, such as alarm limits, that are pre-programmed at the factory.

Hemoglobin	Part of the blood that carries oxygen.
High Priority Alarm	A rapidly repeating, high-pitched tone that signals a loss-of-pulse.
Home Caregiver	Person who provide care for a patient being monitored by the N-395 pulse oximetry monitor in the home.
Indicators	Lights on the front of the monitor that indicate certain conditions when they are lit. This manual lists all indicators and what it means when each one lights.
Invalid Button Press	A slow, low-pitched tone that indicates that an incorrect button has been pressed. Check the mode of the monitor and select another button.
Loss-of-Pulse	The time when the monitor no longer detects a pulse. It sounds an audible alarm and flashes zeroes in the SpO_2 and pulse rate displays.
Low Priority Alarm	A slowly repeating, low-pitched tone. This alarm can mean several things. It can indicate that a sensor is disconnected. It can also mean that the battery is low or that the monitor has failed.
Magnified (or BLIP) View	A patient monitoring mode that displays the pulse amplitude indicator (blip bar) and large (or magnified) numeric %SpO_2 and pulse rate values. Also referred to as "*BLIP view*."

Medium Priority Alarm	A repeating, medium-pitched tone. This alarm tells you that the values have gone beyond the limits of the %SpO_2 or pulse rate settings.
Monitor	The term used in this manual for the N-395 pulse oximeter.
Monitoring	The time when the monitor is detecting a pulse and routinely displaying pulse rate and the oxygen saturation level.
Oxygen Saturation	A measure of the amount of oxygen actually carried in the patient's blood, compared to the amount that the blood in this patient could carry. Expressed as a percentage and displayed on the monitor as "%SpO_2".
Pleth	A short name for "plethysmographic" waveform. It is the waveform, or curved line, displayed on the monitor. It shows changes in blood volume that happens each time the heart pumps blood into the arteries.
PLETH View	A patient monitoring mode that displays pleth waveform and numeric %SpO_2 and pulse rate values.
Port	A place on the monitor where you plug in a sensor or cable.
Power-On Self-Test (POST)	A test performed by the monitor to check its internal systems. It is performed automatically each time the monitor is turned on.

PULSE AMPLITUDE	The strength of the pulse as shown in the vertical PULSE AMPLITUDE indicator (the BLIP Bar). The number of lit lines in the display indicates the pulse strength. (See Figure 8 on page 28.)
Pulse Beep	The sound made by the monitor indicating each pulse beat.
Pulse Oximetry	A method of determining if the blood has adequate oxygen saturation levels (%SpO_2).
Pulse Oximetry Cable	A special cable that must be used to connect a sensor to the Nellcor monitor. Either the MC-10 or the SCP-10 extension cable may be used with your N-395 monitor.
SatSeconds	An alarm management tool that may reduce the number of audible alarms while monitoring a patient.
PULSE SEARCH	The time when the monitor is searching for a pulse. The display flashes saturation and pulse data and the PULSE SEARCH indicator lights.
Sensor	The part of the pulse oximetry system that is attached to the patient. The sensor detects the saturation and pulse data and this information is sent to the monitor where the values are displayed.

SENSOR OFF	When the sensor becomes disconnected from the patient during monitoring, a low priority alarm sounds, values for SpO_2 and pulse rate are replaced with dashes, and SENSOR OFF is displayed on the screen.
Sensor Site	The place on the patient where the sensor is attached, usually a finger or toe. Each sensor has specific sites where the sensor may be used. Each sensor's *Directions for Use* lists the appropriate sites for that sensor.
Trend	The patient's values that have been recorded for up to a 48-hour period. This information can help to track the patient's progress.
%SpO_2	A measurement of oxygen saturation provided by a pulse oximeter.
Valid Button Press	A short, medium-pitched tone that means a correct button has been pressed.
Values	The numbers that appear in the %SpO_2 and PULSE RATE fields on the display as the patient is being monitored.
Volume Setting Tone	A continuous tone that is audible while the alarm volume is being adjusted.

EXPLANATION OF SYMBOLS

This section describes symbols that appear on the monitor, and lists where you will find them. Symbols are located near buttons that you press, or indicators that light up, or both.

The names for buttons and indicators are used frequently in this manual. Take a few minutes to become familiar with these buttons and indicators and their symbols.

Front Panel Buttons

The front of the N-395 monitor has nine buttons that you will use to operate the monitor. Four of these are called softkey buttons. The functions of these softkey buttons are defined according to the specific software menu, or mode, selected by the operator.

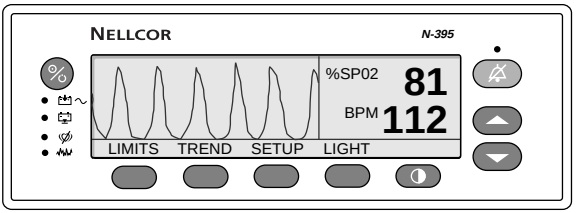

Figure 1: Front Panel of N-395 Monitor

The POWER ON/OFF button. This is used to turn the monitor on or off.

The ALARM SILENCE button. This button is used to silence an audible alarm for a set period of time. The set alarm silence time is called the alarm silence duration. The ALARM SILENCE button is also pressed to clear certain messages from the display. This button is also used to view and adjust the alarm silence duration and alarm volume.

The ADJUST UP button. Used to increase:

- alarm limit values
- pulse beep volume
- display contrast
- date and time

The ADJUST DOWN button. Used to decrease:

- alarm limit values
- pulse beep volume
- display contrast
- date and time

The CONTRAST button. Used with the ADJUST UP/DOWN buttons to lighten or darken the monitor's screen.

There are four softkey buttons located across the bottom of the monitor's front panel. These buttons have many uses. The label on the monitor display above the button indicates the function of each button and is dependent on the currently displayed software menu.

Front Panel Indicators (Lights)

In addition to buttons, the front panel of the monitor contains four indicators (lights). Each light has a symbol near it that describes the reason for the light.

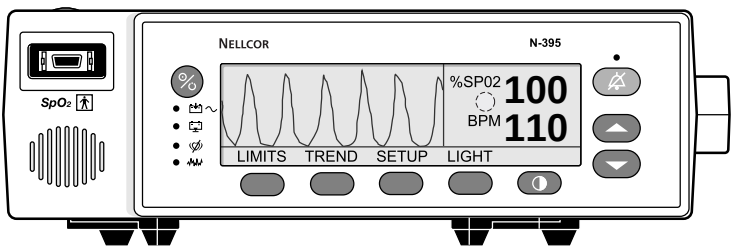

Figure 2: Front Panel with PLETH View Displayed

%SP02 **100** The %SpO2 Display. Shows the oxygen saturation level as a percentage. The displayed value flashes during loss-of-pulse alarms and when SpO2 is outside of the alarm limits. During PULSE SEARCH, the last oxygen saturation measurement is displayed. If alarm limits have been changed from their power-on defaults, a decimal point (.) is displayed after the %SpO2 value (100.).

The PULSE AMPLITUDE indicator (blip bar). Indicates pulse beat and shows the relative strength of each detected pulse. An increased number of bars light on the indicator as the detected pulse becomes stronger. This indicator is available only in the blip (magnified) view.

The Pleth Waveform. Located on the left of the display screen. This indicator is available during patient monitoring only when using the PLETH view.

BPM **110** The Pulse Rate Display. Shows the pulse rate in beats per minute. It flashes during loss-of-pulse alarms and when the pulse rate is outside of the alarm limits. During PULSE SEARCH, the last pulse rate measurement is displayed.

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The AC POWER indicator. Lights continuously when the N-395 is connected to AC power. It also indicates that the battery is charging. The indicator is not lit when the monitor is being powered by its internal battery.

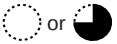
- 

The Low Battery indicator. Lights continuously to indicate that 15 or fewer minutes of battery capacity remains.

The Alarm Silence indicator. Lights continuously when an audible alarm has been silenced. It flashes when the alarm silence duration has been set to OFF.

The Motion indicator. Lights when the monitor detects that motion is present.

The PULSE SEARCH indicator. Lights continuously prior to initial acquisition of a pulse signal, and during PULSE SEARCH. It flashes during a loss-of-pulse signal.



The *SatSeconds*™ indicator. When visible on the display, it indicates that the *SatSeconds* tool is active. The symbol fills in clockwise as the *SatSeconds* alarm management system calculates the time remaining prior to an audible alarm.

DESCRIPTION OF AUDIBLE INDICATORS

Following are descriptions of N-395 audible indicators.

Power-On Self-Test Pass	A one-second tone indicating that the N-395 has been turned on and successfully completed the power-on self-test
Valid Button Press	A short, medium-pitched tone indicating that an appropriate button has been pressed
Invalid Button Press	A short, low-pitched tone indicating that a button has been pressed that is not appropriate for the current state of the monitor
High Priority Alarm	A high-pitched, fast-pulsing tone indicating loss-of-pulse

Medium Priority Alarm	A medium-pitched, pulsing tone indicating an SpO_2 or pulse rate limit violation
Low Priority Alarm	A low-pitched, slow-pulsing tone indicating a sensor disconnect, low battery, or monitor failure
ALARM SILENCE Reminder	Three beeps that sound approximately every 3 minutes.
Pulse Beep	A single beep that sounds for each detected pulse
Volume Setting Tone	A continuous tone that is audible when adjusting the alarm volume
Confirmation Tone	Three beeps sound to indicate that default settings have been saved or reset to factory defaults or trend data has been deleted

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SAFETY INFORMATION

Warnings
Cautions

This section lists general warnings and cautions for your safety and that of the patient.

IMPORTANT: Before using the monitor, read this entire manual.

WARNINGS

WARNING: The monitor is a warning device only. When an alarm occurs, you MUST take action, as you have been instructed by your clinician.

WARNING: Make sure you can hear the monitor's alarm from other rooms in the house, and when you are using noisy appliances such as a vacuum cleaner, dishwasher, clothes dryer, television, or radio. Failure to ensure that the alarm volume is appropriate for the environment may place the patient in danger. If you need the volume adjusted, immediately contact the clinician for help.

WARNING: Do NOT use a monitor you suspect may not be working correctly. Contact your clinician to have the monitor tested or replaced.

WARNING: Do NOT use a monitor or sensor or pulse oximetry cable that appears to be damaged.

WARNINGS - Continued

WARNING: Do NOT remove the cover of the monitor because this will create an electric shock hazard.

WARNING: Carefully route all wires and cables away from the patient to avoid having them get tangled around the patient's head or neck.

WARNING: Carefully route all wires and cables to avoid a tripping hazard.

WARNING: Excessive light such as sunlight or fluorescent light may cause incorrect measurements. If used in the presence of bright light, cover the sensor with a dark cloth to block the excess light.

WARNING: Always remove the sensor from the patient and completely disconnect the patient from the monitor before bathing the patient.

WARNING: Use extra care in handling a monitor with a broken display screen. Chemicals from the screen can be toxic if ingested.

PRECAUTIONS

Caution: Do NOT connect the power cord to an electrical outlet controlled by a wall switch because power to the monitor may be accidentally turned off.

Caution: Do NOT connect any power cord to the monitor other than the hospital grade power cord supplied with the instrument.

Caution: Check all specially set alarm limits each time the monitor is used. All alarm settings return to the factory default settings each time you turn off the monitor and then turn it on again.

Caution: Before applying a sensor to the patient, read the sensor *Directions for Use*.

Caution: Do **NOT** wrap sensors too tightly or use extra tape at the sensor site. Incorrect application of the sensor can cause tissue damage and false values on the monitor.

Caution: Check the sensor site as recommended in the sensor *Directions for Use* to assure that the sensor is in the correct position and that it sticks properly to the patient. If redness, swelling, or other problems appear at the sensor site, move the sensor to another site.

Caution: Do NOT use abrasive or harsh cleaners on the monitor or the sensors.

Caution: Do not spray, pour, or spill any liquid on the monitor, sensor, or cables. Clean the monitor and cables by following the cleaning instructions given later in this manual.

Caution: Do not sterilize the sensor by steam or any other method or solution. Clean a reusable sensor by following the cleaning instructions given in the sensor *Directions for Use*.

Caution: Always use Nellcor-brand sensors with the monitor. Use of any other sensor may cause the monitor to not work correctly.

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PURPOSE OF THE MONITOR

PURPOSE OF THE N-395 MONITOR

The N-395 monitor can be used for patients of all ages, from infants to adults, and is used in the same way for infants, children, and adults.

The monitor continuously measures pulse rate and oxygen saturation in the blood. When either of these goes below or above an alarm limit setting, the monitor warns you by sounding an alarm and lighting an indicator light, flashing a number, or both.

ROLE OF YOUR CLINICIAN

Your clinician is a trained healthcare professional who will:

- Order a monitor for use in your home
- Train you to use the monitor
- Set up the monitor for you
- Set appropriate alarm volume
- Select a sensor for use with the monitor
- Show you how to respond to alarms
- Show you how to set the alarm limits
- Answer your questions about the monitor
- Ensure that the monitor is working correctly
- Follow up with you on a regular basis to make sure the monitor is meeting your needs

HOW THE MONITOR WORKS

OVERVIEW OF PULSE OXIMETRY

A pulse oximetry system—like the Nellcor N-395 monitor and sensor you are about to use—uses two light sources and a light detector to measure oxygen saturation in the blood. Oxygen saturation is a measure of the amount of oxygen in your blood.

Pulse oximetry requires three parts:

- A monitor (the N-395 pulse oximeter)
- An oximetry sensor
- A pulse oximetry extension cable (MC-10 or SCP-10) **or**
- An *OxiCliq* sensor cable, model OC-3 (if using a Nellcor *OxiCliq* oximetry sensor

Caution: Use only one pulse oximetry cable with the sensor. Use of more than one extension cable may have an adverse effect on performance.

Your clinician will provide you with a sensor that is appropriate for your patient.

Figure 3 shows how to attach a sensor and connector cable to the monitor.

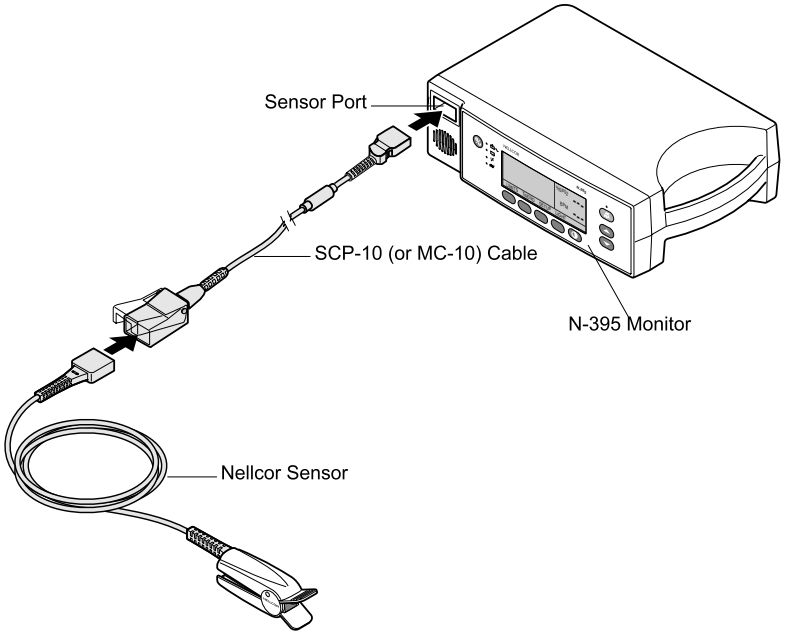

Figure 3: N-395 Monitor and Sensor

Note: To disconnect the cable from the monitor, depress the two buttons on either side of the cable connector and remove the plug from the socket of the monitor. (See Figure 4 below.)

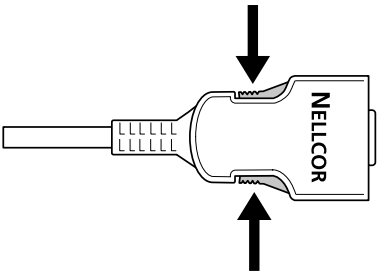

Figure 4: Disconnecting Cable from Monitor

The oximetry sensor is the small device that is attached to the patient on a finger or toe. These are sites that provide ample blood flow near the skin surface.

Figure 5 shows a sensor placed on a finger.

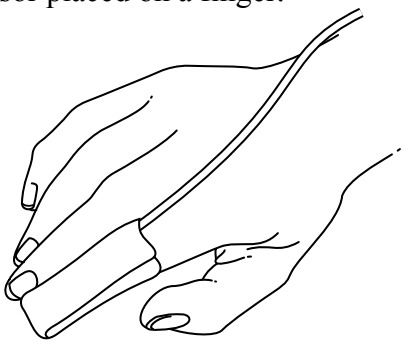

Figure 5: Sensor Applied to Patient (Example)

The sensor emits (shines) two kinds of light: *red* light that you can see and *infrared* light that you cannot see. The light can pass into the body through skin, nail, tissue, and blood. As it passes through blood, hemoglobin—the part of the blood that carries oxygen—absorbs some of the light.

Figure 6 shows a sensor placed on a finger, with light passing through it.

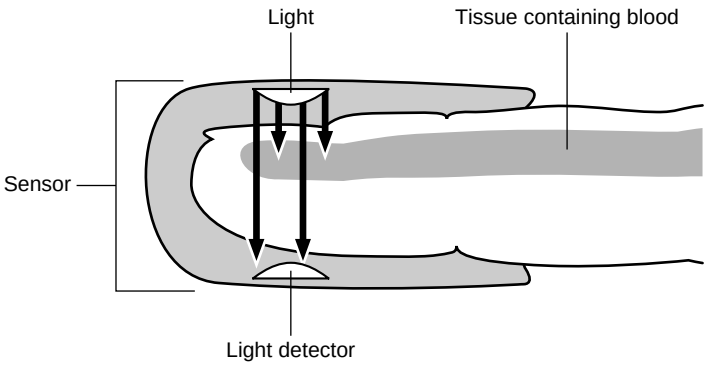

Figure 6: Sensor Light Emissions

The amount of oxygen in the blood determines how much light the blood can absorb. Blood that has a high level of oxygen in it absorbs more infrared light. Blood with a lower level of oxygen in it absorbs more red light.

The sensor detects the light that passes through the tissue containing blood. Based on the amount of light received, the sensor measures the amount of red and infrared light that was not absorbed.

The monitor calculates oxygen saturation based on the amount of light that was not absorbed.

This type of oxygen saturation measurement by a pulse oximeter is known as SpO_2. The monitor displays the SpO_2 measurement as a percentage (%SpO_2).

The monitor also detects and measures the patient's pulse rate. It displays the rate as the number of beats per minute (bpm). At the same time, the monitor displays the *strength* of the pulse.

PLETH VIEW

The strength of the pulse in the PLETH view will be indicated by the height of the waveform. The stronger the pulse, the higher the top of the wave. (See Figure 7 on page 27 for further details regarding the PLETH view.)

BLIP (MAGNIFIED) VIEW

If the pulse is strong, the number of lighted segments of the PULSE AMPLITUDE display (or, BLIP BAR) increases. If the pulse is weak, fewer segments light in the PULSE AMPLITUDE Display.

WHAT TO EXPECT FROM THE MONITOR

The monitor continuously measures and displays oxygen saturation (%SpO_2) at each pulse beat. It also displays the pulse rate (the number of beats per minute). Since there are two displays that you may select, you will see either a waveform on the display area or a blip bar. The BLIP bar is also known as the PULSE AMPLITUDE indicator and shows the *strength* of the pulse.

The monitor compares the oxygen saturation measurement and the pulse rate to the alarm limit settings in the monitor. If pulse rate or oxygen saturation go above or below the alarm limit settings, the monitor sounds an alarm and the numbers in the display flash on and off. (The monitor will not sound, however, if the alarm function has been turned off.)

The monitor is a warning device. It cannot prevent the oxygen saturation level of your patient from falling below a safe level. It cannot prevent your patient's pulse rate from reaching an unsafe level.

The monitor can, however, warn you of situations that may be life threatening to your patient. Therefore, you must make sure that you can hear the alarms at all times and that you respond to alarms immediately and as directed by your clinician.

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SETUP

Your clinician may deliver and set up the monitor and appropriate sensor for you. However, if you receive a monitor in its factory package, follow the instructions in this section to set it up yourself.

UNPACKING AND INSPECTION

Carefully unpack the monitor and check to make sure you have the following parts:

Qty	Item
1	**N-395 Pulse Oximeter.** The monitor. The name Nellcor N-395 is on the front of it.
1	**Nellcor sensor or assortment pack.** Your clinician can select a sensor from this package that is most appropriate for your patient.
1	**Nellcor Hospital-Grade Power Cord.** A thick cord with a three-prong plug on one end and a connector on the other.
1	**Home Use Guide, Nellcor N-395 Pulse Oximeter.** This manual.
1	**Nellcor Pulse Oximetry Cable, Model MC-10 or SCP-10.** This cable connects the sensor to the monitor.
1	**Packing List**

Caution: Contact your clinician if the N-395 shipping carton is damaged. Do NOT use a damaged monitor or one from a damaged carton.

If any part on the list is missing from your monitor, do not attempt to use the monitor. Instead, contact your clinician immediately.

PARTS OF THE MONITOR

The figures in this section show the front and rear panels of the monitor. You will note the two different displays that you may select to use. All controls and displays are described in detail in the *Using the Monitor* section of this manual.

Figure 7 shows the front panel (face) of the monitor. This is the PLETH view. In this figure, a line points to each item and each line is numbered. Refer to the table below the figure to determine what each numbered item is.

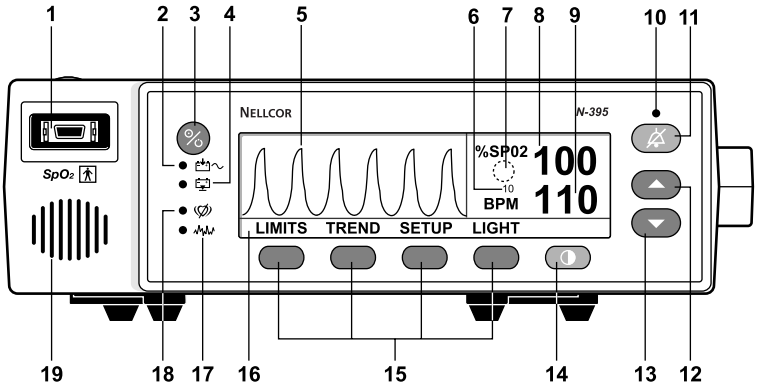

Figure 7: N-395 Front Panel - PLETH View

1 Sensor Port (where you plug in the sensor extension cable)

2 AC POWER Indicator (also lights to indicate that the battery is charging)

3 POWER OFF/ON Button

4 LOW BATTERY Indicator

5 PLETH Display

6 *SatSeconds* Setting

7 *SatSeconds* Indicator

8 %SpO2 Value

9 PULSE RATE Value

10 ALARM SILENCE Indicator

11 ALARM SILENCE Button

12 ADJUST UP Button

13 ADJUST DOWN Button

14 CONTRAST Button

15 Softkeys

16 Softkey Function Labels

17 MOTION Indicator

18 PULSE SEARCH Indicator

19 Speaker

Figure 8 shows where %SpO2, pulse rate, and pulse amplitude are displayed on the monitor in the BLIP view.

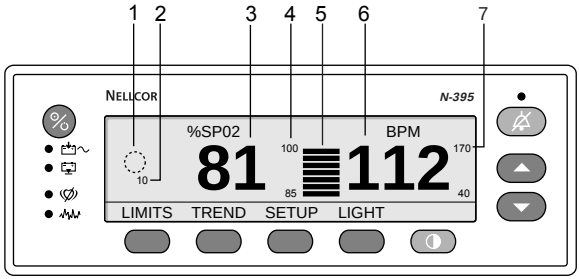

Figure 8: N-395 Front Panel - BLIP View

1 *SatSeconds* Indicator
2 *SatSeconds* Settings
3 %SpO2 Value
4 %SpO2 Alarm Limits
5 PULSE AMPLITUDE Indicator (BLIP Bar)
6 PULSE RATE Value
7 BPM (Beats per Minute) Alarm Limits

Figure 9 shows the rear panel (back) of the monitor.

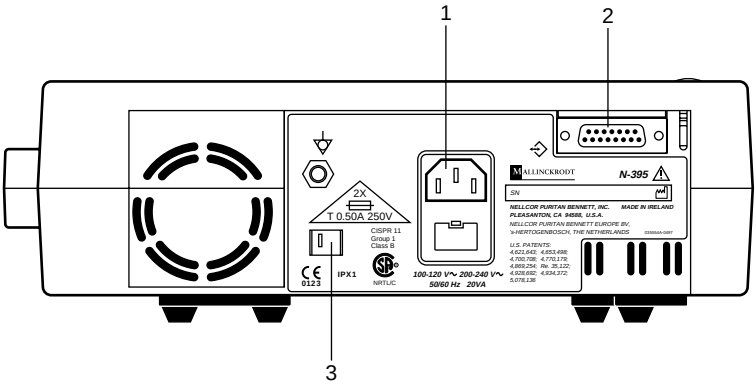

Figure 9: N-395 Rear Panel

1 AC Connector Port
2 Data Port Connector
3 Supply Voltage Selector Switch

The power cord plugs into the AC connector located on the back of the monitor. This connector is identified in Figure 9 by the callout number "1".

The back of the monitor also has the data interface connector port (identified as "2" in the figure). It is unlikely that you will ever use this connector port. Do NOT plug anything into this port without specific instructions from your clinician.

The number "3" figure points to the monitor's voltage selector switch. Do NOT adjust this switch. If you have questions about the purpose of this switch, please ask your clinician.

OTHER PARTS OF THE SYSTEM

The N-395 monitor uses the following additional parts:

- Hospital-Grade Power Cord
- Sensor (either a sensor with a cable permanently attached to it, or a sensor that connects to a separate cable).

Hospital-Grade Power Cord

One end of the hospital-grade power cord has a connector, which connects into the AC power port located on the back of the monitor. (See Figure 10.) The three-prong plug at the other end of the cable connects to a properly grounded electrical wall outlet. A properly grounded outlet is one with three slots.

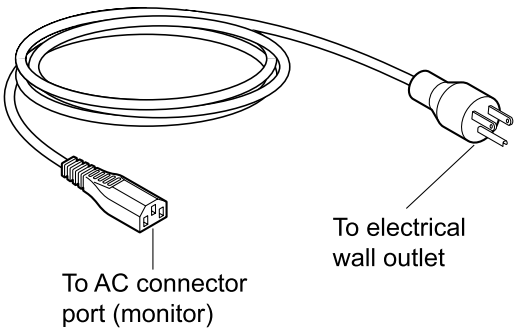

Figure 10: Hospital-Grade Power Cord

WARNING: Do NOT plug the power cord into an electrical outlet controlled by a wall switch because the power may be accidentally turned off.

Sensor

The sensor is the small device that you attach to the patient to detect the passage of light through the blood. There are many types of sensors.

The section of this manual entitled *Nellcor Sensors* lists all available sensors and gives you information about the use of pulse oximetry sensors as well as important safety information. Always read the *Directions for Use* that accompanies each sensor. Important information, warnings, and cautions are contained in these directions.

WHERE TO PLACE THE MONITOR

Choose a place to set up the monitor according to the following safety guidelines:

Warnings

WARNING: Make sure you can hear the monitor's alarm from other rooms in the house, and when you are using noisy appliances such as a vacuum cleaner, dishwasher, clothes dryer, television, or radio. Failure to ensure that the alarm volume is appropriate for the environment may place the patient in danger. If you need the volume adjusted, immediately contact the clinician for help.

WARNING: Carefully route all medical equipment cables away from the patient's face and neck to avoid strangulation.

WARNING: Do NOT place the monitor where the controls may be changed, such as in a crib or bed with the patient.

WARNING: Do NOT place the monitor where a child can reach it and change the controls.

WARNING: Do NOT place the monitor on a carpeted floor. The carpeting may muffle the alarm.

WARNING: Do NOT place the monitor in any position that might cause it to fall on the patient.

WARNING: Do NOT place anything in front of the monitor's speaker that could block or decrease the sound of an alarm.

WARNING: Do NOT place the monitor on or near electrical equipment such as a television, radio, microwave oven, or an electric heater. These may affect the monitor and cause it to work improperly.

Precautions

Caution: Place the monitor where the sensor can easily reach the patient. Make sure the sensor cable hangs loose, without strain, so that the patient can move freely.

Caution: Do NOT expose the monitor to extreme moisture such as direct exposure to rain. Extreme moisture can cause the monitor to fail, or to perform inaccurately.

Caution: Do NOT place the monitor on or near a vaporizer. Moisture in the air may condense on the monitor and cause it to work improperly.

Caution: Do NOT place a glass or other container of liquid on or near the monitor. Liquids spilled on the monitor may cause it to work improperly.

Setup Instructions

The monitor may be operated on AC power, that is, with the power cord plugged into a wall outlet, or it can operate on its internal battery for a limited time.

Note: Do not operate the monitor on its internal battery unless you are instructed to do so by your clinician.

If you are going to operate the monitor on battery power, skip steps 2 and 3 below, and refer to the section, Operating the Monitor on Battery Power, on page 53 for additional information.

Follow these steps to set up the monitor:

1. Place the monitor on a flat, sturdy surface such as a table or shelf.
2. Connect the power cord (the end with the rectangular-shaped connector) to the rear of the monitor, as shown in Figure 11.

   Use only the original hospital-grade power cord provided by Nellcor and your clinician.

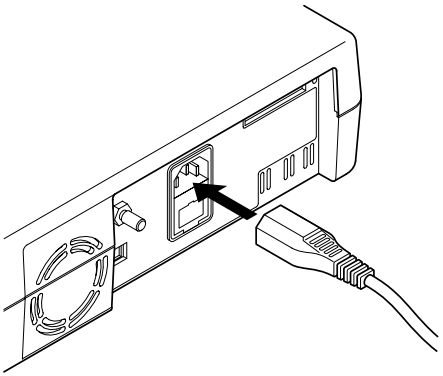

Figure 11: Connecting the Power Cord to the Monitor

Caution: Do NOT plug the power cord into an electrical outlet controlled by a wall switch. The power may be accidentally turned off.

3. Connect the other end of the power cord (the round connector with three prongs) into an electrical wall outlet. The outlet must be grounded—that is, it must have three slots. Contact your clinician if you do not have a suitable outlet.

After the monitor is set up, the sensor may be connected to the monitor. The following section, *Nellcor Sensors*, explains how to connect a sensor to the monitor and it lists all available sensors that may be used with the
N-395 monitor.

The following section also gives you a brief description of the most commonly used types of sensors, and important safety information about the use of sensors.

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NELLCOR SENSORS

OVERVIEW

The sensor is the small device that you attach to the monitor and the patient to detect the patient's pulse rate and oxygen saturation in the blood.

SELECTING A SENSOR

Certain factors make some sensors more suitable for one type of patient than another. Your clinician will choose the correct sensor for your patient after considering the following:

- **Weight of the Patient.** Sensors are designed for different patient weights (for example, babies, children, or adults) and for different application sites on the patient, such as a finger, toe, or foot.
- **Duration of Monitoring Time.** Some sensors can remain on the patient for longer periods of time than others. Some sensors are designed for short periods of monitoring or for spot-check measurements.
- **Activity Level of the Patient.** Adhesive sensors attach securely so that they stay in place as the patient moves. Reusable sensors—the type typically used for short periods of monitoring—do not attach as securely as adhesive sensors.

- **Need for Sterility.** A sterile sensor may be required if the patient has an infection or is at risk of developing an infection. Your clinician will determine whether or not a sterile sensor is needed for your patient.

Nellcor sensors consist of a sensor, a short cable, and a connector.

Figure 12 shows an example of an *Oxisensor II* sensor.

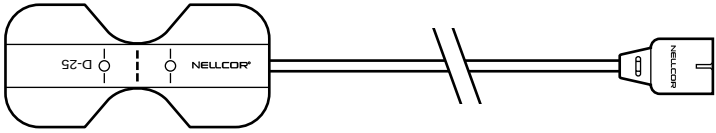

Figure 12: *Oxisensor II* Sensor with its Attached Cable

Figure 13 shows another kind of sensor that can be used with the monitor. It is a *Durasensor*® sensor that is contained in a plastic casing, and clips onto the patient without adhesives. This type of sensor is a reusable sensor and is intended for monitoring a patient for brief periods of time.

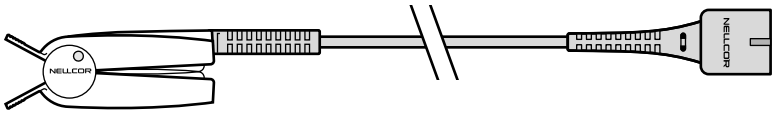

Figure 13: *Durasensor* Sensor with its Attached Cable

Another family of disposable sensors, called the *OxiCliq*® sensor, can also be used with the N-395 monitor. The *Oxicliq* sensor is similar to an *Oxisensor II* sensor in that it is a bandage-type sensor. However, unlike an *Oxisensor II* sensor, the *OxiCliq* sensor does *not* have an attached cable.

Instead, the *OxiCliq* sensor must be first be connected to the OC-3, a special, separate oximetry cable. The sensor is now ready for use. (See Figure 14.)

Your clinician will furnish you with such a sensor and cable, and instruct you on how to attach it, if this type of sensor is to be used with your patient.

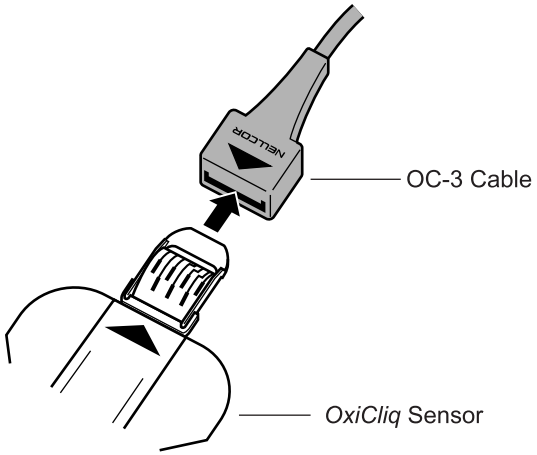

Figure 14: *OxiCliq* Sensor and OC-3 Sensor Cable Connection

The following table (Table 1) lists Nellcor sensors that can be used with the N-395 monitor, the sensor model numbers and names, and their target patient weight ranges. Table 1 shows that the Using the information for an *Oxisensor II* Model N-25 sensor as an example, the table indicates that it is for use on patients who either weigh less than 6.6 pounds, or greater than 88 pounds.

Table 1: Selected Nellcor Sensors

Sensor	Model	Patient Weight In Pounds (lbs.)
Oxisensor® II (sterile, single use)	D-25/D25-L	Greater than 66 lbs.
	D-20	22 lbs. to 110 lbs.
	I-20	6.6 lbs. to 44 lbs.
	N-25	Less than 6.6 lbs. Or greater than 88 lbs.
OxiCliq® (sterile, single use)	A	Greater than 66 lbs.
	P	22 lbs. to 110 lbs.
	N	Less than 6.6 lbs. Or greater than 88 lbs.
	I	6.6 lbs. to 44 lbs.
Dura-Y® (nonsterile, reusable)	D-YS	Greater than 2.2 lbs.
For use with the *Dura-Y* sensor:		
Ear Clip (nonsterile, reusable)	D-YSE	Greater than 66 lbs.
Pedi-Check™ pediatric spot-check clip (nonsterile, reusable)	D-YSPD	7 lbs. to 88 lbs.
Durasensor® (nonsterile, reusable)	DS-100A	Greater than 88 lbs.

SAFETY GUIDELINES

Always use sensors according to these safety guidelines:

Warnings

WARNING: Do NOT use a sensor that appears to be damaged.

WARNING: Do NOT wrap sensors too tightly or use extra tape at the sensor site. Incorrect application of the sensor can cause tissue damage and false values on the monitor.

WARNING: Check the sensor site frequently, as recommended by the sensor *Directions for Use*, to check that the sensor is in the correct place and sticks to the patient. If redness, swelling, or other problems appear at the sensor site, move the sensor to another site.

WARNING: Do NOT sterilize the sensor by steam or any other method or solution. Clean the sensor by following the instructions in the sensor *Directions for Use*.

WARNING: Always remove the sensor before bathing the patient. Do NOT put any part of the sensor completely in water or any other liquid.

Precautions

Caution: Use only Nellcor sensors with the monitor. Use of any other sensor may cause the monitor to work incorrectly.

Caution: Before applying a sensor, carefully read the sensor *Directions for Use*.

Caution: Excessive light such as sunlight or fluorescent light may cause incorrect measurements. If used in the presence of bright light, cover the sensor with a cloth to block the extra light.

CONNECTING A SENSOR TO THE MONITOR

Your clinician will select a sensor that is appropriate for use with your patient. After the monitor is set up (see the *Setup* section of this manual), you will be ready to connect that sensor to the monitor.

To connect the sensor to the N-395 monitor, follow these steps:

1. Plug the connector end of the sensor into the MC-10 or SCP-10 pulse oximetry cable.
2. Snap the clear lock over the sensor connector to secure the connection. Now the sensor is properly attached to the pulse oximetry cable.
3. Insert the connector at the other end of the pulse oximetry cable into the front of the monitor, as shown in Figure 15.

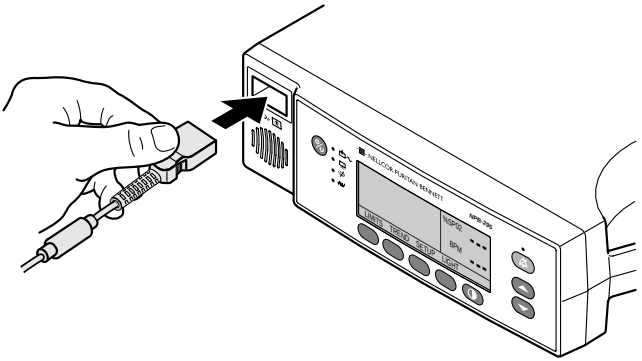

Figure 15: Connecting a Sensor to the Monitor

Note: To disconnect the pulse oximetry cable from the monitor, depress the two buttons on either side of the cable connector and remove the plug from the socket of the monitor. (See Figure 4 on page 20 of this manual.)

ATTACHING A SENSOR TO THE PATIENT

Apply the sensor to the patient as instructed by your clinician. The sensor *Directions for Use* also provides instructions for applying the particular sensor that was chosen for your patient.

WARNING: Use only the Nellcor oximetry cable (MC-10 or SCP-10) provided to you by your clinician. Do not use a standard connector cable to increase the length of the sensor. Use of any other connector cable may cause adverse performance.

CLEANING AND REUSE OF SENSORS

Follow all instructions given in the sensor *Directions for Use*, including specific instructions for cleaning, discarding, or reuse of the sensor you are using to monitor your patient.

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TURNING ON THE MONITOR

WARNING: The monitor and sensor are prescription devices. Use only on the patient for whom it is prescribed. Follow the directions of your clinician.

HOW TO TURN ON THE MONITOR

Make sure that you set the monitor up correctly before turning it on. Set up the monitor by following the instructions shown in the *Setup* section of this manual.

Next, follow the steps for connecting a sensor to the monitor and to the patient. These steps are in the Nellcor Sensors section of this manual.

Press the ON/OFF button to turn on the monitor. It is the round, blue button located in the upper left corner of the front of the monitor.

WHAT YOU CAN EXPECT

Displays, Indicators, and Software Version

When you turn on the monitor, the entire front panel will light. All indicators will light for about 3 seconds. It is important to make sure that all indicators light briefly.

NELLCOR will be displayed, as well as the model number (N-395), and software version number.

It is a normal function for the monitor to display these numbers. These numbers show the version of software that your monitor is using and do not affect the monitoring your patient.

> **WARNING: If you see that the display or an indicator light does not light up at power up, do not use the monitor. Call your clinician immediately.**

Note: The AC POWER indicator light *does not* come on if the monitor is operating on battery power.

The indicator light only comes on when the monitor is plugged into a wall outlet. This is true even if the battery is fully charged. The battery is always being recharged when the monitor is used on AC power.

The displays and indicator lights come on very quickly. They are lit for only a short time. You may want to turn the monitor on and off a few times. This will help you to become familiar with the displays and lights.

The Power-On Self-Test

As soon as you turn on the monitor, all of its displays and indicators light. The monitor begins what is called a "Power-On Self-Test."

Each time the monitor is turned on, it conducts a test to make sure that its system is working properly. This is a way to make sure that it is okay to use it to monitor your patient. The test takes only a few seconds.

If the monitor passes the test, the monitor will sound a one-second tone to let you know that it is okay to use. The monitor's software version will also be displayed.

Caution: If you do not hear the Power-On Self-Test "pass" tone, do NOT try to use the monitor. Call your clinician.

If the monitor detects a problem during the test, a low priority alarm will sound. An error message will also be displayed.

If the self-test fails, you will hear a slow, pulsed tone and see an error code in the display.

Error codes are displayed with EEE in the %SpO_2 Display, and with a number in the PULSE RATE Display. For example, you might see "EEE 1" displayed.

If you see an error code, turn the monitor off and on again. If you get the error code a second time, do the following:

1. Write down the error code number.
2. Turn off the monitor.
3. Call your clinician to report the error code number.

Refer to the *Troubleshooting and Maintenance* section in this manual for additional details about error codes and their meaning.

WHAT THE DISPLAY SHOWS

- If a sensor is properly attached to the monitor and to your patient:

The N-395 will begin monitoring. You will see zeroes displayed in the SpO_2 and pulse rate areas while it searches for a pulse. When the monitor has located the pulse, the front display of the N-395 will look like either Figure 16 or Figure 17 below.

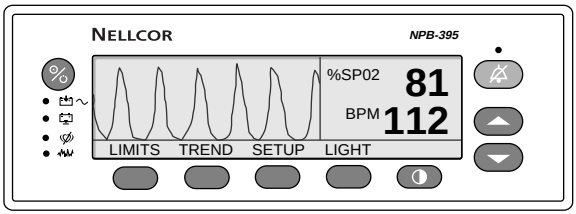

Figure 16: Monitoring Mode Display - PLETH View

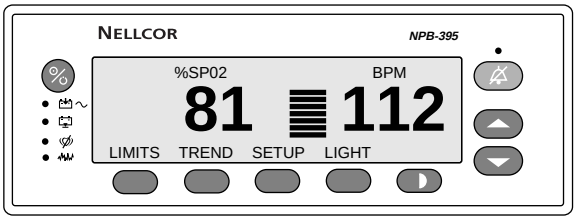

Figure 17: Monitoring Mode Display - BLIP View

- If a sensor is properly attached to the monitor, but not to the patient:

The monitor will search for a pulse. You will see zeroes displayed, and the PULSE SEARCH indicator will light.

- If no sensor is attached to the monitor:

The monitor will not search for a pulse. Dashes will appear in each of the displays.

ADJUSTING SCREEN CONTRAST

To adjust the screen contrast, press and hold the CONTRAST button. Press the ADJUST UP or ADJUST DOWN buttons to increase or decrease the contrast.

USING THE MONITOR

WARNING: The monitor and sensor are prescription devices. Use only on the patient for whom it is prescribed. Follow the directions of your clinician.

OVERVIEW

This section describes what you can expect to see and hear from the monitor during normal operation. The section also tells you what to expect when the monitor stops detecting a pulse beat. Using the monitor on battery power and how to select a display language other than English are described for you. Lastly, there is information necessary for the proper storage of the monitor for a long period of time.

NON-ALARM TONES

There are tones and beeps you will hear from the monitor that are not alarm sounds:

Power-On Self-Test Pass	A one-second tone. This lets you know the monitor has ended and passed its power-on self-test.
Valid Button Press	A single tone that you hear each time you press a valid (correct) button. It lets you know that the monitor accepted the button-press.
Invalid Button Press	A single low-pitched tone that you hear if you press an invalid (incorrect) button. It lets you know that the monitor did not accept the button-press.
Pulse Beep	A beep tone that sounds with each measured pulse or heartbeat detected from the patient. The pitch of this tone varies and is dependent upon the amount of oxygen in the blood. The pulse beep can be silenced. (See page 49.)

ADJUSTING THE PULSE BEEP VOLUME

When the monitor is detecting the patient's pulse rate, it sounds a beep with each heartbeat. This beep, called the "pulse beep," can be turned off (silenced), or its volume can be adjusted up (louder) or down (softer).

To adjust or silence the pulse beep, press the ADJUST UP or ADJUST DOWN buttons. These are located on the right side of the front panel (see Figure 18). You can silence the pulse beep by pressing the ADJUST DOWN button until no sound is heard.

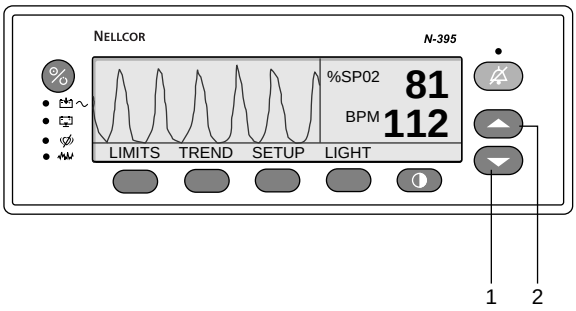

Figure 18: ADJUST UP and ADJUST DOWN Buttons

1 ADJUST DOWN Button 2 ADJUST UP Button

The adjusted pulse beep volume level will remain in effect until you change it or until you turn the monitor off. Once you have turned the monitor off and then back on, the pulse beep volume will return to its original level. This action resets the volume to its factory level. The beep volume ranges from 0 to10.

GENERAL MONITOR INFORMATION

As a caregiver, you may select from two display options on your N-395 monitor. The first display is called the *Monitoring Mode: PLETH* view. The second is called the *Monitoring Mode: BLIP* view.

In the *Monitoring Mode: PLETH* view (Figure 19), the N-395 provides SpO2 values, pulse rate values and a pleth waveform. "Pleth" is short for the word plethysmographic. This waveform on the monitor is an indicator of the volume of blood pumped through the arteries each time the heart beats.

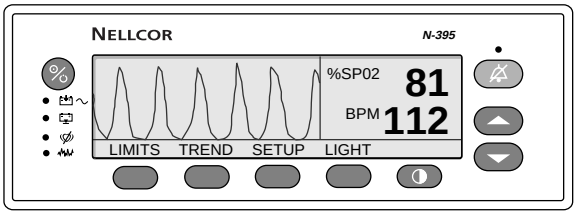

Figure 19: Monitoring Mode Display - PLETH View

In the *Monitoring Mode - BLIP* view, the PULSE AMPLITUDE indicator (blip bar) and large %SpO2 and pulse rate values are displayed. The pleth waveform is not displayed (Figure 20).

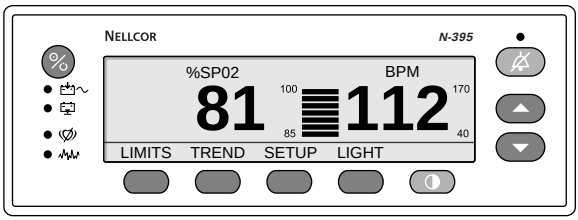

Figure 20: Monitoring Mode Display - BLIP View

Values for %SpO2 show the amount of oxygen in the blood ranging from 0% to 100%. Pulse rate values show a range from 20 to 250 beats per minute, and zero beats per minute. Pulse rates below 20 (except zero) will be shown as 20. Pulse rates higher than 250 will be displayed as 250.

If the volume has not been turned down, you will hear a beep sound for each pulse detected by the monitor. The pitch of this beep drops as %SpO2 drops.

The PULSE AMPLITUDE indicator shows you pulse strength. If a pulse has been lost for a short time (about 4 seconds), the N-395 will go to the PULSE SEARCH Mode.

During routine monitoring, you see and hear the following. This depends upon which display you choose:

- The monitor shows the patient's SpO2 and pulse rate levels in either the PLETH view or the BLIP view.
- In the BLIP view, the BLIP Bar segments light, showing you the patient's pulse amplitude (pulse strength) with each detected pulse.
- In the PLETH view, the pleth waveform height shows you the patient's pulse strength with each detected pulse.
- If the monitor is plugged into a wall outlet, the AC POWER indicator is lit.

PULSE SEARCH

If a pulse has been lost for a short time (about 4 seconds), the N-395 will go to the PULSE SEARCH Mode.

At Initial Power-Up

When the monitor is first turned on and has successfully completed its power-on self-test (described in *Turning on the Monitor*), it immediately begins searching for the patient's pulse.

Finding the patient's pulse usually takes only a few seconds. As soon as the monitor detects the patient's pulse, routine monitoring will begin. While the monitor is searching for the pulse, you see:

- The PULSE SEARCH indicator is lit.
- The monitor displays zeroes in the %SpO2 and PULSE RATE Displays.

Loss-of-Pulse Measurement

In situations where the monitor has been reporting %SpO2 and pulse rate measurements and it then can no longer detect a pulse rate, it enters PULSE SEARCH mode.

When the monitor no longer detects a pulse rate, ***check the patient as you have been instructed by your clinician.***

If the monitor enters pulse search mode, it *could* mean that the patient has no pulse or the monitor cannot locate a pulse. The monitor may not be able to locate the pulse because the sensor has moved and is no longer in the correct position for monitoring. Entering the PULSE SEARCH mode is a normal function of the monitor.

In the PULSE SEARCH mode, the monitor tries to again locate the pulse. Here is what you see and hear during PULSE SEARCH:

- The PULSE SEARCH indicator is lit.
- The last %SpO2 and pulse rate values flash on and off on the display screen.

If no pulse is detected within a few seconds, this sequence of events occurs:

1. Numbers and dashes will alternately flash rapidly in the %SpO2 and pulse rate displays.
2. Numbers and dashes will be replaced with flashing zeroes (0).
3. The monitor rapidly sounds a high-pitched alarm. (See the Alarms section (page 65) of this manual for a discussion of alarms).
4. The PULSE SEARCH indicator will flash rapidly.

This sequence of events lets you know that a pulse could not be detected.

OPERATING THE MONITOR ON BATTERY POWER

Do not operate the monitor on its internal battery unless you have been instructed to do so by your clinician. The internal battery should always remain fully charged and available in case of an emergency, such as a power failure in your home.

> **Caution:** If a power failure should occur, continue to use the monitor, but contact your clinician right away.

When the monitor uses only its battery for power, the "life" of the battery may be reduced. For example, a fresh, unused battery will operate for at least two hours. However, that same battery may provide less monitoring time each time it is recharged and reused.

During a Power Failure

In case of a power failure, the monitor automatically begins drawing power from its battery, and will continue monitoring your patient for at least two hours.

Your clinician should give you instructions regarding what to do if the power failure lasts longer than the length of time the battery can power the monitor. Options could include moving the patient to another location, or providing you with a handheld monitor.

What You See and Hear

When the monitor converts from AC power to battery power while it is monitoring, it will simply continue routine monitoring. You will still hear the pulse beep and see values displayed.

When the monitor switches from AC power to battery power, the AC POWER Indicator, located on the front panel of the monitor, will go out (extinguish). (See Figure 7 on page 27 to locate the AC POWER indicator.)

The only way that you can determine if the monitor is running on battery power, rather than AC power, is to check this AC POWER indicator light. Remember, if it is no longer lit and patient values continue to be displayed on the monitor, the power to the monitor is being supplied by the battery.

This is one reason why it is so important to check all indicator lights when you first turn on the monitor.

> Note: This light is only ON when the monitor is connected to an active AC power source (an active wall outlet).

LOW BATTERY Indicator

When approximately 15 minutes of monitoring time remains on the internal battery, the LOW BATTERY indicator lights, and the monitor sounds a low priority alarm (low priority alarms are discussed in the *Alarms* section of this manual).

Discharged Battery

If the battery completely discharges, it can no longer power the monitor. The monitor will NOT operate with a "dead" battery. This is true even after the monitor is again connected to AC power.

If this occurs, plug the monitor into an active AC power wall outlet and let the battery charge. It may take a few minutes of charging before the monitor can be turned on. The monitor does not have to be ON in order for the battery to recharge. It just has to be plugged into a wall outlet. It can take up to 14 hours to fully recharge a "dead" battery. If the monitor is being used, it can take the battery up to 18 hours to fully recharge.

STORING THE MONITOR

If the monitor must be stored for a long period of time (2 months or longer), the battery must be removed from the monitor. Do NOT try to do this yourself. Contact your clinician.

When returning the monitor, let your clinician know if the monitor has been stored or has not been used for 2 months or longer.

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SETUP OPTIONS

USING THE SETUP KEY

The SETUP softkey allows you to select the type of view displayed on the screen (BLIP or PLETH). It also allows you to view or adjust the time and date. It has other functions that can assist your clinician. A second language may also be a standard feature on your monitor. Contact your clinician to discuss these features.

SELECTING A VIEW TYPE

As stated earlier, there are two displays or views that you may choose for general monitoring of the patient. These are either the PLETH or BLIP (magnified) views.

To select either one of these follow these steps:

Press the SETUP softkey.

Next, press the softkey for VIEW.

Now press either the softkey for PLETH or BLIP. Press the BLIP softkey to select the BLIP view.

If you want to change this view to the PLETH view (waveform), press the softkey for VIEW and then select the PLETH softkey.

The BLIP view shows the blip bar (PULSE AMPLITUDE indicator). It also displays larger (magnified) numbers for easier viewing.

SETTING THE TIME AND DATE

To change or set the time on the monitor, follow these steps:

From the first display, press the SETUP softkey.

Then press the softkey for CLOCK.

The time and date will appear on the display. Press the SET softkey.

The SET softkey is now the SELECT button (Figure 21). Each press of the SELECT softkey will move to the next time or date parameter.

If you do not want to change a particular parameter, simply press SELECT to move to the next one.

Pressing the ADJUST UP/DOWN buttons changes the highlighted parameter on the display.

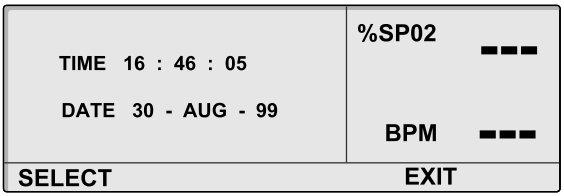

Figure 21: Set Time and Date Display

Press the EXIT softkey to select the new settings. Only after you press the EXIT softkey will the changes be made. To return to the main menu, press EXIT again.

If you need assistance with these changes, contact your clinician.

OTHER SETUP INFORMATION

While other information can be viewed or changed with the SETUP softkey, you will not be using any of these other items for routine monitoring of your patient.

If you have questions about these items, contact your clinician.

Selecting the Monitor's Display Language

The monitor is able to display information in one of seven languages. English is the language that appears when you turn on the monitor.

Before changing the display to another language, contact your clinician.

To select a language, follow these steps.

1. From the first display, press the SETUP softkey.
2. Then press the softkey for NEXT.
3. Next, press the softkey for LANG.

After you press the LANG softkey, the language selection display will appear (Figure 22).

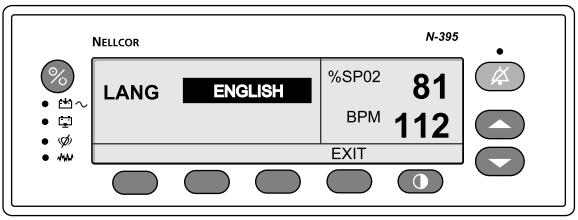

Figure 22: Language Selection Display - English

At this point, you can select a language that best suits your needs. If you want to continue using the English display, press EXIT.

If you want another language, press the ADJUST UP/DOWN buttons on the front of the monitor. Each press will offer a different language. Your choices include:

English (English)	Espanol (Spanish)
Francais (French)	Nederlands (Dutch)
Deutsch (German)	Portug (Portuguese)
Italiano (Italian)	

After you have selected the desired language, press EXIT to return to the monitoring mode.

In the following example, you will see that the language chosen is Spanish. It is shown on the screen as "ESPAÑOL."

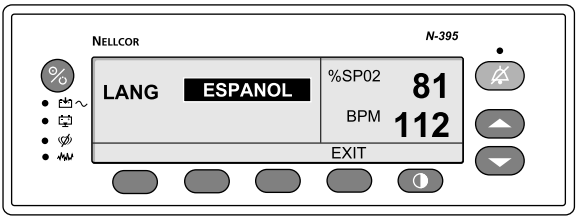

Figure 23: Language Selection Display - Spanish

This will be the language appearing on the display screen when you return to the monitoring mode. To return to the monitoring display, press the EXIT softkey. You will see that the language has changed. Now the information in each display appears in Spanish. Refer to the example shown in Figure 24.

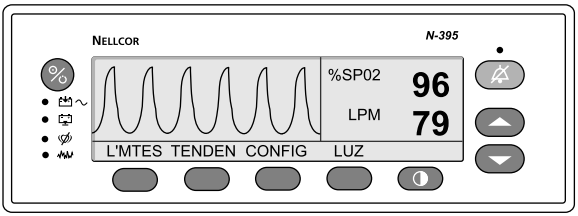

Figure 24: Spanish Language Display

If Spanish is not your desired language you can turn the monitor off and then back on again. It will automatically return to the English display.

If turning off the monitor is not an option, follow these visual steps to return to English as the display language:

1. From the first display, press the third softkey as shown.

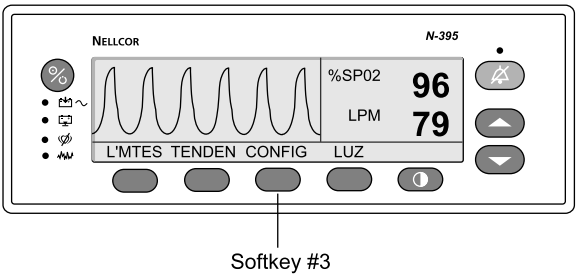

Figure 25: CONFIG Softkey

2. The display will change and look like the following example. Press the third softkey again.

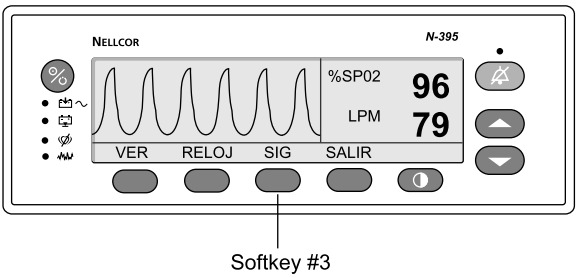

Figure 26: SIG Softkey

3. Once again, the display will change to look like Figure 27. Now press the second softkey from the left.

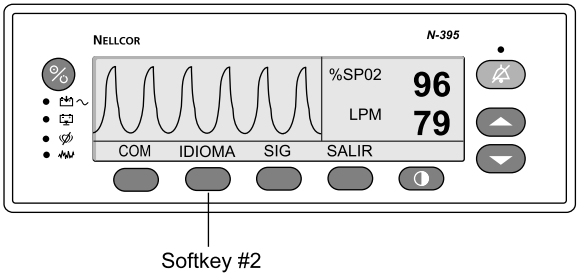

Figure 27: IDIOMA Softkey

4. You will now see the language selection display and the language that is currently selected.

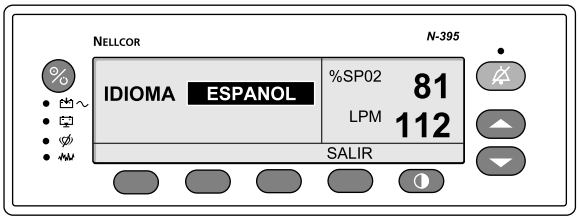

Figure 28: Language Selection Display - Spanish

5. Press the ADJUST UP/ADJUST DOWN arrow buttons to select the language of your choice. Your options include:

English (English)
Francais (French)
Deutsch (German)
Italiano (Italian)
Espanol (Spanish)
Nederlands (Dutch)
Portug (Portuguese)

6. Remember that the language shown in the box will be the language shown on the display screen once you press the fourth softkey to exit.

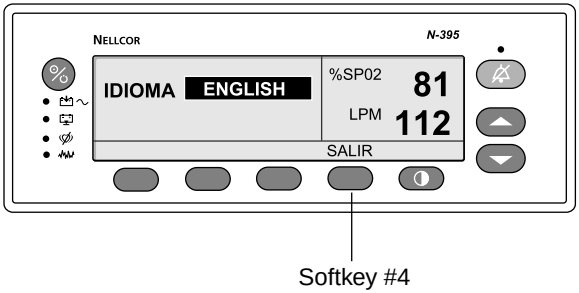

Figure 29: Language Selection Display and SALIR Softkey

7. If further assistance is needed, call your clinician.

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ALARMS

OVERVIEW

Alarms are used to alert you when the patient's oxygen saturation level (%SpO_2) or pulse rate goes beyond a set limit. When the patient's %SpO_2 or pulse rate is beyond the set limits, the patient's values flash on the display and an alarm sounds.

> **Important:** This manual tells you how to respond to the *monitor* when it alarms. It does **not** tell you how to respond to the patient when the monitor alarms. Your clinician will tell you how to respond in an alarm situation.

Different types of alarms can also sound for other reasons, such as:

- The sensor is disconnected from the sensor cable.
- The sensor cable is disconnected from the monitor.
- The monitor's self-test fails.
- The monitor detected a pulse, but lost it.
- The battery becomes low on power.
- The internal parts of the monitor fail.

This section of the manual describes types of alarms and what they mean.

TYPES OF ALARMS

There are three basic types of alarms:

High Priority Alarm	This alarm makes a high-pitched, fast, pulsing sound. A high priority alarm sounds during loss-of-pulse.
Medium Priority Alarm	This alarm makes a medium-pitched, pulsing tone. A medium priority alarm sounds when the patient's %SpO_2 or pulse rate goes beyond its set upper- or lower-limit.
Low Priority Alarm	This alarm makes a low-pitched, slow, pulsing tone. A low priority alarm sounds if the monitor is running on battery power and the battery is low, or if the sensor is disconnected from the monitor, or if there is an internal monitor failure.

Note: Limit and pulse alarms sound *only after* a pulse has been monitored. For example, no loss-of-pulse alarm will sound if the monitor is turned on before the sensor is applied to the patient.

While alarms are sounding, you still hear beeps each time you press a button (the valid and invalid button-press tones described earlier), and you can still hear the beeps that indicate the patient's pulse.

ALARM CONDITIONS

Following are some situations that cause the monitor to sound an alarm, and a description of what you see and hear.

– Loss-of-Pulse

Problem:

The monitor cannot find a pulse and it does not detect patient motion.

You hear and see:

- A high priority alarm tone
- Flashing PULSE SEARCH indicator
- %SpO_2 and pulse rate read "0" and flash

You should:

Immediately check the patient and respond to this alarm as you have been instructed by your clinician.

– Alarm Limit Violation

Problem:

The monitor detects a pulse or %SpO_2 value that goes beyond an alarm limit setting.

You hear and see:

- A medium-priority alarm tone
- Flashing displays of last value

You should:

Immediately check the patient and respond to this alarm as you have been instructed by your clinician.

– Low Battery

Problem:

You are operating the monitor on its internal battery, and the battery has approximately 15 minutes of operation remaining.

You hear and see:

- A low priority-alarm tone
- Battery Low indicator (stays on constantly)

You should:

Plug the power cord into a properly grounded electrical outlet. The battery will begin recharging. Continue monitoring on AC (wall outlet) power.

> **Caution:** Do **NOT** plug the power cord into an electrical outlet controlled by a wall switch. The power may be accidentally turned off.

– Sensor Disconnect

The sensor cable has become disconnected from the monitor, the sensor has become disconnected from the cable, or both have occurred. You hear and see:

- Slow, low-priority alarm tones
- Dashes in displays

You should check the sensor cable connection to the monitor (and the sensor connection to the pulse oximetry cable, if required for your sensor). Reconnect any parts that are loose or disconnected.

VIEWING AND CHANGING ALARM LIMITS

> **WARNING: Do NOT change alarm limits unless your clinician has specifically instructed you to do so.**

Alarm limits for %SpO_2 and pulse rate are pre-set in the monitor. (See Figure 40.) As long as the patient's oxygen saturation level and pulse rate stay within the alarm limits, regular monitoring continues.

However, if a limit is violated, that is, if either the oxygen saturation level or pulse rate exceeds the highest limit or falls below the lowest limit set in the monitor, an alarm will sound.

Your clinician will instruct you on what to do if an alarm sounds.

Your clinician will also tell you if you should change the alarm limits for your particular patient.

Do **NOT** change any alarm limit unless your clinician has specifically told you to do so.

The following information explains how to change, or *adjust,* alarm limits temporarily. Any changes you make will be in effect only while the monitor remains ON. When you turn off the monitor and then back on again, the alarm limits will return to their original, pre-set values.

VIEWING CURRENT ALARM LIMITS FOR SpO2 AND PULSE RATE

To view the upper and lower alarm limits for oxygen saturation (%SpO2) and pulse rate, press the LIMITS softkey. The Alarm Limits will be displayed, as shown in the figure below.

.

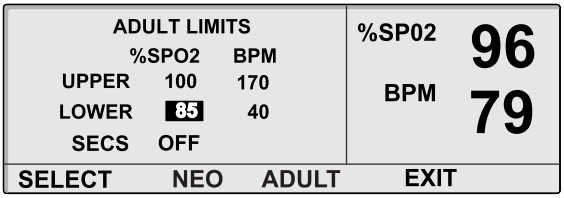

Figure 30: Alarm Limits with Factory Settings

CHANGING ALARM LIMITS

> **WARNING: Do NOT change alarm limits unless your clinician has instructed you to do so.**

Press NEO to select the neonate alarm limits or press ADULT to select the adult alarm limits. (The adult alarm limits will always be displayed when you first enter this mode.)

Press the "SEL" softkey to select your choice of %SpO2 or PULSE RATE limits. Each press of the SEL softkey moves the selection box from one limit to the next.

When the selection box is positioned on the limit you wish to change, use the ADJUST UP/ADJUST DOWN buttons to increase or decrease the selected alarm limit.

Repeat step 3 as many times as necessary, until all of the limits you wish to change have been adjusted to their new values.

Note: If the select key is not pressed within a few seconds, the display will return to the previous screen. To return to the ALARM LIMITS screen, press the LIMITS softkey again.

ALARM LIMITS CHANGED INDICATOR

If any alarm limit has been changed, the value that was changed (either %SpO2 or PULSE RATE) will appear on the display during monitoring with a decimal point (period) after the number.

This decimal point is there as a reminder to you that the alarm limit has been temporarily changed from what was originally set in the monitor. (See the example in Figure 31.)

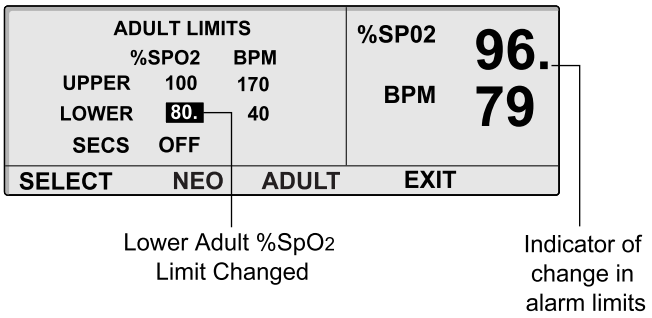

Figure 31: %SpO2 Alarm Limits Changed

CHANGING ALARM VOLUME

> **WARNING: Make sure you can hear the monitor's alarm from all rooms in the house, and when you are using noisy household appliances such as a vacuum cleaner, dishwasher, clothes dryer, television, or radio. Failure to ensure that the alarm volume is appropriate for the environment may place the patient in danger. If you need the volume adjusted, immediately contact the clinician for help.**

When the monitor is used in the home, the alarm volume must always be set at the highest volume level (Level 10).

If the volume of the audible alarm is too soft or too loud, contact the clinician for assistance.

SILENCING AN AUDIBLE ALARM

When an alarm sounds, it can be temporarily silenced by pressing the ALARM SILENCE button on the front panel. If an alarm sounds during monitoring, follow your clinician's instructions regarding what to do during an alarm condition.

If you aren't sure what to do next, *contact your clinician immediately*.

NURSE CALL FEATURE

The N-395 has a feature called "nurse call." Qualified personnel use this only in hospitals or other healthcare centers. The mode for nurse call is shown as NCALL on the display. **This will not function in the home use environment.** If by chance you see this on your display screen, simply press the EXIT softkey.

TROUBLESHOOTING AND MAINTENANCE

OVERVIEW

This section lists possible problems that may occur during normal use of the monitor, along with possible solutions.

If one of the problems described here occurs and you feel uncertain about your patient's condition, ***contact your clinician immediately***.

In general, if the monitor does not appear to be working correctly, contact your clinician.

ERROR CODES

The monitor periodically performs self-tests similar to the Power-On Self-Test that occurs when monitor is first turned on.

These self-tests are done internally and you are not aware of them unless the monitor determines it has a problem somewhere in its internal system.

If that happens, the monitor will display an error code — you will see "EEE" followed by a number (for example, "EEE 1") and a low-priority alarm tone will sound.

When an error code (other than those listed in Table 3) is displayed, turn the monitor off and back on again. If the error code still appears, contact your clinician.

Error messages will be displayed along with the error codes listed in Table 3. If any of the error codes in appears, take action as indicated in Table 3.

Table 2: Error Codes and Messages

Error Code	Error Message	Action
4	LOW BATTERY	The battery is no longer charged and available for use. Turn the monitor off (but keep it plugged into the wall outlet) and let the battery charge for 10 minutes. Then turn the monitor back on. If the error code appears again, turn the monitor off and let it continue to charge for 30 minutes. After 30 minutes, turn the monitor on again. If the error code is still present, notify your clinician.
80	DEFAULTS LOST	The monitor is shipped from the factory with factory default settings that the clinician can change. If the factory defaults are changed, the new settings are called power-on default settings. If this error message appears, it means that the power-on default settings have been lost and the monitor has returned to its factory-set default settings. If this message appears, notify your clinician.
81	SETTINGS LOST	The current settings (not default settings) have been lost and the monitor has returned to the power-on default settings. If it is necessary to have settings different from the power-on default settings, turn the monitor off and back on again, and reenter the desired settings. Notify your clinician.
82	CLOCK SETTING LOST	The date and time settings have been lost. Reenter the date and time. Notify your clinician.

Other error messages that may appear on the display are:

- SENSOR DISCONNECTED – If this happens, check the sensor and ensure that it is firmly plugged into the extension cable. Also, check the connection of the cable at the monitor. If the message does not go away, call your clinician *immediately*.
- DISALLOWED ON BATTERY – Ensure monitor is connected to AC power. Turn the monitor off and back on again.
- DISALLOWED ON LOW BATTERY – An attempt to turn on the backlight has been made while the battery is low. Either plug the monitor into an AC power outlet or do not use the backlight.

If one of these messages appears on the display and you are unable to correct the problem, contact your clinician immediately.

The following message may appear briefly on the display when the TREND data is accessed.

- READING TRENDS – This message will appear briefly after the TREND softkey is pressed. Then the trend information will appear on the display.

PROBLEMS THAT MAY OCCUR

The following information discusses possible problems that could arise during use of the monitor, and suggestions for correcting them.

1. There is no response to the POWER ON/OFF button.

The monitor is not connected to AC power AND the battery is either missing or is discharged (dead). Try plugging the monitor into another AC power source (wall outlet); check to see if the wall outlet you were trying to use is controlled by a wall switch (it may have been switched off).

If changing to a known good outlet does not solve the problem, call your clinician.

2. **During the power-on self-test, you notice that one or more display segments or indictors do not light.**
   - Do **not** use the N-395; call your clinician.
3. **The monitor does NOT sound a tone indicating successful completion of the power-on self-test.**
   - The monitor has detected a problem with its internal system. Do not attempt to use the monitor. Call your clinician.
4. **The PULSE SEARCH indicator is lit for more than 10 seconds.**
   - Check the sensor *Directions for Use* to be sure that the sensor being used is appropriate for your patient (it should be one provided to you by your clinician). Check to see that the sensor is correctly applied.
   - Check the sensor and SCP-10 or MC-10 cable connections to be sure they are securely in place. Test the sensor on someone else. Move the sensor to another sensor site (these are listed in each sensor's *Directions for Use*).
     Try another sensor or extension cable, if they are available to you. Call your clinician.
   - Check the patient. If the patient is moving around a lot, the monitor may have trouble tracking the patient's pulse. Keep the patient still, if possible. Make sure that the sensor is securely applied, and replace it if necessary. Change the sensor to another site (listed in the sensor *Directions for Use*). Call your clinician.

- Check the monitor location. The monitor could be too close to some electrical appliances that are in use, such as a cellular phone, two-way radio, television set, or others. Excessive interference from such appliances can prevent the monitor from tracking the pulse. Move such appliances away from the monitor to see if that corrects the problem. Call your clinician.

5. The monitor may cause static or interference on a nearby radio or television. To solve the problem try the following options.

- Move or relocate the antenna on the radio or television.
- Move the radio or television away from the monitor.
- Plug the monitor into a different outlet. This should be one **not** used by the radio or television.
- Contact an experienced radio or television technician for advice.

CLEANING THE MONITOR AND SENSOR

> **WARNING: Do not spray, pour, or spill any liquid on the monitor, sensor, connectors, switches, or openings in the chassis.**

To clean the monitor, dampen a cloth with a commercial, gentle cleaner and wipe the top, bottom, and front surfaces lightly. Wipe the sensor extension cable with a damp cloth.

To clean a sensor, follow the cleaning instructions recommended by your clinician. Cleaning instructions can also be found in the sensor *Directions for Use.*

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