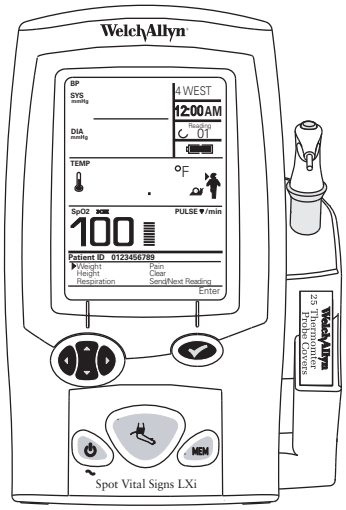
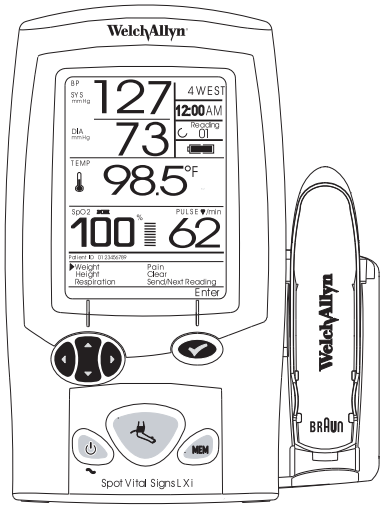
Welch Allyn Spot Vital Signs LXi





Directions for Use

Welch Allyn®

Advancing Frontline Care™

For patent information, please visit www.welchallyn.com/patents.

For information about any Welch Allyn product, contact Welch Allyn Technical Support: www.welchallyn.com/about/company/locations.htm.

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CE 0297

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Initial Configuration

Before using Spot LXi for the first time, you must program an initial configuration screen. See page 21 for more details.

Contents

1 Introduction

This Directions for Use manual is a comprehensive guide designed to help you understand the capabilities and operation of your Spot Vital Signs LXi. The information in this manual includes all options available with Spot LXi (e.g., pulse oximetry, barcode scanner, printer, mobile stand, and wall mount). The applicability of some sections of this manual depends on the configuration of your particular device. Read this manual thoroughly before attempting to use the device.

Table 1. Available Versions of Spot Vital Signs LXi

REF	Description
450T0	SureBP Technology with SureTemp Plus Thermometer
450E0	SureBP Technology with Braun ThermoScan PRO 4000 Thermometer
45MT0	SureBP Technology with Masimo SpO_2 and SureTemp Plus Thermometer
45ME0	SureBP Technology with Masimo SpO_2 and Braun ThermoScan PRO 4000 Thermometer
45NT0	SureBP Technology with Nellcor SpO_2 and SureTemp Plus Thermometer
45NE0	SureBP Technology with Nellcor SpO_2 and Braun ThermoScan PRO 4000 Thermometer
Note	Depending on destination countries, the model numbers above may have a suffix shown as 45xxx-XXX, where XXX can be any characters from 0 to 9 or from A to Z. The suffix is used to specify configuration options, which the first two XXs stand for user interface language and Direction for Use language, and the last X stands for power cord type.

Intended Use

The Spot Vital Signs LXi measures systolic and diastolic pressure (excluding neonates), pulse rate, temperature (oral, adult axillary, pediatric axillary, rectal, and ear), and pulse oximetry (SpO_2) as well as calculates Mean Arterial Pressure (MAP). Furthermore, Spot Vital Signs LXi allows the entry of height, weight, respiration rate, and pain level. Spot Vital Signs LXi also calculates Body Mass Index (BMI) following height and weight entry.

The device is intended to be used by clinicians and medically qualified personnel. It is available for sale only upon the order of a physician or licensed health care provider.

Symbols

The following symbols are associated with the Spot Vital Signs LXi.

Safety Symbols

Identifies information within the manual to avoid injury.

Caution: consult accompanying documents

Handle with Care

Storage Humidity

Class II Equipment

Type BF Equipment

Recycle the product separate from other disposables, see “Product Disposal” on page 65.

Consult operating instructions/ directions for use (DFU).
A copy of the DFU is available on this website.
A printed copy of the DFU can be ordered from Welch Allyn for delivery within 7 calendar days.

Mode of Operation: Continuous

Identifies information within the manual to avoid equipment failure.

Internally Powered, Rechargeable Lithium-Ion Battery

Transport Temperature

Recycle

IPXØ

Equipment is not protected against the ingress of liquid.

On/Off

Non-ionizing radiation (RF transmitter)

DC Power In

Reorder number

Button Symbols

Navigation Buttons

Select

Power On/Off

Blood Pressure

Memory

Connection Symbols

USB Connection

Serial Port Connection

Agency Symbols

CONFORMS TO:
UL STD 60601-1

IEC 60601-1

CE
0297

The CE mark on this product indicates that it has been tested to and conforms with the provisions noted within the 93/42/EEC Medical Device Directive.

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Related Publications

Braun ThermoScan PRO 4000 User's Guide - for models 450E0, 45NE0, 45ME0.

Masimo Directions for Use - for models 45MT0, 45ME0.

Nellcor Directions for Use - for models 45NT0, 45NE0.

Warnings and Cautions

Familiarize all operating personnel with the general safety information in this summary. Specific warnings and cautions are also found throughout this manual.

General Warnings

A warning statement in this manual identifies a condition or practice, which if not corrected or discontinued immediately, could lead to patient injury, illness, or death.

These warnings pertain to the entire Spot Vital Signs LXi device.

WARNING The information in this manual is a comprehensive guide to the operation of Spot LXi. For best results, read this manual thoroughly before using the device.

WARNING Spot LXi is designed for medical clinician use. Although this manual may illustrate medical spot-check techniques, only a trained clinician who knows how to take and interpret a patient's vital signs should use this device.

WARNING Spot LXi is not intended for use in environments that are without health care practitioner supervision.

WARNING Spot LXi is not intended for continuous monitoring. **Do not leave the device unattended while taking measurements on a patient.**

WARNING To ensure data integrity, save readings and clear the Spot LXi display between patients.

WARNING The Spot LXi is not defibrillator proof.

WARNING Spot LXi is not intended for use during patient transport.

WARNING This device is not suitable for use in the presence of a flammable anesthetic mixture with air or oxygen or nitrous oxide. An explosion may result.

WARNING To ensure patient safety, use only accessories and supplies (i.e., cuffs, hoses, temperature probes, SpO_2 sensors, etc.) recommended for or supplied with Spot LXi. Using unapproved accessories with Spot LXi can affect patient and/or operator safety.

WARNING Take care to prevent water or other fluid from entering any connectors on the device. Should this occur, dry the connectors with warm air. Check the accuracy of all operating functions.

WARNING Every three months, inspect the blood pressure cuff, SpO_2 cable, and other accessories for fraying or other damage. Replace as necessary.

WARNING Do not use Spot LXi on patients who are on heart/lung machines.

WARNING Electric shock hazard. There are no user-serviceable parts inside Spot LXi other than battery replacement (see "Battery Replacement" on page 61). An operator may only perform maintenance procedures specifically described in this manual. For service, refer the device to an Authorized Service Center.

WARNING This device is not intended for hand-held use during operation.

WARNING Do not autoclave.

WARNING This device complies with current required standards for electromagnetic interference and should not present problems to other equipment or be affected by other devices. As a precaution, avoid using this device in close proximity to other equipment.

WARNING Welch Allyn is not responsible for the integrity of any mounting installation. Welch Allyn recommends that the customer contact their Biomedical Engineering Department or maintenance service to ensure professional installation for safety and reliability of any mounting accessory.

WARNING The Spot LXi consists of high-quality precision parts. Protect it from severe impact and shock. A qualified service technician must check any Spot LXi that is dropped or damaged for proper operation prior to further use. Do not use the Spot LXi if you notice any signs of damage. Contact the Welch Allyn Customer Service Department for assistance.

WARNING Do not use an SpO_2 finger clip sensor and a blood pressure cuff simultaneously on the same limb. Doing so may result in inaccurate pulse rate and perfusion readings.

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 appropriate to the device. Connecting additional devices to the Spot LXi may increase leakage currents. To maintain operator and patient safety, it is necessary to consider the requirements of IEC 60601-1-1.

WARNING For proper patient electrical isolation, use only a Welch Allyn power supply (4500-101A) to charge Spot Vital Signs LXi.

WARNING When connecting a weight scale to the Spot LXi, only operate the scale using battery power. DO NOT use the weight scale's AC adapter power supply.

WARNING Lithium ion battery. 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 national or local regulations.

Blood Pressure Warnings

These warnings pertain to the Spot LXi blood pressure feature.

WARNING Spot LXi is not intended to measure BLOOD PRESSURE on neonatal patients. The AAMI SP10:2002 standard defines neonates as children 28 days or less of age if born at term (37 weeks gestation or more); otherwise up to 44 gestational weeks.

WARNING To ensure pediatric blood pressure accuracy and safety, the Child Reusable Two-Piece Blood Pressure Cuff (4500-01), Infant Durable One-Piece Cuff (REUSE-07-2MQ), and the Infant Disposable One-Piece Cuff (SOFT-07-2MQ) are the smallest cuffs approved for use with young children and infants. The child's arm must fit within the range markings on the cuff.

WARNING Avoid compression of the blood pressure hose or cuff tubing of Spot LXi. This may cause system errors to occur in the device.

WARNING Patients who are experiencing moderate to severe arrhythmias may give inaccurate blood pressure measurements.

WARNING Spot LXi does not operate effectively on patients who are experiencing convulsions or tremors.

WARNING Use only Welch Allyn blood pressure cuffs and/or hoses. Using other manufacturers' blood pressure cuffs and/or hoses may produce inaccurate blood pressure readings.

WARNING When several blood pressure measurements are taken on the same patient, regularly check the cuff site and extremity for possible ischemia, purpura, and/or neuropathy.

WARNING Do not place the cuff on any extremity that is used for intravenous infusions or any area where circulation is compromised.

WARNING Excessive cuff tightness may cause venous congestion and discoloration of the limb.

WARNING Wrapping the cuff too loosely (preventing proper inflation) may result in errors.

WARNING Do not change the connector(s) on the blood pressure cuff tubing of this device to luer type. Luer type connectors are commonly used in intravenous infusion systems. Using the luer connectors on blood pressure cuff tubing creates the risk that the blood pressure tubing could be mistakenly connected to a patient's intravenous line, resulting in the introduction of air into the patient's circulatory system.

Temperature Warnings

These warnings pertain to the Spot LXi temperature feature.

SureTemp® Plus

These warnings are specific to the SureTemp Plus thermometer option.

WARNING Use only Welch Allyn probe covers. Using other manufacturers' probe covers or no probe cover may produce temperature measurement errors and/or inaccuracy.

WARNING Always use a probe cover whenever coming into contact with a patient.

WARNING 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 Oral/axillary probes (blue ejection button at top of probe) and blue removable probe wells are used for taking oral and axillary temperatures only. Rectal probes (red ejection button) and red removable probe wells are used for taking rectal temperatures only. Use of the probe at the wrong site will result in temperature errors. Use of the incorrect removable probe well could result in patient cross-contamination.

WARNING The thermometer connectors and probe are not waterproof. Do not immerse or drip fluids on these items. Should this occur, dry the connectors and probe with warm air. Check all functions for proper operation and accuracy.

WARNING Do not take an axillary temperature through patient's clothing. Direct probe cover to skin contact is required.

WARNING Do not autoclave.

WARNING Use Welch Allyn single-use disposable probe covers to limit patient cross-contamination.

WARNING Incorrect insertion of probe can cause bowel perforation.

WARNING Washing hands greatly reduces the risk of cross-contamination and nosocomial infection.

WARNING To ensure optimal accuracy, always confirm that the correct mode is selected.

Braun ThermoScan PRO 4000

These warnings are specific to the Braun ThermoScan PRO 4000 thermometer option.

WARNING Keep the probe window clean, dry, and undamaged at all times to ensure accurate measurements. To protect the probe window, always keep the thermometer in the storage cover while transporting or when not in use.

WARNING Only use Braun ThermoScan probe covers with this thermometer. Using other manufacturer's probe covers or no probe cover may produce temperature measurement errors and/or inaccuracies. If the thermometer is used without a probe cover attached, clean the lens (see "Braun ThermoScan PRO 4000 Thermometer" on page 60).

WARNING Do not autoclave.

WARNING The thermometer is not waterproof. Do not immerse or drip fluids on it. Should this occur, dry the thermometer with warm air. Check for proper operation and accuracy.

SpO_2 Warnings

These warnings pertain to the Spot LXi SpO_2 feature.

WARNING Only use Spot LXi with Masimo or Nellcor SpO_2 option with Masimo or Nellcor brand sensors and accessories, respectively. Using the wrong or unapproved sensors or cables may cause improper performance.

WARNING The SpO_2 sensor and extension cables are intended for use only for pulse oximetry measurements. Do not attempt to connect these cables to a PC or any similar device.

WARNING Before using, carefully read the sensor Directions for Use, including all warnings, cautions, and instructions.

WARNING Do not use a damaged sensor or pulse oximetry cable or a sensor with exposed optical components.

WARNING Incorrect application or a long duration of use of an SpO_2 sensor may cause tissue damage. Inspect the sensor site periodically as directed in the sensor's Directions for Use.

WARNING Certain ambient environmental conditions, sensor application errors, and certain patient conditions may affect SpO_2 readings and pulse signal.

WARNING Do not immerse the sensor or patient cables in water, solvents, or cleaning solutions (the sensors and connections are not waterproof). Do not use irradiation, steam, or ethylene oxide for sterilization.

WARNING The SpO_2 in the Spot LXi device is not intended for use as an apnea monitor.

WARNING Consider the SpO_2 an early warning device. As a trend toward patient deoxygenation is indicated, use laboratory instruments to analyze blood samples to completely understand the patient's condition.

WARNING Tissue damage can be caused by incorrect application or duration of use of a Nellcor OxiMax sensor. Inspect the sensor site as directed in the sensor Directions for Use.

WARNING Do not use the sensors during magnetic resonance imaging (MRI) scanning. Induced current could potentially cause burns. The MS board pulse oximeter may affect the MRI image, and the MRI unit may affect the accuracy of the oximetry measurements.

WARNING Carefully route patient cabling to reduce the possibility of patient entanglement or strangulation.

WARNING Failure to cover the Nellcor OxiMax sensor site with opaque material in high ambient light conditions may result in inaccurate measurements.

WARNING Do not use the pulse oximeter as a replacement or substitute for ECG-based arrhythmia analysis.

General Cautions

A caution statement in this manual identifies a condition or practice, which if not corrected or discontinued immediately, could lead to equipment failure, equipment damage, or data loss.

These cautions pertain to the entire Spot Vital Signs LXi device.

Caution If the accuracy of any measurement is in question, check the patient's vital sign(s) with an alternate method and then check to verify the device is functioning properly.

Caution Place the device on a secure surface or use one of the optional mounting accessories.

Caution Do not place fluids on or near the device.

Caution It is recommended that the device is used within stated operating temperature ranges (see "Environmental" on page 55). The device will not meet its performance specifications if used outside these temperatures ranges.

Caution Always unplug the AC power transformer from the outlet before moving the mobile stand to a new location.

Caution The basket has a three-pound weight limit. Take care not to exceed this limit.

Blood Pressure Cautions

These cautions pertain to the Spot LXi blood pressure feature.

Caution Minimize extremity and cuff motion during blood pressure readings.

Caution If the blood pressure cuff is not at heart level, note the difference in reading due to the hydrostatic effect. Add the value of 1.80 mmHg (.2 kPa) to the displayed reading for every inch (2.5 cm) above heart level. Subtract the value of 1.80 mmHg (.2 kPa) from the displayed reading for every inch (2.5 cm) below heart level.

Caution Proper blood pressure cuff size and placement is essential to the accuracy of the blood pressure determination. See Reusable Two-Piece Cuff Measurements (Table 10) or Durable One-Piece Cuff Measurements (Table 11) on page 33 for sizing information.

Caution The position and physiologic condition of the subject can affect a blood pressure reading.

Temperature Cautions

These cautions pertain to the Spot LXi temperature feature.

Caution The SureTemp Plus feature only operates with the probe well in place.

Caution Biting the probe tip may result in damage to the probe.

Caution Do not use alkaline batteries in the Braun ThermoScan PRO 4000. Welch Allyn supplies a rechargeable battery pack with the Braun ThermoScan PRO 4000 thermometer.

SpO_2 Cautions

These cautions pertain to the Spot LXi SpO_2 feature.

Caution The pulse oximeter is calibrated to determine the percentage of arterial oxygen saturation of functional hemoglobin. Significant levels of dysfunctional hemoglobin such as carboxyhemoglobin or methemoglobin may affect the accuracy of the measurement.

Caution Some sensors may not be appropriate for a particular patient. If at least 10 seconds of perfusion pulses cannot be observed for a given sensor, change sensor location or sensor type for perfusion to resume.

Caution Physiological conditions, medical procedures, or external agents that may interfere with the pulse oximeter's ability to detect and display measurements include dysfunctional hemoglobin, arterial dyes, low perfusion, dark pigment, and externally applied coloring agents such as nail polish, dye, or pigmented cream.

Caution When selecting a sensor, consider the patient's weight and activity level, the adequacy of perfusion, the available sensor sites, the need for sterility, and the anticipated duration of monitoring.

Mises en gardes et avertissements

Tout le personnel d'exploitation doit connaître les consignes de sécurité générale de cette synthèse. Des mises en garde et avertissements spécifiques sont également donnés tout au long de ce manuel.

Mises en garde générales

Les mises en garde de ce manuel identifient les conditions ou pratiques qui, si elles ne sont pas corrigées ou arrêtées immédiatement, risquent de provoquer des blessures, des maladies ou le décès du patient.

Ces mises en garde ont trait à tout le dispositif du Spot Vital Signs LXi.

MISE EN GARDE Les informations de ce manuel constituent un guide complet de l'utilisation du Spot LXi. Pour obtenir les meilleurs résultats possibles, lisez attentivement ce manuel avant d'utiliser le dispositif.

MISE EN GARDE Le Spot LXi est conçu pour usage clinique médical. Bien que ce manuel puisse illustrer des techniques de surveillance médicale ponctuelle, cet instrument ne doit être utilisé que par un clinicien formé sachant comment prendre et interpréter les signes vitaux du patient.

MISE EN GARDE Le Spot LXi n'est pas destiné à être utilisé dans des environnement non supervisés par un professionnel de la santé.

MISE EN GARDE Le Spot LXi n'est pas conçu pour les surveillances en continu. **Ne laissez pas le dispositif sans surveillance lors de la prise de mesures sur un patient.**

MISE EN GARDE Pour assurer l'intégrité des données, enregistrez les mesures et effacez l'affichage du Spot LXi entre les patients.

MISE EN GARDE Le Spot LXi n'est pas conçu pour résister aux défibrillateurs.

MISE EN GARDE Le Spot LXi n'est pas destiné à être utilisé pendant le transport des patients.

MISE EN GARDE Ce dispositif n'est pas adapté aux utilisations en présence d'un mélange anesthésique inflammable contenant de l'air, de l'oxygène ou de l'oxyde nitreux. Une explosion pourrait se produire.

MISE EN GARDE Pour garantir la sécurité du patient, utilisez seulement les accessoires et fournitures (par ex., brassards, sondes de température, détecteurs de SpO_2, capteurs, etc.) recommandés pour, ou fournis avec, le Spot LXi. L'utilisation d'accessoires non approuvés pour le Spot LXi est nuisible à la sécurité du patient et/ou de l'opérateur.

MISE EN GARDE Veillez à éviter que de l'eau ou d'autres fluides pénètre(nt) dans l'un des connecteurs du dispositif. Si cela se produisait, séchez les connecteurs avec de l'air chaud. Vérifiez l'exactitude de toutes les fonctions opérationnelles.

MISE EN GARDE Tous les trois mois, inspectez le brassard, le câble du SpO_2 et les autres accessoires pour vérifier qu'ils ne sont pas effilochés ni autrement endommagés. Remplacez-les si nécessaire.

MISE EN GARDE N'utilisez pas le Spot LXi sur des patients raccordés à des appareils cardiaques/respiratoires.

MISE EN GARDE Risque d'électrocution. Outre la batterie qui peut être remplacée (see "Battery Replacement" on page 61) aucune pièce pouvant être entretenue par l'utilisateur ne se trouve à l'intérieur du Spot LXi. Chaque opérateur ne peut effectuer que les procédures de maintenance spécifiquement décrites dans ce manuel. Pour l'entretien du dispositif, consultez un centre d'entretien agréé.

MISE EN GARDE Ce dispositif n'est pas destiné à être tenu à la main pendant son fonctionnement.

MISE EN GARDE Ne passez pas à l'autoclave.

MISE EN GARDE Ce produit satisfait aux normes actuelles en vigueur concernant les interférences électromagnétiques et ne devrait ni affecter, ni être affecté par les autres appareils. Par mesure de précaution, évitez d'utiliser ce produit très près d'un autre appareil.

MISE EN GARDE Welch Allyn n'est pas responsable de l'intégrité de l'installation de support quelle qu'elle soit. Welch Allyn recommande au client de contacter son service d'ingénierie biomédicale ou son service de maintenance pour veiller à ce tout accessoire d'installation soit monté de manière professionnelle et respecte les critères de sécurité et de fiabilité.

MISE EN GARDE Le Spot LXi est constitué de pièces de précision de grande qualité. Protégez-le des impacts et chocs importants. Avant d'être utilisé à nouveau, tout Spot LXi qui est tombé ou endommagé doit être vérifié par un technicien d'entretien qualifié qui s'assurera de son bon fonctionnement. N'utilisez pas le Spot LXi en cas de signe d'endommagement. Contactez le service clientèle Welch Allyn pour assistance.

MISE EN GARDE N'utilisez pas simultanément un capteur de doigt SpO_2 et un brassard sur le même membre. Ceci risquerait d'entraîner des lectures inexactes de la fréquence du pouls et de la perfusion.

MISE EN GARDE Tous les connecteurs d'entrée et de sortie du signal (I/O) sont conçus pour le branchement uniquement d'appareils conformes aux normes CEI 60601-1, ou autres normes CEI (par exemple, CEI 60950), selon ce qui est adapté à l'appareil. Le branchement d'autres appareils au Spot LXi peut augmenter le courant de fuite. Pour assurer la sécurité de l'opérateur et du patient, il est nécessaire de prendre en compte les exigences de la norme CEI 60601-1-1.

MISE EN GARDE Pour une isolation électrique appropriée du patient, utiliser exclusivement une alimentation Welch Allyn (4500-101 A) pour charger le Spot Vital Signs LXi.

MISE EN GARDE Lorsqu'une balance est raccordée au Spot LXi, utiliser la balance uniquement avec une batterie. NE PAS utiliser l'adaptateur d'alimentation c.a. de la balance.

MISE EN GARDE Batterie lithium-ion. Risque d'incendie, d'explosion et de brûlures. Ne mettez pas la batterie en court-circuit, ne l'écrasez pas, ne l'incinérez pas et ne la démontez pas. Ne jetez jamais les batteries à la poubelle. Les batteries doivent toujours être recyclées conformément aux réglementations locales.

Mises en garde relatives à la pression artérielle

Ces mises en garde ont trait à la fonction de pression artérielle du Spot LXi.

MISE EN GARDE Le Spot LXi n'est pas destiné à mesurer la PRESSION ARTÉRIELLE des nouveau-nés. La norme AAMI SP10:2002 définit les nouveau-nés comme les enfants âgés de 28 jours au plus s'ils sont nés à terme (37 semaines de gestation minimum) ; ou les enfants jusqu'à 44 semaines de gestation maximum.

MISE EN GARDE Pour assurer l'exactitude et la sécurité des mesures de pression artérielle pédiatrique, le brassard pédiatrique à deux pièces (4500-01), le brassard pour nourrissons mono-pièce longue durée (REUSE-07-2MQ), et le brassard pour nourrissons mono-pièce à usage unique (SOFT-07-2MQ) sont les plus petits brassards approuvés pour les jeunes enfants et les nourrissons. Le bras de l'enfant doit être compris entre les marques limites de plage d'utilisation figurant sur le brassard.

MISE EN GARDE Évitez de comprimer le flexible de pression artérielle ou la tubulure du brassard du Spot LXi. Ceci risque de provoquer des erreurs système au niveau du dispositif.

MISE EN GARDE Les patients souffrant d'arythmies légères à grave peuvent donner lieu à des mesures inexactes de la pression artérielle.

MISE EN GARDE Le Spot LXi ne fonctionne pas efficacement sur des patients qui sont en crise de convulsions ou de tremblements.

MISE EN GARDE Utilisez exclusivement les brassards et/ou les tubulures de Welch Allyn. Utiliser les brassards et/ou les tubulures d'autres fabricants risque de provoquer des mesures inexactes de la pression artérielle.

MISE EN GARDE Si plusieurs mesures de pression artérielle sont prises sur le même patient, inspectez régulièrement le site du brassard et les extrémités pour vérifier l'absence de d'ischémie, de purpura et/ou de neuropathie.

MISE EN GARDE Ne placez pas le brassard sur un membre servant à une perfusion intraveineuse ou une zone dont la circulation est ou pourrait être compromise.

MISE EN GARDE Un brassard trop serré risque d'entraîner une congestion veineuse et la décoloration du membre.

MISE EN GARDE Ne pas serrer suffisamment le brassard (ce qui empêche de le gonfler correctement) risque de provoquer des erreurs.

MISE EN GARDE Ne pas changer le(s) connexion(s) de la tubulure du brassard de ce dispositif avec des connexions de type luer. Ces dernières s'utilisent généralement dans le cas d'intraveineuses. L'utilisation de connexions de type luer sur les tubulures du brassard présente le risque de voir la tubulure du brassard connectée par erreur au système d'intraveineuse du patient, ce qui peut entraîner l'introduction d'air dans le système circulatoire du patient.

Mises en garde relatives à la température

Ces mises en garde ont trait à la fonction de température du Spot LXi.

SureTemp® Plus

Ces mises en garde sont spécifiques à l'option du thermomètre SureTemp Plus.

MISE EN GARDE Utilisez exclusivement les protections Welch Allyn. L'utilisation de protections de sonde d'un autre fabricant ou la non-utilisation d'une protection de sonde risque de produire une prise de température erronée et/ou inexacte.

MISE EN GARDE Toujours utiliser un embout de sonde lors du contact avec un patient.

MISE EN GARDE Pour des relevés précis, il est recommandé d'effectuer un relevé continu de 3 minutes pour le site oral et le site rectal, et de 5 minutes pour le site axillaire. Ne pas effectuer un relevé continu de plus de 10 minutes, dans quelque mode que ce soit.

MISE EN GARDE Les sondes orales/axillaires (bouton d'éjection bleu au-dessus de la sonde) et le puits de sonde oral/axillaire amovible bleu sont utilisés exclusivement pour les prises de température orales et axillaires. Les sondes rectales (bouton d'éjection rouge) et le puits de sonde amovible rouge sont utilisés exclusivement pour les prises de température rectales. L'utilisation de la sonde dans un site incorrect entraîne des erreurs de température. L'utilisation du puits de sonde amovible incorrect risque d'entraîner une contamination croisée entre patients.

MISE EN GARDE Les connecteurs du thermomètre et la sonde ne sont pas étanches. N'immergez pas ces éléments et ne faites pas tomber de gouttes dessus. Si cela se produisait, séchez les connecteurs et la sonde avec de l'air chaud. Vérifiez ensuite que toutes les fonctions sont bien opérationnelles et fournissent des résultats exacts.

MISE EN GARDE Ne prenez pas la température axillaire au-dessus des vêtements du patient. La sonde doit toucher directement la peau.

MISE EN GARDE Ne pas passer à l'autoclave.

MISE EN GARDE Utilisez des protections de sonde à usage unique et jetables afin de limiter la contamination croisée entre patients.

MISE EN GARDE L'insertion incorrecte de la sonde risque de provoquer la perforation des selles.

MISE EN GARDE Se laver les mains réduit considérablement le risque de contamination croisée entre les patients et le risque d'infection hospitalière.

MISE EN GARDE Pour vous assurer d'obtenir une exactitude optimale, assurez-vous toujours que le mode approprié est sélectionné.

Braun Thermoscan PRO 4000

Ces mises en garde sont spécifiques à l'option du thermomètre Braun ThermoScan PRO 4000.

MISE EN GARDE Maintenez à tout moment la fenêtre de la sonde propre, sèche et sans dommages pour vous assurer de l'exactitude des mesures. Pour protéger la fenêtre de la sonde, gardez toujours le thermomètre dans sa protection de rangement lorsque vous ne le transportez pas ou ne l'utilisez pas.

MISE EN GARDE Utilisez exclusivement les protections de sonde Braun ThermoScan avec ce thermomètre. L'utilisation de protections de sonde d'un autre fabricant ou la non-utilisation d'une protection de sonde risque de produire une prise de température erronée et/ou inexacte. Si le thermomètre est utilisé sans protection de sonde, nettoyez la lentille (see "Braun ThermoScan PRO 4000 Thermometer" on page 60).

MISE EN GARDE Ne passez pas à l'autoclave.

MISE EN GARDE Le thermomètre n'est pas étanche. Ne l'immergez pas et ne faites pas tomber de gouttes dessus. Si cela se produisait, séchez le thermomètre avec de l'air chaud. Vérifiez ensuite qu'il fonctionne et fournit des résultats exacts.

Mises en garde relatives au SpO_2

Ces mises en garde ont trait à la fonction Spot LXi SpO_2.

MISE EN GARDE Utilisez exclusivement Spot LXi et l'option Masimo ou Nellcor SpO_2 avec les capteurs et accessoires de la marque Masimo ou Nellcor, respectivement. Utiliser des capteurs ou des câbles incorrects ou non approuvés risque d'entraîner des performances incorrectes.

MISE EN GARDE Le capteur et les câbles d'extension SpO_2 sont destinés à être utilisés exclusivement pour les mesures d'oxymétrie du pouls. N'essayez pas de connecter ces câbles à un PC ou à un dispositif similaire.

MISE EN GARDE Avant d'utiliser le capteur, lisez attentivement son mode d'emploi, dont l'ensemble des mises en garde, avertissements et instructions.

MISE EN GARDE N'utilisez pas un capteur ou un câble d'oxymétrie de pouls endommagé et n'utilisez pas un capteur dont les composants optiques sont exposés.

MISE EN GARDE Une application ou une durée inappropriée d'utilisation du capteur du SpO_2 risque d'entraîner l'endommagement des tissus. Inspectez régulièrement le site occupé par le capteur conformément au mode d'emploi de celui-ci.

MISE EN GARDE Certaines conditions de l'environnement ambiant, des erreurs d'application du capteur et certaines conditions du patient risquent d'avoir un impact sur les mesures du SpO_2 et sur le signal du pouls.

MISE EN GARDE N'immergez pas le capteur ou les câbles du patient dans de l'eau, des solvants ou des solutions de nettoyage (les capteurs et les connexions ne sont pas étanches). N'utilisez pas d'irradiations, de vapeur ou d'oxyde d'éthylène pour la stérilisation.

MISE EN GARDE Le SpO_2 du dispositif Spot LXi n'est pas destiné à être utilisé en tant que moniteur d'apnée.

MISE EN GARDE Considérez le SpO_2 comme un dispositif de mise en garde précoce. Si une tendance vers la désoxygénation du patient est indiquée, utilisez des instruments de laboratoire pour analyser des échantillons sanguins afin de bien comprendre la condition du patient.

MISE EN GARDE Une application ou une durée inappropriée d'utilisation du capteur du Nellcor OxiMax peut entraîner l'endommagement des tissus. Inspectez le site occupé par le capteur conformément au mode d'emploi de celui-ci.

MISE EN GARDE N'utilisez pas les capteurs pendant les scannages MRI (imagerie par résonance magnétique). Le courant induit risque de provoquer des brûlures éventuelles. L'oxymètre de pouls de la carte MS risque d'avoir un impact sur l'image MRI, et l'unité MRI risque d'avoir un impact sur l'exactitude des mesures d'oxymétrie.

MISE EN GARDE Acheminez avec soin les câbles du patient pour réduire le risque d'emmêlement ou d'étranglement du patient.

MISE EN GARDE Ne pas recouvrir le site du capteur de Nellcor OxiMax avec un matériau opaque lorsque l'éclairage ambiant est fort risque d'entraîner des mesures inexactes.

MISE EN GARDE Ne pas utiliser l'oxymètre de pouls comme appareil de remplacement pour l'analyse de l'arythmie par ECG.

Avertissements généraux

Les avertissements de ce manuel identifient les conditions ou pratiques qui, si elles ne sont pas corrigées ou arrêtées immédiatement, risquent de provoquer des défaillances ou des endommagements des équipements ou encore des pertes de données.

Ces avertissements ont trait à tout le dispositif du Spot Vital Signs LXi.

Avertissement Si l'exactitude d'une mesure quelconque est en doute, vérifiez le(s) signe(s) vital(aux) du patient par une autre méthode, puis vérifiez que le dispositif fonctionne correctement.

Avertissement Vérifiez que le dispositif est placé sur une surface fixe ou utilisez l'un des accessoires de fixation en option.

Avertissement Ne placez pas de liquides sur ou à proximité du dispositif.

Avertissement Nous recommandons d'utiliser le dispositif dans les plages de température opérationnelle indiquées (see "Environmental" on page 55). Le dispositif ne sera pas conforme aux performances spécifiées s'il est utilisé hors de ces plages de température.

Avertissement Débranchez toujours le transformateur d'alimentation C.A. de la prise avant de placer le pied mobile dans un nouvel endroit.

Avertissement La capacité du panier est limitée à 1,32 kg. Il est donc important de ne pas dépasser cette limite.

Avertissements relatifs à la pression artérielle

Ces avertissements ont trait à la fonction de pression artérielle du Spot LXi.

Avertissement Minimisez les déplacements des extrémités et du brassard pendant les mesures de la pression artérielle.

Avertissement Si le brassard ne se trouve pas au même niveau que le cœur, notez la différence de lecture due à l'effet hydrostatique. Ajoutez 1,80 mm Hg (0,2 kPa) à la valeur affichée pour chaque pouce (2,5 cm) au-dessus du niveau du cœur. Soustrayez 1,80 mm Hg (0,2 kPa) de la valeur affichée pour chaque pouce (2,5 cm) au-dessous du niveau du cœur.

Avertissement Pour obtenir des lectures exactes de la pression artérielle, il est essentiel que le brassard soit d'une taille appropriée et placé correctement. Reportez-vous à Mesures avec un brassard à deux pièces réutilisable (Table 10) ou à Mesures avec un brassard mono-pièce longue durée (Table 11) à la page 33 pour de plus amples informations sur la taille.

Avertissement La position et la condition physiologique du sujet peuvent avoir un impact sur la mesure de la pression artérielle.

Avertissements relatifs à la température

Ces avertissements ont trait à la fonction de température du Spot LXi.

Avertissement La fonction SureTemp Plus ne fonctionne que lorsque le puits de sonde est en place.

Avertissement Ne pas mordre l'embout de la sonde pour ne pas l'endommager.

Avertissement Ne pas utiliser de piles alcalines dans le Braun ThermoScan PRO 4000. Welch Allyn fournit une batterie rechargeable avec le thermomètre Braun ThermoScan PRO 4000.

Avertissements relatifs au SpO_2

Ces avertissements ont trait à la fonction Spot LXi SpO_2.

Avertissement L'oxymètre de pouls est calibré de façon à déterminer le pourcentage de la saturation artérielle en oxygène de l'hémoglobine fonctionnelle. Des teneurs importantes en hémoglobine dysfonctionnelle comme la carboxyhémoglobine et la méthémoglobine peuvent altérer l'exactitude de la mesure.

Avertissement Certains capteurs peuvent s'avérer inappropriés pour un patient donné. Si vous ne parvenez pas à observer un minimum de 10 secondes de pulsations de perfusion sur un capteur donné, changez l'emplacement du capteur ou le type du capteur jusqu'à ce que cette observation soit faite.

Avertissement Les conditions physiologiques, les procédures médicales ou les agents externes pouvant interférer avec la capacité de l'oximètre du pouls de détecter et d'afficher les mesures incluent l'hémoglobine dysfonctionnelle, les colorants artériels, les perfusions faibles, les pigments foncés et les agents colorants à application externe tels que les vernis à ongle, les teintures ou les crèmes pigmentées.

Avertissement Lorsque vous sélectionnez un capteur, considérez le poids et le niveau d'activité du patient, le caractère adéquat de la perfusion, le site de capteur disponible, les besoins en matière de stérilité et la durée anticipée de la surveillance.

Contents Checklist

Unpack the Spot LXi and any applicable accessories and then inspect for missing items. Retain the shipping materials in the event of shipping damage or for return, if necessary, to Welch Allyn for repair or warranty service. Report any signs of shipping damage to the carrier. Report any missing or damaged items to the Welch Allyn Service Center near you.

All Spot LXi devices include the following components:

Spot LXi Device. This device measures and displays blood pressure, pulse rate, and temperature.

Directions for Use Manual. Read this manual thoroughly before using Spot LXi. Save this manual for reference.

Warranty Card. This card validates the Spot LXi warranty. Fill out the warranty card and mail it today.

Blood Pressure Cuff. One cuff with connectors. Other size cuffs are available separately.

Blood Pressure Hose. Latex-free pressure hose with connectors to attach various sizes of blood pressure cuffs to the Spot LXi.

AC Power Transformer and Cord Assembly. Provides power to the Spot LXi and charges the internal battery.

Quick Reference Card. Attach this quick operating guide to the device handle, mobile stand, or wall mount.

Possible Attachments

Spot LXi may include the following items based on the model and accessories purchased:

SureTemp Plus Temperature Probe, Well, and Covers. One oral temperature probe (blue ejection button and well) and one box of 25 single-use, disposable probe covers.

Braun ThermoScan PRO 4000 Thermometer and Covers. One ear thermometer; one box of 20 single-use, disposable probe covers; one rechargeable battery pack; and one lock release pin.

Barcode Scanner and Mounting Bracket. Attach these items on the basket of the mobile stand or wall mount.

Pulse Oximetry (SpO_2). The finger clip SpO_2 sensor and extension cable are for use with adult and pediatric patients. Other sensors are available separately.

2 Controls, Display Window, and Connections

Drawings and text are representative of Spot Vital Signs LXi with all available options. Your device may not include all functions based on the model purchased.

Controls

Figure 1. Spot LXi Front Panel with SureTemp Plus Thermometer

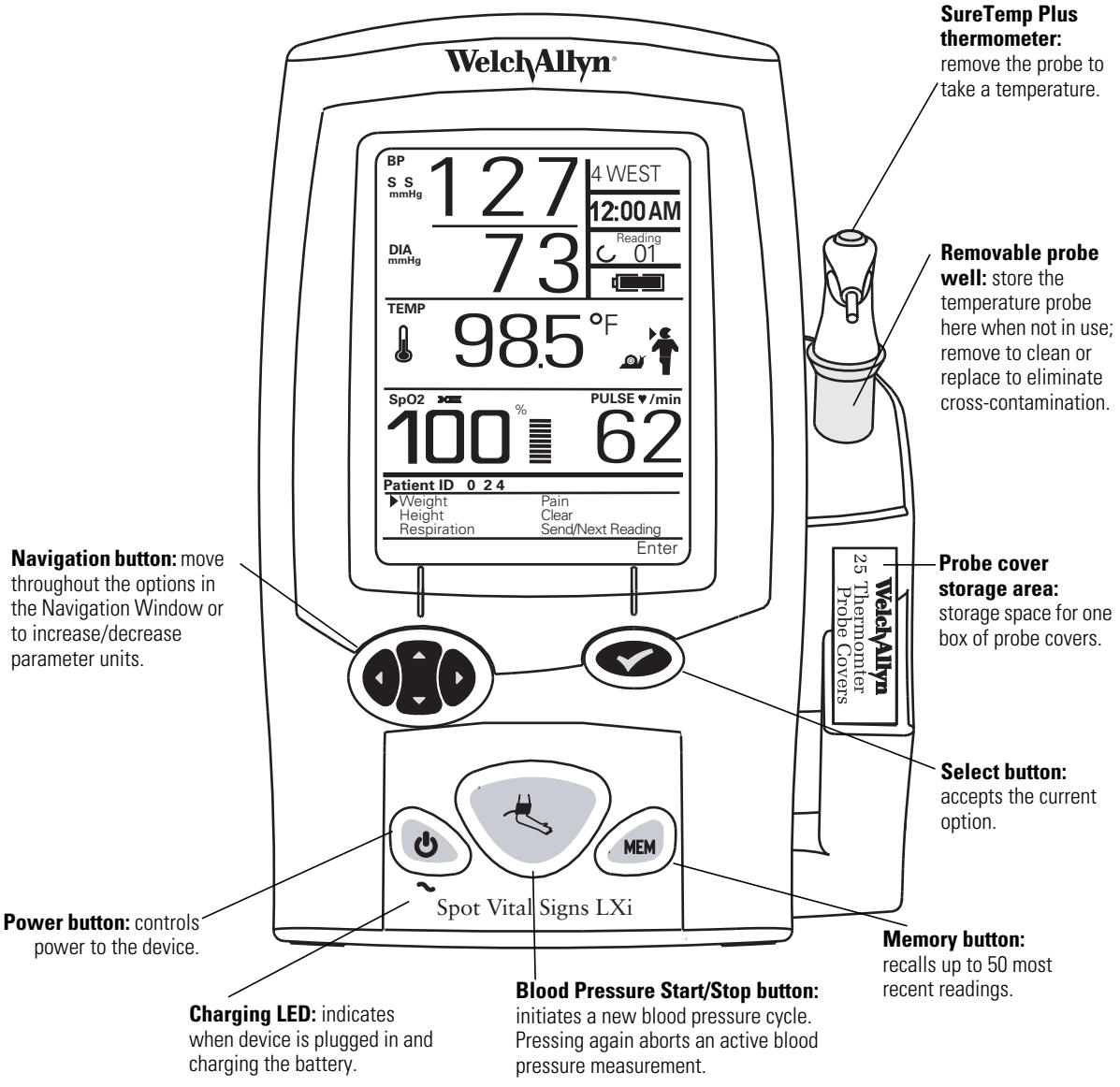
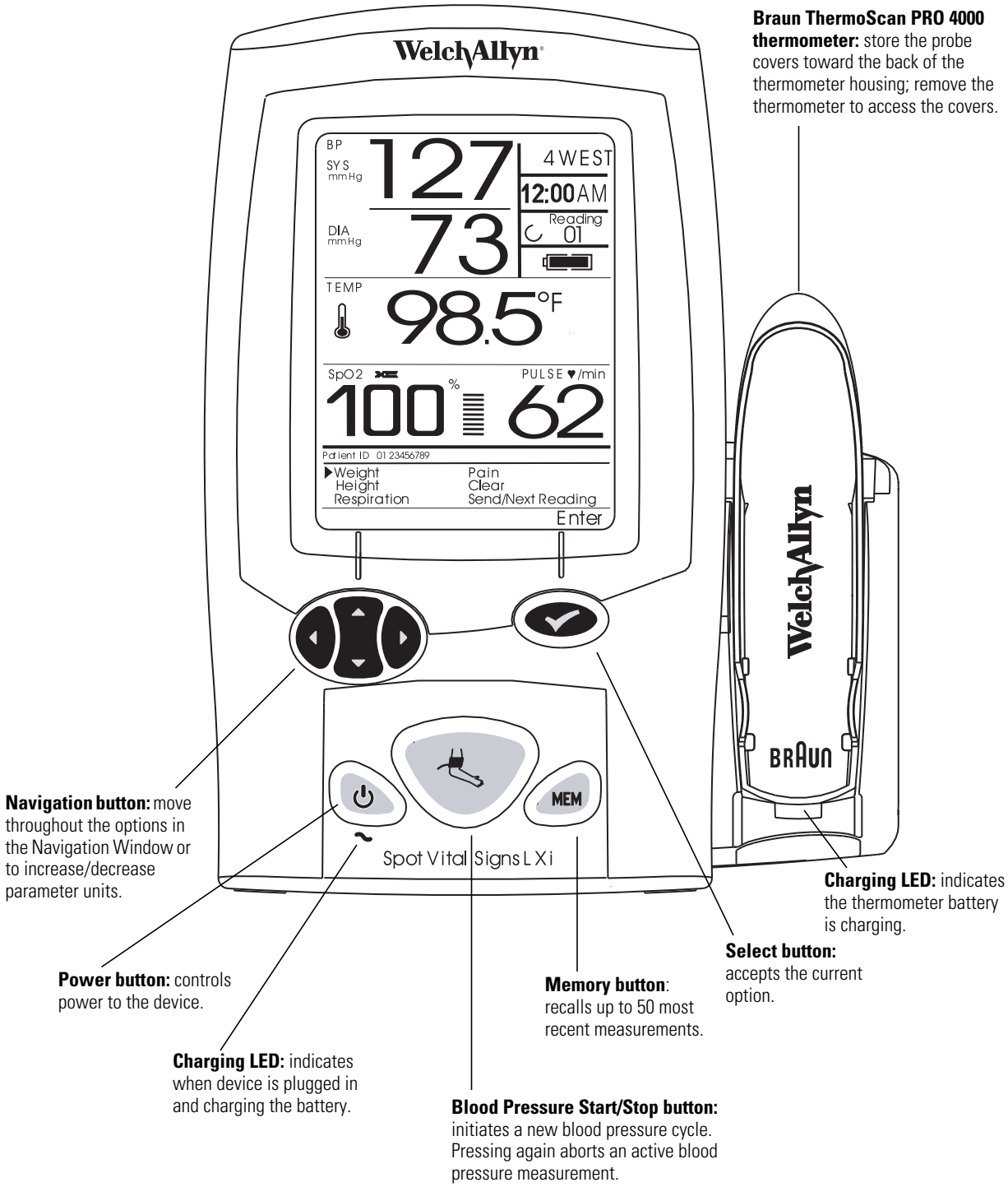


Figure 2. Spot LXi Front Panel with Braun ThermoScan PRO 4000 Thermometer

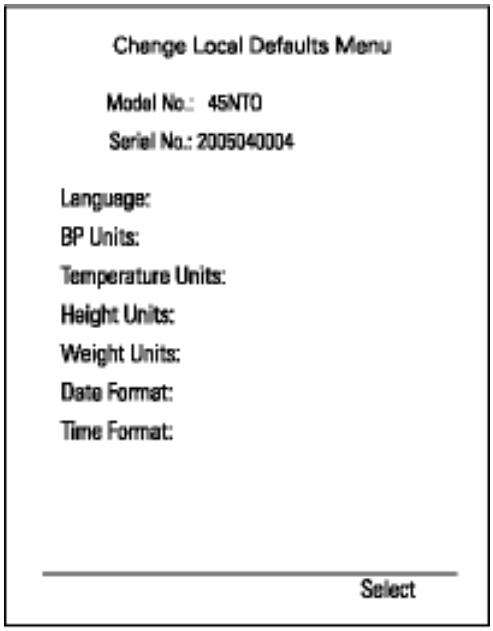


Display Window

Before using Spot LXi for the first time, you must program an initial configuration screen.

1. Press the **Power** button. The display window shows the initial configuration screen.

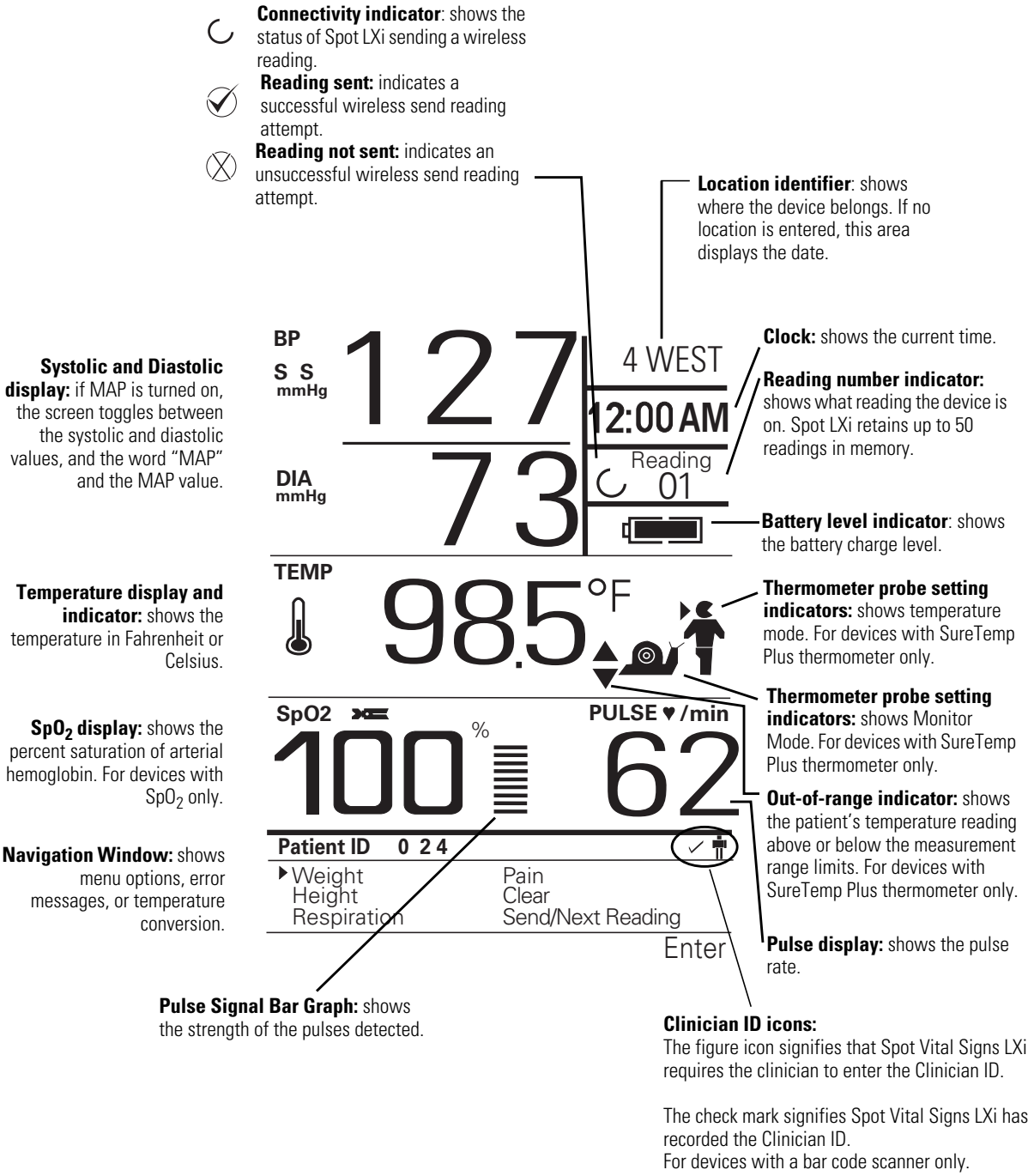
Figure 3. Initial Configuration Screen



2. Use the **Select** button to access the options and accept the entries, and use the **Navigation** buttons to move through the menu.
3. The word "Exit" appears at the bottom of the list after you have programmed all items in the menu. You must program all items before you can start to use the device.
4. Scroll to Exit and press the **Select** button to save the entries.

The liquid crystal display (LCD) may indicate any of the following: systolic blood pressure (mmHg or kPa), diastolic blood pressure (mmHg or kPa), MAP (mmHg or kPa), temperature (°F or °C), temperature mode, pulse rate, pulse signal level, SpO_2 percent, department location, date, time, record number, height (in or cm), weight (lb or kg), respiration rate, pain level, connectivity signal strength, and battery charge level.

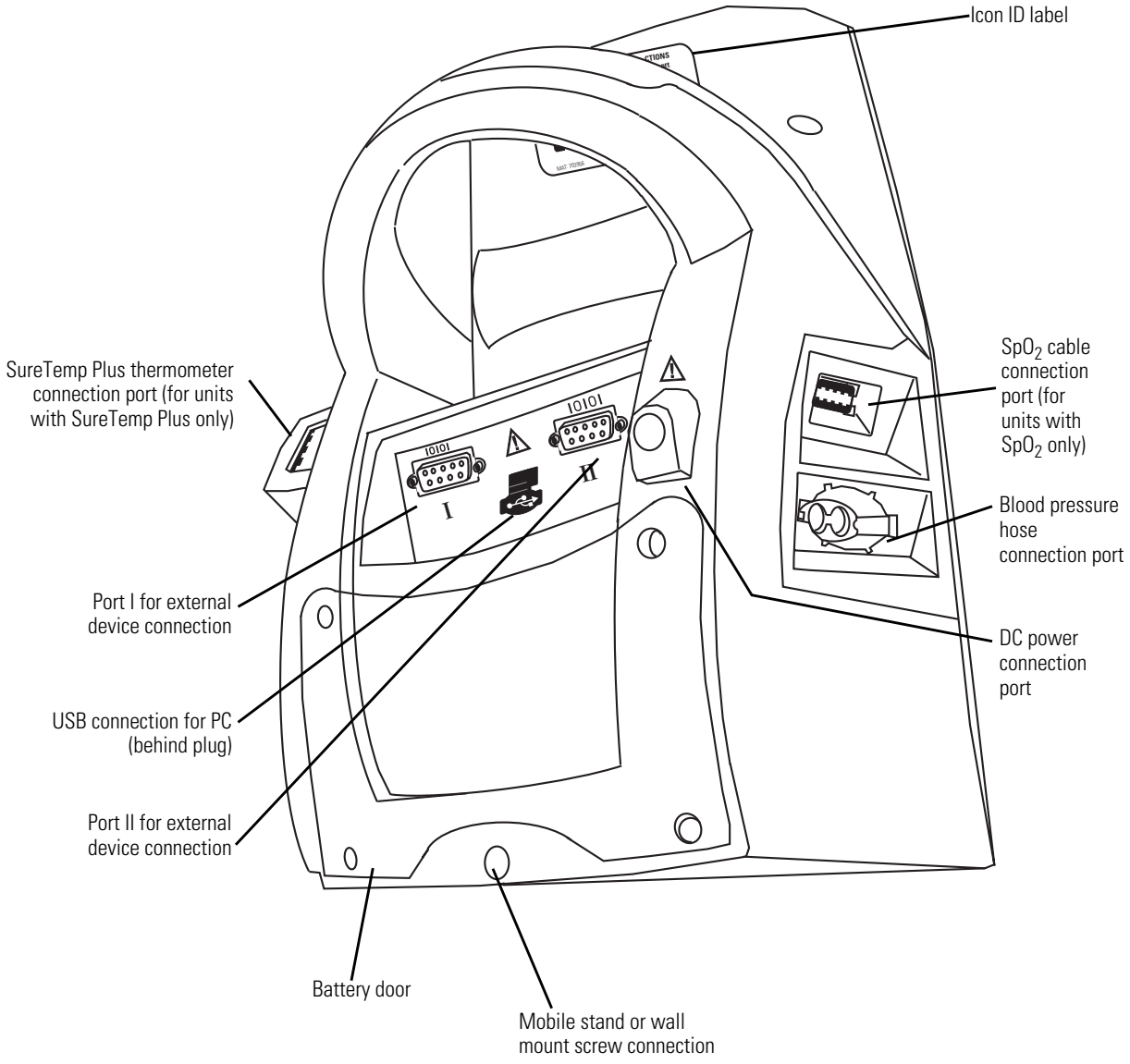
Figure 4. Display Window



Connections

Use the following instructions to connect the blood pressure hose, thermometer probe, and optional attachments to the Spot Vital Signs LXi.

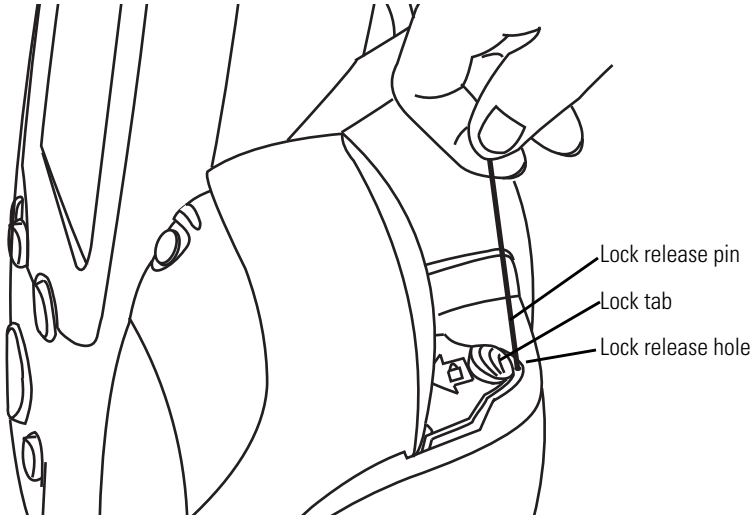
Figure 5. Spot LXi Side and Rear Panel Connections



Braun ThermoScan PRO 4000 Lock

Press the lock tab toward the Braun ThermoScan PRO 4000 thermometer until it clicks. To release the housing, insert the lock release pin into the lock release hole until the lock tab snaps back.

Figure 6. Spot LXi with Braun ThermoScan PRO 4000 Lock



Blood Pressure Hose and Cuff

Identify and have available the Spot LXi, blood pressure cuff, and the blood pressure hose.

1. Inspect the blood pressure hose; notice that one end has a single, gray connector fitting and the other end has two white fittings.
2. Squeeze the side tabs on the gray connector and completely push the blood pressure hose connector into the blood pressure hose connection port until it clicks into place (see Figure 5 on page 23).
3. Twist the white connectors on the blood pressure hose and cuff connectors together.

Thermometer

Spot LXi is available with either the SureTemp Plus thermometer or the Braun ThermoScan PRO 4000 thermometer.

SureTemp Plus

SureTemp Plus is available with two probes and matching wells; one for oral/axillary temperatures (blue ejection button and probe well) and one for rectal temperatures (red ejection button and probe well). The rectal probe and well are accessory items that are sold separately (see "Temperature" on page 68).

WARNING Always use a probe cover whenever coming into contact with a patient.

Caution The SureTemp Plus feature only operates with the probe well in place.

1. Align the probe well with the tabs facing up and down into the round opening of the SureTemp Plus housing on the right side of Spot LXi. Push it into place.
2. Align the temperature probe connector with the SureTemp Plus thermometer connection port on the back of the Spot LXi (see Figure 5 on page 23). You can only insert the connector into the port one way.
3. Press the tab on the connector and push it until it clicks into place.
4. Insert the temperature probe into the probe well.

Braun ThermoScan PRO 4000

Caution Do not use alkaline batteries in the Braun ThermoScan PRO 4000. Welch Allyn supplies a rechargeable battery pack with the Braun ThermoScan PRO 4000 thermometer.

1. Open the package of rechargeable batteries and follow the installation guide provided.
2. Open the box of probe covers as directed on the box and slide the box into the metal guides toward the back of the thermometer housing with the opening at the top and perforation facing forward.
3. Hold the Braun thermometer at a 45° angle then insert the probe and the top of the thermometer into the housing.
4. Lower the bottom portion of the thermometer into the housing until it snaps into place. If you do not properly seat the thermometer, it could fall out of the holder and become damaged.
5. Slide the thermometer housing into the thermometer slot on the right side of the Spot LXi device.
6. Push the lock tab forward to prevent the thermometer housing from falling out of Spot LXi (see Figure 6 on page 24).

   To release the lock, insert the lock release pin into the lock release hole.

SpO_2 Sensor

Spot LXi is available with a wide variety of SpO_2 sensors and ships with a reusable finger clip sensor. All other sensors are accessory items that are sold separately (see "Pulse Oximetry" on page 69).

1. Align the shape and pin configuration of the extension cable connector to the SpO_2 cable connection port on the left side of the Spot LXi device.
2. Push the connector firmly into the SpO_2 cable connection port until you hear it click into place (see Figure 5 on page 23).
3. Align the opposite end of the extension cable to the sensor cable connector and firmly push them together.

WARNING Use only Masimo or Nellcor SpO_2 sensors and accessories with the Spot LXi with Masimo or Nellcor configurations, respectively. Using the wrong or unapproved sensors or cables may cause improper performance.

Quick Reference Card

Attach the Quick Reference Card to the Spot LXi handle, mobile stand, or wall mount using the supplied plastic cable tie.

AC Power Transformer

The operator can use the Spot LXi with AC or battery power (after charging the battery).

1. Insert the round transformer connector into the AC power connection port on the back of the Spot LXi (see Figure 5 on page 23).
2. Insert the line cord into the line connector on the transformer then plug the power cord on the transformer into the AC main power source to charge the battery.

Battery

Charge the Spot LXi lithium-ion battery for 8 hours before initial use.

Charge the device an additional hour if it includes a Braun ThermoScan PRO 4000 thermometer.

While Spot LXi is charging, the charging LED (~) flashes and the battery level indicator segments on the display continuously sequence. When the battery is fully charged, the charging LED stops flashing and the battery level indicator will stop sequencing.

If the device includes a Braun ThermoScan PRO 4000 thermometer, the charging LED below the thermometer will illuminate orange as it is charging. When the battery is fully charged, the LED will power off.

Note There is no hazard associated with leaving the battery in the device, even if the device is not used for long periods of time.

A dead battery may result if the Spot LXi is left uncharged or shipped/stored for a long period of a time. If this occurs use the supplied transformer to plug the Spot LXi into the AC line. In extreme cases, the charge condition LED does not blink (to indicate a fast charge) or the device loses the time and date stamp. If this happens unplug the accessories and plug the Spot LXi into the AC line using the appropriate adapter. If the Spot LXi still fails to indicate a fast charge, unplug the AC adapter, disconnect and reconnect the battery, and plug in the AC adapter. Leave unused for two hours.

As the battery charge level decreases, the battery indicator segments turn off left to right. The device is usable as long as all four battery segments are lit. If less than all four segments are lit, recharge the battery.

Power On/Off

Press the **Power** button to turn the device on or off. Upon each power up, the display lights up, a beep sounds, and the Spot LXi displays the model and serial numbers. If the internal self-check is successful, the display shows its normal functions (see Figure 4 on page 22) with all values blank, and the device is ready for operation. If the self-check fails, an error code is shown in the Navigation Window.

Spot LXi automatically powers off when not used for 30 minutes.

Standby Mode

The Standby Mode conserves battery power. The device goes into Standby Mode if it is not used for two minutes. Press any button to bring the Spot LXi out of Standby Mode.

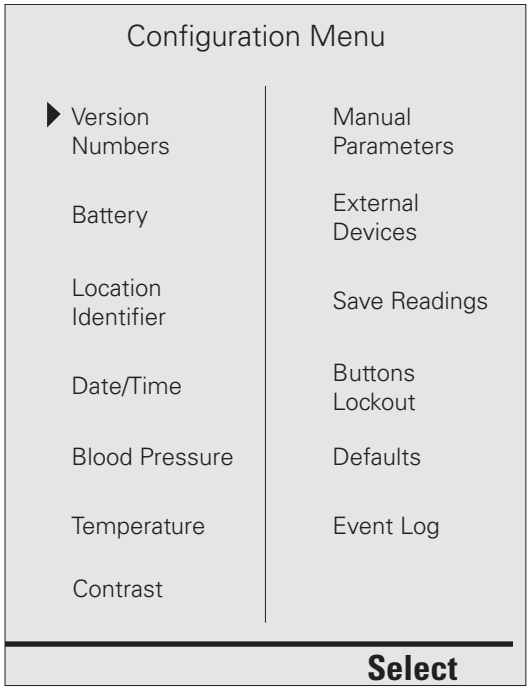
3 Internal Configuration

You can change several device operating parameters in the Internal Configuration Mode. When changed, these settings become the default power-up settings. You will also see non-changeable device configurations for technical service purposes.

To Enter the Internal Configuration Mode:

1. Turn the Spot LXi off.
2. Press and hold the **Select** and **Power** buttons for 5 seconds. The device enters the Internal Configuration Mode and the Configuration Menu screen appears on the display.

Figure 7. Internal Configuration Mode Menu



3. Use the **Navigation** buttons to move through the menu options and then press the **Select** button to access the options or accept a change. See the following tables for descriptions of the menu options.
4. Press the **Power** button to exit the Internal Configuration Mode.

Setting	Description
Version Numbers*	Displays the software and hardware version numbers in the Spot LXi device.
Battery*	Displays the battery level.
Location Identifier	Allows the entry of the device's location (e.g., the department name). Follow the display prompts to enter up to 10 characters.
Date/Time	Changes the date and time formats or updates the actual date and time. See Table 3, "Date/Time Menu Options" for available settings.
Blood Pressure	Changes the blood pressure options. See Table 4, "Blood Pressure Menu Options" for available settings.
Temperature	Changes the temperature options. See Table 5, "Temperature Menu Options" for available settings.
Contrast	Changes the Display Contrast options. Use the left/right navigation buttons to adjust.
Manual Parameters	Changes the manual parameters defaults. See Table 6, "Manual Parameters Menu Options" for available settings.
External Devices	Enables or disables available external devices. See Table 7, "External Devices Menu Options" for available settings.
Save Readings	Saves the current patient reading at a preselected time interval or upon request. See Table 8, "Save Readings Menu Options" for available settings.
Buttons Lockout	Secures Spot LXi so unauthorized people cannot use the device or access data without enacting the proper key sequence.
Defaults	Allows the user to select the default settings for the device and reset the unit to the default settings. See Table 9, "Change Local Defaults Options" for available settings.
Event Log*	Displays the recent button presses, errors, measurements, measurement sites, battery state changes, and patient reading send events.

* Displayed information only; operator cannot change.

Setting	Description
Date Format	Displays the date in one of the following styles: • mm/dd/yyyy example: July 16, 2005 = 07/16/2005 • dd/mm/yyyy example: 16 July 2005 = 16/07/2005
Date	Changes the date on the Display Window and in patient readings. If a location is entered (see "Location Identifier "in Table 2, "Configuration Menu Options"), the date will not appear on the Display Window; the location will.
Time Format	Displays the time in one of the following styles: • 12-hour example: 5:00 PM • 24-hour example: 17:00
Time	Changes the time on the Display Window.

Setting	Description
BP Calibration Check	Prepares the Spot LXi for calibration. Only qualified personnel should verify the Spot LXi blood pressure calibration. For more details, see “Calibration“ on page 64.
Blood Pressure Units	mmHg or kPa.
Mean Arterial Pressure (MAP)	On or off.

Setting	Description
Temperature Units	Fahrenheit (°F) or Celsius (°C).
Temperature Mode	SureTemp Plus models only: Oral, Pediatric Axillary, Adult Axillary, and Last Mode. In Last Mode the device takes the next temperature in the mode in which the previous temperature was measured. Rectal Mode is available only when the rectal probe (red ejection button) and probe well are attached.

Setting	Description
Height	On or off.
Height Units	Inches (in) or centimeters (cm).
Height Default	Changes the default patient height displayed in the Navigation Window.
Weight	On or off. Even if weight is enabled here, if weight scale is enabled in the External Devices Menu, you cannot manually enter the weight.
Weight Units	Pounds (lb) or kilograms (kg).
Weight Default	Changes the default patient weight displayed in the Navigation Window.
Respiration	On or off.
Pain Level	On or off.

Setting	Description
Information System	On or off. You must enable this option to send patient readings wired or wirelessly.
Barcode Patient ID	On or off. You must enable this option to send patient readings wirelessly.
Barcode Clinician ID	On or off.
Required for Send	Yes or no. You must enable this option to require the sign-in of the clinician. Only visible when Information System is on.
Clear on Send/Save	Yes or no. You must enable this option to clear the Clinician ID after sending or saving the measurements. Disable to keep Clinician ID until power down.
Weight Scale	On or off. Spot Vital Signs LXi can connect to a scale and the weight will appear in the display window (see "Weight Scale" on page 44 for details).
Wireless Module	None or DPAC. You must enable DPAC to send patient readings wirelessly. The wireless radio is available as an accessory.
Printer	On or off.
Printer Paper	Plain or labels. Only available if the Printer is enabled.

Setting	Description
Save Mode	Manual or automatic. If automatic, Spot LXi saves readings at a preselected time interval. For either option, Spot LXi automatically saves the measured parameters into memory before automatically powering off when not used for 30 minutes.
Auto Save Interval	Changes the amount of time before automatically saving the current patient reading. Only available if Automatic Save Mode is enabled.
Reading Full Action	Auto Overwrite, Ask Overwrite, Do not Overwrite. Spot LXi can save 50 patient readings in memory. Upon reaching reading 51, the device may automatically overwrite reading 1, ask the user if he/she wants to overwrite reading 1, or disable the ability to take another reading until at least one reading is erased.

Setting	Description
Language	English, Dansk, Nederlands, Suomi, Français, Deutsch, Italiano, Norsk, Español, Português, Svenska, or Chinese.
BP Units	mmHg or kPa.
Temperature Units	Fahrenheit (°F) or Celsius (°C).
Height Units	Inches (in) or centimeters (cm).
Weight Units	Pounds (lb) or kilograms (kg).
Date Format	Displays the date in one of the following styles: • mm/dd/yyyy example: July 16, 2005 = 07/16/2005 • dd/mm/yyyy example: 16 July 2005 = 16/07/2005
Time Format	Displays the time in one of the following styles: • 12-hour example: 5:00 PM • 24-hour example: 17:00

4 Blood Pressure Operation

Blood Pressure Cuff Selection

Careful sizing of the cuff is important for accurate blood pressure readings. If the cuff is too small or too large, you may have false high or low readings, respectively. When there is an area of overlap for using a smaller or larger cuff, use the larger size cuff.

The device uses oscillometric technology; therefore, if the cuff extends to the antecubital fossa (bend in the elbow) this does NOT result in an inaccurate blood pressure reading.

Measure the arm circumference (midway between the elbow and shoulder) for the correct Reusable Two-Piece Cuff size (Table 10) or Durable One-Piece Cuff size (Table 11).

Wrap the cuff around the patient's upper arm and verify that the artery index marker falls within the two divisions that identify the "range" on the cuff to indicate a proper fit.

Cuff Size	Reusable Two-Piece Cuff (1 per pack)	Maximum Range (cm)	Maximum Range (in)
Child	4500-01	20.8	8.2
Adult	4500-02	31.5	12.4
Large Adult	4500-03	38.4	15.1
Thigh	4500-04	47.4	18.7

Cuff Size	Reusable One-Piece Cuff (1 per pack)	Disposable One-Piece Cuff (20 per pack)	Range (cm)	Range (in)
Infant	REUSE-07-2MQ	SOFT-07-2MQ	9.0 to 13.0	3.5 to 5.1
Small Child	REUSE-08-2MQ	SOFT-08-2MQ	12.0 to 16.0	4.7 to 6.3
Child	REUSE-09-2MQ	SOFT-09-2MQ	15.0 to 21.0	5.9 to 8.3
Small Adult	REUSE-10-2MQ	SOFT-10-2MQ	20.0 to 26.0	7.9 to 10.2
Adult	REUSE-11-2MQ	SOFT-11-2MQ	25.0 to 34.0	9.8 to 13.4
Large Adult	REUSE-12-2MQ	SOFT-12-2MQ	32.0 to 43.0	12.6 to 16.9
Thigh	REUSE-13-2MQ	SOFT-13-2MQ	40.0 to 55.0	15.7 to 21.7

To ensure pediatric blood pressure accuracy and safety, the Child Reusable Two-Piece Blood Pressure Cuff (4500-01), Infant Durable One-Piece Cuff (REUSE-07-2MQ), and the Infant Disposable One-Piece Cuff (SOFT-07-2MQ) are the smallest cuffs approved for use with young children and infants. The child's arm must fit within the range markings on the cuff.

Blood Pressure Measurement

The preferred blood pressure measurement site for adults and children is the upper arm. Keep the patient's arm relaxed and motion-free during measurement(s). Alternate blood pressure measurement sites include the thigh, ankle, or forearm.

WARNING Do not place the cuff on any extremity that is used for intravenous infusions, or any area where circulation is compromised.

WARNING Using the same arm for cuff inflation and SpO_2 measurement may cause inaccurate SpO_2 results.

WARNING Excessive cuff tightness may cause venous congestion and discoloration of the limb.

WARNING Wrapping the cuff too loosely (preventing proper inflation) may result in errors.

WARNING The Spot LXi is not intended to measure blood pressure on neonatal patients. The AAMI SP10:2002 standard defines neonates as children 28 days or less of age if born at term (37 weeks gestation or more); otherwise up to 44 gestational weeks.

To initiate blood pressure measurements:

1. Properly size the blood pressure cuff and position it around the patient's bare upper arm (or alternate site as necessary) with the artery index marker over the brachial artery. Leave room between the cuff and the arm for two fingers.
2. Press the **Blood Pressure Start/Stop** button. Spot LXi inflates the cuff to the appropriate level, measuring the blood pressure as the cuff is inflating. The systolic display shows the pressure in the cuff as the blood pressure determination is in process.

   Pressing the Blood Pressure Start/Stop button at any time during a blood pressure determination aborts the measurement and rapidly deflates the cuff.

   When complete, Spot LXi displays the systolic, diastolic, and pulse rate measurements. If you have enabled MAP in the Internal Configuration Mode Spot LXi also displays this value.

   If Spot LXi is unable to determine a blood pressure while the cuff is inflating due to patient movement, excessive noise, or an arrhythmia, the device will attempt to measure the blood pressure while deflating the cuff.

Note Spot LXi displays the pulse rate, as determined from the blood pressure measurement method only if the SpO_2 option is absent or disabled. If the SpO_2 function is operational, all pulse rate determinations are a result of the SpO_2 measurement method.

5 Temperature Operation

Temperature Operation Mode Selection

Spot LXi with the SureTemp Plus thermometer takes a temperature in either Normal or Monitor Mode. The default setting is Normal Mode.

In the Normal Mode, the SureTemp Plus thermometer "predicts" body temperature in the oral, axillary, or rectal modes. The thermometer takes an oral reading in approximately 4 to 6 seconds, a pediatric axillary reading (ages 17 years and younger) in approximately 10 to 13 seconds, an adult axillary reading (ages 18 years and older) in approximately 12 to 15 seconds, and a rectal reading in approximately 10 to 13 seconds. Use the Monitor Mode when difficult situations prevent taking an accurate temperature in the Normal Mode.

WARNING To ensure optimal accuracy, always confirm that the correct mode is selected.

WARNING Use only Welch Allyn probe covers. Using other manufacturers' probe covers or no probe cover may produce temperature measurement errors and/or inaccuracy.

WARNING Always use a probe cover whenever coming into contact with a patient.

Normal Mode

Patient actions may interfere with accurate oral temperature readings. Ingesting hot or cold liquids, eating food, chewing gum or mints, brushing teeth, smoking, or performing strenuous activity may affect oral temperature readings for up to 20 minutes after activity has ended.

Probe contact with electrodes or bandages, poor tissue contact, taking an axillary temperature over clothing, or prolonged exposure of axilla to ambient air can cause inaccurate axillary temperature readings.

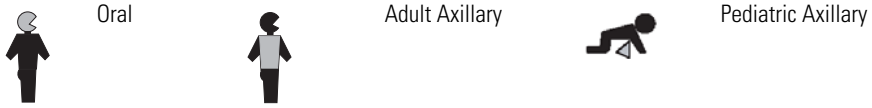
To take a temperature in oral or axillary mode:

WARNING Do not take an axillary temperature through the patient's clothing. Direct contact between the patient's skin and the probe is required.

Caution Use the temperature probe with the blue ejection button and blue probe well to obtain accurate oral or axillary temperatures.

1. Verify that the oral probe (blue ejection button) and matching probe well are installed (see "SureTemp Plus" on page 25).
2. Hold the probe handle with your thumb and two fingers on the indentations of the probe handle and withdraw the probe from the probe well.
3. Verify the desired temperature mode in the temperature display area and the desired temperature mode icon is flashing.

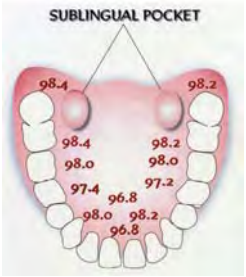
Figure 8. Temperature Mode Icons



If the desired mode is not selected, press the **Navigation** button up or down until the desired mode is highlighted in the Navigation Window and the correct icon is flashing in the temperature display area. Then press the **Select** button.

4. Insert the probe into a probe cover and press the probe handle down firmly. The probe handle moves slightly to engage the probe cover.
5. Quickly put the probe in place.
   a. 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.

Figure 9. Sublingual Pocket Location



   b. For axillary temperatures, lift the patient's arm so that the entire axilla is easily seen and place the probe as high as possible in the axilla. Do not allow the probe tip to come into contact with the patient until the probe is placed in the measurement site. Any prior contact between the probe tip and the tissue with another material may cause inaccurate readings. Verify that axillary tissue completely surrounds the probe tip and place the arm snugly at the patient's side.

6. Firmly hold the probe in place and keep the tip of the probe in contact with the tissue throughout the measurement process. During the measurement process, the temperature display area displays rotating "walking" segments.

   The device beeps when the final temperature is reached. The temperature display area displays the patient temperature, temperature scale, and measurement site.

   The temperature is shown in degrees Fahrenheit and degrees Celsius for 5 seconds in the Navigation Window.

   To switch to Monitor Mode, leave the probe in place. The Spot LXi automatically switches to Monitor Mode after approximately 30 seconds. Once in Monitor Mode proceed to Step 6 on page 38.

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

8. Return the probe to the probe well.

To take a temperature in Rectal Mode:

WARNING Incorrect insertion of probe can cause bowel perforation.

WARNING Washing hands greatly reduces the risk of cross-contamination and nosocomial infection.

Caution To obtain accurate rectal temperatures, use the temperature probe with the red ejection button and red probe well.

1. Verify that the rectal probe (red ejection button) and matching probe well are installed (see "SureTemp Plus" on page 25). Spot LXi only operates in Rectal Mode if the red rectal probe and probe well are installed.

2. Hold the probe handle with your thumb and two fingers on the indentations of the probe handle and withdraw the probe from the probe well.

3. Verify the lower-body icon in Spot LXi's temperature display area is flashing.

4. Insert the probe into a probe cover and press the probe handle down firmly. The probe handle moves slightly to engage the probe cover.

5. Separate the patient's buttocks with one hand. Use the other hand to gently insert the probe only 5/8 in. (1.5 cm) inside the rectum (less for infants and children). The use of a lubricant is optional.

6. Tilt 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. During the measurement process, the temperature display area displays rotating "walking" segments.

   The device beeps when the final temperature is reached. The temperature display area displays the patient temperature, temperature scale, and measurement site.

   The temperature is shown in degrees Fahrenheit and degrees Celsius for 5 seconds in the Navigation Window.

   To switch to Monitor Mode, leave the probe in place. The Spot LXi automatically switches to Monitor Mode after approximately 30 seconds. Once in Monitor Mode proceed to Step 6 on page 38.

7. Remove the probe after the temperature measurement is complete and firmly press the ejection button on the top of the probe to release the probe cover.
8. Return the probe to the probe well and wash your hands.

Monitor Mode

Monitor Mode displays the temperature of the probe as long as the probe 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 three minutes in the oral and rectal sites and five minutes in the axillary site.

WARNING 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.

Note Spot LXi does not retain Monitor Mode temperatures in memory for recall.

To take a temperature in Monitor Mode:

1. Verify that the correct probe (oral/axillary = blue ejection button or rectal = red ejection button) and matching probe well are installed (see "SureTemp Plus" on page 25).
2. Hold the probe handle with your thumb and two fingers on the indentations of the probe handle and withdraw the probe from the probe well.
3. Insert the probe into a probe cover and press the probe handle down firmly. The probe handle moves slightly to engage the probe cover.
4. Take the patient's temperature using the Normal Mode as previously described. Leave the probe in place after Spot LXi beeps and the temperature is displayed.
5. Hold the probe in place for approximately 30 seconds after the temperature is displayed until the temperature display shows the Monitor Mode indicator. 

6. Hold the thermometer in place for a total of three minutes for oral and rectal mode or five minutes for axillary mode. The thermometer will not beep to indicate a final temperature.
7. Record the temperature before removing the probe from the site; the monitored temperature is not stored in memory for recall.
8. Remove the probe from the patient and firmly press the ejection button on the top of the probe to release the probe cover.
9. Return the probe to the probe well to reset the thermometer to Normal Mode.

Temperature Measurement Range Indicators

When Spot LXi detects a temperature out of the SureTemp Plus measurement range, it beeps twice and displays the exceeded temperature limit. A small arrow flashes to indicate whether the out-of-range temperature measurement is too high (up arrow) or too low (down arrow).

Ear Temperatures

Spot LXi with the Braun ThermoScan PRO 4000 thermometer takes a temperature in the ear. The thermometer probe shape prevents insertion far into the ear canal which could perforate the tympanic membrane.

WARNING Keep the probe window clean, dry, and undamaged at all times to ensure accurate measurements. To protect the probe window, always keep the thermometer in the storage cover while transporting or when not in use.

WARNING Only use Braun ThermoScan probe covers with this thermometer. Using other manufacturer's probe covers or no probe cover may produce temperature measurement errors and/or inaccuracies. If the thermometer is used without a probe cover attached, clean the lens (see "Braun ThermoScan PRO 4000 Thermometer" on page 60).

WARNING Do not autoclave.

WARNING The thermometer is not waterproof. Do not immerse or drip fluids on it. Should this occur, dry the thermometer with warm air. Check for proper operation and accuracy.

To take an ear temperature reading:

1. Pull the bottom of the thermometer gently toward you to remove it from the housing.
2. Locate the probe cover box inside the thermometer housing. Firmly push the probe tip into the probe cover box. When the probe cover is in place the thermometer turns on automatically.
3. Listen for the ready signal beep and three dashes to appear on the thermometer display.
4. Fit the probe snugly into the ear canal and then push the **Start** button.
   a. 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.
   b. 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 display shows an error message («POS» = position error).
5. Press the ejector button to eject the used probe cover into the trash when you are finished taking the temperature.
6. Return the thermometer to its holder. Spot LXi displays the patient's temperature and temperature scale in the Temperature Display area on the LCD (see "Display Window" on page 22).

6 Pulse Oximetry Operation

The following factors may cause inaccurate measurements during an SpO_2 reading:

- Patient is in cardiac arrest or shock.
- Bright light.
- Moisture in the sensor.
- Incorrect sensor application or use.
- Arterial occlusion proximal to the sensor.
- Intravascular dyes such as indocyanine green or methylene blue.
- Fingernail polish (if finger sensor is used).
- Excessive patient movement.
- Sensor is too tight.
- Placement of a sensor on an extremity with a blood pressure cuff, arterial catheter, or intravascular line.
- Poor patient perfusion.
- Venous pulsations.
- Significant levels of dysfunctional hemoglobins (e.g., carboxyhemoglobin or methemoglobin).
- Patient has hypotension, severe vasoconstriction, severe anemia, or hypothermia.
- Exposure to excessive illumination, such as surgical lamps (especially ones with a xenon light source), bilirubin lamps, fluorescent lights, infrared heating lamps, or direct sunlight (exposure to excessive illumination can be corrected by covering the sensor with a dark or opaque material).

WARNING Tissue damage can be caused by incorrect application or duration of use of a Nellcor OxiMax sensor. Inspect the sensor site as directed in the sensor Directions for Use.

WARNING Do not use a damaged sensor or pulse oximetry cable or a sensor with exposed optical components.

If blood pressure measurement is occurring simultaneously, place the finger clip sensor on the limb opposite the one with the blood pressure cuff.

1. Insert the patient's finger completely into the sensor; the thumb is specifically not recommended for use with the Nellcor finger clip sensor.

   The pulse signal bar graph illuminates, indicating the relative strength and quality of the patient's pulses at the sensor site. The sensor takes approximately 10 seconds to determine the initial SpO_2% value and pulse rate. When the initial values are determined, they are shown in the SpO_2 display and the pulse rate display, respectively. If the accuracy of any measurement does not seem reasonable, first use an alternate means to check the patient's vital signs and then check the Spot LXi for proper functioning.

   Spot LXi measures a patient's SpO_2 for up to 10 minutes. After 10 minutes, a C9 error code is displayed. This error code means that the use has exceeded the 10-minute time limit.

2. Check sensor sites periodically to assess circulation, sensor positioning, and skin sensitivity.
3. Remove the sensor from the patient. The SpO_2 reading flashes for 8 seconds. If the sensor is not reattached to the patient in 8 seconds, the SpO_2% and pulse rate flashing, signalling that the measurement period has ended. The device continues to display the last SpO_2 reading.

7 Manual Entries and External Device Operation

Manual Entries

Weight, Height, Respiration, and Pain Level

Users can manually enter weight, height, respiration rate, and pain level parameters along with the Spot LXi readings if the specific parameter is turned on in the Internal Configuration Mode (see "Internal Configuration" on page 29). The default for each manual parameter is on.

1. Press the **Navigation** buttons until the cursor is in front of the parameter in the Navigation Window.
2. Press the **Select** button. The default parameter value appears and flashes above the Navigation button.
3. Press the **Navigation** buttons to increase or decrease the value.
4. Press the **Select** button to accept the value. The Navigation Window returns to its previous state with the accepted parameter value appearing next to the parameter heading in the list.

   If a parameter is entered incorrectly, repeat these steps to correct the value.

Body Mass Index

Body Mass Index (BMI) is calculated with weight and height entry. After you save the reading, press the **Memory** button to view the BMI calculation as part of the entire reading.

Memory Recall

The Memory button allows you to scroll through, print, or erase readings.

1. Press the **Memory** button. Spot Vital Signs LXi displays the previous reading.

   The Navigation Window displays the scroll, print, erase, and erase all options.

Scroll	Allows the user to move up and down through the saved readings with the Navigation button.
Print	Sends the current reading to the printer (see "You must enable each external device in the Internal Configuration Mode before using it (see Table 7 on page 32). Verify that each device is attached on the back of Spot LXi as instructed in the Internal Configuration Mode." on page 44)

Erase	Removes the displayed record from memory. Yes or no.
Erase All	Removes all records from memory. Yes or no.

2. Press the **Navigation** buttons to select the desired function and press the **Select** button. Follow instructions on the display.

External Devices

You must enable each external device in the Internal Configuration Mode before using it (see Table 7 on page 32). Verify that each device is attached on the back of Spot LXi as instructed in the Internal Configuration Mode.

Weight Scale

WARNING When connecting a weight scale to the Spot LXi, only operate the scale using battery power. DO NOT use the weight scale's AC adapter power supply.

The Health o meter® 349KLX scale is not sold with an RS-232 cable to connect the scale to the Spot Vitals Signs LXi. The customer must purchase a standard RS-232 cable.

Note If the weight scale is enabled in the Internal Configuration Mode, you cannot manually enter the patient's weight.

Weight scales and connectivity kits

For a list of approved weight scales and connectivity kits, go to www.welchallyn.com.

Barcode Scanner

The Internal Configuration Mode allows you to enable the scanning of patients' and/or clinicians' barcodes for identification purposes. The barcode scanner supports most linear barcodes.

1. Remove the barcode scanner from its holder.
2. Hold the scanner approximately 6 inches (15.4 cm) from the barcode and squeeze the button so that the light from the scanner appears on the barcode. The scanner provides an audible tone with each successful barcode reading.

   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 button. If it continues to have difficulty, verify that the barcode is as flat as possible.

   The patient identification number displays in the Navigation Window on the Spot LXi display. However, if both Patient ID and Clinician ID are enabled in the Internal Configuration Mode, Spot LXi asks if the scanned ID is for the patient or the clinician. If Patient ID is enabled and the Clinician ID is disabled in the Internal Configuration Mode, Spot Vital Signs LXi interprets the scanned bar code as the Patient ID.

   Follow the instructions on the display. Clinician ID numbers do not appear on the Spot LXi display; however, they are retained in memory for recall, printing, or to send electronically to patient records.

8 Troubleshooting

Error Codes

The following tables of error codes provide a quick reference of the descriptions and probable causes of error codes. For service-level troubleshooting, refer to the Service Manual (part number 704432).

Code	Description	Corrective Action
C12	Device outside operating temperature range.	Change ambient temperature.
C13	Low battery level.	Charge battery.
E30	Internal malfunction.	Contact Technical Service.
E31	Internal malfunction.	Contact Technical Service.
E32	Internal malfunction.	Contact Technical Service.
E33	Internal malfunction.	Contact Technical Service.
E38	Date and time not set.	Set date and time (see “Date/Time Menu Options” on page 30)
E42	Internal malfunction.	Contact Technical Service.
E44	Internal malfunction.	Contact Technical Service.
E45	Internal malfunction.	Contact Technical Service.

Code	Description	Corrective Action
C01	Blood pressure reading cancelled by user.	Retake blood pressure reading.
C02	Unable to release cuff pressure.	Check tubing for kinks and connection integrity.
C03	Inflation too quick.	Check tubing and connections.
C04	Air leak.	Check blood pressure cuff and tubing connections.
C05	Unable to determine blood pressure.	Check connections; restrict patient movement.
C06	Unable to determine blood pressure.	Check connections; restrict patient movement.
C07	Internal NIBP error.	Device will power down.
E10	Cuff pressure limits exceeded.	Device will power down.
E11	Cuff pressure duration exceeded.	Device will power down.
E20	Internal NIBP error.	Device will power down.

Code	Description	Corrective Action
C22	Temperature time limit exceeded.	Remove probe from patient.
E0.1	Probe heater error.	Retake reading. If problem persists, replace probe.
E0.2	Thermometer probe or device malfunction.	Replace probe. If problem persists, contact Technical Service.
E0.4	Probe is over temperature.	If problem persists, contact Technical Service.
E0.5	Unable to determine temperature.	Retake reading. If problem persists, replace probe.
E0.6	Probe data error.	Retake reading. If problem persists, replace probe.
E0.7	Broken thermometer probe.	Replace probe.
E0.8	Cannot read the probe's configuration information.	Contact Technical Service.
E0.8	Temperature module data error.	Contact Technical Service to return the device.
E0.8	Cannot read the device's Error Log.	This problem will correct itself. If it persists, contact Technical Service.
E0.9	Broken thermometer probe.	Replace probe.
E4.0	Internal temperature malfunction.	Retake temperature. If problem persists, contact Technical Service.
E4.1	Internal temperature malfunction.	Retake temperature. If problem persists, contact Technical Service.
E4.2	Internal temperature malfunction.	If problem persists, contact Technical Service.
E4.3	Internal temperature malfunction.	If problem persists, contact Technical Service.
E4.4	Temperature malfunction.	Restart device. If problem persists, contact Technical Service.
E4.5	Temperature malfunction.	Restart device. If problem persists, contact Technical Service.
E4.6	Temperature malfunction.	Restart device. If problem persists, contact Technical Service.
E4.7	Cannot initialize thermometer.	If problem persists, contact Technical Service.
E4.8	Thermometer needs to be calibrated.	Contact Technical Service.
E4.9	Probe well missing or installed improperly.	Reinstall probe well.
E5.0	Temperature heater error.	If problem persists, contact Technical Service.
E5.2	Heatsink Failsafe Failure	If problem persists, contact Technical Service.
A^!	Device outside operating temperature range.	Change ambient temperature.
Av!	Device outside operating temperature range.	Change ambient temperature.
b^	Internal temperature malfunction.	Contact Technical Service.
bv	Internal temperature malfunction.	Contact Technical Service.

Code	Description	Corrective Action
C8	Faulty SpO_2 sensor.	Replace sensor.
C9	SpO_2 time limit exceeded.	Remove sensor from patient.
E7	Internal SpO_2 error.	Retake reading.

Event Causes and Corrective Actions

Note Differences of up to 10 mmHg between manual and automatic readings are considered normal and occur for a number of reasons including intra-patient BP variability, observer hearing differences, and auscultatory deflation rate.

Table 2. Inaccurate Blood Pressure Readings

Possible Cause	Corrective Action and Explanation
Incorrect cuff size	Use Welch Allyn approved cuffs only. Measure patient's arm circumference midway between elbow and shoulder (see "Blood Pressure Cuff Selection" on page 33 to select correct cuff size). Use reference markings on cuff to ensure correct cuff size.
Patient's arm position	Ensure patient's arm is at heart level.
Arm movement during blood pressure cycle	Keep arm still during blood pressure cycle. • Movement may cause inaccuracies from artifact.
Blood pressure taken over clothing	Take blood pressure on a bare arm.
Arrhythmia	Check for regularity of heart rate (palpate pulse or check device). • Moderate to severe heart rate irregularities may make blood pressure difficult to measure accurately.
Change in blood pressure between auscultatory reading and Spot LXi reading	Check blood pressure immediately before Spot LXi reading. • Blood pressure is dynamic and changing. It is normal for blood pressure to fluctuate 5 to 10 mmHg.
Incorrect reference	Use the correct Korotkoff sound to determine diastolic blood pressure. • Many listeners incorrectly equate diastolic blood pressure with the disappearance of sound only (phase 5). Spot LXi was developed using the American Heart Association recommendations, which state that phase 5 be used unless sound continues to 0 mmHg, in which case the change in the quality of sound (phase 4) is to be used. Deflate cuff no faster than 3 mmHg per second. • One of the major sources of error in auscultatory blood pressure measurement is deflating the cuff too quickly. The American Heart Association recommends deflation no faster than 3 mmHg per second. Only use a sphygmomanometer that is calibrated. • An uncalibrated sphygmomanometer may result in inaccurate blood pressure measurements.
Poor auscultatory sound recognition by observer	Use high-quality stethoscope. Have a different observer check patient's blood pressure.

Table 3. Cuff Inflation and Deflation with No Blood Pressure Reading Displayed (or Error Code in Display)

Possible Cause	Corrective Action and Explanation
Leak in pneumatic system	Ensure all cuff attachments are tight. Carefully check for leaks in the blood pressure cuff, tubing, and pressure hose attached to Spot LXi.
Arm movement during cycle	Keep arm still during blood pressure cycle. • Movement may cause inaccuracies from artifact, long cycle times, and error message.
Cuff tubing or pressure hose movement artifact	Do not contact cuff tubing or pressure hose during blood pressure cycle. • Movement may cause inaccuracies from artifact.

Table 4. No Cuff Inflation

Possible Cause	Corrective Action
Connections between device and cuff loose	Check all connections (do not overtighten).

Table 5. Cuff Pops Off

Possible Cause	Corrective Action
Inappropriate cuff size	See "Blood Pressure Cuff Selection" on page 33. If cuff continues to pop off, notify biomedical department or Welch Allyn Technical Support.
Cuff not applied securely	Smooth hook and loop securely before inflating cuff.
Cuff applied inside out	Re-apply cuff. Verify that the Welch Allyn label is facing away from arm.

Table 6. Cuff Deflating Too Slowly

Possible Cause	Corrective Action and Explanation
Patient movement	Have patient sit still. Do not have arm tight against chest wall, as respiration may affect speed and accuracy of blood pressure measurement.
Arrhythmia	Check for regularity of heart rate (palpate pulse or check device). • Moderate to severe heart rate irregularities may make blood pressure difficult to measure accurately.
Small leak in pneumatic system	Check cuff tubing and pressure hose for leaks.

Table 7. Temperature Malfunction

Possible Cause	Corrective Action and Explanation
Error code displayed	Probe is broken, replace it. Consult Service Manual. Notify biomedical department or Welch Allyn Technical Support.
Low temperature readings	Place probe in the most posterior sublingual pocket when in Oral Mode. Verify the thermometer is in the correct mode.
No temperature displayed	Place the temperature probe in holder prior to taking another temperature. Check the temperature probe connection to Spot LXi, see "SureTemp Plus" on page 25 (SureTemp Plus models only). Check and clean both the Braun and SPOT LXi housing charging contacts See "Braun ThermoScan PRO 4000 Thermometer" on page 60 and "Braun ThermoScan PRO 4000" on page 63 for further cleaning information.
Loss of tissue contact	The probe has lost contact with the patient's tissue. Once you achieve proper contact Spot LXi continues the temperature measurement. It is recommended that you take a new temperature reading.
Ambient temperature exceeds lower or upper measurement range limit	Bring the device into the proper ambient temperature. • Ambient temperature range limit is 50° F to 104° F (10° C to 40° C).

Table 8. SpO_2 Malfunction

Possible Cause	Corrective Action
Sensor in place but no SpO_2 on display	Insert the patient's finger completely into sensor. Verify blood pressure and SpO_2 measurements are not taken on the same extremity. Verify the sensor cable is correctly plugged into Spot LXi (see "SpO2 Sensor" on page 26). Verify you are using the correct sensor. Use only Masimo or Nellcor SpO_2 sensors and accessories with the Spot LXi with Masimo or Nellcor configurations, respectively.

Table 9. Device Does Not Turn On

Possible Cause	Corrective Action
Low battery	Plug in the device. Check connections between the Spot LXi and transformer then between the transformer and wall receptacle.
Device not powering up	Unplug Spot LXi from wall receptacle and check for breaks in cord. If connections are secure, check electrical outlet for power. Charging indicator is on if connections are good and the device is plugged into a working outlet. If the battery is completely discharged, the LEDs will not illuminate. Allow the unit to charge at least 15 minutes before proceeding. Replace the battery. Verify that the AC power transformer connections are intact and that the charging indicator is on. If the connections are secure, check the electrical outlet for power. Plug the device into a known working electrical outlet. Notify biomedical department or Welch Allyn Technical Support.

Table 10. Barcode ID does not scan

Possible Cause	Corrective Action
Barcode scanner does not read barcode.	Slowly adjust the distance and the angle between the scanner and the barcode while squeezing the scanner button. Verify that the barcode is as flat as possible.
Poor barcode scanner connection.	Unplug and re-plug in the barcode scanner into serial Port I or Port II beneath the Spot Vital Signs LXi handle. Verify the power light illuminates on the barcode scanner.
Spot LXi has a low battery.	Look at the battery level indicator on the display window to confirm battery charge level. If the battery level indicator shows no battery power then charge the battery (page 27).

9 Specifications

Performance

This section describes normal ranges for Spot Vital Signs LXi.

Blood Pressure Accuracy

Blood pressure accuracy meets or exceeds AAMI SP10:2002 standards for non-invasive blood pressure accuracy (± 5 mmHg mean error, 8 mmHg standard deviation). Blood pressure accuracy is validated for pressure measurement using the upper arm only.

Cuff Pressure Range	0 to 300 mmHg
Systolic Range	60 to 250 mmHg
Diastolic Range	30 to 160 mmHg
Blood Pressure Determination Time	Typical: 15 seconds
Mean Arterial Pressure Range	40 to 190 mmHg
Pulse Rate Range (using SpO_2 determination)	25 to 240 bpm
Pulse Rate Range (using Blood Pressure determination)	35 to 199 bpm
Pulse Rate Accuracy (using SpO_2 determination)	Without Motion: 25 to 240 bpm ± 3 digits[1] With Motion: normal physiologic range (55 to 125 bpm) ± 5 digits Low Perfusion: 25 to 240 bpm ± 3 digits[1]
Pulse Rate Accuracy (using Blood Pressure determination)	±5.0%
Overpressure Cutoff	315 mmHg ±15 mmHg

[1] Specification applies to device performance and was validated with Biotek and Nellcor simulators.

Temperature Specifications

Temperature Range	
SureTemp Plus	80° to 110° F (26.7° to 43.3° C)
Braun ThermoScan PRO 4000	68° to 108° F (20° to 42.2° C)
Calibration Accuracy	
SureTemp Plus	±0.2° F (0.1° C) (Monitor Mode)
Braun ThermoScan PRO 4000 for displayed	± 0.4° F (±0.2° C) 95.9° to 107.6° F (35.5° to 42° C)
Temperature ranges	±0.5° F (±0.3° C) (outside this temperature range)
Display Resolution	0.1° F or ° C
SureTemp Plus Predict Time	
Oral	Approx. 4 to 6 seconds
Adult Axillary	Approx. 12 to 15 seconds (age 18 years and older)
Pediatric Axillary	Approx. 10 to 13 seconds (age 17 years and younger)
Rectal	Approx. 10 to 13 seconds

SpO_2 Specifications

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. SpO_2 accuracy from 70% to 100%. Pulse rate accuracy from 25 to 240 bpm.

Performance Measurement Range	SpO_2: 1 to 100% Pulse Rate: 25 - 240 beats per minute (BPM)
Perfusion	0.02% to 20%
Accuracy	Saturation: 70% to 100% No Motion: Adults, Pediatrics ± 2 digits Neonates ± 3 digits Motion: Adults, Pediatrics ± 3 digits Neonates ± 3 digits Low Perfusion: Adults, Pediatrics ± 2 digits Neonates ± 3 digits
Pulse Rate Accuracy	Pulse Rate: 25 to 250 bpm No Motion: Adults, Pediatrics, Neonates ± 3 digits Motion: Adults, Pediatrics, Neonates ± 5 digits Low Perfusion: Adults, Pediatrics, Neonates ± 5 digits

		Saturation Accuracy		Pulse Rate Accuracy	
Sensor	**Weight Range**	**No Motion**	**Motion**	**No Motion**	**Motion**
LNOP-ADT	> 30 kg	± 2%	± 3%	± 3 bpm	± 5 bpm
LNOP-PDT	10 to 50 kg	± 2%	± 3%	± 3 bpm	± 5 bpm
LNOP-NEO	< 10 kg	± 3%	± 3%	± 3 bpm	± 5 bpm
LNOP-NEOPT	< 1 kg	± 3%	± 3%	± 3 bpm	± 5 bpm
LNOP-DCI	> 30 kg	± 2%	± 3%	± 3 bpm	± 5 bpm
LNOP-DCIP	10 to 50 kg	± 2%	± 3%	± 3 bpm	± 5 bpm

Masimo Patents

The Masimo sensors and cables are covered under one or more of the following U.S.A. patents: 5,758,644; 5,823,950; 6,011,986; 6,157,850; 6,263,222; 6,501,975; and other applicable patents listed at www.masimo.com/patents.htm.

Nellcor® Sensor Accuracy Guide

Accuracy specifications are based on controlled hypoxia studies with healthy, non-smoking adult volunteers over the specified saturation SpO_2 range. Pulse oximeter SpO_2 readings were compared to SaO_2 values of drawn blood samples measured by hemoximetry. All accuracies are expressed as ± "X" digits. This variation equals ± one standard deviation (± 1 SD), which encompasses 68% of the population.

Table 11. OxiMax Sensor Models, Single Patient Use

Sensor Models	SpO_2 Range 70% to 100%
MAX-AI	± 2
MAX-PI*	± 2
MAX-II	± 2
MAX-RI[1]	± 3.5

[1] The accuracy specification has been determined between saturations of 80% to 100%.

Table 12. OxiCliq Sensor Models, Single Patient Use

Sensor Models	SpO_2 Range 70% to 100%
OXICLIQ-PI	± 2.5

Table 13. Reusable Sensor Models

Sensor Models	SpO_2 Range 70% to 100%
D-YS (Infant to Adult)	± 3
D-YS and D-YSE	± 3.5
D-YS and D-YSPD	± 3.5
DS-100A	± 3
OXI-A/N (Adult/neonate)	Adult: ± 3 Neonate: ± 4
OXI-P/I (Pediatric/infant)	± 3

Nellcor Patents

Covered by one or more of the following U.S. patents and foreign equivalents:

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.

Mechanical

Dimensions	Height: 10.63" (27 cm) Length/Braun: 8" (20.32 cm) Length/SureTemp Plus: 7.5" (19 cm) Depth: 5.25" (13.34 cm)
Weight	6 lbs (2.7 kg)
Mounting	Self-supporting on rubber feet Custom mobile stand Custom wall mount
Portability	May be hand-carried when held by the rear handle

Electrical

Power Requirements	Patient-rated transformer is connected to AC mains: 100-240V, 50-60Hz, 0.4A or internal power: 6.4 VDC, 6 Ah

Battery

Lithium-ion, with external charger.

The Spot LXi battery is 100% charged after 8 hours of charging with the device off.

The rechargeable batteries in the Braun ThermoScan PRO 4000 thermometer requires an additional 1 hour to charge.

The battery automatically charges when Spot LXi is powered through the AC power transformer. An operator can use the device while the battery is charging; however, the battery charges faster when the instrument is not in operation.

Environmental

WARNING This device is not suitable for use in the presence of a flammable anesthetic mixture with air or oxygen or nitrous oxide. An explosion may result.

Operating Temperature	50° to 104° F (10° to 40° C)
Storage/Transport Temperature	Device with SureTemp Plus: -13° to 131°F (-25° to 55°C) Device with Braun ThermoScan PRO 4000: -4° to 122°F (-20° to 50°C)
Relative Humidity	15 to 95% (non-condensing)
Operating Altitude	-557 to 16,000 ft. (-170 to 4877 m)

Guidance and Manufacturer's Declaration

Emissions and Immunity Information

Electromagnetic Emissions

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

Emissions Test	Compliance	Electromagnetic Environment - Guidance
RF emissions CISPR 11	Group 1	The Spot Vital Signs LXi 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 B	The Spot Vital Signs LXi is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Electromagnetic Immunity

The Spot Vital Signs LXi is intended for use in the electromagnetic environment specified below. The customer or user of the Spot Vital Signs LXi 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 Spot Vital Signs LXi requires continued operation during power mains interruptions, it is recommended that the Spot Vital Signs LXi be powered from an uninterruptible power supply or battery.
Power frequency (50/60Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

Electromagnetic Immunity

The Spot Vital Signs LXi is intended for use in the electromagnetic environment specified below. The customer or user of the Spot Vital Signs LXi 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 Spot Vital Signs LXi, 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 2.5 GHz	3 V/m	$d = (1.17)\sqrt{P}$ 80 MHz to 800 MHz $d = (2.33)\sqrt{P}$ 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (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: 

Note 1: 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.

[a] Field 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 Spot Vital Signs LXi is used exceeds the applicable RF compliance level above, the electrocardiograph should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the electrocardiograph.

[b] Over 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 Spot Vital Signs LXi

The Spot Vital Signs LXi is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or user of the Spot Vital Signs LXi can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Spot Vital Signs LXi 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** $d = (2.33)\sqrt{P}$
0.01	0.117	0.117	0.233
0.1	0.37	0.37	0.74
1	1.17	1.17	2.33
10	3.70	3.70	7.37
100	11.70	11.70	23.30

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.

10 Maintenance and Service

Cleaning

WARNING Before performing any maintenance or service to the Spot LXi, disconnect the AC power line from the electrical outlet.

Spot Vital Signs LXi

Caution Prevent water or other fluids from entering any connectors. If the connectors get wet, dry them with warm air. Check all measurement functions.

Caution Do not sterilize or autoclave the Spot LXi device.

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

The following agents are compatible with the Spot LXi:

- 70 percent isopropyl alcohol
- 10 percent chlorine bleach solution

Never immerse Spot LXi in any type of fluid.

Caution When cleaning the device, avoid using cloths or solutions that include quaternary ammonium compounds (ammonium chlorides) or glutaraldehyde-based disinfectants.

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

70 percent isopropyl alcohol

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

10 percent chlorine bleach solution

1. Wipe the Spot LXi 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 Spot LXi surface to dry for a minimum of 10 minutes before using the Spot LXi.

Blood Pressure Cuff

Refer to the Directions for Use provided with the blood pressure cuff for cleaning procedures.

Blood Pressure Hose and Cable

Wipe the pressure hose with a damp cloth moistened in a mild detergent solution. Do not immerse hose.

SureTemp Plus Thermometer

Temperature Probe

Caution DO NOT immerse or soak the probe in any type of fluid.

Caution DO NOT use steam, heat, or gas sterilization on the probe.

Caution DO NOT autoclave the probe.

Press down on the connector tab and slide the connector out of the port to remove the temperature probe.

Regularly wipe the probe with a cloth dampened with warm water and a mild detergent solution, a 70% isopropyl alcohol solution, or a 10% chlorine bleach solution.

Removable Probe Well

Caution DO NOT use hard or sharp objects to clean the probe well. This could damage the probe well and cause the device to not function properly.

Caution DO NOT use steam, heat, or gas sterilization on the probe well.

Caution DO NOT autoclave the probe well.

1. Remove the temperature probe from Spot LXi (see "Temperature Probe" on page 60).
2. Grasp the well under the probe opening and pull up gently to remove it from the device.
3. Swab the inner and outer surface of the probe well with a cloth dampened with a mild detergent solution, 70% isopropyl alcohol, or 10% chlorine bleach solution. Immerse the probe well in mild detergent solution as necessary for cleaning.
4. Dry all surfaces thoroughly before re-assembling the device (see "SureTemp Plus" on page 25) for reassembly instructions.

Braun ThermoScan PRO 4000 Thermometer

Use a soft cloth slightly moistened with alcohol to clean the thermometer display and exterior. Do not use abrasive cleaners.

Damage to the probe window or the presence of dirt or cerumen on the probe window can affect the accuracy of your temperature measurement. To clean the window, gently

wipe it with a cotton swab slightly moistened with alcohol and immediately wipe dry with a clean cotton swab. Allow to dry at least five minutes before taking a temperature.

Every month, clean the charging contacts on both the Braun ThermoScan PRO 4000 and the Spot LXi dock with a swab slightly dampened with alcohol.

SpO_2 Sensors

WARNING Do not immerse the sensor in water, solvents, or cleaning solutions (the sensors and connections are not waterproof). Do not use irradiation, steam, or ethylene oxide for sterilization.

Clean the reusable SpO_2 sensor with a 70% isopropyl alcohol solution. Do not immerse the sensor.

Battery Replacement

Spot Vital Signs LXi

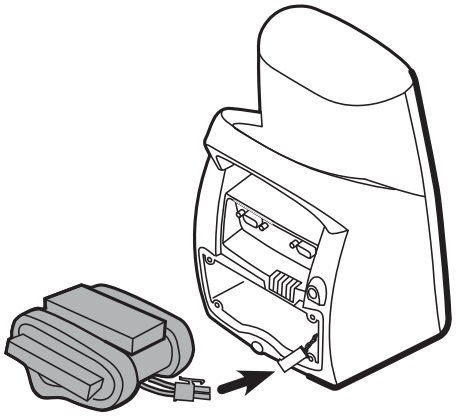
Caution Only use the Welch Allyn Lithium Ion battery (105632). Using an incorrect battery will cause damage to the Spot LXi and void the warranty.

Caution Do not break the shrinkwrap around the battery.

If necessary, replace the internal battery after heavy use or the battery no longer charges.

1. Power off the Spot LXi and disconnect the AC power transformer cord.
2. Remove the four screws holding the battery door using a phillips-head screwdriver. Remove the battery door to expose the battery.
3. Tip the Spot LXi backward and slide the battery out. Disconnect the one-way connector and then attach a new battery to the connector as shown. The one-way connector ends only connect one way. Do this as quickly as possibly to prevent loss of clock time.

Figure 10. Battery Replacement



4. Slide the battery into the compartment as far as it will go. Push the connector down into the case next to the battery.
5. Replace the battery door and tighten each of the four screws.
6. Connect the AC power transformer to the Spot LXi and allow the new battery to charge for approximately 8 hours. The rechargeable batteries in the Braun ThermoScan PRO 4000 thermometer requires an additional 1 hour to charge. You can use the Spot LXi during this charging period via the AC power cord.

   If Spot LXi displays the E38 error code after power up, set the date (see "Date/Time Menu Options" on page 30).

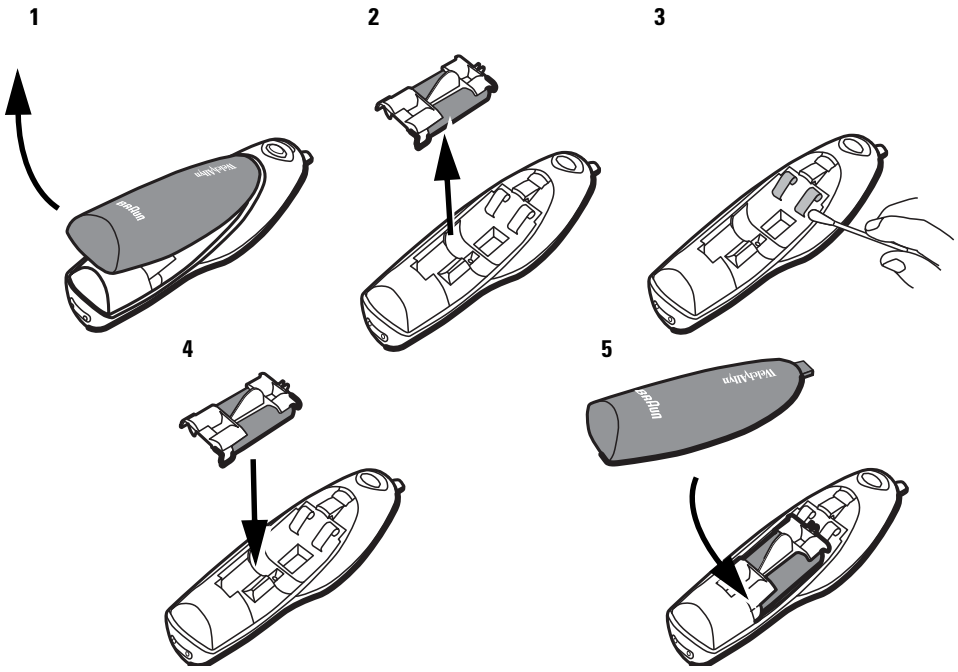
Recycle lithium-ion battery according to local or national regulations.

Braun ThermoScan PRO 4000

Caution Do not use alkaline batteries in the Braun ThermoScan PRO 4000. Welch Allyn supplies a rechargeable battery pack with the Braun ThermoScan PRO 4000 thermometer.

Welch Allyn supplies a rechargeable battery pack with the Braun ThermoScan PRO 4000 thermometer.

1. Open the battery compartment.
2. Remove the battery pack.
3. Clean the two internal battery charging contacts on the Braun ThermoScan PRO 4000 with a swab slightly dampened with alcohol.



4. Install the new battery pack, verify the poles are in the right direction.
5. Slide the battery door back in until it snaps into place.

   If the battery is completely discharged, the LEDs will not illuminate. Allow the unit to charge at least 15 minutes before proceeding. (Overnight charging is recommended.)

The battery is a rechargeable battery and must be recycled or disposed of properly according to national or local regulations.

Calibration

Blood Pressure Calibration Check

The calibration check is a simple, yet valuable test to determine that the unit is sensing pressure accurately. Verify the pressure measurement accuracy of the Welch Allyn Spot LXi with an accurate, calibrated pressure meter or sphygmomanometer.

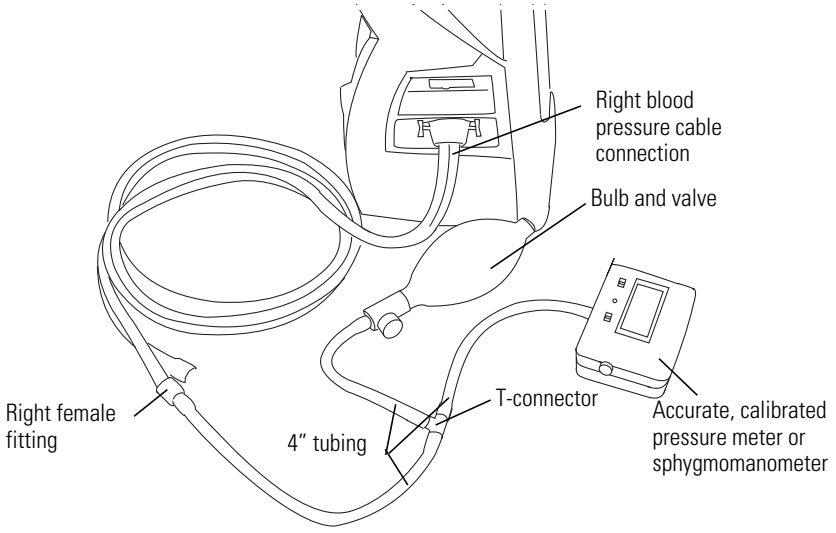
To perform the calibration check:

Have the following equipment available:

- Accurate, calibrated pressure meter or sphygmomanometer
- T-connector
- Female fittings (12P524-1) (quantity 2 each)
- 4" tubing with an inside diameter of approximately .250" (quantity 3 each)
- Bulb and valve (5088-01)

1. Disconnect the blood pressure cuff from the blood pressure tubing.
2. Attach two pieces of the 4" tubing to the T-connector. Verify that the tubing is positioned perpendicular to each other.
3. Attach the pressure meter or sphygmomanometer to one of the tubes and the bulb and value assembly to the second tube.
4. Push a female fitting into the third piece of 4" tubing and connect the opposite end of the tubing to the T-connector.
5. Twist the blood pressure tubing fitting that connects to the right blood pressure cable connection port to the female fitting and connect the opposite end of the blood pressure tubing to the blood pressure cable connection port. Verify that all connections are tight.

Figure 11. Blood Pressure Calibration Tubing Connections



6. Enter the Internal Configuration Mode (see "Internal Configuration" on page 29).

7. Press the **Navigation** button to highlight "Blood Pressure" on the display and press the **Select** button.
8. Press the **Navigation** button to highlight "BP Calibration Check" on the display and press the **Select** button.
9. Press the **Select** button to close the valve.
10. Verify that the pressure meter is on and the thumb screw valve is closed. Inflate the device manually to about 250 mmHg.
11. Drop the pressure to 200 mmHg, wait 15 seconds for stabilization, and take a reading.
12. Repeat for 150 mmHg, 50 mmHg, and 0 mmHg (all measuring downscale).
13. If the calibration at any point is outside of ±3 mmHg, call Welch Allyn Technical Service for assistance.

Temperature Calibration Check

Use the 9600 Plus Calibration Tester (see "Temperature" on page 68) to check the SureTemp Plus or Braun ThermoScan PRO 4000 thermometer accuracy. If the thermometer is out of calibration, contact Technical Service.

Masimo SpO_2 Calibration Check

Use a Masimo-approved SpO_2 simulator (Fluke Biotek or Clinical Dynamics SmartSat) to check the SpO_2 accuracy. There is no way to change the calibration of the SpO_2 module. If the SpO_2 is out of calibration, contact Technical Service.

Nellcor SpO_2 Functional Check

Use a Nellcor SpO_2 simulator (SRC-MAX) to check the SpO_2 functionality. There is no way to change the functionality of the SpO_2 module. If the SpO_2 is not functioning properly, contact Technical Service.

Product Disposal

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.

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

Service

Caution Unauthorized repairs will void the warranty.

A Welch Allyn Service Center must perform all repairs on products under warranty. Qualified electronics personnel or a Welch Allyn Service Center should repair products out of warranty.

Technical Assistance

If you have an equipment problem that you cannot resolve, call the Welch Allyn Service Center nearest you for assistance. Technical service telephone support is available on normal business days.

If you are advised to return a product to Welch Allyn for repair or routine maintenance, schedule the repair with the service center nearest you.

Before returning a product for repair, you must obtain authorization from Welch Allyn. Service personnel will give you an Return Material Authorization (RMA) number. Please note this number on the outside of your shipping box. Returns without an Return Material Authorization (RMA) number will not be accepted for delivery.

Service Manual/Spare Parts

A Service Manual is available by request to qualified electronics personnel. The Service Manual is a comprehensive guide to troubleshooting, service, and repair of Spot LXi (see "Miscellaneous" on page 71).

Also included with the Service Manual is a complete spare parts list. Order spare parts from your local Welch Allyn Service Center.

Service Loaners

Service loaners are provided, on request, if a Welch Allyn Service Center provides repair service. Loaners for products repaired while under the original warranty, or while under service contract, are provided free of charge and are shipped within 48 hours of notification of need.

For service repairs outside of warranty or contract, loaners are available for a nominal charge and shipment is subject to availability. Loaners are shipped pre-paid; however, this charge is added to the service charges.

11 Supplies and Accessories

Blood Pressure

Table 14. Reusable Two-Piece Blood Pressure Cuffs (1 per pack)

REF	Size	REF	Size
4500-01	Child	4500-03	Large Adult
4500-02	Adult	4500-04	Thigh

Table 15. Durable One-Piece Blood Pressure Cuffs (1 per pack)

REF	Size	REF	Size
REUSE-07-2MQ	Infant	REUSE-11-2MQ	Adult
REUSE-08-2MQ	Small Child	REUSE-12-2MQ	Large Adult
REUSE-09-2MQ	Child	REUSE-13-2MQ	Thigh
REUSE-10-2MQ	Small Adult		

Table 16. Disposable One-Piece Blood Pressure Cuffs (20 per box)

REF	Size	REF	Size
SOFT-07-2MQ	Infant	SOFT-11-2MQ	Adult
SOFT-08-2MQ	Small Child	SOFT-12-2MQ	Large Adult
SOFT-09-2MQ	Child	SOFT-13-2MQ	Thigh
SOFT-10-2MQ	Small Adult		

Table 17. Miscellaneous Supplies and Accessories

REF	Description	REF	Description
4500-30	Blood Pressure Hose (5ft/1.5M)	5200-08	Calibration T-Connector

Temperature

Table 18. SureTemp Plus

REF	Description
02895-000	SureTemp Plus Oral Probe and Well (9 feet/2.7M)
02895-100	SureTemp Plus Rectal Probe and Well (9 feet/2.7M)
02894-0000	SureTemp Plus Oral Well
02894-1000	SureTemp Plus Rectal Well
06138-000	SureTemp Plus Temperature Calibration Key
01802-110	9600 Plus Calibration Tester
05031-101	Disposable SureTemp Plus Probe Covers (1,000 covers, packaged 25/box)

Table 19. Braun ThermoScan PRO 4000

REF	Description
04000-200	Braun ThermoScan PRO 4000 Thermometer (for North America, South America, and Asia Pacific)
04000-600	Braun ThermoScan PRO 4000 Thermometer (for Europe, Middle East, and Africa)
05075-800	Braun ThermoScan PRO 4000 Disposable Probe Covers (Case of 800 covers for North America, South America, and Asia Pacific)
04000-800	Braun ThermoScan PRO 4000 Disposable Probe Covers (Case of 800 covers for Europe, Middle East, and Africa)
01802-110	9600 Plus Calibration Tester
53020-0000	Braun ThermoScan PRO 4000 Rechargeable Battery Pack
4500-53	Braun Locking Key

Pulse Oximetry

Masimo Accessories

Table 20. Adhesive Sensors: Single-Patient Use

Catalog #	Description	Weight Range	Quantity
LNCS-ADTX	Adhesive Finger Sensor - Adult (20 per case)	>30 kg	LNCS-ADTX
LNCS-PDTX	Adhesive Finger Sensor - Pediatric (20 per case)	10 to 50 kg	LNCS-PDTX
LNCS INF-L	Adhesive Finger Sensor - Infant (20 per case)	3 to 20 kg	LNCS INF-L
LNOP-ADT	Adult sensor	>66 lbs (30 kg)	20
LNOP-PDT	Pediatric sensor	22 to 110 lbs (10 to 50 kg)	20
LNOP-NEO	Neonatal sensor	<22 lbs (10 kg)	20
LNOP-NEOPT	SofTouch neonatal preterm sensor	<2.2 lbs (1 kg)	20

Table 21. Reusable Sensor

Catalog #	Description	Weight Range	Quantity
LNCS-DCI	Finger sensor - adult	>66 lbs (30 kg)	1
LNCS-DCIP	Finger sensor - pediatric	10 to 50 kg	1
LNOP-DCI	Finger clip probe - adult	>66 lbs (30 kg)	1
LNOP-DCIP	Finger clip probe - pediatric	10 to 50 kg	1

Table 22. Sensor Cables

Catalog #	Description	Weight Range	Quantity
LNC-4-WA	4-foot cable with DB-9 connector for LNCS	NA	1
LNC-10-WA	10-foot cable with DB-9 connector for LNCS	NA	1
PC-04	4-foot cable with sensor connector	NA	1
PC-08	8-foot cable with sensor connector	NA	1
PC-12	12-foot cable with sensor connector	NA	1

Nellcor Accessories

Table 23. OxiMax Adhesive Sensors: Single-Patient Use

Catalog #	Description	Weight Range	Quantity
MAX-AI	MAX-A Adhesive Sensor, adult	>66 lbs (30 kg)	Case of 24
MAX-PI	MAX-P Adhesive Sensor, pediatric	22 to 110 lbs (10 to 50 kg)	Case of 24
MAX-II	MAX-I Adhesive Sensor, infant	6.5 to 44 lbs (3 to 20 kg)	Case of 24
MAX-RI	MAX-R Adhesive Sensor, adult nasal	>110 lbs (50 kg)	Case of 24

Table 24. OxiMax OxiCliq® Sensors: Reusable Cable with Adhesive Sensor Bandage

Catalog #	Description	Weight Range	Quantity
OC-3	OxiCliq Sensor Cable (3 ft / 91cm)	N/A	1
OXICLIQ-PI	OxiCliq P, pediatric	22 to 110 lbs (10 to 50 kg)	Case of 24

Table 25. OxiMax Reusable Sensors

Catalog #	Description	Weight Range	Quantity
DS-100A	Durasensor® DS-100A finger-clip sensor, adult	>88 lbs (40 kg)	1
OXI-A/N	Oxiband® OXI-A/N, adult/neonatal	< 6.5 lbs or > 88 lbs (<3 kg or >40 kg)	1
OXI-P/I	Oxiband OXI-P/I, pediatric/infant	6.5 lbs to 88 lbs (3 to 40 kg)	1
D-YS	Dura-Y® D-YS, multisite sensor	>2.2 lbs (1 kg)	1
D-YSE	D-YSE ear clip for Dura-Y sensor	>66 lbs (30 kg)	1
D-YSPD	PediCheck™ D-YSPD pediatric spot-check sensor	6.5lbs to 88 lbs (3 to 40 kg)	1

Table 26. OxiMax Sensor Cables

Catalog #	Description	Weight Range	Quantity
DOC-10	DOC-10 (10 ft/3M)	N/A	1

Miscellaneous

REF	Description
4500-60	Mobile Stand
4500-62	Wall Mount
105632	Lithium-Ion Battery
409953	Directions for Use
700862	Quick Reference Card
704432	Service Manual
4500-150E	Training Video
4500-100	Carrying Case
4500-101A	AC Power Transformer (desktop transformer, line cord not included)
4500-400	Line Cord (United States/Canadian/Japanese version)
4500-402	Line Cord (European version)
4500-404	Line Cord (United Kingdom version)
4500-406	Line Cord (Australian Version)
4500-408	Line Cord (South African version)
4500-910	Barcode Scanner with Mounting Bracket
4500-925	Cable for Wired Connectivity
4500-927	USB 2.0 Cable/Serial Cable Kit

Service Contracts

REF	Description
4500-BT0	Blood Pressure with Thermometry
4500-BTS	Blood Pressure with Thermometry and SpO_2

Warranty

Spot LXi

Welch Allyn warrants that the Spot Vital Signs LXi products meet the labeled specifications of the products and will be free from defects in materials and workmanship that occur within one year after the date of purchase.

The date of purchase is: 1) the date specified in our records if you purchased the Product directly from us, 2) the date specified in the warranty registration card that we ask you to send to us, or 3) the date of purchase of product from the authorized Welch Allyn 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.

If a Product or accessory covered by this warranty is determined to be defective because of defective materials, components, or workmanship, and the warranty claim is made within the warranty period described above, Welch Allyn will, at its discretion, repair or replace the defective Product or accessory free of charge.

You must obtain an Return Material Authorization (RMA) number from Welch Allyn to return your Product before you send it to Welch Allyn's designated service center for repair. 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.

Accessories

Refer to the manufacturer's Directions for Use for the Masimo and Nellcor finger sensor and cable warranty.

Refer to the Directions for Use provided with the Welch Allyn Blood Pressure Cuff for warranty information.

The SureTemp Plus probe is covered by a one-year warranty and the SureTemp Plus probe well is covered by a 90-day warranty against original defects in material and workmanship. Probe covers are intended for single-use only.

The Braun ThermoScan PRO 4000 is covered by a three-year warranty against original defects in material or workmanship.

The barcode scanner is covered by a five-year warranty against original defects in material or workmanship.

Welch Allyn®

Advancing Frontline Care™

Manual Material No. 721257 C