

Welch Allyn Connex[®] Integrated Wall System



Directions for use

Software versions 1.5X–1.7X

WelchAllyn[®]

Advancing Frontline Care[™]

© 2011 Welch Allyn. All rights are reserved. To support the intended use of the product described in this publication, the purchaser of the product is permitted to copy this publication, for internal distribution only, from the media provided by Welch Allyn. No other use, reproduction, or distribution of this publication, or any part of it, is permitted without written permission from Welch Allyn. Welch Allyn assumes no responsibility for any injury to anyone, or for any illegal or improper use of the product, that may result from failure to use this product in accordance with the instructions, cautions, warnings, or statement of intended use published in this manual.

Welch Allyn, Connex, SureTemp, FlexiPort, and SureBP are registered trademarks of Welch Allyn.

Vital Signs Monitor 6000 Series is a trademark of Welch Allyn.

LNCS, SpHb, ReSposable, and Rainbow are trademarks of, and SET, LNOP, and Masimo are registered trademarks of, Masimo Corporation. Possession or purchase of a Masimo SpO2- or MasimoSpHb-equipped device does not convey any express or implied license to use the device with unauthorized sensors or cables which would, alone or in combination with this device, fall within the scope of one or more of the patents relating to this device.

Nellcor and OxiMax are registered trademarks of Nellcor Puritan Bennett Inc.

Braun and ThermoScan are registered trademarks of Braun GmbH.

Health o meter is a registered trademark of Sunbeam Products, Inc., used under license.

Software in this product is Copyright 2011 Welch Allyn or its vendors. All rights are reserved. The software is protected by United States of America copyright laws and international treaty provisions applicable worldwide. Under such laws, the licensee is entitled to use the copy of the software incorporated with this instrument as intended in the operation of the product in which it is embedded. The software may not be copied, decompiled, reverse-engineered, disassembled, or otherwise reduced to human-perceivable form. This is not a sale of the software or any copy of the software; all right, title, and ownership of the software remain with Welch Allyn or its vendors.

For information about any Welch Allyn product, call Welch Allyn Technical Support:

USA +1 800 535 6663
+1 315 685 4560
Canada +1 800 561 8797
European Call Center +353 46 90 67790
Germany +49 695 098 5132
Japan +81 42 703 6084
Malaysia +603 7875 3341
Singapore +65 6419 8100
Spain +34 917 499 357
United Kingdom +44 207 365 6780

Australia +61 2 9638 3000
China +86 21 6327 9631
France +33 155 69 58 49
Italy +39 026 968 2425
Latin America +1 305 669 9003
Netherlands +31 202 061 360
South Africa +27 11 777 7555
Sweden +46 85 853 6551

Software version 1.5X–1.7X

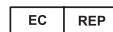
REF 104066 (CD)
Material Number 408441, Ver. A



Welch Allyn, Inc.
4341 State Street Road
Skaneateles Falls, NY 13153-0220 USA

www.welchallyn.com

REF 104069 (printed copy)
Material Number 717603, 80016142 Ver. G



Regulatory Affairs Representative
Welch Allyn Limited
Navan Business Park
Dublin Road
Navan, County Meath
Republic of Ireland



Advancing Frontline Care™

Contents

Introduction	1
Intended use	1
Contraindications	2
Symbols	3
Screen elements	5
About warnings and cautions	9
General warnings and cautions	9
Controls, indicators, and connectors	13
Setup	17
Supplies and accessories	17
Unpack the wall system	17
Insert the battery	18
Prepare for mounting	19
Mounting location	20
Mount the wall system	21
Mount the accessory bin	25
Connect the blood pressure (NIBP) hose	26
Set up the physical assessment instrument handles and specula dispenser	27
Set up the SureTemp® Plus thermometer	27
Set up the Braun ThermoScan® PRO 4000 thermometer	28
Connect AC power	29
Attach an accessory	30
Startup	33
Power	33
Power up the monitor	34
Power down the monitor	35
Reset the wall system	35
Select a language	36
Set the date and time	36
Enter clinician information	36
Set the default configuration	37
Navigation	39
Home tab	39
Device Status area	39

Content area	41
Navigation area	42
Profiles	45
Select a profile	48
Using the keypad, keyboard, and barcode scanner	49
Open the numeric keypad	49
Numeric keypad	49
Enter a number	50
Close the numeric keypad	50
Open the keyboard	50
Keyboard	50
Enter a letter or number	52
Enter a symbol or special character	52
Enter a diacritical mark	52
Close the keyboard	53
Use a barcode scanner	53
Patient data management	55
Add a patient to the patient list	55
Load patient data with the barcode scanner	55
Select a patient	56
Manage patient records	56
Delete a patient from the list	57
Modifiers	57
Set modifiers	58
Alarms	59
Reset (pause or turn off) audio alarms	62
Adjust vital sign alarm limits	63
Modify audio alarm notification	63
Alarm messages and priorities	64
Nurse call	67
Patient monitoring	69
NIBP	69
Temperature	78
SpO2	88
SpHb	93
Pulse rate frame	96
Manual parameters frame	97
Physical assessment instrument handles	101
Use the physical assessment instrument handles	101
Maintenance and service	103
Perform periodic checks	103
Remove the wall system from the wall	103
Change the battery	105
Clean the wall system (excluding handle cradles and accessories)	106
Clean the handle cradles	107

Clean the wall system accessories	107
Specifications	109
Physical specifications	109
Environmental specifications	113
Monitor radio	114
Configuration options	115
Patents	115
Standards and compliance	117
General compliance and standards	117
General radio compliance	118
Guidance and manufacturer's declaration	121
EMC compliance	121
Emissions and immunity information	121
Advanced settings	125
General	125
Parameters	129
Data management	133
Network	136
Service	138
Troubleshooting	139
NIBP messages	139
SpO2 and SpHb messages	140
Temperature messages	141
Weight scale messages	142
Physical assessment instrument handles	142
Patient data management messages	143
Radio messages	143
Ethernet messages	144
USB messages	144
System messages	144
Battery power manager messages	145
Configuration Manager messages	145
Problems and solutions	146
Appendix	147
Approved accessories	147
Warranty	155

Introduction

The Welch Allyn Connex® Integrated Wall System combines the advanced, easy-to-use monitor capabilities of the Welch Allyn Connex® Vital Signs Monitor 6000 Series with the Welch Allyn 767 Power Handles. This manual (directions for use) is designed to help you understand the capabilities and operation of the wall system. The information in this manual, including the illustrations, is based on a wall system configured with non-invasive blood pressure (NIBP), body temperature, pulse oximetry (SpO₂), total hemoglobin concentration (SpHb), pulse rate, weight scale, and two power handles. If your wall system configuration lacks any of these options, some information in this manual may not apply.

Before using the wall system, read the sections of the manual that pertain to your use of the system.

Note Throughout this directions for use, the Integrated Wall System may be referred to as a wall system or monitor.

Note Some product features described in this publication might not be available in your country. For the latest information about products and features, please call Welch Allyn Customer Care.

Intended use

Handle module assembly

Handles supply power to Welch Allyn 3.5V instruments.

Connex® Vital Signs Monitor patient monitor

The VSM 6000 Series of monitors is intended to be used by clinicians and medically qualified personnel for monitoring of neonatal, pediatric, and adult patients for

- noninvasive blood pressure,
- pulse rate,
- noninvasive functional oxygen saturation of arteriolar hemoglobin (SpO₂), and
- body temperature in normal and axillary modes

The most likely locations for patients to be monitored are general medical and surgical floors, general hospital, and alternate care environments.

The optional Masimo Rainbow SET® and accessories are indicated for the continuous noninvasive monitoring of total hemoglobin concentration of adult, pediatric, and neonatal patients during both

motion and no motion conditions, and for patients who are well or poorly perfused in hospitals and hospital-type facilities.

Optional compatible weight scales (e.g., Health o meter®) can be used for height, weight, and BMI input.

This product is available for sale only upon the order of a physician or licensed health care professional.

Contraindications

This system is not intended to be used:

- on patients connected to heart/lung machines
- on patients being transported outside a healthcare facility
- near an MRI machine
- in a hyperbaric chamber
- near flammable anesthetics
- near electro-cauterization devices

For contraindications of SpO2 and SpHb sensors, consult the sensor manufacturer's directions for use.

Symbols

Documentation symbols



WARNING The warning statements in this manual identify conditions or practices that could lead to illness, injury, or death.



Caution The caution statements in this manual identify conditions or practices that could result in damage to the equipment or other property, or loss of data. This definition applies to both yellow and black and white symbols.



Consult operating instructions.

Power symbols



Power on/standby



Equipotential terminal



(on the display) monitor is plugged into Alternating Current power



Battery absent or faulty



(on the monitor, green indicator) Alternating Current power present, battery fully charged



Battery charge level



(on the monitor, amber indicator) Alternating Current power present, battery is charging



Battery cover



Alternating Current (AC)



Rechargeable battery



Li-ion battery



AC input power

Connectivity symbols

	USB		Ethernet RJ-45
	Wireless signal strength • Best (4 bars) • Good (3 bars) • Fair (2 bars) • Weak (1 bar) • No signal (no bars) • No connection (blank)		Nurse call

Miscellaneous symbols

	Meets essential requirements of European Medical Device Directive 93/42/EEC		European Community Representative
	Country of manufacture		Defibrillation-proof Type BF applied parts
	Manufacturer		Recycle
	Reorder number		Serial number
	Do not reuse		China RoHS markings for control of pollution caused by electronic information products. XX indicates Environmentally Friendly Use Period in years.
	Nonionizing electromagnetic radiation		Recycle the product separate from other disposables
	Restrictions for use of wireless device in Europe. European Community's Class 2 radio equipment.		Call for maintenance

Screen elements

Global navigation



Select option



NIBP



NIBP start



NIBP stop



Intervals status indicators



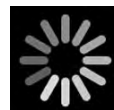
NIBP view toggle



Temperature



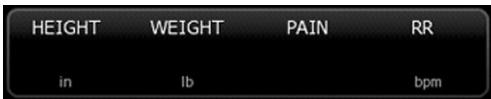
Temperature site control



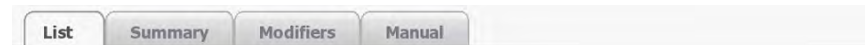
Process indicator



Direct mode selector

SpO2 and Pulse rate			
	Pulse amplitude bar		SatSeconds timer (Nellcor feature only)
	SpO2 view toggle		Response mode selector (touch for Fast mode)
	Heart rate (in beats per minute)		
Total hemoglobin (SpHb)			
	SpHb view toggle		Averaging selector
Manual parameters			
			Manual parameter selector
Alarm and information messages			
	Alarm limit button		Alarm On/Off toggle
	Multiple alarms toggle		Alarm audio paused
	Alarm active		

Patients list and review



Diacritical marks key
(available for languages
that use diacritical marks;
appearance differs based
on language)



Symbols key



Send patient test reports



Print patient test reports



Cancel print request
(Not available)



Add patient identifiers



Retrieve the patient list
from the network

Settings



Save configuration
settings

Advanced settings



Save to USB flash
drive



Configure from USB
flash drive



Restore factory
default settings

About warnings and cautions

Warning and caution statements can appear on the monitor, on the packaging, on the shipping container, or in this document.

The monitor is safe for patients and clinicians when used in accordance with the instructions and with the warning and caution statements presented in this manual.

Before using the monitor, familiarize yourself with the sections of this directions for use that pertain to your use of the monitor.

- Failure to understand and observe any warning statement in this manual could lead to patient injury, illness, or death.
- Failure to understand and observe any caution statement in this manual could lead to damage to the equipment or other property, or loss of patient data.

General warnings and cautions



WARNING Many environmental variables, including patient physiology and clinical application, can affect the accuracy and performance of the monitor. The clinician must verify all vital signs information before treating the patient. If there is any question about the accuracy of a measurement, verify the measurement using another clinically accepted method.



WARNING Alarm limits are patient- or facility-specific. The clinician must set or verify alarm limits appropriate for each patient. Each time the monitor is powered on, you must check that the alarm settings are appropriate for your patient before you start monitoring.



WARNING Use only Welch Allyn approved accessories, and use them according to the manufacturer's directions for use. Using unapproved accessories with the monitor can affect patient and operator safety and can compromise product performance and accuracy.



WARNING Inaccurate measurement risk. Do not connect more than one patient to a monitor.



WARNING Inaccurate measurement risk. Dust and particle ingress can affect the accuracy of blood pressure measurements. Use the monitor in clean environments to ensure measurement accuracy. If you notice dust or lint build-up on the monitor's vent openings, have the monitor inspected and cleaned by a qualified service technician.



WARNING Liquids can damage electronics inside the Connex IWS. Prevent liquids from spilling on the wall system.

If liquids are spilled on the wall system:

1. Power down the wall system.
2. Disconnect the power plug.
3. Remove the wall system from the wall.
4. Remove battery pack from the wall system.
5. Dry off excess liquid from the wall system.

Note If liquids possibly entered the wall system, remove the wall system from use until it has been properly dried, inspected, and tested by qualified service personnel.

6. Reinstall battery pack.
7. Mount the wall system on the wall.
8. Power on the wall system and verify that it functions normally before using it.



WARNING Safety risk. Damaged cords, cables, and accessories can affect patient and operator safety. Routinely inspect the AC power cord, blood pressure cuff, SpO2 cable, and other accessories for strain relief wear, fraying, or other damage. Replace as necessary.



WARNING Fire and explosion hazard. Do not operate the monitor in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide; in oxygen-enriched environments; or in any other potentially explosive environment.



WARNING Fire and shock hazard. Only connect LAN cables contained within the perimeter of a single building. Conductive LAN cables spanning multiple buildings may introduce fire or shock hazards unless they are fitted with fiber optic cables, lightning arrestors, or other applicable safety features.



WARNING The monitor may not function properly if dropped or damaged. Protect it from severe impact and shock. Do not use the monitor if you notice any signs of damage. Qualified service personnel must check any monitor that is dropped or damaged for proper operation before putting the monitor back into use.



WARNING Defective batteries can damage the monitor. If the battery shows any signs of damage or cracking, it must be replaced immediately and only with a battery approved by Welch Allyn.



WARNING Improper disposal of batteries may create an explosion or contamination hazard. Never dispose of batteries in refuse containers. Always recycle batteries according to local regulations.



WARNING Electric shock hazard. Do not open the monitor or attempt repairs. The monitor has no user-serviceable internal parts. Only perform routine cleaning and maintenance procedures specifically described in this manual. Inspection and servicing of internal parts shall only be performed by qualified service personnel.



WARNING Inaccurate measurement risk. Do not expose to temperatures higher than 122° F (50° C).



WARNING Inaccurate measurement risk. Do not use the monitor on patients who are on heart-lung machines.



WARNING Use the monitor only as described in this directions for use. Do not use the monitor on patients as described in the Contraindications.



WARNING Inaccurate measurement risk. Do not use the monitor on patients who are experiencing convulsions or tremors.



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



WARNING Welch Allyn is not responsible for the integrity of a facility's power. If the integrity of a facility's power or protective earth conductor is in doubt, always operate the monitor on battery power alone when it is attached to a patient.



WARNING For operator and patient safety, peripheral equipment and accessories that can come in direct patient contact must comply with all applicable safety, EMC, and regulatory requirements.



WARNING All signal input and output (I/O) connectors are intended for connection of only devices complying with IEC 60601-1, or other IEC standards (for example, IEC 60950), as applicable to the monitor. Connecting additional devices to the monitor may increase chassis or patient leakage currents. To maintain operator and patient safety, consider the requirements of IEC 60601-1-1. Measure the leakage currents to confirm that no electric shock hazard exists.



WARNING Equipment failure and patient harm risk. Do not cover the air intake vents on the right or exhaust vents on the front of the Connex IWS. Covering these vents could cause overheating or muffling of alarms.



WARNING This equipment is not suitable for use in the presence of electro-surgery.



WARNING Cross-contamination or nosocomial infection risk. Clean and disinfect the monitor on a routine basis according to your facility's protocols and standards or local regulations. Thorough hand-washing before and after contact with patients greatly reduces the risk of cross-contamination and nosocomial infection.



WARNING The physical assessment instruments (handles) are designed for intermittent use. On-time should not exceed 2 minutes. Allow at least 10 minutes off-time between patients.



Caution United States Federal law restricts this monitor to sale, distribution, or use by or on the order of a physician or licensed healthcare professional.



Caution Welch Allyn is not responsible for the integrity of any wall mounting interface. Welch Allyn recommends that you contact your Biomedical Engineering Department or maintenance service to ensure professional installation, safety, and reliability of any mounting accessory.



Caution Electromagnetic interference risk. The monitor complies with applicable domestic and international standards for electromagnetic interference. These standards are intended to minimize medical equipment electromagnetic interference. Although this monitor is not expected to present problems to other compliant equipment or be affected by other compliant devices, interference issues still may occur. As a precaution, avoid using the monitor in close proximity to other equipment. In the event that equipment interference is observed, relocate the equipment as necessary or consult manufacturer's directions for use.



Caution Use only a Class I (grounded) AC power supply cord for powering this monitor.



Caution Do not use a long press of  to power down the monitor when it is functioning normally. You will lose patient data and configuration settings.



Caution Never pull on the power cord when removing it from the power outlet. When disconnecting the power cord, always grasp the attachment plug and not the cord. Keep the cord away from liquids, heat, and sharp edges. Replace the power cord if the strain relief or cord insulation is damaged or begins to separate from the attachment plug.



Caution Use only the Welch Allyn USB client cable to connect a laptop computer to the USB client port. Any laptop connected to the monitor must be running on a battery, a 60601-1 compliant power supply, or a 60601-1 compliant isolation transformer.



Caution If the touchscreen is not responding properly, refer to the troubleshooting section. If the problem cannot be resolved, discontinue use of the monitor and contact an authorized Welch Allyn service center or qualified service personnel.

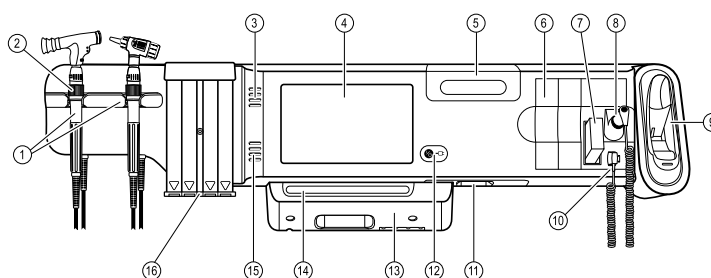


Caution Verify patient identity on the monitor after manual or barcode entry and before printing or transferring patient records.

Controls, indicators, and connectors

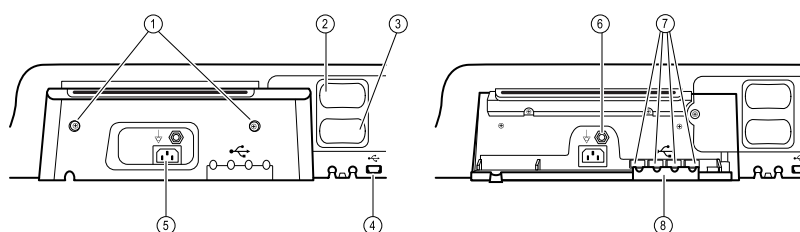
Note Your model might not contain all of these features.

Front view



No.	Feature	Description
1	Physical assessment instruments - Handles and handle cradles	Handles will accept any 3.5V Welch Allyn instrument head. The handle cradles support using one handle at a time. A handle turns on automatically when you remove it from a cradle and turns off when you return it.
2	Rheostat	Located on each handle. Turn clockwise to increase light output; turn counterclockwise to decrease light output.
3	Exhaust vents	Exhaust vents cool the monitor.
4	LCD screen	1024 x 600 color touchscreen provides a graphical user interface.
5	Storage compartment	Provides covered storage for additional probe covers and other small accessories.
6	Expansion slots	Provide space to add modules.
7	SureTemp® Plus thermometer probe covers	Support temperature measurements from oral, axillary, and rectal sites.
8	SureTemp® Plus thermometer probe	Supports temperature measurements from oral, axillary, and rectal sites.

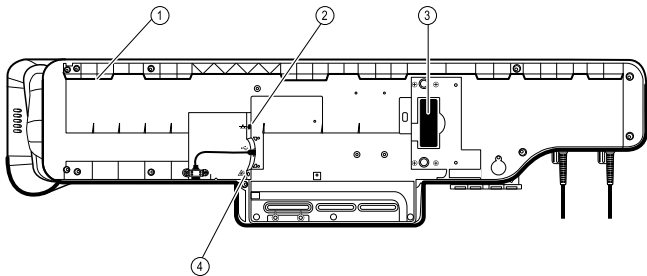
No.	Feature	Description
9	Braun ThermoScan® PRO 4000 thermometer and dock	Support temperature measurements from the ear. Dock charges the thermometer battery.
10	SureTemp® Plus thermometer connector	Secures the probe connection to the wall system.
11	Blood pressure and pulse oximetry	See front underside view for more detail.
12	Power switch and LED	Power-on/Standby switch. The LED indicates the charging status when connected to AC power: - Green: The battery is charged. - Amber: The battery is charging.
13	USB/Comms cover	Houses light bar. Provides access to host USB connections for optional accessories and some routing for cords and cables.
14	Light bar	Provides a visual alarm with red and amber LEDs.
15	Speaker	Provides tones. A piezo beeper inside the monitor provides backup.
16	Specula dispenser	Dispenses KleenSpec® disposable specula in pediatric (2.75 mm) and adult (4.25 mm) sizes.

Front underside views**(Left: USB/Comms cover attached; Right: USB/Comms cover removed)**

1	Retention screws	Supports removing and attaching USB/Comms cover.
2	Blood pressure	Self-contained module for easy replacement. Supports dual-lumen or single-lumen hoses.
3	Pulse oximetry	Optional Nellcor (SpO2) or Masimo Rainbow SET (SpO2 or combined SpO2/SpHb) in a self-contained module for easy replacement.
4	USB-to-computer connector	Provides a connection to an external computer for testing, data transfer, and software upgrades.
5	Power connection	Provides an external AC power connection.

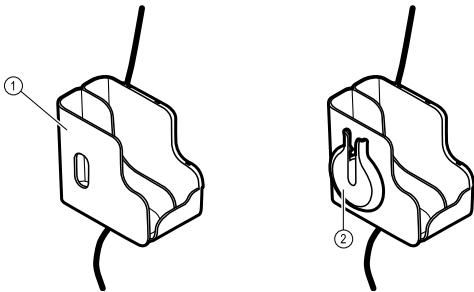
No.	Feature	Description
6	Ground lug (equipotential terminal)	Supports electrical safety testing; terminal for connecting a potential equalization conductor.
7	USB connectors	Provides access to host USB connections for optional accessories.
8	USB cable retainer	Reduces strain on USB cables and connectors; helps prevent cables from disconnecting.

Back view

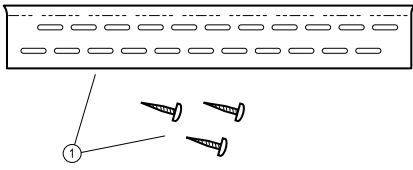
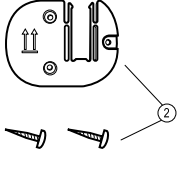


1	Recess for mounting bracket	Secures the monitor when mounted on the wall.
2	Ethernet RJ-45	Provides a hardwired connection to the computer network.
3	Li-ion battery	Provides backup power to wall system.
4	Nurse call	Provides a connection to the hospital nurse call system.

Accessory bin



1	Accessory bin	Stores accessories and organizes cables.
2	SpO2 holder	Provides location to wrap SpO2 cable and attach SpO2 finger clip.

No.	Feature	Description
Mounting materials		
		
1	Wall mounting rail bracket and hardware	Secures the wall system to the wall.
2	Accessory bin mounting bracket and hardware	Secures accessory bin to the wall and provides routing and strain relief for power cord.

Setup



Caution Welch Allyn is not responsible for the integrity of any wall mounting interface. Welch Allyn recommends that you contact your Biomedical Engineering Department or maintenance service to ensure professional installation, safety, and reliability of any mounting accessory.

Supplies and accessories

For a list of all approved supplies and accessories, see *Approved Accessories* in the Appendix.

Unpack the wall system

This procedure applies to first-time setup of the wall system.

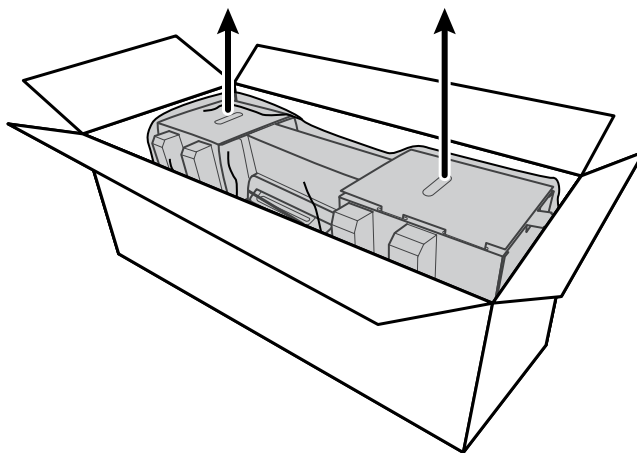


Caution You must follow these instructions exactly to ensure safety and ease of assembly.

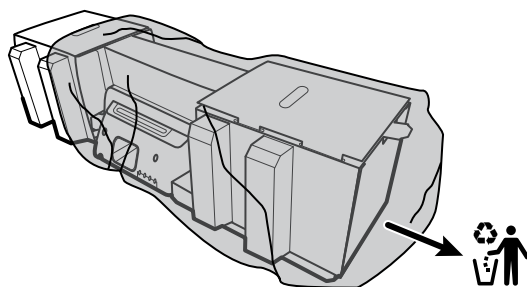


Caution Do not remove any packing materials around the wall system until the instructions tell you to do so.

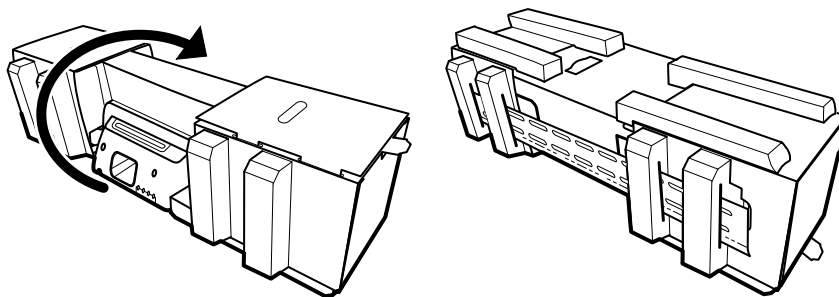
1. Lift the wall system out of the box by the cardboard handles.



2. With the wall system still in its packing material, place it onto a table or flat work surface and remove it from the plastic bag.



3. Turn the wall system over so that back of the wall system faces up.



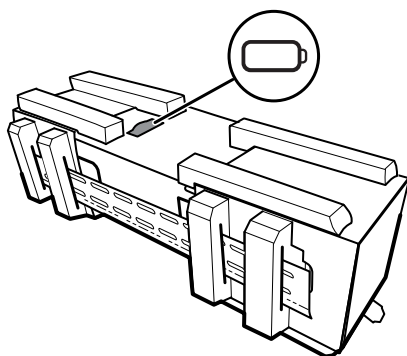
Insert the battery

This procedure applies to first-time setup of the wall system. Therefore, the wall system is assumed to be shut down.

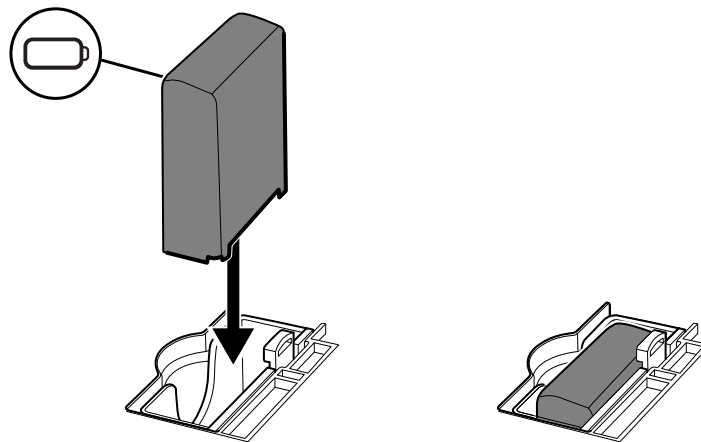


WARNING Risk of fire, explosion, and burns. Do not short-circuit, crush, incinerate, or disassemble the battery pack.

1. Locate the battery compartment, indicated by .

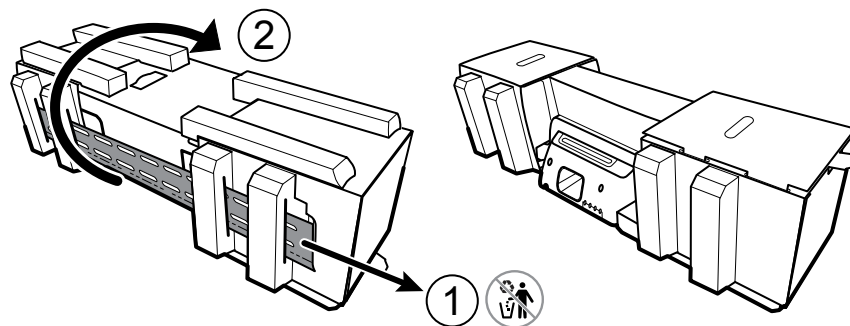


2. Insert the battery. (The battery is in a pink anti-static bag in the accessory box.)

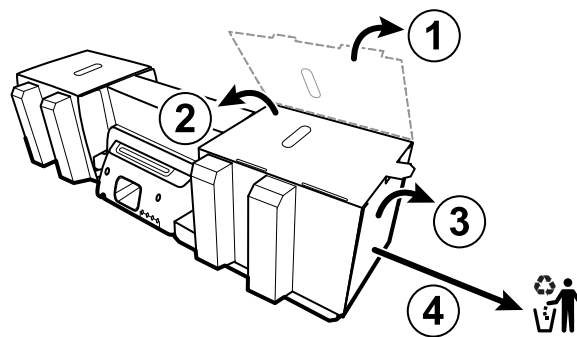


Prepare for mounting

1. Slide the mounting rail bracket out of the packing material and put it aside. Do not discard. Then flip the wall system onto its back.

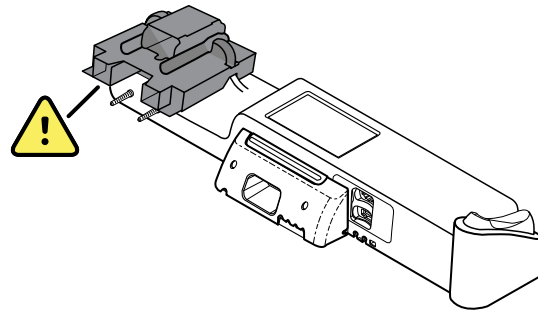


2. Remove the cardboard end caps and all foam as shown and put aside for recycling.



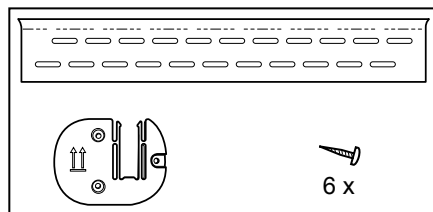


Caution Do not remove the cardboard securing the handles on the left side of the wall system at this time. The cardboard prevents damage to those instruments during the mounting process.



Mounting hardware inventory

Use these items to mount the wall system.



- Mounting rail bracket
- Accessory bin bracket
- Screws

Tools list

Use these tools to mount the wall system.

- #2 Phillips screwdriver
- level
- tape measure
- stud finder
- drill
- 1/8-inch (3.17 mm) diameter drill bit

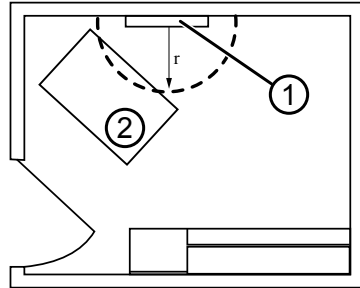
Mounting location

Before mounting the wall system, consider the following recommendations to determine the best mounting location:

- Mount the wall system to studs.
- Mount the wall system within reach of the AC power outlet. The power cord is 8 ft. (2.44 m) long.
- Avoid brightly lit areas.
- Blood pressure tubing is 8 ft. (2.44 m) long.

- Position the wall system so that all instruments are accessible and in a location that allows for ergonomic examinations.

Sample room layout



- Connex Integrated Wall System
- Examination table

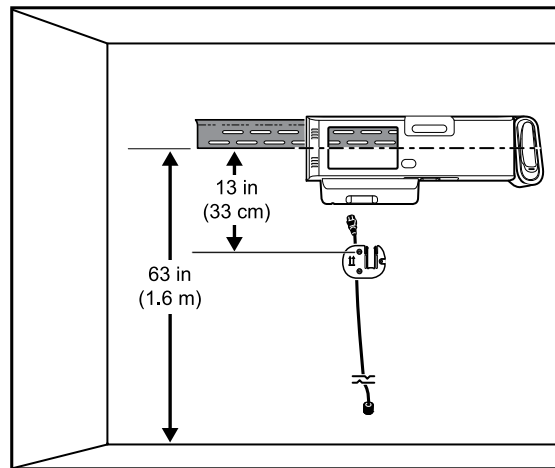
Mount the wall system

- On the selected wall, find and mark the studs, and choose the system height and corresponding height for the mounting rail bracket.

Recommendation: Place the mounting rail bracket 63 in. (1.6 m) from the floor, which places screen center height at approximately 63 in. (1.6 m) from the floor.



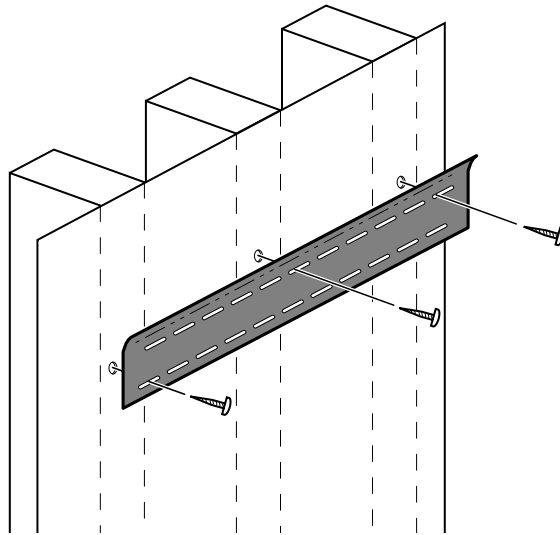
Caution This drawing shows the physical relationships of the mounting brackets to each other and to the wall system **after** you complete the mounting instructions. Do not place the wall system on the wall until you have completed all preliminary steps.



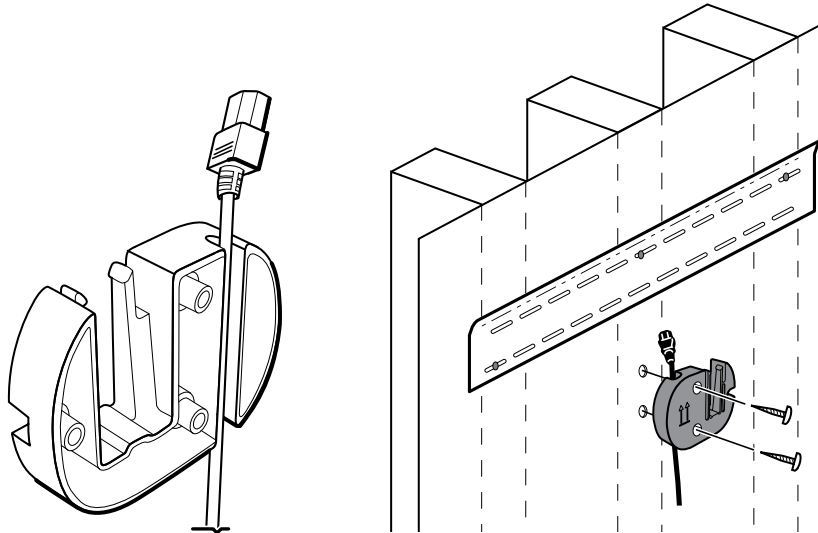
- Affix the mounting rail bracket to three studs at the selected height using the available screws (anchors are provided for additional support).



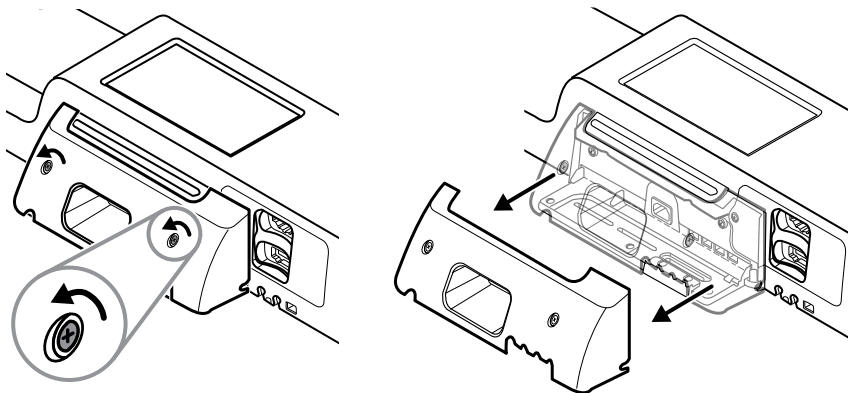
Caution Ensure that the upper "lip" of the bracket sticks out from the wall and that the bracket is level.



3. Route the power cord through the channel in the back of the accessory bin bracket, then mount the bracket on the center stud at least 13 in. (33 cm) below the mounting rail bracket.



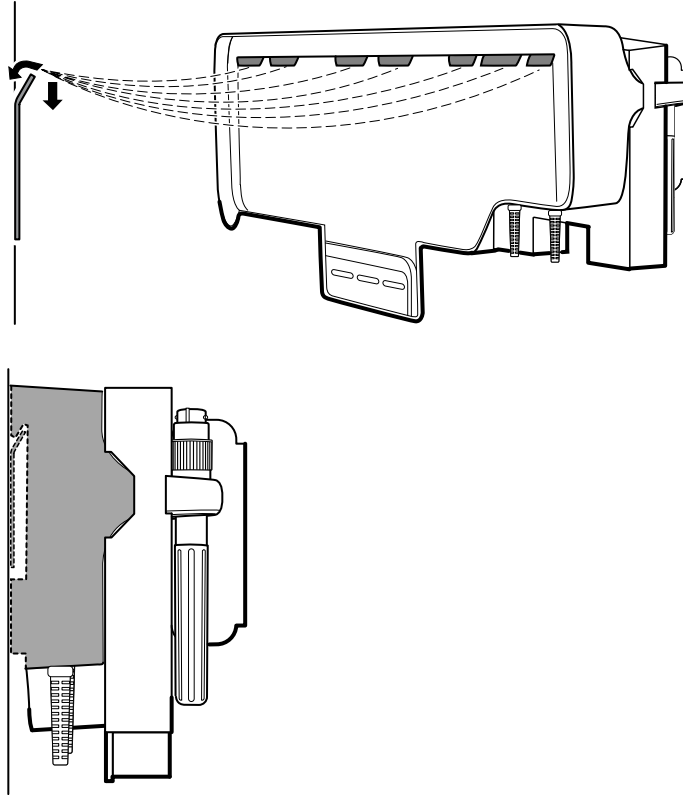
4. Before mounting the wall system, remove the cover by loosening the captive retention screws.



5. Hang wall system on the mounting rail bracket.



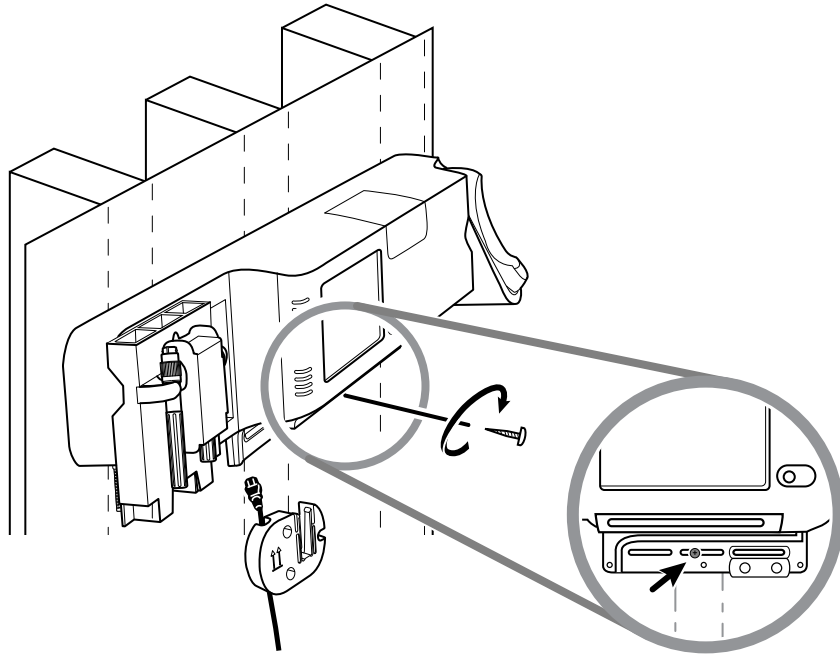
WARNING Ensure that the ribs on the back of the wall system fully engage the mounting rail bracket. The wall system should be level and flush to the wall.



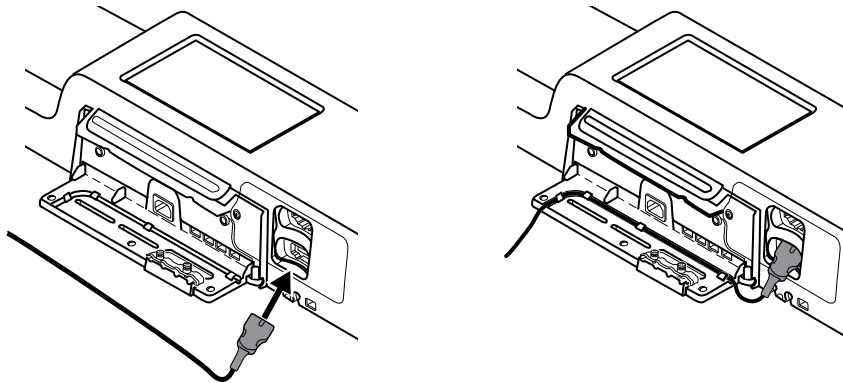
6. Select one of the three available slots at the bottom of the unit that overlaps a stud, and secure the unit to the stud with the remaining screw.



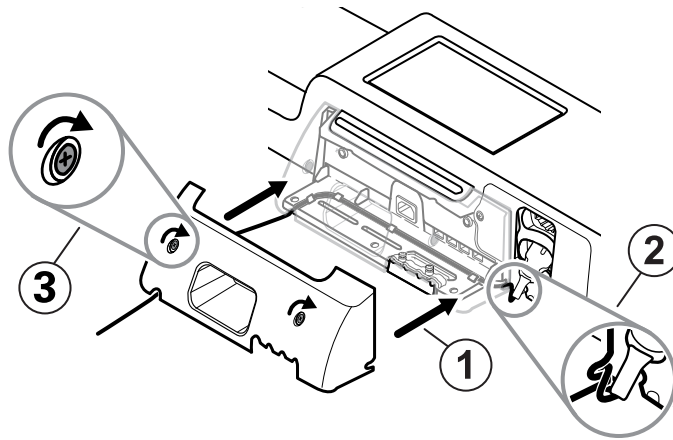
WARNING Failure to install this security screw may result in personal injury and equipment damage.



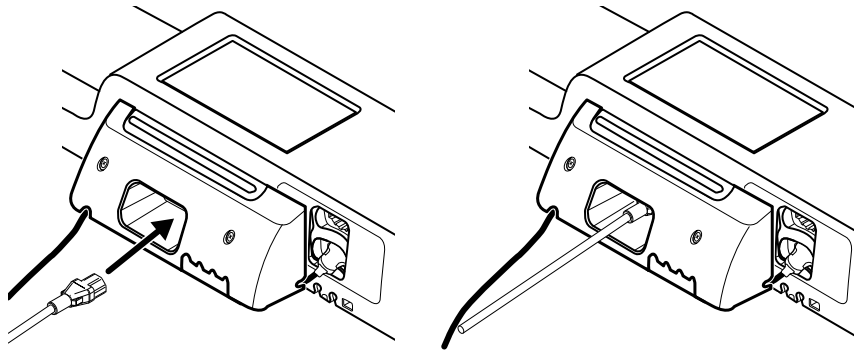
7. If the wall unit is configured for SpO2 or SpHb, connect the sensor cable and route it through the channel above the security screw you just installed.



8. Re-attach the cover.
 - a. Thread the sensor cable through the cutouts on the top right and bottom left of the cover.

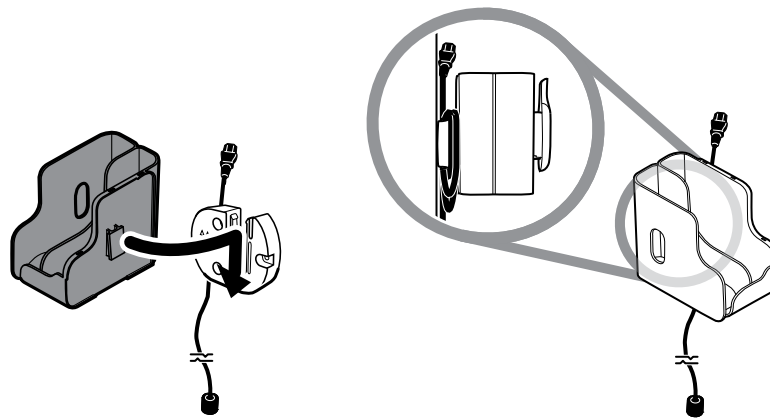


- b. Tighten the two retention screws.
9. Attach the system power cord to the wall unit. Do not plug the cord into an outlet at this time.

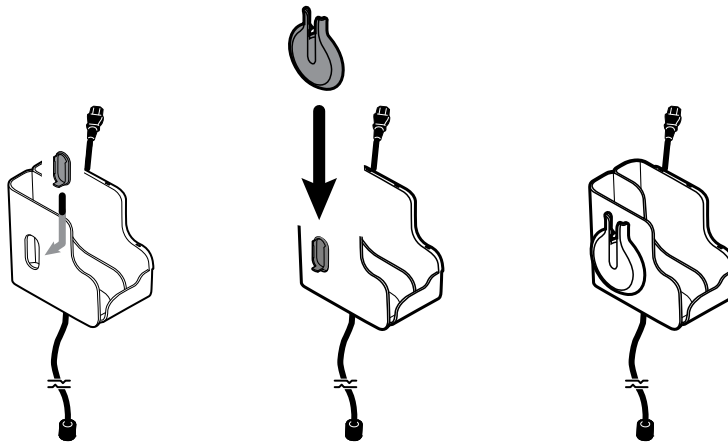


Mount the accessory bin

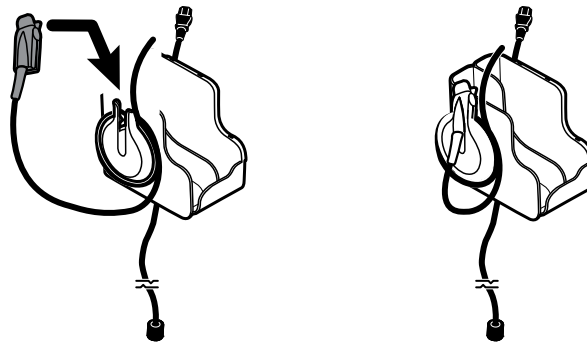
1. Mount the accessory bin on the accessory bin bracket, then loosely wrap the excess power cord around the accessory bin bracket.



2. If your wall system is configured for SpO2 (or SpHb), attach the spool to the accessory bin by sliding the spool onto the retention clip.

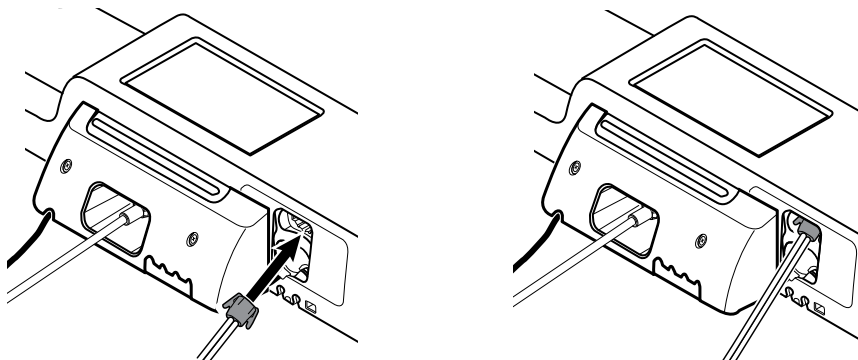


3. Properly orient and insert the sensor cable into the patient cable connector. (You just connected the opposite end of the sensor cable to the wall system.) Ensure the sensor cable is inserted completely, then close the protective cover. (See the sensor manufacturer's directions for use.)
4. Wrap the excess patient cable around the spool, and place the finger clip in the holder.



Connect the blood pressure (NIBP) hose

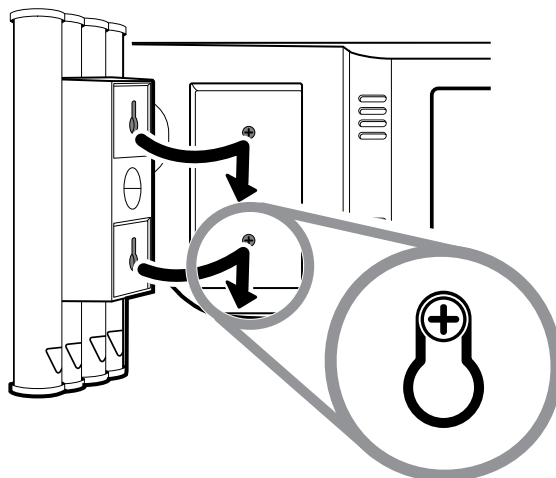
1. Align the hose connector with the hose connector port on the bottom of the monitor.
2. Insert the hose connector, pressing firmly until it clicks into place.



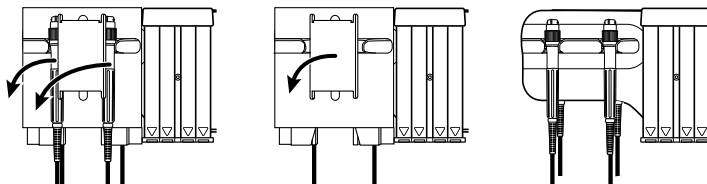
3. Attach a blood pressure cuff to the tubing (see the cuff manufacturer's directions for use), then store the cuff in the accessory bin.

Set up the physical assessment instrument handles and specula dispenser

1. Attach the specula dispenser. Ensure that the keyhole locking slots on the back of the dispenser engage the locking screws on the wall system, then push down firmly.



2. Remove cardboard securing instrument handles.



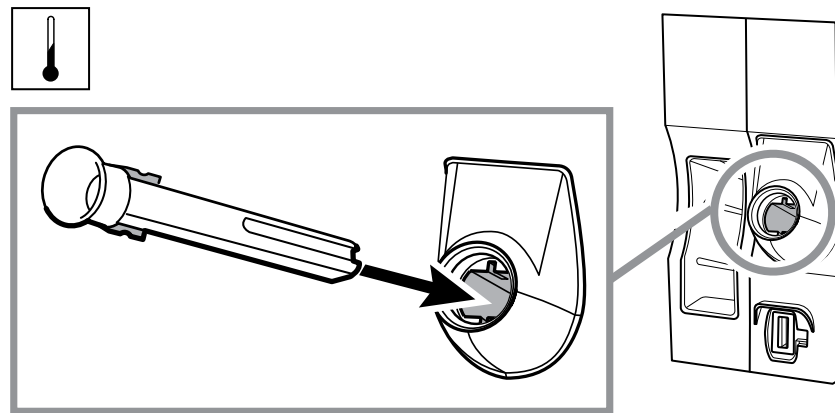
3. Attach Welch Allyn 3.5V instrument heads of your choice to the handles. See the directions for use for each instrument head.

Set up the SureTemp® Plus thermometer

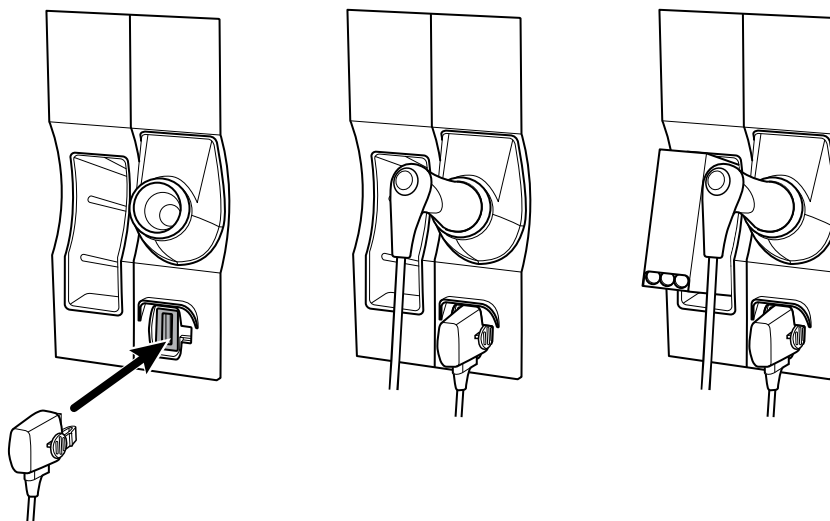
If your wall system is configured for a SureTemp Plus thermometer, follow these setup instructions.

1. Align the probe well with the tabs facing up and down and insert the probe well into the temperature module.

The probe well snaps into place when it is fully seated.



2. Hold the temperature probe cable connector with the spring tab on the right and insert it into the probe port of the temperature module. Push it into place until it clicks.
3. Insert the temperature probe into the probe well.
4. Open a box of probe covers and place it in the probe cover box holder.

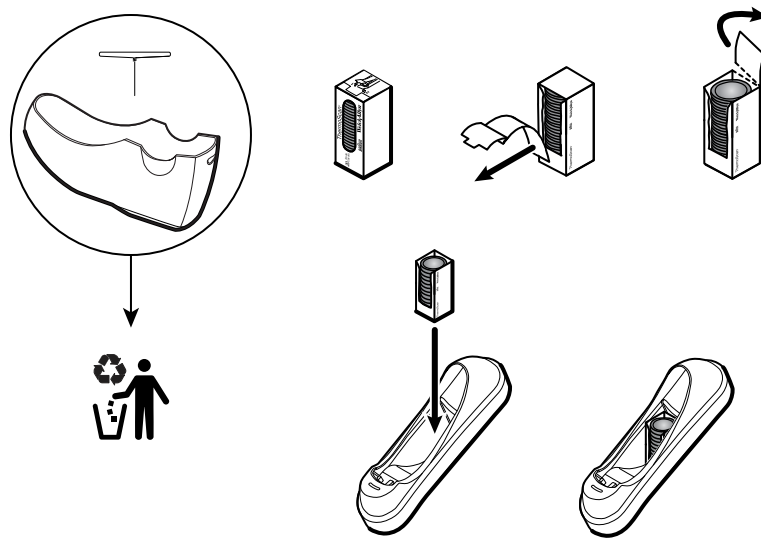
**Note**

Spare boxes of probe covers can be stored in the compartment on the top of the wall system.

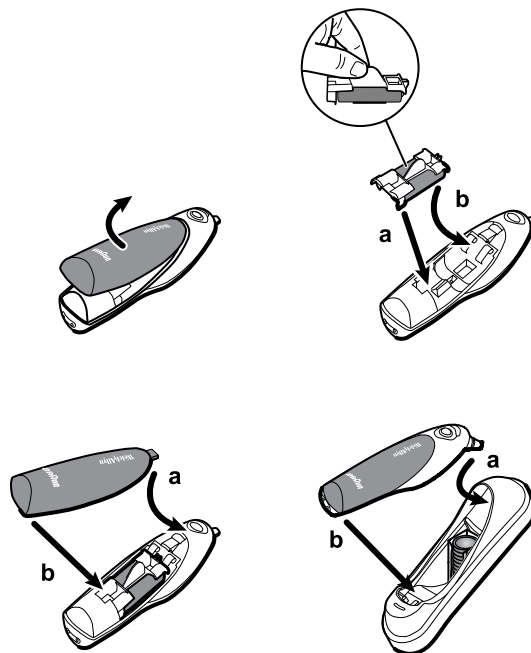
Set up the Braun ThermoScan® PRO 4000 thermometer

If your system is configured for the Braun ThermoScan thermometer, follow these setup instructions.

1. Remove the thermometer from the package and discard the protective casing. Then open a box of probe covers and place it in the dock.



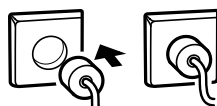
2. Remove the thermometer cover, insert the battery, replace the thermometer cover, then place the thermometer in the dock.



Connect AC power

The wall system uses both battery and AC power. After completing all other setup activities, you can apply power to the wall system.

1. Insert the power plug into an outlet to power the monitor and to charge the battery.

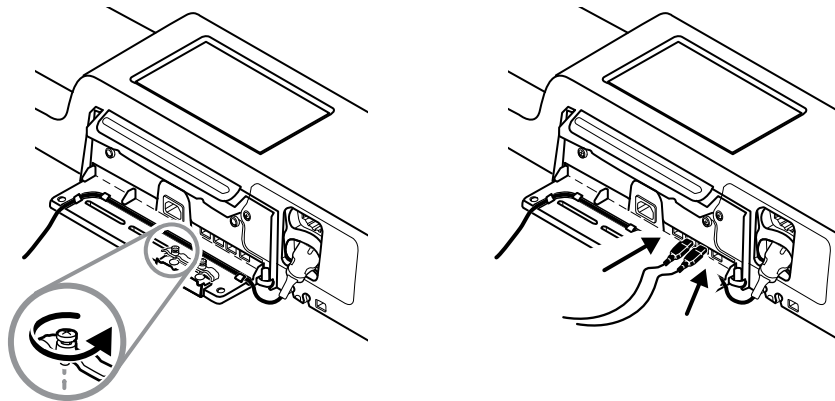


Note New batteries are only 30 percent charged. You must plug the wall system into AC power to fully charge the battery. Do not plug in the power cord until completing all preliminary steps.

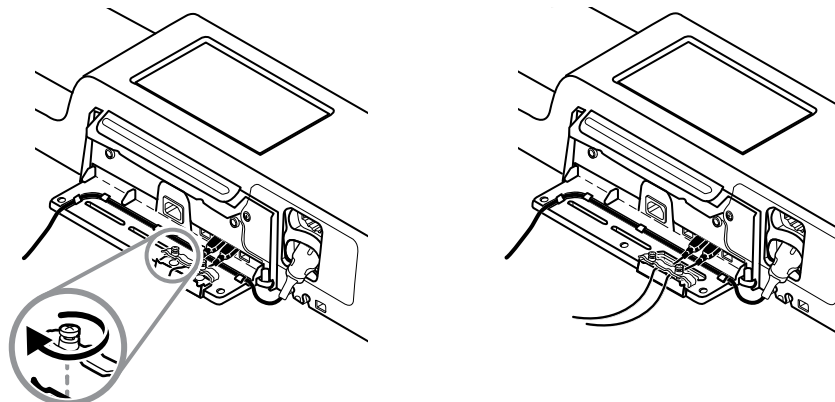
2. Proceed to Startup.

Attach an accessory

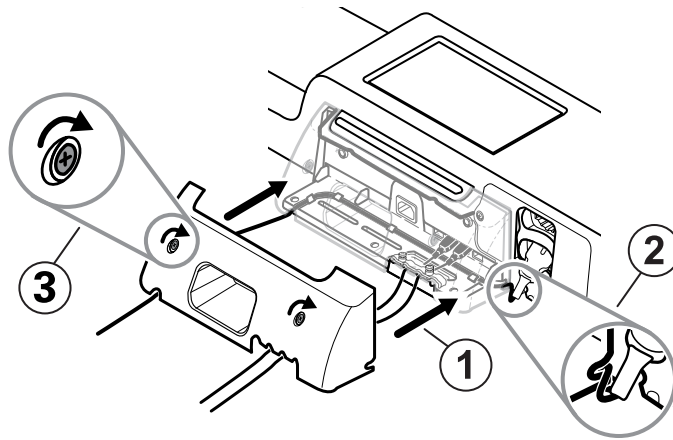
1. Shut down the wall system and detach the power cord. Then remove the cover from the wall system by loosening the captive retention screws.
2. Loosen the two screws on the cable retention clamp and remove it. Then connect the USB cable(s) to an available connector and thread the cable(s) through the cable guide(s).



3. Replace the cable retention clamp and tighten the two screws.



4. Re-attach the cover.
 - a. Thread the SpO2 (or SpHb) cable through the cutouts on the top right and bottom left of the cover.



b. Tighten the two retention screws.

5. Re-attach the system power cord and power up the wall system.

Note Some accessories require a license to enable them for use. These accessories are packaged with an authorization code and instructions for activating the license using the Welch Allyn Service Tool. For more information, refer to the instructions and the service tool installation guide.

Startup

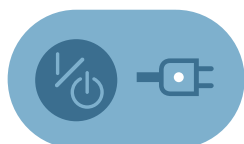
Power

The power button, located on the front of the monitor, performs the following functions:

- Powers up the monitor
- Sets the monitor into Display power saving mode, except when an alarm condition is active (brief press)
- Resets the monitor and sets the monitor into Standby mode (press and hold for 6 seconds)



Caution Do not use a long press of  to power down the monitor when it is functioning normally. You will lose patient data and configuration settings.



The LED in the center of the power plug symbol indicates the battery charging status:

- Green indicates that AC power is present and that the battery is fully charged.
- Amber indicates that AC power is present and that the battery is charging.

The monitor has distinct power states.

Monitor on

The monitor is operating on battery power or AC power. You can utilize the monitor's features, and the display is active.

Display power saving

The monitor is operating on battery or AC power, but the display is off to conserve power. A brief press of the power button sets the monitor into Display power saving mode from the active state. Settings for this mode can be changed in the Advanced Settings Display tab.

Battery-powered accessories connected to the monitor continue to charge while the monitor is in this mode and connected to AC power.

Note The monitor will not enter the Display power saving mode while an alarm condition is active. In addition, the monitor will exit this mode if an alarm occurs.

The following actions will return the monitor display to the active state:

- Touch the screen
- Remove the temperature probe from the probe well
- Attach the SpO2 sensor to a patient
- Press 

Standby

The monitor is plugged into a power outlet, but the sensors and the display do not operate.

Note Because power is still available to charge the battery and power the monitor, the monitor is in Standby mode.

The monitor remains in Standby mode until you press . Settings for this mode can be changed in the Advanced Settings Display tab.

Power up the monitor

The monitor runs a brief diagnostic self-test each time it powers up.



WARNING Equipment failure risk. The monitor includes a fan that circulates air through the device. If the fan does not run when you power up the device, remove it from use and inform qualified service personnel immediately. Do not use the monitor until the problem is corrected.



WARNING To ensure patient safety, listen for two audible indicators (a piezo beeper and a speaker tone) and watch for visual alerts at power-up. Correct any system errors before using the monitor. In addition to the audible indicators, the monitor LED light bar illuminates to alert you of alarms. Amber indicates a low-level alarm. Flashing amber indicates a medium-level alarm. Flashing red indicates a high-level alarm.



WARNING Always observe the monitor during power-up. If any display fails to illuminate properly, or if an error code displays, inform qualified service personnel immediately, or call your nearest Welch Allyn Customer Service or Technical Support facility. Do not use the monitor until the problem is corrected.



Caution Always use the monitor with an adequately charged and properly functioning battery. For continuous monitoring, always connect to AC power.



Caution Use only a Class I (grounded) AC power cord for powering this monitor.

Press  to power up the monitor.

Following a successful self-test, the monitor displays the Welch Allyn logo, the LED light bar (located on the handle) flashes, and a power-up tone sounds. The startup screen then appears with the following banner across the bottom.

The banner displays the Welch Allyn logo in green and blue, followed by the word "Connex" in blue.

If a system error is detected, the monitor becomes inactive until you press  or until the monitor shuts down automatically. The monitor displays a system fault message that contains

a wrench icon  and a system fault code to aid service and engineers in diagnosing the problem.

Power down the monitor

1. Touch the **Settings** tab.
2. Touch the **Device** tab.
3. Touch **Power down**.

This power-down method, which places the monitor into Standby mode, ensures that patient measurements are retained in the monitor memory for a maximum of 24 hours. (These saved measurements are available for recall, printing, or to send electronically to the network.) This method also ensures that any configuration settings you have changed and saved will be maintained at the next startup.

Note Because power is still available to charge the battery and power the monitor, the monitor is in Standby mode.

Reset the wall system

If the wall system stops functioning, you can press and hold  for approximately 6 seconds to allow the hardware to completely cycle off and to reset the wall system configuration settings to the last saved default power-up configuration. The button is located on the front of the wall system.



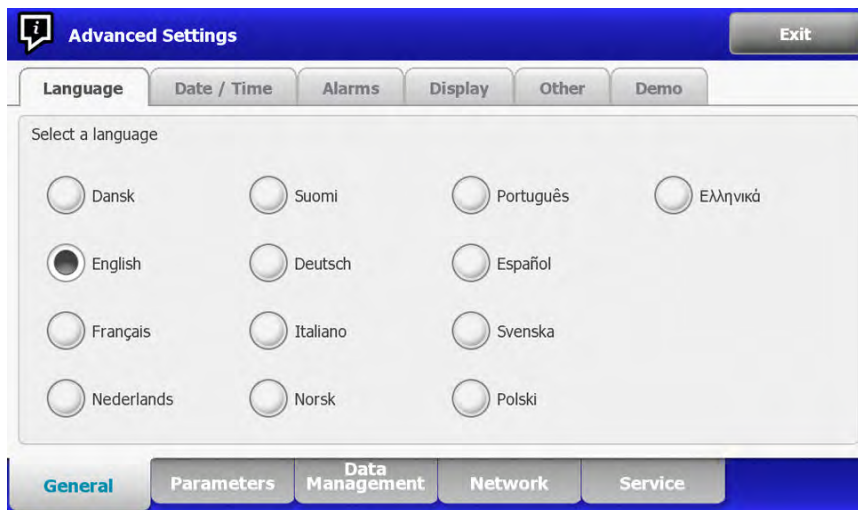
Caution Do not use a long press of  to power down the wall system when it is functioning normally. You will lose patient data and configuration settings.

Note Because power is still available to charge the battery and power the wall system, the wall system is in Standby mode.

Select a language

When you power up the wall system for the first time, the language selection screen appears.

1. Select your language.



2. Touch **Exit**.

The Home tab appears.

Set the date and time

1. Touch the **Settings** tab.
2. Touch the **Device** tab.
3. To change the date and time values: Touch the up and down arrow keys or touch  and enter a value.

Repeat for each value you want to change.

Note The date and time stamps on saved patient measurements will adjust in response to new date and time settings.

Enter clinician information

1. Go to the Clinician tab using one of these methods:
 - Touch the Clinician ID section (left edge) of the Device Status area on the Home tab.
 - Touch the **Settings** tab and then touch the **Clinician** tab.

2. To enter the clinician name, touch , located at the right of the text field, and enter characters.

You can enter up to 32 characters for the clinician's first and last name. Enter only 1 character for the middle initial.

3. To enter the clinician ID, use one of these methods:

- Touch  and enter the ID.

- Scan the clinician's barcode with a barcode scanner. The scanned ID appears in the field.
4. If prompted, enter your system password.
 5. Touch **OK** to save your entries and return to the Home tab.

Set the default configuration

1. Touch the **Settings** tab.
2. Touch the **Device** tab.
3. Enter or adjust the desired settings you want to add or change.

Note The new settings appear as they are completed but are temporary until they are saved.

4. Touch **Save as default**.
5. Touch **OK** to confirm that you want to overwrite your previous settings and replace them with your current settings in the startup default configuration. Or touch **Cancel** to retain the previous settings.

The new settings are stored as the default startup settings once you restart the monitor.

Note If your monitor is connected to the network, the date and time settings are synchronized with the network settings.

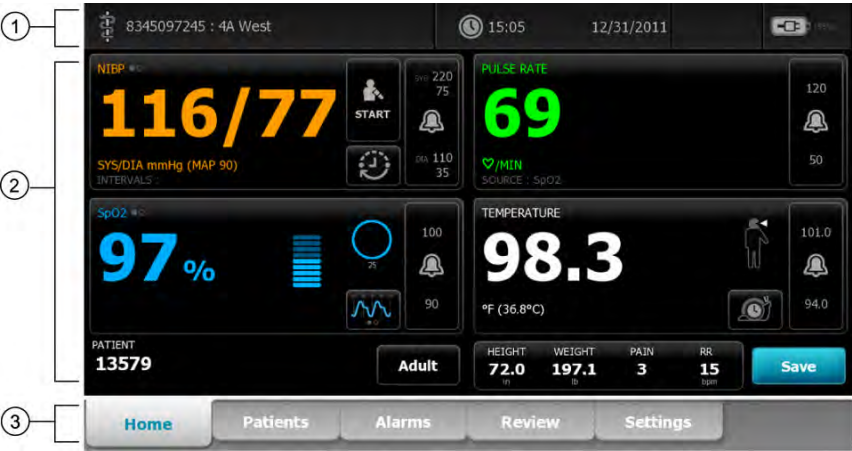
Note The date and time stamps on saved patient measurements will adjust in response to new date and time settings.

Navigation

The monitor screen provides the interface that you use to complete your workflow. You access the monitor's features by touching the screen.

Home tab

The Home tab includes the following areas:



Item	Area
1	Device Status
2	Content
3	Navigation

Device Status area



- The Device Status area, located at the top of the Home screen, displays the following monitor information, from left to right:
- Clinician identification. The format can be a name, ID number, or icon. Touch this area to navigate to the Clinician login.
 - Device location.

- Time and date. Touch this area to navigate to date and time settings.
- Connection status (wired or wireless). The icons indicate which connection type, if any, is currently active.

Icon	Connection type
	Ethernet
	USB
	Wireless
Blank	No connection

- Process indicator. This indicator appears when system or patient data is transferred between the monitor and the network.
- Battery condition. Estimated battery capacity is displayed in hour(s):minute(s) format.

This area also provides:

- Interactive alarm and information messages.
- Shortcuts to some setting controls. For example, touching the Alarm icon displays the Alarms tab.

Battery status

The battery status indicator displays the state of the battery.

The battery status is represented by icons in the right corner of the Device Status area:

- The monitor is connected to a power outlet and the battery is charging or is fully charged. The estimated charge rate is displayed as a percentage of capacity.



- The monitor is not connected to a power outlet and is running on battery power. The estimated charge time remaining is displayed in the hour(s):minute(s) format. Each section of the battery status indicator represents a percentage of remaining charge.



- The monitor is connected to a power outlet but the battery does not maintain a charge (or has been removed).



When the battery is not being recharged and power becomes low, an information message displays in the Device Status area.



Note Observe the remaining battery charge in the battery status indicator and plug the monitor into a power outlet as soon as you are able.

If the information message is dismissed or you do not take any action to charge the battery, a low battery alarm condition results. An error message displays in the Device Status area to prompt you to take action to help prevent the monitor from shutting down due to a critically low battery.



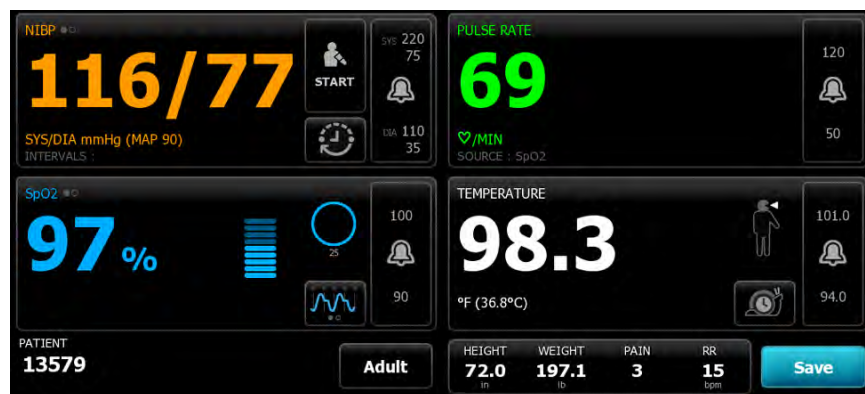
Alarm and information messages

The Device Status area provides alarm and information messages that are either temporary or exist as long as the condition to which the message applies remains. Alarm or information messages may also include controls and/or behavior that you can use to manage alarm and information messages.

When the monitor detects an alarm condition, an alarm message appears. When multiple alarms occur, the highest priority message appears. You can cycle through each alarm message by touching the multiple alarm toggle.

Information messages instruct you to interact with the monitor in a specific way or provide information that does not require action. You can dismiss an information message by selecting the control associated with the message or waiting for the message to time out.

Content area



The Content area displays vital sign measurements. It also provides shortcuts to several controls.

The Content area includes the following frames:

- NIBP
- SpO2 with optional SpHb
- Pulse rate
- Temperature
- Patient
- Manual parameters (height, weight, pain, temperature, respiration, and BMI, depending on configuration)

The Content area also includes a **Save** button, which you use to manually save current measurements.

Save patient data

Patient data can be saved to the monitor.

After taking a patient reading, touch **Save**.

A message will appear indicating a successful or failed save.

Note You can configure some profiles and settings to automatically save measurements.

Navigation area



The Navigation area includes the following tabs:

- **Home:** Displays vital-sign measurements and provides shortcuts to several controls.
- **Patients:** Accesses the patient list, patient summary, patient modifiers, and manual parameters.
- **Alarms:** Accesses global alarm response and settings controls, plus alarm limits settings (available only in Monitor mode).
- **Review:** Prints, deletes, and sends patient data.
- **Settings:** Accesses device configuration settings.

To navigate to a tab, touch the tab in the Navigation area with the corresponding name. The active tab is highlighted.

Display lock

The display lock prevents clinician input, which may be useful when cleaning the display.

Note The lock feature is not a security mechanism.

The display locks when any of the following occur:

- You touch **Lock display now**.
- No interaction with the monitor occurs for the period specified in the Display tab. Use the Advanced tab to set or change the time it takes for the display to lock. (This requires the Advanced settings access code.)

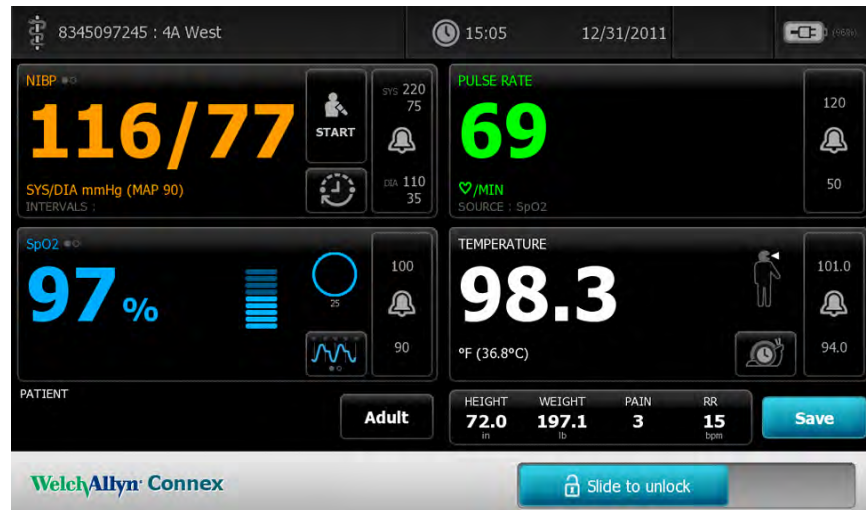
Lock the display

Follow these steps to touch the screen without activating the controls.

1. Touch the **Settings** tab.
2. Touch the **Device** tab.
3. Touch **Lock display now**.

The following occurs:

- The Home screen appears.



- A title bar with a sliding button and lock icon replaces the Navigation area, located at the bottom of the screen.
- Patient information no longer appears at the bottom left of the screen.
- Only **Slide to unlock** (located at the bottom right) responds to touch. All other controls on the screen are locked. If any area of the screen, other than the sliding button, is selected, a message appears.

Unlock the display

On the locked screen, touch and move **Slide to unlock** (located at the bottom right) to the rightmost position on the sidebar.

The following occurs:

- Patient information appears in the Patient frame.
- The Navigation area appears.
- Home tab controls are available for use.

The display also unlocks when any of the following occur:

- An alarm condition.
- An externally initiated action, such as taking or stopping an NIBP measurement or upgrading software.
- The monitor powers up.

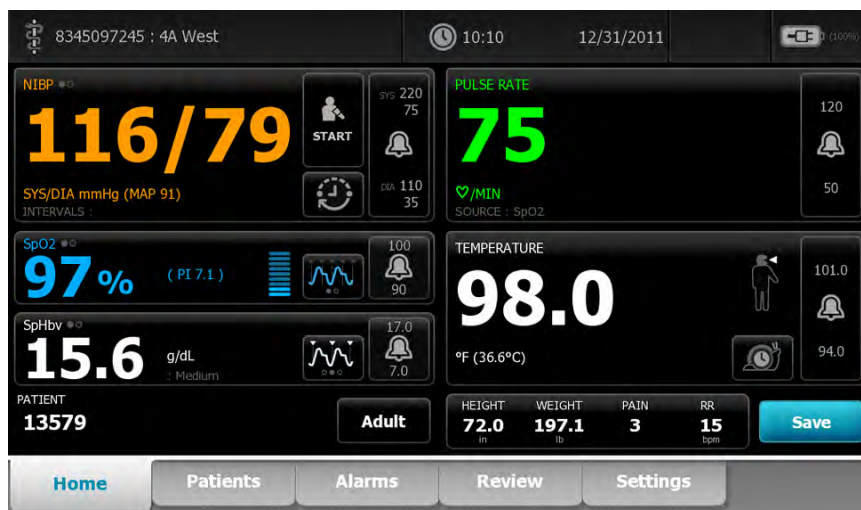
Profiles

Profiles are variations of the Home tab. Each profile gives you access to a different set of features. Choose the profile that best suits your needs.

The monitor offers multiple profiles—including Monitor, Spot Check, and Triage—based on the model and any upgrade licenses you purchase.

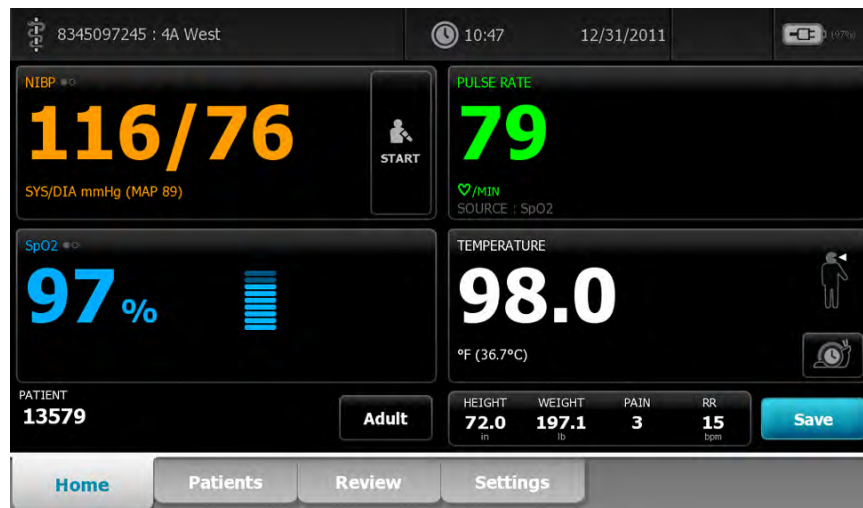
Monitor profile

The Monitor profile enables you to use alarms and timed intervals. It is designed for continuous patient monitoring.



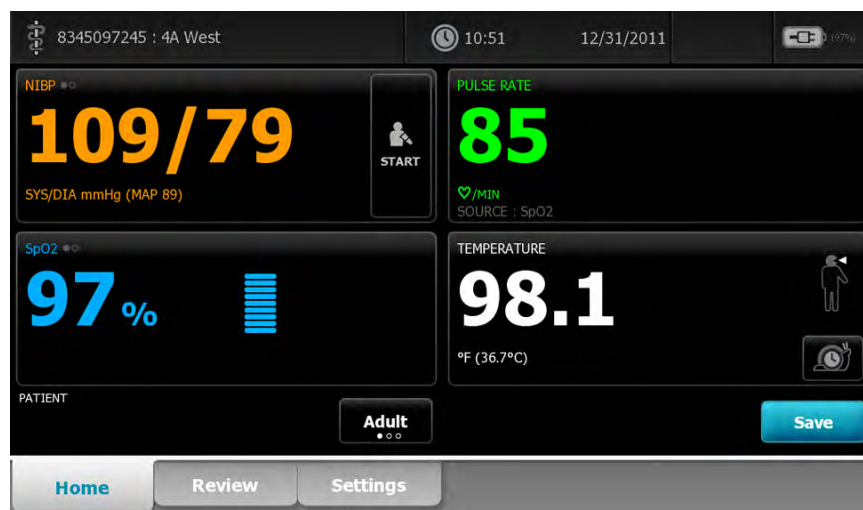
Spot Check profile

The Spot Check profile is optimized for clinicians who take spot-check vital readings and do not need automatic reading or alarm features.



Triage profile

The Triage profile allows for vital signs capture without alarms or access to the Patients tab.



Profile feature comparison

The following table compares the features of the profiles.

Feature	Monitor	Spot Check	Triage
Take NIBP, SpO ₂ , temperature, and pulse rate readings	X	X	X
Take SpHb readings (Masimo only)	X		
Configure and use interval timing setting	X		
Observe and configure alarm limits	X		
Observe and respond to physiological alarms	X		
Change patient type (adult, pediatric, neonate)	X	X	X
View and enter manual parameters (height, weight, pain, respiration, temperature*, BMI**)	X	X	
Save currently displayed data to device memory	X	X	X
Save and review patient data	X	X	X
Access Patients tab	X	X	
Access Alarms tab	X		
Access Review tab	X	X	X
Access Settings tab	X	X	X

* Braun IR thermometers configured to work with the monitor transfer temperature data automatically to the Temperature frame. You can enter temperature manually if you take a patient temperature with a thermometer that is not connected to the monitor, and you have selected temperature as one of the four manual parameters to display.

** Body Mass Index (BMI) is calculated and transferred to the monitor only by an attached weight scale. You cannot enter or adjust BMI values. BMI displays on the Manual tab and in the Manual parameters frame if you have selected it as one of the four parameters to display.

Select a profile

Follow these steps to select a profile, which controls the appearance and functionality of the device.

1. Touch **Settings**.
2. Touch **Profiles**.
3. Touch the desired profile.
4. Touch **Home** to return to the Home tab.

Note Profiles cannot be changed while acquiring patient measurements or while unsaved patient measurements are on the display.

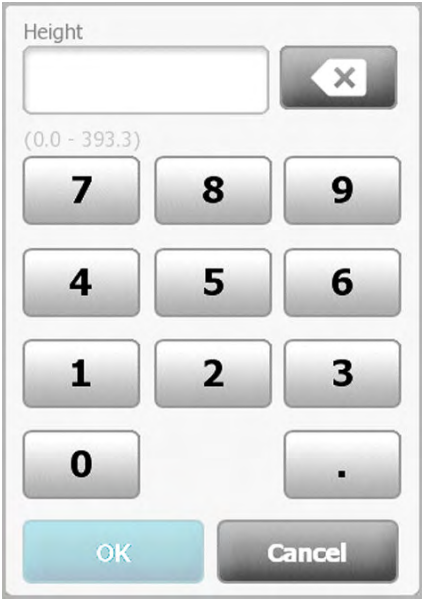
Using the keypad, keyboard, and barcode scanner

Open the numeric keypad

Touch any field that includes the numeric keypad icon .

The numeric keypad appears.

Numeric keypad



The numeric keypad includes the following components:

Component	Name	Description
	Data field	Displays the numbers you enter. The field name appears above and the range of values you can enter appears below this field.
	Backspace key	When touched, removes the rightmost number from the data field.

Component	Name	Description
	Cancel button	When touched, the numeric keypad disappears and the selected number does not change.
	OK button	When touched, the numeric keypad disappears and the entered number appears in the associated frame or data field.

Enter a number

- With the numeric keypad open, touch a number or numbers.
The value must be within the range that appears below the data field.
- Touch **OK**.
 - If the value is within the required range and format, the numeric keypad disappears and the entered numbers replace the previous numbers.
 - If the number is not within the required range and format, **OK** remains inactive until you enter a valid number.

Close the numeric keypad

Touch one of the following:

- OK**: Exits the numeric keypad and inserts the number.
- Cancel**: Exits the numeric keypad without saving entered numbers.

Open the keyboard

Touch any field that includes the keyboard icon



The keyboard appears.

Keyboard



The keyboard includes the following components:

Component	Name	Description
	Data field	Displays the characters you enter.
	Backspace key	When touched, removes the rightmost character from the data field.
	Space bar	When touched, enters a space in the data field.
	Shift key	When touched, enters the next letter as uppercase.
	Letters key	When touched, returns to the primary keyboard layout. The keyboard changes from normal layout when you touch one of these: • The symbols key • The diacritical marks key
	Symbols key	When touched, the keyboard displays symbols. The keyboard returns to its normal layout when you touch one of these: • Any symbol • The letters key • The symbols key Note The symbols that display match the selected language.
	Diacritical marks key (appearance varies in some languages)	When touched, the keyboard displays letters with diacritical marks. The keyboard returns to its normal layout when you touch one of these: • Any letter • The letters key • The diacritical marks key Note This key appears only when the selected language uses diacritical marks.
	Next button	When touched, accepts the entry for the current field, then clears the field to allow data entry for the next field.
	Cancel button	When touched, the keyboard disappears and the content of the data field remains the same.

Component	Name	Description
	OK button	When touched, the keyboard disappears and the entered characters appear in the data field.

Enter a letter or number

- With the keyboard open, touch letters or numbers.
- Do one of the following:
 - Touch **Next**. This control accepts the entry for the current field, then clears the data field to allow data entry in the next field.
 - Touch **OK**. The keyboard disappears and the entered characters appear in the data field.

Enter a symbol or special character

Note To return to the keyboard's normal layout, touch .

- With the keyboard open, touch .
Symbols and special characters for the selected language appear.



- Touch the appropriate symbol or special character.
The keyboard returns to its normal layout.

Enter a diacritical mark

Note Keyboards with diacritical marks are available only for languages that use diacritical marks.

Note To return to the keyboard's normal layout without saving changes, touch .

Diacritical marks key	Language(s)
None (Not applicable)	Danish, English, Dutch, German, Italian
	French

Diacritical marks key	Language(s)
	Finnish, Norwegian, Spanish, Swedish
	Portuguese
	Polish
	Greek

1. With the keyboard open, touch the diacritical marks key. This key varies based on the language, as noted above.

The keyboard displays diacritical marks for the selected language and therefore varies from one language to another. On each diacritical marks keyboard, the letters key in the top left corner returns you to the standard keyboard.

2. Touch a diacritical mark.

The keyboard returns to its normal layout.

Close the keyboard

Touch one of the following:

- **Next:** Accepts the entry for the current field, then clears the field to allow data entry for the next field.
- **OK:** Exits the keyboard and inserts the data.
- **Cancel:** Exits the keyboard without saving entered data.

Use a barcode scanner

The monitor enables the scanning of patients' and clinicians' barcodes to enter ID information. The barcode scanner supports linear and two-dimensional barcodes.

If you haven't done so already, attach the barcode scanner to the monitor. Use the instructions to attach an accessory.

Note Refer to the manufacturer's directions for use to ensure that the scanner is set to USB Com Emulation mode.

1. Remove the barcode scanner from its holder.
2. Hold the scanner approximately 6 inches (15.4 cm) from the barcode and squeeze the trigger so that the light from the scanner appears on the barcode.

Once the scanner completes a successful barcode reading, the ID appears in the targeted area (Patient frame, data field, or Device Status area). See additional notes below.

If the scanner has difficulty reading the barcode, slowly adjust the distance and the angle between the scanner and the barcode while squeezing the scanner trigger. If it continues to have difficulty, verify that the barcode is as flat as possible.

Note You can scan a patient's barcode from the Home tab or the Summary tab. The scanned ID appears in the Patient frame on the Home tab and in the Patient ID field on the Summary tab.

Before you scan a barcode on the Summary tab, touch the keyboard icon in the Patient ID field. To return to the Home tab and begin taking patient measurements, touch **OK**.

Note Scanning a clinician ID while the Clinician ID pane is open places the scanned ID into the Clinician ID section of the Device Status area. Touch **OK** to return to the Home tab and to begin taking patient measurements.

Note Use the Advanced settings Data Management tab to change the appearance of the Clinician ID if you do not want your ID to appear in the Device Status area. (This requires the Advanced settings access code.) However, this information is still retained in the monitor memory for recall, printing, or to send measurements electronically to the network.

Patient data management

Patient data is managed through the Patients tab.

From this tab, you can do the following:

- Retrieve a patient list from the network or manually create a patient list.
- Select a patient from the list.
- Scan a patient ID with the barcode scanner and return an Admit/Discharge/Transfer (ADT) patient name match.
- Enter additional patient information such as modifiers and manual parameters.



Caution Verify patient identity on the monitor after manual or barcode entry and before printing or transferring patient records.

Add a patient to the patient list

Note If the monitor is configured to retrieve the patient list from the network, you cannot manually add a patient to the patient list.

1. Touch the **Patients** tab.
2. Touch **Add**.
3. Touch  and then enter patient information. Touch  to cycle through the patient data fields.

Note You can use a barcode scanner to enter a patient ID in the Patient ID field. Touch  in the Patient ID field, scan the barcode, and touch **OK**.

4. Touch **OK** to return to the Home tab.
The information is saved.



Caution Verify patient identity on the monitor after manual or barcode entry and before printing or transferring patient records.

Load patient data with the barcode scanner

You can use a barcode scanner to query existing patient records and perform an ADT patient name match.

Note If the monitor is connected to the network, the monitor can receive a patient name from patient records associated with a scanned ID number.

1. Ensure that you are on the Home tab.
2. Scan the patient's barcode with the barcode scanner.

The Patient ID appears in the Patient frame.



Caution Verify patient identity on the monitor after manual or barcode entry and before printing or transferring patient records.

Select a patient

1. Touch the **Patients** tab.
2. If the monitor is connected to the network, touch **Retrieve list** on the List tab.
The monitor retrieves the patient list from the network.
3. From the patient list, touch the patient's identifier (name, ID number, or location).
The patient's identifier is determined in Advanced settings.
4. Touch **Select**.

Note In the Spot Check and Triage profiles, previous patient data will be overwritten by a new save. In the Monitor profile, selecting a new patient will clear the current patient data and readings.

Patient data can be sorted in ascending or descending order by selecting the heading row and touching ▲ or ▼.

Manage patient records

Patient records can be sent to the network, printed, or deleted.

1. Touch the **Review** tab.

Note Measurements that triggered a physiological alarm are highlighted on this tab.

☒	Patient		Date / Time	NIBP	Temp	PR	SpO2	SpHb	Ht Wt P RR	
☒	13579	✉	12/31/2011 13:33	113/73(87)	36.5	88	96	15.5	182.9/89.4/3/15	▲
☒	13579	✉	12/31/2011 13:36	141/72(95)	36.6	87	95	14.2	182.9/89.4/3/15	
☒	13579	✉	12/31/2011 13:37	108/64(79)	36.3	90	95	14.1	182.9/89.4/3/15	
☒	13579	✉	12/31/2011 13:38	117/75(89)	36.3	86	97	14.0	182.9/89.4/3/15	
☒	13579	✉	12/31/2011 13:39	117/77(90)	36.4	91	96	13.9	182.9/89.4/3/15	
☒	13579	✉	12/31/2011 13:41	120/68(85)	36.2	90	96	13.9	182.9/89.4/3/15	▼

View

2. Select patients by touching the check box next to their names.
3. Touch **Send** to transmit the records to the network, **Print** to print the records, or **Delete** to permanently remove the records as desired.



Caution Verify patient identity on the monitor after manual or barcode entry and before printing or transferring patient records.



Caution Always visually verify the printed patient records.

Note

The  icon indicates the records have been sent to the network.

Note

You can configure some profiles and settings to automatically send measurements to the network.

Note

Patient measurements older than 24 hours are automatically deleted from the patient records list on the Review tab.

Note

The date and time stamps on saved patient measurements will adjust in response to new date and time settings.

Delete a patient from the list

1. Touch the **Patients** tab.
2. From the List tab, touch the patient record you want to delete.
3. Touch **Delete**.

At the Delete Confirmation window, touch **OK** to permanently delete the selected patient. Touch **Cancel** to cancel the deletion.

Note

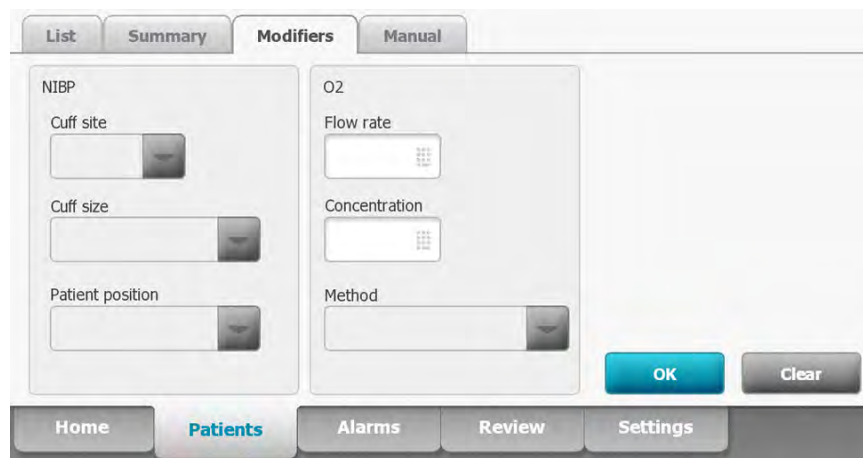
Deleting a patient from the Patients List does not delete saved records. Touch **Review** to see or delete saved records.

Note

For monitors connected to the network, deleting a patient on the monitor does not affect data on the network.

Modifiers

The Modifiers tab enables you to enter additional information for current measurements.



The screenshot shows the 'Modifiers' tab selected in a patient data management interface. The interface has a top navigation bar with tabs: 'List', 'Summary', 'Modifiers' (selected), and 'Manual'. Below this, there are two main sections: 'NIBP' (Non-Invasive Blood Pressure) and 'O2' (Oxygen Saturation). The 'NIBP' section contains three input fields: 'Cuff site' (with a dropdown arrow), 'Cuff size' (with a dropdown arrow), and 'Patient position' (with a dropdown arrow). The 'O2' section contains three input fields: 'Flow rate' (with a numeric keypad icon), 'Concentration' (with a numeric keypad icon), and 'Method' (with a dropdown arrow). At the bottom right of the input fields are two buttons: 'OK' (blue) and 'Clear' (grey). At the very bottom of the screen is a bottom navigation bar with tabs: 'Home', 'Patients' (selected), 'Alarms', 'Review', and 'Settings'.

Set modifiers

1. Touch the **Patients** tab.
2. Touch the **Modifiers** tab.
3. Adjust the NIBP, O2, and Temperature settings as required.
4. Touch **OK** to accept the changes and return to the home screen, or touch **Clear** to delete all entries.

The Modifier settings clear after a power cycle, after you clear the Home tab, or after you select a new patient.

Alarms

The monitor presents physiological alarms and technical alarms. Physiological alarms occur when vital sign measurements fall outside of set alarm limits, but they occur only in the Monitor profile. Technical alarms occur in all profiles.

Note The three modes of data communication—USB, Ethernet, and IEEE 802.11—are not intended for real-time alarms.

Alarm types

Type	Priority	Color	Alarm audio tone
- NIBP, SpO2, or SpHb limit exceeded - Some technical alarms	High	Red	10-pulse tone
- Pulse rate limit exceeded - Some technical alarms	Medium	Amber	3-pulse tone
- Temperature limit exceeded - Some technical alarms	Low	Amber	2-pulse tone or 1-pulse tone

Alarm notification locations



WARNING If you are relying on visual alarm notifications, maintain a clear line of sight with the monitor and/or Nurse Call. If you are relying on audio alarm notifications, ensure that you can hear audio alarms from where you are. Set the volume as needed considering the environment and ambient noise levels.

Nurse Call

When the Nurse Call cable is connected and Nurse Call has been enabled, the monitor immediately notifies the Nurse Call system when an alarm occurs. Nurse Call notification settings are specified in the Advanced settings.

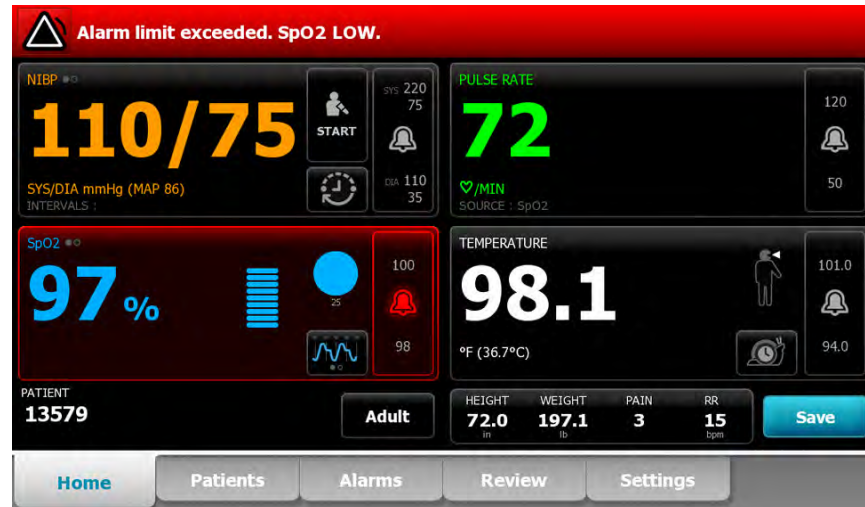
LED light bar

The light bar on the handle of the monitor illuminates as follows:

- Flashing red for high priority alarms
- Flashing amber for medium priority alarms

- Constant amber for low priority alarms

Home tab



Home tab notifications

Notification	Description
Device Status area	The area changes color and displays a message with an accompanying status icon or button. If the alarm tone is in a pause interval, a timer countdown appears. If multiple alarms and information messages are active, the Device Status area shows the highest priority alarm. If the alarms are equal in priority, the most recent alarm message appears. You can cycle through the messages for each active alarm.
Parameter frame	The background color changes. Touch this area to pause or turn off an alarm audio tone. Visual indicators and Nurse Call notification will persist during an audio paused condition.
Alarm Limit control	The icon in this control indicates the status of the alarm limit settings. Red and amber icons indicate measurements that have exceeded alarm limits. Touch this control to navigate to a parameter-specific tab where you can modify alarm limit settings.

Icons on the Home tab

Icons in parameter frames

The icons in the parameter frames indicate alarm notification settings. When alarm limits are on, the icons will be black and white until an alarm occurs. Then, the icons will change color to indicate the priority of the alarm. Red icons represent high priority alarms, and amber icons represent medium or low priority alarms.

Icons in parameter frames

Icon	Name and status
	Alarm off. No visual or audio alarms or Nurse Call notification will occur for this parameter.
	Alarm on. Audio and visual notifications and Nurse Call are enabled.
	Alarm audio off. Only visual notifications, including Nurse Call, will occur.
	Alarm audio paused. The audio tone is paused for a period ranging from 90 seconds to 15 minutes. The icon remains until the paused time counts down to 0.

Icons in the Device Status area

The icons in the Device Status area are black and white, but the background area changes colors to indicate the alarm priority. Messages accompany these icons. These icons can be controls or status indicators.

Icons in the Device Status area

Icon	Name and status
	Alarm active. One or more alarms are active. Touch this icon to pause or turn off the audio tone.
	Alarm audio off. Audio signals are disabled, but alarm limits and visual alarm signals remain active.
	Multiple alarms toggle. Touch this icon to cycle through the messages for each active alarm.
	Alarm audio paused. The audio tone is paused for a period ranging from 90 seconds to 15 minutes. The icon remains until the paused time counts down to 0. Touch this icon to reset the pause interval. The pause interval is determined by settings in the Advanced tab.

Reset (pause or turn off) audio alarms

Audio alarm characteristics

- After you reset an audio alarm, some tones do not return, but others return after a pause interval if the condition that caused the alarm persists. Settings in the Advanced tab determine the length of the pause interval.
- If a new alarm condition occurs during a pause interval, a new audio tone occurs.
- If an audio alarm is not paused or turned off after a period of time, a buzzer accompanies the tone.

Pause or turn off an audio alarm

1. In the Device Status area, touch .

- Visual indications remain in the parameter frame until the condition is corrected or until the next measurement is taken.

- In the Device Status area, if the icon changes to  and the message remains, the timer counts down and the audio tone returns after a pause interval. You can touch



again to restart the timer.

If you responded to an NIBP alarm and multiple NIBP limits have been exceeded, the first audio tone and message go away, but another NIBP limit message shows with a countdown timer. A new NIBP audio tone sounds after the countdown unless you touch



to dismiss each remaining NIBP limit message.

2. If multiple alarms are active, a multiple alarm toggle will appear in the Device Status area. Respond to multiple alarms as follows:

- a. Touch  in the Device Status area. (See note below.)
- b. Read the alarm message for the second alarm.

- c. Touch .

- d. Continue to touch multiple alarm toggle buttons and to reset tones until you have read all of the messages.

Note

The multiple alarm toggle button will display the number of active alarms inside the alarm icon. A set of dots indicating the display order of alarms from highest (left) to lowest (right) priority (as well as the most recent in the case of multiple alarms of the same priority) will appear below it.

Adjust vital sign alarm limits

You can adjust vital sign alarm limits or turn off alarm limit checking for individual parameters.

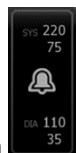


WARNING Alarm limits are user adjustable. All alarm limit settings should take into account the patient's condition and acute care needs. Appropriate alarm limits should be set accordingly for each patient.



Caution Loss of power will cause the monitor to return to default settings. Each time you power up the monitor, you must set alarm limits appropriate for your patient.

1. On the Home tab, touch the alarm limits control in the selected parameter frame. For example,



to adjust the NIBP alarm limits, touch

2. Adjust vital sign alarm limits.

- To adjust a limit: Enter the desired upper and lower alarm limits using the up/down arrow keys or the keypad.



- To turn alarm limits off or on for the vital sign: Touch **ON OFF** or **ON OFF**. This button toggles to display the current alarm state. If you turn off alarm limit checking for a vital sign, no visual or audio alarm signals will



occur for those limits. If alarm limit checking is off, the icon changes to  on the Home tab in the parameter frame.

Modify audio alarm notification

You can modify the volume of all audio alarms.

Note

If the *Allow user to turn off general audio* option has been selected in Advanced settings, you can turn off audio alarms, but turning off alarms is not recommended in some circumstances, such as unattended monitoring.



WARNING The alarm volume should be loud enough for you to hear it from where you are. Set the volume considering the environment and ambient noise levels.

As you are working in the Alarms tab, parameter measurements appear across the top of the tab.

1. Touch the **Alarms** tab.



2. On the **General** tab, modify audio alarm notification.

- To enable or disable audio alarms, select **Alarm audio on** or **Alarm audio off**. If you turn off audio alarms, visual alarm signals still occur in the LED light bar, Device Status area, and on the Home tab in parameter frames.



The  in the Device Status area indicates alarm audio turned off, and a similar bell



will appear in the parameter frames. If an alarm condition occurs, the bell will be red or amber in the alarming frame, according to the priority of the alarm, as shown here:



or

- To modify the volume of audio alarms: Select a volume level. An audio tone sounds briefly to indicate the volume level.

Note Periodically test the speaker by selecting different speaker volumes and listening for the different tones.

Alarm messages and priorities

The following tables list the physiological and technical alarm messages and their priority.

Physiological alarms

Alarm messages	Priority
Alarm limit exceeded. NIBP systolic HIGH.	High
Alarm limit exceeded. NIBP systolic LOW.	High

Alarm messages	Priority
Alarm limit exceeded. NIBP diastolic HIGH.	High
Alarm limit exceeded. NIBP diastolic LOW.	High
Alarm limit exceeded. NIBP MAP HIGH.	High
Alarm limit exceeded. NIBP MAP LOW.	High
Alarm limit exceeded. Pulse rate HIGH.	Medium
Alarm limit exceeded. Pulse rate LOW.	Medium
Alarm limit exceeded. SpO2 HIGH.	High
Alarm limit exceeded. SpO2 LOW.	High
Alarm limit exceeded. SpHb HIGH.	High
Alarm limit exceeded. SpHb LOW.	High
Alarm limit exceeded. Temperature HIGH.	Low
Alarm limit exceeded. Temperature LOW.	Low

Technical alarms

Alarm messages	Priority
Low battery 5 minutes or less remaining.	High
Searching for pulse signal.	High
Communications module did not power on properly. Power down the device.	High
Network not found; check network cable connections.	Low
Powering down. Call for service.	Low
Battery is absent or faulty. Call for service.	Low
NIBP air leak; check cuff and tubing connections.	Low
NIBP not functional. Call for service.	Low
Unable to determine NIBP; check connections and tubing for kinks.	Low
Incorrect NIBP cuff size; check patient type.	Low
Inflation too quick; check NIBP cuff and tubing connections.	Low
Unable to determine NIBP; check inflation settings.	Low

Alarm messages	Priority
SpO2 not functional.	Low
Attach SpO2 sensor to monitor.	Low
Replace the SpO2 sensor.	Low
Set date and time.	Low
Maximum number of patient records saved. Oldest record overwritten.	Low
Unable to access patient information.	Low
Connect temperature probe.	Low
Insert correct color coded probe well.	Low
Replace temperature probe.	Low
Temperature not functional. Call for service.	Low
Retry temperature measurement.	Low
Temperature time limit exceeded. Retry temperature measurement.	Low
Low battery; plug into outlet.	Low
Radio not functional. Call for service.	Low
Radio error. Power down and restart.	Low
Unable to establish network communications. Radio out of network range.	Low
Unable to establish network communications. Call for Service.	Low
Radio software upgrade failed.	Low
Unable to load configuration; using factory defaults.	Low
Functional error. Call for service.	Low
External device not recognized.	Low
Incompatible Welch Allyn device.	Low
USB Communication failure.	Low
Low battery 30 minutes or less remaining.	Low
Low SpHb signal quality. Check sensor.	Low
Low SpO2 signal quality. Check sensor.	Low
Low perfusion. Check sensor.	Low

Alarm messages	Priority
Replace the SpO2 cable.	Low
SpO2 mode only. Check sensor or cable.	Low
SpO2 sensor expires in....	Low
Unexpected restart occurred. Call for service.	Low
Weight scale not functional. Call for service.	Low

Nurse call

The monitor can be connected to a Nurse Call system through a cable that connects to the Nurse Call connector.

When the Nurse Call cable is connected and Nurse Call is enabled, the monitor immediately notifies the Nurse Call system when a physiological alarm that exceeds the preset threshold occurs. The Nurse Call system is also synchronized with the flashing LED lightbar and audible alerts on the monitor.

Nurse Call thresholds are set in the Advanced Settings.

To connect the monitor to a Nurse Call system, you must have a cable that has been adapted to your Nurse Call system (REF 6000-NC), rated 25V AC or 60V DC maximum at 1A maximum. For ordering information, see *Approved Accessories* in the Appendix.



WARNING Do not rely exclusively on Nurse Call for patient monitoring. Although the Nurse Call option enables remote notification of an alarm condition, it is not intended to replace appropriate bedside patient monitoring by trained clinicians.

Note

When a patient alarm occurs, touching the alarm icon in the Device Status area pauses the alarm tone for a period ranging from 90 seconds to 15 minutes, as specified in Advanced settings, but the visual alarm indicator(s) on the monitor and Nurse Call continue.

Patient monitoring

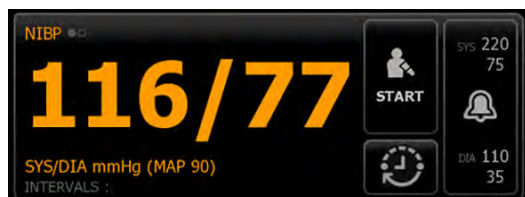
NIBP

Noninvasive Blood Pressure (NIBP) frame

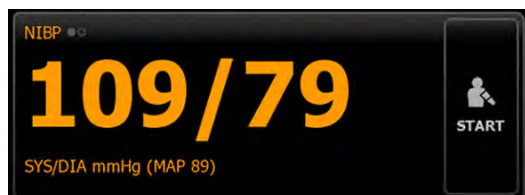
From the NIBP frame, you can measure blood pressure.

Located in the upper left corner of the Home tab, the NIBP frame contains data and features relevant to noninvasive blood pressure measurement. The frame provides different features based on the profile you are using.

NIBP frame in Monitor profile



NIBP frame in Spot Check and Triage profiles



NIBP measurement display

In all profiles, the frame can display systolic and diastolic measurements, and MAP calculations. You can configure the default view in Advanced settings.

View indicator

Touch the NIBP frame to toggle between views.

- NIBP view 1  displays the SYS/DIA measurements as the primary content and the MAP calculation as secondary content.

- NIBP view 2  displays the MAP calculation as the primary content and the SYS/DIA as secondary content.

Buttons

The buttons on the right side of the frame enable you to do different tasks depending on the profile you are using. The availability of functions depends on which profile is selected. See the Profiles section for more information.

Button name	Button image	Description
Start/Stop	The appearance and function of this button dynamically changes.	
		Touch to start a manual measurement or a cycle of automatic measurements.
		Touch to stop a measurement that is in progress.
Interval	This button shows the status of automatic measurements. Touch the button to display the Intervals tab, where you can configure automatic measurements.	
		Automatic measurements are off.
		Automatic measurements are on.
Alarm Limit control	This button displays alarm limits and status.	
		Touch the button to display the Alarms tab.

Select a cuff



WARNING Use only blood pressure cuffs and hoses listed as approved accessories to ensure safe and accurate NIBP measurements.



WARNING Never use an adult or pediatric monitor setting or cuff for an NIBP measurement on a neonatal patient. Adult and pediatric inflation limits can be excessive for neonatal patients, even if a neonatal cuff is used. Neonates are defined in the AAMI SP10:2002 standard as children 28 days or less of age if born at term (37 weeks gestation or more); otherwise, up to 44 gestational weeks.



Caution Correct sizing of the blood pressure cuff is important for accurate blood pressure readings. A cuff that is too small might provide false high readings, while a cuff that is too large might provide false low readings.

The monitor uses the oscillometric method to determine blood pressure; therefore, if the cuff extends to the antecubital fossa (bend in the elbow), you can still acquire an accurate blood pressure reading.

Before taking an NIBP measurement, follow these steps to select the appropriate cuff for the patient.

1. Measure the circumference of the patient's bare upper arm, midway between the elbow and shoulder.
2. Choose the appropriate cuff size based on the circumference measurement. If the circumference of the patient's arm falls between two cuff sizes, use the larger cuff size.
3. Wrap the cuff around the patient's bare upper arm and verify that the artery index marker lies somewhere between the two range markings on the cuff.

Cuff measurements

The following tables provide measurements for Welch Allyn blood pressure cuffs.

One-piece cuff measurements

Cuff Size	Circumference (cm)	Circumference (in)
Infant	9.0 – 13.0	3.5 – 5.1
Small child	12.0 – 16.0	4.7 – 6.3
Child	15.0 – 21.0	5.9 – 8.3
Small adult	20.0 – 26.0	7.9 – 10.2
Adult	25.0 – 34.0	9.8 – 13.4
Large adult	32.0 – 43.0	12.6 – 16.9
Thigh	40.0 – 55.0	15.7 – 21.7

Neonatal soft disposable cuffs with male Luer slips

Cuff Size	Circumference (cm)	Circumference (in)
NEO 1	3.3 – 5.6	1.3 – 2.2
NEO 2	4.2 – 7.1	1.6 – 2.8
NEO 3	5.4 – 9.1	2.1 – 3.6
NEO 4	6.9 – 11.7	2.4 – 4.6
NEO 5	8.9 – 15.0	3.5 – 5.9
Multi-pack	1 of each	1 of each

For ordering information, see *Approved Accessories* in the Appendix.

Position the cuff

Note The monitor and cuffs were validated using the bare upper arm site.



WARNING Patient injury risk. Do not use the NIBP for continuous monitoring without frequently checking the patient's limb. When a patient is being monitored frequently or for a prolonged period, regularly remove the cuff to inspect it and to check the cuff site for ischemia, purpura, or neuropathy.



WARNING Inaccurate measurement risk. Do not place the cuff where it can disturb proper circulation. Do not place the cuff on any area where circulation is compromised or on any extremity used for intravenous infusions. Do not use an SpO2 finger clip sensor and a blood pressure cuff simultaneously on the same limb. Doing so may cause a temporary loss of pulsatile flow, resulting in either no reading or an inaccurate SpO2 or pulse rate until the flow returns.



WARNING The blood pressure cuff must be properly positioned to ensure blood pressure accuracy and patient safety. Wrapping the cuff too loosely (preventing proper inflation) may result in inaccurate NIBP readings.



Caution If a site other than the bare upper arm is used, the blood pressure measurements may be different. It is important to document the alternate site on the patient record.



Caution To minimize inaccurate measurement, limit patient movement during an NIBP measurement cycle.

Before taking an NIBP measurement, follow these steps to properly attach the cuff to the patient.

1. Position the cuff on the patient's bare upper arm midway between the shoulder and the elbow.
2. Wrap the cuff snugly so that there is room for no more than two fingers between the cuff and the patient's bare upper arm.
3. Position the alignment mark on the cuff directly over the brachial artery.
4. Ensure that the blood pressure tubing has no kinks or twists.

Note In situations where you cannot position the cuff level with the heart, you should adjust the measurements as follows for greater accuracy. For each inch (2.54 cm) that the cuff is above the level of the heart, add 1.8 mmHg to the displayed reading. For each inch (2.54 cm) that the cuff is below the level of the heart, subtract 1.8 mmHg from the displayed reading. It is important to document the adjustment on the patient record.

NIBP measurement

The monitor enables you to take manual and automatic NIBP measurements.



WARNING NIBP readings may be inaccurate for patients experiencing moderate to severe arrhythmia.



WARNING Do not allow a blood pressure cuff to remain on neonatal patients more than 90 seconds when inflated above 5 mmHg. Do not allow a blood pressure cuff to remain on the adult patients more than 3 minutes when inflated above 15 mmHg. Excessive cuff tightness may cause venous congestion, peripheral nerve injury, discoloration of the limb, and patient distress.



WARNING Inaccurate measurement risk. Pulse rate measurements generated through the blood pressure cuff or through SpO2 are subject to artifact and might not be as accurate as heart rate measurements generated through ECG or through manual palpation.



WARNING Use caution when measuring blood pressure using oscillometric blood pressure devices in severely ill neonates and pre-term infants because these devices tend to measure high in this patient population.



Caution Inaccurate measurement risk. Any external compression of the blood pressure hose or cuff may cause system errors or inaccurate measurements.

At the start of a measurement, the monitor inflates the cuff to the appropriate level. In the NIBP frame, the systolic display shows the cuff inflation pressure while the blood pressure measurement is in progress.

The monitor measures blood pressure as the cuff is inflating. If patient movement, excessive noise, or an arrhythmia prevent the monitor from determining the blood pressure while the cuff is inflating, the monitor attempts to measure the blood pressure while deflating the cuff.

When the measurement is complete, the NIBP frame displays the measurement until you save it to the patient's record or you start another NIBP measurement.

Note The Pediatric and Adult blood pressure modes are supported on patients 29 days and older. The Pediatric mode gives you the option of setting a lower initial inflation pressure when using the StepBP deflation and not SureBP.

Note Use dual-lumen tubes for adult and pediatric blood pressure measurements and single-lumen tubes for neonate blood pressure measurements. Mismatching tube types, patient types, and algorithms causes an information message to appear in the Device Status area. For neonate patients, set the NIBP settings as follows: Patient = Neonate, Tube type = 1 tube, Algorithm = Step.

Note Welch Allyn uses the following definition of Neonate: Children 28 days or less of age if born at term (37 gestation or more); otherwise, up to 44 gestational weeks.

Take a manual NIBP measurement



WARNING Patient injury risk. Never install Luer Lock connectors on Welch Allyn blood pressure cuff tubing. Using these connectors on blood pressure cuff tubing creates the risk of mistakenly connecting this tubing to a patient's intravenous line and introducing air into the patient's circulatory system.



Caution Inaccurate measurement risk. Any external compression of the blood pressure hose or cuff may cause system errors or inaccurate measurements.

1. Properly size the blood pressure cuff and position it around the patient's bare upper arm.
2. Touch **Start** to take a measurement.

Interval NIBP measurement

The monitor can take NIBP measurements automatically based on intervals you choose.

The Intervals tab provides all interval features.

From this tab, you can do the following:

- Configure intervals
- Turn off intervals
- Configure the monitor to print automatic measurements as they are completed

When the measurement is complete, the NIBP frame displays the measurement until the next measurement is complete.

Note During intervals, each automatic and manual save of patient measurements clears all measurements from Manual parameters frame.



The button changes to a timer (, which counts down to the next automatic measurement.

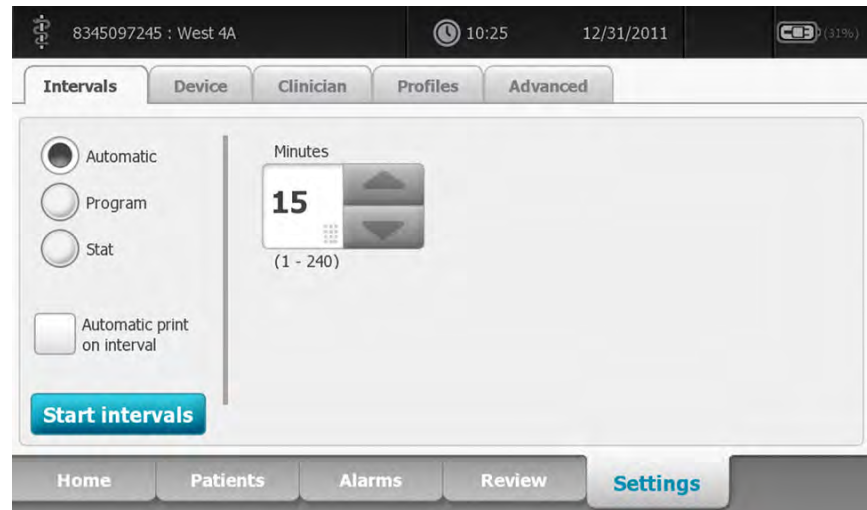
Automatic measurements continue until you turn off intervals.



WARNING Patient harm risk. Do not use intervals on neonates out of earshot. Verify that audio can be heard from where you intend to be.

Automatic intervals

You can configure the monitor to take automatic NIBP measurements at consistent intervals.



Note An alarm does not turn off intervals. Subsequent automatic measurements continue to occur as scheduled.

Start automatic intervals

Follow these steps to configure the monitor to take NIBP measurements at consistent intervals.

1. Properly size the blood pressure cuff and position it around the patient's bare upper arm.



2. On the Home tab, touch .
3. Select **Automatic**.
4. Use the numeric keypad to enter the length of time between NIBP measurements.
5. Touch **Start intervals**.

Note Intervals are not available in all profiles. See the Profiles section for more information.

Program intervals

You can configure the monitor to take automatic NIBP measurements at variable intervals. The monitor comes with preset interval programs that can be edited to meet your needs. The numbers below the program name indicate the length of time between each interval in the cycle.

Start program intervals

Follow these steps to configure the monitor to take automatic NIBP measurements at variable intervals.

1. Properly size the blood pressure cuff and position it around the patient's bare upper arm.
2. On the Home tab, touch .
3. Select **Program**.
4. Touch the desired program.
5. Touch **Start intervals**.

Create a new program interval or edit an existing program

Follow these steps to create or edit a program interval.

1. On the Home tab, touch the interval button ( or .
2. Select **Program**.
3. Touch the desired program.
4. Touch the keyboard icon and enter the desired program name.
5. Enter the desired duration and interval settings.
6. Touch **Start Intervals**.

The new intervals take effect at the start of the next NIBP measurement.

Stat intervals

You can configure the monitor to take NIBP measurements continuously.



When you select the Stat option in the Intervals tab, the monitor takes repeated NIBP measurements for 5 minutes, starting a new cycle each time the cuff deflates below safe venous return pressure (SVRP) for 2 seconds.



WARNING Patient injury risk. If you use Stat mode repeatedly, periodically observe the patient's limb to ensure that circulation is not impaired and that the cuff remains in place. Prolonged impairment of circulation or improper cuff position can cause bruising.

Current cuff pressures are not dynamically displayed during a Stat reading. The Home tab displays the NIBP reading from the previous cycle until the current cycle finishes.



Note If you are in Stat intervals, you can stop intervals by touching . If you touch the button twice, you will restart Stat intervals. The control toggles between STOP and START with each touch.

Start Stat intervals

Follow these steps to start Stat intervals.

1. Properly size the blood pressure cuff and position it around the patient's bare upper arm.
2. Select **Stat**.
3. Touch **Start intervals**.

Stop automatic measurements

Follow these steps to turn off intervals.

1. On the Home tab, touch the interval timer button ().
2. Touch **Stop intervals**.

Cancel a measurement that is in progress

Follow these steps to cancel any NIBP measurement that is in progress.



On the Home tab, touch

The monitor rapidly deflates the cuff, and the screen displays the NIBP cancellation message.



If intervals are turned on, the button changes to a timer (), which counts down to the next automatic measurement.



Configure NIBP alarms

Follow these steps to set alarm limits for systolic and diastolic measurements, and MAP calculation.

1. Verify that you are using the Monitor profile, which contains the Alarms tab.
2. Touch the **Alarms** tab.
3. Touch the **NIBP** tab.
4. Enter the desired upper and lower alarm limits for systolic and diastolic measurements, and MAP calculation using the up/down arrow keys or the keypad.
5. Touch the **Home** tab.

The new alarm settings display in the Alarm Limit control button.

Temperature

Temperature frame

From the temperature frame you can measure patient temperature.

Located in the lower right corner of the Home tab, the temperature frame contains data and features relevant to temperature measurement. The frame provides different features based on the profile you are using.

Temperature frame in Monitor profile



Temperature frame in Spot Check and Triage profiles



Temperature measurement display

In all profiles, the frame can display temperature in Celsius or Fahrenheit. You can configure the default view in Advanced settings.

Site selection

Remove the temperature probe and touch the **Temperature site control** to toggle between sites.



Pediatric axillary



Adult axillary



Oral



Note Monitors configured with the temperature module and the red rectal probe well and probe default to the rectal mode.

Rectal



Note The monitor displays the ear mode when it receives a temperature measurement from the ear thermometer.

Ear



Temperature buttons

The buttons on the right side of the frame enable you to do different tasks depending on the profile you are using. The availability of functions depends on which profile is selected.

Button name	Button image	Description
Temperature alarm		This button displays alarm limits and status. Touch the button to display the Alarms tab.
Direct mode		Touch the button to enter Direct mode.

Configure temperature alarms

Follow these steps to set alarm limits for temperature measurement.

1. Verify that you are using the Monitor profile, which contains the Alarms tab.
2. Touch the **Alarms** tab.
3. Touch the **Temperature** tab.
4. Enter the desired upper and lower alarm limits for temperature using the up/down arrow keys or the keypad.
5. Touch the **Home** tab.

The new alarm settings display in the Alarm Limit control button.

SureTemp® Plus temperature module

The temperature module uses a thermistor thermometer design and a predictive algorithm to calculate patient temperatures in the Predictive mode.



WARNING Patient injury risk. Prior to taking a temperature, instruct the patient not to bite down on the probe as patient injury and damage to the probe may result.



WARNING Patient injury risk. Do not exceed the recommended temperature measurement durations in Direct mode. Continuous measurement durations of 3 minutes at the oral and rectal sites and 5 minutes at the axillary site are recommended for accurate measurement. Do not continuously measure beyond 10 minutes in any mode.



WARNING Probe covers are single-use only. Re-use of a probe cover may result in spread of bacteria and cross-contamination.



WARNING Patient injury risk. Use only Welch Allyn single-use disposable probe covers. Never take a temperature measurement without a single-use probe cover securely attached. Failure to use a probe cover can cause patient discomfort from a heated probe, patient cross-contamination, and inaccurate temperature readings.



WARNING Patient illness may result from improper use of oral and rectal temperature probes. Using the incorrect probe may also produce inaccurate measurements.

- Use only oral probes, identified by a blue ejection button at the top of the probe, to take oral and axillary temperatures.
- Use only rectal probes, identified by a red ejection button at the top of the probe, to take rectal temperatures.



WARNING Patient illness or cross-contamination may result from improper placement of oral and rectal temperature probes in the probe wells.

- Place only oral probes, identified by a blue ejection button at the top of the probe, in the blue probe wells.
- Place only rectal probes, identified by a red ejection button at the top of the probe, in the red probe wells.



WARNING Inaccurate measurement risk. Never take an axillary temperature through the patient's clothing. Carefully place the probe in the axilla, avoiding contact with other objects or material. Always verify direct contact between the probe cover and skin.



WARNING Patient injury risk. When taking rectal temperatures, insert the probe tip only 5/8 inch (approximately 1.5 cm) inside the rectum of adults and only 3/8 inch (approximately 1 cm) inside the rectum of children to avoid the risk of bowel perforation.



WARNING Never use a damaged temperature probe. The thermometer consists of high-quality precision parts and should be protected from severe impact or shock. Do not use the thermometer if you notice any signs of damage to the probe or monitor. If the thermometer probe is dropped or damaged, remove it from use and have it inspected by qualified service personnel.



Caution Inaccurate measurement risk. Patient activities such as strenuous exercise, ingesting hot or cold liquids, eating, chewing gum or mints, brushing teeth, or smoking may affect oral temperature measurements for up to 20 minutes.



Caution Inaccurate measurement risk. Always use new probe covers taken from the monitor's probe cover box holder to ensure accurate temperature measurements. Probe covers taken from other places or that haven't stabilized in temperature may result in inaccurate temperature measurements.

Temperature mode selection

The monitor with the temperature module takes a patient temperature in either Predictive (Normal) or Direct mode. The default setting is the Predictive mode.



WARNING Inaccurate measurement risk. To ensure optimal accuracy, always confirm that the correct mode and site are selected.



WARNING Patient injury risk. Do not exceed the recommended temperature measurement durations in Direct mode. Continuous measurement durations of 3 minutes at the oral and rectal sites and 5 minutes at the axillary site are recommended for accurate measurement. Do not continuously measure beyond 10 minutes in any mode.

Predictive mode

Is a one-time measurement that takes a temperature in approximately 6 to 15 seconds. Removing the probe from the probe well, loading a probe cover, and holding the probe tip in place at the measurement site initiates a Predictive mode measurement. The monitor sounds a tone to indicate the end of a predictive measurement.

Direct mode

Provides continual temperature measurements. For oral and rectal measurements, it is recommended to measure temperature until the temperature stabilizes or for 3 minutes. For axillary measurements, it is recommended to measure temperature until the temperature stabilizes or for 5 minutes. The monitor changes to Direct mode approximately 60 seconds after the probe is removed from the probe well.



Caution The monitor does not retain Direct mode temperatures in memory. Therefore, it is important to note the temperature before removing the thermometer probe from the measurement site and then manually record it in the patient record.

After 10 minutes of using the Direct mode, the monitor generates a technical alarm condition and clears the measurement.

Take a temperature in the Predictive mode



WARNING Inaccurate measurement risk. To ensure optimal accuracy, always confirm that the correct mode and site are selected.



WARNING Patient injury risk. Prior to taking a temperature, instruct the patient not to bite down on the probe as patient injury and damage to the probe may result.

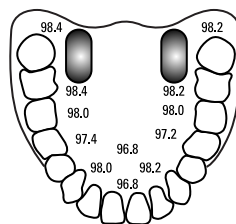


Caution Probe covers are disposable, nonsterilized, and single-use. Probes are also nonsterilized. Do not autoclave probes and probe covers. Ensure that probe covers are disposed of according to facility requirements or local regulations.

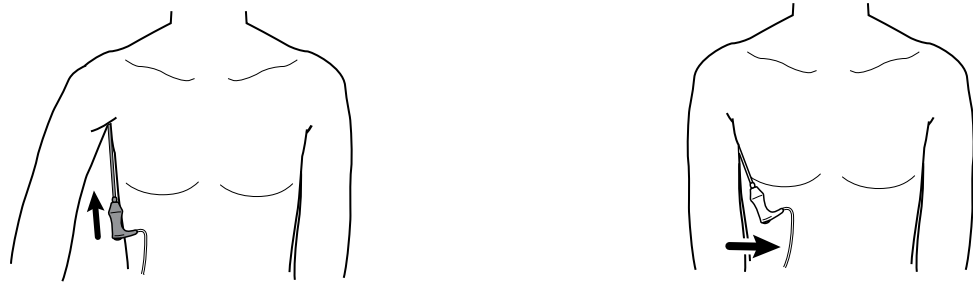
1. Remove the temperature probe from the probe well.
The monitor sounds a tone as it enters the ready state.
2. Insert the probe into a new probe cover and press the probe handle down firmly.
3. Touch the **Temperature site control**  to choose from these measurement sites: oral, pediatric axillary, or adult axillary.
4. Hold the probe tip in place at the measurement site.

For oral temperatures, place the probe tip under the patient's tongue on either side of the mouth to reach the sublingual pocket and ask the patient to close his/her lips.

Note Do not hand the probe to patients to place in their mouth.



For axillary temperatures, lift the patient's arm so that the entire axilla is easily seen and place the probe tip as high as possible in the mid-axilla. Verify that axillary tissue completely surrounds the probe tip and place the arm snugly at the patient's side.



While the measurement is taking place, the temperature frame displays the process indicator.



5. The monitor sounds a tone when the final temperature is reached (in approximately 6 to 15 seconds). The temperature frame continues to display the temperature in degrees Fahrenheit and degrees Celsius even after the probe is returned to the probe well.



Note

To switch to the Direct mode, touch  after you acquire the Predictive mode measurement. The temperature frame (in the lower-left corner) changes to "MODE: Direct..." as it switches to the Direct mode.

The monitor sounds a tone at the start of a Direct mode measurement.

6. Remove the probe after the temperature measurement is complete and firmly press the eject button on the top of the probe to release the probe cover.



WARNING Patient injury risk. Do not exceed the recommended temperature measurement durations in Direct mode. Continuous measurement durations of 3 minutes at the oral and rectal sites and 5 minutes at the axillary site are recommended for accurate measurement. Do not continuously measure beyond 10 minutes in any mode.

Ensure that probe covers are disposed of according to facility requirements or local regulations.

7. Return the probe to the probe well.
8. Wash your hands to reduce the risk of cross-contamination.

Take a temperature in the Direct mode

Direct mode displays the temperature of the probe as long as the probe tip remains in place at the measurement site and remains within the operating patient temperature range. The patient's temperature will reach final equilibrium in approximately 3 minutes at the oral and rectal measurement sites and approximately 5 minutes at the axillary site.

The monitor enters Direct mode by the following methods.

- After you complete a Predictive mode measurement, touch  to switch from Predictive to Direct mode. The temperature frame (in the lower-left corner) changes to "MODE: Direct..." as it switches to the Direct mode.
- Remove the probe from the probe well, load a probe cover, select a temperature site, and expose the probe to ambient air for more than 60 seconds to switch the monitor to Direct mode. The temperature frame changes to "MODE: Direct...".
- If you have a patient whose body temperature is below the normal temperature range and you follow the previous step, the probe sensor identifies this condition and turns off the probe preheater in order to accommodate the lower body temperature measurement.



WARNING Patient injury risk. Do not exceed the recommended temperature measurement durations in Direct mode. Continuous measurement durations of 3 minutes at the oral and rectal sites and 5 minutes at the axillary site are recommended for accurate measurement. Do not continuously measure beyond 10 minutes in any mode.



WARNING Inaccurate measurement risk. To ensure optimal accuracy, always confirm that the correct mode and site are selected.



WARNING Patient injury risk. Prior to taking a temperature, instruct the patient not to bite down on the probe as patient injury and damage to the probe may result.



Caution Probe covers are disposable, nonsterilized, and single-use. Probes are also nonsterilized. Do not autoclave probes and probe covers. Ensure that probe covers are disposed of according to facility requirements or local regulations.

1. Remove the temperature probe from the probe well.
The monitor sounds a tone as it enters the ready state.
2. Insert the probe into a new probe cover and press the probe handle down firmly.
3. Touch the **Temperature site control**  to choose from these measurement sites: oral, pediatric axillary, or adult axillary.
The temperature frame changes to Direct mode approximately 60 seconds after the probe is removed from the probe well.
The monitor sounds a tone to indicate the start of a Direct mode measurement.
4. Hold the probe tip in place at the oral or rectal measurement site for a total of 3 minutes and for 5 minutes at the axillary site.
5. While the measurements are taking place, the temperature frame displays the patient's continuous temperature measurements in degrees Fahrenheit and degrees Celsius.

**Note**

The monitor does not retain Direct mode temperatures in memory. Therefore, it is important to note the temperature before removing the probe from the measurement site and then manually record it in the patient record.

6. Remove the probe after the temperature measurement is complete and firmly press the eject button on the top of the probe to release the probe cover.
7. Return the probe to the probe well to continue taking temperatures in the Predictive mode.
8. Wash your hands to reduce the risk of cross-contamination.

Take a temperature at the rectal site



WARNING Patient injury risk. When taking rectal temperatures, insert the probe tip only 5/8 inch (approximately 1.5 cm) inside the rectum of adults and only 3/8 inch (approximately 1 cm) inside the rectum of children to avoid the risk of bowel perforation.



WARNING Cross-contamination or nosocomial infection risk. Thorough hand-washing greatly reduces the risk of cross-contamination and nosocomial infection.



WARNING Patient injury risk. Do not exceed the recommended temperature measurement durations in Direct mode. Continuous measurement durations of 3 minutes at the oral and rectal sites and 5 minutes at the axillary site are recommended for accurate measurement. Do not continuously measure beyond 10 minutes in any mode.



WARNING Inaccurate measurement risk. To ensure optimal accuracy, always confirm that the correct mode and site are selected.



Caution Probe covers are disposable, nonsterilized, and single-use. Probes are also nonsterilized. Do not autoclave probes and probe covers. Ensure that probe covers are disposed of according to facility requirements or local regulations.

1. Remove the rectal temperature probe from the rectal probe well.

The monitor sounds a tone as it enters the ready state. The Temperature Site Control defaults to the rectal site.



2. Insert the rectal probe into a new probe cover and press the probe handle down firmly.
3. Separate the patient's buttocks with one hand. Use the other hand to gently insert the probe tip only 5/8 inch (1.5 cm) inside the rectum of adults and only 3/8 inch (approximately 1 cm) inside the rectum of children. The use of a lubricant is optional.
4. Insert the probe so that the tip is in contact with tissue. Continue to separate the buttocks and hold the probe in place throughout the measurement process. While the measurement is taking place, the temperature frame displays the process indicator.



5. The monitor sounds a tone when the final temperature is reached (in approximately 10 to 13 seconds). The temperature frame continues to display the temperature in degrees Fahrenheit and degrees Celsius even after the probe is returned to the probe well.

**Note**

To switch to the Direct mode, touch  after the Predictive

mode measurement is acquired. The temperature frame (in the lower-left corner) changes to "MODE: Direct..." as it switches to the Direct mode. The monitor sounds a tone to indicate the start of a Direct measurement. Once you are in the Direct mode, continue to separate the buttocks and hold the probe in place throughout the measurement process.

Note

The monitor does not retain Direct mode temperatures in memory. Therefore, it is important to note the temperature before removing the probe from the measurement site and then manually record it in the patient record.

6. Remove the probe after the temperature measurement is complete and firmly press the eject button on the top of the probe to release the probe cover.
7. Return the probe to the probe well.
8. Wash your hands to reduce the risk of cross-contamination.

Braun ThermoScan® PRO 4000 thermometer and dock

The thermometer and dock enable you to transfer an ear temperature measurement to the monitor. The dock also charges the thermometer battery.

Read the thermometer manufacturer's directions for use before attempting to configure, use, troubleshoot, or maintain the thermometer.



WARNING Liquids can damage electronics inside the thermometer. Prevent liquids from spilling on the thermometer. If liquids are spilled on the thermometer, dry off the thermometer with a clean cloth. Check for proper operation and accuracy. If liquids possibly entered the thermometer, remove the thermometer from use until it has been properly dried, inspected, and tested by qualified service personnel.



Caution Probe covers are disposable, nonsterilized, and single-use. The thermometer is also nonsterilized. Do not autoclave the thermometer and probe covers. Ensure that probe covers are disposed of according to facility requirements or local regulations.



Caution The thermometer has no user-serviceable parts. If service is required, call your nearest Welch Allyn Customer Service or Technical Support facility.



Caution Store the thermometer and probe covers in a dry location, free from dust and contamination and away from direct sunlight. Keep the ambient temperature at the storage location fairly constant and within the range of 50°F to 104°F (10°C to 40°C).

Take a temperature at the ear site



WARNING Probe covers are single-use only. Re-use of a probe cover may result in spread of bacteria and cross-contamination.



WARNING Inaccurate measurement risk. Use only Braun ThermoScan probe covers with this thermometer.



WARNING Inaccurate measurement risk. Frequently inspect the probe window and keep it clean, dry, and undamaged. Fingerprints, cerumen, dust, and other contaminants reduce the transparency of the window and result in lower temperature measurements. To protect the window, always keep the thermometer in the dock when the thermometer is not in use.



Caution Inaccurate measurement risk. Before taking a temperature measurement, make sure that the ear is free from obstructions and excess cerumen build-up.



Caution Inaccurate measurement risk. The following factors can affect ear temperature measurements for up to 20 minutes:

- The patient was lying on his or her ear.
- The patient's ear was covered.
- The patient was exposed to very hot or very cold temperatures.
- The patient was swimming or bathing.
- The patient was wearing a hearing aid or an ear plug.



Caution Inaccurate measurement risk. If ear drops or other ear medications have been placed in one ear canal, take the temperature in the untreated ear.

Note

A temperature measurement taken in the right ear might differ from a measurement taken in the left ear. Therefore, always take the temperature in the same ear.

Note

When the monitor receives an ear temperature measurement, it displays the measurement on the Home tab. If the Home tab already contains a temperature measurement, the new measurement overwrites it.

To take a measurement and transfer it to the monitor:

1. Make sure that the monitor is powered on.
2. Remove the ear thermometer from the dock.
3. Locate the probe cover box in the dock.
4. Firmly push the probe tip into the probe cover box.

When the probe cover is in place, the thermometer turns on automatically.

5. Wait for the ready beep and three dashes to appear on the thermometer display.
6. Fit the probe snugly into the ear canal and then push and release the **Start** button.

- If the probe is positioned correctly in the ear canal the ExacTemp light flashes. When the thermometer detects an accurate measurement, the ExacTemp light is continuously on, a long beep signals the end of the measurement, and the display shows the result.
 - If the probe is positioned incorrectly in the ear canal or is moved during the measuring process, the ExacTemp light goes out, a sequence of short beeps sounds, and the error message POS (position error) appears.
7. When you are finished taking the temperature, press the ejector button to eject the used probe cover.
 8. Return the thermometer to the dock.

The LED on the dock flashes while the measurement is being transferred.

After the transfer is complete, the temperature and the temperature scale appear on the Home tab according to the monitor settings.

Note Only the latest measurement is transferred to the monitor.

Note Measurements that have already been transferred to the monitor cannot be transferred again.

For more information about thermometer functionality, refer to the thermometer manufacturer's directions for use.

Change the temperature scale on the ear thermometer

To switch from Celsius to Fahrenheit, refer to the thermometer manufacturer's directions for use.

Charge the ear thermometer battery

To charge the battery pack:

- Place the thermometer in the dock.
- Make sure that the monitor is connected to AC power.
- Make sure that the monitor is powered on.

The LED on the dock indicates the charging status of the battery pack:

- Orange: The battery pack is charging.
- Green: The battery pack is charged.
- Not illuminated: The battery pack is not charging.

Note The battery pack continues to charge while the monitor is in Display power saving mode.

Note It is strongly recommended that you use only the Welch Allyn rechargeable battery pack in the thermometer because the dock cannot charge other batteries.

SpO2

SpO2 and pulse rate monitoring continuously measures saturation level of oxygen in hemoglobin as well as the pulse rate in a patient through a pulse oximeter.

SpO2 frame

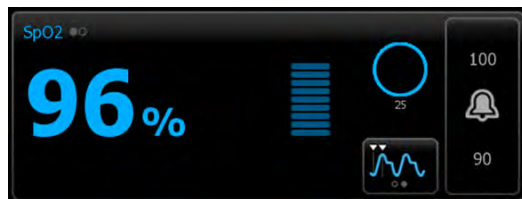
The SpO2 frame displays data and controls used in pulse oximetry measurements.

The frame provides a numeric view and a waveform view of SpO2 data. You can toggle between views by touching the left side of the frame.

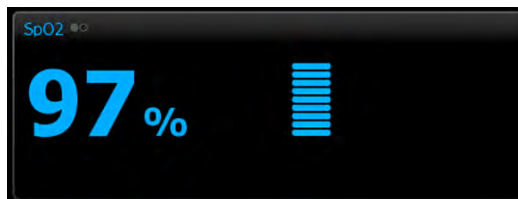
SpO2 numeric view

The numeric view indicates the SpO2 saturation percentage and the pulse amplitude. Features of this view differ based on the type of sensor enabled and the profile selected.

Nellcor sensor

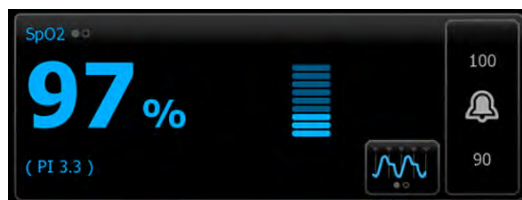


Monitor profile

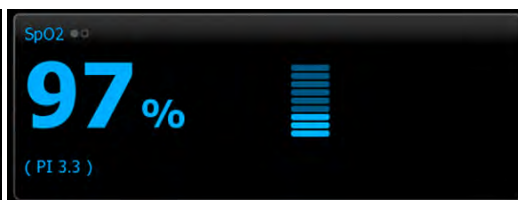


Spot Check and Triage profiles

Masimo sensor



Monitor profile



Spot Check and Triage profiles

Pulse amplitude

The pulse amplitude bar indicates the pulse beat and shows the relative pulse strength. More bars illuminate as the detected pulse gets stronger.



Response Mode Control

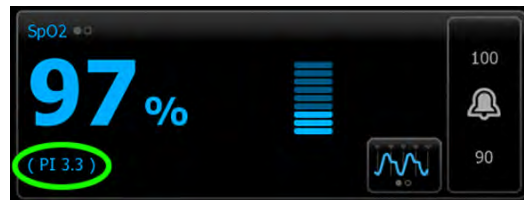
The Response Mode Control allows you to set the SpO2 measurement time to either Normal or Fast.



Perfusion index

Perfusion Index (PI) is an SpO2 feature available only with Masimo-equipped monitors.

PI is a relative reading of pulse strength at the monitoring site. PI is a numerical value that indicates the strength of the IR (infrared) signal returning from the monitoring site. PI display ranges from .02 percent (very weak pulse strength) to 20 percent (very strong pulse strength). PI is a relative number and varies between monitoring sites and from patient to patient, as physiological conditions vary.



During sensor placement, the PI can be used to evaluate the appropriateness of an application site, looking for the site with the highest PI number. Placing the sensor at the site with the strongest pulse amplitude (highest PI number) improves performance during motion. Monitor the trend of the PI for changes in physiological conditions.

SatSeconds™ alarm management

The SatSeconds feature is an SpO2 alarm management system available only with monitors that are equipped with Nellcor OxiMax Technology.

The SatSeconds feature is the product of the time and magnitude that a patient falls outside of the SpO2 alarm limits. For example, three points below the alarm limit for 10 seconds equals 30 SatSeconds. An alarm is triggered only when a desaturation event reaches the SatSeconds limit. The SatSeconds feature is clinician controlled and can be set to 0, 10, 25, 50, or 100 SatSeconds. If a desaturation event resolves on its own within the preset time, the clock will automatically reset and the monitor will not alarm.

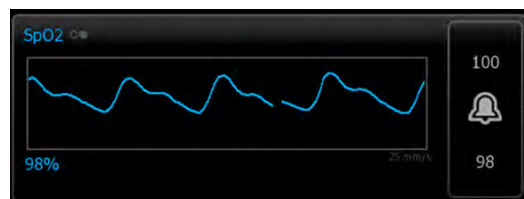


Note

The SatSeconds feature has a built-in safety protocol that sounds an alarm whenever three SpO2 violations of any amount or duration occur within a 1-minute period.

SpO2 waveform view

The waveform view shows the real-time SpO2 plethysmograph waveform. You can select the waveform sweep speed in Advanced settings.



Measure SpO2 and pulse rate



WARNING Inaccurate measurement risk. Use only Masimo Rainbow SET sensors and accessories on Masimo-equipped monitors.



WARNING Inaccurate measurement risk. Use only Nellcor sensors and accessories on Nellcor-equipped monitors.



WARNING The pulsations from intra-aortic balloon support can increase the pulse rate displayed on the monitor. Verify the patient's pulse rate against the ECG heart rate.



WARNING Patient injury risk. Do not attempt to reprocess, recondition, or recycle any sensors or patient cables. Doing so might damage electrical components.



WARNING Pulse rate measurement might not detect certain arrhythmias because it is based on the optical detection of a peripheral flow pulse. Do not use the pulse oximeter as a replacement or substitute for ECG-based arrhythmia analysis.



WARNING Use the pulse co-oximeter as an early warning device. As you observe a trend toward patient hypoxemia, use laboratory instruments to analyze blood samples to better understand the patient's condition.



WARNING The accuracy of SpO2 measurements can be affected by any of the following:

- elevated levels of total bilirubin
- elevated levels of Methemoglobin (MetHb)
- elevated levels of Carboxyhemoglobin (COHb)
- hemoglobin synthesis disorders
- low perfusion at the monitored site
- the presence of concentrations of some intravascular dyes, sufficient to change the patient's usual arterial pigmentation
- patient movement
- patient conditions such as shivering and smoke inhalation
- motion artifact
- painted nails
- poor oxygen perfusion
- hypotension or hypertension
- severe vasoconstriction
- shock or cardiac arrest
- venous pulsations or sudden and significant changes in pulse rate
- proximity to an MRI environment
- moisture in the sensor
- excessive ambient light, especially fluorescent
- the use of the wrong sensor
- a sensor applied too tightly

1. Verify that the sensor cable is connected to the monitor.



WARNING Patient injury risk. The sensor and extension cable are intended only for connection to pulse co-oximetry equipment. Do not attempt to connect these cables to a PC or any similar device. Always follow the sensor manufacturer's directions for care and use of the sensor.

2. Clean the application site. Remove anything, such as nail polish, that could interfere with sensor operation.

Note Do not use disposable sensors on patients who have allergic reactions to the adhesive.

3. Attach the sensor to the patient according to the manufacturer's directions for use, observing all warnings and cautions.

Note If a sterile sensor is required, select a sensor that has been validated for sterilization, and follow the sensor manufacturer's directions for sterilizing the sensor.

Place the sensor and the NIBP cuff on different limbs to reduce unnecessary alarms when you monitor these parameters at the same time.

Note A range of sensors is available for different patient sizes and measurement sites. Consult the sensor manufacturer's instructions for selecting the correct sensor.

4. Confirm that the monitor displays SpO2 and pulse rate data within 15 seconds of connection to the patient.



WARNING Patient injury risk. Incorrect sensor application or excessive duration of sensor use can cause tissue damage. Inspect the sensor site periodically as directed in the sensor manufacturer's instructions.

While SpO2 is being measured, the displayed pulse rate is derived from the sensor. If SpO2 is not available, the pulse rate is derived from NIBP.

Detaching the sensor during a measurement in Monitor mode triggers an alarm.

If SpO2 is being measured continuously on a patient for an extended period, change the sensor location at least every three hours or as indicated by the sensor manufacturer's instructions.

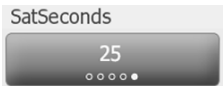
Configure SpO2 alarms

Follow these steps to set alarm limits for SpO2 measurements.

1. Verify that you are using the Monitor profile, which contains the Alarms tab.
2. Touch the **Alarms** tab.
3. Touch the **SpO2** tab.
4. Enter the desired upper and lower alarms limits for SpO2 using the up/down arrow keys or the keypad.
5. Touch the **Home** tab.

The new alarm settings display in the Alarm Limit control button.

Set SatSeconds limits

1. Touch the **Alarm limit control** of the SpO2 frame .
2. Touch the **Alarms** tab.
3. Touch  to select a SatSeconds setting.
4. Touch **Home** to save your settings and return to the Home tab.

Set Response Mode

To set the Response Mode from the Home tab, the monitor must be in the Monitor profile.

Touch  in the SpO2 frame.

The SpO2 frame displays **MODE: Fast** when Fast mode is selected.

SpHb

Monitors configured with Masimo total hemoglobin can measure hemoglobin (SpHb), SpO2, and pulse rate. SpHb monitoring continuously measures blood constituents and anemic status in a patient through a noninvasive SpHb pulse co-oximeter.

SpHb frame

The SpHb frame displays data and controls used in total hemoglobin measurements.

Note SpHb is available only in the Monitor profile.

In this frame, one of two labels appears:

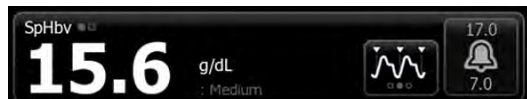
- **SpHbv** indicates the venous calibrated reference for total hemoglobin measurement.
- **SpHb** indicates the arterial calibrated reference for total hemoglobin measurement.

You can specify the reference source in Advanced settings.

The frame provides a numeric view and a graphical trend view of total hemoglobin data. You can toggle between views by touching the left side of the frame.

SpHb numeric view

The numeric view indicates the total hemoglobin level in either grams per deciliter (g/dL) or millimoles per liter (mmol/L). You can select the unit of measure in Advanced settings.



Averaging

The averaging button enables you to select the moving window of time used by the parameter to calculate the SpHb value and update the display: short (approximately 1 minute), medium (approximately 3 minutes), or long (approximately 6 minutes).



SpHb graphical trend view

The graphical trend view presents a trend of the real-time measurements over a user-selected period. In Advanced settings, you can select the period displayed.



The graph shows total hemoglobin level on the y-axis and time on the x-axis (oldest measurements on the left to newest measurements on the right). The entire graph updates every 10 seconds.

To the right of the graph, the frame displays the current measurement in numeric format.

Measure SpHb



WARNING Inaccurate measurement risk. Use only Masimo Rainbow SET sensors and accessories on Masimo-equipped monitors.



WARNING The pulsations from intra-aortic balloon support can increase the pulse rate displayed on the monitor. Verify the patient's pulse rate against the ECG heart rate.



WARNING Patient injury risk. Do not attempt to reprocess, recondition, or recycle any sensors or patient cables. Doing so might damage electrical components.



WARNING Pulse rate measurement might not detect certain arrhythmias because it is based on the optical detection of a peripheral flow pulse. Do not use the pulse oximeter as a replacement or substitute for ECG-based arrhythmia analysis.



WARNING Use the pulse co-oximeter as an early warning device. As you observe a trend toward patient hypoxemia, use laboratory instruments to analyze blood samples to better understand the patient's condition.



WARNING The accuracy of SpHb measurements can be affected by any of the following:

- elevated levels of total bilirubin
- elevated levels of Methemoglobin (MetHb)
- elevated levels of Carboxyhemoglobin (COHb)
- hemoglobin synthesis disorders
- low perfusion at the monitored site
- the presence of concentrations of some intravascular dyes, sufficient to change the patient's usual arterial pigmentation
- patient movement
- patient conditions such as shivering and smoke inhalation
- motion artifact
- painted nails
- poor oxygen perfusion
- hypotension or hypertension
- severe vasoconstriction
- shock or cardiac arrest
- venous pulsations or sudden and significant changes in pulse rate
- proximity to an MRI environment
- moisture in the sensor
- excessive ambient light, especially fluorescent
- the use of the wrong sensor
- a sensor applied too tightly

1. Verify that the sensor cable is connected to the monitor.



WARNING Patient injury risk. The sensor and extension cable are intended only for connection to pulse co-oximetry equipment. Do not attempt to connect these cables to a PC or any similar device. Always follow the sensor manufacturer's directions for care and use of the sensor.

2. Verify that you are using the Monitor profile.
3. Clean the application site. Remove anything, such as nail polish, that could interfere with sensor operation.

Note Do not use disposable sensors on patients who have allergic reactions to the adhesive.

4. Attach the sensor to the patient according to the manufacturer's directions for use, observing all warnings and cautions.

Note If a sterile sensor is required, select a sensor that has been validated for sterilization, and follow the sensor manufacturer's directions for sterilizing the sensor.

Place the sensor and the NIBP cuff on different limbs to reduce unnecessary alarms when you monitor these parameters at the same time.

Note A range of sensors is available for different patient sizes and measurement sites. Consult the sensor manufacturer's instructions for selecting the correct sensor.

5. Confirm that the monitor displays SpHb or SpHbv data within 160 seconds of connection to the patient.



WARNING Patient injury risk. Incorrect sensor application or excessive duration of sensor use can cause tissue damage. Inspect the sensor site periodically as directed in the sensor manufacturer's instructions.

While SpHb is being measured, the displayed SpO2 and pulse rate are derived from the same sensor. If SpO2 is not available, the pulse rate is derived from NIBP.

Detaching the sensor during a measurement triggers an alarm.

If SpHb is being measured continuously on a patient for an extended period, change the sensor location at least every three hours or as indicated by the sensor manufacturer's instructions.

Configure SpHb alarms

Follow these steps to set alarm limits for SpHb measurements.

1. Verify that you are using the Monitor profile, which contains the Alarms tab.
2. Touch the **Alarms** tab.
3. Touch the **SpHb** tab.
4. Enter the desired upper and lower alarm limits for SpHb using the up/down arrow keys or the keypad.
5. Touch the **Home** tab.

The new alarm settings appear in the Alarm Limit control button.

Set SpHb averaging mode



Touch  in the SpHb frame.

The SpHb frame displays the current mode.

Pulse rate frame

The pulse rate frame, located in the upper right of the Home tab, displays data, information, and controls used in reading pulse rates.

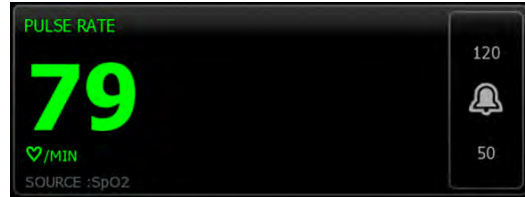
Typically, the displayed pulse rate is derived from the SpO2 sensor. If SpO2 is not available, the pulse rate is derived from NIBP.



WARNING Inaccurate measurement risk. Pulse rate measurements generated through the blood pressure cuff or through SpO2 are subject to artifact and might not be as accurate as heart rate measurements generated through ECG or through manual palpation.

Note You can specify pulse tone volume in the Pulse rate tab (located in the Alarms tab).

Monitor profile



Spot Check and Triage profiles



Configure pulse rate alarms

Follow these steps to set alarm limits for pulse rate.

1. Verify that you are using the Monitor profile, which contains the Alarms tab.
2. Touch the **Alarms** tab.
3. Touch the **Pulse rate** tab.
4. Enter the desired upper and lower alarm limits for pulse rate using the up/down arrow keys or the keypad.
5. Touch the **Home** tab.

The new alarm settings display in the Alarm Limit control button.

Manual parameters frame

The Manual parameters frame, located in the lower right of the Home tab, supports manual entry of parameters and displays measurements taken by some accessories.

Note Manual parameters are not available in the Triage profile.

Note Body mass index (BMI) is only available with an attached weight scale that calculates BMI.

Note When a measurement is transferred from an attached weight scale to the monitor, the measurement displayed on the monitor is within one decimal place (0.1) of the measurement displayed by the weight scale.

Note You cannot manually enter temperature on a monitor configured with a SureTemp Plus temperature module.

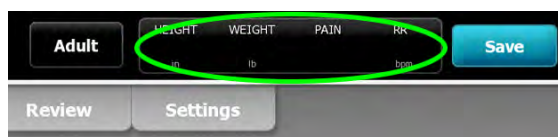
Enter manual parameters

Note The Manual parameters frame enables you to enter measurements taken manually and displays measurements taken by some accessories. You can select and configure the parameters in Advanced settings. Only four parameters appear in the Manual parameters frame.

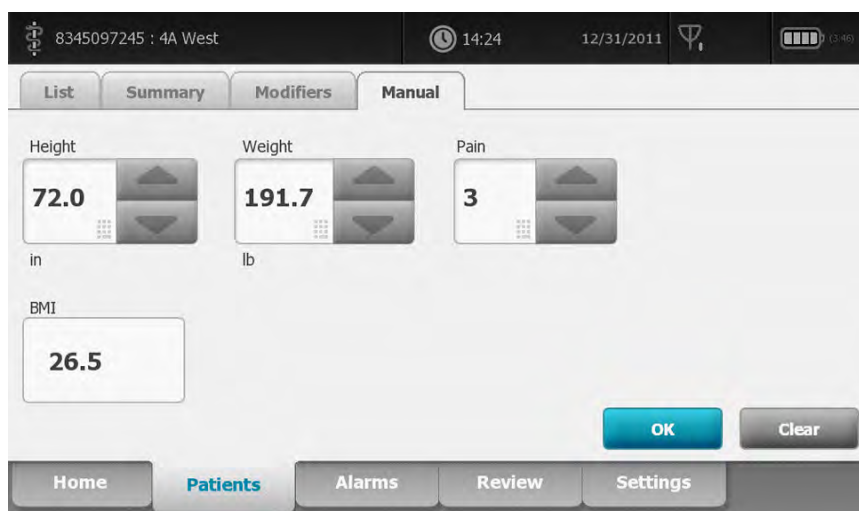
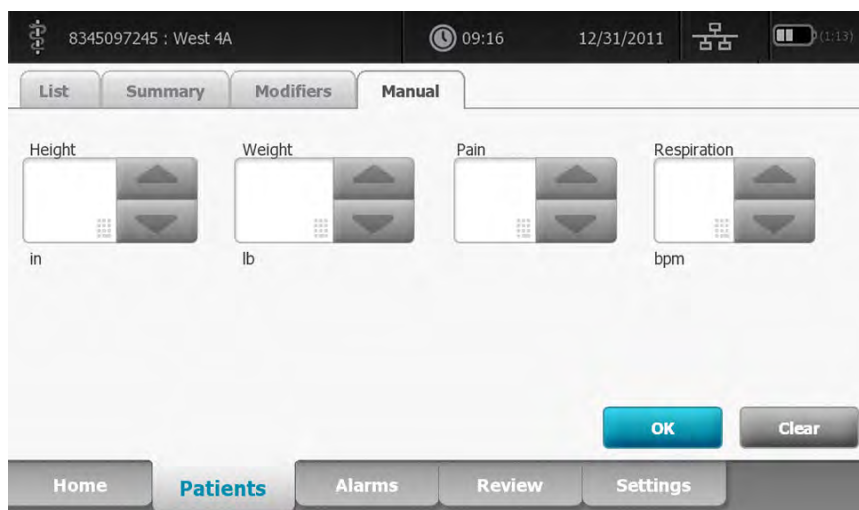


Caution Weight scales attached to this monitor must be running on battery power (battery type is specified in the weight scale manufacturer's directions for use). Do not use the weight scale's external power supply.

1. From the Home tab, touch anywhere within the Manual parameters frame.



The Manual tab appears. Two examples appear below.



2. Touch the up/down arrow keys or the keypad to manually adjust height, weight, pain level, temperature, respiration rate, or other parameters.

Note If an approved, battery-powered weight scale is attached to the monitor, measurements from the weight scale populate fields in the Manual tab. You can adjust weight and height measurements on this tab, but if you do, the read-only BMI field will clear.

Note Ensure that the current patient ID is correct before saving.

3. Touch  to confirm settings and return to the Home tab.

Note During intervals, each automatic and manual save of patient measurements clears all measurements from the Manual parameters frame.

Physical assessment instrument handles

Use the physical assessment instrument handles

The handles supply power to Welch Allyn 3.5V instruments. This section focuses on operation of the handles only. Refer to the directions for use for each instrument head to use it properly.

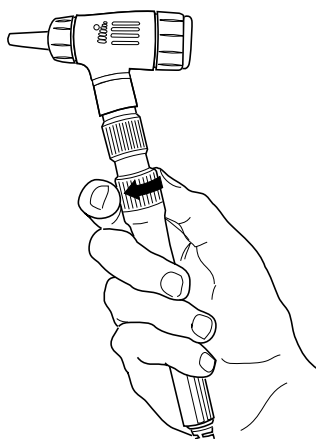
Note Handle modules are available only in the 84- and 85-series models.

Ensure the wall system is plugged in.

1. Lift the handle you want to use from the handle cradle.

The instrument will automatically power on when you remove it from the handle cradle. Only one handle is powered at a time.

2. Attach a specula to the end of the instrument head if appropriate.
3. Adjust light output by turning the rheostat on the handle.
 - Turning the rheostat clockwise increases the light output.



- Turning the rheostat counterclockwise decreases the light output.

Note The rheostat does not power down the instrument when you turn it counterclockwise as far as it will go.

4. Follow the directions for use for the instrument head when examining a patient.



Caution Do not overstretch the cords on these handles to prevent damage. Always examine patients within a comfortable reach of the wall system to protect the cords.



Caution To minimize the external housing temperature of the diagnostic instrument heads, on-time should not exceed 2 minutes, and off-time should be a minimum of 10 minutes.

5. Return the handle to the handle cradle.

Placing the handle in the cradle disengages the OptiSense™ optical sensor and powers down the instrument.

Note The handles continue to receive power as long as the wall system is plugged in, has a charged and functioning battery, and is powered on. You can power down the handles by powering down the entire wall system. See the Startup section for details.

Maintenance and service

Perform periodic checks

Welch Allyn recommends that each facility conduct periodic checks of each monitor.

1. Check the following at least daily:
 - Audio (speaker and piezo beeper tones), especially at startup
 - Fan, especially at startup
 - Touchscreen alignment
 - Date
 - Time
2. Visually inspect the following at least weekly:
 - the monitor for any damage or contamination
 - all cables, cords, and connector ends for damage or contamination
 - all mechanical parts, including covers, for integrity
 - all safety-related labeling for legibility and adhesion to the monitor
 - all accessories (cuffs, tubing, probes, sensors) for wear or damage
 - documentation for current revision of the monitor
3. Visually inspect the following at least monthly:
 - Mounting screws on wall for looseness and wear

Update settings, replace items, or call for service as necessary based on results of visual inspection. Do not use the monitor if you see any signs of damage. Qualified service personnel must check any monitor that is damaged for proper operation before putting the monitor back into use.



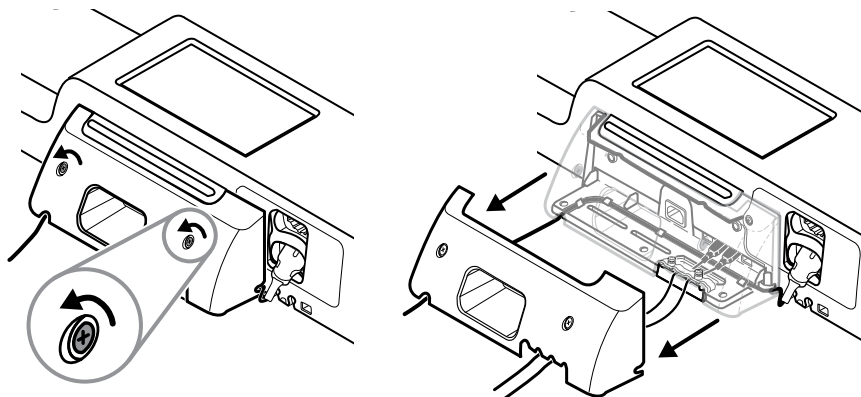
Caution Wall system components shall be replaced by Welch Allyn service centers or qualified service personnel.

Remove the wall system from the wall

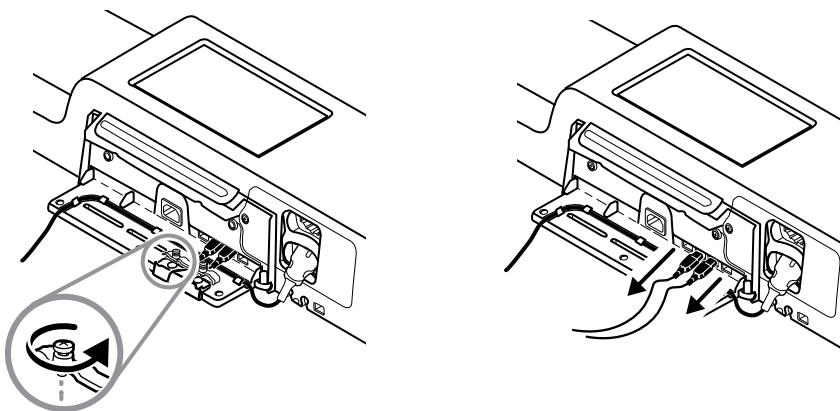
For maintenance or service activities that require access to the back of the wall system, follow these steps to remove the wall system from the wall.

1. Touch the **Settings** tab.
2. Touch the **Device** tab.
3. Touch **Power down**.

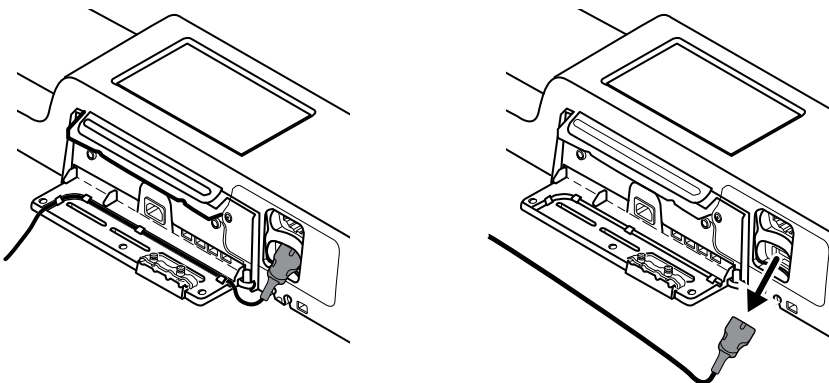
4. Remove all instrument heads, detach all accessible cords and cables, and unplug the power cord from the outlet.
5. Remove the cover by loosening the captive retention screws.



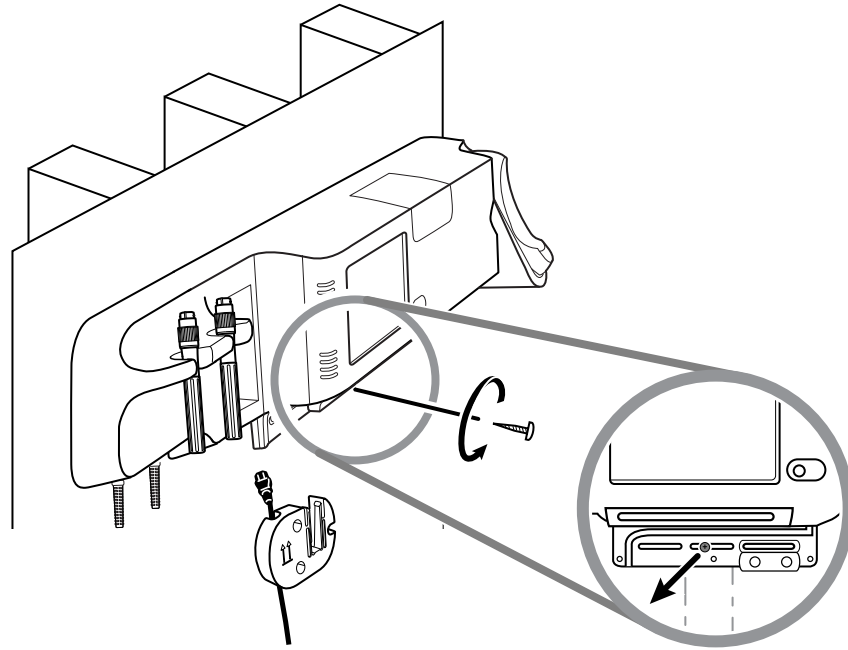
6. If USB accessories are connected, loosen the two screws on the cable retention clamp and remove it, then disconnect all USB cables.



7. If the wall system is configured with SpO2, disconnect the SpO2 cable and remove it from the channel on the bottom of the wall system.



8. Remove the security screw at the bottom of the wall system.



9. Carefully lift the wall system off the mounting rail bracket and place it onto a table or flat work surface.

Change the battery

Before removing the battery, follow the instructions to remove the wall system from the wall.

1. Place the wall system on a table or flat work surface so that the back of the wall system faces up.
2. Locate the battery, indicated by .
3. Remove the battery.
4. Insert the new battery. Ensure that you insert the new battery in the same orientation as the old battery.
5. Mount the wall system on the wall using the instructions presented in the Setup section of this directions for use.



WARNING Risk of fire, explosion, and burns. Do not short-circuit, crush, incinerate, or disassemble the battery pack. Never dispose of batteries in refuse containers. Always recycle batteries according to local regulations.

Note

New batteries are approximately 30 percent charged. Therefore, connect the battery to AC power immediately after inserting a new a battery.

Clean the wall system (excluding handle cradles and accessories)



WARNING Electric shock hazard. Before cleaning the wall system, disconnect the AC power cord from the power outlet.



WARNING Electric shock hazard. DO NOT autoclave the wall system or accessories. The wall system and the accessories are not heat-resistant.



WARNING Liquids can damage electronics inside the wall system. Prevent liquids from spilling on or dripping into the wall system. If liquids are spilled on or drip into the wall system:

1. Power down the wall system.
2. Disconnect the power plug.
3. Remove the wall system from the wall.
4. Remove battery pack from the wall system.
5. Dry off excess liquid from the wall system.

Note

If liquids possibly entered the wall system, remove the wall system from use until it has been properly dried, inspected, and tested by qualified service personnel.

6. Reinstall battery pack.
7. Mount the wall system on the wall. (See the Setup section of this directions for use.)
8. Power on the wall system and verify that the wall system functions normally before using it.

Clean on a routine basis according to your facility's protocols and standards or local regulations. If the monitor is on, lock the display and disconnect the AC power cord.

The following agents are compatible with the wall system:

- CaviWipes™ (see Caution below)
- Sani-Cloth® Plus
- 70 percent isopropyl alcohol
- 10 percent chlorine bleach solution



Caution Some components and accessories of the wall system require special care during cleaning. To ensure optimal functioning and availability of specific components and accessories, use only the cleaning agents noted and the processes described for these items presented later in this section.

Note

Disinfect according to your facility's protocols and standards or local regulations.

CaviWipes™ or Sani-Cloth® Plus

1. Using CaviWipes™ or Sani-Cloth® Plus, wipe the surface of the monitor to remove all debris.
2. Allow the monitor surface to dry for a minimum of 10 minutes before using the monitor.

70 percent isopropyl alcohol

Wipe the monitor with a clean cloth slightly dampened with 70 percent isopropyl alcohol.

10 percent chlorine bleach solution

1. Wipe the monitor with a clean cloth slightly dampened with a 10 percent bleach and water solution. Follow the cleaning agent manufacturer's guidelines.
2. Rinse with a clean cloth slightly dampened with water that meets EP and USP quality standards.
3. Allow the monitor surface to dry for a minimum of 10 minutes before using the monitor.

Clean the handle cradles

The blue handle cradles in the wall system require special attention.



Caution Do not use CaviWipes™ to clean the blue handle cradles. This cleaning agent produces bubbles and liquid during the cleaning process that can enter openings in the cradles and limit handle performance for as long as 30 minutes after cleaning.

Clean the handle cradles on a routine basis according to your facility's protocols and standards or local regulations.

The following agents are compatible with the handle cradles:

- Sani-Cloth® Plus
- 70 percent isopropyl alcohol
- 10 percent chlorine bleach solution

Note Disinfect according to your facility's protocols and standards or local regulations.

Clean the wall system accessories

The cleaning procedures for wall system accessories vary from the procedure to clean the wall system itself.

1. Wipe the NIBP hose and any reusable cuffs with a damp cloth moistened in a mild detergent solution.
2. Wipe the temperature probe with a cloth dampened with alcohol, warm water, or an appropriately diluted, nonstaining disinfectant solution.
3. Clean the pulse oximetry sensors with a cloth dampened with 70 percent isopropyl alcohol or 10 percent chlorine bleach solution.



Caution Never immerse any wall system accessories.

4. Clean the ear thermometer according to the manufacturer's directions for use.
5. Clean the physical assessment instrument handles and cords using the same cleaning agents used on the wall system. Clean on a routine basis according to your facility's protocols and standards, or local regulations.
6. To clean Welch Allyn 3.5V instrument heads attached to the physical assessment handles, follow instructions provided in their directions for use.

Specifications

Physical specifications

Protection classifications, Wall system configurations

Characteristic	Specification
Electrical rating	100 – 240 V AC, 50 – 60 Hz, 1.5 – 0.8 A
Duty cycle - monitor	Continuous operation
Duty cycle - physical assessment handles	2 minutes on, 10 minutes off
Type of protection against electric shock	Class I equipment (protectively earthed) with double insulation
Degree of protection against electric shock, for parts applied to patients	Type BF defibrillator proof IEC EN 60601-1
Recovery time following defibrillator discharge	Less than or equal to 10 seconds
Flammable anesthetics	 WARNING Not suitable for use with flammable anesthetics.
Degree of protection provided by the enclosure with respect to harmful ingress of liquids	IPX0 Non-protected according to EN/IEC 60529; Pulse oximeter equipment complies with ISO 9919 Cl. 44.6 Ingress of liquids tests and EN/IEC 60601-1, 60601-2-30, 60601-2-49 Cl. 44.3 Spillage tests
Height	10.56 in. (268.26 mm)
Width	39.92 in. (1014 mm)
Depth	7.51 in. (190.8 mm)
Weight (including battery)	14.1 lb. (6 kg)

Protection classifications, Wall system configurations

Graphical display resolution

Display area	8 in. (H) x 4 in. (V) (19.5 [H] cm x 11.3 [V] cm)
Pixels	1024 (H) x 600 (V)
Pixel arrangement	RGB (red, green, blue)
Color depth	16 bits per pixel

Speaker volume

Output sound pressure	57 dB at 1.0 meter
Measured sound range	46 – 66 dB(A)

Alarm and pulse tones

Pulse frequency (f_0)	150 – 1000 Hz
Number of harmonic components in the range 300 Hz to 4000 Hz	minimum of 4
Effective pulse duration (t_d)	high priority: 75 – 200 ms medium and low priority: 125 – 250 ms
Rise time (t_r)	10 – 20% of t_d
Fall time ^a (t_f)	$t_f \leq t_s - t_r$

Note The relative sound pressure level of the harmonic components should be within 15 dB above or below the amplitude at the pulse frequency.

^a Prevents overlap of pulses.

Battery specifications

Rating	10.8V 1.9 Ah (20Wh)
Composition	Lithium-ion

Nurse Call connection specifications

Nurse Call	25 V AC or 60 V DC maximum at 1A maximum
------------	--

Handle specifications

Handle output	3.00 - 3.90v, .700 - 1.5A
---------------	---------------------------

Leakage current is less than 10 microamps from any exposed metal part.

NIBP specifications

Cuff pressure range	Meets or exceeds ANSI/AAMI SP10:2002 standards for cuff pressure range
Systolic range	Adult: 30 to 260 mmHg Pediatric: 30 to 260 mmHg Neonate: 20 to 120 mmHg
Diastolic range	Adult: 20 to 220 mmHg Pediatric: 20 to 220 mmHg Neonate: 10 to 110 mmHg
Cuff Inflation Target	Adult: 160 mmHg (StepBP) Pediatric: 120 mmHg (StepBP) Neonate: 90 mmHg (StepBP)
Maximum Target Pressure	Adult: 280 mmHg (StepBP, SureBP) Pediatric: 280 mmHg (StepBP, SureBP) Neonate: 130 mmHg (StepBP)
Blood pressure determination time	Typical: 15 seconds Maximum: 150 seconds
Blood pressure accuracy	Meets or exceeds ANSI/AAMI SP10:2002 standards for noninvasive blood pressure accuracy (± 5 mmHg mean error, 8 mmHg standard deviation)
Mean Arterial Pressure (MAP) range The formula used to calculate MAP yields an approximate value.	Adult: 23 to 230 mmHg Pediatric: 23 to 230 mmHg Neonate: 13 to 110 mmHg
Pulse rate range (using blood pressure determination)	Adult: 30 to 200 bpm Pediatric: 30 to 200 bpm Neonate: 35 to 220 bpm
Pulse rate accuracy (using blood pressure determination)	$\pm 5.0\%$ (± 3 bpm)
Overpressure cutoff	Adult: 300 mmHg ± 15 mmHg Pediatric: 300 mmHg ± 15 mmHg Neonate: 150 mmHg maximum

SureTemp Plus temperature module specifications

Temperature range	80°F to 110°F (26.7°C to 43.3°C)
Calibration accuracy	$\pm 0.2^\circ\text{F}$ ($\pm 0.1^\circ\text{C}$) (Direct mode)

Braun ThermoScan PRO 4000 thermometer specifications (refer to manufacturer's directions for use for additional information)

Temperature range	68°F to 108°F (20°C to 42.2°C)
Calibration accuracy	±0.4°F (±0.2°C) for temperatures ranging from 95.9°F to 107.6°F (35.5°C to 42°C) ±0.5°F (±0.3°C) for temperatures outside of this range
Display resolution	0.1°F or °C

SpO2 specifications (refer to sensor manufacturer's directions for use for additional information)

SpO2 performance measurement range	1 to 100%
------------------------------------	-----------

Masimo sensor accuracy guide

Accuracy specified when used with Masimo SET pulse oximetry monitors or with licensed Masimo SET pulse oximetry modules using PC series patient cables, during no motion. Numbers present ± 1 standard deviation. Plus or minus one standard deviation represents 68% of the population.

Perfusion	0.02 % to 20 %
Pulse rate	25 to 240 beats per minute (bpm) No motion: ± 3 digits Motion: ± 5 digits
Saturation	70% to 100%
Note Saturation accuracy varies by sensor type.	Adults, Pediatrics (No motion): ± 2 digits Neonates (No motion): ± 3 digits Adults, Pediatrics, Neonates (Motion): ± 3 digits Low Perfusion: 0.02 % to 20 % ± 2 digits

Nellcor sensor accuracy guide

SpO2 measurement accuracy can only be evaluated in vivo by comparing pulse oximeter readings with SaO2 measurements obtained from simultaneously sampled arterial blood made using a laboratory CO-oximeter. SpO2 accuracy was validated through breathe-down-equivalent testing by Covidien using electronic measurements to prove equivalence to the Nellcor N600x predicate device. The Nellcor N600x predicate device was validated by performing human-subject, "breathe-down" clinical trials.

Perfusion	0.03 % to 20 %
Pulse rate	20 to 250 beats per minute (bpm) ± 3 digits
Saturation	70% to 100%
Note Saturation accuracy varies by sensor type.	Adult, Pediatrics: ± 2 digits Neonate: ± 3 digits Low Perfusion: 0.02 % to 20 % ± 2 digits

SpO2 specifications (refer to sensor manufacturer's directions for use for additional information)

Functional tester



WARNING A functional tester cannot be used to assess the accuracy of a pulse oximeter monitor.
1

¹ Some models of commercially available bench top functional testers and patient simulators can be used to verify the proper functionality of Nellcor pulse oximeter sensors, cables and monitors. See the individual testing device's operator's manual for the procedures specific to the model of tester being used.

While such devices may be useful for verifying that the pulse oximeter sensor, cabling, and monitor are functional, they are incapable of providing the data required to properly evaluate the accuracy of a system's SpO2 measurements. Fully evaluating the accuracy of the SpO2 measurements requires, at a minimum, accommodating the wavelength characteristics of the sensor and reproducing the complex optical interaction of the sensor and the patient's tissue. These capabilities are beyond the scope of known bench top testers. SpO2 measurement accuracy can only be evaluated in vivo by comparing pulse oximeter readings with SaO2 measurements obtained from simultaneously sampled arterial blood made using a laboratory CO-oximeter.

Many functional testers and patient simulators have been designed to interface with the pulse oximeter's expected calibration curves and may be suitable for use with Nellcor monitors and/or sensors. Not all such devices, however, are adapted for use with the Nellcor OXIMAX digital calibration system. While this will not affect use of the simulator for verifying system functionality, displayed SpO2 measurement values may differ from the setting of the test device. For a properly functioning monitor, this difference will be reproducible over time and from monitor to monitor within the performance specifications of the test device.

SpHb specifications (refer to sensor manufacturer's directions for use for additional information)

SpHb saturation range

0 to 25 g/dL

Masimo SpHb sensor accuracy guide

Adults, Pediatrics (no motion): 8 to 17 g/dL $\pm$ 1 g/dL. SpHb accuracy has been validated on healthy adult male and female volunteers and on surgical patients with light to dark skin pigmentation in the range of 8 to 17 g/dL SpHb against a laboratory co-oximeter. This variation equals $\pm$ 1 standard deviation which encompasses 68% of the population. The SpHb accuracy has not been validated with motion or low perfusion.

Environmental specifications

Operating temperature

50°F to 104°F (10°C to 40°C)

Storage temperature

-4°F to 122°F (-20°C to 50°C)

Operating altitude

-557 to 10,000 ft. (-170 m to 3,048 m)

Operating humidity

15 to 95% noncondensing

Storage humidity

15% to 95% noncondensing

Monitor radio

The monitor's radio operates on Welch Allyn FlexNet™ or other 802.11 networks.

Wireless network interface	IEEE 802.11 b/g, 802.11a
Frequency	802.11 b/g: 2.402 GHz to 2.4835 GHz
	802.11a: 5.125 GHz to 5.875 GHz
Channels	Up to 14 in 802.11b/g, up to 24 in 802.11a; country-dependent
Security/encryption/authentication	WPA2/AES (either EAP or PSK authentication)
Antenna	Internal multiband PIFA
Wireless data rates	802.11b: 1Mbps or higher during vitals transmission only
	802.11a/g: 6Mbps or higher during vitals transmission only
	(approximately 2 seconds per reading)
Agency approvals	US: FCC Part 15, Class B; C/UL; CE; 47 CFR Part 2.1093, 15.207, 15.209, 15.247, 15.407; FCC OET Bulletin 65C
	Europe: CE; EN 50371; EN/ETSI 300 328 V1.7.1, 301 489-1 V1.6.1, 301 489-17 V1.2.1, 301 893 V1.4.1
	Canada: RSS-210; RSS-GEN; RSS-102
	Hong Kong: HKTA 1039
Protocols	UDP, DHCP, TCP/IP
Data transfer protocols	UDP/TCP/IP
Modulation	OFDM (802.11a/g), DSSS/CCK (802.11b)
Output power	40mW typical, country-dependent
Ancillary IEEE standards	802.11e, 802.11h, 802.11i, 802.11X

Channel restrictions in the 5-GHz band are determined by country.

Marking by the symbol (!) indicates that usage restrictions apply. To ensure compliance with local regulations, be sure the correct country in which the access point is installed is selected. This product can be used with the following restriction(s):

France - Outdoor use is limited to 10 mW EIRP within the band 2454 to 2483.5 MHz.

Note Effective Isotropic Radiated Power (EIRP).

Note Some countries restrict the use of 5-GHz bands. The 802.11a radio in the monitor uses only the channels indicated by the access point with which the radio associates. The hospital IT department must configure access points to operate with approved domains.

Configuration options

The wall system is available in the following configurations.

Model Prefix	Description
84 series	Standard. Includes nurse call, Ethernet, and USB connectivity.
85 series	Wireless. Includes all Standard features plus an internal 802.11 a/b/g radio.

Patents

The monitor is covered under the following patents:

6,000,846; 6,036,361; 7,255,475; 7,429,245; D480,977; D632,397; and other patents pending.

For SureTemp Plus configured monitors, US patent 6,971,790 applies.

For Nellcor-equipped monitors, the following Nellcor US patents and foreign equivalents apply:

5,485,847; 5,676,141; 5,743,263; 6,035,223; 6,226,539; 6,411,833; 6,463,310; 6,591,123; 6,708,049; 7,016,715; 7,039,538; 7,120,479; 7,120,480; 7,142,142; 7,162,288; 7,190,985; 7,194,293; 7,209,774; 7,212,847; 7,400,919.

For Masimo-equipped monitors, the following Masimo US patents and foreign equivalents apply:

5,758,644; 5,823,950; 6,011,986; 6,157,850; 6,263,222; 6,501,975; 7,469,157; and others listed at www.masimo.com/patents.htm.

Standards and compliance

General compliance and standards

The monitor complies with the following standards:

21 CFR Subchapter H – Medical Devices – US Food and Drug Administration
 2002 No. 236 – Australian Therapeutic Goods Act
 93/42/EEC – European Economic Community Medical Devices Directive
 2007/47/EC – European Economic Community Medical Devices Directive 2007 Amendment
 94/62/EC – European Economic Community Packaging Directive
 2002/96/EC – European Economic Community Waste Electrical and Electronic Equipment Directive
 2006/66/EC – European Economic Community Batteries and Accumulators Directive
 SOR/98-282 – Canadian Medical Devices Regulation
 IATA DGR – International Air Transport Association Dangerous Goods Regulation
 United Nations ST/SG/AC.10/11 – Manual of Tests and Criteria, Part III, Sub-Section 38.3

ANSI/AAMI SP10
 AS/NZS 3200.1.0¹
 ASTM D 4332, E 1104
 CAN/CSA C22.2 NO.601.1¹ CAN/CSA-C22.2 NO.60601-1-2, CSA Z9919
 EN 1060-1, 1060-3, 1060-4²
 EN/IEC 60601-1, 60601-1-2, 60601-1-4, 60601-1-6, 60601-1-8, 60601-2-30, 60601-2-49, 62304, 62366
 EN/ISO 9919, 13485, 14971
 ISTA 2A
 UL 60601-1¹



Directive 2002/96/EC-WEEE:
Disposal of noncontaminated electrical and electronic equipment

This product and its accessories must be disposed of according to local laws and regulations. Do not dispose of this product as unsorted municipal waste. Prepare this product for reuse or separate collection as specified by Directive 2002/96/EC of the European Parliament and the Council of the European Union on Waste Electronic and Electrical Equipment (WEEE). If this product is contaminated, this directive does not apply.

¹ Standard is essentially the IEC 60601-1 General standard plus the listed country's National Deviations.

² Non-Invasive Sphygmomanometers – Part 1: General Requirements, Part 3. Supplementary Requirements for Electro-Mechanical Blood Pressure Measuring Systems, Part 4: Test Procedures to Determine the Overall System Accuracy of Automated Non-Invasive Sphygmomanometers.

For more specific disposal or compliance information, see www.welchallyn.com/weee, or contact Welch Allyn Customer Service at +44 207 365 6780.

General radio compliance

The wireless features of this monitor must be used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

This device complies with Part 15 of the FCC rules and with the rules of the Canadian ICES-003 as described below.

Federal Communications Commission (FCC)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the distance between the equipment and the receiver
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

The user may find the following booklet prepared by the Federal Communications Commission helpful:

The Interference Handbook

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-0034504.

Welch Allyn is not responsible for any radio or television interference caused by unauthorized modification of the devices included with this Welch Allyn product, or the substitution or attachment of connecting cables and equipment other than specified by Welch Allyn.

The correction of interference caused by such unauthorized modification, substitution, or attachment will be the responsibility of the user.

Industry Canada (IC) emissions

This device complies with RSS 210 of Industry Canada.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device.

L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes: (1) il ne doit pas produire de brouillage et (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

European Union

Czech	Welch Allyn tímto prohlašuje, že tento RLAN device je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
Danish	Undertegnede Welch Allyn erklærer herved, at følgende udstyr RLAN device overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF
Dutch	Bij deze verklaart Welch Allyn dat deze RLAN device voldoet aan de essentiële eisen en aan de overige relevante bepalingen van Richtlijn 1999/5/EC.
English	Hereby, Welch Allyn, declares that this RLAN device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Estonian	Käesolevaga kinnitab Welch Allyn seadme RLAN device vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
Finnish	Welch Allyn vakuuttaa täten että RLAN device tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
French	Par la présente, Welch Allyn déclare que ce RLAN device est conforme aux exigences essentielles et aux autres dispositions de la directive 1999/5/CE qui lui sont applicables
German	Hiermit erklärt Welch Allyn die Übereinstimmung des Gerätes RLAN device mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 1999/5/EG. (Wien)
Greek	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ Welch Allyn ΔΗΛΩΝΕΙ ΟΤΙ RLAN device ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/EK
Hungarian	Alulírott, Welch Allyn nyilatkozom, hogy a RLAN device megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
Italian	Con la presente Welch Allyn dichiara che questo RLAN device è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latvian	Ar šo Welch Allyn deklarē, ka RLAN device atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.

Lithuanian	Šiuo Welch Allyn deklaruojama, kad šis RLAN device atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Malti	Hawnhekk, Welch Allyn, jiddikjara li dan RLAN device jikkonforma mal-htigijiet essenzjali u ma provvedimenti ohrajn relevanti li hemm fid-Direttiva 1999/5/EC
Portuguese	Welch Allyn declara que este RLAN device está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Slovak	Welch Allyn týmto vyhlasuje, ze RLAN device spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Slovene	Šiuo Welch Allyn deklaruojama, kad šis RLAN device atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Spanish	Por medio de la presente Welch Allyn declara que el RLAN device cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE
Swedish	Härmed intygar Welch Allyn att denna RLAN device står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Guidance and manufacturer's declaration

EMC compliance

Special precautions concerning electromagnetic compatibility (EMC) must be taken for all medical electrical equipment. This device complies with IEC EN 60601-1-2.

- All medical electrical equipment must be installed and put into service in accordance with the EMC information provided in this document.
- Portable and mobile RF communications equipment can affect the behavior of medical electrical equipment.

The Connex Integrated Wall System complies with all applicable and required standards for electromagnetic interference.

- It does not normally affect nearby equipment and devices.
- It is not normally affected by nearby equipment and devices.
- It is not safe to operate the monitor in the presence of high-frequency surgical equipment.
- However, it is good practice to avoid using the monitor in extremely close proximity to other equipment.

Emissions and immunity information

Electromagnetic emissions

The monitor is intended for use in the electromagnetic environment specified below. The customer or user of the monitor should assure that it is used in such an environment.

Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The monitor uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The monitor is suitable for use in all establishments other than domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes, provided the following warning is heeded:
Harmonic emissions IEC 61000-3-2	Class A	

Electromagnetic emissions

Voltage
fluctuations/flicker
emissions
IEC 61000-3-3

Complies



WARNING This equipment/system is intended for use by healthcare professionals only. This equipment/ system may cause radio interference or may disrupt the operation of nearby equipment^a. It may be necessary to take mitigation measures, such as re-orienting or relocating the monitor or shielding the location.

^a The monitor contains a 5-GHz orthogonal frequency-division multiplexing transmitter or a 2.4-GHz frequency hopping spread-spectrum transmitter for the purpose of wireless communication. The radio is operated according to the requirements of various agencies, including FCC 47 CFR 15.247 and R&TTE Directive (1995/5/EC). The transmitter is excluded from the EMC requirements of 60601-1-2, but should be considered when addressing possible interference issues between this and other devices.

Electromagnetic immunity

The monitor is intended for use in the electromagnetic environment specified below. The customer or the user of the monitor should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV differential mode ± 2 kV common mode	± 1 kV differential mode ± 2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	>95% dip in 0.5 cycle 60% dip in 5 cycles 30% dip for 25 cycles >95% dip in 5 seconds	>95% dip in 0.5 cycle 60% dip in 5 cycles 30% dip for 25 cycles >95% dip in 5 seconds	Mains power quality should be that of a typical commercial or hospital environment. If the user of the monitor requires continued operation during power mains interruptions, it is recommended that the monitor be powered from an uninterruptible power supply or a battery.

Electromagnetic immunity

The monitor is intended for use in the electromagnetic environment specified below. The customer or the user of the monitor should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
			Portable and mobile RF communications equipment should be used no closer to any part of the monitor, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Recommended separation distance			
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	$d = (1.17) \sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 1 GHz	3 V/m	$d = (1.17) \sqrt{P}$ 80 to 800 MHz

$$d = (2.33) \sqrt{P} \text{ 800 MHz to 2,5 GHz}$$

where P is the maximum output power rating of the transmitter in watts (W) and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey^a, should be less than the compliance level in each frequency range^b. Interference may occur in the vicinity of equipment marked with the following symbol:



Note1: At 80 MHz and 800 MHz, the higher frequency range applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

^aField strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the monitor is used exceeds the applicable RF compliance level above, the monitor should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the monitor.

^bOver the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distances between portable and mobile RF communications equipment and the monitor

The monitor is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or user of the monitor can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the monitor as recommended below, according to the maximum output power of the communications equipment.

Separation distance according to frequency of transmitter (m)			
Rated max. output power of transmitter (W)	150 kHz to 80 MHz $d = (1.17) \sqrt{P}$	80 MHz to 800 MHz $d = (1.17) \sqrt{P}$	800 MHz to 2.5 GHz $d = (2.23) \sqrt{P}$
0.01	0.11667	0.11667	0.23333
0.1	0.36894	0.36894	0.73785
1	1.1667	1.1667	2.3333
10	3.6894	3.6894	7.3785
100	11.667	11.667	23.3333

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

Note 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

Advanced settings

The Advanced tab provides password-protected access to the monitor's Advanced settings (or Admin mode), enabling nurse administrators, biomedical engineers, and/or service engineers to configure specific features. The Advanced tab also presents read-only information about the monitor.

Note You cannot enter the Advanced settings if sensors or physiological alarms are active or if vital sign measurements are displayed.

General

Specify the language

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears, displaying the Language tab.
2. Select a language.
3. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.

- To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Specify date and time settings

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.
2. On the General tab, touch the **Date / Time** tab.
3. Specify settings.

Setting	Action/Description
Date format	Select a date format for display.
Time zone	Select your time zone offset from Coordinated Universal Time (UTC).
Automatically adjust clock for daylight saving time, reported by host	Select this to adjust the displayed time by +/- one hour when the connected host reports daylight savings time.
Allow users to change date and time	Select this to allow clinicians to set the date and time from the Settings tab.
Display date and time	Select this to display the date and time on the Home tab in the Device Status area.

4. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Specify advanced alarm settings

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.
2. Touch the **Alarms** tab.
3. Specify settings.

Setting	Action/Description
Allow user to disable alarms	Select to allow clinicians to turn off or turn on all alarm limits for each vital sign. The control is on each parameter-specific tab on the Alarms tab.
Allow user to turn off general audio	Select to allow clinicians to turn off all audio notification for alarms. This control is on the Alarms tab (on the General tab).

Minimum alarm volume	Select the minimum alarm volume available. If you select High, then Medium and Low are not available to the clinician. These controls are on the Alarms tab (on the General tab).
Nurse call threshold	Select the minimum priority alarm that activates a nurse call relay. If you select High, only high-level alarms activate a nurse call relay.
Audio pause time	Specify the amount of pause time that is added to the 60-second pause time. When a clinician pauses an audio alarm tone, the tone is paused for the combined amount of time.
SpO2 alarm condition delay	Specify the minimum amount of time that an SpO2 alarm condition must be active before audio and visual signals occur. SatSeconds is available with Nellcor SpO2 sensors. If you select 0 seconds or 10 seconds, SatSeconds is disabled, and it is removed from the SpO2 tab in the Alarms tab.
SpHb alarm condition delay	Specify the minimum amount of time that an SpHb alarm condition must be active before audio and visual signals occur.

4. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Specify advanced display settings

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.

2. Touch the **Display** tab.
3. Specify settings.

Setting

Display lock

Display power saver

Device power down

Action/Description

Specify the required period of clinician inactivity before the touchscreen locks.

Specify the required period of monitor inactivity before the display turns off.

Clinician interactions, new vital sign measurements, or alarm conditions automatically turn on the display.

Specify the required period of monitor inactivity before the monitor turns off.

4. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Specify a monitor location

You can associate the monitor with a specific location. The location appears in the Device Status area.

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.

2. Touch the **Other** tab.
3. In the **Location ID** box, touch  and enter up to 20 alphanumeric characters.
4. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Enable monitor profile changes

You can allow clinicians to change the active profile on the monitor. Available profiles are **Monitor**, **Spot Check**, and **Triage**. When this option is enabled, clinicians can change the name of the profile as well.

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.
- The General tab appears.
2. Touch the **Other** tab.
 3. Select **Allow profile change**.
 4. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Specify power line frequency

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.

2. Touch the **Other** tab.

3. Select the power line frequency for AC power supplied to the monitor.
4. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Set and start the demo mode

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.

2. Touch the **General** tab.
3. Touch the **Demo** tab.
4. Specify settings.

Setting

Type

Start

Action/Description

Select a type of demonstration mode.

Touch **Start** to put the monitor in demonstration mode. Navigate to the Home tab to begin Demo mode.

5. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Demo mode, touch **Exit** on the Home tab. The monitor restarts automatically.

Parameters

Specify advanced NIBP settings

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.

2. Touch the **Parameters** tab.
3. Touch the **NIBP** tab.
4. Specify settings.

Setting

Default view

Action/Description

Select primary and secondary views.

Select **Display MAP** to display mean arterial pressure (MAP) in the NIBP frame on the Home tab.

Default patient type

If **Display MAP** is selected, specify which numerics are primary in the NIBP frame. On the Home tab, clinicians can touch the NIBP frame to toggle between views.

Select a default patient type for this monitor. The patient type shows in the Patient frame on the Home tab.

In the Patients tab on the Summary tab, clinicians can change the displayed patient type from the default patient type that you set here.

Tube type

Select the number of tubes that are connected to the NIBP cuff that is used with this monitor. If you select **1 tube**, the only algorithm available for selection is **Step**.

Unit of measure

Select the NIBP unit of measure for display.

Allow interval program changes

Enable clinicians to modify interval program settings from the Intervals tab.

Algorithm and Cuff inflation target (CIT)

Select the default algorithm used to determine NIBP measurements.

If you select the **Step** algorithm, touch  and enter a default cuff inflation target for each type of patient. In the Patients tab on the Summary tab, clinicians can change the CITs from the default CITs that you set here.

5. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Specify advanced temperature settings

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab will appear.

2. Touch the **Parameters** tab.
3. Touch the **Temperature** tab.
4. Specify settings.

Setting

Unit of measure

Action/Description

Select primary units of measure for the temperature display on the Home tab

Display temperature conversion

Select this to display primary units of measure and secondary units of measure for the temperature display on the Home tab.

Default SureTemp Plus site

Select the default site for SureTemp measurements. The default site applies when clinicians power up the monitor and each time

clinicians remove the temperature probe from the well.

Select **Last Site** to set the default to the site selected for the last measurement.

5. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Specify advanced SpO2 settings

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.

2. Touch the **Parameters** tab.
3. Touch the **SpO2** tab.
4. Specify settings.

Setting

Default view

Default response

Sweep speed

Action/Description

Select a numeric view or a waveform view as the primary SpO2 display on the Home tab.

Select the default speed of response to changes in SpO2 measurements.

Select the waveform sweep speed for the SpO2 display in the Home tab.

5. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Advanced tabs and return to the Home tab, touch **Exit**.

Specify advanced SpHb settings

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.

2. Touch the **Parameters** tab.
3. Touch the **SpHb** tab.
4. Specify settings.

Setting

Reference

Action/Description

Select arterial or venous as the calibrated reference source.

Unit of measure	Select the primary unit of measure for the SpHb display on the Home tab.
Default averaging	Select the default moving window of time used by the parameter to calculate the SpHb value and update the display: short (approximately 1 minute), medium (approximately 3 minutes), or long (approximately 6 minutes).
Trend view time	Select the period displayed in the SpHb trend graphic on the Home tab.
5. Do one of the following:	
- To continue in the Advanced Settings, touch another tab. - To exit the Advanced tabs and return to the Home tab, touch Exit.	

Specify advanced pulse rate settings

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.

2. Touch the **Parameters** tab.
3. Touch the **Pulse rate** tab.
4. Specify settings.

Setting

Display source

Action/Description

Select this to show the source of pulse rate measurements (NIBP or SpO2) on the Home tab.

5. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Advanced Settings and return to the Home tab, touch **Exit**.

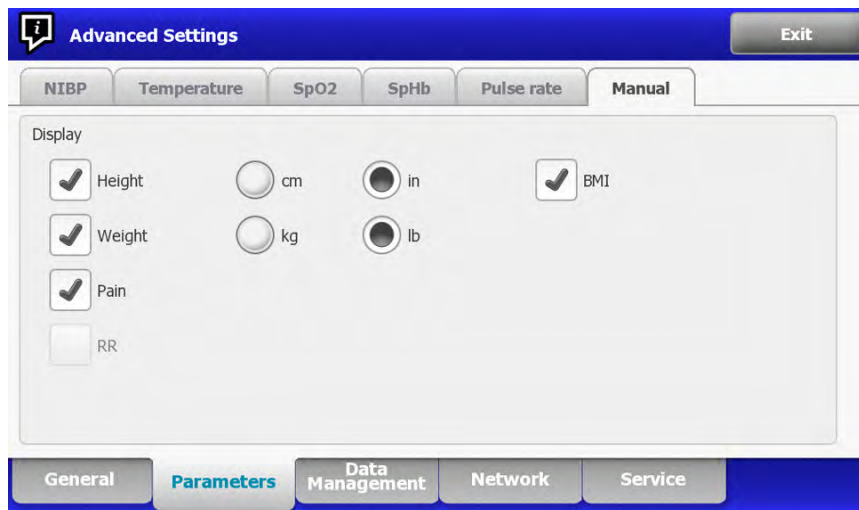
Specify the manual parameters

The Manual Parameters frame is in the lower right corner of the Home tab. You can manually enter values for parameters in the frame. You also can specify which parameters appear in the frame.

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.

2. Touch the **Parameters** tab.
3. Touch the **Manual** tab.



4. Select up to four parameters and associated units of measure for display in the Manual Parameters frame.

If the monitor has the SureTemp Plus temperature module, the **Temperature** parameter is not available here or in the Manual Parameters frame.

5. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Data management

Specify patient ID settings

Patient identification appears on the Home tab in the Patient frame, and it is listed in various tabs, such as the Patient tab and the Review tab.

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.

2. Touch the **Data Management** tab.
3. Touch the **Patient IDs** tab.
4. Specify settings.

Setting

Name format

Primary label

Secondary label

Action/Description

Select a format for all displayed patient names:
Full name or **Abbreviation**.

Select the primary identification label for all displayed patients.

Select a secondary identification label for patients. A secondary label displays only on the Home tab, after the primary label.

Require patient ID to save readings	Make entering a patient ID a prerequisite for saving measurements. If they fail to enter an identifier, the monitor prompts them when they try to save.
Search by patient ID	Enable clinicians to enter a patient ID to query for the patient's information. If clinicians scan the ID onto the Home tab or the Summary tab, the monitor queries the patient list and the network. Returned patient information populates the Patient frame on the Home tab and fields on the Summary tab.
Clear patient information on manual save	Specify that the monitor clears the selected patient after a clinician manually saves measurements from the Home tab. Patient information clears from the Patient frame and the Summary tab. Note: This setting does not take effect when intervals are in progress.
Retrieve list	Enable the monitor to retrieve the patient list from the network. When this option is selected, a Retrieve list button replaces the Add button on the List tab. Information from the network populates the List tab when clinicians touch the Retrieve list button. Since the Add button is not available, clinicians cannot add a patient to the patient list.
5. Do one of the following:	
- To continue in the Advanced Settings, touch another tab. - To exit the Advanced Settings and return to the Home tab, touch Exit.	

Specify clinician ID settings

Clinician identification appears next to the medicine symbol in the Device Status area on the Home tab.

- Access the Advanced Settings.
 - Touch the **Settings** tab.
 - Touch the **Advanced** tab.
 - Enter the **Advanced settings code**.
 - Touch **OK**.

The General tab appears.

- Touch the **Data Management** tab.
- Touch the **Clinician IDs** tab.
- Specify settings.

Setting

Label

Require clinician ID to save readings

Search by clinician ID

Action/Description

Select a type of clinician identification label for display on the Home tab: **Full name**, **Abbreviation**, **Clinician ID**, or **Symbol only**.

Make entering a clinician ID a prerequisite for saving measurements. If they fail to enter identification, the monitor prompts them when they try to save measurements. Clinicians can enter clinician identification on the Clinician tab.

Enable the monitor to query the network for clinician information based on ID. The monitor

initiates the search when the clinician enters or scans the ID from the Clinician tab. Returned clinician information populates the Device Status area and fields on the Clinician tab.

Select **Require password** to require clinicians to enter their password, in addition to ID, on the Clinician tab. The monitor uses the ID and password combination to query the network for clinician information.

Clear clinician information on manual save

Specify that the monitor clears the selected clinician after a clinician manually saves measurements from the Home tab. Clinician information clears from the Clinician tab and the Device Status area.

5. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Specify clinical data settings

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.

2. Touch the **Data Management** tab.
3. Touch the **Clinical Data** tab.
4. Specify settings.

Setting

Automatically send on manual save

Action/Description

Select this option to specify that measurements are sent to the network when a clinician saves measurements on the Home tab.

Delete readings after successful send

Select this option to specify that measurements are deleted from the monitor after they are successfully sent to the network. Sent measurements do not appear in the Review tab.

Emulate Spot Vital Signs LXi

Select this option to specify that clinical data sent to the network appears as Spot Vital Signs LXi data at the network.

5. Do one of the following:
 - To continue in Advanced Settings, touch another tab.
 - To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Network

View advanced monitor information

The Status tab shows the monitor's software version, MAC and IP addresses, network, server and access point information, session information, and more.

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.
2. Touch the **Network** tab.
3. Touch the **Status** tab.
4. View the information.
5. Do one of the following:
 - To continue in the Advanced Settings, touch another tab.
 - To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Specify radio settings

This task is applicable only to monitors that have a radio installed.

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.
2. Touch the **Network** tab.
3. Touch the **Radio** tab.
4. Specify settings.

Setting

Enable radio

Enable radio network alarms

SSID

Radio band

Authentication type

Action/Description

Enable the radio for device communications. When disabled, the radio is not available.

Activate radio network alarms when an alarm condition occurs. When disabled, radio network alarms are not available.

Touch  and enter the service set identifier (SSID). Enter a maximum of 16 characters.

Select the radio band.

Select an authentication scheme. Then specify any additional settings that appear.

Method

Select a method. Then touch  and enter characters: **Network key** (64 characters), or **Passphrase** (8 to 63 characters).

Security protocol

Select the security protocol.

EAP type

Select the EAP type.

Identity

Enter the EAP identity (maximum of 32 characters).

Password

Enter the EAP password (maximum of 32 characters).

Key number

Select the WEP key number.

Key

Enter the WEP key (10 characters for WEP 64, or 26 characters for WEP 128).

Configure radio

Touch **Configure radio** to activate all new radio settings not selected previously.

Touch **OK** in the confirmation popup telling you to power down the monitor.

Touch the **Settings** tab. Touch the **Device** tab. Touch **Power down**.

The radio will reboot.

Note If you do not touch **Configure radio**, none of the changed radio settings will take effect.

5. Do one of the following:

- To continue in the Advanced Settings, touch another tab.
- To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Specify server settings

1. Access the Advanced Settings.
 - a. Touch the **Settings** tab.
 - b. Touch the **Advanced** tab.
 - c. Enter the **Advanced settings code**.
 - d. Touch **OK**.

The General tab appears.

2. Touch the **Network** tab.
3. Touch the **Server** tab.
4. Specify settings.

Setting

Obtain server IP information automatically

Action/Description

Enable the monitor to automatically obtain the server IP information via the network.

UDP broadcast port: Touch  and enter the port number that is used to automatically obtain server IP information. The range of entry is 0 to 65535.

IP address



Touch  and enter the IP address of the server that is used for patient data communication. The range of entry for each field is 0 to 255.

Port



Touch  and enter the port number associated with the server IP address. The range of entry is 0 to 65535.

Test

Touch **Test** to test the connection to the configured server.

5. Do one of the following:

- To continue in the Advanced Settings, touch another tab.
- To exit the Advanced Settings and return to the Home tab, touch **Exit**.

Service

For service-related advanced settings, see the service manual for this product.

Troubleshooting

This section presents tables of technical alarm and information messages, as well as problem descriptions that do not generate messages, to help you troubleshoot issues on the monitor.

Note Problem descriptions without messages appear at the end of this section.

When the monitor detects certain events, a message appears in the Device Status area at the top of the screen. Message types include the following:

- Information messages, which appear on a blue background.
- Low- and medium-priority alarms, which appear on an amber background.
- High-priority alarms, which appear on a red background.

Technical alarm messages are low priority unless noted in the Message column.

You can dismiss a message by touching the message on the screen, or, for some messages, you can wait for the message to time out.

To use these tables, locate the message that displays on the monitor in the left column of the table. The remainder of the row explains possible causes and suggests actions that can resolve the issue.

Note Instructions to "Call for service" in the following tables mean that you should contact qualified service personnel in your facility to investigate the issue.

NIBP messages

Message	Possible cause	Suggested action
NIBP air leak; check cuff and tubing connections.	The NIBP module has an air leak	Check the cuff and tubing connections. Clear the alarm and retry NIBP.
NIBP not functional. Call for service.	A module error occurred	Call for service.
Unable to determine NIBP; check connections; limit patient movement.	The NIBP module experienced a motion artifact	Check connections; limit patient movement. Clear the alarm and retry NIBP.
Unable to determine NIBP; check connections and tubing.	The NIBP tubing has a kink	Check the connections and tubing for kinks.

Message	Possible cause	Suggested action
		Clear the alarm and retry NIBP.
Incorrect NIBP cuff size; check patient type.	The cuff size is not correct	Check the patient type. Clear the alarm and retry NIBP.
Inflation too quick; check NIBP cuff and tubing connections.	NIBP inflation was too quick	Check the connections and tubing for kinks. Clear the alarm and retry NIBP.
Unable to determine NIBP; check inflation settings.	NIBP check inflation settings message	Check inflation settings and change as necessary. Clear the alarm and retry NIBP. Change the cuff inflation target (CIT).
Excessive patient movement.	NIBP measurements are not accurate because of artifact	Limit patient movement during blood pressure measurement.
Tube type does not match device configuration. (NIBP measurement is available)	The tube connected to the NIBP sensor does not match the monitor's configuration	Use the tube specified for the monitor.
Tube type does not match device configuration. (NIBP measurement is not available)	User is using a single-lumen tube with the following Advanced settings: 1. Patient type is Pediatric or Adult 2. Tube type is 2 3. Algorithm is SureBP	Clear message. Modify settings or tube use to match patient type.

SpO2 and SpHb messages

Message	Possible cause	Suggested action
SpO2 not functional. Call for service.	A module error has occurred	Try a new cable/sensor pair. Call for service.
Searching for pulse signal. (High-priority alarm)	The SpO2 sensor is not attached to the patient's finger	Touch the alarm icon or the SpO2 frame to dismiss the alarm. Set SpO2 alarm limits to OFF. Reattach the SpO2 sensor to the patient's finger.
Attach SpO2 sensor to monitor.	The sensor was not detected	Check the sensor connection. Replace the SpO2 sensor.

Message	Possible cause	Suggested action
Replace the SpO2 sensor.	The SpO2 sensor is faulty or expired	Replace the SpO2 sensor.
	No SpO2 sensor is connected	Connect an SpO2 sensor.
	The cable is faulty or expired	Replace the cable.
Replace the SpO2 cable.	The cable is faulty or expired	Replace the cable.
Low SpO2 signal quality. Check sensor.	Poor sensor placement on the patient	Remove the sensor from the patient and reapply.
Low SpHb signal quality. Check sensor.	Poor sensor placement on the patient	Remove the sensor from the patient and reapply.
Low perfusion. Check sensor.	Poor sensor placement on the patient	Remove the sensor from the patient and reapply.
SpO2 mode only. Check sensor or cable.	The sensor is operating as an SpO2-only sensor because it failed to calibrate properly	Reattach the cable to the monitor.
		Remove the sensor from the patient and reapply.
SpO2 sensor expires in....	The SpO2 sensor will expire soon	Replace the SpO2 sensor.

Temperature messages

Message	Possible cause	Suggested action
Connect temperature probe.	No probe is connected	Connect a temperature probe and retry.
	The probe is faulty	Replace the temperature probe.
	The temperature module returned a connect probe message	Connect a temperature probe and retry. If a probe is already connected, replace the probe.
Insert correct color-coded probe well.	The probe well is missing	Insert a temperature probe well.
Replace temperature probe.	The probe is faulty	Replace the temperature probe.
Temperature not functional. Call for service.	A module error occurred	Call for service.
Temperature time limit exceeded.	The 10-minute timeout for temperature measurement has occurred	Remove the probe from the measurement site.
Tissue contact lost	The probe has lost contact with the patient's tissue	Reposition the probe to restore proper contact with the patient's tissue.

Message	Possible cause	Suggested action
Retry temperature measurement.	A probe heater or data error occurred	Retry the temperature measurement. If the problem persists, replace the probe.
Note This message often accompanies other temperature messages.	User settings require adjustment	Adjust the user settings and retry.

Weight scale messages

Message	Possible cause	Suggested action
Weight scale not functional. Call for service.	The weight scale is not operating properly.	Call for service.

Physical assessment instrument handles

Symptom	Possible cause	Suggested action
The lamp does not illuminate	There is no lamp in the handle head	Install a lamp in the handle head.
	The lamp is burned out	Install a new lamp.
	The other handle is off the cradle	Place the other handle in the cradle.
	The system is not powered up	Power up the system.
	The platform handle controller PCBA is defective	Call service.
	The handle assembly is defective	Call service.
The lamp is too dim	The rheostat setting is too low	Increase the rheostat setting.
	The platform handle controller PCBA is defective	Call service.
	The handle assembly is defective	Call service.
The lamp is too bright	The rheostat setting is too high	Decrease the rheostat setting.
	The platform handle controller PCBA is defective	Call service.
	The handle assembly is defective	Call service.
The lamp brightness does not adjust	The platform handle controller PCBA is defective	Call service.
	The handle assembly is defective	Call service.
The handle becomes very hot to the touch	The lamp has been on for an extended period of time	Return the handle to the cradle.

Patient data management messages

Message	Possible cause	Suggested action
Maximum number of patient records saved. Oldest record overwritten.	The maximum number of patient records in the monitor's memory has been exceeded	On the Review tab, delete old records to prevent the alarm from appearing when new records are saved.
Unable to access patient information.	An error occurred when reading the patient list or patient record during startup	Power down and restart the monitor. If the error persists, call for service.
No data to save.	No patient data is available	Take or enter vital signs before saving.
Patient ID required to save data.	The configuration requires a patient ID to save data	Call for service.
Clinician ID required to save data.	The configuration requires a clinician ID to save data	Call for service.
Patient ID required to send data.	The configuration requires a patient ID to send data	Add a patient ID.
Patient list is full. Delete some patients to add more.	The maximum number of patients was exceeded	Delete a patient from the list to add a new patient.
Stop intervals to select new patient.	The monitor is set to take interval readings	Stop intervals before changing the patient.
No connection for send.	No connectivity is available to support sending data manually or automatically sending data on manual save	Call for service.
Unable to retrieve list.	The monitor is unable to retrieve a patient list from the network	Call for service.
Unable to identify clinician.	The clinician ID or password is incorrect	Confirm the clinician ID and password (if applicable), and retry.

Radio messages

Message	Possible cause	Suggested action
Radio not functional. Call for service.	A hardware failure occurred (not currently used)	Call for service.
	The radio has the wrong software	
	The radio is not connected	
Radio error. Power down and restart.	The monitor and the radio failed to establish communication with each other	Power down and restart. If problem persists, call for service.

Message	Possible cause	Suggested action
Unable to establish network communications. Radio out of network range.	The radio is no longer communicating with the access point	Call for service.
Unable to establish network communications. Call for service.	Unable to get an IP address from the DHCP server	Call for service.
Communications module did not power on properly. Power down the device. (High-priority alarm)	Communication failure.	Call for service.

Ethernet messages

Message	Possible cause	Suggested action
Network not found; check network cable connection.	A network cable is unplugged	Check the network cable connection. If problem persists, call for service.
	A network connection is broken elsewhere	

USB messages

Message	Possible cause	Suggested action
USB Communication failure. Call for service.	An internal or external device is connected but failed enumeration	Call for service.
External device not licensed for use.	A license for an external device (e.g., barcode scanner) has not been activated	Disconnect the unlicensed device.
External device not recognized.	An unrecognized external device is connected	Disconnect the unrecognized device.
Incompatible Welch Allyn device.	A communication protocol failure has occurred	Call for service.
USB accessory disconnected.	The USB cable between an external device and the monitor is disconnected	Confirm that the USB cable is connected to the device and the monitor.

System messages

Message	Possible cause	Suggested action
Set date and time.	The date or time is not set	Set the date and time.
	The date or time is not set properly	Reset the date or time.
Ambient temperature outside operating range. Retry measurement.	The ambient temperature is out of range	Operate the monitor within the specified temperature range. Retry patient temperature measurement. If the message

Message	Possible cause	Suggested action
		persists, move the patient and the monitor to a cooler location.
Device shutdown is not available at this time.	Device cannot perform an immediate shutdown	Touch OK , wait, and retry.
Advanced settings unavailable	Sensors are taking measurements	Stop continuous measurements.
	A physiological alarm condition is active	Respond to or reset the alarm.
	Spot Check measurements have not been saved	Save the measurements.
Unable to load language.	Chinese did not load	Power down and restart the monitor.
Unexpected restart occurred. Call for service.	A system error caused the monitor to restart. Call for service.	

Battery power manager messages

Message	Possible cause	Suggested action
Low battery 5 minutes or less remaining. (High-priority alarm)	Battery power is extremely low	Connect the monitor to AC power. (If not connected to AC power, the monitor powers down when AC power is depleted.)
Low battery 30 minutes or less remaining.	Battery power is low	Touch the alarm icon to dismiss or connect the monitor to AC power.
Powering down. Call for service.	Power manager or battery faults have occurred	Call for service.
Battery is absent or faulty.	There is no battery in the monitor	Insert a battery.
	The battery is faulty	Replace the battery.
Device is operating in battery mode.	The AC power cord has been disconnected	Touch OK to dismiss or connect the monitor to AC power.

Configuration Manager messages

Message	Possible cause	Suggested action
Unable to load configuration; using factory defaults.	A configuration load error occurred	Call for service.

Message	Possible cause	Suggested action
Functional error. Call for service.	A critical configuration load error occurred	Call for service.
No connection for send.	The monitor is not configured to the network	Call for service.

Problems and solutions

The problems addressed in this table do not generate alarm or information messages on the monitor.

Problem	Possible cause	Suggested action
No SpHb value is displayed	An SpO2-only cable is connected to the monitor	Replace the SpO2-only cable with an SpO2/SpHb (Masimo Rainbow) cable.
	The SpHb cable has expired	Replace the SpHb cable.
	Note A technical alarm appears.	
	Poor sensor placement on the patient	Remove the sensor from the patient and reapply.
No weight measurement is transferred from the scale to the monitor	The monitor may have the SpHb license, but the SpO2 module does not	Contact Welch Allyn to verify that the SpO2 module contains the SpHb license.
	The scale is not connected	Inspect the USB cables from the device to the adapter to the scale to ensure that they are connected properly.
	The scale setting is incorrect	Ensure that the scale settings are enabled for transfer.

Appendix

Approved accessories

The following tables list approved wall system accessories and documentation. For information about options, upgrades, and licenses, refer to the service manual.

FlexiPort® cuffs (Latex free)

Part Number	Model	Description
Reuse-08	Reusable	Cuff, reuse, SM CHILD, 2-tube
Reuse-09	Reusable	Cuff, reuse, CHILD, 2-tube
Reuse-10	Reusable	Cuff, reuse, SM AD, 2-tube
Reuse-11	Reusable	Cuff, reuse, ADULT, 2-tube
Reuse-11L	Reusable	Cuff, reuse, AD LONG, 2-tube
Reuse-12	Reusable	Cuff, reuse, LG AD, 2-tube
Reuse-12L	Reusable	Cuff, reuse, LG AD LONG, 2-tube
Reuse-13	Reusable	Cuff, reuse, THIGH, 2-tube
Soft-08	Disposable	Cuff, soft, SM CHILD, 2-tube (box of 20)
Soft-09	Disposable	Cuff, soft, CHILD, 2-tube (box of 20)
Soft-10	Disposable	Cuff, soft, SM AD, 2-tube (box of 20)
Soft-11	Disposable	Cuff, soft, ADULT, 2-tube (box of 20)
Soft-11L	Disposable	Cuff, soft, AD LONG, 2-tube (box of 20)
Soft-12	Disposable	Cuff, soft, LG AD, 2-tube (box of 20)
Soft-12L	Disposable	Cuff, soft, LG AD LONG, 2-tube (box of 20)
Soft-13	Disposable	Cuff, soft, THIGH, 2-tube (box of 20)
5082-101-1	Disposable	Neo-1 disposable cuff, male luer connector (box of 10 cuffs)

Part Number	Model	Description
5082-102-1	Disposable	Neo-2 disposable cuff, male luer connector (box of 10 cuffs)
5082-103-1	Disposable	Neo-3 disposable cuff, male luer connector (box of 10 cuffs)
5082-104-1	Disposable	Neo-4 disposable cuff, male luer connector (box of 10 cuffs)
5082-105-1	Disposable	Neo-5 disposable cuff, male luer connector (box of 10 cuffs)
008-0851-00	Disposable	Neonatal Cuff Kit, (1 each neo #1 — 5, reusable infant cuff, NIBP hose)

Blood pressure accessories (Latex free)

Part Number	Model	Description
4500-30	SureBP	Double tube blood pressure hose (5 ft)
4500-31	SureBP	Double tube blood pressure hose (10 ft)
4500-32	SureBP	Double tube blood pressure hose (8 ft)
6000-30	BP	Single tube blood pressure hose (5 ft)
6000-31	BP	Single tube blood pressure hose (10 ft)
6000-33	BP	Neonatal blood pressure hose (10 ft)
5200-08		Calibration "T" connector

Masimo pulse oximetry (for use with devices with SpO2)

Part Number	Model	Description
LNOP-DCI	LNOP	Reusable finger sensor - Adult
LNOP-DCIP	LNOP	Reusable finger sensor - Pediatric
PC-04	LNOP	4-foot cable with sensor connector
PC-08	LNOP	8-foot cable with sensor connector
LNCS-DCI	LNCS	Reusable finger sensor - Adult
LNCS-DCIP	LNCS	Reusable finger sensor - Pediatric
LNCS-ADTX	LNCS	Disposable adhesive finger sensor - Adult (20 per case)
LNCS-PDTX	LNCS	Disposable adhesive finger sensor - Pediatric (20 per case)
RED LNC-10	LNCS	10-foot cable with sensor connector
LNCS-YI	LNCS	Multisite reusable sensor (1 sensor, 6 adhesive wraps)

Part Number	Model	Description
LNCS-TC-I	LNCS	Reusable ear sensor
LNCS-Neo-L-3	LNCS	Disposable adhesive finger sensor - Neonate/Adult (20 per case)
Neo-Wrap-RP	LNCS	Replacement wrap for neonatal adhesives (100 per case)
LNCS-Inf-3	LNCS	Disposable adhesive finger sensor - Infant (20 per case)
Inf-Wrap-RP	LNCS	Replacement wrap for infant adhesives (100 per case)
YI-AD	LNCS	Multisite adhesive wrap adult/pediatric/neonatal for YI sensor (100 per case)
YI-FM	LNCS	Multisite foam wrap adult/pediatric/neonatal for YI sensor (12 per case)

Masimo Rainbow SET (for use with devices with SpO2 and SpHb)

Part Number	Model	Description
104220	Rainbow	Adult reusable sensor and 3-foot cable
104360	Rainbow	ReSposable R2-25 sample pack
104149	Rainbow	Extension cable, 20 pin, 12 feet

Nellcor pulse oximetry

Part Number	Model	Description
DS-100A	OxiMax	Durasensor adult oxygen transducer
DOC-10	OxiMax	Extension cable (10 feet)
DOC-8	OxiMax	Extension cable (8 feet)
DOC-4	OxiMax	Extension cable (4 feet)
D-YS	OxiMax	Dura-Y oxygen transducer (1 sensor, 40 wraps)
D-YSE	OxiMax	Ear clip (use with Dura-Y sensor)
D-YSPD	OxiMax	PediCheck pediatric spot check (use with Dura-Y sensor)
MAX-AI	OxiMax	OxiMax adult sensor (single use, case of 24)
MAX-PI	OxiMax	OxiMax pediatric sensor (single use, case of 24)
MAX-II	OxiMax	OxiMax infant sensor (single use, case of 24)
OXI-A/N	OxiMax	Oxiband adult/neonatal transducer (1 sensor, 50 wraps)

Part Number	Model	Description
OXI-P/I	OxiMax	Oxiband pediatric/infant transducer (1 sensor, 50 wraps)

SureTemp® Plus thermometry

Part Number	Description
02895-000	Oral probe and well kit (9ft., 2.7M)
02895-100	Rectal probe and well kit (9ft., 2.7M)
02894-0000	Oral probe well (blue)
02894-1000	Rectal probe well (red)
05031-101	Disposable probe covers (1,000 covers, packaged 25/box)
05031-110	Disposable probe covers (10,000 covers, packaged 25/box)
06138-000	Temperature calibration key

Braun ThermoScan® PRO 4000 thermometry

Part Number	Description
53020-0000	Rechargeable battery pack for the thermometer
05075-005	Disposable probe covers (5,000 covers, packaged 20/box)
05075-800	Disposable probe covers (800 covers, packaged 20/box)

Physical assessment instruments

Part Number	Description
Otoscopes	
23810	MacroView™ otoscope
23820	MacroView™ otoscope with throat illuminator
23814	MacroView™ otoscope with insufflation bulb
23824	MacroView™ otoscope with throat illuminator and insufflation bulb
25020	Diagnostic otoscope with specula
25021	Diagnostic otoscope with insufflation bulb

Part Number	Description
20201	Pneumatic otoscope without specula
20200	3.5V pneumatic otoscope with specula
20250	3.5V pneumatic otoscope with 12-diopter lens and specula
20251	Pneumatic otoscope with 12-diopter lens
21700	3.5V operating otoscope with specula
21701	3.5V operating otoscope without specula
Specula and specula dispensers	
52432-U	2.75 mm Universal KleenSpec® disposable ear specula (case of 10 bags, 850/bag)
52434-U	4.25 mm Universal KleenSpec® disposable ear specula (case of 10 bags, 850/bag)
52100-PF	Dispenser (full), large ear specula
52400-PF	Dispenser (full), small ear specula
Ophthalmoscopes	
11810	Panoptic ophthalmoscope
11820	Panoptic ophthalmoscope with cobalt blue filter and add-on corneal viewing lens
11710	Standard ophthalmoscope
11720	Coaxial ophthalmoscope
11730	AutoStep® coaxial ophthalmoscope
11735	Prestige coaxial-plus ophthalmoscope
Illuminators	
41100	Finnoff ocular transilluminator
41101	Finnoff ocular transilluminator with cobalt blue filter
43300	Curved all-purpose transilluminator
26535	Nasal illuminator (section only)
26538	Complete nasal illuminator
26035	Bivalve nasal speculum
26038	Bivalve nasal speculum with illuminator
27000	Larynx illuminator

Part Number	Description
27050	Nasopharynx illuminator
28100	Tongue blade holder
Lamps	
03100-LED	LED replacement lamp
06500-LED	LED replacement lamp
04900-LED	LED replacement lamp
03800-LED	LED replacement lamp
03100-U	Halogen replacement lamp
06500-U	Halogen replacement lamp
04900-U	Halogen replacement lamp
03800-U	Halogen replacement lamp

Weight scales and connectivity kits

For a list of approved weight scales and connectivity kits, go to www.welchallyn.com.

Miscellaneous accessories

Part Number	Description
BATT33	Replacement battery
PWCD-B	Line cord B, North America, 8'
PWCD-2	Line cord 2, Europe, 8'
PWCD-4	Line cord 4, United Kingdom, 8'
PWCD-6	Line cord 6, Australia/New Zealand, 8'
PWCD-7	Line cord 7, South Africa, 8'
6000-NC	Nurse Call Cable
6000-915	2D barcode scanner kit --scanner, mounting bracket, hardware
6000-915HS	HS1-M 2D barcode scanner with coiled USB
4500-925	USB cable for wired connectivity
660-0321-00	Patch cable, 50'

Part Number	Description
660-0320-00	Patch cable, 100'
660-0138-00	Patch cable, 5'
104279	Connex IWS shipping box
6000-50	USB memory stick

Service

Part Number	Description
103371	Barcode license
Partnership Programs for Global Use	
S1-CIWS	One-year Comprehensive Partnership Program
S1-CIWS-2	Two-year Comprehensive Partnership Program
S2-CIWS	One-year Biomed Partnership Program
S2-CIWS-2	Two-year Biomed Partnership Program
Technical Training	
CIWSSERREPW-TRN	Technical online training for Biomed
CIWSSERREP-TRN	Technical onsite training for Biomed
International Only	
PRV-001	Preventive SVC WA bench per unit
PRV-002	Preventive SVC planned onsite per unit
S4-CIWS	One-year Extended Warranty
S4-CIWS-2	Two-year Extended Warranty

Literature/Documentation

Part Number	Description
104066	CD, Directions for Use (Multi-lingual), Service Manual (English only)
4600-90E	Blood Pressure Accuracy and Variability Card-English
Directions for Use	

Part Number	Description
104069	Directions for Use, Connex Integrated Wall System, Printed Copy, English
104091	Directions for Use, Connex Integrated Wall System, Printed Copy, Spanish
104492	Directions for Use, Connex Integrated Wall System, Printed Copy, French
Quick Reference Card	
104067	Quick Reference Card, Connex Integrated Wall System, English
104068	Quick Reference Card, Connex Integrated Wall System, Spanish
104491	Quick Reference Card, Connex Integrated Wall System, French
Service Manual (English only)	
104092	Service Manual, Connex Integrated Wall System, English

Warranty

Welch Allyn warrants the product to be free of defects in material and workmanship and to perform in accordance with manufacturer's specifications for the period of one year from the date of purchase from Welch Allyn or its authorized distributors or agents. The coiled cords carry a special 10-year warranty against breakage during normal usage.

The warranty period shall start on the date of purchase. The date of purchase is: 1) the invoiced ship date if the device was purchased directly from Welch Allyn, 2) the date specified during product registration, 3) the date of purchase of the product from a Welch Allyn authorized distributor as documented from a receipt from said distributor.

This warranty does not cover damage caused by: 1) handling during shipping, 2) use or maintenance contrary to labeled instructions, 3) alteration or repair by anyone not authorized by Welch Allyn, and 4) accidents.

The product warranty is also subject to the following terms and limitations: Accessories are not covered by the warranty. Refer to the directions for use provided with individual accessories for warranty information.

A service notification number must be obtained from Welch Allyn prior to returning any products or accessories to Welch Allyn's designated service centers for repair. To obtain a service notification number, contact Welch Allyn Technical Support.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. WELCH ALLYN'S OBLIGATION UNDER THIS WARRANTY IS LIMITED TO REPAIR OR REPLACEMENT OF PRODUCTS CONTAINING A DEFECT. WELCH ALLYN IS NOT RESPONSIBLE FOR ANY INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM A PRODUCT DEFECT COVERED BY THE WARRANTY.

