SPACELABS HEALTHCARE
An OSI Systems Company

Ultraview DM3 Monitor

91330

070-2054-01 Rev. F | www.spacelabshealthcare.com

August 2024

SERVICE MANUAL

Spacelabs Healthcare considers itself responsible for the effects on safety, reliability and performance of the equipment only if:

- *assembly operations, re-adjustments, modifications or repairs are carried out by persons authorized by Spacelabs Healthcare, and*
- *the electrical installation of the relevant room complies with the requirements of the standard in force, and*
- *the equipment is used in accordance with the operations manual.*

In the event of a serious incident, notify Spacelabs.

Spacelabs Healthcare will make available, on request, such circuit diagrams, component part lists, descriptions, calibration instructions or other information which will assist appropriately qualified technical personnel to repair those parts of the equipment which are classified by Spacelabs Healthcare as field repairable.

Spacelabs Healthcare is committed to providing comprehensive customer support beginning with your initial inquiry through purchase, training, and service for the life of your Spacelabs Healthcare equipment.

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- **Rx Only** U.S. Federal law restricts the devices documented herein to sale by or on the order of a physician.
- **Before use, carefully read the instructions, including all warnings and cautions.**

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Introduction

Overview

Spacelabs Healthcare products are designed and manufactured under good manufacturing practices and in compliance with all applicable regulatory requirements. Trained technicians using Spacelabs Healthcare authorized replacement parts maintain this product to make sure that proper operation is in accordance with these guidelines.

The Ultraview® DM3 monitor is a lightweight, compact dual-mode monitor with a 7-inch (17.78 cm) touchscreen display. Designed for bedside and portable usage, it monitors Spacelabs SpO_2, Nellcor SpO_2, Masimo SpO_2, pulse rate, NIBP, and temperature. This manual contains information for servicing the Ultraview DM3 monitor, referred to as the monitor throughout this manual.

Note:

- *Before technicians use the monitor, read the* Ultraview DM3 Operations Manual *(P/N 070-2052-xx) carefully for a thorough understanding of safe operation.*
- *Be sure to read and understand all safety warnings and service notes printed in this service manual and the* Ultraview DM3 Operations Manual *(P/N 070-2052-xx).*

This service manual is a reference document containing recommendations for planned maintenance. Corrective services are available through the depot return service only. Corrective service is not supported to the level of field-replaceable parts. This manual provides troubleshooting, information, and instructions for functional testing and performance verification. It is intended for use only by technically qualified service personnel.

Spacelabs Healthcare Technical Support Services

Spacelabs Healthcare offers these support services listed:

- Telephone support
- Loaner equipment
- Factory service

For information on any of these services, contact Spacelabs Healthcare Technical Support at (800) 522-7025.

When requesting technical support, have this information available:

- Serial Number (on the back of the unit)
- Option string (Nellcor, Spacelabs, Masimo SPO2)
  - *To view the software version, refer to Configuration on page 2-9.*

Service Menus

Service Menus located in the Monitor Setup window. For details, refer to Figure on page 1-2

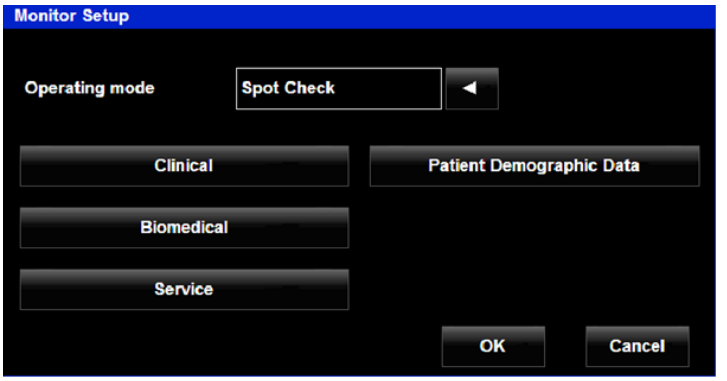
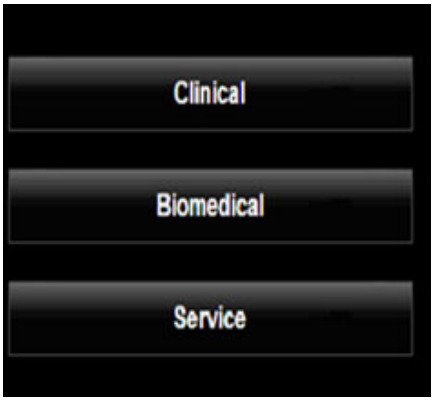


Figure 1-1 Monitor Setup Window in SPOT mode

Service, biomed, and clinical related settings are accessed through the menu keys and passwords shown in Figure 1-2 on page 1-2.



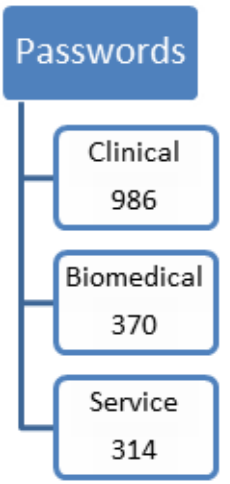


Figure 1-2 Settings buttons with passwords.

Warnings, Cautions, and Notes

The formats below show warnings, cautions, and notes throughout this manual. Be sure to read all warnings, cautions, and notes included in each section of this manual.

	***Alerts the user to potentially serious outcomes (death, injury, or serious adverse events) to the patient or user.***

	**Alerts the user to actions to be taken to avoid non-serious injury to the patient or user, or to adverse effects to the device.**

Note:

Failure to observe notifications can result in unexpected outcomes.

Physical Characteristics

Dimensions	25.4 cm W x 15.2 cm H x 15 cm D (10 inches W x 6 inches H x 5.9 inches D)
Weight	4 lbs (1.81 kg)

Monitor Configurations

Option	Definition
Option M	Pulse Oximetry (SpO_2); compatible with Masimo SET sensors
Option N	Pulse Oximetry (SpO_2); compatible with Nellcor Oximax sensors
Option S	Pulse Oximetry (SpO_2); (Spacelabs) compatible with Spacelabs TruLink sensors as well as Nellcor, Masimo, and Novametrix sensors
Option T	Oral and Axillary Temperature (Predictive or Continuous)
040-1644-xx	Wireless Adapter Kit; provides 802.11b/g/n (2.4 GHz) wireless network capability with WEP/WPA/WPA2 security

Electrical Specifications

Designated Class II, Type BF (SpO_2 Type CF) by applicable electrical safety standards.

Power requirements	AC mains 100 to 240 V 50 to 60 Hz 0.7 A maximum

Battery

- *BATTERY HANDLING. The Ultraview DM3 monitor contains a lithium ion coin cell battery and transport battery pack. The following precautions should be taken regarding these batteries:*
  - *Do not immerse in water.*
  - *Do not heat or throw in fire.*
  - *Do not leave in conditions over 60°C or in a heated car.*
  - *Do not attempt to crush or drop.*
  - *Only use the battery pack with the Ultraview DM3 monitor.*
  - *Follow the instructions in the Ultraview DM3 Service Manual when the Ultraview DM3 monitor is taken out of service or when the battery reaches the end of its useful life and must be replaced.*
- *Do not use any other power supply other than the one supplied by Spacelabs. Refer to https://spacelabshealthcare.com/products/ supplies, for accessories.*
- *• Electric shock hazard - Do not open the monitor cover except to replace the batteries. Only qualified personnel may perform maintenance procedures specifically described in this Manual. Contact Spacelabs for assistance.*
- *• Explosion hazard - Do not use the monitor in the presence of flammable anesthetics or other flammable substance in combination with air, oxygen-enriched environments, or nitrous oxide.*

Rechargeable lithium-ion batteries are widely used in technology today due to their high energy density and efficiency, but they do come with certain risks that require caution.

- *Risk of overheating and fire: Lithium-ion batteries can overheat and catch fire if they are damaged, improperly charged, or used beyond their use life.*
- *Toxic and flammable gases: When lithium-ion batteries overheat, they can release toxic and flammable gases, which pose a risk of inhalation and combustion.*
- *Expired batteries have a fire hazard associated with them when they are used. Check battery age, replace battery pack every two (2) years.*
- *Replace batteries that no longer hold a charge.*
- *Do not short circuit, crush, or expose the battery to high temperature, incinerate or disassemble the battery.*
- *Do not use any damaged battery.*
- *Check battery age, replace battery pack every two (2) years.*
- *Batteries, 2 years or older, are not to be used and are considered expired.*

Type	Lithium-ion rechargeable

Operating time	eight hours (minimum)
Charging time	three hours to 90% (four hours to full charge)
Replacement	Recommended replacement interval: two years

Safety Tips:

- Purchase: Only buy batteries listed by a nationally recognized testing laboratory and the manufacturer.
- Charging: Use the correct charging equipment and avoid charging at extreme temperatures.
- Storage: Store batteries at room temperature, away from direct sunlight and anything that can burn.
- Handling: Be careful with batteries to prevent physical damage.

Environmental Requirements

Operating temperature	0° to 40°C (32° to 104°F)
Storage temperature	–20° to 60°C (–4° to 140°F)
Operating humidity	15 to 90%, non-condensing
Storage humidity	15 to 95%, non-condensing
Operating altitude	0 to 4,572 m (0 to 15,000 feet)
Storage altitude	0 to 12,200 m (0 to 40,000 feet)

Standards Conformance

IEC 60601-1-2 (Class B):2004

FCC Part 15 (Class B):1997

IEC 60601-2-30:1999

IEC 60068-2-27:2008

IEC 60068-2-64:2008

ISO 9919:2005

EN 60601-1:2006

EN 60601-1-2:2007

EN 60601-1-4:1997

EN 60601-2-49:2001

EN 1060-1:1996

EN 1060-2:1996

EN 1060-3:1997

EN 1060-4:2004

EN ISO 9919:2005

ANSI/AAMI SP10:2002; SP10/A1:2003; and SP10/A2:2006

Display

Type	Active matrix widescreen LCD
Display resolution	800 × 480 pixels
Screen size	17.78 cm (7 inches)

Setup Menus

Overview

This chapter describes how to use the Ultraview DM3 setup menus to review and change monitor settings.

Ultraview DM3 monitors ship with factory defaults, but you can change them to meet the needs of patients or to comply with protocol for your facility. The monitor uses touchscreen keys to access menus and adjust settings. When you make changes to a particular window, touch the **OK** button at the bottom of the window to save changes and close the menu window. If you touch **Cancel**, the menu disappears and the monitor keeps the previously saved values or settings.

For information about specific menus, refer to the *Ultraview DM3 Operations Manual* (P/N 070-2052-XX).

Monitor Setup Menu

From the normal screen, touch the **Monitor Setup** button in the upper-right corner of the display. The **Monitor Setup** window shows. If you are in Spot check (SPOT) or Monitoring (MON) mode, the window looks slightly different.

Figure 2-1 Monitor Setup window in SPOT mode

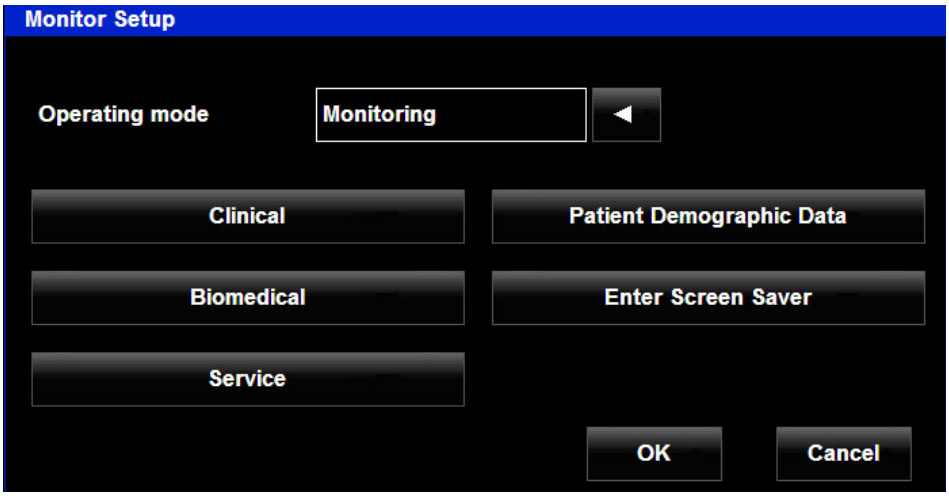


Figure 2-2 Monitor Setup window in MON mode

Viewing Setup Categories

From the **Monitor Setup** window, you can access functions and submenus in three categories. Touch the button that corresponds to the category you want to access: **Clinical**, **Biomedical**, or **Service**.

Clinical Settings

To gain access to the **Clinical Setup** submenus from the **Monitor Setup** window

1. Touch **Clinical**.
2. Enter the password **986** using the onscreen keyboard.
   The **Clinical Setup** window shows.

Figure 2-3 Clinical Setup window

These settings are available on the **Clinical Setup** window.

Table 2-1 Clinical Setup Settings

Button	Description
Alerts*	Touch to show Alerts settings for SPOT mode.
System	Touch to show system-wide settings for the monitor.
NIBP Initial Inflation	Touch to show the low, medium, and high pressures to which the Ultraview DM3 inflates the NIBP cuff for the first measurement of a new patient.
NIBP Protocol	Touch to show settings for NIBP protocols. This feature enables multiple, subsequent readings at specific frequency and duration settings.
Configuration	Touch to show current system configuration information.
Alarms	Touch to show Alarms settings for MON mode.
Print	Touch to show settings for automatic printing of patient data.
Modifiers	Touch to show Modifiers settings for SPOT mode.
Delete Trend Data	Touch to delete all trend data (SPOT and MON) from the monitor.

* *Not available in all software versions.*

Alerts (for SPOT mode only)

To adjust settings for alerts from the **Clinical Setup** window

1 Touch the **Alerts** button.

The **Alerts Setup** window shows the alert settings for SpO_2, pulse rate, and NIBP (systolic, mean, and diastolic).

Note:

The Alerts settings only apply to the DM3 monitors with version 1.3.

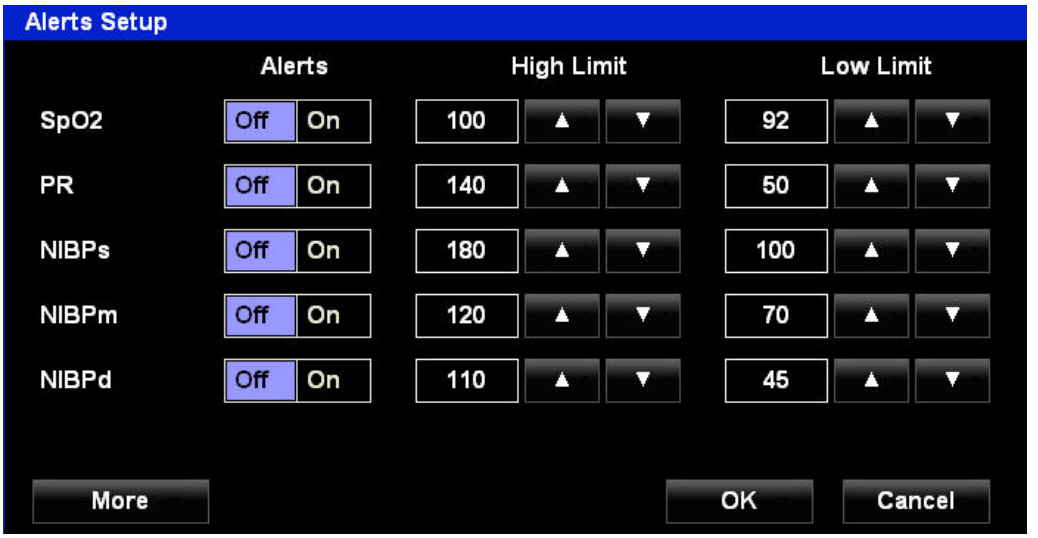


Figure 2-4 Alerts Setup window

To enable or disable alerts for a setting

1 Touch **On** or **Off**.

For **High Limit**

1 To set the high limit for the setting, above which an alert is generated, touch the arrow keys.

For **Low Limit**

1 To set the low limit for the setting, below which an alert is generated, touch the arrow keys.

For alert settings for respiration and temperature

1 Touch **More**.

Figure 2-5 Alerts Setup window, RESP and TEMP settings

System

To set system-wide parameters from the **Clinical Setup** window

1 Touch the **System** button.

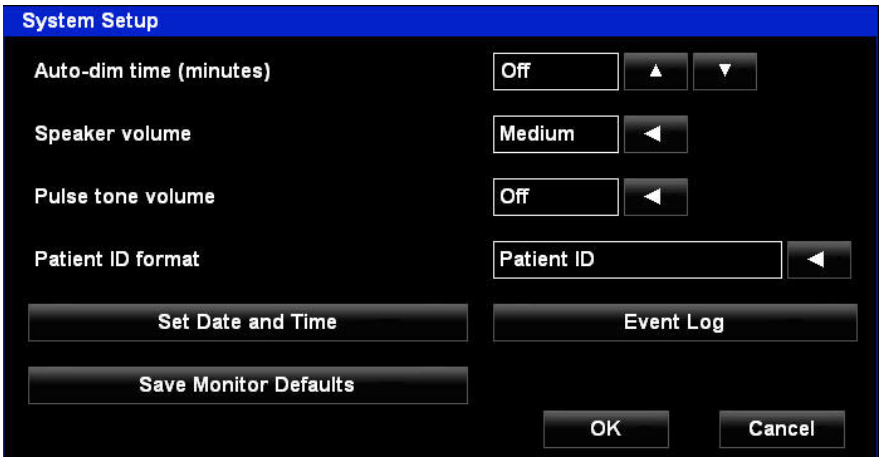


Figure 2-6 System Setup window

These settings are available on the **System Setup** window.

Table 2-2 System Setup Settings

Setting	Description
Auto-dim time (minutes)	Used to set the time period, in minutes, of user inactivity with the screen after which the monitor display is dimmed. Set to **Off** to disable auto dim timeout.
Speaker volume	Used to define the default volume of alarm tones.
Pulse tone volume	Used to set the default volume of audible pulse tones from SpO_2 for each detected beat. Touch **Off** to disable pulse tones.
Patient ID format	Sets the patient information that shows in the Patient ID display zone on the monitor. Also shows the information that is included on strip recordings generated from the optional external recorder.
Set Date and Time	Sets the current date and time for the monitor. *Note:* • *Before initial clinical use, review and adjust the date and time settings.* • *Manually update the system clock time on DM3 monitors to reflect time changes resulting from Daylight Saving Time (DST). If your DM3 monitors are connected to ICS G2 (v4.02 or newer) on a network, the DM3 system clock is automatically synchronized to network time. The network time updates to DST automatically.*

Table 2-2 System Setup Settings

Setting	Description
Save Monitor Defaults	Saves the current configuration settings and uses them as the power-on default user settings, instead of the factory-default settings.
Event Log	Used to access and review all events registered by the monitor. *Note:* *The event log can be downloaded to a USB flash drive using the rear USB port on the monitor. For more information, refer to Service Settings on page 2-16.*

NIBP Initial Inflation

To set values for NIBP initial inflation pressure from the **Clinical Setup** window

1 Touch the **NIBP Initial Inflation** button.

NIBP Initial Inflation is the pressure to which the monitor inflates the NIBP cuff for the first measurement attempt on each new patient. If a numeric systolic pressure value is shown, the monitor uses that previous systolic value (plus 40 mmHg) as the inflation pressure for the next measurement.

In the front-end **NIBP Setup** menu, you configure the monitor to inflate to one of three specific inflation pressure settings specified in this menu. The three pressure settings are Low, Medium, and High. In general, inflation pressures are set between 100 and 270 mmHg in increments of 10 mmHg.

As a rule:

- the Low-pressure setting must be below the Medium setting
- the Medium setting must be above the Low setting but below the High setting
- the High setting must be above the Medium setting.

The monitor always reverts to the Medium inflation pressure setting after it completes a saved spot-check record (SPOT mode) or discharge of the previous patient (MON mode).

Figure 2-7 NIBP Initial Inflation window

These settings are available on the **NIBP Initial Inflation** window.

Table 2-3 NIBP Initial Inflation Default Settings

Setting	Defaults
Low	110 mmHg
Medium	160 mmHg
High	210 mmHg

NIBP Protocols (MON mode only)

To set values for NIBP protocols from the **Clinical Setup** window

1 Touch the **NIBP Protocols** button.

The settings for NIBP protocols initiate automatic measurement of specified quantities of NIBP measurements to be completed sequentially for multiple, specified q time intervals. When initiated, an immediate measurement starts and the first reading in the protocol starts at the next even five-minute increment.

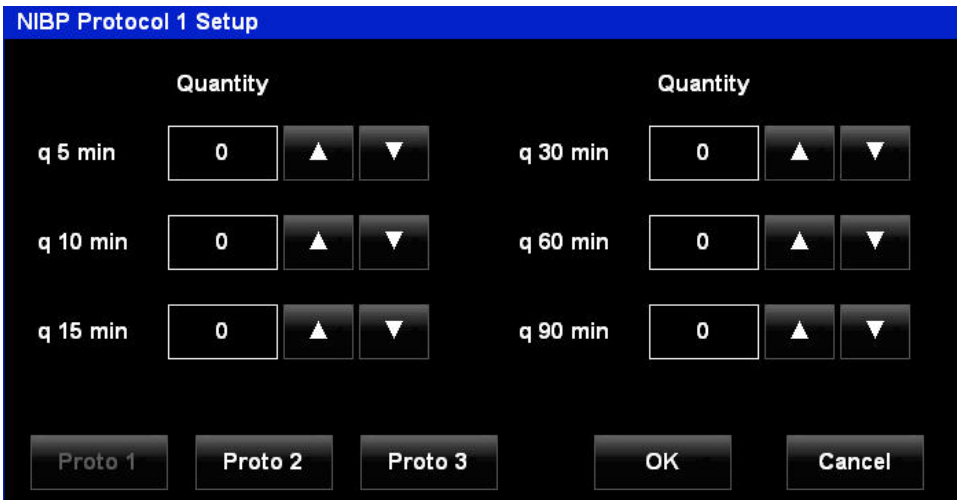


Figure 2-8 NIBP Protocol 1 Setup window (MON mode)

To change NIBP protocols for each time interval

1 To set the number of readings required, touch the arrow keys.

Note:

After you specify the quantities for a protocol (such as Proto 1), touch OK to save the protocol (Proto 1) settings. If you do not touch OK before you view one of the other two protocol settings windows (Proto 2 and Proto 3), then the protocol settings specified (for Proto 1) are not retained.

To view or change the settings for each protocol

1 Touch the button at the bottom of the window that corresponds to that protocol.

Configuration

To view the serial number (S/N) and hardware and software versions installed from the **Clinical Setup** window

1 Touch the Monitor Setup key in upper right corner of display.
2 Touch Clinical in the Monitor Setup window.
3 Type in the clinical setup access password: 986
4 Touch the OK button.
5 Touch the **Configuration** button.
6 When you are done reviewing this window, touch **Close**.
You cannot change any of these values.

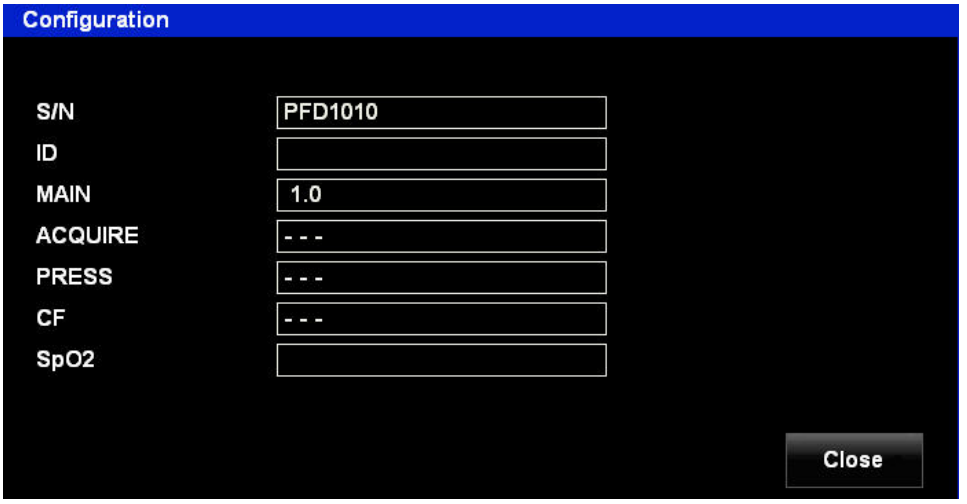


Figure 2-9 Configuration window

Alarms (for MON mode only)

To adjust settings for alarms from the **Clinical Setup** window

1 Touch the **Alarms** button.

The **Alarms Setup** window provides access to the alarm settings for all parameters. These settings are the same settings that appear on the individual parameter menus described in the *Ultraview DM3 Operations Manual*. The table provides a single view of all the settings for ease of verifying or changing all settings.

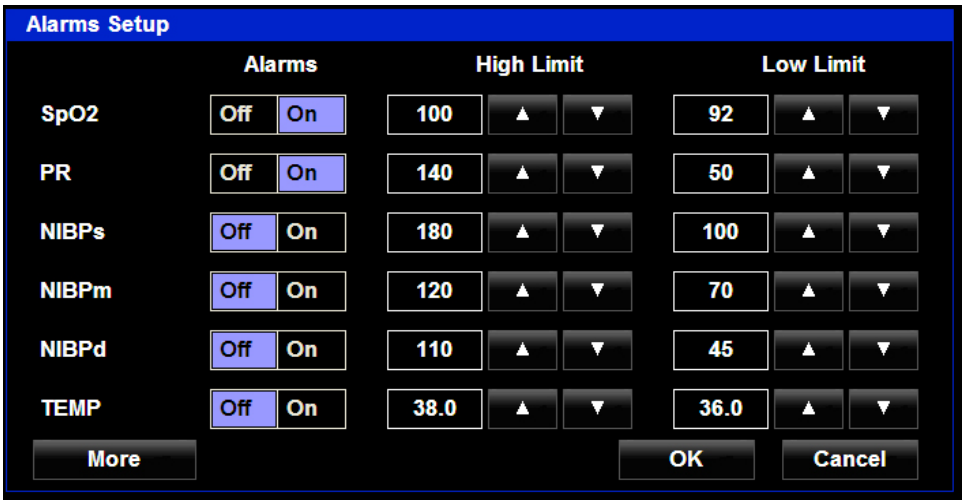


Figure 2-10 Alarms Setup window

For more alarms settings, touch the **More** button.

Figure 2-11 Alarms Setup window, second window

These settings are available on the second page of the **Alarms Setup** window.

Table 2-4 Alarms Setup Settings

Setting	Description
Second speaker time	Used to specify how much time elapses while an alarm tone sounds before the second speaker (backup) starts sounding. This setting applies to all messages except High priority alarms. For High priority alarms, the second speaker engages after 30 seconds of the alarm continuously annunciating.
Alarm delay	Used to configure the Alarm Delay setting, which applies only to high and low limit violations in MON mode. If set to ON, the monitor delays annunciation of the alarm for five seconds during a limit violation for any parameter in which alarms are actively enabled.
User access	Used to enable or disable front-end control of parameter alarm states (on/off) and high/low limits for MON mode. If disabled, you are able to view current alarm state and limit settings within the respective parameter menus. However, you are not able to adjust settings.
SatSeconds (Nellcor SpO_2 option, 91330-N)	Used to configure the SatSeconds alarm delay setting.

Print

For system-wide settings related to strip chart recording from the **Clinical Setup** window

1 Touch the **Print** button to show the **Print Setup** window.

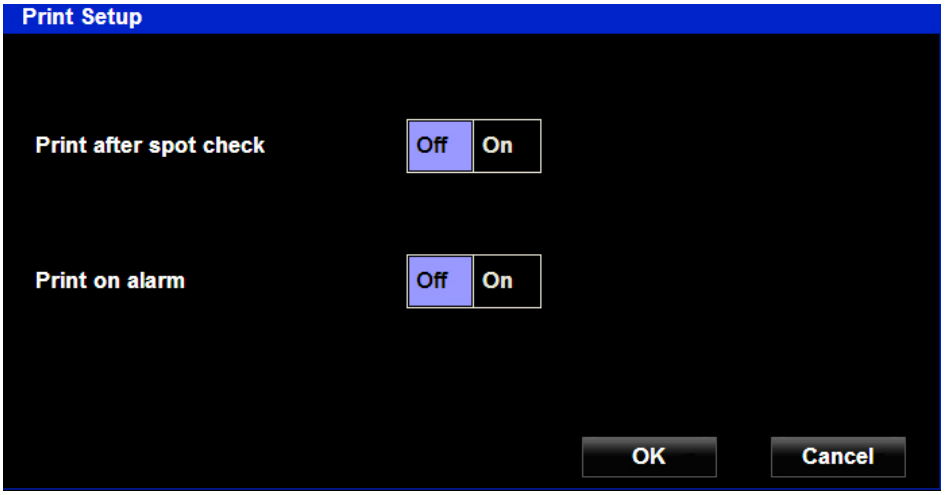


Figure 2-12 Print Setup window

These settings are available on the **Print Setup** window.

Table 2-5 Print Setup Settings

Setting	Description
Print after spot check	Used to specify whether a parameter snapshot (measurement report) is automatically printed upon completion of the Save process in SPOT mode.
Print on alarm	Used to specify whether a recording is generated automatically upon annunciation of an alarm in MON mode.

Modifiers (SPOT mode only)

To specify whether certain supplemental patient information must be provided as part of the Save process for spot-check measurements from the **Clinical Setup** window

1 Touch the **Modifiers** button.
The **Modifiers Setup** window shows.

If any modifiers are set to **Required**, then during the **Save** process, you cannot finish saving the record until the required information has been specified.

If Patient ID is set to Disabled:

- When **Save** is touched to store a measurement record, the Trend window immediately shows. The **Save Spot Check Data - Demographics** and **Save Spot Check Data - Supplemental** windows are bypassed.
- When the **Enter Patient ID** key is touched, the **Patient Demographic Data window** shows but the **Patient ID** setting appears inactive.

If all modifiers except **Patient ID** are set to **Disabled**, when **Save** is touched to store a measurement record, the **Save Spot Check Data - Supplemental** window is bypassed.

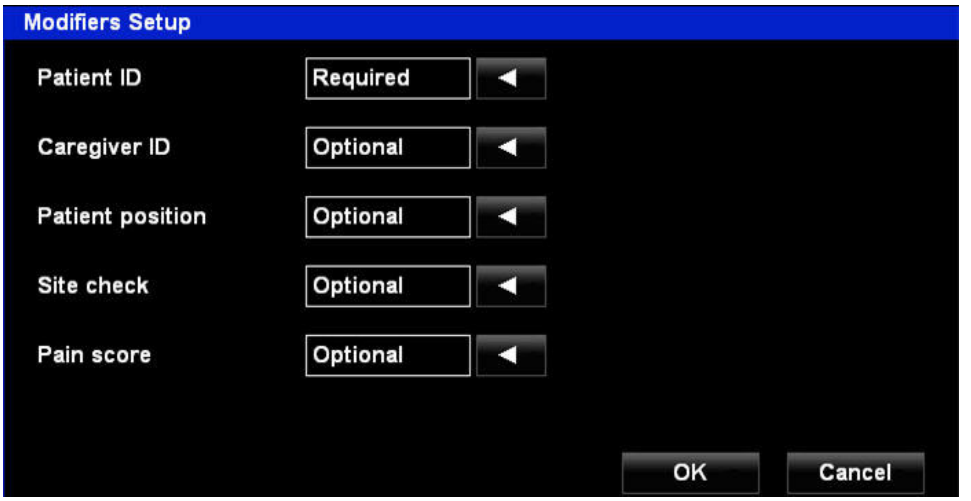


Figure 2-13 Modifiers Setup window

For each setting, touch the arrow key and then touch **Required**, **Optional**, or **Disabled**.

Delete Trend Data

To delete all trend data on the monitor from the **Clinical Setup** window

1. Touch the **Delete Trend Data** button.
   The **Delete Trend Data** window opens to confirm that you want to delete trends data permanently.
2. Touch **OK** to confirm.
   All SPOT and MON trend data is then deleted.

Biomedical Settings

To gain access to the **Biomedical Setup** submenus from the **Setup** window

1. Touch **Biomedical**.
2. Enter the passcode **370** using the onscreen keyboard.
3. Touch **OK**.
   The **Biomedical Setup** window shows.

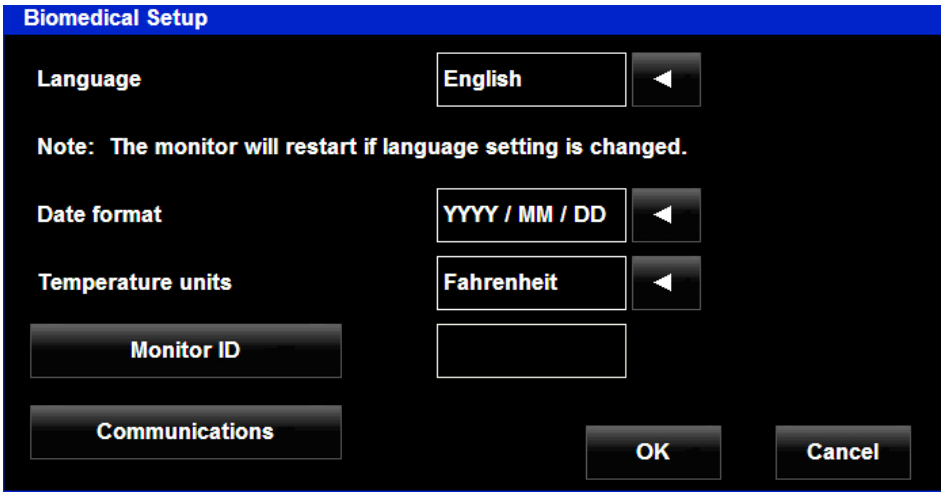


Figure 2-14 Biomedical Setup window

These settings are available on the **Biomedical Setup** window.

Table 2-6 Biomedical Setup Settings

Setting	Description
Language	Used to configure the language for monitor operation.
Date Format	Used to configure the format in which date information appears on the monitor.
Temperature units	Used to configure whether temperature is shown in degrees Fahrenheit or degrees Celsius.
Monitor ID	Used to specify a unique device ID, such as “MedSurg1”, as defined by the hospital. When entered, the device ID is always shown in the upper-left corner of the screen display. Supports entry of up to 10 characters.
Communications	Used to configure network communication settings for the monitor.

Communications

To gain access to the **Communication Setup** window from the **Biomedical Setup** window

1 Touch **Communications**.
The **Communications Setup** window shows.

These settings are available on the **Communications Setup** window.

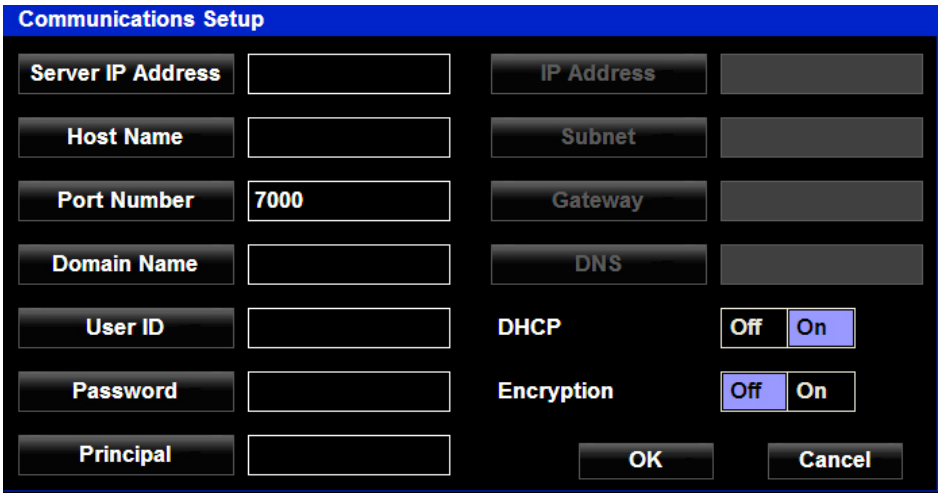


Figure 2-15 Communications Setup window

These settings are available from the **Communications Setup** window. The settings are used to establish connectivity with ICS G2 (version 4.02.02 or newer) for transmission of vital sign measurements.

Note:

The Ultraview DM3 must be manually restarted after configuring or reconfiguring the Communication settings.

Table 2-7 Communications Settings

Setting	Description
Server IP Address	IP address of the network server running the DM3 Loader component of ICS G2 Services (4.02.02 or newer). This is typically specified in ICS Admin under DM3 Loader settings.
Host Name	Name of the network server running the DM3 Loader component of ICS G2 Services (4.02.02 or newer). This is typically specified in the ICS Admin under DM3 Loader settings.
Port Number	Port number used to connect to the network. The port number that is assigned to the DM3 Loader is specified in the ICS Admin.
Domain Name	Domain name for network communication. This can be a DNS default domain name or the name assigned to a collection of principal accounts managed as a group.
User ID	User identifier used to connect to the network.
Password	Password used to connect to the network.
Principal	Name of the security principal that the monitor attempts to authenticate with to gain access to the network.
IP Address	IP address of the monitor when it is placed on a network. (This button is disabled if DHCP is **On**.)
Subnet	Subnet mask for the address. (This button is disabled if DHCP is **On**.)
Gateway	IP address of the default gateway for the network. (This button is disabled if DHCP is **On**.)

Table 2-7 Communications Settings

Setting	Description
DNS	IP address of your DNS server. (This button is disabled if DHCP is **On**.)
DHCP	Touch **On** if the device receives its network addressing information from DHCP. Touch **Off** if the network address is static. If you touch **Off**, enter IP Address, Subnet, Gateway, and DNS settings.
Encryption	Enables or disables network authentication and encryption capability for establishing connection to the ICS database by way of the hospital network. If enabled, the Ultraview DM3 communicates securely using encryption. *Note:* *Encryption is only available for those Ultraview DM3 monitors that are authenticated on a domain controller that is running Microsoft Windows Server 2003.*

Service Settings

To gain access to the **Service Setup** window from the **Setup** window

1. Touch **Service**.
2. Enter the passcode **314** using the onscreen keyboard.
   The **Service Setup** window shows.

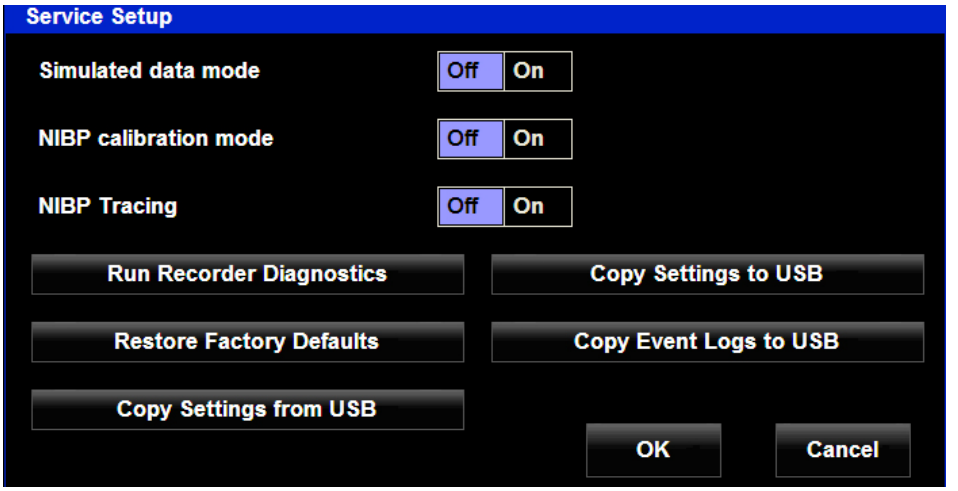


Figure 2-16 Service Setup Menu

Table 2-8 Service Setup Settings

Setting	Description
Simulated data mode	Touch **On** or **Off** to enable or disable the display of simulated data to perform diagnostic procedures on the monitor. When enabled, the monitor continuously shows the message "Simulated data." in the message zone at the bottom of the screen. The default setting is **Off**. If enabled, the monitor must be manually restarted.
NIBP calibration mode	Touch **On** or **Off** to enable or disable NIBP calibration mode, which can be used to diagnose problems with the NIBP function.
NIBP Tracing	Touch **On** or **Off** to enable or disable NIBP Tracing, which can be used to diagnose problems with the NIBP function.
Run Recorder Diagnostics	Touch to run diagnostic procedures on the strip chart recorder. The recorder must be plugged in before touching the key. A diagnostics report prints.
Restore Factory Defaults	Touch to restore factory defaults on the monitor. This causes the monitor to clear all Trend data and all user-specified power-on defaults.
Copy Settings from USB	Touch to upload settings that were copied to a USB device from another monitor.
Copy Settings To USB	Touch to download the current settings of the monitor to a USB device for upload and use on other monitors.
Copy Logs To USB	Touch to copy the event log of the monitor to a USB device for viewing as a text file on a computer.

Wireless Setup

Overview

The Wireless Adapter Kit (040-1644-00) allows the Ultraview DM3 monitor to wirelessly transmit patient data across the hospital network for viewing in ICS G2 Clinical Access Trends, or in a hospital EMR via ICS HL7 interface.

Note:

Requires DM3 version 1.5 or newer and ICS G2 version 4.02.02 or newer.

Unpacking and Inspection

The Wireless Adapter Kit is shipped in one carton. Examine the carton carefully for evidence of damage. Contact Spacelabs Healthcare immediately if you discover any damage. Return all packing material with the kit.

Before starting

First make sure that all components have been included in the Wireless Adapter Kit (040-1644-00). Contact Spacelabs Healthcare if any parts are missing addition, you will need a PC computer preferably with a CD drive.

Table 3-1 Kit Contents: 040-1644-00

	Description	Quantity	Part Number
1	ADAPTER, WIRELESS LAN, 802.11BGN	1	010-1970-00
2	CABLE, RJ45 ETHERNET AND USB POWER	1	012-0905-00
3	HOUSING, WIRELESS ADAPTER, 010-1970-00, 91330	1	019-0823-00

Table 3-1 Kit Contents: 040-1644-00 (Continued)

	Description	Quantity	Part Number
4	MOUNT, BRACKET, WLAN ADAPTER, 010-1970-00, 91330	1	407-0915-00
5	WASHER, FLAT, SST; METRIC	1	215-0077-00
6	SCR, M3X25, FLAT, PHILLIPS, SS	1	215-0407-00
7	SCR, M3X6, CSK, SS	2	215-0406-00

Wireless Adapter Setup

The Wireless Adapter (010-1970-00) uses a web browser-based graphical user interface (GUI) to configure the necessary wireless connection settings. To set up and configure the Wireless Adapter:

1. Insert one end of the supplied RJ45 cable into the Ethernet port of the Wireless Adapter and insert the other end into the PC computer's RJ45 Eternet port (or into a network switch or router connected to the PC).
2. Insert the micro connector of the supplied USB power cord into the Wireless Adapter DC-IN socket and insert the other end into the PC computer's USB port.
3. Power on the computer and adjust the LAN network adapter setting to use static IP address 192.168.1.5 and Subnet 255.255.255.0. This will allow the PC to communicate with the Wireless Adapter which is configured with the default IP address 192.168.1.1. and Subnet 255.255.255.0.

Note:

The Wireless Adapter includes an installation disc with several utilities. The Device Discovery program can be used to simplify PC connection to and configuration of the Wireless Adapter.

4. Make sure there is communication between the PC and the Wireless Adapter by running a ping test. The Device Discovery utility can also be used to detect connection to the Wireless Adapter.
5. Launch the web GUI by opening your web browser (i.e. Internet Explorer) and entering 192.168.1.1. into the address bar.
6. The login screen should show up. Enter admin (case-sensitive) as the user name and password.

Figure 3-1 Web GUI login screen

7 The Setup Wizard is then shown. Selected Network Adapter mode.

Figure 3-2 Operating mode selection screen

8 The Network Adapter page shows. The table on the right shows a list of detected wireless networks. Click on the wireless network you wish to connect to and then press Connect.

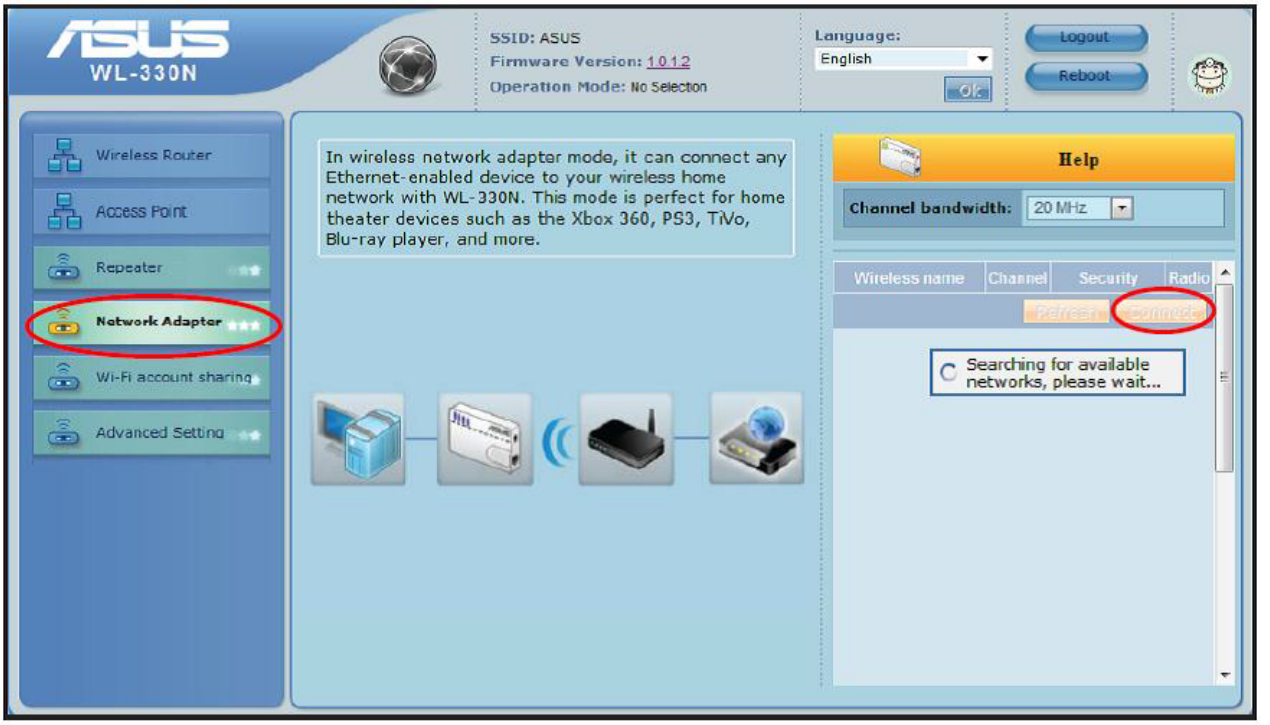


Figure 3-3 Network adapter configuration page

9 A wireless connection login window shows. Enter the proper security/ authentication information and touch Connect.

Wireless Adapter Hardware Installation

1 Using the two M3X6 screws, attach the bottom half of the wireless housing to the mounting bracket.

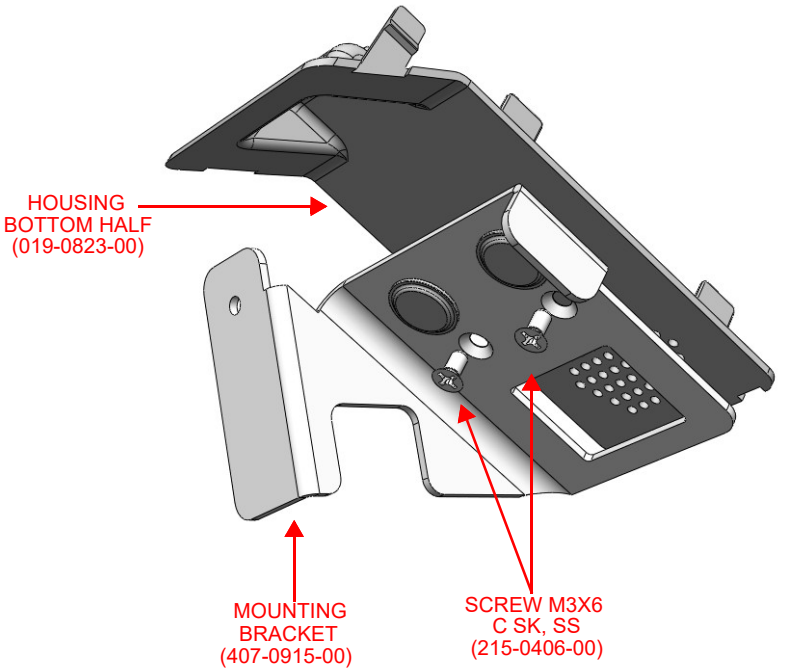


Figure 3-4 Install, wireless housing (bottom half) to mounting bracket

2 Looking at the rear of the DM3, remove the screw from the upper right hand corner, and install the mounting bracket using the M3X25 screw.

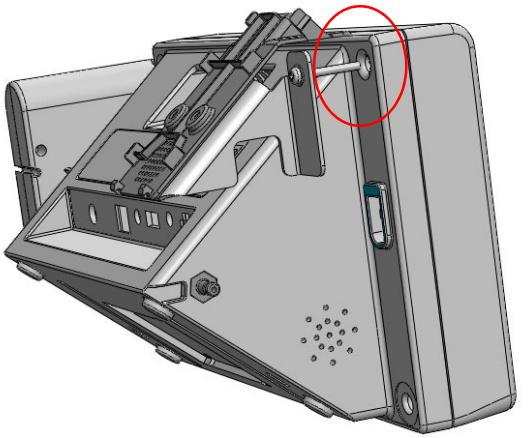


Figure 3-5 Install, mounting bracket to DM3 (rear)

3 With the status LEDs facing up, insert the Wireless Adapter into the top half of the wireless housing. The LEDs on the Wireless Adapter should mate up with the LED slots on the housing.

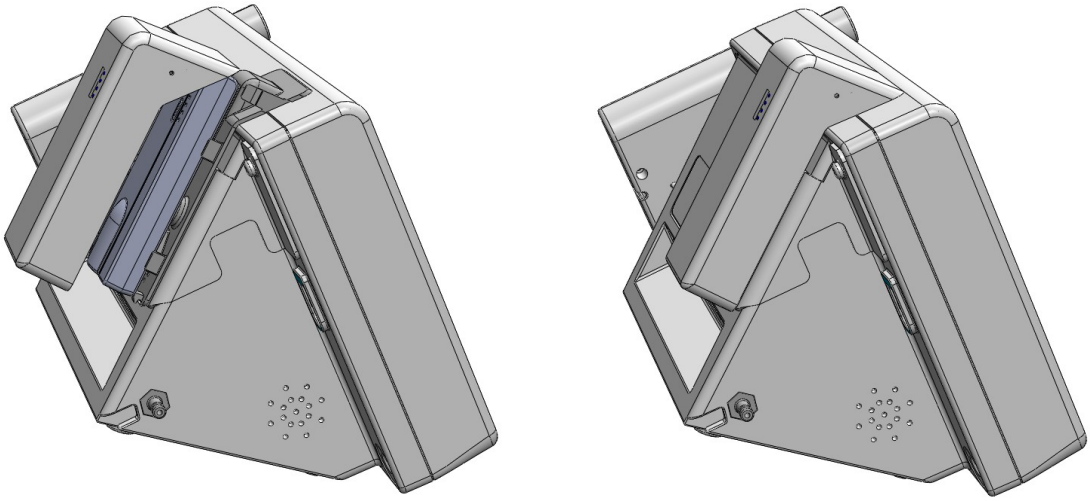


Figure 3-6 Install, wireless adapter and housing cover

4 Using the supplied combination RJ45 Ethernet and USB Power cable (012-0905-00), insert the micro USB connector into the Wireless Adapter DC-IN socket and insert the RJ45 connector on the same end into the Wireless Adapter Ethernet port.

5 Attach the top half of the wireless housing cover to the bottom half.

6 With the DM3 turned off, insert the other end of the USB cable into the DM3 USB port and insert the other end of the RJ45 connector into the DM3 Ethernet port.

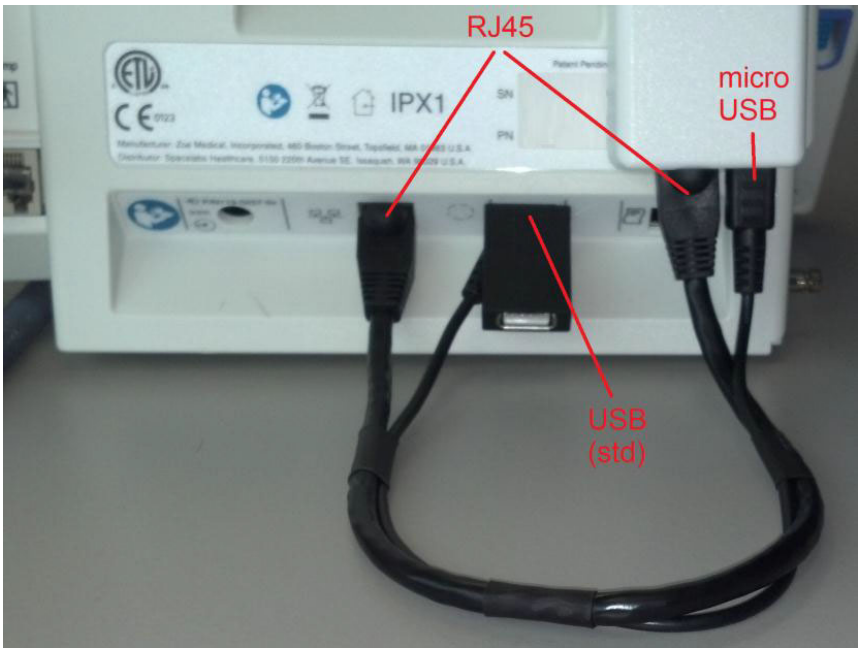


Figure 3-7 Cable installation, Wireless Adapter to DM3

DM3 Network Communication Setup

Before the DM3 can transmit data to the ICS G2 server, the DM3 Communication settings must be configured.

1. With the DM3 turned on, touch Monitor Setup, then Biomedical. Using the on-screen keyboard, enter the code 370 and touch OK. The Biomedical Setup window shows.
2. If the Monitor ID field is blank, touch Monitor ID to enter a device identification code using the on-screen keyboard.
3. Next, touch Communications. The Communications Setup window shows.

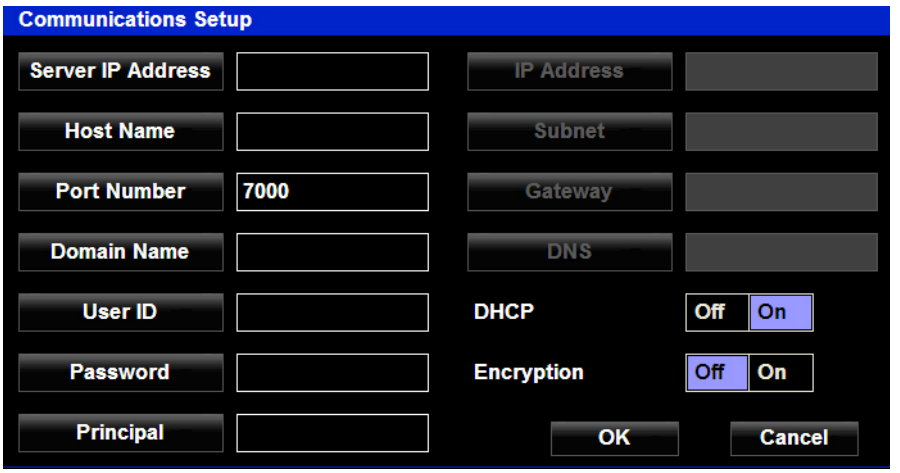


Figure 3-8 Communications Setup *window*

4. The left column of fields are settings that apply to the ICS server that the DM3 will be communicating with. At minimum, Server IP Address and Port Number must be entered. To configure a setting, touch the corresponding key and enter the settings using the on-screen keyboard. When finished, touch OK to save the settings and return to the Communications Setup window.

Notes:

- *DM3 communication with the ICS G2 server requires DM3 version 1.5 or newer and ICS G2 version 4.02.02 or newer.*
- *Server IP Address and Port Number settings should be entered based on the DM3 Loader settings as configured in the ICS Admin application.*

5. The right column of fields are network settings that apply to the DM3's Ethernet connection. Enter network communication settings based on your hospital's specific network connection and security policies. When finished, touch OK to save settings and exit. Then reboot the monitor.

Notes:

- *When configured, the DM3 will utilize these settings for network communication out through its Ethernet port. When used, the Wireless adapter will receive the data and act as a network bridge to wirelessly transmit the data over the hospital's wireless network.*

- *The Encryption setting is disabled by default. Encryption is only available for DM3 monitors that are authenticated on a domain controller that is running Microsoft Windows Server 2003.*
- *Detailed information for the DM3 wired network adapter, such as MAC address and current network settings, can be viewed on page two of the system's event log, available in Monitor Setup/ Clinical/ System/ Event Log.*

6 When the DM3 boots up again, it will automatically attempt to connect to the ICS server. The DM3 message zone (at the bottom of the screen) and network connection status icon (at the top right of the screen) provide indicators for the connection state.

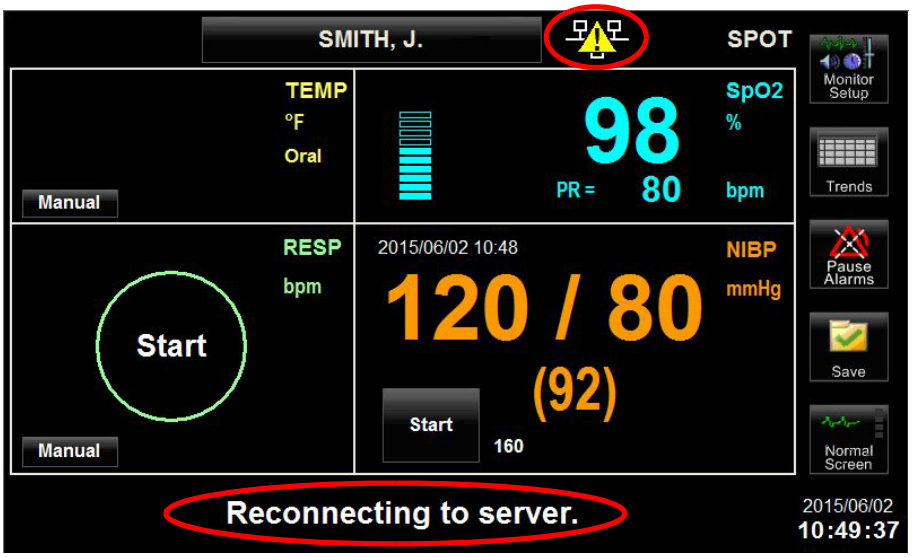


Figure 3-9 On-screen indicators for network connection attempt

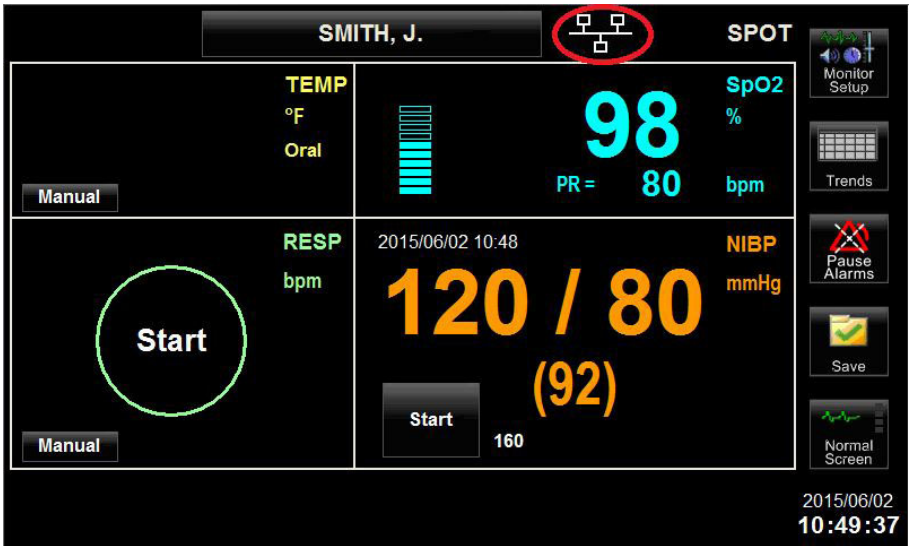


Figure 3-10 On-screen indicator of desired network connection state

Troubleshooting Network Connection Issues

If DM3 connection to the ICS server is not successfully achieved, consult the following information for possible assistance in resolving the problem. If these steps do not help you resolve connection issues, contact Spacelabs Healthcare Technical Support.

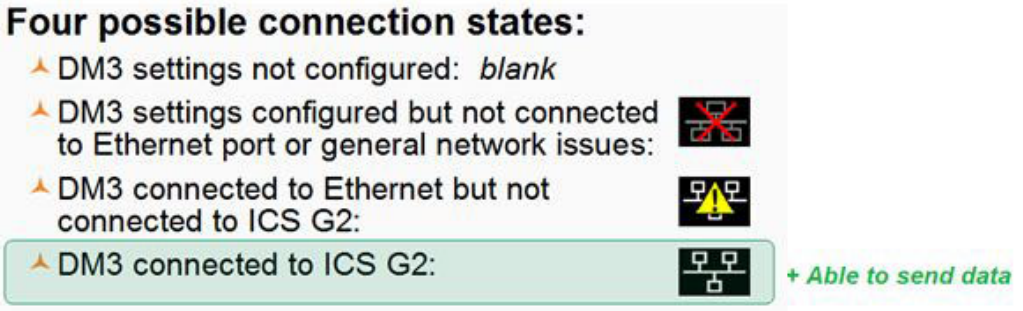


Figure 3-11 Network connection status icons

LED		CONDITION	INDICATION
	Power	On	On and ready
		Flashing	Under "rescue" or "reset to default" mode
		Off	The device is off
	Wireless	On	Associated with a wireless access point (AP)
		Flashing	Attempting to associate
	Ethernet	On	Connected to an Ethernet network
		Flashing	Transferring data
		Off	Not connected to an Ethernet network
	Link	On	Successfully connected to a wireless AP

Figure 3-12 Wireless Adapter LED indicators

Table 3-2 Troubleshooting

Symptom	Possible Causes	Things to Try
The network connection status is not shown on the screen.	Network connection settings have not been configured.	Go to Monitor Setup/ Biomedical/ Communications and configure the network settings. Then reboot the monitor.
The network connection status icon shows a red "x" through it.	The DM3 is not connected to a live network connection.	• If hard-wired, confirm physical network port is live. • If wireless, check LED status on Wireless Adapter to confirm operation and link status. Reboot Wireless Adapter if necessary.

Table 3-2 Troubleshooting (Continued)

Symptom	Possible Causes	Things to Try
The network status icon shows the yellow caution triangle and never connects to the ICS server.	Incorrect software version.	Confirm software version is 1.5 or newer. In the Clinical back end menu, touch Configuration and check MAIN field. If software version is 1.4 or lower, contact Spacelabs Technical Support.
	ICS configurations issue(s).	• Make sure the DM3 devices are properly liscensed within the ICS system. • Make sure the care area departments/subnets are properly set up for DM3s • Review DM3 Loader Service event log. Re-start DM3 Loader Service and DM3, then re-check. • Make sure ICS Server settings are entered correctly in the DM3 Communications Setup Menu.
	DM3 network settings issues.	If wired, run a ping test from the ICS Server to confirm network communication. If ping test fails, re-check or re-configure the DM3 network settings in the Communications Setup menu. If the ping test passes, check the ICS configuration settings and DM3 Loader service.
	Wireless Adapter issues.	Looking at the LED status, confirm that the LEDs show a steady light. With the DM3 on, reboot the Wireless Adapter by disconnecting the micro USB connector from the Wireless Adapter and then re-connecting it. If that doesn't work, try rebooting the DM3.

Routine Maintenance

Overview

The Ultraview DM3 monitor does not require routine service other than cleaning, battery maintenance, and service activity required by your facility. Only qualified service personnel perform periodic inspections of the monitor. If service is necessary, contact qualified service personnel or your Spacelabs Healthcare Service Representative.

Touchscreen Calibration

Make sure that you have the equipment listed:

- 011-0224-00 Touchscreen Calibration Tool

1. With the monitor OFF, insert the Touchscreen Calibration Tool into the USB connector on the back of the monitor.
2. Power the monitor ON.
   After the monitor starts, a message appears on the screen: "Carefully press and briefly hold finger tip on the center of the target."
3. To calibrate the monitor, briefly touch the designated target shown on the display.

Note:

Do not use the temperature probe to calibrate the touchscreen. The use of the probe can damage the monitor display.

4. Touch the message box "Save touch-panel calibration constants."
5. Turn the monitor power OFF.
6. The monitor touchscreen has been calibrated.

Recommended Maintenance Procedures

Table 4-1 shows the recommended maintenance procedures for the Ultraview DM3 monitor and accessories. The monitor does not require periodic recalibration. It is a good idea to check that the monitor is in good working order, as described in the table. Clinicians or qualified service personnel performs checks every 12 months.

If one of the checks fails, contact Spacelabs Healthcare Customer Support. If you must return your Ultraview DM3 to the factory for repair, Customer Support provides a return authorization number. For information on how to ship the monitor, contact Spacelabs Healthcare Technical Support Services on page 1-1.

Table 4-1 Recommended Maintenance Procedures

Function	Procedure
Mechanical integrity	Check for cracks, abrasive edges, and other signs of damage.
Touch panel	Verify that menu keys respond.
Power LED	Verify that the green LED is illuminated on the Ultraview DM3 power supply.
Battery charging LED	Verify that the LED blinks green when the battery charges or is on solid when the battery is charged. When not connected to a power supply (battery not charged), the LED is off.
Speaker	Turn off the monitor, then turn back on. Verify that the power-ON speaker test tones are generated.
Second speaker	Turn off the monitor, then back on. Verify that the power-ON second speaker test tones are generated.
SpO_2	Apply the pulse oximeter probe to your finger. Verify that the reported pulse rate matches your measured pulse rate on your wrist. Check that the SpO_2 value seems reasonable (about 95% for a healthy non-smoker). Use the appropriate SpO_2 cable and sensor.
NIBP	Apply the appropriate-sized blood pressure cuff to your arm. Measure your blood pressure, and verify that the reported blood pressure is reasonably close to your typical blood pressure.
Alarm	Set the monitor to MON mode. Apply the pulse oximeter probe to your finger. Wait for an SpO_2 value to show. To enter the SpO_2 menu, touch the SpO_2 parameter box. Adjust the SpO_2-low limit above the current SpO_2 value. Exit the menu. Verify that the SpO_2 parameter box flashes yellow, a medium grade alarm is annunciated, and a flashing yellow message show (**SpO2 - Lower than <low limit>**).
Temperature (Option T only)	Take an oral measurement in Continuous Temperature mode. At the three-minute mark, note the value. The result is between 97.5 and 98.6°F for a healthy adult. *Note:* *If the temperature range is not correct, verify the temperature parameter by completing the steps in Temperature (if included) on page 5-4.*

Cleaning

- *Use only recommended cleaning solutions, or you can void the warranty from the manufacturer.*
- *Harsh chemical agents degrade plastics and compromises the safety of the device. Some germicidal and other harsh cleaning compounds are known to damage some plastics by weakening the structural integrity and compromising the electrical insulating properties.*
- *Disconnect the equipment from the patient and the electrical supply before cleaning.*
- *Do not allow liquid to enter the interior of the monitoring equipment.*
- *Do not immerse the equipment or cables in water or cleaning solutions.*
- *Do not autoclave.*

Use caution when cleaning cable connectors so that liquid is not permitted to collect around the electrical contacts or seep inside the connector. Trapped liquids and surface residues provide an unintentional electrical path, which can cause noisy signals and false alarms.

Monitors, Cables, and Printers

To clean the exterior of monitors, cables, and printers

1. Prepare the cleaning solution according to the instructions from the manufacturer.
2. Wet a clean cloth with the selected cleaning solution.
3. Remove excess liquid from the cloth. Squeeze dry.
4. Wipe exposed surfaces of the equipment and cables.
5. Remove any soap residue by gently wiping with a clean damp cloth.
6. Wipe dry with a clean dry cloth.

Use only the following recommended cleaning solutions:

- Mild soap and water solution
- U.S. Pharmacopoeia (USP) green soap
- Sodium hypochlorite solution (1:10 dilution of household chlorine bleach in water)
- Glutaraldehyde (2.4%) (Cidex)
- Isopropyl alcohol (70% solution)

Note:

Over time, repeated use of a chlorine bleach solution can cause some colors to fade.

Tape adhesive can be removed with Spacelabs Healthcare adhesive tape remover pads (P/N 392196-001).

- ***Accelerated Hydrogen Peroxide (AHP) and quaternary ammonia-based products ARE NOT RECOMMENDED for cleaning monitors and cables. These chemicals attack the plastics used in patient monitors and cables, and causes serious safety hazards as the electrical insulating properties and structural integrity of the equipment breakdown.***
- ***Cavicide, Virex, Virex 256, SaniCloth, and Sanicloth Plus are common quaternary ammonia germicidal products. The manufacturers of these solutions advertise that these germicidal products are safe for use on hard, non-porous surfaces, such as linoleum floors, formica countertops, and stainless steel. The manufacturers discourage the use of quaternary ammonia germicidal products on computer-grade plastics and on data, patient, and power cables, which are classified as porous materials.***

Direct questions and concerns about cleaning issues to Spacelabs Healthcare Technical Support.

Touchscreen

Clean the touchscreen with a soft cloth moistened with either 70% isopropyl alcohol solution or soapy water.

Note:

- *Follow your hospital protocol for the handling of blood and body fluids.*
- *Do not allow liquid to enter the monitor.*

Accessories

- Where provided, follow the instructions from the manufacturer concerning disposable and reusable supplies.
- As applicable, follow your hospital protocol concerning cleaning, disinfection, and sterilization of reusable supplies.
- Use of patient cables, sensors, or supplies other than those specified by Spacelabs Healthcare can adversely affect monitor performance.

Figure 4-1 91330 Accessories

Figure 4-2 91330 Accessories and Part Numbers

Item	Accessory	Part Number
1	AC Power Supply, External	119-0527-xx
2	Temperature Probe Extender Cable	019-0869-00
3	Probe, Temperature, Oral/Axillary	019-0539-xx
4	US Power Cord Adapter Kit	019-0552-01

NIBP Cuffs

For information on cleaning NIBP cuffs, refer to the *Ultraview DM3 Operations Manual.*

Batteries

Rechargeable lithium-ion batteries are widely used in technology today due to their high energy density and efficiency, but they do come with certain risks that require caution.

- ***Risk of overheating and fire: Lithium-ion batteries can overheat and catch fire if they are damaged, improperly charged, or used beyond their use life.***
- ***Toxic and flammable gases: When lithium-ion batteries overheat, they can release toxic and flammable gases, which pose a risk of inhalation and combustion.***
- ***Expired batteries have a fire hazard associated with them when they are used. Check battery age, replace battery pack every two (2) years.***
- ***Replace batteries that no longer hold a charge.***
- ***Do not short circuit, crush, or expose the battery to high temperature, incinerate or disassemble the battery.***
- ***Do not use any damaged battery..***

Safety Tips:

- Purchase: Only buy batteries listed by a nationally recognized testing laboratory and the manufacturer.
- Charging: Use the correct charging equipment and avoid charging at extreme temperatures.
- Storage: Store batteries at room temperature, away from direct sunlight and anything that can burn.
- Handling: Be careful with batteries to prevent physical damage.

Under normal conditions with proper charging, the battery life is typically 2 years. Only a qualified service personnel should attempt replacing the battery. For more details on this procedure, contact Spacelabs Healthcare Customer Support

Table 4-2 Replacement Kit

Kit	Part Number
Battery Replacement	019-0547-xx

Disposal and Recycling

Dispose of accessories such as blood pressure cuffs, temperature probes, and SpO_2 sensors according to the recommendations from the manufacturer.

Dispose of the Ultraview DM3 properly at the end of its useful life. The monitor contains a lithium coin battery, a lithium ion battery, and electronic circuit boards. Do not incinerate or expose to extreme heat.

Contact your local waste disposal agency for guidance on the proper recycling or disposal of these components.

Recorder Paper Replacement

1 Press down the recorder door release latch, as shown in *Figure 7-13*. The front of the recorder assembly is hinged at the bottom andwill drop open, revealing two spoon-shaped arms.

Figure 4-3 Recorder door latch

2 Unroll a short length of paper from the roll, and orient the roll so that the paper feeds from the bottom.

3 Slip the paper roll spindle between the plastic arms, and close thefront of the assembly so that the end of the paper roll protrudesout of the recorder assembly just below the release latch as shown in *Figure 7-14*.

Figure 4-4 Recorder with paper correctly installed

Functional Verification

Overview

This chapter describes the procedure to verify that the Ultraview DM3 monitor functions correctly. A qualified service technician checks the monitor for acceptable performance in 12-month interval. The monitor can also be checked at an interval determined to be appropriate by an effective risk-based equipment management program.

There are no internal adjustments to perform on the monitor. If the monitor is damaged in any way, check it for proper operation and verify the accuracy of the measurements that the monitor takes. Use the procedures in this chapter whenever the monitor software upgrades or when the monitor is placed into use after repair.

Test Equipment

The required equipment is listed:

- Safety analyzer
- SpO_2 simulator, Fluke 2XLFE (or equivalent)
- Calibrated water bath

Note:

SpO_2 simulators and functional tests are used only for verifying the functionality of pulse oximeter monitors and the electrical integrity of the pulse oximeter probes. They are incapable of characterizing or validating the complex interaction between the probe optics and the skin that determines the true accuracy of the probe.

The equipment listed is optional:

- NIBP simulator
- Dynatech Nevada Cuff Link (or equivalent)

Verification

Touchscreen Verification Test

To check the touchscreen

1. Press the primary touchscreen keys on the right side of the monitor display.
2. Press any of the parameter keys in the parameter zone of the display.
3. Confirm that the monitor responds to the primary and parameter keys when pressed.

Battery Verification Test

To check the battery

1. Connect the monitor to AC power.
2. Power ON the monitor.
3. Confirm that the front LED blinks if the battery charges, and is steady ON if the battery is fully charged.
4. Remove the AC cable from the back of the monitor.
5. Confirm that the display does not power OFF (with a fully charged battery) and that the front LED is OFF.

Note:

The battery supplies enough power to the monitor for up to eight hours with NIBP and SpO_2 running continuously.

SpO_2

To check SpO_2

1. For units configured with Option M, connect the Masimo SET adapter cable (P/N 700-0789-xx) and appropriate Masimo sensor to the SpO_2 connector of the module.
   - For units configured with Option N, connect the Nellcor Oximax adapter cable (P/N 700-0792-xx) and appropriate Nellcor sensor to the SpO_2 connector of the module.
   - For units configured with Option S, connect the appropriate SpO_2 adapter cable (P/N 700-0030-xx for Nellcor sensors; P/N 700-0029-xx for Novametrix sensors) and the appropriate sensor to the SpO_2 connector of the module.
2. Connect the SpO_2 sensor to the Fluke 2XLFE (or equivalent) simulator.

3 Set up the Fluke 2XLFE simulator as follows:

a Power ON the simulator. Use the **?** keys under the display to make selections or to change the values of the parameters.

b Press **more**.

c Presses **make**.

d Press **+** or **–** to select the correct probe for the test: Nellcor, Masimo, or Novametrix.

e Press **esc**.

f Press **more**.

g Press **sim**.

h Press **man**.

i Press **+** or **–** to set the simulator to the bpm and saturation settings in *Table 5-1*. Confirm that the monitor shows the saturation levels shown in the table.

4 If you use a simulator other than the Fluke 2XLFE, confirm that the simulator is compatible with:

- Masimo sensors (for units configured with Option M)
- Nellcor Oximax sensors (for units configured with Option N)
- Nellcor or Novametric sensors (for units configured with Option S).

For setup instructions, refer to the simulator user guide.

Table 5-1 Saturation levels for SpO_2 accuracy test

Simulator Setting		Monitor Display
Signal Attenuation	Saturation (%)	Saturation (%)
4	92	92 ±2
4	82	82 ±2
4	72	72 ±3
4	62	62 ±3
6	100	99 ±1
8	92	92 ±2
8	62	62 ±3

Temperature (if included)

The Spacelabs Healthcare DM3 monitor with Option T provides measurement of patient temperatures. The temperature option utilizes the IVAC TurboTemp predictive software algorithm to determine a patient's actual temperature based on initial temperature readings. Due to the nature of predictive temperature measurements, the reading provided may not be reproducible when repeated measurements are taken. In addition, comparison of the temperature readings provided from different manufacturer monitors will often result in different readings since manufacturers may utilize a different algorithm for the temperature measurement.

If multiple temperature readings are attempted on a patient, the DM3 monitor may provide different results. Some significant variables which may affect the temperature measurement include:

- The initial temperature of the probe tip. When removed from the well:
  - If the ambient temperature is less than 80.0°F (26.7°F), the Temperature parameter will indicate an immediate failure.
  - If the temperature at the probe tip is higher than 92°F (33.3°C), the thermometer may not be able to quickly predict the patient’s temperature.

- The temperature within the measurement site.
- Ensure that only approved disposable temperature probe covers are used with the DM3 monitor. (Spacelabs P/N 701-0122-00; Cardinal Health/CareFusion model P850A). Use of non-compatible probe covers from other manufacturers may not fit appropriately and can result in inaccurate temperature readings.
- Ensure proper placement of the temperature probe within the sublingual pocket at the base of the tongue (for oral readings) or within the armpit area (for axillary readings).

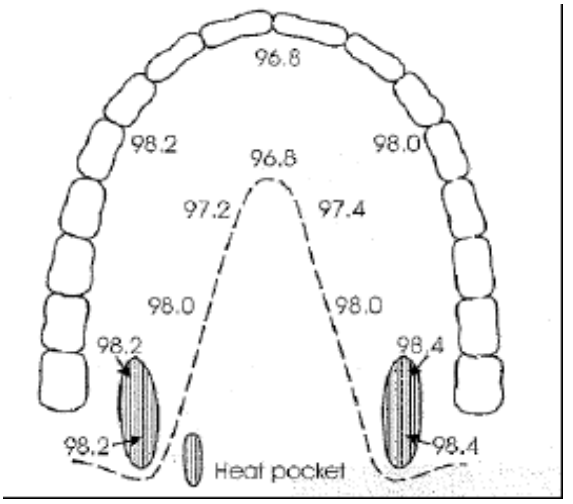


Figure 5-1 : Temperatures in the mouth can vary as much as 3°F (1.66°C) from the relatively cool hard palate to the warm sublingual area. To take an accurate oral temperature reading, place the thermometer tip in either the right or left posterior pocket at the base of the tongue.

Note:

Continuous mode is only accessible to the user in software versions 1.5 or newer.

Perform temperature verification in Continuous Temperature mode.

Note:

To verify the accuracy of the temperature parameter, use a calibrated water bath.

To check temperature

1. Set the **Mode** to **Continuous** in the **TEMP Setup** menu.
2. Confirm that **Cont** shows in the **TEMP** zone.
3. Take the temperature probe out of the well. The monitor makes two rapid beeps, a real-time changing value appears, and the **Manual** key disappears.

Notes:

- *If any of the three indications described do not occur, or if a problem appears while you start a new measurement, put the temperature probe back into the well to reset the system. Start the measurement steps again.*

- *If the parameter zone shows a stamped measurement before you started a new measurement, make sure that no completion stamp shows when you take the temperature probe out of the well.*

4 To verify that the DM3 can read temperatures of 96°F (35.5°C), 98.6°F (37°C), and 105°F (40.5°C) within +/-0.2 °F, use a calibrated water bath.

5 Wait at least three minutes at each temperature level. Note the shown temperature value.

NIBP

To check NIBP

1 Connect the NIBP adapter hose to a cuff. Wrap the cuff around a solid object.

2 Connect a manometer in line with the cuff using a T connector.

3 Use the monitor setup menu to set the monitor mode to MON.

4 Press the START key. Verify that the following occurs:

a The cuff inflates to approximately 160 mmHg or whatever initial inflation pressure is selected.

b The cuff begins to deflate in approximately 8-mmHg steps.

c The cuff deflation continues until the pressure is approximately 15 mmHg.

d This message shows: **NIBP – Signal is weak**.

5 Press the **START** key. Wait 5 seconds. Press the **STOP** button.

6 Verify that the pump stops and that the cuff deflates to less than 15mmHg (2 kPa) within 30 seconds.

7 Unwrap the cuff. Disconnect the manometer.

8 Take a reading. Turn S/D/M alarms to ON.

9 Adjust the alarm limits so that an alarm condition occurs on the next measurement.

10 Take another reading. Verify that the alarms function properly.

Optional NIBP Accuracy Test

To check NIBP accuracy

1 Connect an NIBP simulator to the NIBP adapter hose.

2 Set the simulator input to a specific pressure setting.

3 Allow the monitor to acquire several readings.
Verify that the readings are within 5 mmHg (0.7 kPa) or 5% of the simulator setting, whichever is greater.

4 Change the simulator input to a different pressure setting. Repeat as needed.

NIBP Calibration/Leakage Test

To check NIBP calibration and leakage

1 Connect the NIBP test fixture to the NIBP port on the monitor, as shown in *Figure 5-2*.

Note:

The length of the tubing (P/N 166-0011-xx) connecting the 100cc container, manometer, bulb, and monitor (shown as T1+T2+T3+T4 in Figure 5-2) must not exceed 0.61 meters (20 inches). No restrictions apply to the length of the tubing T5 (P/N 162-0019-xx).

2 Enter NIBP calibration mode:

a From the **Monitor Setup** window, touch **Service**.

b Enter **314**.

c Touch **OK**.

d Next to **NIBP calibration mode**, touch **ON**.

e Touch **OK**.

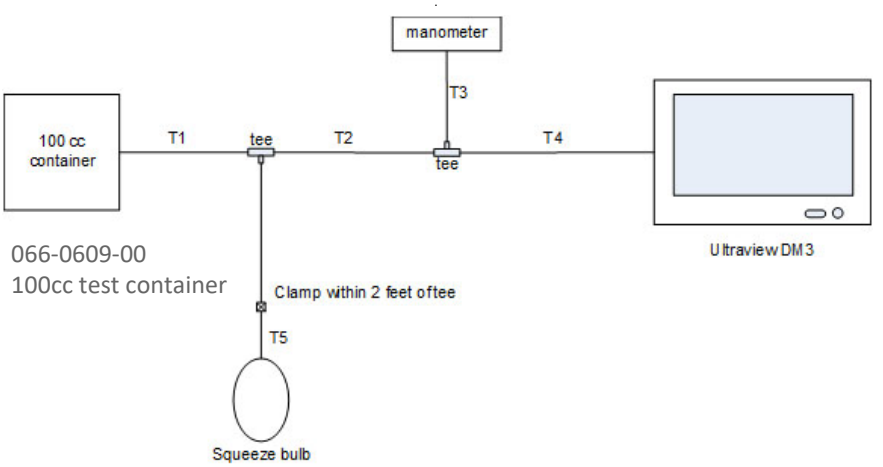


Figure 5-2 Calibration/Leakage Test Setup

Table 5-2 Calibration Test Setup Parts

Part Numbers	Part Description
214-0159-00	TEE,TUBING,FiITTING
343-0389-00	CLAMP,HOSE, .25” OD
706-0178-00	HAND PUMP W/ FLOW CONTROL VALVE
166-0011-00	TUBING, .125ID, .250 OD, POLYURTHNE CLR
162-0019-00	TUBING,SILICONE, .125 ID, .25 OD
066-0609-00	FIXTURE, NIBP, 100 CC CONTAINER

Note:

Tubing is sold by the foot. Do not exceed recommended length of 20 inches (50.8 cm) for T1-T4 connections.

Calibration Check at 250 mmHg:

Note:

Complete this test before the safety processor automatically releases pressure in 150 seconds. If the safety processor times out before the completion of the test, turn the monitor OFF, then ON, and then restart the test.

1. To pump up pressure in the system to a value 250 ± 5 mmHg, use the bulb.
2. Wait approximately one minute to allow the system to settle.
3. Check the pressure in the system on the manometer. Check the pressure on the monitor. Confirm that the pressure readings are ± 3 mmHg.
4. Wait 45 seconds.
5. Check the pressure on the manometer. Check the pressure on the monitor. Confirm that the pressure readings are ± 3 mmHg. Confirm that the leak rate is less than 4 mmHg in one minute.
6. Release pressure in the system before the safety processor releases at 150 seconds.

Calibration Check at 150 mmHg:

Note:

Complete the test before the safety processor automatically releases pressure in 150 seconds. If the safety processor times out before the completion of the test, turn the monitor OFF, then ON, and then restart the test.

1. To pump up pressure in the system to a value 150 ± 5 mmHg, use the bulb.
2. Wait approximately one minute to allow the system to settle.
3. Check the pressure in the system on the manometer. Check the pressure on the monitor. Confirm that the pressure readings are ± 2 mmHg.
4. Wait 45 seconds. Check the pressure on the manometer. Check the pressure on the monitor. Confirm that the pressure readings are ± 2 mmHg. Confirm that the leak rate is less than 4 mmHg in one minute.
5. Release pressure in the system before the safety processor releases at 150 seconds.

Calibration Check at 50 mmHg:

Note:

Complete this test before the safety processor automatically releases pressure in 150 seconds. If the safety processor times out before to the completion of the test, turn the monitor OFF, then ON, and then restart the test.

1. To pump up pressure in the system to a value 50 ± 5 mmHg, use the bulb.
2. Wait approximately one minute to allow the system to settle
3. Check the pressure in the system on the manometer. Check the pressure on the monitor. Confirm that the pressure readings are ± 2 mmHg.
4. Wait 45 seconds.

5 Check the pressure on the manometer. Check the pressure on the monitor. Confirm that the pressure readings are ± 2 mmHg. Confirm that the leak rate is less than 4 mmHg in one minute

6 Release pressure in the system before the safety processor releases at 150 seconds.

7 Cancel NIBP calibration mode:

a On the **Service** menu, next to **NIBP calibration mode**, touch **OFF**.

b Touch **OK**.

Electrical Safety Testing

Safety testing protects the patient from electrical shock, especially micro-shock. Current values in the microampere (µA) range can cause fatal arrhythmias in electrically susceptible patients. A patient is deemed electrically susceptible when connected to monitoring equipment.

The DM3 monitor uses a Class 2, double insulated power supply, which does not require the use of a Ground (Protective Earth) conductor in the line cord. Because there is no Ground conductor; there is no Ground (Earth) leakage current. Enclosure (touch) and patient leakage currents should be checked before to placing the unit in service.

Table 5-3 Summary of Standards for Medical Monitoring Equipment

International Mains to Chassis Leakage	U.S. (120 V) Mains to Chassis Leakage	Mains Resistance
100 µA - normal condition, ground attached (AC connector to chassis)	300 µA - normal condition, ground attached (AC connector to chassis)	500 milliohms
500 µA - single fault condition, open ground, or reverse polarity	300 µA - single fault condition, open ground, or reverse polarity	500 milliohms

Equipment Required

Electrical Safety Analyzer, Fluke model 232D, or equivalent.

Perform these tests according to the scheduling requirements of your hospital, at least annually or after repair or after software upgrades.

Note:

Perform all tests according to the Operations Manual for the safety analyzer, and any local requirements.

Do not conduct electrical safety tests with the monitor connected to a patient.

Software Installation

Overview

This chapter tells how to install new software versions if needed.

Preinstallation

Before you update the monitor software

1. Power ON the monitor.
   If the **First Time Settings** window appears, touch **Cancel** to show the main screen.
2. In the upper-right corner of the main screen, touch the **Monitor Setup** key.
   The top-level **Setup** window shows.
3. Touch **Clinical**.
4. Enter **986** on the onscreen keyboard. Touch **OK**.
   The **Setup Clinical** window shows.
5. Touch **Configuration**.
   The Main software version listed on the screen is the version currently installed on the monitor. Note the installed software version.

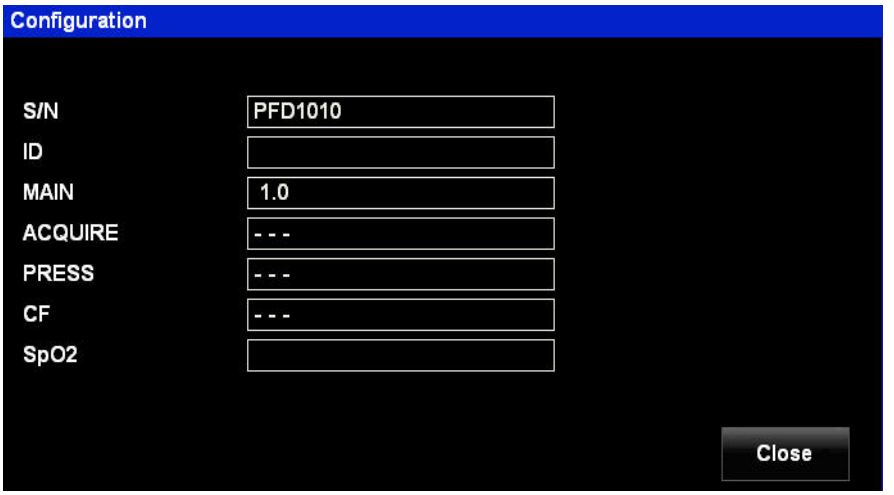


Figure 6-1 Configuration window

6 Verify that the S/N (serial number) on the screen matches the label on the back of the monitor.

7 Power OFF the monitor.

Software Update

Required equipment:

- Software installation tool
  - 011-0223-01 V1.5
  - 011-0223-03 V1.7

1 Examine the USB flash drive provided for the software update. Note the software version printed on the label of the flash drive. Confirm the software version needed for the software update.

2 With the monitor OFF, insert the USB flash drive into the USB connector on the back of the monitor.

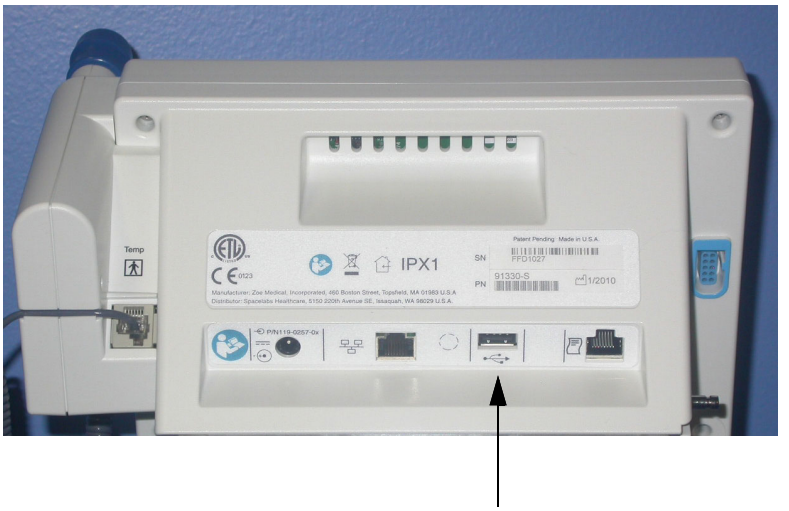


Figure 6-2 Location of USB connector

3 Power the monitor ON.
After the monitor starts, a message appears on the screen that indicates the software is updated:

Copying\Hard Disk\Flo.exe to \Storage Card \ Startup

Note:

The text can be different depending on the software version.

When the software update is done, the following message appears:

File Transfer Complete. Turn off power and remove memory stick.

4 Power the monitor OFF.

5 Remove the USB flash drive.

Verifying the Installation

After you finish installing the software, verify that the software version loaded on the unit is the version intended.

To verify the installation

1 Power ON the monitor.
If the **First Time Settings** window appears, touch **Cancel** to show the main screen.

2 In the upper-right corner of the main screen, touch the **Monitor Setup** key.
The top-level **Setup** window shows.

3 Touch **Clinical**.

4 Enter **986** on the onscreen keyboard. Touch **OK**.
The **Setup Clinical** window shows.

5 Touch **Configuration**. Verify that the Main software version matches the version on the label of the USB flash drive.

6 Verify that the S/N (serial number) on the screen matches the label on the back of the monitor.

7 Power the unit OFF.

Troubleshooting

Overview

This chapter provides helpful information about troubleshooting the Ultraview DM3 monitor.

Troubleshooting Table

Table 7-1 helps you solve problems that you may find when you use the Ultraview DM3 monitor. If these steps do not help you fix the problem, contact Spacelabs Healthcare Technical Support.

Table 7-1 Troubleshooting

Symptom	Possible Causes	Things to Try
Monitor will not boot up	No power to outlet.	• Make sure that the power outlet works. • Make sure that the green power LED on the monitor front panel illuminates.
	The monitor power supply does not work. The monitor is powered OFF. Internal system error	• If possible, use a different Ultraview DM3 power supply. • Set the power switch to the ON position. • Turn the monitor OFF, then turn it back ON. If the problem persists, contact Spacelabs Healthcare Technical Support
Blood pressure cuff does not inflate even though the pump is on.	Cuff is not connected to monitor or there is a leak in the setup, possibly a leak in the hose.	• Check cuff connection.
Pump repeatedly starts and stops.	The cuff has a leak or the hose is pinched.	• Check cuff connection. • Replace cuff.

Table 7-1 Troubleshooting

Symptom	Possible Causes	Things to Try
Blood pressure measurement completes without a numeric reading.	Hypertensive patient.	
	Patient movement.	• Ensure that the patient is remaining as still as possible during the reading.
	Weak signal	• Ensure that cuff size and placement are correct.
Blood Pressure measurement does not start.	Circuit failure.	• Turn the monitor OFF, then ON. If the problem persists, contact Spacelabs Healthcare Technical Support.
The touchscreen does not work properly.	The touchscreen is not responding to touch.	• Perform the touchscreen calibration procedure, as described in"Touchscreen Calibration" on page 3-1. • Calibate Touchscreen with calibration tool 011-0224-00. • Turn the monitor OFF, then ON. If the problem persists, contact Spacelabs Healthcare Technical Support. • If touchscreen fails to calibrate, send the device in for repair.
Bar code scanning is not working properly.	Bar code dropping characters randomly	• Restore factory defaults on the scanner and then scan the 50 msec keystroke delay programming code. • Ensure software is up to date on the scanner itself. • The DM3 should work with the USB bar code scanners that can scan Code 128-type bar codes (a very common type).
The display does not work properly.	Display failure.	• Turn the monitor OFF, then ON. If the problem persists, contact Spacelabs Healthcare Technical Support.
The speaker does not work properly.	Speaker failure.	• Turn the monitor OFF, then ON. If the problem persists, contact Spacelabs Healthcare Technical Support.
The monitor does not work properly and shows an error message	Operating system failure.	• Turn the monitor OFF, then ON. If the problem persists, contact Spacelabs Healthcare Technical Support.

Table 7-1 Troubleshooting

Symptom	Possible Causes	Things to Try
Network connection is not working properly.	DM3 is not connecting to the network.	• Verify all configuration settings in the communication menu are correct for the network you are connected to. • Ensure that DM3 Loader is installed and running. • Verify that the Encryption check box is unchecked in the Spacelabs ICS Administration application under DM3 Loader Gateway Settings. • Turn off Firewall settings. • Verify port (default 6858) is on and configured to receive data. • Recommended software version for network connectivity is V1.5 or higher.

Nellcor Oximax SpO_2 Messages

Status messages show in the waveform zone and on the messages prompt line of the Ultraview DM3 monitor when certain conditions are detected. Each status message is preceded by SPO_2 when shown. The messages below relate to the Nellcor Oximax SpO_2 technology (option N).

OXIMETER FAILURE

Error XXX

If there is a communications failure or an unexpected or fatal error in processing, the OXIMETER FAILURE message shows, with the corresponding error number (xxx). This message shows while the SpO_2 hardware resets.

If the monitor cannot reset the SpO_2 hardware, the message shows:

OXIMETER FAILURE

Error XXX—Contact Service

This is a non-recoverable hardware error. This error occurs as a result of failed or compromised Nellcor hardware.

The error numbers correspond to the following:

Table 7-2 Error Conditions

Error Number	Error Condition
below 600	Nellcor-specific error
600	Packet error; invalid packets from NELL-1
700	Message error; illegal or out-of-bounds
800	Time-out error; not responding

To attempt to restore communications with the monitor:

- Replace the SpO_2 sensor and adapter.
- Turn the monitor OFF, then ON.

If this error recurs, contact *Spacelabs Healthcare Technical Support Services* on page 1-1 to arrange for repair.

HARDWARE INCOMPATIBILITY

Contact Service

This is a non-recoverable hardware error. This condition is detected at power-ON, and indicates that the hardware in the monitor is not operational. Contact*Spacelabs Healthcare Technical Support Services* on page 1-1 to arrange for repair.

Masimo SET SpO_2 Messages

Status messages show in the waveform zone and on the messages prompt line of the Ultraview DM3 monitor when certain conditions are detected. Each status message is preceded by SPO_2 when shown. The messages below relate to the Masimo SET SPO_2 technology (option M).

FAULTY OXIMETER—Contact Service

This is a non-recoverable hardware error.

This error occurs as a result of one of more of the following:

- Failed or compromised Masimo SET sensors or adapters
- Failed or compromised Masimo SET hardware in the monitor

To attempt to restore communications with the monitor:

- Replace the SpO_2 sensor and adapter
- Turn the monitor OFF, then ON

If this error recurs, contact *Spacelabs Healthcare Technical Support Services* on page 1-1 to arrange for repair.

HARDWARE INCOMPATIBILITY

Contact Service

This is a non-recoverable hardware error. This condition is detected at power-ON and indicates that the hardware in the monitor is not operational. Contact *Spacelabs Healthcare Technical Support Services* on page 1-1 to arrange for repair.

Spacelabs SpO_2 Messages

Status messages show in the waveform zone and on the messages prompt line of the monitor when certain conditions are detected. Each status message is preceded by SPO_2 when shown on the prompt line. The messages below relate to the Spacelabs SpO_2 technology (option S).

FAULTY OXIMETER—Contact Service

This is a non-recoverable hardware error.

This error occurs as a result of one of more of the following:

- Failed or compromised TruLink or Nellcor/Novametrix-compatible sensors or adapters
- Failed or compromised SpO_2 board in the monitor

To attempt to restore communications with the monitor:

- Replace the SpO_2 sensor and adapter
- Turn the monitor OFF, then ON

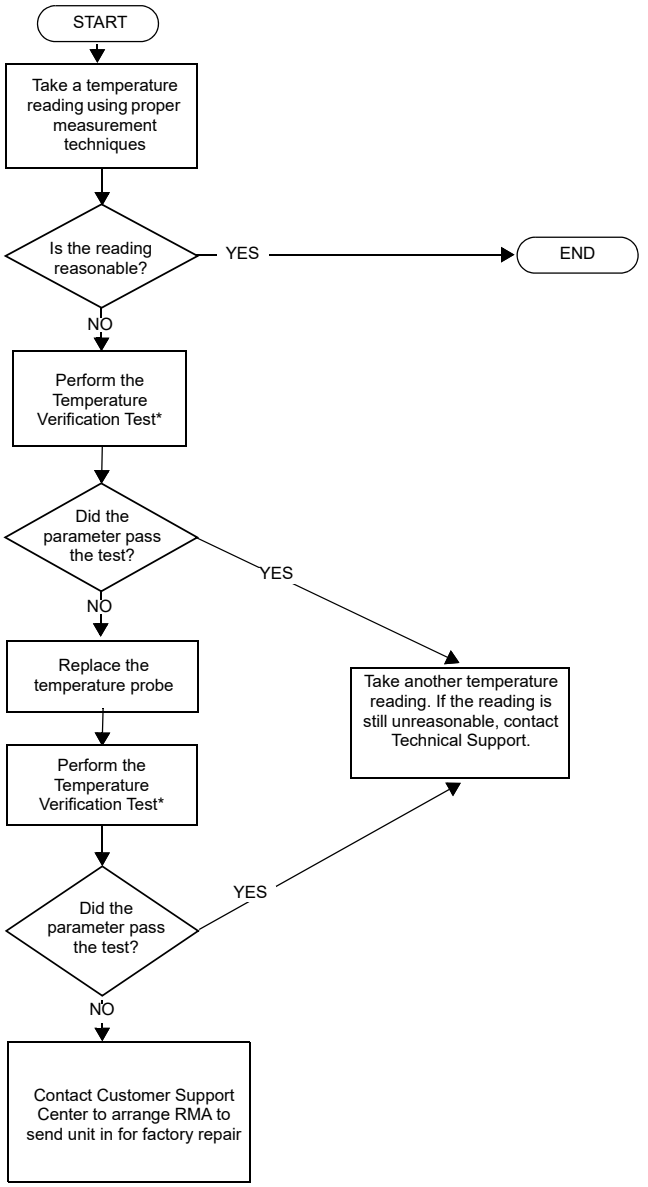
If this error recurs, contact *Spacelabs Healthcare Technical Support Services* on page 1-1 to arrange for repair.

HARDARE INCOMPATIBILITY

Contact Service

This is a non-recoverable hardware error. This condition is detected at power-ON and indicates that the hardware in the monitor is not operational. Contact Spacelabs Healthcare to arrange for service repair. For more details, refer to *Spacelabs Healthcare Technical Support Services* on page 1-1.

Troubleshooting Flow Chart: Temperature



*See *Temperature (if included)* on page 5-4

Service Tools

Table 8-1 Service Tools

Description	Part Number
Touchscreen Calibration Tool, USB	011-0224-00
Battery replacement kit	019-0547-00

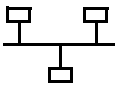
Appendix A — Symbols

The following list of international and safety symbols describes all symbols used on Spacelabs Healthcare products. No one product contains every symbol.

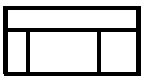
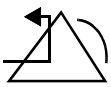
Note:

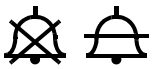
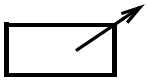
Graphic elements of certain keys and symbols may vary between product lines.

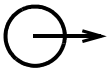
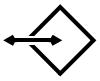
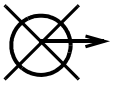
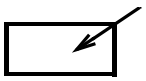
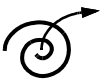
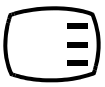
 	HELP Key
?	HELP (Explain Prior Screen) Key
 	MONITOR SETUP Key
	REMOTE Key
 	TRENDS Key

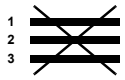
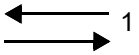
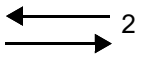
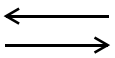
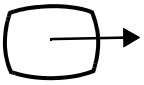
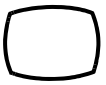
 	RECORD Key
	Dynamic Network Access (DNA) Key
	SPECIAL FUNCTIONS Key
	NORMAL SCREEN Key
	SAVE Key
	No Network Connection
	Network Connection
	Do Not Connect to Network
	No Connection to Intesys® Clinical Suite (ICS)
	Compression
	Magnifying Glass
	File Cabinet
	List of Rooms
	Printer

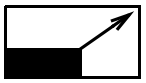
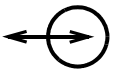
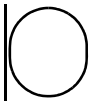
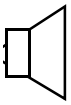
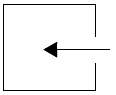
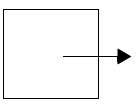
	Service Message
 	PREVIOUS MENU Key
	HOME Key
 	Arrows
	On Direction
	ON — Power Connection to Mains
	ON — Part of the Instrument Only
	ON Position for Push Button Power Switch
	OFF — Power Disconnection from Mains
	OFF Position for Push Button Power Switch
	OFF — Part of the Instrument Only
	Partial ON/OFF
	ON/OFF
	Standby

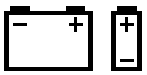
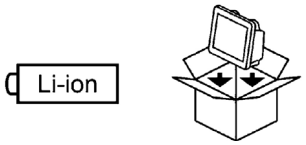
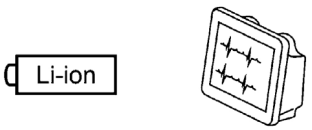
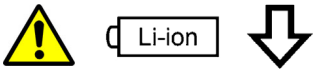
	STANDBY Key Power ON/OFF Key
	Keyboard Connection
	Mouse Connection
	PAUSE or INTERRUPT
	START/STOP Key
	START/STOP
	STOP or CANCEL Key
	CONTINUE Key
	ENTER Key
	Delete
	Nurse Alert Interface
	ALARM SUSPEND/TONE RESET Key
	ALARMS Key
	Alarm, General
	Alarm Reset

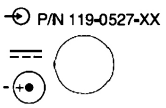
	Alarm Audio ON
	Alarm Audio OFF
	Alarm Audio Paused
	Low Priority Alarm
	Medium Priority Alarm
	High Priority Alarm
	Alarms Paused
	Alarm OFF
---	Parameter below measurement range
+++	Parameter above measurement range
???	Parameter measurement indeterminate
	Indicator — Remote Control
	PRINT REPORT Key
	Normal Screen
	Clock/Time Setting Key
	Slow Run

	Activate Recorder for Graphics
	Reset
	START (NIBP) Key
	Power Indicator LED
	Activate Telemetry Recorder
	Output (Non-terminated)
	Data Input/Output
	Input
	No Output (Terminated)
	Indicator — Local Control
	Indicator — Out of Paper
	Recorder Paper
	Menu Keys
	Waveform/Parameter Keys
	Return to Prior Menu

	Monitor Setup Select Program Options
	Set Initial Conditions Menu
	Access Special Function Menu
	Return Unit to Monitor Mode
	Keypad
	Serial Port 1
	Serial Port 2
	Serial Port
	Auto Mode (NIBP)
	External Marker Push Button Connection
	Arterial Pulse
	Gas Exhaust
	Video Output
	Television; Video Display
	Video Output, Primary
	Video Output, Secondary

	Enlarge, Zoom
	Input/Output
	PCMCIA Card
	Touchscreen, External
	Universal Serial Bus
	SDLC Port
	Hard Drive
	Antenna
	Electrocardiograph or Defibrillator Synchronization
	Microphone
	Foot Switch
	Audio Output, Speaker
	Event
	Gas Sampling Port
	Gas Return Port

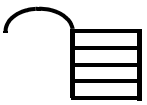
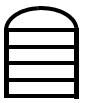
	Battery Replace only with the appropriate battery.
	Battery Status
	Battery Replace only with the appropriate battery.
	Low Battery
	Replace only with the appropriate battery. (+ / - signs may be reversed)
	Battery off. Shipping and service mode.
	Battery on. Regular operating mode.
	Check battery switch on bottom of unit.
	All batteries should be disposed of properly to protect the environment. Lithium batteries should be fully discharged before disposal. Batteries such as lead-acid (Pb) and nickel-cadmium (Ni-Cd) must be recycled. Please follow your internal procedures and or local (provincial) laws regarding disposal or recycling.
	This symbol indicates that the waste of electrical and electronic equipment *must not* be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.
	Caution - hazardous voltages. To reduce risk of electric shock, do not remove the cover or back. Refer servicing to a qualified field service engineer (U.S.A.). DANGER - High Voltage (International)
	Protective Earth Ground
	Replace Fuse Only as Marked
	Power supply jack polarity. (+ / - signs may be reversed)

	Alternating Current
	Both Direct and Alternating Current
	Functional Earth Ground
	Fuse
	Equipotentiality Terminal
	Direct Current
	Input Power. Use only Spacelabs Power Supply (P/N 119-0527-xx).
	AC/DC Input
	Loop Filter
	Audio Output, Speaker
	IEC 60601-1 Type B equipment. The unit displaying this symbol contains an adequate degree of protection against electric shock.
	IEC 60601-1 Type BF equipment which is defibrillator-proof. The unit displaying this symbol is an F-type isolated (floating) patient-applied part which contains an adequate degree of protection against electric shock, and is defibrillator-proof.
	IEC 60601-1 Type BF equipment. The unit displaying this symbol is an F-type isolated (floating) patient-applied part providing an adequate degree of protection against electric shock.
	IEC 60601-1 Type CF equipment. The unit displaying this symbol is an F-type isolated (floating) patient-applied part providing a high degree of protection against electric shock, and is defibrillator-proof.
	IEC 60601-1 Type CF equipment. The unit displaying this symbol is an F-type isolated (floating) patient-applied part providing a high degree of protection against electric shock.

	IEC 60601-1 Class II equipment, double-isolated. The unit displaying this symbol does not require a grounded outlet.
	Warning: Do not modify this equipment without authorization of the manufacturer.
	Operates on Non-Harmonized Radio Frequencies in Europe
	Adult Noninvasive Blood Pressure (NIBP)
	Fetal Monitor Connection (Analog)
	Fetal Monitor Connection RS-232 (Digital)
	Physiological Monitor Connection RS-232 (Digital)
	Noninvasive Blood Pressure (NIBP), Neonate
	Symbol Set, Adult/Pediatric Cuff Sizes
	Symbol Set, Neonatal Cuff Sizes
	NIBP Cuff, Neonatal 1
	NIBP Cuff, Neonatal 2
	NIBP Cuff, Neonatal 3
	NIBP Cuff, Neonatal 4
	NIBP Cuff, Neonatal 5

	NIBP Cuff, Single Hose
	NIBP Cuff, Dual Hose
THIS SIDE TO PATIENT	NIBP Cuff, Surface Applied to Patient
CHILD	NIBP Cuff, Child Size (12 to 19 cm)
CHILD, LONG	NIBP Cuff, Child Size, Long (12 to 19 cm)
SMALL ADULT, LONG	NIBP Cuff, Small Adult Size, Long (17 to 25 cm)
SMALL ADULT	NIBP Cuff, Small Adult Size (17 to 25 cm)
ADULT, LONG	NIBP Cuff, Adult Size, Long (23 to 33 cm)
LARGE ADULT, LONG	NIBP Cuff, Large Adult Size, Long (31 to 40 cm)
LARGE ADULT	NIBP Cuff, Large Adult Size (31 to 40 cm)
ADULT	NIBP Cuff, Adult Size (23 to 33 cm)
INFANT	NIBP Cuff, Infant Size (8 to 13 cm)
NEONATAL 1	NIBP Cuff, Neonatal 1 Size (3 to 6 cm)
NEONATAL 2	NIBP Cuff, Neonatal 2 Size (4 to 8 cm)
NEONATAL 3	NIBP Cuff, Neonatal 3 Size (6 to 11 cm)
NEONATAL 4	NIBP Cuff, Neonatal 4 Size (7 to 13 cm)

NEONATAL 5	NIBP Cuff, Neonatal 5 Size (8 to 15 cm)
THIGH	NIBP Cuff, Thigh Size (38-50 cm)
NYLON	NIBP Cuff, Nylon Material
SOFT	NIBP Cuff, Soft Material
VINYL	NIBP Cuff, Vinyl Material
QTY	Quantity
ARTERY	Place Artery Symbol and Arrow over Brachial or Femoral Artery
	eIFU = electronic Instructions for Use (CD-ROM or website) is available
	Consult Instructions For Use
	Follow Instructions For Use
	Warning About Potential Danger to Human Beings (Consult Accompanying Documents)
	Caution About Potential Danger to a Device (Consult Accompanying Documents)
Note	Note
	Keep Dry
	Indoor Use Only

	Environmental Shipping/Storage Altitude Limitations
	Environmental Shipping/Storage Temperature Limitations
	Fragile
	Handle with Care
	This Way Up
	Up Arrow
	Down Arrow
	Environmental Shipping/Storage Humidity Limitations
	Humidity limitation
	Atmospheric pressure limitation
	Open Padlock
	Closed Padlock
	Happy Face
	Sad Face
	PVC-Free (Polyvinyl Chloride)

	Do Not Reuse; Single Use Only
	Reusable
IPX1	Drip-Proof
IPX7	Unit can withstand accidental immersion in one meter of water for up to 30 minutes
	Reference Number or Order Number
	Use by date [YYYY-MM-DD]
	Recycle
	Non Sterile
	Latex-Free
	Date of Manufacture
	Manufacturer
	Radio transmitting device; elevated levels of non-ionizing radiation
	A CE mark certifies that a product has met EU health, safety, and environmental requirements, which ensure consumer safety.
	XXXX is the European Notified Body number. 0123 is the number for TÜV SÜD Product Service GmbH, München, Germany.
	Canadian Standards Association Approved

	Does not contain hazardous substances — Europe
	Does not contain hazardous substances — China
	Batch Code
	Nellcor Oxisensor II Compatible
	Novametrix Compatible
	Spacelabs TruLink Compatible
	Nellcor OxiMax Compatible
	Spacelabs Compatible
	UL recognized component in Canada and United States
	Nellcor OxiMax Compatible
	Masimo SET Compatible

ABBREVIATIONS USED AS SYMBOLS ARE SHOWN BELOW.

1 - 32	Access Codes 1 Through 32
AIR	Air
A	Amperes
ANT 1 ANT 2	Diversity Antenna System 1 Diversity Antenna System 2
Arr1 ArrNet2	Arrhythmia Net 1 Arrhythmia Net 2
$avDO_2$	Arterial/Venous Oxygen Difference
CaO_2	Arterial Oxygen
CH ch	EEG, EMG, or ECG Channel EEG Channels - CH1, CH2, CH3, CH4 EMG Channel - CH5
cmH_2O	Centimeters of Water
C.O. CO	Cardiac Output
CvO_2	Venous Oxygen
CO2 CO_2	Carbon Dioxide
DIA dia	Diastolic
ECG ecg	Electrocardiogram
EEG eeg	Electroencephalogram
EMG emg	Electromyogram
ESIS	Electrosurgical Interference Suppression
EXT	External
FECG	Fetal Electrocardiogram
FHR1 FHR2	Fetal Heart Rate, Channel 1 Fetal Heart Rate, Channel 2
GND gnd	Ground
Hz	Hertz
Hgb	Hemoglobin
HLO hlo	High-Level Output
Multiview	Multi-Lead Electrocardiogram

N_2O	Nitrous Oxide
NIBP nibp	Noninvasive Blood Pressure
O_2AV	Oxygen Availability
O_2	Oxygen
PaO_2	Partial Pressure of Arterial Oxygen
PRESS press PRS	Pressure
PvO_2	Partial Pressure of Mixed Venous Oxygen
Ref.	Oxygen reference gas port
RESP resp	Respiration
SDLC	Synchronous Data Link Control
SN	Serial number
MDL	Model number
OPT	Option
SPO2 SpO2 SpO_2 SaO_2	Arterial Oxygen Saturation as Measured by Pulse Oximetry
SVO2 $S\bar{v}O2$ $S\bar{v}O_2$	Mixed Venous Oxygen Saturation
SYS sys	Systolic
T1 T2 T3 T4	Temperature 1 Temperature 2 Temperature 3 Temperature 4
TEMP temp	Temperature
UA	Uterine Activity or Umbilical Artery
UV	Umbilical Venous
VAC	Vacuum Connection
VO_2	Oxygen Consumption
V	Volts
W	Watts