Service Manual Small Animal Configuration

SMART DR 4.2

Supports the Varex 2530W-G5, 4336W-G5, and 4343W panels

Supports integration with Summit HF X-ray generator

721-806-G2, Rev. B

Notices

Reasonable precautions have been taken in the preparation of this book, but Sound Technologies, Inc. assumes no responsibility for errors or omissions or for damage resulting from the use of the information contained herein. For improvement of product performance, supplementation, or follow-up of information, the contents of this manual are subject to change without notice.

The SMART DR™ digital x-ray imaging system is a high resolution digital imaging system intended to replace conventional film techniques, or existing digital systems, in multipurpose or dedicated applications specified below. The digital x-ray imaging system enables an operator to acquire, display, process, export images to portable media and send images over a network for long-term storage. Image processing algorithms enable the operator to bring out diagnostic details difficult to see using conventional imaging techniques. Images can be stored locally for temporary storage. The Sound Technologies, Inc. product has the ability to interface with a variety of flat panel image receptors. The major system components include an image receptor, computer, monitor and imaging software. The Sound Technologies, Inc. digital x-ray imaging system is intended for use in general radiographic examinations and applications (excluding fluoroscopy) for veterinary applications only and is not for human use.

EU Authorized Representative

EC REP

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Standards and compliance

CE for Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU
ETL approved
CAN/CSA-C22.2 No. 60601-1
IEC 60601-1, 60601-1-2, 62304, 62366
AAMI ES60601-1

It is the responsibility of the system integrator to ensure detectors are CE marked for use in the European Union.

This product conforms to the necessary IEC standards for patient safety & isolation as-shipped from the factory. The end user and/or the installer is responsible to insure that when connected, as a system with other devices, this product meets all the rules of IEC 60601-1 Clause 16.

Statement of intended use

The SMART DR™ digital x-ray imaging system is a high resolution digital imaging system intended to replace conventional film techniques, or existing digital systems, in multipurpose or dedicated applications specified below. The digital x-ray imaging system enables an operator to acquire, display, process, export images to portable media and send images over a network for long-term storage. Image processing algorithms enable the operator to bring out diagnostic details difficult to see using conventional imaging techniques. Images can be stored locally for temporary storage. The product has the ability to interface with a variety of flat panel image receptors. The major system components include an image receptor, computer, monitor and imaging software.

The digital x-ray imaging system is intended for use by a veterinary technologist or other trained person under the supervision of a veterinarian. The target population will be canine, feline, (small) mammal, primate, avian, and reptile undergoing medical diagnostic imaging for reasons that were judged to be medically necessary by a competent veterinary practitioner.

Warning: Do not modify this equipment without authorization by Sound Technologies, Inc.

Warning: Ne pas modifier cet équipement sans l'autorisation de Sound Technologies, Inc.

Operating principle

The essential performance of the SMART DR™ system is to synchronize the image acquisition of the digital receptor with the X-ray beam of the host X-ray system to capture, display and archive quality images of the intended anatomy, with reasonable patient exposure to X-rays.

The SMART DR™ digital imaging system uses a solid-state X-ray detector to capture digital images of anatomy penetrated by an incident X-ray beam. A host X-ray system generates the X-ray beam, which passes through a patient and strikes the detector of SMART DR™. The detector converts the X-ray energy to digital image data that is then passed to the SMART DR™ computer. The computer processes the image data, displays the image to the user, and provides temporary storage for image data and associated patient information, which can be imported from a worklist or entered manually. When the user has finished applying processing, annotation, and measurement features of SMART DR™ software, the images can be archived to appropriate DICOM-compliant devices.

Intended user profile

The digital x-ray system is intended for use in general radiographic examinations and applications (excluding fluoroscopy) by a veterinary technologist or other trained person under the supervision of a veterinarian.

There are no user-serviceable parts inside the digital x-ray system or subsystem components. Refer all repair needs to a service organization that has been trained and authorized by Sound Technologies, Inc.

Intended patient population

The target population is canine, feline, (small) mammal, primate, avian, and reptile undergoing medical diagnostic imaging for reasons that were judged to be medically necessary by a competent veterinary practitioner. The x-ray system is intended for veterinary applications only and is not for use on humans.

Intended anatomy

The x-ray system may be used to image any part or area of the target population's anatomy that can be imaged with x-ray radiation, with or without a contrast agent.

Maintenance and cleaning

See *Cleaning the x-ray system* on page 165, for information about maintaining and cleaning the system components.

Trademarks

Sound™ and SMART DR™ are trademarks and SMART DR™ is a registered trademark of Sound Technologies, Inc. The Intel Core™ i5 Processor is a trademark of Intel, Santa Clara, Calif. The Dual Band Wireless-AC 7260 is a product of Intel. Windows is a registered trademark of Microsoft® Corporation in the United States and other countries; LUMEN 4336W, LUMEN 2530W, and LUMEN 4343W are brand names of Varex Imaging Corporation for 4336W-G5, 2530W-G5, and 4343W; ViVA™ is a trademark of Varex Imaging Corporation; Pleora is a brand and trade name of Pleora Technologies, Inc., Kanata, Ontario, Canada. Symantec, the Symantec Logo, Altiris, and any Altiris or Symantec trademarks used in the product are trademarks or registered trademarks of Symantec Corporation or its affiliates in the U.S. and other countries; Dell™ and the Dell logo are trademarks of Dell Inc. All other trademarks are properties of their respective companies.

About This Document

This manual, together with company training, gives service technicians the step-by-step instructions they need to install, configure, maintain, and diagnose an x-ray system.

Caution: Please read and follow the safety and equipment handling practices in this manual.

Caution: Veuillez lire et suivre les pratiques de sécurité et de manipulation de l'équipement dans ce manuel.

Revision history

The following table shows when this document has been revised and a description of the major updates for each revision.

Table 1: Revision table

Revision letter	Issue date	EC	Changes
A	2022-05-20	EC-0004181	Version 4.1 update. The features are covered in this manual: Updated user interface; updated licensing; Varex detectors 4343W, 2530W-G5, and 4336W-G5 integrated; support for dual panel configurations; support for viewing shock logs for detectors; replaced color scheme options with light and dark modes; updated firmware version for detectors; new Status tab for viewing detector status in Diag screen; ability to log users out from Maintenance screen; ability to edit the local AE titles for MPPS and Worklist servers; ability to edit the Network Activity Timeout value for DICOM; changes to calibration: show each calibration image, configurable parameters, simplify calibration instructions, show Median Pixel Values for calibration images; required field indicators are now red, updated Reports screen, updated SSID prefix, SMARTDR shortcut added to Windows desktop. Exit button added to Login screen to close browser. New Show Notifications icon that displays number of total notifications until cleared. New options to select a color other than white/default color for overlays, overlay highlights, and anchor points. Added/corrected selectable options for Manual Generator Technique Entry in Intermediate Options tab. New Zoom Factor ability in Basic Options tab to enlarge or downsize the user interface. New feature in Intermediate Options tab to display preview of an image during acquisition.

Revision letter	Issue date	EC	Changes
B	2023-01-09	EC-0005953	Version 4.2.0. The manuals were updated to include the following features and changes: detector sleep time was changed from 10 minutes to 30 minutes, the annotation mode toolbar now contains LH and RH markers, g (grams) was added to the list of default weight units in Intermediate Options, Require Patient DOB was added to the Advanced Options, support for a Multi-user QR code was added, the option Save to USB was added to the list of export types, updated the System Configuration Tool to include Import 4.X-to-4.X Selected Configuration and Import Legacy (3.9) Configuration.

Related and supplemental information

The following documents are part of the product library or provide supplemental information on this product.

Table 2: Related and supplemental information

Title	Description	Part number
SMART DR™ User Manual	This manual, together with Sound Technologies, Inc. training, gives radiologic technologists the step-by-step instructions that they need to acquire, review, and store images with the x-ray system.	721-805-G1
SMART DR™ Service Manual	This manual, combined with manufacturer-provided training classes, supplies the information that a service technician requires to set up, configure, calibrate, and diagnose a Sound Technologies, Inc. x-ray system.	721-806-G2
Online help	See the online help for videos and text that describes the most common tasks in the user interface. The help is context sensitive and can be launched from the x-ray system software user interface by clicking the question mark icon (?) in the main tool bar of the screen that you want to see help for.	Not applicable. The online help is installed with the product.
X-ray generator documentation	In addition to the other documentation in the product library, please read the documentation that accompanies the x-ray generator.	Not applicable. The documentation accompanies the x-ray generator.

Information symbols

Informational symbols are used in the Sound Technologies, Inc. imaging system documentation and on some labeling.

Table 3: Informative markings: Documents and equipment

Symbol	Title/Meaning
	Notice. An important aspect of Sound Technologies, Inc. imaging system operation is presented.
	Caution. On product, indicates need to consult instructions for use for important cautionary information.
	Warning. General warning.
	Read accompanying documents or instructions for use.
	The date of manufacture is adjacent to this symbol.
SN	The manufacturer’s serial number is displayed with this symbol.
	The procedure requires making X-ray exposures and producing radiation. Follow safety precautions when operating the X-ray system.
	Earthing terminal Grounding terminal
	Warning. Warning, electricity
	Dangerous voltage. Indicates hazard from dangerous voltages.
	Non-ionizing electromagnetic radiation. Indicates elevated or potentially hazardous levels on non-ionizing electromagnetic radiation.

Symbol	Title/Meaning
	The manufacturer’s catalog number (model number) is displayed with this symbol.
	The name and address of the manufacturer is displayed with this symbol. The date of manufacture may also be included with this information.
	Authorized representative in the European Community.

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Chapter

1

System Overview

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This chapter provides a high-level overview of the x-ray system to orient you to the more detailed tasks involved in installing, configuring, maintaining, and troubleshooting the system. More detailed tasks and information is provided later in the manual.

System components

The x-ray system is shipped with the following components.

Table 4: Supported computer hardware

Hardware component	Details	Part numbers
PC	DT Research DT504T All-In-One (AIO). For details, see the topics, *DT504T AIO PC technical specifications* on page 6 and *DT504T AIO PC controls and connectors* on page 7.	Varex part number: 099-772
Keyboard	Microsoft® Wireless Keyboard 900	Not included with PC; supplied by Sound™ and shipped to customer with PC. Sound part number: 20-457
Mouse	Microsoft® Wireless Mouse 900	Not included with PC; supplied by Sound™ and shipped to customer with PC. Sound part number: 20-457
Mousepad	Sound SMART DR™ Radiography Evolved mousepad	Supplied by Sound™. Sound part number: 70-117
Recovery media	The USB thumb drive (recovery media) contains a software image supplied by Sound™ that is installed and configured on a client's PC/system.	Recovery media for use with DT ResearchAIO PC; supplied by Sound™ for Varex use. Sound part number: 70-939

Table 5: Panels and connection boxes

Panels, switch, and access point	Panel details	Part numbers
2530W-G5 standard x-ray panel	The detector comes with the following hardware: • Battery (142144) • Single-bay battery charger (136331) • Power supply for charger (138737) • Wall mounting hardware for the battery charger (117881) • Mains 110V, hospital grade power cord for the charger (11616) • Service cable (149961)	151360
4336W-G5 DRZ+	The detector comes with the following hardware: • Battery (142144) • Battery charger (136331) • Battery charger power supply (138737) • Service cable (149961)	150031
4336W-G5 CsI standard	The detector comes with the following hardware: • Battery (142144) • Battery charger (136331) • Battery charger power supply (138737) • Service cable (149961)	148780
4336W-G5 CsI premium	The detector comes with the following hardware: • Battery (142144) • Battery charger (136331) • Battery charger power supply (138737) • Service cable (149961)	150027

Panels, switch, and access point	Panel details	Part numbers
4343W DRZ+ x-ray detector	The detector comes with the following hardware: • Battery (142144) • Battery charger (136331) • Battery charger power supply (138737) • Service cable (149961) • Tether cable (148710)	145452
4343W CsI standard x-ray detector	The detector comes with the following hardware: • Battery (142144) • Battery charger (136331) • Battery charger power supply (138737) • Service cable (149961) • Tether cable (148710)	146241
4343W CsI premium x-ray detector	The detector comes with the following hardware: • Battery (142144) • Battery charger (136331) • Battery charger power supply (138737) • Service cable (149961) • Tether cable (148710)	146245

Table 6: Interconnect cables

Cable	Length	Details	Part number
Tether Y cable, USB-C, GEN 5	7ft / 84in	Connects the 4343W panels to the Ethernet cable for the PC and the power supply for the detector.	148710
Detector power supply unit (PSU) with AC power cord	NA	Connects the tether Y cable to the AC power supply for the detector.	148709
Gigabit Ethernet cable	10m 18m	Connects the tether Y cable to the PC.	26359 30754

Cable	Length	Details	Part number
DB9 serial cable	NA	For detectors using the integrated generator feature, connects the PC to the x-ray generator for communication between the two components.	Supplied by Sound™.
Six outlet power surge strip	6ft / 72in	A power supply outlet with 6 sockets; connects to a wall outlet.	099-610

Important: If antivirus software is desired, it is the site's responsibility to install and maintain it.

DT504T AIO PC

The DT504T All-In-One (AIO) medical-grade LCD--integrated system/PC provides a rugged platform for the SMART DR™ software.

Figure 1: DT504T AIO PC

 [1]

[2]

The DT504T AIO PC contains the following components:

- Intel® 10th Generation Core™ i5-100500T 6-core 2.3 GHz processor
- 1TB solid state drive (SSD)
- 16GB random access memory (RAM)
- Microsoft® Windows® 10 IoT Enterprise
- Built-in Wi-Fi and Bluetooth

1 Courtesy of DTResearch.com

2 Courtesy of CDW

- 1920 x 1080 pixels, high-brightness (1000 nits) capacitive touch display with fanless cooling
- Built-in speaker and microphone
- Wireless keyboard and mouse
- AC-DC 100/240V power adaptor with power cord
- Smart card/Common access card (CAC) reader

DT504T AIO PC technical specifications

The DT504T AIO PC has the following technical specifications.

Table 7: DT504T technical specifications

Parameter	Description
CPU	Intel® 10th Generation Core™ i5-100500T 6-core 2.3 GHz processor
RAM	16GB
Storage	1TB solid state drive (SSD)
Operating system	Microsoft® Windows® 10 IoT Enterprise
Display	23.8" LCD (widescreen with antimicrobial coating), high-brightness (1,000 nits) screen with capacitive touch and fanless cooling
Display resolution	1920 x 1080 pixels (Full HD)
Speaker and microphone	Built-in
WLAN	Built-in Wi-Fi 802.11a/b/g/n/ac/ax, 2.4GHz/5GHz dual band
Bluetooth	Bluetooth 5.1
Ports	HDMI (1), USB 3.0 (4), USB 2.0 (2), RJ-45 for Ethernet (2), COM port (3), Audio (1), DC (1), potential equalization conductor (1, optional)
AC/DC adaptor	Input: 100-240V AC Output: 19V DC, 6.31A
Major options	Smart card/CAC reader: Full-slot, reads ISO 7816 T=0, T=1; 1.8/3/5V smart card Battery: 1 integrated UPS battery (not included)
Enclosure	Aluminum alloy, antimicrobial
Dimensions (H x W x D)	14.6 x 22.3 x 1.8 in (370.5 x 567 x 45.2 mm)
Weight	17.6 lbs/8 kg

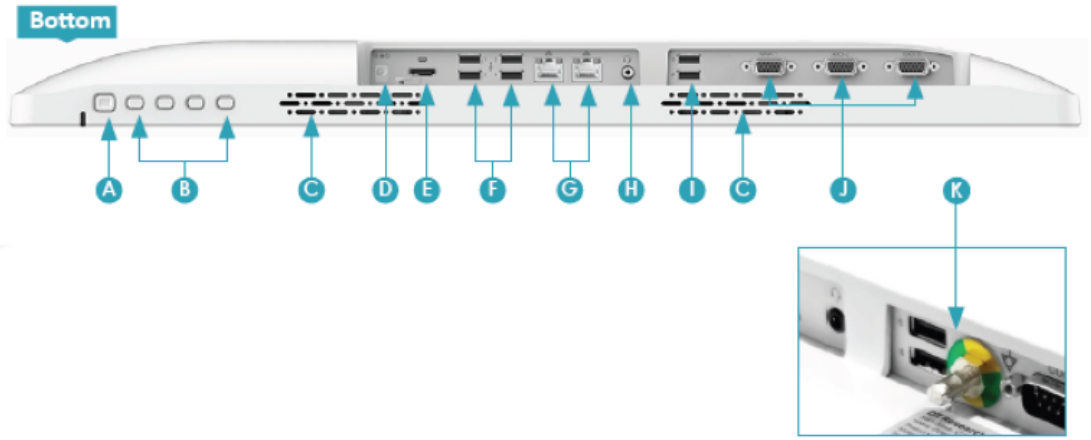
Parameter	Description
Water Resistance	Front panel: IP65; Enclosure: IPX2
Regulatory	ANSI/AAMI ES60601-1, IEC60601-1, IEC60601-1-2, FCC Part 18, FCC Part 15 Class B, GB 17625.1, GB 4943.1, GB/T 9254, CE-EMC, CE-RED, Energy Star 8.0, RCM, CCC
Temperature	Operating: 0°C to 40°C (32°F to 104°F) Storage: -20°C to 60°C (-4°F to 140°F)
Humidity	0% – 90% non-condensing

DT504T AIO PC controls and connectors

This section describes the controls and connectors for the DT504T AIO PC.

DT504T controls and connectors

Figure 2: DT504T controls and connectors



3

Table 8: DT504T controls and connectors

Item	Description
A	Power button. Press to power the PC on or off.
B	Programmable buttons
C	Speakers
D	DC input. Connect to AC-DC power adaptor to charge or power the PC. Use only the adaptor shipped with the PC.

3 Courtesy of DTResearch.com

Item	Description
E	HDMI output
F	USB 3.0 ports
G	Ethernet port (RJ-45)
H	Audio jack
I	USB 2.0 port
J	COM ports
K	Potential equalization conductor (optional)

Figure 3: DT504T PC and AC-DC adaptor

Connect the AC-DC adaptor to the PC (at the DC input) and to a wall outlet to power the PC or charge the PC's batteries.

Wireless keyboard and mouse

A wireless keyboard and mouse are supplied as part of the Sound™ accessory kit.

About the wireless keyboard and mouse

Figure 4: Wireless keyboard and mouse

Table 9: Wireless keyboard specifications

Parameter	Description
Keyboard Name	Microsoft® Wireless Keyboard 900
Mouse Name	Microsoft® Wireless Mouse 900
Dimensions (L x W x D/H)	Keyboard: 16.7 x 6.09 x 1.11 in (424 x 155 x 28.2 mm) Mouse: 4.46 x 2.49 x 1.74 in (113 x 63.1 x 44.1 mm)
Weight	Keyboard: 18.2 ounces (517 grams), includes 2 AAA alkaline batteries (battery weight may vary) Mouse: 2.56 ounces (72.5 grams), includes 2 AA alkaline batteries (battery weight may vary)
Battery	• Keyboard: 2 AAA alkaline batteries (included) • Mouse: 2 AA alkaline batteries (included)
Battery life	24 months typical. 40 hours of uninterrupted work (continuous typing) 30 days in standby mode.

Parameter	Description
Supported operating systems	Microsoft® Windows 10/8.1/8/7 Advanced functionality is not available with all devices. See compatibility information at: microsoft.com/hardware/compatibility.
Connections	None
Indicators	None

Varex detectors

The 4336W-G5 (LUMEN 4336W), 4343W (LUMEN 4343W), and 2530W-G5 (LUMEN 2530W) detectors are part of a new generation of detectors designed for increased durability and convenience for customers and end-users.

When the detectors are configured on the system, they are activated when entering a study as an acquirer. When the detector icon stops spinning, the detector is ready, and the user with acquirer status can capture an image.

When using a detector:

- A preview of the image to be captured is shown before the final image is displayed, if the option for the preview image is configured in the **Management** screen.
- Battery, temperature, Wi-Fi or tether link information is provided. If any of the parameters are out of bounds, Sound SMART DR™ will notify all users.
- After 30 minutes of inactivity, the detector times out and is deactivated. It can be reactivated by selecting the **Refresh Status** button in the **Detector Status** information box. It can also be reactivated in the 30-minutes detector timeout pop-up dialog box that appears only in the Acquire/Review screen when the detector is deactivated.

  See the *User Manual*, for details.
- The detector is deactivated when shots are added, Icon Help is enabled, etc.
- If the detector is powered by a battery, the super capacitor in the detector will power the detector for 3 minutes so the battery can be replaced without powering the detector down.

2530W-G5 detector specifications

This section describes the 2530W-G5 detector specifications, housing, and surfaces and features.

Table 10: Sensor specifications

Sensor	2530W-G5
Detector	Amorphous Silicon active TFT/PIN diode Technology
Scintillator	CsI Premium and CsI Standard
Pixel Matrix	2304 (v) x 1900 (h)
Pixel Pitch	131 µm
Active Area	2264 (v) x 1860 (h) CsI

Table 11: Electronics specifications

Electronics	2530W-G5
Battery	Lithium-ion
Battery Charger	1 or 3 Bay, Inductive
ADC	16-bit

Table 12: Mechanical specifications

Mechanical	2530W-G5
Housing	Plastic with Carbon Fiber entrance window
Weight (without Battery)	CsI 2.3 kg (5.07 lbs)
Load Support	150 kg over diameter 40 mm at center, 300 kg entire surface
Surface Temperature	Rated to not exceed 42°C

Table 13: Wireless communication specifications

Wireless Communication	2530W-G5
Signal Strength	Requires > -70 dBm or no image will be acquired
Standard	IEEE 802.11ac/a/n
Interface	USB
Security	WEP WPA WPA2

Wireless Communication	2530W-G5
Operating Voltage	DC5V

Table 14: Radio specifications

Radio	2530W-G5
Antenna	2 x IPEX connector for 2T2R
Frequencies	UNII - 1: 5150MHz -5250MHz UNII - 3: 5725MHz -5850MHz **Note:** Subject to local regulations. **Note:** The 2.4GHz frequency is not available for use with these detectors. Do not use the 2.4GHz band setting with the router or access point being used with the detector.
Modulation	802.11a: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n:OFDM (BPSK, QPSK, 16-QAM, 64- QAM) 802.11ac:OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)
Transmit Power WIFI_Chain 0	802.11a: 9 ± 1dBm 802.11n/ac 20_5180MHz~5240MHz: 9 ± 1dBm 802.11n/ac 20_5745MHz~5825MHz: 9 ± 1dBm 802.11n/ac 40_5190MHz: 9 ± 1dBm 802.11n/ac 40_5230MHz: 9 ± 1dBm 802.11n/ac 40_5755MHz~5795MHz: 9 ± 1dBm 802.11ac 80: 8 ± 1dBm
Transmit Power WIFI_Chain 1	802.11n/ac 20_5180MHz~5240MH z: 9 ± 1dBm 802.11n/ac 20_5745MHz~5825MH z: 9 ± 1dBm 802.11n/ac 40_5190MHz: 9 ± 1dBm 802.11n/ac 40_5230MHz: 9 ± 1dBm 802.11n/ac 40_5755MHz~5795MH z: 9 ± 1dBm 802.11ac 80: 8 ± 1dBm
Receive Sensitivity	802.11a: ≤ -70dBm@54Mbps 802.11n/5GHz (HT20): ≤ -60dBm@MCS7 802.11n/5GHz (HT40): ≤ -60dBm@MCS7 802.11ac (VHT80): ≤ -51dBm@MCS9

Detector housing

Figure 5: 2530W-G5 detector with handle (top)

Figure 6: 2530W-G5 surfaces and features (back)

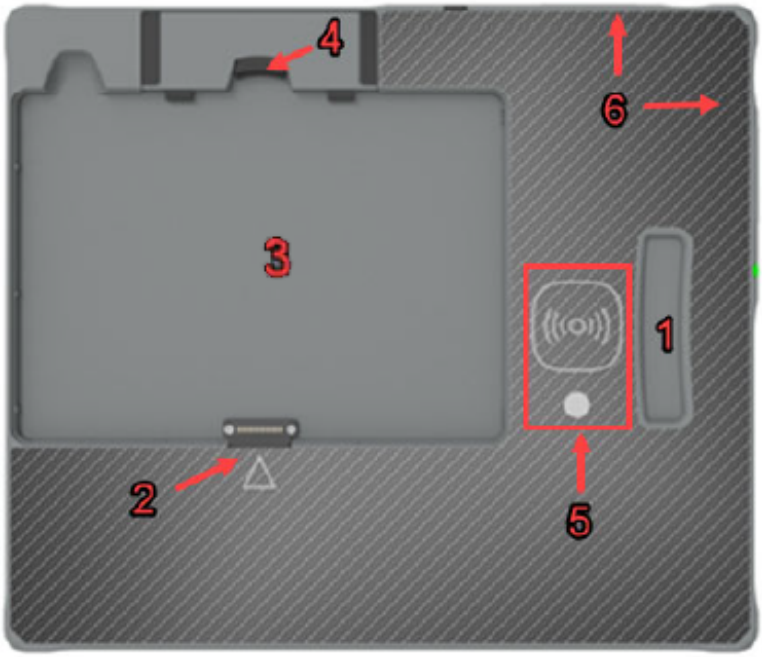


Table 15: 2530W-G5 detector surfaces and features (back, 1-6)

Number	Description
1	Handle
2	Battery Alignment Marker and Contacts
3	Battery Well

Number	Description
4	Replaceable Battery Latch
5	Inductive Charging Receiver
6	Antennas

Figure 7: 2530W-G5 surfaces and features (side)

Table 16: 2530W-G5 detector surfaces and features (side, 7-8)

Number	Description
7	Tether Cable Connection
8	LED Status Indicator

Figure 8: 2530W-G5 detector electronics and orientation (top)

Table 17: 2530W-G5 detector surfaces and features (top, 9-11)

Number	Description
9	Top of X-ray detector, interior electronics location
10	Orientation Mark, also indicates glass array coordinates (X=0, Y=0)
11	Orientation Mark

4336W-G5 detector specifications

This section describes the 4336W-G5 detector specifications, housing, and surfaces and features.

Table 18: Sensor specifications

Sensor	4336W-G5
Detector	Amorphous Silicon active TFT/PIN diode Technology
Scintillator	CsI Premium and CsI Standard
Pixel Matrix	3072(v) x 2476 (h)
Pixel Pitch	139 µm
Active Area	3052 (v) x 2456 (h) DRZ+, 3032 (v) x 2436 (h) CsI

Table 19: Electronics specifications

Electronics	4336W-G5
Battery	Lithium-ion
Battery Charger	1 or 3 Bay, Inductive
ADC	16-bit

Table 20: Mechanical specifications

Mechanical	4336W-G5
Housing	Plastic with Carbon Fiber entrance window
Weight (without Battery)	DRZ+ 2.65 kg (5.84 lbs), CsI 2.85 kg (6.28 lbs)
Load Support	150 kg over diameter 40mm at center, 300 kg entire surface
Surface Temperature	Rated to not exceed 42°C

Table 21: Wireless communication specifications

Wireless Communication	4336W-G5
Signal Strength	Requires > -70 dBm or no image will be acquired
Standard	IEEE 802.11ac/a/n
Interface	USB

Wireless Communication	4336W-G5
Security	WEP WPA WPA2
Operating Voltage	DC5V

Table 22: Radio specifications

Radio	4336W-G5
Antenna	2 x IPEX connector for 2T2R
Frequencies	UNII - 1: 5150MHz -5250MHz UNII - 3: 5725MHz -5850MHz **Note:** Subject to local regulations. **Note:** The 2.4GHz frequency is not available for use with these detectors. Do not use the 2.4GHz band setting with the router or access point being used with the detector.
Modulation	802.11a: OFDM (BPSK, QPSK, 16-QAM, 64- QAM) 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64- QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64- QAM, 256-QAM)
Transmit Power WIFI_Chain 0	802.11a: 14.5 ± 1dBm 802.11n/ac 20_5180MHz~5240MHz: 13.5 ± 1dBm 802.11n/ac 20_5745MHz~5825MHz: 13 ± 1dBm 802.11n/ac 40_5190MHz: 11 ± 1dBm 802.11n/ac 40_5230MHz: 13.5 ± 1dBm 802.11n/ac 40_5755MHz~5795MHz: 13 ± 1dBm 802.11ac 80: 10.5 ± 1dBm
Transmit Power WIFI_Chain 1	802.11n/ac 20_5180MHz~5240MHz: 13.5 ± 1dBm 802.11n/ac 20_5745MHz~5825MHz: 13 ± 1dBm 802.11n/ac 40_5190MHz: 11 ± 1dBm 802.11n/ac 40_5230MHz: 13.5 ± 1dBm 802.11n/ac 40_5755MHz~5795MHz: 13 ± 1dBm 802.11ac 80: 10.5 ± 1dBm
Receive Sensitivity	802.11a: ≤ -70dBm@54Mbps 802.11n/5GHz (HT20): ≤ -60dBm@MCS7 802.11n/5GHz (HT40): ≤ -60dBm@MCS7 802.11ac (VHT80): ≤ - 51dBm@MCS9

Detector housing

Figure 9: 4336W-G5 detector with handle (top)

Figure 10: 4336W-G5 surfaces and features (back)

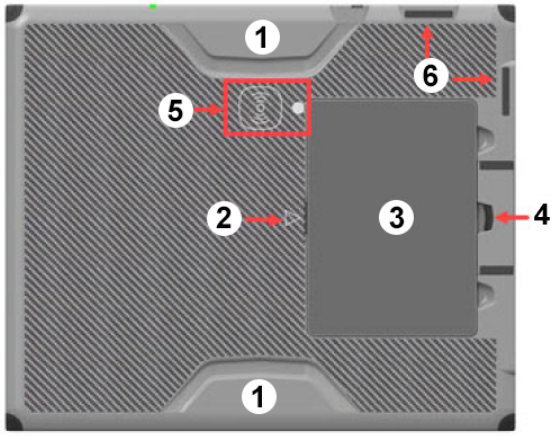


Table 23: 4336W-G5 detector surfaces and features (back, 1-6)

Number	Description
1	Handles
2	Battery Alignment Marker
3	Battery and Battery Well
4	Replaceable Battery Latch
5	Inductive Charging Receiver

Number	Description
6	Antennas

Figure 11: 4336W-G5 surfaces and features (top and side)

Table 24: 4336W-G5 detector surfaces and features (top and side, 7-9)

Number	Description
7	Patient Contact Surface
8	Tether Cable Connection
9	LED Status Indicator

Figure 12: 4336W-G5 detector electronics and orientation (top)

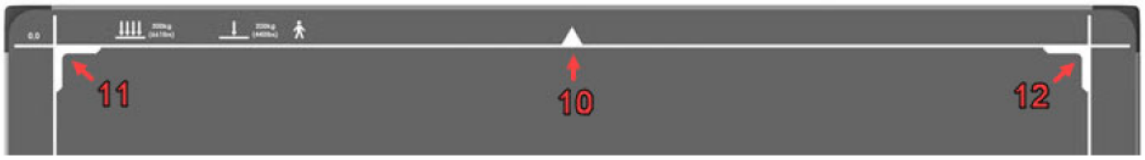


Table 25: 4336W-G5 detector surfaces and features (top, 10-12)

Number	Description
10	Top of X-ray detector, interior electronics location
11	Orientation Mark, also indicates glass array coordinates (X=0, Y=0)
12	Orientation Mark

4343W detector specifications

For dual detector configurations, the 4343W detector is powered by a network/power tether cable. For single detector configurations, the 4343W detector can be powered either by the tether cable or battery.

Table 26: Sensor specifications

Sensor	4343W
Detector	Amorphous Silicon active TFT/PIN diode Technology
Scintillator	CsI Premium, CsI Standard, and DRZ+
Pixel Matrix	3072 (v) x 3072 (h)
Pixel Pitch	139 µm
Active Area	3052 (v) x 3052 (h) DRZ+, 3032 (v) x 3032 (h) CsI

Table 27: Electronics specifications

Electronics	4343W
Battery	Lithium-ion
Battery Charger	1 or 3 Bay, Inductive
ADC	16-bit

Detector housing

Figure 13: 4343W x-ray detector surfaces and features

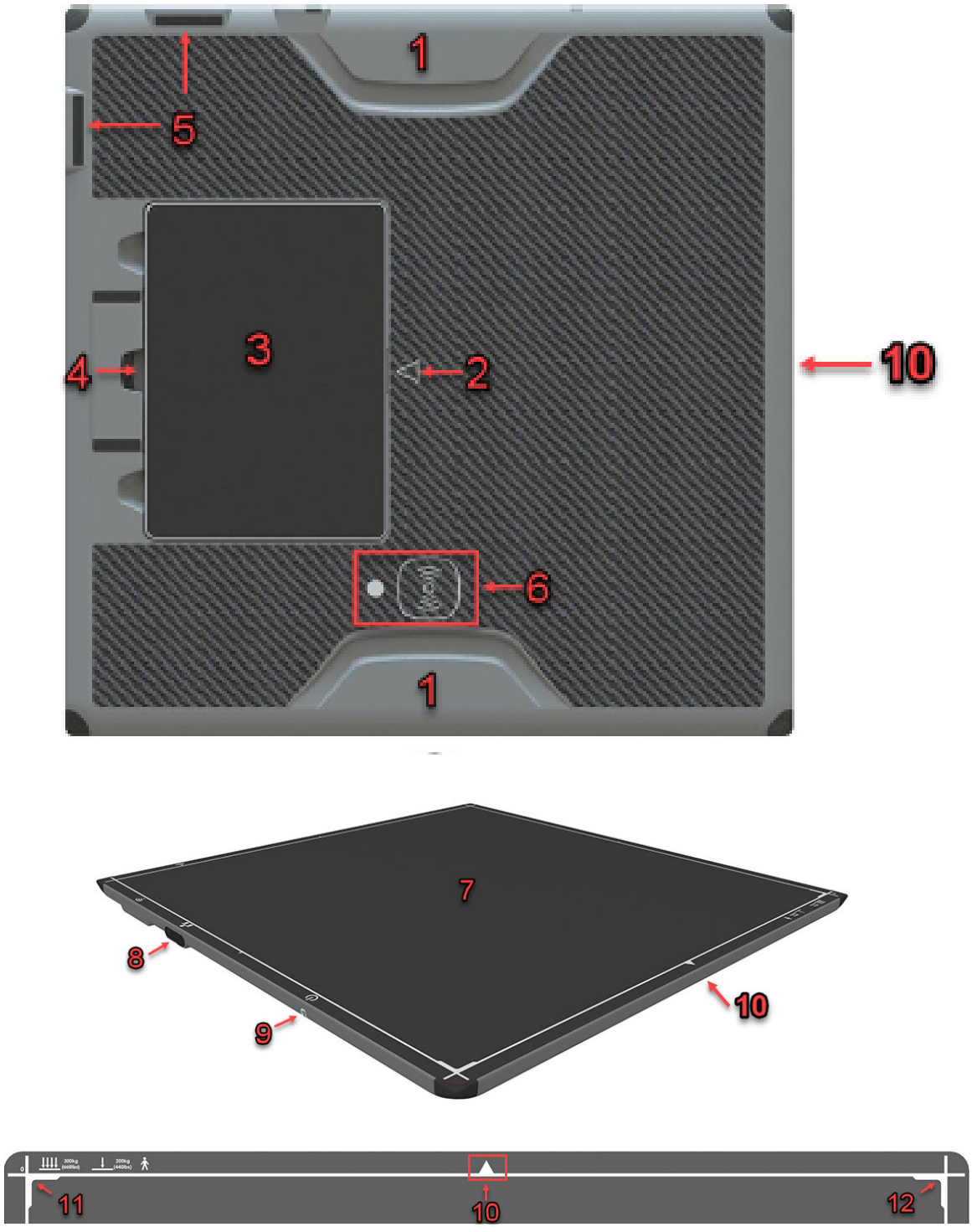


Table 28: Description of 4343W detector surfaces and features

Number	Description
1	Handles
2	Battery alignment marker
3	Battery and battery well
4	Replaceable battery latch
5	Antennas
6	Inductive charging receiver
7	Patient contact surface
8	Service cable connection
9	LED status indicator
10	Top of x-ray detector, interior electronics location
11	Orientation mark, also indicates glass array coordinates (X=0, Y=0)
12	Orientation mark

Supported software

The following software is supported for use with this x-ray system.

- Windows 10 IoT Enterprise
- PaxScan M01 R1.12
- Musica2 v1.12.10.1
- SMART DR™ 4.2

Finding the IP address of the imaging computer

The IP address of the imaging computer is necessary to connect to the Sound SMART DR™ application from another device.

Procedure

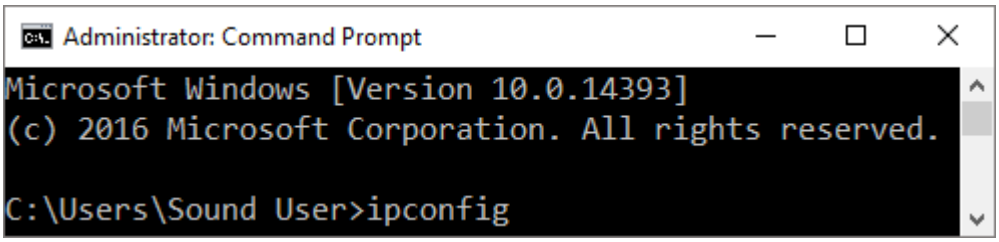
1. On the imaging computer, select the Windows **Start** button.

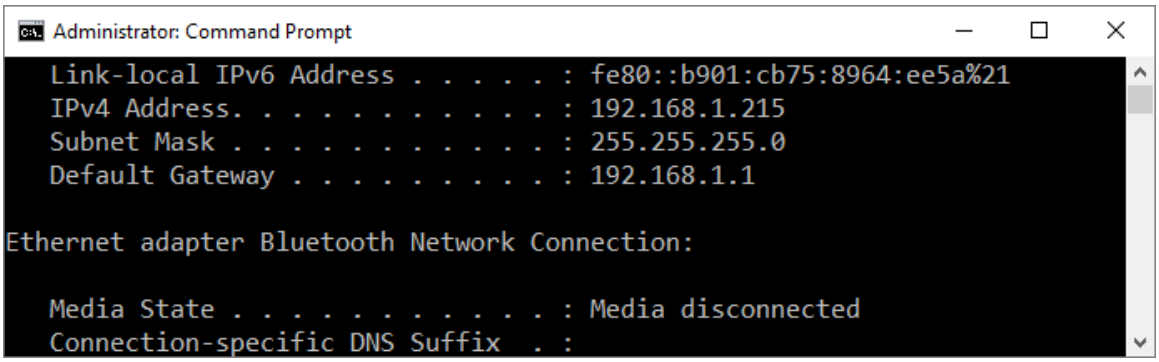
2. In the pop-up menu, select **Search**.
3. In the **Search** field, type `Command`.
4. Select **Command Prompt** from the **Best Match** list.

   The **Administrator Command Prompt** window opens.

5. At the prompt, type `ipconfig`.



6. Tap the **Enter** key.
   The IP configuration for the computer is displayed.



7. Note the `IPv4 Address`.
   This is the IP address of the computer.

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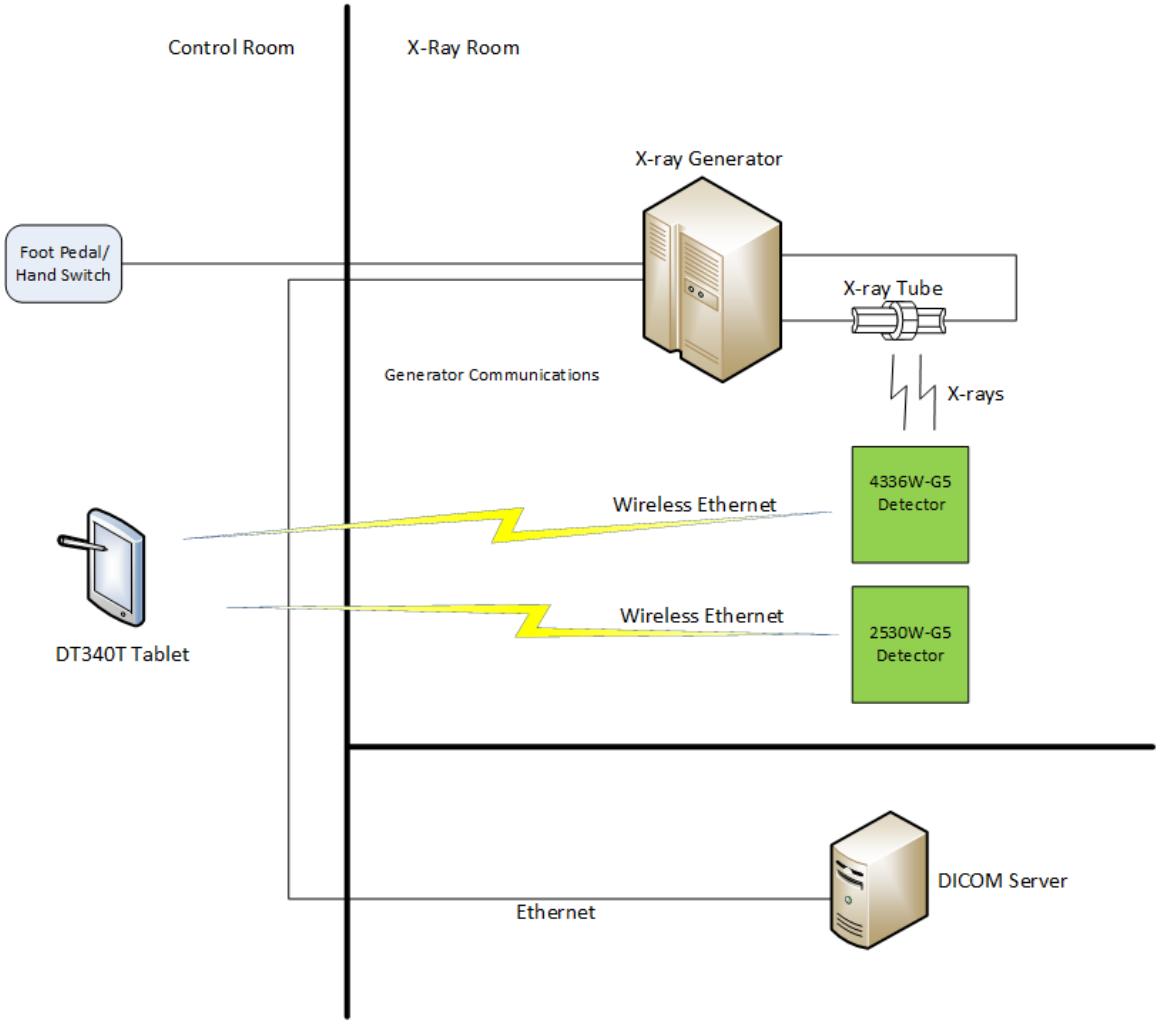
Dual 4336W-G5 and 2530W-G5 detectors connection diagram

The following diagram shows the connections for a system with dual 4336W-G5 and 2530W-G5 detectors.

About this task

Figure 14: Dual 4336W-G5 and 2530W-G5 detectors

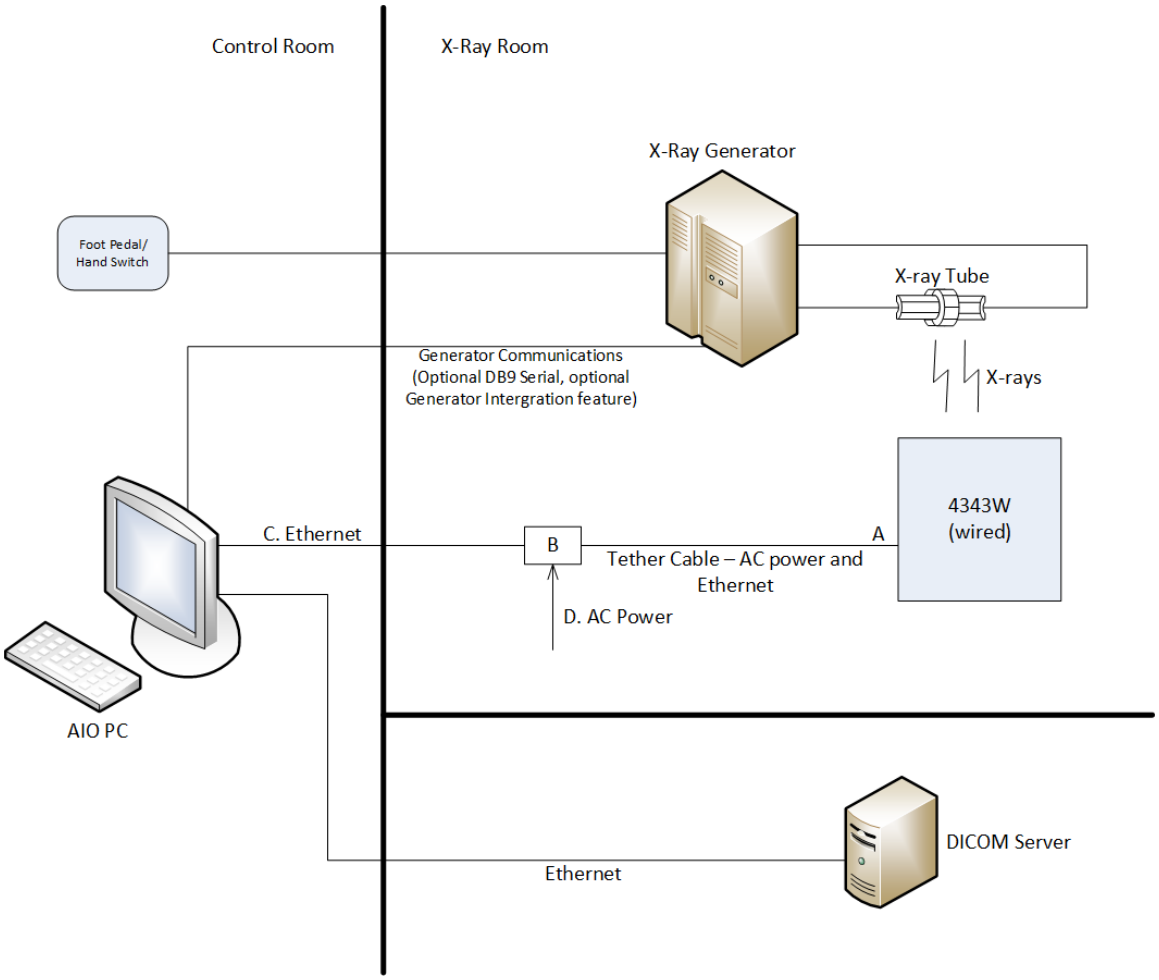


Each detector has its own SSID number.

Important: The PC can connect to only one detector at a time. Switching detectors causes the system to switch wireless networks automatically.

4343W wired detector connection diagram

The following diagram shows the connection between the detector and the imaging system.



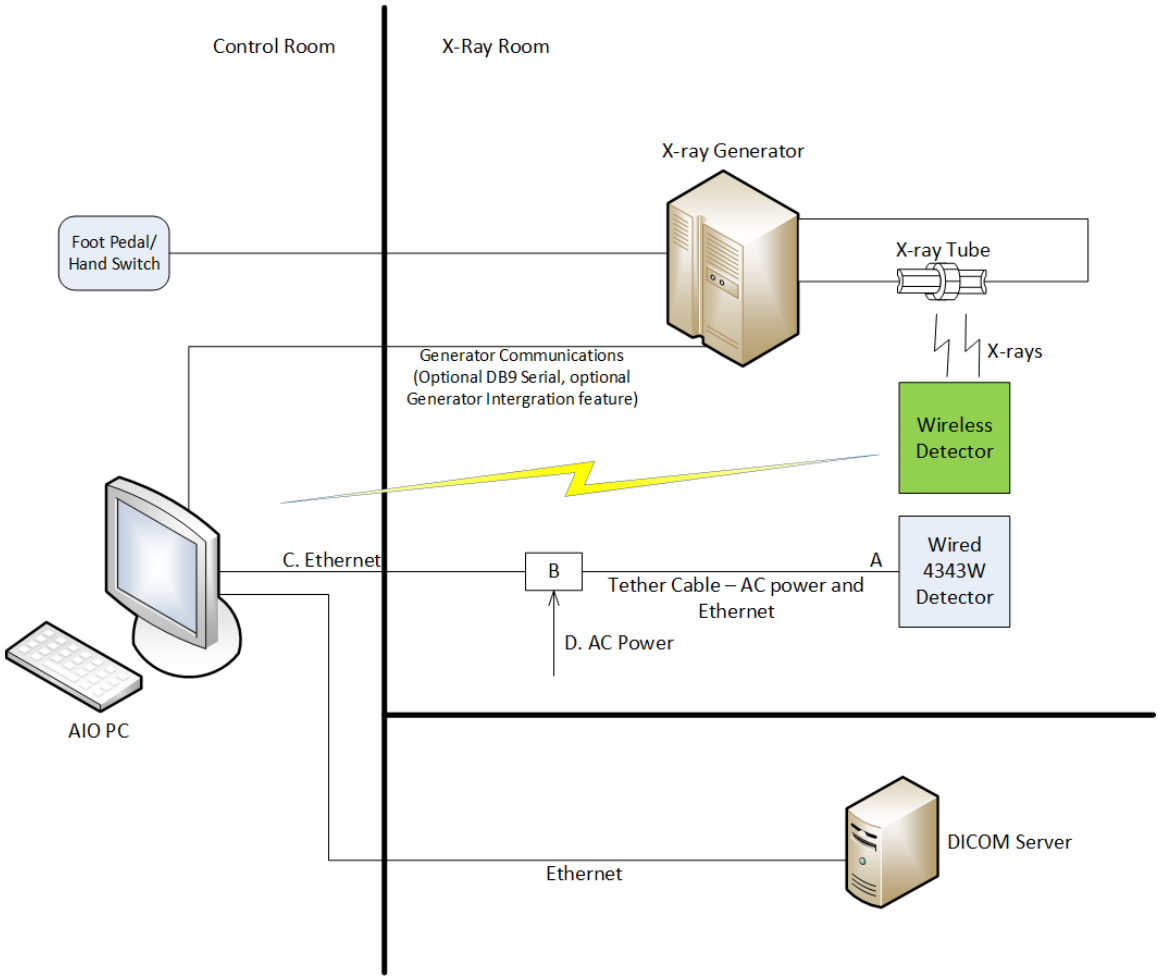
The tether cable for the 4343W detector has a combination power and USB-C connector (A) at one end, and a brick (B) with ethernet and AC power ports at the other end. The computer connects to the brick using an ethernet cable (C) to facilitate communication between the detector and the PC. The AC power cord (D) also connects to the brick to provide power to the detector. If the detector has a battery inserted into it while the tether is attached, the tether powers the detector and trickle-charges the battery.

The 4343W detector can be operated wirelessly.

4343W wired and wireless 4336W-G5 or wireless 2530W-G5 detector connection diagrams

The following diagrams show the connections between the detectors and the imaging system.

Figure 15: Wired 4343W and Wireless 2530W-G5 detector or 4336W-G5 detector



Wired 4343W connections

The tether cable for the 4343W detector has a combination power and USB-C connector (A) at one end, and a brick (B) with ethernet and AC power ports at the other end. The computer connects to the brick using an ethernet cable (C) to facilitate communication between the detector and the PC. The AC power cord (D) also connects to the brick to provide power to the detector. If the detector has a battery inserted into it while the tether is attached, the tether powers the detector and trickle-charges the battery.

The 4343W detector can be operated wirelessly.

Wireless 2530W-G5 or 4336W-G5 detector connection

The 2530W-G5 or 4336W-G5 detectors are battery powered and connect to the PC wirelessly.

Optional integrated generator connection

If the integrated generator feature is used, a DB9 serial cable connects the PC to the x-ray generator for communication between the two components.

All other connections

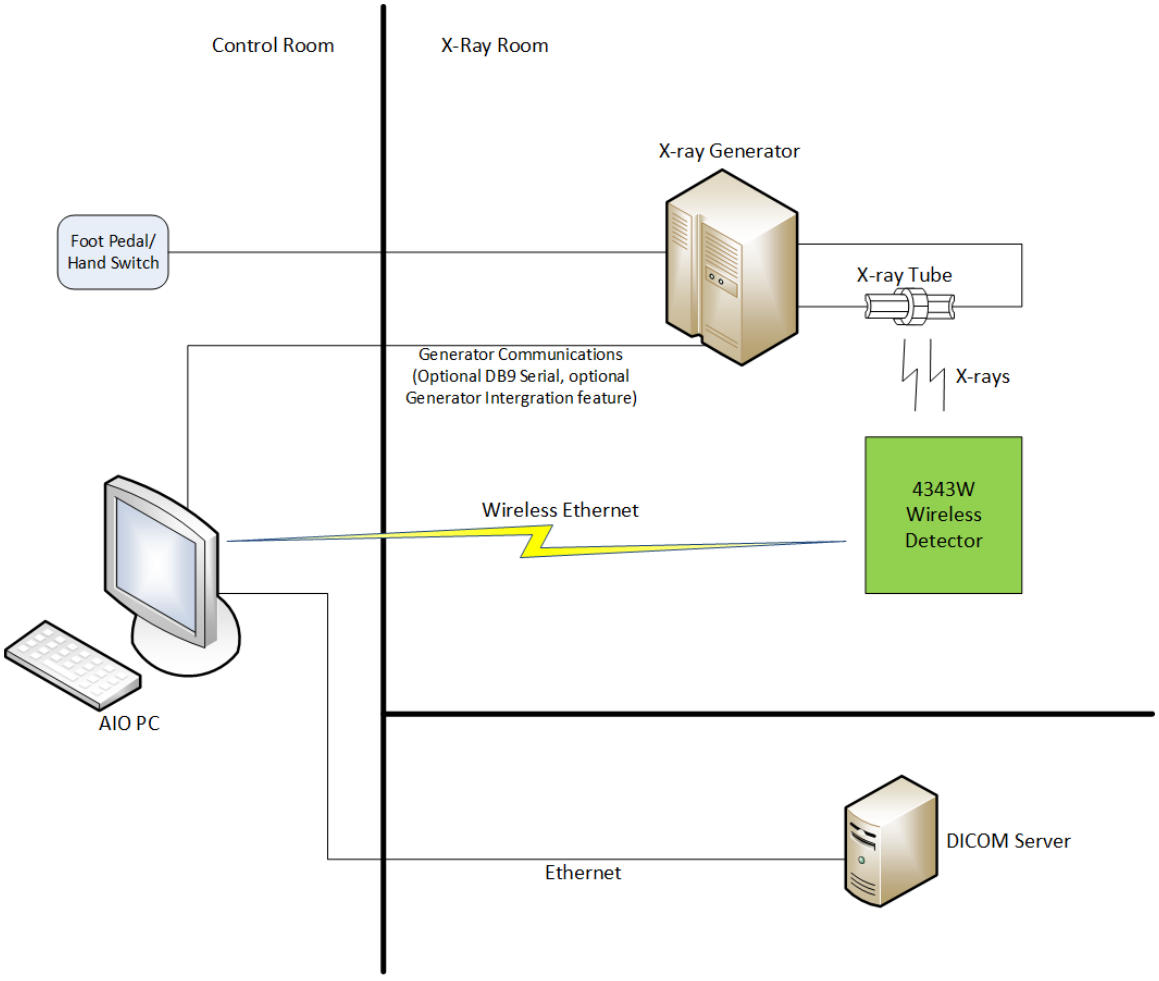
All other connections are as shown.

4343W wireless detector connection diagram

The 4343W detector can be operated wirelessly.

See the topic, *Transitioning the 4343W from tether to battery power* on page 60

Figure 16: Wireless 4343W connection diagram



Chapter

2

Safety, Warranty, and Licensing Information

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- *Electromagnetic emissions* on page 30
- *Electromagnetic immunity* on page 32
- *Equipment classification* on page 38
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Your x-ray system uses the Sound SMART DR™ software. All information and instructions contained in this document are intended to promote safe and effective installation, service, and maintenance of the x-ray system. Observe all warnings provided in documentation and labeling, and follow all instructions precisely to avoid potential injury to users, patients, or other personnel, malfunction of the equipment, or damage to the x-ray system components.

All components of the x-ray system are designed and suitable for use in close proximity to patients. The system and associated components are commonly placed and in use within 6 feet (1.8m) of the patient.

Do not connect any other equipment or parts to the x-ray system without the express authorization of the manufacturer.

Caution: Federal law restricts this device to sale by or on the order of a licensed veterinarian.

Caution: La loi fédérale restreint vente de cet appareil par ou sur l'ordre d'un vétérinaire agréé.

Service Technician training

All service technicians conducting installation, service, and maintenance of the x-ray system must be properly trained and certified through a Sound Technologies, Inc.-authorized program.

Failure to meet these obligations may result in charges for phone support and voiding of warranties. Service technicians may be required to substantiate their training at time of call or warranty-based request.

Electromagnetic compatibility

The detector complies with EN 60601-1-2 fourth edition. Prevent the potential risk of electromagnetic interference between this equipment and other devices.

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

The detector has been tested for electromagnetic compatibility (EMC) compliance, but interference can still occur in an electromagnetically noisy environment. Maintain a suitable distance between electrical devices to prevent cross-interference. The PC cabinet should be placed as far as possible from any device that generates large amounts of electromagnetic disturbance.

Caution: Electrical equipment requires special precautions to maintain electromagnetic compatibility. The system must be installed and put into service according to the EMC information provided in this document. Portable and mobile RF communications equipment can affect medical electrical equipment.

Caution: Les appareils électromédicaux requièrent des précautions particulières pour maintenir la compatibilité électromagnétique. Le système 0doit être installé et mis en service conformément aux informations EMC fournies dans ce document. Les équipements de communication RF portables et mobiles peuvent affecter les équipements électromédicaux.

Caution: Failure to avoid RF interference while operating SMART DR may cause failure of the digital imaging system to capture or store images.

Caution: Défaut d'éviter les interférences RF lors de l'utilisation SMART DR peut provoquer une défaillance du système d'imagerie numérique pour capturer ou stocker des images.

Warning: Use of accessories, transducers, and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.

Warning: L'utilisation d'accessoires, de transducteurs et de câbles autres que ceux spécifiés ou fournis par le fabricant de cet équipement pourrait entraîner une augmentation des émissions électromagnétiques ou une diminution de l'immunité électromagnétique de cet équipement et entraîner une mauvaise opération.

Electromagnetic emissions

Table 29: 4336W-G5 and 2530W-G5 radiated/conducted emissions, harmonics, voltage, fluctuations, and flicker

Emissions test	IEC60601-1-2 test level	Compliance	Electromagnetic environment
RF conducted emissions EN55011/CISPR11	Group 1, Class A, 150 kHz – 30 MHz	For Group 1, infrequency range 150KHz to 30 MHz limits are not specified, the test is unnecessary.	The detector uses RF energy for its internal function. Nearby electronic equipment may be affected.
RF radiated emissions EN55011/CISPR11	Group1, Class A, 30 MHz – 1 GHz	Group1, Class A, 30 MHz – 1 GHz	The detector uses RF energy for its internal function. Nearby electronic equipment may be affected.
Harmonic emissions EN/IEC61000-3-2	Class A	Class A	The detector is suitable for use in all establishments other than domestic and those directly connected to the low voltage power supply network that supplies buildings used for domestic purposes.
Voltage fluctuations / flicker emissions IEC61000-3-3	Complies	Complies	The detector is suitable for use in all establishments other than domestic and those directly connected to the low voltage power supply network that supplies buildings used for domestic purposes.

Table 30: 4343W radiated/conducted emissions, harmonics, voltage, fluctuations, and flicker

Emissions test	IEC 60601-1-2 test level	Compliance	Electromagnetic environment
RF conducted emissions EN55011/CISPR11	Group 1, Class A, 150 kHz – 30 MHz	N/A Battery power equipment not connected to mains	The detector uses RF energy for its internal function. Nearby electronic equipment may be affected.
RF radiated emissions EN55011/CISPR 11	Group 1, Class A, 30 MHz – 1 GHz	Group 1, Class A, 30 MHz – 1 GHz	The detector uses RF energy for its internal function. Nearby electronic equipment may be affected.
Harmonic emissions EN/IEC 61000-3-2	Class A	N/A Battery power equipment not connected to mains.	The detector is suitable for use in all establishments other than domestic and those directly connected to the low voltage power supply network that supplies buildings used for domestic purposes.
Voltage fluctuations / flicker emissions IEC 61000-3-3	Complies	N/A Battery power equipment not connected to mains	The detector is suitable for use in all establishments other than domestic and those directly connected to the low voltage power supply network that supplies buildings used for domestic purposes.

Electromagnetic immunity

Table 31: 4336W-G5 and 2530W-G5 ESD, transient/burst, surge, voltage variation, magnetic fields

Immunity test	IEC60601-1-2 test level	Compliance	Electromagnetic environment
Electrostatic discharge (ESD) IEC 61000-4-2	±2, 4, 8 kV contact discharge ±2, 4, 8, 15 kV air discharge	±2, 4, 8 kV contact discharge ±2, 4, 8, 15 kV air discharge	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV AC Mains ±1 kV I/O Lines	±2 kV AC Mains ±1 kV I/O Lines	Mains power quality should be that of a typical professional healthcare environment.
Surge IEC 61000-4-5	±0.5 kV, ±1 kV Line to Line ±0.5 kV, ±1 kV, ±2 kV Line to Ground	±0.5 kV, ±1 kV Line to Line ±0.5 kV, ±1 kV, ±2 kV Line to Ground	Mains power quality should be that of a typical professional healthcare environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	Voltage dips: 0% UT (100% dip in UT) for 0.5 cycle at 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315° 0% UT (100% dip in UT) for 1 cycle at 0° 70% UT (30% dip in UT)for 25/30 cycles at 0° Voltage Interruptions: 0% UT (100% dip in UT) for 250/300 cycles	Voltage dips: 0% UT (100% dip in UT) for 0.5 cycle at 0° 0% UT (100% dip in UT) for 1 cycle at 0° 70% UT (30% dip in UT) for 25 cycles at 0° Voltage Interruptions: 0% UT (100% dip in UT) for 250 cycles	Mains power quality should be that of atypical professional healthcare environment. If the user of the detector requires continued operation during power mains interruptions, it is recommended that the system be powered from an uninterruptible power supply or a battery.

Immunity test	IEC60601-1-2 test level	Compliance	Electromagnetic environment
Power frequency (50 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	Magnetic field should be that of a typical location in a typical professional healthcare environment.
IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz 6 V/m (in ISM bands between 0.15 MHz and 80 MHz) 80% AM (at 1 kHz)	3 Vrms 150 kHz to 0 80 MHz 6V/m (in ISM bands between 0.15 MHz and 80 MHz) 80% AM (at 1 kHz)	This cell intentionally left blank.
IEC 61000-4-3	3 V/m 80 MHz to 2.7 GHz 80% AM at 1 kHz	3 V/m 80 MHz to 2.7 GHz 80% AM at 1 kHz	$d = \frac{6}{E}\sqrt{P}$ Where *P* is the maximum power in *W*, *d* is the minimum separation distance in *m*and *E* is the Immunity Test Level in V/m. If the X-ray detector complies with Immunity Test Levels for this test, the 30cm minimum separation distance (in 5.2.1.1 f) may be replaced with minimum separation distances calculated from the higher Immunity Test Levels.

Table 32: 4343W ESD, transient/burst, surge, voltage variation, magnetic fields

Immunity test	IEC 60601-1-2 test level	Compliance	Electromagnetic environment
Electrostatic discharge (ESD) IEC 61000-4-2	Contact Discharge: ± 2, 4, 8 kV Air Discharge: ± 2, 4, 8, 15 kV	Contact Discharge: ± 2, 4, 8 kV Air Discharge: ± 2, 4, 8, 15 kV	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV AC Mains ±1 kV I/O Lines	N/A Battery power equipment not connected to mains.	Mains power quality should be that of a typical professional healthcare environment.
Surge IEC 61000-4-5	±0.5 kV, ±1 kV Line to Line ±0.5 kV, ±1 kV, ±2 kV Line to Ground	N/A Battery power equipment not connected to mains.	Mains power quality should be that of a typical professional healthcare environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	Voltage dips: 0% UT (100% dip in UT) for 0.5 cycle at 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315° 0% UT (100% dip in UT) for 1 cycle at 0° 70% UT (30% dip in UT) for 25/30 cycles at 0° Voltage Interruptions: 0% UT (100% dip in UT) for 250/300 cycle	N/A Battery power equipment not connected to mains.	Mains power quality should be that of a typical professional healthcare environment. If the user of the detector requires continued operation during power mains interruptions, it is recommended that the system be powered from an uninterruptible power supply or a battery.

Immunity test	IEC 60601-1-2 test level	Compliance	Electromagnetic environment
Power frequency (50 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	Magnetic field should be that of a typical location in a typical professional healthcare environment.
IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz 6V/m (in ISM bands between 0.15MHz and 80MHz) 80% AM (at 1kHz)	N/A Battery power equipment not connected to mains.	Intentionally left blank.
IEC 61000-4-3	3 V/m 80 MHz to 2.7 GHz 80% AM at 1 kHz	3 V/m 80 MHz to 2.7 GHz 80% AM at 1 kHz	$d = \frac{6}{E}\sqrt{P}$ Where P is the maximum power in W, d is the minimum separation distance in m and E is the Immunity Test Level in V/m. If the X-ray detector complies with Immunity Test Levels for this test, the 30cm minimum separation distance (in 5.2.1.1 f) may be replaced with minimum separation distances calculated from the higher Immunity Test Levels.

Table 33: 4336W-G5 and 2530W-G5 test specs for enclosure port immunity to RF wireless communications equipment

Test Frequency (Mhz)	Band (Mhz)[a]	Service[a]	Modulation	Max Power (W)	Distance (m)	Immunity Test Level (V/m)
385	380-390	TETRA 400	Pulse Modulation[b]	1.8	0.3	27
450	430-470	GMRS 460, FRS 460	FM[c] +/-5 kHz deviation 1 kHz sine	2	0.3	28
710 745 780	704-787	LTE BAND 13, 17	Pulse modulation[b] 217 Hz	0.2	0.3	9
810 870 930	800-960	GSM 1800; TETRA 800; iDEN 820; CDMA 850; LTE Band 5	Pulse modulation[b] 18 Hz	2	0.3	28
1720 1845 1970	1700-1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation[b] 217 Hz	2	0.3	28
2450	2400-2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation[b] 217 Hz	2	0.3	28
5240 5500 5785	5100-5800	WLAN 802.11 a/n	Pulse modulation[b] 217 Hz	0.2	0.3	9

[a] For some services, only the uplink frequencies are included.

[b] The carrier shall be modulated using a 50% duty cycle square wave signal.

[c] As an alternative to FM modulation, 50% pulse modulation at 18 Hz may be used because, while it does not represent actual modulation, it would be the worst case.

Table 34: 4343W test specs for enclosure port immunity to RF wireless communications equipment

Test Frequency (Mhz)	Band[a](Mhz)	Service[a]	Modulation	Max Power (W)	Distance (m)	Immunity Test Level
385	380-390	TETRA 400	Pulse Modulation[b] 18 Hz	1.8	0.3	27
450	430-470	GMRS 460, FRS 460	FMc+/- 5 kHz deviation 1 kHz sine	2	0.3	28
710 745 780	704-787	LTE BAND 13, 17	Pulse modulation[b] 217 Hz	0.2	0.3	9
810 870 930	800-960	GSM 1800; TETRA 800; iDEN 820; CDMA 850; LTE Band 5	Pulse modulation[b] 18 Hz	2	0.3	28
1720 1845 1970	1700-1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation[b] 217 Hz	2	0.3	28
2450	2400-2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation[b] 217 Hz	2	0.3	28

Test Frequency (Mhz)	Band[a](Mhz)	Service[a]	Modulation	Max Power (W)	Distance (m)	Immunity Test Level
5240 5500 5785	5100-5800	WLAN 802.11 a/n	Pulse modulation[b] 217 Hz	0.2	0.3	9

[a] For some services, only the uplink frequencies are included.

[b] The carrier shall be modulated using a 50% duty cycle square wave signal.

[c] As an alternative to FM modulation, 50% pulse modulation at 18 Hz may be used because, while it does not represent actual modulation, it would be the worst case.

Equipment classification

The x-ray system has the following equipment classification.

- Protection against electric shock - Class I
- Degree of protection against electric shock - Type B
- Degree of protection against ingress of water - Ordinary
- Mode of operation - Continuous

Caution: The X-ray detectors have an IP68 ingress protection rating. They are completely protected against ingress of dust and have protection against full water immersion for up to 60 minutes, at depths up to 1m.

Caution: Les détecteurs de rayons X ont un indice de protection IP68. Ils sont complètement protégés contre la pénétration de poussière et ont une protection contre l'immersion totale dans l'eau jusqu'à 60 minutes, à des profondeurs allant jusqu'à 1 m.

Inspecting components

Ensure that the system components are received in good condition.

About this task

The x-ray system is shipped in several boxes. The x-ray system is composed of sensitive electronic devices; keep the boxes upright at all times and follow the caution stickers regarding proper handling.

Procedure

1. Upon receipt of your shipment from Sound Technologies, Inc., inspect the packaging.

   A packing list is attached to the outside of one of the boxes. Check this packing list when you first receive the shipment or if the items have been removed from the pallet when they are delivered to the x-ray room. If you need another copy of the packing list or if any of the packaging is damaged, call technical support. See *Technical Support* for contact information.

   Note: Sound Technologies, Inc. ships the components selected by the customer. For example, if multiple receptors are discussed in this manual, a customer may have chosen only one of them for their site.

2. Open each box and check the components for damage.

   Don't discard any packaging, and leave all electronic components in their original antistatic bags and foam cushioning until they are ready to be installed.

   Do not proceed if any components or cables are missing or damaged. If anything in the x-ray system appears to be damaged, contact *Technical Support* immediately.

3. Check cable connectors for bent or damaged pins.
4. Allow equipment to acclimatize appropriately.

   Flat panel detectors are sensitive and often require special handling including extensive acclimatization times. Review the information about the detector in the pertinent chapter of this manual and the documentation that accompanies the detector.

What to do next

After installation, take extra precautions to verify the normal operation of the configuration used at the site.

Mechanical safety

- Use only cabling and mounting hardware included with the x-ray system. Do not install x-ray system components with hardware, such as extensions, shelves, or brackets, obtained from retail or other third-party sources.
- Where the PC is to be mounted to a mobile surface or structure, such as a wheeled cart, wall-mounted armature, or overhead support, use only the mounting brackets provided or specifically approved by the manufacturer.
- Verify that all signal and power cabling is appropriately secured. Provide sufficient strain relief to avoid damage due to unnecessary stress or movement of cabling. Ensure that securing mechanisms and structures are of sufficient strength to support the weight of cabling.
- Cables must be routed such that they do not present trip or fall hazards to personnel or patients walking near the equipment. Do not route cabling across the floor in traffic areas such as hallways or doors.
- Where wheeled devices are used, ensure that cabling on or near the floor is properly secured out of the path of wheels and is protected from crush damage where appropriate.

- Ensure that all mounting and fastening hardware is tightened properly, and that all securing mechanisms on connectors and covers are properly latched.
- Inspect all cabling, mounting, and securing mechanisms during each Preventive Maintenance (PM) cycle to ensure that electrical connections and other hardware do not become loose over time.
- Some components of the x-ray system are of significant size and weight. Observe appropriate lifting and handling techniques when moving heavy equipment or components. Obtain assistance, when necessary, to avoid injury to persons or damage to equipment.

Electrical safety

Electrical power sufficient to cause injury or death is present inside many of the x-ray system components whenever they are connected to AC power. Take appropriate safety precautions, use safety disconnects (such as fuses or breakers), wherever possible, and disconnect AC supply cables from components prior to removing covers for maintenance or service.

Warning: To avoid the risk of electric shock,the x-ray system must be powered from an AC supply circuit that includes an adequate earth ground.

Warning: Pour éviter le risque de choc électrique, le système de rayons X doit être alimenté à partir d'un circuit d'alimentation CA qui comprend une terre adéquate.

Warning: Connecting electrical equipment of the x-ray system to an integral multiple-socket outlet effectively can result in a reduced level of safety. Refer to the IEC 60601-1 standard.

Warning: Connexion d'un équipement électrique du système à rayons X à une intégralePrise multiple - sortie efficace peut se traduire par une réduction du niveau de sécurité. Reportez-vous à la CEI 60601-1standard.

- Failure to adequately ensure safety grounding may result in injury to users or patients, or fire or other damage to equipment.
- Connect the x-ray system components only to receptacles labeled or marked as medical grade.

Warning: The x-ray system and its components are designed to be connected to a properly grounded AC supply sufficient to support system operation. Using power strips or other multiple-socket outlets that are not specifically approved for use with the x-ray system may compromise safety grounding or present other power-related safety hazards. When a power strip must be used

to provide power to any component of the x-ray system, refer to the IEC60601-1 standard for guidance in selecting a power strip of appropriate type and rating.

Warning: Le système à rayons X et de ses composants sont conçus pour être relié à une alimentation CA mise à terre suffisante pour soutenir le fonctionnement du système. En utilisant des bandes de puissance ou d'autres points de vente multi-socket qui ne sont pas spécifiquement approuvés pour une utilisation avec le système x -ray peut compromettre la terre de sécurité ou présentent d'autres risques de sécurité liés à l'alimentation. Quand une bande de puissance doit être utilisé pour fournir de l'énergie à tout composant du système x-ray, reportez-vous à la norme CEI 60601-1 pour les guider dans la sélection d'une bande de puissance de type et le calibre approprié.

- Use rated electrical components to forestall single fault conditions. When electrical components must be replaced, use only components that are appropriately rated for the application.

  Replace fuses, switches, or connectors only with components of the same type and rating as the original equipment.
- Electronic components of the x-ray system are sensitive to electrostatic discharge (ESD) and can be damaged. Personnel servicing components of the x-ray system must take appropriate ESD prevention measures to minimize the risk of damage to system hardware.

  Sound Technologies, Inc. has tested the exposed components for ESD, and has provided beads and shielding for cables. The party that is the final integrator, however, is responsible to ensure compliance for electrostatic compatibility.
- Use the equipment in a space that is properly ventilated. Provide sufficient free space around the components to permit their ventilation.

  Do not block or restrict airflow into or out of the computer or the enclosure around the detector, if applicable. Adequate air cooling is required to prevent overheating the components inside these enclosures.

  Some electrical components, if operated beyond the stated temperature range, may emit toxic fumes. Do not permit components to overheat.
- Prevent toxic or hazardous liquids from reaching the hardware. Apply measures to prevent liquids, particularly toxic or hazardous fluids, from coming into contact with the x-ray system components and equipment.

  When cleaning the x-ray system equipment, do not spray or pour fluid directly onto equipment surfaces. Use a soft cloth, dampened lightly with a cleaning solution, and gently wipe system components.
- All components of the x-ray system must be powered off before connecting any cables.

Caution: Internal power supplies contain capacitors that may remain charged for a period of time after the power source is removed. Before performing work inside any of the enclosures

of x-ray system components, wait at least 60 seconds after removing the AC supply cable for complete discharge.

Caution: Alimentations internes contiennent des condensateurs qui peuvent rester chargés pour une période de temps après que la source d'alimentation est débranché. Avant d'effectuer tout travail à l'intérieur des enceintes de composants du système x - ray, attendez au moins 60 secondes après avoir retiré le câble d'alimentation CA pour une décharge complète.

- All electrical and grounding connections to the x-ray system must be inspected during each preventive maintenance (PM) cycle.
- Replace or repair faulty connections prior to returning the system to service.

Software safety and use

Do not install any software that is not explicitly approved by Sound Technologies, Inc.. Unauthorized software may disrupt the processes or resources required by the x-ray system software and result in abnormal system operation.

- Do not add or remove any component of the host operating system unless specifically directed to do so by Sound Technologies, Inc.. Note that Windows Updates have been known to change behaviors of the operating system and should be installed or removed only at the explicit direction of Sound Technologies, Inc.
- Perform system calibration using only the processes prescribed in this manual. Any other calibration method may result in abnormal system operation or poor image quality.
- After the system is operational, only properly trained and authorized personnel can access patient records on the system.
- Information about operating the x-ray system is located in and the *User Manual*. In addition, Sound Technologies, Inc. provides training for operators and service technicians to help them properly operate the system and obtain acceptable image quality.

Operator safety

Only authorized and trained personnel may access patient records stored on the x-ray system or use the x-ray system for clinical imaging of patients. Proper operation and care are critical to maintaining system performance and optimal image quality. On-site training is available and may be scheduled by contacting Sound Technologies, Inc..

- The x-ray system must not be powered up or used in the presence of a flammable or explosive atmosphere, including certain gases used for anesthesia. Electric motors and other electrical equipment within or related to the x-ray system can ignite flammable or explosive gases or vapors, resulting in injury, death, or damage. Consult the site documentation or personnel to determine the presence of and hazards posed by gases in the vicinity of the x-ray system. Observe all cautions and warnings in this manual and the *User Manual*. Failure to abide by the instructions and precautions provided in this manual may result in unnecessary risk to patients, users, or equipment.

- The x-ray system must be installed and operated such that no direct patient contact with any part of the system is possible.
- Do not attempt to perform service or troubleshooting on the x-ray system in the presence of patients or unauthorized personnel. Do not remove protective covers or otherwise disable safety devices while in the presence of patients.
- The x-ray system is designed for use in conjunction with equipment that generates ionizing x-ray radiation. Observe appropriate precautions and wear protective equipment when the x-ray equipment is in use.
- Do not bypass or otherwise disable safety mechanisms provided by the x-ray generator. Take all available and appropriate measures to prevent unnecessary or unintentional radiation exposure.
- Observe all cautions and warnings in this manual. Failure to abide by the instructions and precautions provided in this manual may result in unnecessary risk to patients, users, or equipment.

Service safety

Only trained personnel are authorized to service or maintain the x-ray system and related equipment. Failure to obtain training prior to servicing the x-ray system may result in support charges, voiding of product warranty, abnormal system behavior, or any of a number of potential risks to the safety of patients, users, or service engineers. Contact the manufacturer to arrange for appropriate training prior to servicing or maintaining the x-ray system.

- The x-ray system must not be powered up or used in the presence of a flammable or explosive atmosphere, including certain gases used for anesthesia. Electric motors and other electrical equipment within or related to the x-ray system can ignite flammable or explosive gases or vapors, resulting in injury, death, or damage. Consult site documentation or personnel to determine the presence of and hazards posed by gases in the vicinity of the x-ray system.
- Do not attempt to perform service or troubleshooting on the x-ray system in the presence of patients or unauthorized personnel. Do not remove protective covers or otherwise disable safety devices while in the presence of patients.
- The x-ray system is designed for use in conjunction with equipment that generates ionizing x-ray radiation. Observe appropriate precautions and wear protective equipment when the x-ray equipment is in use.
- Do not bypass or otherwise disable safety mechanisms provided by the x-ray generator. Take all available and appropriate measures to prevent unnecessary or unintentional radiation exposure.
- Some components of the x-ray system are of significant size and weight. Observe appropriate lifting and handling techniques when moving heavy equipment or components. Obtain assistance when necessary to avoid injury to persons or damage to equipment.
- Some components of the x-ray system may have sharp edges by design, or may develop sharp edges due to impact or other improper handling. Use caution and wear appropriate protective equipment when handling any component of the system.
- Take appropriate measures to prevent the spilling of liquids or bodily fluids on or into the components of the x-ray system.

- Observe all cautions and warnings in this manual. Failure to abide by the instructions and precautions provided may result in unnecessary risk to patients, users, or equipment.

Environmental safety

All components of the x-ray system must be stored, transported, installed, and operated in accordance with the environmental conditions provided in this manual. Follow these guidelines to ensure environmental safety when handling and using the x-ray system.

- The x-ray system is designed for use in conjunction with equipment that generates x-ray radiation. Observe appropriate precautions and wear protective equipment when the x-ray equipment is in use.
- Take appropriate measures to prevent the spilling of liquids or bodily fluids on or into the components of the x-ray system.
- Do not block or restrict the airflow into or out of the computer or the enclosure around the detector, if applicable. Adequate air cooling is required to prevent overheating of the components inside these enclosures.
- The x-ray system must not be powered up or used in the presence of a flammable or explosive atmosphere, including certain gases used for anesthesia. Electric motors and other electrical equipment within or related to the x-ray system can ignite flammable or explosive gases or vapors, resulting in injury, death, or damage. Consult the site documentation or personnel to determine the presence of and hazards posed by gases in the vicinity of the x-ray system. Observe all cautions and warnings in these manuals. Failure to abide by the instructions and precautions provided in this manual may result in unnecessary risk to patients, users, or equipment.
- Transport, store, and operate the electronic components of the x-ray system within recommended parameters.
- At the end of service life of any component of the x-ray system, dispose of the component safely and in accordance with local regulations for the disposal of electronic components.

Table 35: Environmental parameters for transportation storage, and operation of computer and peripherals

Action	Temperature	Humidity	Air pressure
Transportation and storage	-4ºF – 131ºF (-20ºC – 55ºC)	10 – 95% non-condensing	700 hPa – 1060 hPa (10 – 5 lb/in2, 0.7 – 1.0 atm)
Operation	50ºF – 90ºF (10ºC – 32Cº)	30 – 75% non-condensing	700 hPa – 1060 hPa (10 – 15 lb/in2, 0.7 - 1.0 atm)

Licensing

A license is required to log in and use the application.

If no license is present, a message is displayed on the login page that indicates the license is needed. The Site ID is also displayed and should be noted because it is required when requesting the license file.

In the event that a license is needed, it is recommended that you notify a supervisor who has the authority to contact Sound Technologies, Inc. so that the pertinent licenses can be secured to provide you with the full functionality of the product.

Adding a license to a system

A license is required to log in and use the application. Use this procedure to add a license to your system.

Prerequisites

Before you begin this task, ensure that you have the Site ID of the computer where the software is installed.

About this task

If a license is not present on a system, a message and the Site ID is displayed on the login screen.

Procedure

1. Navigate to the login screen of the application.
2. Note down the Site ID.
3. Contact technical support and request a license.
   The Site ID is necessary to complete this step.
4. When the license is received, place the file into the following directory: `C:\Program Files\SmartDRViewer`
5. Refresh the Sound SMART DR™ login page.
   You can now log in to the Sound SMART DR™ application.

Warranty

Any of the following actions voids the manufacturer's warranty:

- Modification, abuse, misuse, or operation of your equipment at ambient temperatures below 50ºF or above 90ºF (10ºC, 32Cº) or at other abnormal conditions. Ambient operating temperature for the isolation transformer, if used, is 32–113ºF (0–45ºC).

Consult later chapters in this manual or other manufacturers' documents for operating conditions of imaging devices.

- Use of any software other than that supplied or approved by seller.
- Use of supplied software and hardware outside seller's or FDA, CSA, and VDE guidelines or applicable standards.
- Misuse, negligence, or accident or unauthorized repair or alteration of the product.
- Use for purposes for which the product was not designed.

Warning: Make no attempt to connect any other equipment or parts to your system without authorization by the seller.

Warning: Ne tentez pas de connecter d'autres équipements ou pièces à votre système sans l'autorisation du vendeur.

Safety

Apply the directions in this chapter precisely to avoid damage to the x-ray system or its components, yourself, or others; loss of data; or corruption of files. Sound Technologies, Inc. assumes no liability for failure to comply.

Caution: Federal law restricts this device to sale by or on the order of a licensed veterinarian.

Caution: La loi fédérale restreint vente de cet appareil par ou sur l'ordre d'un vétérinaire agréé.

Warning: Connect only items that have been specified as part of the x-ray system or that have been specified as being compatible with the imaging system.

Warning: Connectez uniquement les éléments qui ont été spécifiés dans le cadre du système Sound Technologies, Inc. ou qui ont été compatibles avec le système d'imagerie.

All parts of the x-ray system are suitable for use within patient environment. However, in a typical clinical installation, the host PC and the primary monitor of the system are installed outside the patient exam room, which can be more than 6 ft (2 m) away from the patient. The other parts of the system are sometimes placed within 6 ft (2 m) of the patient.

Warning: Make no attempt to connect any other equipment or parts to the x-ray system without authorization by the seller.

Warning: Faire aucune tentative pour raccorder tout autre appareil ou des parties du système Sound Technologies, Inc. sans autorisation par le vendeur.

Environmental safety

All components of the x-ray system must be stored, transported, installed, and operated in accordance with the environmental conditions provided in this manual.

- At the end of its useful life, this equipment and its accessories must be disposed of safely and in accordance with government regulations.
- Be aware that disposed electronics release materials such as lead, mercury, or cadmium into the soil, ground water, and atmosphere, thus having a negative impact on the environment.
- Follow procedures with regard to electromagnetic compatibility.

General safety

Transport, store, and operate the electronic components of the x-ray system within recommended parameters. For recommended environmental parameters, for transportation, storage, and operation of computer and peripherals, see the table in the topic, *Environmental safety* on page 44.

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Chapter

3

Room Readiness

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- *Room layout* on page 50
- *Power* on page 50
- *Table, cart, or shelf space* on page 50
- *PC placement* on page 51
- *Varex detector placement* on page 51
- *Cable layouts and routing* on page 51
- *Network connection* on page 51
- *Network information* on page 51
- *DICOM device connectivity information* on page 51
- *X-ray generator function* on page 52

Review this section carefully before you begin the installation process.

Room layout

Discuss with the site personnel the preferred location for each component. Sketch the room layout to assist with placement of the components and cabling of SMART DR™.

Power

SMART DR™ system power must meet the specifications in the following table. Power must be from a dedicated AC line. Dedicated is defined as having no other branch circuits and the outlet is powered directly from a circuit breaker in the local AC distribution panel.

Table 36: System power specifications

Power phase	V	Hz	A
Single	115±10%	50/60	8
Single	230±10%	50/60	4

Power must be free of noise, spikes, surges, and brownouts that exceed the nominal voltage by ±10%. If these conditions cannot be met, the optional power conditioner is required. The following conditions must also be met:

- Peak impulse levels (line to neutral) are to be under 100V peak above nominal (peak time interval 2 ms or less).
- The neutral wire must be the same gauge as the line wire.
- Frequency requirements are: 60Hz system: 60Hz ±0.5Hz, 50Hz systems: 50Hz ±0.5Hz.
- Neutral to ground potential: 2V p-p or less.

For sites using 240V AC, an approved plug must be used on the isolation transformer provided it has ratings of 250V AC and 5A or greater.

Notice: The power source must meet the power supply requirements defined in this service manual. Use of the system outside these limits voids the product warranty.

Table, cart, or shelf space

A flat work surface (table or cart) is required to hold the operator's controls.

Check that the area has enough room for comfortable use of the keyboard and pointing device, if used, and that the table or cart is at a suitable height. If space is limited, consider using a retractable keyboard shelf (not supplied by Sound Technologies, Inc.). Some configurations replace the physical keyboard with an on-screen touch keyboard. Consult the site personnel for their preferences.

PC placement

Ensure that the placement of the PC meets the following requirements.

- PC station provides 4 inches of clearance behind and in front of the PC for adequate ventilation.
- Surface where the PC is installed is flat and level. Use a PC stand, if necessary.
- PC station allows service personnel adequate access to the area where the PC resides.

Varex detector placement

The Varex x-ray detector is specifically designed for fixed applications where the detector is installed on a table, chest stand, or any other holding fixture.

The detector must be within 50 cable ft (15 m) of the PC system. The detector is primarily powered by an external AC power supply. This power supply must be located within 6 ft (2 m) of the detector.

For detectors with I/O interface/control modules, position the detector within 7.5 ft (2.25 m) of the Varex power supply and I/O interface/control module.

Cable layouts and routing

Review this manual for details on required cables, routing restrictions, cable sizes and lengths.

Also consider cables for other devices in the x-ray room and control room. Ensure that there is an acceptable path for each cable.

Network connection

The site must provide the network connection cable. Work with the site's network administrator to have this arranged.

SMART DR™ supports 10/100/1000 Base-T connections.

Network information

The network address must be obtained from the local network administrator. This information can then be entered into SMART DR™ when the system parameters are set.

DICOM device connectivity information

The site must provide connectivity data for DICOM service classes, store, worklist, and so forth that are necessary for the particular site.

X-ray generator function

Ensure that the x-ray generator is functioning properly before making any connections between it and SMART DR™.

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Chapter

4

Installing the SMART DR X-ray System

Contents

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- *Tools needed for installation* on page 54
- *Varex detector power sequence* on page 54
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- *Logging into the imaging comptuter* on page 66
- *Logging out of the SMART DR software* on page 69
- *Shutting down the PC* on page 70
- *Installation report form* on page 71

This section provides conceptual, reference, and task-related content needed for installing components of the x-ray system.

Pre-installation Site Survey

Ensure that this survey is completed and submitted before the day of installation.

About this task

Sound Technologies, Inc. requires that dealers of our products assess the facilities into which the x-ray system will be installed. We give them a short form, the Pre-installation Site Survey, to complete. They submit the Survey to Sound Technologies, Inc., and it helps us to send the correct equipment. This survey is helpful to the installer of the system, too. Therefore, if you do not have the completed version of the Pre-installation Site Survey, check with the administrator of the organization that purchased the x-ray system. If necessary, contact Technical Support to see if a copy was submitted or if you have any questions or problems. See the topic, *Appendix A. Technical Support*, for contact information.

If you require a blank copy of the Pre-installation Site Survey, it is available, with password protection, on the Sound Technologies, Inc. website. Select the Pre-installation Site Survey that matches your product.

Tools needed for installation

The following basic tools are needed for installing the x-ray system:

Digital volt-ohm meter (20,000 Ω/V)	Basic hand tools including screwdrivers.
Dosimeter Must be able to read uR per exposure.	ESD wrist strap.
X-ray phantoms	Calibration filter supplied with panel or with the x-ray system.

Varex detector power sequence

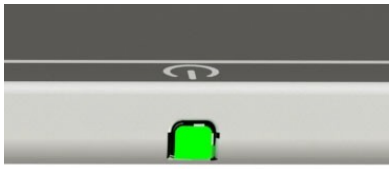
This section describes how to power the detectors on and off.

The 4336W-G5 (LUMEN 4336W) and 2530W-G5 (LUMEN 2530W), and 4343W detectors are powered by removable, rechargeable batteries. The 4343W detector is also powered by removable, rechargeable batteries. For dual detector configurations, the 4343W detector is powered by a network/power tether cable. For single detector configurations, the 4343W detector can be powered either by the tether cable or battery.

LED status indicator behavior

This section describes the behavior of the LED status indicator for the 4336W-G5, 2530W-G5, and the 4343W detectors.

Figure 17: LED status indicator



Note: The blinking behavior occurs based on a 4Hz clock. Each digit for the blinking pattern represents 1/4s. 0 =LED OFF, 1 =LED ON, X = Previous State.

Table 37: 4343W and 4336W-G5 LED status details

LED Behavior	Status
Orange Solid (1111)	Booting
Green Slow Blinking (100000)	No connection to the detector, blinks every 1.5 seconds
Green Fast Blinking (1010)	Connected to the PC, blinks twice (2) per second
Green Solid (1111)	Link Opened, detector controlled remotely, LED always on
Green Slow Blinking (110011)	Connected to Service Cable or Tether Cable, blinks once (1) per second
Yellow Solid (111111)	Detector Error
Purple Blinking (1xxxxx)	Battery Hot-Swap Active (battery exhausted or removed)
Blue Blinking (1xxxxx)	Battery is able to charge

Table 38: 2530W-G5 LED status details

LED Behavior	Status
Orange Solid (1111)	Booting
Green Slow Blinking (100000)	No connection to the detector, blinks every 1.5 seconds
Green Fast Blinking (1010)	Connected to the PC, blinks twice (2) per second
Green Solid (1111)	Link Opened, detector controlled remotely, LED always on

LED Behavior	Status
Green Slow Blinking (1100)	Connected to Tether Cable, blinks once (1) per second
Yellow Solid (1111)	Detector Error
Purple Blinking (100000)	Battery Hot-Swap Active (battery exhausted or removed)

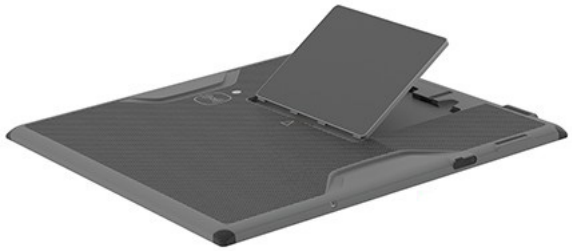
Inserting the battery and powering on the detector

This procedure describes how to insert the battery into a Varex detector and power it on,

Procedure

1. Insert the battery into the 1 or 3-bay charger to remove from shut-down mode (only applies to batteries that are new).
2. Insert battery at a slight angle so that the side with contacts sits over the adjoining contacts in the battery compartment, and press the battery down until it latches.

Figure 18: Insert battery at a slight angle

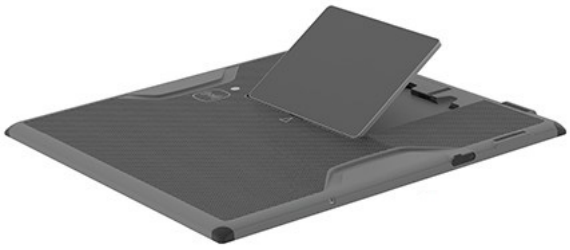


Note: When inserting the battery the angle of the battery should not be more than 20 degrees, inserting a battery at a larger angle could cause damage to the battery contact pins.

Note: When a battery is inserted into the x-ray detector, the LED Status Indicator will turn orange as it boots. After booting, it connects directly to the PC and is in standby mode, where the LED Status Indicator will blink twice (2) per second. If the x-ray detector does not connect to the PC, it will blink slowly.

3. Lay the battery down, with the side opposite of the battery contacts slightly lifted.

Figure 19: Lay the battery down



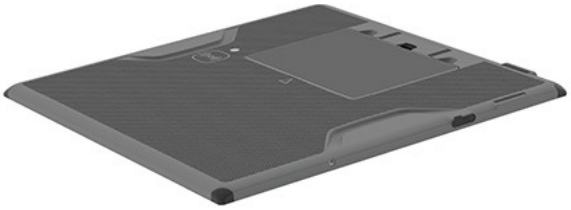
4. Press down on the lifted side of battery, the battery will snap into place in the battery compartment.

Figure 20: Press down on the lifted side

The x-ray detector will automatically power-on when battery is inserted.

5. The x-ray detector is now ready for use.

Figure 21: Detector is ready for use



6. See *LED status indicator behavior* on page 55 for information about the LED signals the detector will display.

The rest of this page intentionally left blank.

Connecting the tether cable for 4343W detector

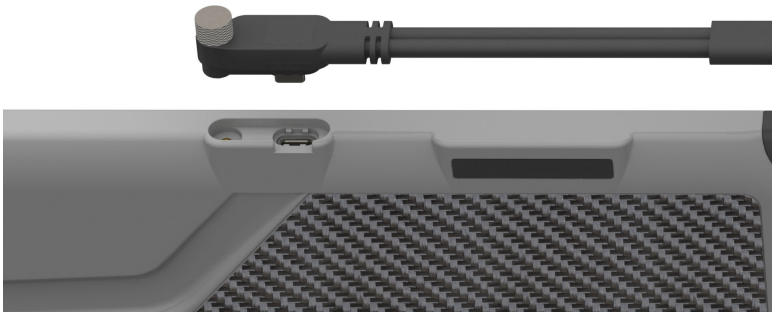
The tether cable provides AC power to the x-ray detector. This task provides the procedure for securely connecting the tether cable to your x-ray detector.

About this task

If the tether cable is connected to the x-ray detector while the battery is in the detector, it charges the battery while providing power to the detector. The tether cable is a Y-cable.. It provides 19V of power to the x-ray detector and the communication connection between the detector and the computer.

Figure 22: 4343W detector tether cable

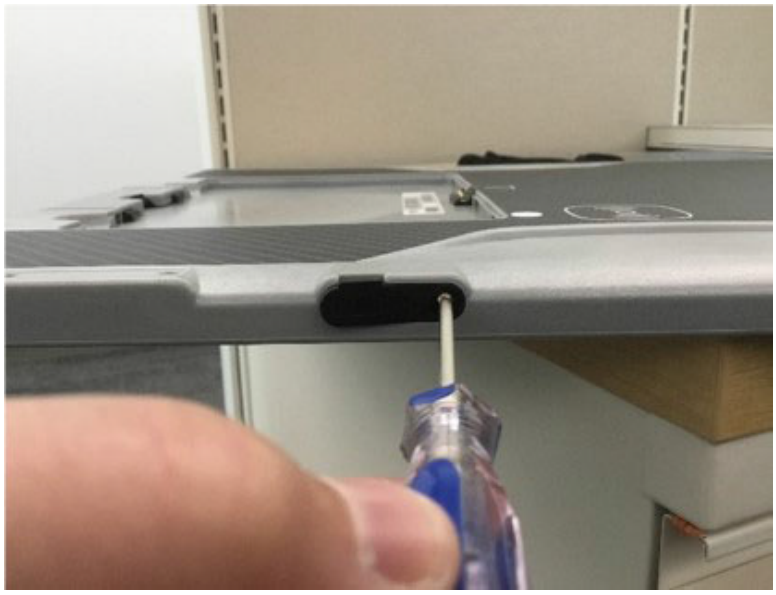
Figure 23: 4343W detector tether cable and USB slot



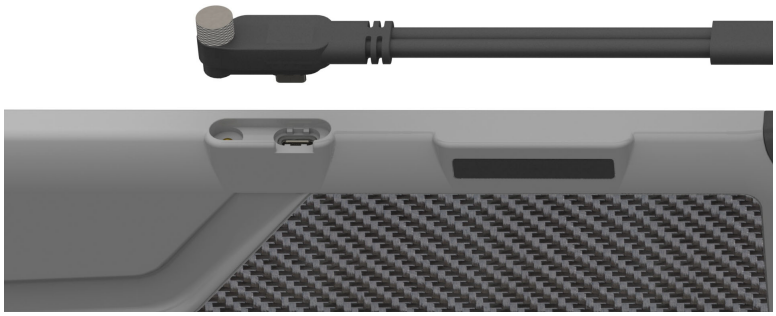
Procedure

1. Remove the overlay to reveal the screw holding the USB door in place.

2. Completely remove the screw and the USB door.



3. Plug the tether cable into the USB slot and tighten the thumb screw into the threaded hole to secure the connection.



The tether cable is securely connected to your x-ray detector.

4. Plug the other end of the tether Y-cable as follows:
   a) Connect one branch of the Y-cable to an Ethernet cable.
   b) Connect the Ethernet cable to the Ethernet port on your PC.
   c) Connect the other branch of the Y-cable to the AC power supply for the detector.

Results

The x-ray detector is now on tether power.

Transitioning the 4343W from tether to battery power

The tether cable provides AC power to the x-ray detector. This task provides the procedure for transitioning your x-ray detector from tether to battery power.

About this task

Use this procedure to transition from tether to battery power for the detector.

Procedure

1. Unscrew the thumb screw from the threaded hole of the USB slot with the connected tether cable.
2. Remove the tether cable from the USB slot.
   The tether cable is disconnected and your x-ray detector is now on battery power.

   Note: If there is no battery in the x-ray detector, the detector will remain powered for three minutes after you disconnect the tether cable. You must insert a charged battery in your detector to continue using it on battery power.
3. (Optional) To completely remove the tether cable from your system, unplug the ends of the tether Y-cable from the Ethernet port on your PC and the AC power supply for the detector.

Removing the battery and powering down the detector

This procedure describes how to remove the battery from a Varex detector and power it down,

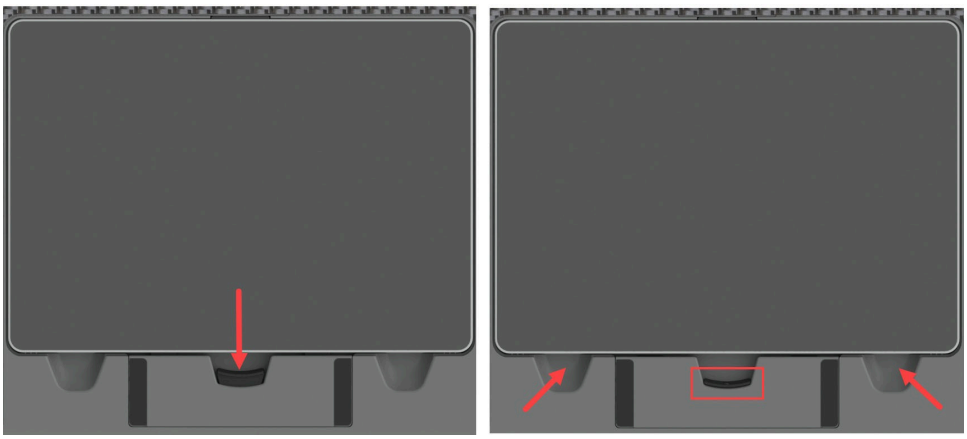
About this task

When the battery is removed, Sound SMART DR™ displays a message indicating that the super capacitor is in use. If the battery is not replaced before the super capacitor is discharged, Sound SMART DR™ displays a message indicating that the panel is disconnected.

Procedure

1. Place a finger on the battery latch and lift until it opens.

Figure 24: Unlatch Battery



2. Place a finger in opening on either side of the latch and lift the battery out.

Figure 25: Battery Removal

Warning: Do not use the battery latch as a handle. Ignoring this warning may cause damage to the battery latch or increase the likelihood that the x-ray detector may be dropped, causing substantial product damage.

Warning: N'utilisez pas le loquet de la batterie comme poignée.Le non-respect de cet avertissement peut endommager le loquet de la batterie ou augmenter le risque de chute du détecteur de rayons X et d'endommager considérablement le produit.

Note: Removal of the battery does not automatically power off the x-ray detector. The x-ray detector will stay powered on for approximately 3 minutes or until discharged after battery removal.

Detector battery

This section describes battery-related features for Varex detectors.

The detector battery has the following features:

- Battery charge-level indicator
- Battery hot-swapping
- Inductive charging

Note: New batteries are shipped in shut-down mode. Before inserting it into the x-ray detector, the battery must be inserted into the 1 or 3-bay charger to remove the shut-down mode.

Note: For additional information about Varex Imaging wireless battery and chargers, visit *www.vareximaging.com*.

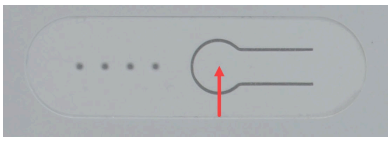
Battery charge level

The battery charge-level indicator is located on the battery.

About this task

Press the indicator button on the battery and the charge level will illuminate. Each LED illuminated represents 25% charge.

Figure 26: Battery charge level



Battery hot-swap

The x-ray detector is equipped with a battery that can be hot-swapped, meaning that the detector can be powered on when the battery is removed and replaced.

When a battery is removed from the x-ray detector or becomes completely discharged,you have a set amount of time for the battery hot-swap to occur before the super capacitor is fully discharged. The super capacitor temporarily provides power to the detector so the detector can remain powered on during the battery change.

When the super capacitor is in use, the following events occur:

- Sound SMART DR™ sends a notification to all users currently logged in.
- In Clinical (Patient) mode, within the Acquire/Review screen, the detector battery status indicator loses all of its green battery bars and begins to pulse until the battery is replaced.
- The detector status indicator shows that the detector is running on super capacitor.
- Image acquisitions are disabled until the battery has been replaced.

Table 39: Battery hot-swap operation time

X-ray detector	Operation time
2530W-G5	3 minutes
4336W-G5	3 minutes
4343W	3 minutes

Warning: If a fully charged battery is not re-inserted within the time window, the x-ray detector will power OFF.

Warning: Si une batterie complètement chargée n'est pas réinsérée dans la fenêtre de temps, le détecteur de rayons X s'éteindra.

Note: Acquisition and calibration features are not available while hot-swapping a battery.

Inductive charging

Varex detectors support inductive charging.

Inductive charging technology allows the detector's battery to be charged cordlessly. The detector status window indicates when inductive charging is in progress. See the detector manual for detailed information about the inductive charger and inductive charging.

Reboot Sequence

The x-ray detector may be rebooted, if needed.

Procedure

Do one of the following:

- For battery-powered detectors, insert and remove the battery 4 times within an 8 second window.
- For wired detectors with a battery inserted, disconnect the tether and insert and remove the battery 4 times within an 8 second window.
- For wired detectors without a battery inserted, disconnect the tether and allow the super capacitor to power down (3 minutes).

Figure 27: Remove and insert the detector battery

X-ray generator

This x-ray system allows software-based integration with the Summit HF generator. Or, you may operate it as a non-integrated system.

The generator is connected directly to the system through a COM port. On systems using generator integration feature, the technique for each shot will be set automatically, based on pre-configured technique charts programmed into the SMART DR application. Service technicians configure the SMART DR application to use the integrated generator feature in the **Management** screen.

If your system is configured to use the integrated generator feature, SMART DR™ provides a tool that allows you to make changes to the technique values on a shot-by-shot basis and save those changes for future use. This tool, called the **Integrated Generator** control, is accessible from the Acquire/Review screen in the Clinical (Patient) module.

The generator must be configured using the generator software on the unit itself. See the documentation that accompanies the x-ray generator for detailed instructions on configuration.

Connecting the x-ray generator

The imaging computer connects to the x-ray generator via a serial cable.

Procedure

Ensure that both the x-ray generator and the panel are on, and refer to the x-ray generator documentation.

Note: When you configure the x-ray generator, always set the exposure window to less than the panel integration window. The integration window for the Varex panels is 1000ms.

Powering up the system

After you have connected all of the system components, you can power up the system and verify the connections.

About this task

Danger: The x-ray system must not be powered up or used in the presence of a flammable or explosive atmosphere, including certain gases used for anesthesia. Electric motors and other electrical equipment within or related to the x-ray system can ignite flammable or explosive gases or vapors, resulting in injury, death, or damage. Consult the site documentation or personnel to determine the presence of and hazards posed by gases in the vicinity of the x-ray system. Observe all cautions and warnings in this manual and the

User Manual. Failure to abide by the instructions and precautions provided in this manual may result in unnecessary risk to patients, users, or equipment.

Danger: Le système à rayons X ne doit pas être mis sous tension ou utilisé en présence d'une atmosphère inflammable ou explosive, y compris certains gaz utilisés pour l'anesthésie. Les moteurs électriques et autres équipements électriques à l'intérieur ou liés au système à rayons X peuvent enflammer des gaz ou des vapeurs inflammables ou explosifs, entraînant des blessures, la mort ou des dommages. Consultez la documentation ou le personnel du site pour déterminer la présence de gaz et les dangers posés par les gaz à proximité du système à rayons X. Respectez toutes les mises en garde et avertissements de ce manuel et du manuel de l'utilisateur. Le non-respect des instructions et des précautions fournies dans ce manuel peut entraîner des risques inutiles pour les patients, les utilisateurs ou l'équipement.

Procedure

1. Verify that the PC, panel, and x-ray generator have sufficient battery power to remain active during the configuration process. If it is possible to plug in a component to power it, then do so.
2. Turn on the x-ray generator.
3. Turn on the PC, keyboard (if used), and mouse (if used).

   The PC automatically logs in to the Sound User account.
4. Turn on the panel:

   - For battery-powered detectors, insert a charged battery in to the detector.
   - For wired detectors, ensure that the power cable is connected.

   The power button is on the side of the casing.

   The detector powers on and connects.

Results

The system is now installed and ready for configuration.

Logging into the imaging comptuter

The default user is Sound User; however, other users can be created on the system as needed. This topic describes how to log in with the credentials you want to use or a QR code.

Procedure

1. Power on the SMART DR computer.
2. Log in using one of the following procedures:

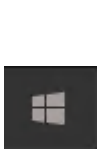
Option	Procedure
Log in as Sound User.	Default. See *Logging in as Sound User* on page 66.
Log in as a Vet or Tech user.	**a.** See *Logging in as a Vet or Tech user* on page 67.
Manually logging in from a tablet, phone, or other peripheral device.	See *Manually logging into the imaging computer from another device* on page 67.
Log in from a tablet, phone, or other peripheral device using a QR code.	See *Logging in to the imaging computer with a QR code* on page 68.
Switching users	See *Switching users* on page 68.

Logging in as Sound User

Sound User is the default user and provides access to all of the clinical and management functionality in the Sound SMART DR™ software.

Procedure

- If the Sound SMART DR™ software is not running, select the **Windows Start Menu** > **smartDR**

   > 

  You are automatically logged in as Sound User.
- If you are logged into the Sound SMART DR™ software as a Vet or Tech user, see *Switching users* on page 68.

Logging in as a Vet or Tech user

Users can be configured on the system in the Vet or Tech user groups. The privileges a user has on the system depend upon which group they belong to.

About this task

For information about the privileges for each user group, see the *Service Manual*.

When the Sound SMART DR™ application is started on the main imaging computer, you are logged in as Sound User by default. If you want to log in as a Vet or Tech user, you must log out and log back in as the desired user. The same applies if you want to switch from a Vet or Tech user to Sound User or another user Vet or Tech user.

Procedure

See *Switching users* on page 68 for information about switching user logins.

Manually logging into the imaging computer from another device

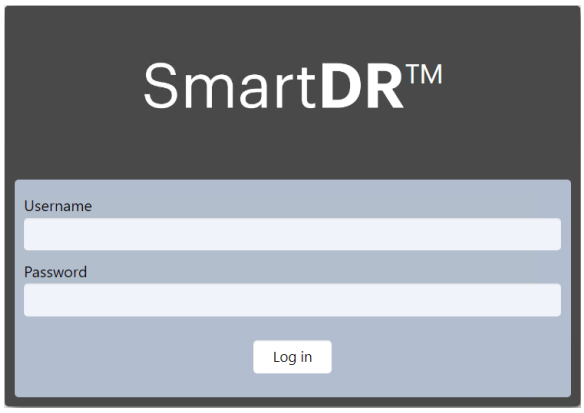
If the QR code is not configured on the system or if you are away from the main imaging computer, you can log in from another device manually.

Procedure

1. On your device, open a web browser, and navigate to the IP address of the imaging computer using the following URL format:

   http://ipAddress/SD2

   The SmartDR™ login page is displayed.



2. Enter your credentials into the login page.
3. Select **Log in**.

Logging in to the imaging computer with a QR code

If configured on the system, a QR code can be used to log in to the Sound SMART DR™ software from a peripheral device such as a cell phone or tablet.

Prerequisites

Before you begin this task, the following prerequisites must be met:

- The main imaging computer must be on and the Sound SMART DR™ application must be running.
- The QR code must be enabled in the **Management** screen on the main imaging computer.

Procedure

1. On the main imaging computer, enter the **Management** screen.
2. In the **Management** screen, select **Hardware** > **Multi-User QR Code**.
3. Use your device to scan the QR code displayed on the tab.

   The login page is displayed.
4. Use your credentials to log in.

Switching users

If there are multiple users configured in the SMART DR software, you can change users by logging out and logging back in.

Prerequisites

Credentials for Vet and Tech users must be configured in the SMART DR software.

Procedure

1. In the SMART DR interface, select **Logout** icon.
   A dialog box displays that asks, Are you sure you want to log out?
2. Select **OK**.
   The SMART DR login page displays.

3. Enter your user ID and password.
   For the Sound User, the credentials are:

   User: Sound User
   Password: $oundSRVC

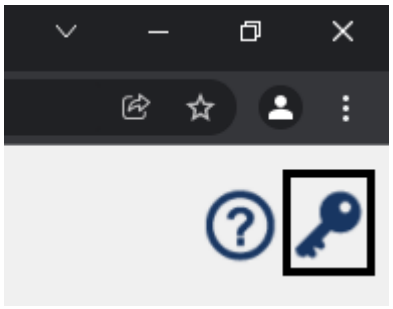
   For Vet or Tech users, use the credentials configured on the system for your user.
4. Select **Log in**.
   The Patient List is displayed.

Logging out of the SMART DR software

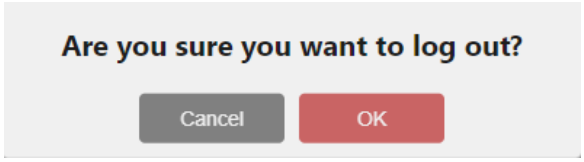
Use this procedure to log out of the SMART DR software.

Procedure

1. Select the key icon in the upper-right corner of the screen.



2. At the prompt, tap **OK** to log out.



   You are logged out and the SmartDR™ login screen is displayed.
3. Tap the **Exit** button to close the browser and return to your desktop.

Shutting down the PC

If desired, the PC can be shut down from the Windows desktop.

Prerequisites

Log out of the SMART DR application.

About this task

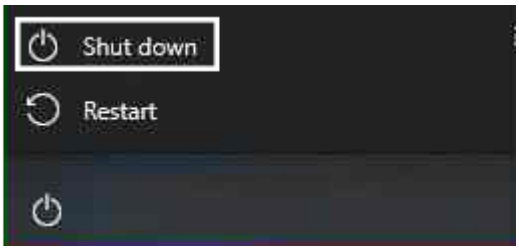
Note: If system updates are available, but have not been installed, you must complete this process twice to shut down the system.

Procedure

1. On the Windows desktop, select the **Start** icon.

2. In the pop-up list, select the **Power** icon.

3. In the pop-up menu, select **Shut down**.



The computer shuts down.

Installation report form

An installation report form is issued uo the customer upon installing the system.

Important: Required. This installation report form, including acceptance testing, must be completed within 30 days of installing the system. Contact technical support for the correct mailing address for this form and any other questions you might have.

Enter **NA** if an item is not applicable.

Installation:	___New	___Reinstalled	___Used	Date: ___ / ___ / 20___
System serial number:				

Site information	Distributor information
Name	Name
Street	Street
City, State, Zip	City, State, Zip
Department administrator	Service engineer
Phone	Phone
Email	Email
Survey completed by (print)	
Signed	Date
Room configuration	
Bucky replacement	_____Chest stand _____Table
Positioner type	Make Model
High resolution monitor type	Make Model
Control station in:	_____Exam area _____Control area
Are all interface cables clearly labeled?	_____Yes _____No
Distance from tower PC to patient area	
Modem telephone number (if any)	

Detector setup	
Detector manufacturer and model	Wireless _____Yes _____No
Mfr and model of second panel (if any)	Wireless _____Yes _____No
X-ray generator	
Manufacturer	Model
Integrated with the x-ray system	Wireless _____Yes _____No

The rest of this page intentionally left blank.

Chapter

5

Configuring the SMART DR X-ray system

Contents

- *Configuring the x-ray generator* on page 74
- *Displaying the Management screen* on page 75
- *Configuring basic options* on page 77
- *Configuring intermediate options* on page 81
- *Configuring advanced options* on page 84
- *Site information* on page 88
- *Configuring network connections* on page 88
- *Removing network connections* on page 90
- *Configuring Bluetooth connections* on page 91
- *Configuring the QR code for multi-user access* on page 93
- *Configuring panels* on page 94
- *DICOM storage devices* on page 104
- *Configuring acquisition profiles* on page 119
- *Managing users* on page 132
- *Configuring logging* on page 141
- *Configuring the integrated x-ray generator* on page 142
- *Customizing overlays* on page 143

The x-ray system is configured in the **Management** screen of the software application. This chapter describes how to configure each part of the system.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Configure Basic Options. See the topic, *Configuring basic options* on page 77, for instructions.
3. Configure Intermediate Options. See the topic, *Configuring intermediate options* on page 81, for instructions.
4. Configure Advanced Options. See the topic, *Configuring advanced options*, for instructions.
5. Configure the panel. See the topic, *Configuring panels* on page 94, for instructions.
6. Configure DICOM. See the topic, *DICOM storage devices* on page 104, for information.
7. Configure acquisition profiles. See the topic, *Configuring acquisition profiles* on page 119, for instructions.

   Note: For most sites, the default acquisition profiles are sufficient, and no configuration is required.
8. Manage users. See the topic, *Managing users* on page 132, for instructions.
9. Configure logs. See the topic, *Log files* on page 171, for information about log file options.
10. Customize overlays. See the topic, *Customizing overlays* on page 143, for instructions.
11. Select system backup options. See the topic, *Backing Up SMART DR data and settings* on page 158, for instructions.

Configuring the x-ray generator

The x-ray generator is configured in the generator console.

- Review the documentation that accompanies the x-ray generator for instructions on configuring the generator for use with the x-ray system.

  Important: The x-ray generator exposure window must always be set to less than the panel integration window (1 second).

Displaying the Management screen

The x-ray system application is configured in the **Management** screen. Vet Techs and Vets have some access to the **Management** screen, but Sound Users have full access. After the PC is powered up, it logs in to the Sound User account and starts the software automatically.

Procedure

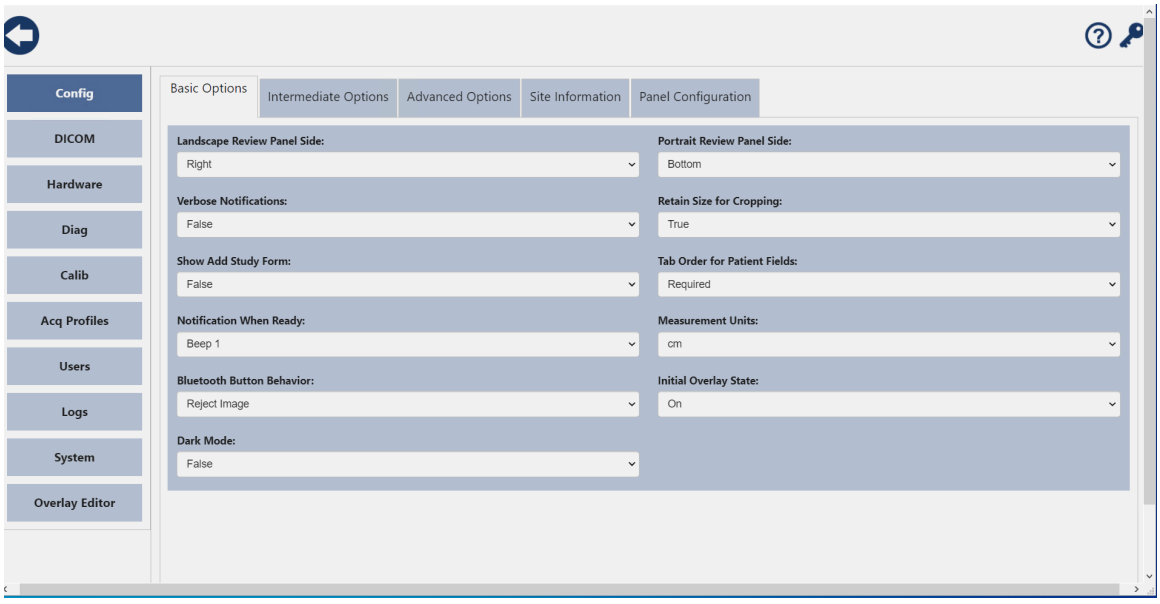
In the menu ribbon at the top of the main **Patient** screen, click the **Management** icon, which is shaped like a gear: .

The following figure shows the location of the **Management** icon at the top of the main **Patient** screen.

Figure 28: Location of Management icon

The **Management** screen opens, where you can complete your maintenance and configuration tasks. The user type that is logged into the system controls the tasks that can be performed. See the topic, *Management screen menu options* on page 76 for information about the menu options.

Figure 29: Management screen



Management screen menu options

This section describes the **Management** screen menu options.

The **Management** screen menu provides access to screens needed to complete maintenance and configuration tasks. The user type that is logged into the system controls the tasks that can be performed.

Figure 30: Management screen

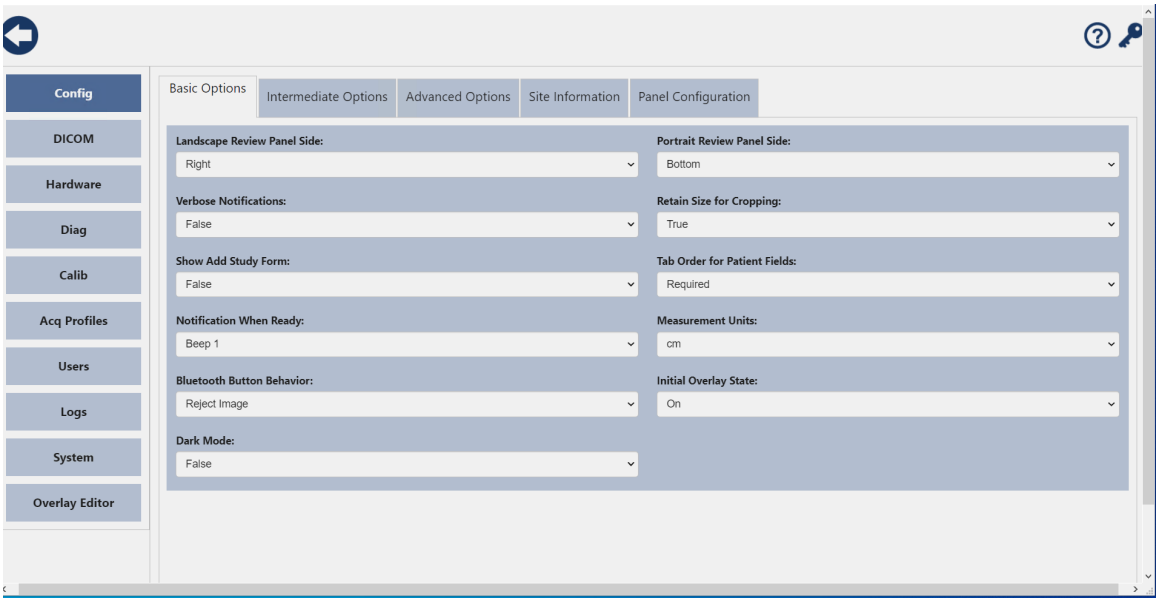


Table 40: Management screen menu options

Menu Tab	Description
Config	Used for configuring basic, intermediate, and advanced system options. Also provides access to site information and panel configuration screens.
DICOM	Used for configuring general DICOM options. Also provides screens for configuring DICOM storage, worklist and email servers, as well as MPPS.
Hardware	Used for configuring network, bluetooth, and generator connections.
Diag	Provides access to the data collector and information about the detector connected to the system.
Calib	Provides access to the gain calibration and calibration history screens.
Acq Profiles	Used for configuring acquisition profile settings and acquisition protocols.
Users	Used for managing user accounts.
Logs	Provides access to various system logs.
System	Provides access to backup, restore, and update features. Also displays version information.
Overlay Editor	Used for configuring overlays.

Configuring basic options

Configuring the basic options is the first step in configuring the x-ray system.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.

   The **Config** screen displays. The **Basic Options** tab is displayed, by default.
2. Configure the basic options, as necessary, for the site. See *Basic Options window* on page 78.

   Changes are saved automatically.

The rest of this page intentionally left blank.

Basic Options window

This section describes the details of the **Basic Options** tab of the Management screen.

Figure 31: Basic Options tab

Figure 32: Basic Options tab, left side

Table 41: Basic configuration options, left side

Field	Details
Landscape Review Panel Side	Select **Right** or **Left** to determine the side of the screen that the Review panel is displayed on. **Right** is the default value.
Verbose Notifications	Select **True** to enable verbose system notifications. **False** is the default value.
Show Add Study Form	When set to **True**, the **Add Study Information** dialog box is shown when a study is added to a patient record in the main **Patient** screen. When set to **False**, the **Add Study Information** dialog box is displayed only if the patient has no studies. When set to **False**, adding a study to a patient that has at least one study does not display the **Add Study Information** dialog box. Instead, the **Shotlist** screen is displayed and the study information is copied from the previous study in the patient record.
Notification When Ready	Set this option to sound an audible tone when the panel is ready to acquire. Options are: None, Beep 1, Beep 2, Beep 3, Beep 4, and Beep 5.
Bluetooth Button Behavior	Options: Reject Image, Select Next Shot. Default value: Reject Image. When **Reject Image** is selected, the reject button behaves as it does in existing versions of the application on the acquisition screen. If **Select Next Shot** is selected, the button selects the next shot in the list. If the last shot is selected when the button is pressed, the first shot in the list becomes selected.

The rest of this page intentionally left blank.

Field	Details
Dark Mode	When set to **True**, the color scheme of the application changes to dark hues.

Figure 33: Basic Options tab, right side

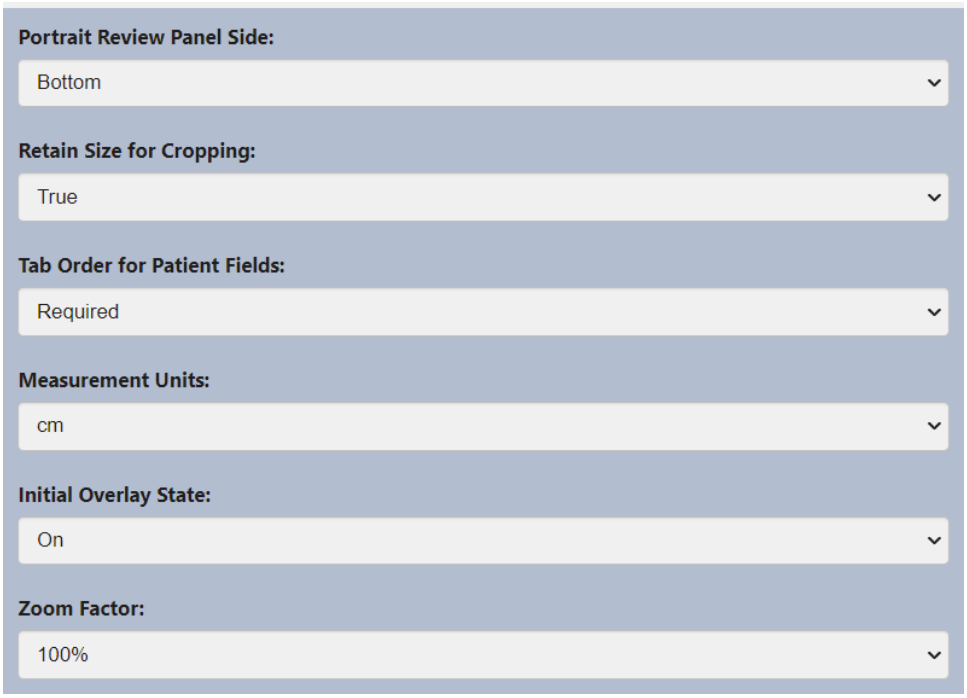


Table 42: Basic configuration options, right side

Field	Details
Portrait Review Panel Side	Select **Top** or **Bottom** to determine which side of the monitor the Review panel is displayed on when the monitor is rotated for portrait display. **Bottom** is the default value.
Retain Size for Cropping	Select **True** to retain the display size of the anatomy in an image regardless of the ROI setting. Select **False** to allow the ROI setting to affect the size of the anatomy in the displayed image. True is the default value.
Tab Order for Patient Fields	When this option is set to **Required**, pressing the tab button will navigate through only the required fields in a screen. If it is set to **All**, pressing the tab button will navigate through all of the fields on a screen. **Required** is the default value.
Measurement Units	Set the units for measurements to millimeters (mm) or centimeters (cm).

Field	Details
Initial Overlay State	Determines whether the initial overlay state is **On** or **Off**. The **On** state indicates that the overlay will be displayed over images automatically in the Acquisition screen. The **Off** state indicates that the overlay is not displayed automatically.
Zoom Factor	Select the percentage value to enlarge or downsize the user interface. You can set the following zoom values: 80%, 90%, 100%, 110%, or 120%. Default: 100%

Configuring intermediate options

As part of the system configuration, you can configure intermediate options.

Procedure

1. Open the **Management** screen. See *Displaying the Management screen* on page 75. The **Config** screen displays, by default.
2. Select **Config** > **Intermediate Options**. See *Intermediate Options window* on page 81. Changes are saved automatically.

Intermediate Options window

This section describes the details of the **Intermediate Options** tab of the Management screen.

Figure 34: Intermediate Options tab

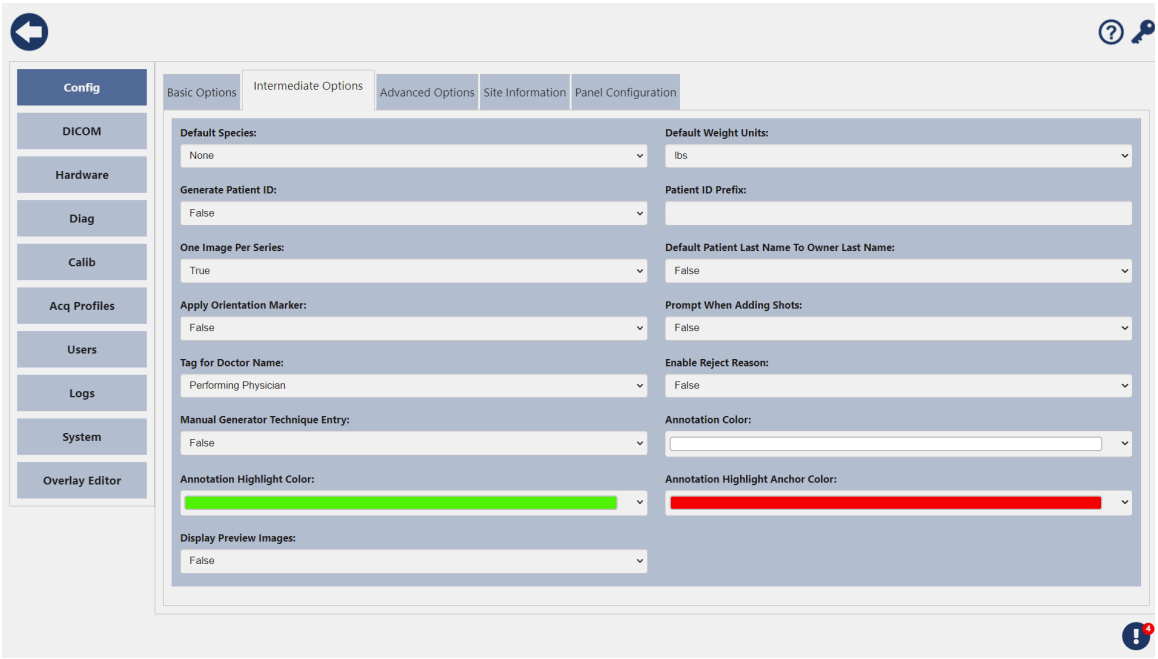


Figure 35: Intermediate Options tab, left side

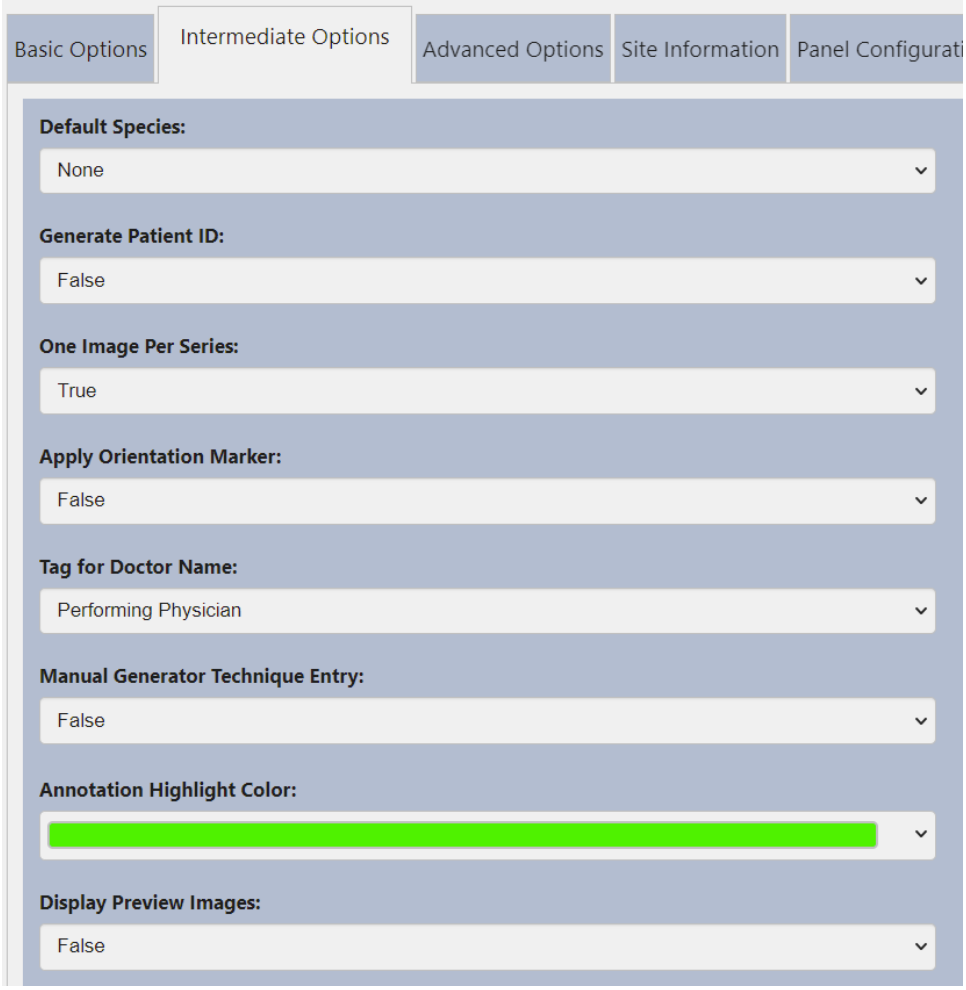


Table 43: Intermediate configuration options, left side

Field	Details
Default Species	Select the default species for imaging. **None** is the default value.
Generate Patient ID	Selecting **True** in this field causes patient IDs to be automatically generated. The default value is **False**.
One Image Per Series	When this option is set to **True**, the system assigns each image a new series ID at acquisition.
Apply Orientation Marker	Set this value to **True** to automatically place an orientation marker in the upper left corner of the image. This marker indicates the orientation of the panel in the image. An "F" indicates that the number of flips applied is even. A "B" indicates that the number of flips applied is odd. The default value is **False**.
Tag for Doctor Name	Set the value for the Doctor Name tag to **Performing Physician** or **Referring Physician**.

Field	Details
Manual Generator Technique Entry	A value of **False** means technicians will not be required to manually enter generator techniques after each acquisition. A value of **mAs** means that technicians are required to enter the kV and mAs values from the generator manually after each acquisition. A value of **mA - ms** means that technicians are required to enter the kV, mA, and ms values from the generator manually after each acquisition.
Annotation Highlight Color	Select the color of the annotation when highlighted. The highlight color is visible when hovering over an annotation. Default: Green
Display Preview Images	Set this value to **True** to show a preview image during acquisition. Set this value to **False** if a preview of the image is not required during acquisition. Default: False

Figure 36: Intermediate Options tab, right side

Table 44: Intermediate configuration options, right side

Field	Details
Default Weight Units	Select the default unit for patient weights. The options are pounds (**lbs**), kilograms (**kg**), and grams (**g**). **lbs** (pounds) is the default value.
Patient ID Prefix	When **Generate Patient ID** is set to **True**, you can specify an alpha-numeric patient ID prefix of up to 10 characters in this field.

Field	Details
Default Patient Last Name to Owner Last Name	Set this option to **True** to populate the **Patient Last Name** field with the value in the **Owner Last Name** field. If the **Patient Last Name** field contains a value, the system leaves this value in place. Set this option to **False** to leave the **Patient Last Name** field empty, if the **Owner Last Name** field contains no value.
Prompt When Adding Shots	Set this value to **True** to present a warning to users who enter the shotlist screen of a study that already contains images. This message warns the user that images added to the study at this time will reflect the original study date. From here, users can continue the operation or cancel and return to the previous screen. Options: True or False. Default: False
Enable Reject Reason	Set this value to **True** to require technicians to enter a reason for rejecting an image. Set this value to **False** to allow technicians to reject an image without entering a reason. Default: False
Annotation Color	Select the color of the annotation used for annotating images. Selecting an annotation color relative to the background color of the image provides greater visibility to the annotation. Default: White
Annotation Highlight Anchor Color	Color of the anchor (end) points of an annotation. Anchor points are located at the ends of pointer arrows, measurements, and angles. Anchor points are visible when hovering over the annotation. Default: Red

Configuring advanced options

As part of the system configuration, you can configure advanced options such as the gain calibration interval.

About this task

Access the **Advanced Options** tab from the **Management** screen.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.

   The **Config** screen displays, by default.
2. Select **Config** > **Advanced Options**.
3. Configure the fields as desired. See the topic, *Configuring advanced options* on page 84 for information about these parameters.

   Changes are saved automatically.

Advanced Options window

Figure 37: Advanced Options tab

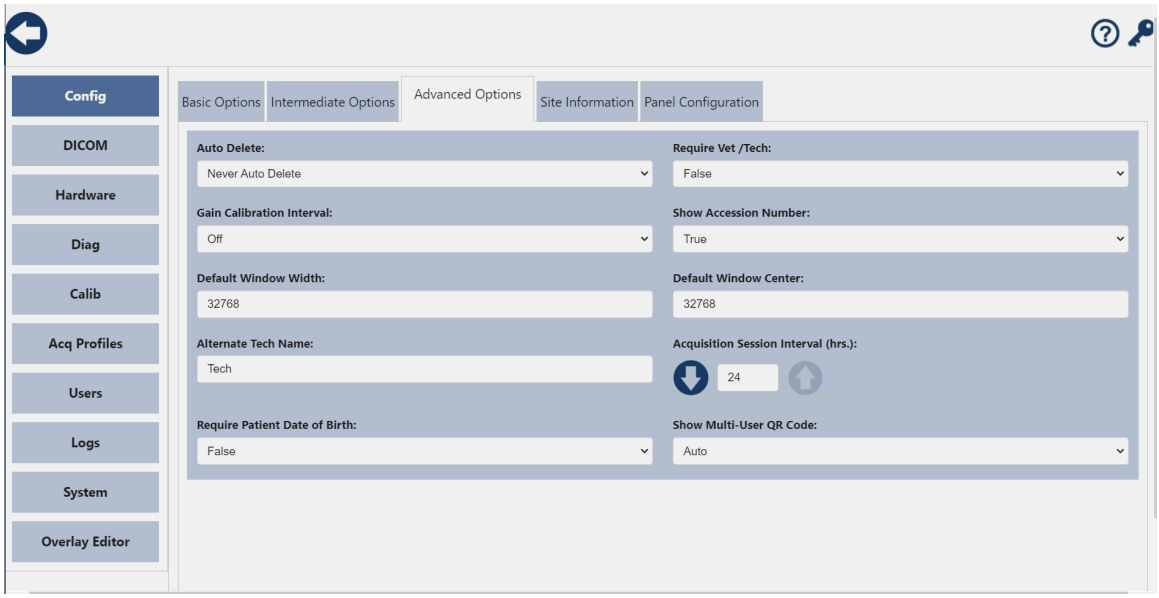


Figure 38: Advanced Options tab, left side

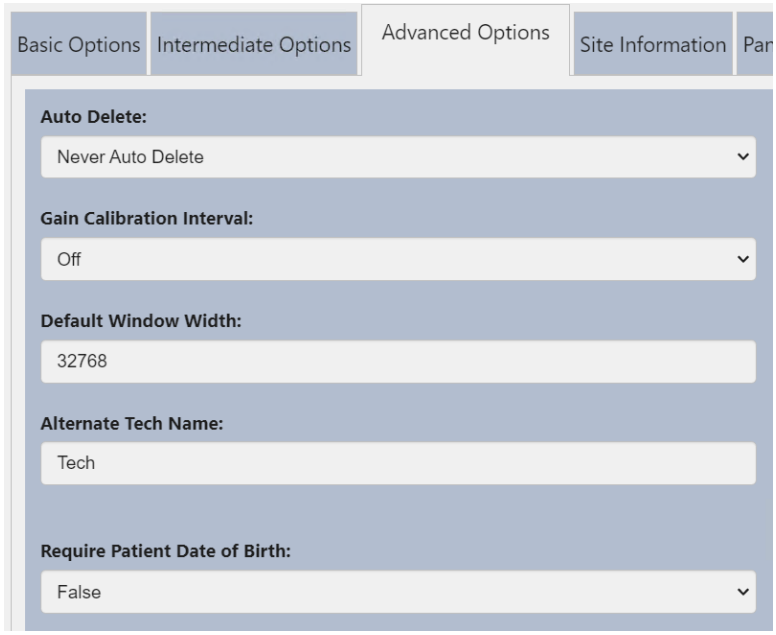


Table 45: Advanced configuration options, left side

Field	Details
Auto Delete	Select the option that best fits the needs of the site. The options are Never Auto Delete, 50, 75, and 90. **Never Auto Delete** is the default value. Selecting any value other than **Never Auto Delete** causes patient records to be deleted when the percent of used hard disk space is greater than the value selected. The oldest patient records are deleted first and records are deleted until the percent of used disk space is less than the selected value. You can also specify that records older than the selected number of months should be automatically deleted. Selecting one of the date range options (3 months, 6 months, or 12 months) will cause the auto-delete function, which runs on logoff, to delete any patient record that is older than the number of months selected.
Gain Calibration Interval	Specify the gain calibration interval from one of these options: Off (calibration does not expire), Quarterly (calibration is valid for three months), Semi-annual (calibration is valid for six months), or Annual (calibration is valid for one year). The default value is **Off**.
Default Window Width	Use this field to set the default window value for Musica.
Alternate Tech Name	Enter up to 12 characters to create an alternate technician name.
Require Patient Date of Birth	Set this option to **True** to require the user to select the date of birth (DOB) when creating a new patient. Values: True or False. Default: False

Figure 39: Advanced Options tab, right side

Table 46: Advanced configuration options, right side

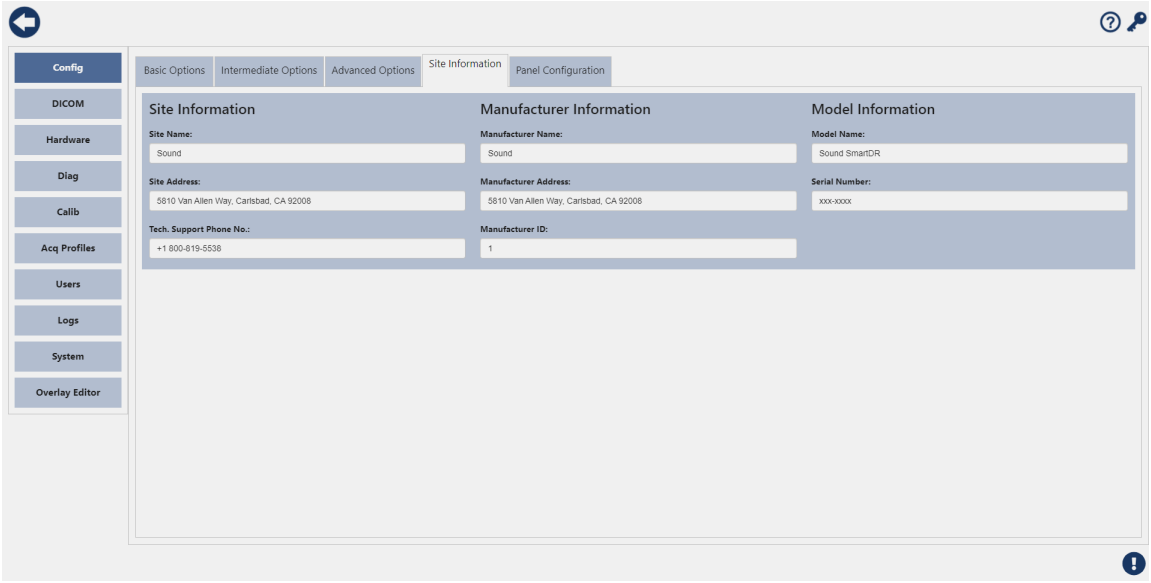
Field	Details
Require Vet/Tech Selection	Set this value to **True** to require the user to select a vet and/or tech before closing the study. Options: True or False. Default: False

Field	Details
Show Accession Number	If set to **True**, the **Accession Number** field displays on the **Add Patient Information**, **Edit Patient Information**, and **Add Study Information** screens. If set to **False**, this field does not appear on these screens.
Default Window Center	Use this field to set the default level value for Musica.
Acquisition Session Interval (hours)	Specify the acquisition session interval in hours. When a shot is acquired into a study that already has a shot of the same anatomy, the new shot is placed into a new series, if the interval between the first shot and the new shot exceeds the acquisition session interval.
Show Multi-User QR Code	Use this option to display or hide a QR code that allows users to access SMART DR from a device other than the SmartDR computer. Users accessing the SMART DR using the QR code can administer the application, and view or modify images from their cell phone, tablet, or other devices. Values: Hide, Auto, *IP address of the SmartDR computer*. Default value: Hide. When this field is set to **Auto** or the IP address of the SMART DR computer, the **Multi-User QR Code** tab is added to the **Hardware** page in Manage Mode and displays a QR code that users can scan to access SMART DR from another device. See *Configuring the QR code for multi-user access* on page 93 for detailed instructions.

Site information

The site information is preconfigured at the factory.

Figure 40: Site Information tab



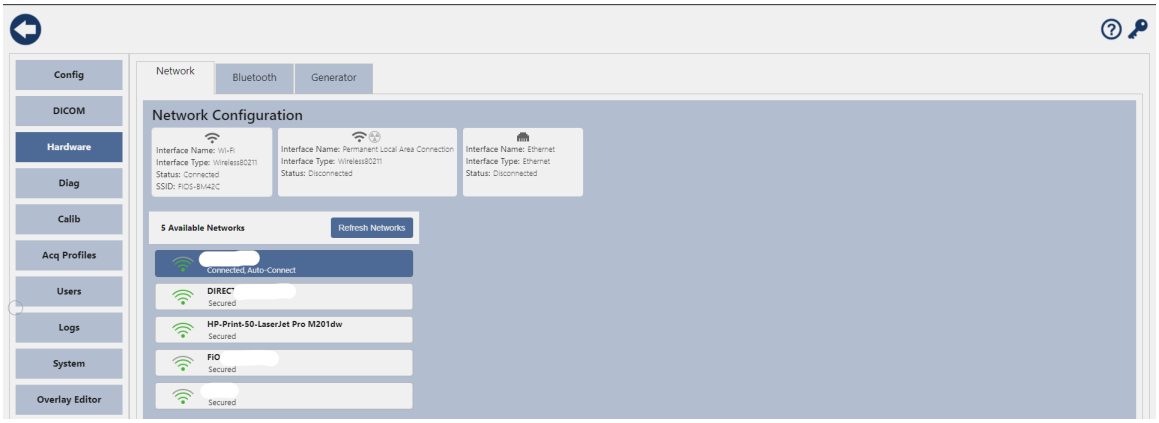
Configuring network connections

Network connections can be configured in the **Management** screen within the **Hardware** tab.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75*Configuring network connections* on page 88, for instructions.

   The **Network** tab is displayed by default.



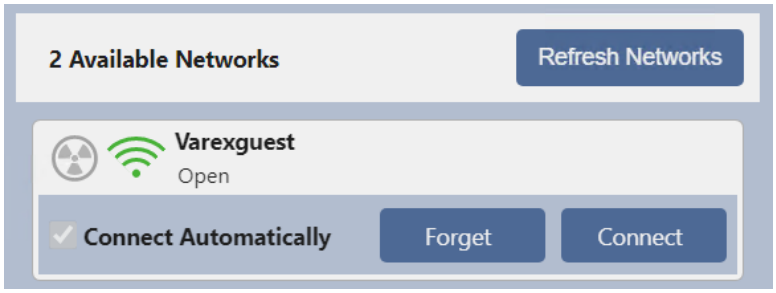
2. Select **Refresh Networks**, then select your desired network from the list of available networks.

3. If you want the x-ray system to connect to the network automatically, select or tap on **Connect Automatically**.

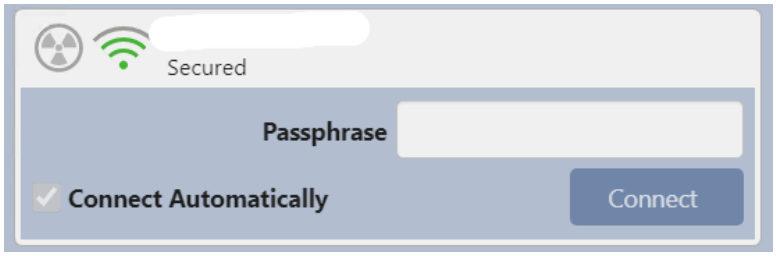
   An `Auto-Connect` message will display at the top of the **Connect** box.

4. Do one of the following:

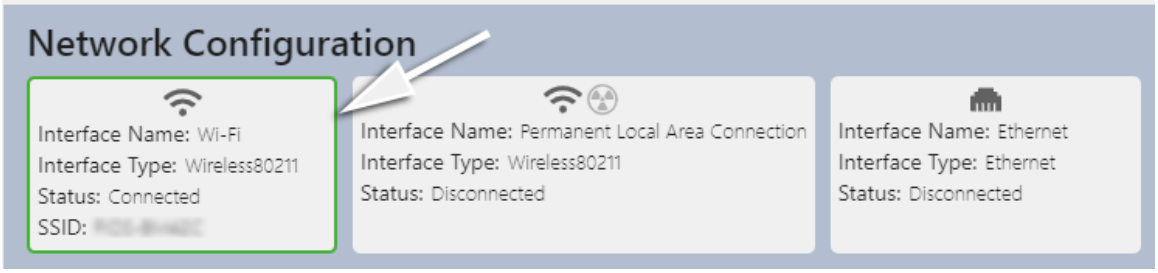
   - For an open network, select **Connect**.



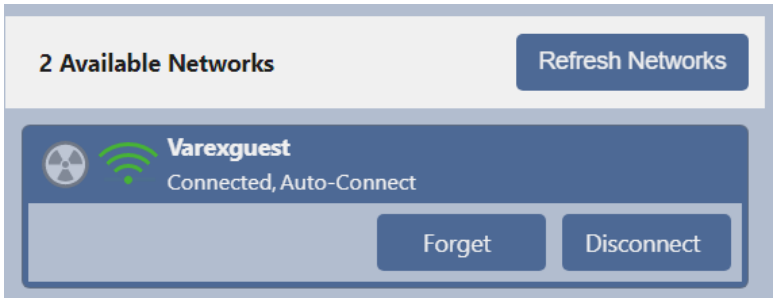
   - For a secure network, in the **Passphrase** field, type the password for connecting to the network, then select **Connect**.



   The connection is established and the type of network is surrounded with a green border at the top of the screen. In the following image, the wireless connection has been configured.



5. To disconnect from the selected network, select **Disconnect**.



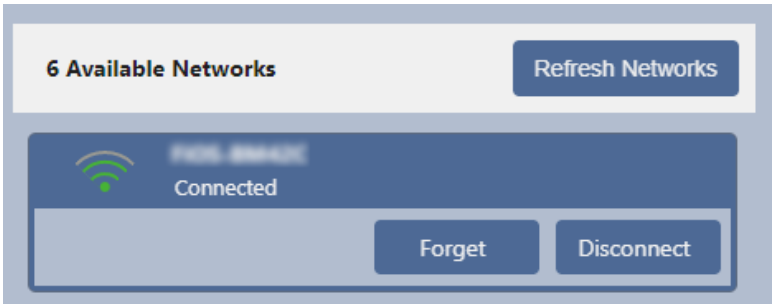
Removing network connections

Network connections can be removed from the system in the **Management** screen within the **Hardware** tab.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select the **Hardware** tab.

   The **Network** screen is displayed, by default.
3. Select the network connection that you want to remove.



4. Select **Forget**.

   The connection is removed and the green border disappears from the network type at the top of the tab. In the following image, Wi-Fi is the network type that was disconnected.

Configuring Bluetooth connections

Bluetooth connections can be created in the **Management** screen within the **Hardware** tab.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **Hardware** > **Bluetooth**.

3. Select **Discover**.

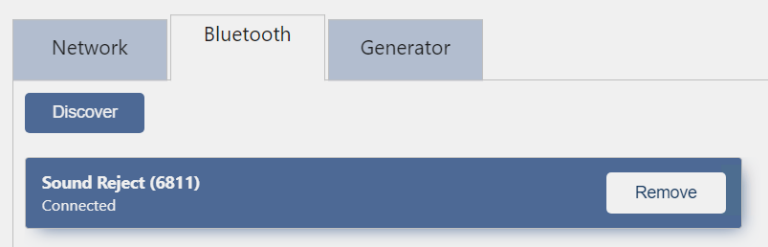
   The system searches for Bluetooth connections and displays the available devices in a list.

4. Select either the **Stop Discovery** button to stop the discovey process, or select **Connect** next to the desired device in the list to complete the pairing.

   Note: The **Stop Discovery** button is displayed on the screen only during the discovery process.

   A Bluetooth connection is successfully established with your selected device.

5. To remove the connection to the selected device, select the **Remove** button.



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Configuring the QR code for multi-user access

The multi-user QR code feature allows users to connect to SMART DR, administer the SMART DR application, and view or modify images simultaneously from their mobile phones or other devices.

About this task

When the multi-user QR code feature is enabled, the **Multi-User QR Code** tab is shown on the **Hardware** screen.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **Config** > **Advanced Options**.
3. In the **Show Multi-User QR Code** drop-down list, select the desired option:

Option	Description
Hide	Select this option if you do not want the QR code to be used.
Auto	Select this option if the SMART DR computer has multiple IP addresses. The Sound SMART DR™ software selects the most likely IP address. In the event that the auto-selected IP address does not work, the IP address can be set manually. See the next option.
IP address	To set the IP address for the QR code manually, select an IP address from those displayed at the bottom of the **Show Multi-User QR Code** drop-down list.

Configuring panels

This topic describes how to configure the flat-panel detectors that are supported for use with this system.

Prerequisites

- Power the detector on.
- Ensure the detector is configured as an access point.

About this task

Detectors can be added to the system from the **Config** or **Hardware** screens.

Procedure

- Add the detector through the **Config** screen.
  See *Adding detectors through the Config screen* on page 95.
- Add the detector through the **Hardware** screen.
  Adding detectors through the Hardware screen on page 96.

Panel configuration controls

This section describes how to remove a detector from the configuration and refresh a detector's status.

Controls for configuring detectors

Control	Description	Steps
Remove Panel	Removes the panel from the configuration.	1. In the **Management** screen, select **Config** > **Panel Configuration**. 2. Select the desired panel. 3. Tap **Remove Panel** . 4. Select **Delete**, at the prompt.
Refresh Status	Updates the status of the selected panel, if connected.	1. In the Acquire/Review screen or the main **Patient** screen, select the detector status (panel) icon. 2. For dual panel configurations, select the desired detector from the **Active Panel** drop-down list; otherwise, go to Step 3. 3. Tap **Refresh Status**.

Adding detectors through the Config screen

Wireless detectors can be detected by the Sound SMART DR™ software and added to the system from the **Config** screen.

Prerequisites

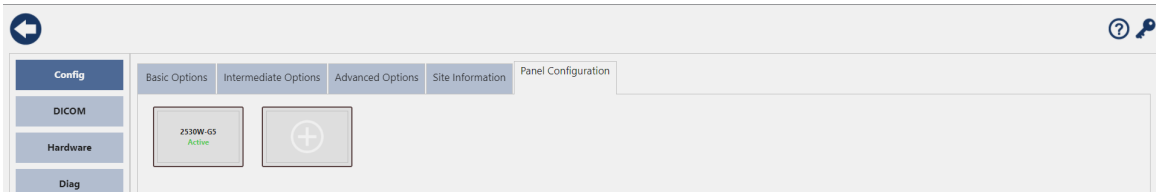
Before you begin this task, complete the following requirements:

- Power the detector on.
- Ensure the detector is configured as an access point.

Procedure

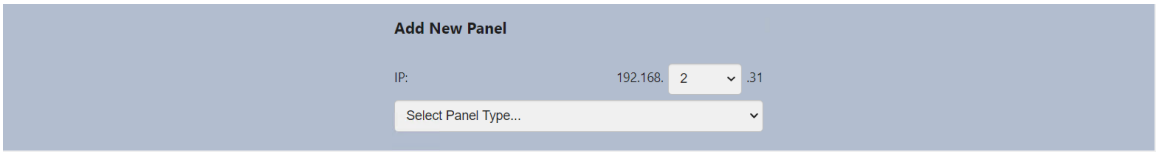
1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.

   The **Config** screen is displayed, by default.
2. Select **Panel Configuration**.



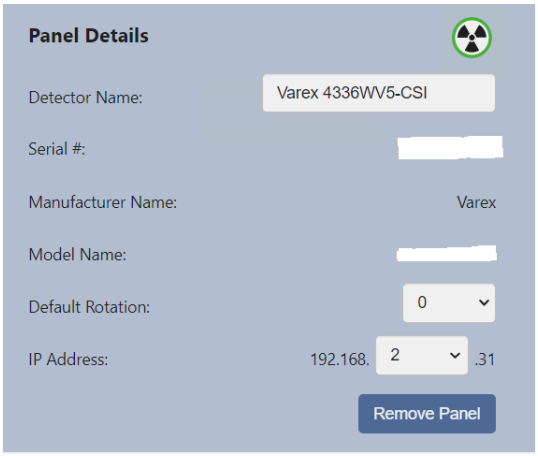
3. Select the panel icon (box with a plus (+) sign).

   The **Add New Panel** drop-down list is displayed.



4. From the **Add New Panel** drop-down list, select the panel that you want to add to the system.

   The drop-down list contains all the detectors that are installed on the system. After you select a detector from the list, the **Panel Details** window is displayed.



5. If desired, change the name in the **Detector Name** field.
6. From the **Default Rotation** drop-down list, select the default rotation setting for the panel.

   Changes are saved automatically.

Adding detectors through the Hardware screen

Wireless detectors can be detected by the Sound SMART DR™ software and added to the system from the **Hardware** screen.

Prerequisites

Before you begin this task, complete the following requirements:

- Power the detector on.
- Ensure the detector is configured as an access point.

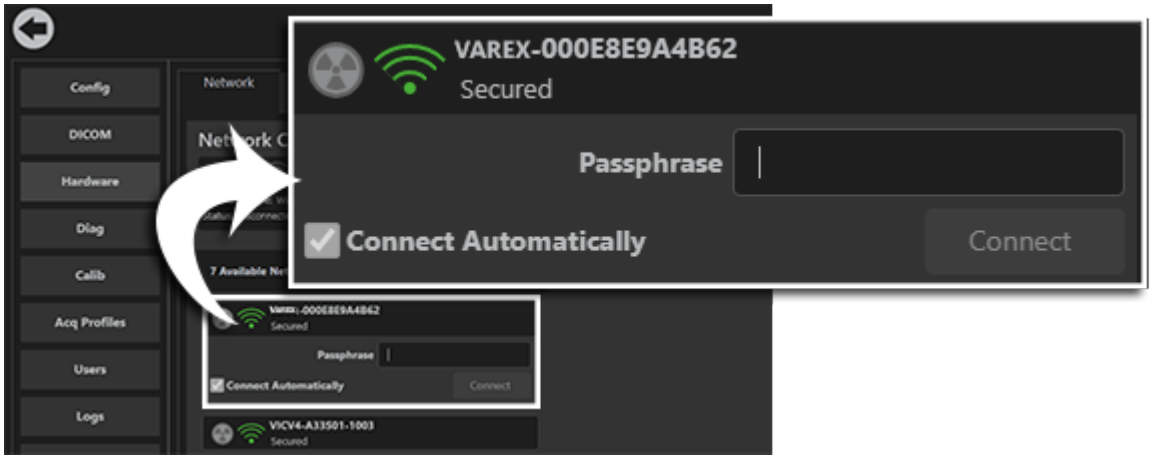
Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.

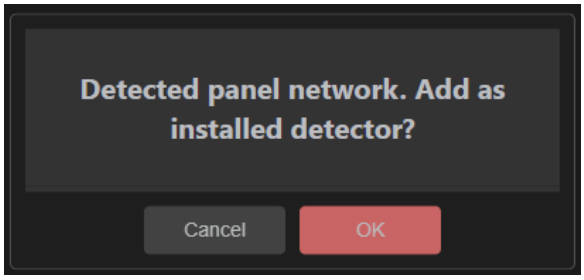
   The **Config** screen is displayed, by default.
2. Select **Hardware**.

   The **Network** tab is displayed, by default.

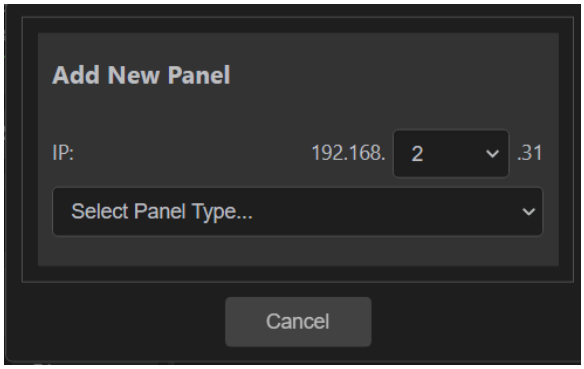
3. Select the detector from the list of available networks.
   The detector name will include VIC or VAREX.



4. In the **Passphrase** field, type `abcd1234`.
5. Select **Connect**.
   The following message is displayed:

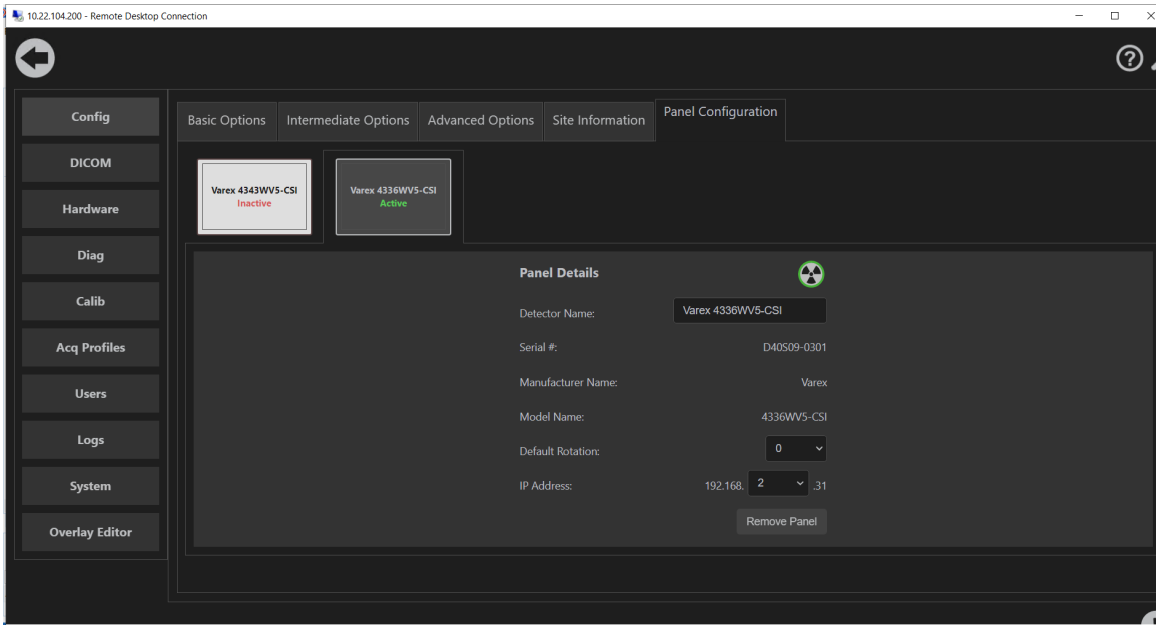


6. Select **OK**.
   The **Add New Panel** drop-down list is displayed.



7. Select the detector from the list.
   Sound SMART DR™ connects to the detector.

8. Select **Config** > **Panel Configuration**.
   The detector is available at the top of the **Panel Configuration** tab.



9. Select the detector and configure the **Detector Name** and **Default Rotation**, as needed.
   Changes are saved automatically.

Creating the initial panel connection manually

Complete this task to create the initial connection between the PC and the panel manually through the Windows **Network and Sharing Center**.

Prerequisites

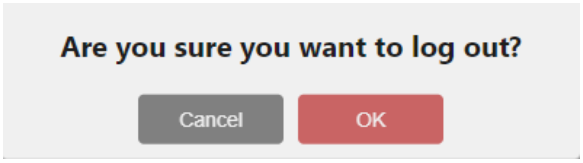
Ensure that the following prerequisites are met:

- Remove the battery from the panel and write down the WI-FI SSID address on the sticker underneath. You will need this address to create the network connection to the panel.
- Insert a charged battery into the detector to power the detector on. See *Varex detector power sequence* on page 54 for detailed information about the power sequence for the detector.

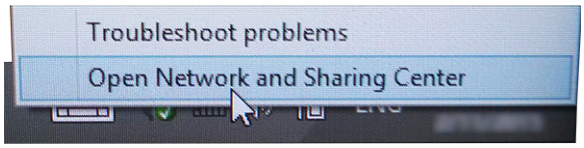
Procedure

1. Select the **Log off** button.

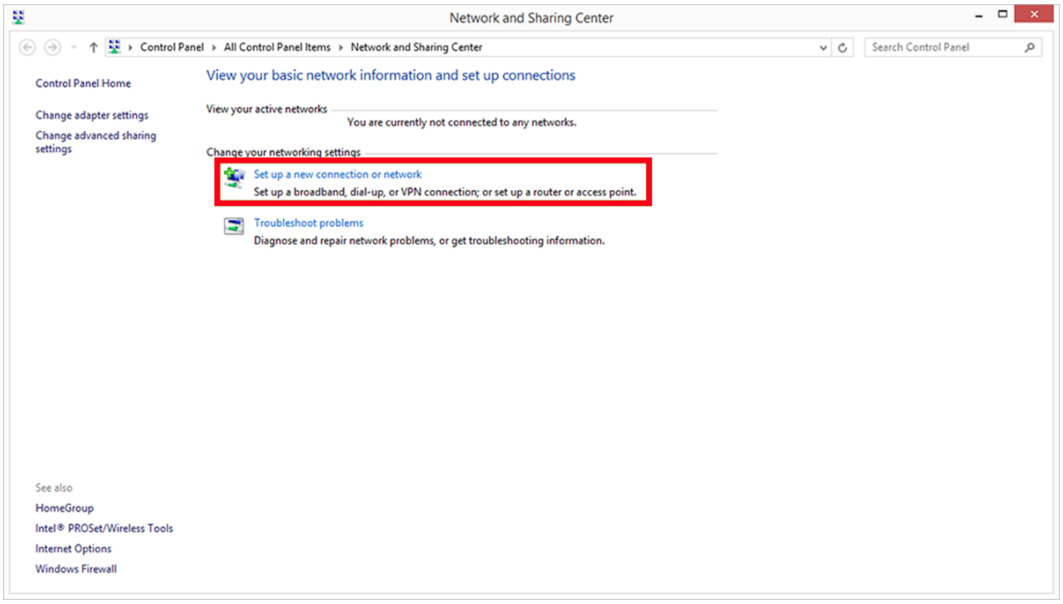
2. In the **Are you sure you want to log out?** dialog box, select **OK** to log off.



3. Depending on whether you are using the touch screen or a mouse, complete one of the following actions:
   - **Touch screen:** Press and hold on the wireless icon in the lower-right side of the Windows system tray, then remove your finger from the screen and select **Open Network and Sharing Center** from the pop-up menu.
   - **Mouse:** Right-click on the wireless icon in the lower-right side of the Windows system tray, and select **Open Network and Sharing Center** from the pop-up menu.

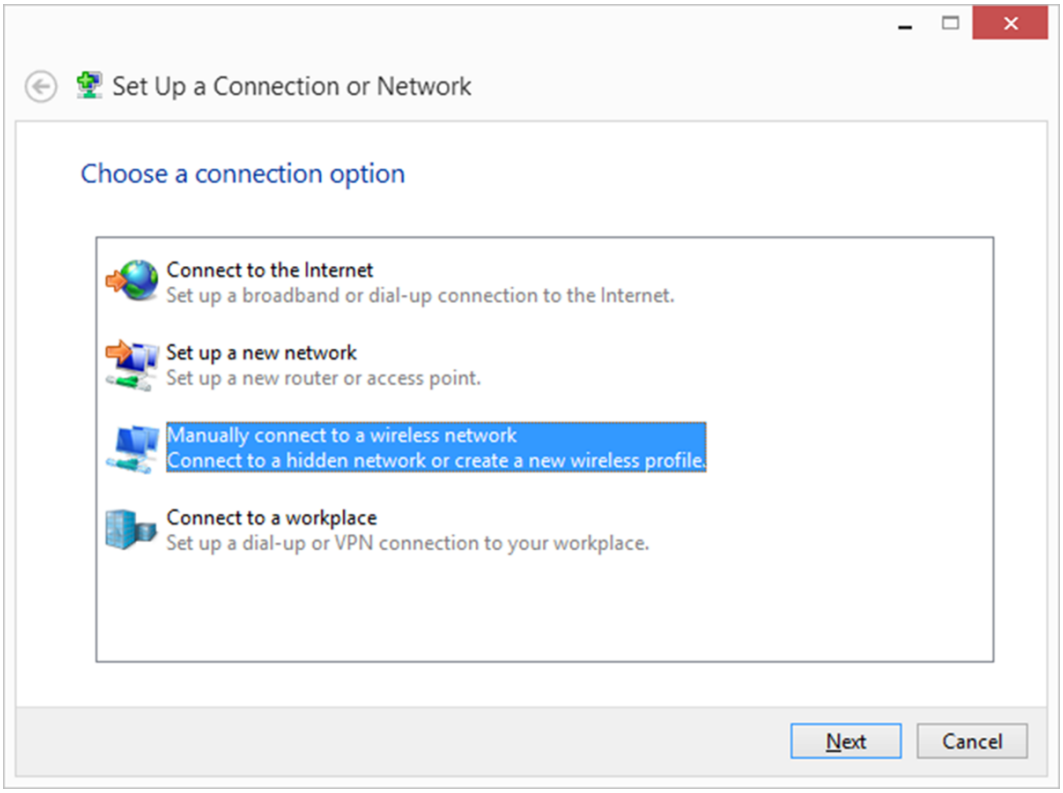


4. In the **Network Connections** window, select **Set up a new connection or network**.



The **Set Up a Connection or Network** window is displayed.

5. Select **Manually connect to a wireless network**, and click **Next**.

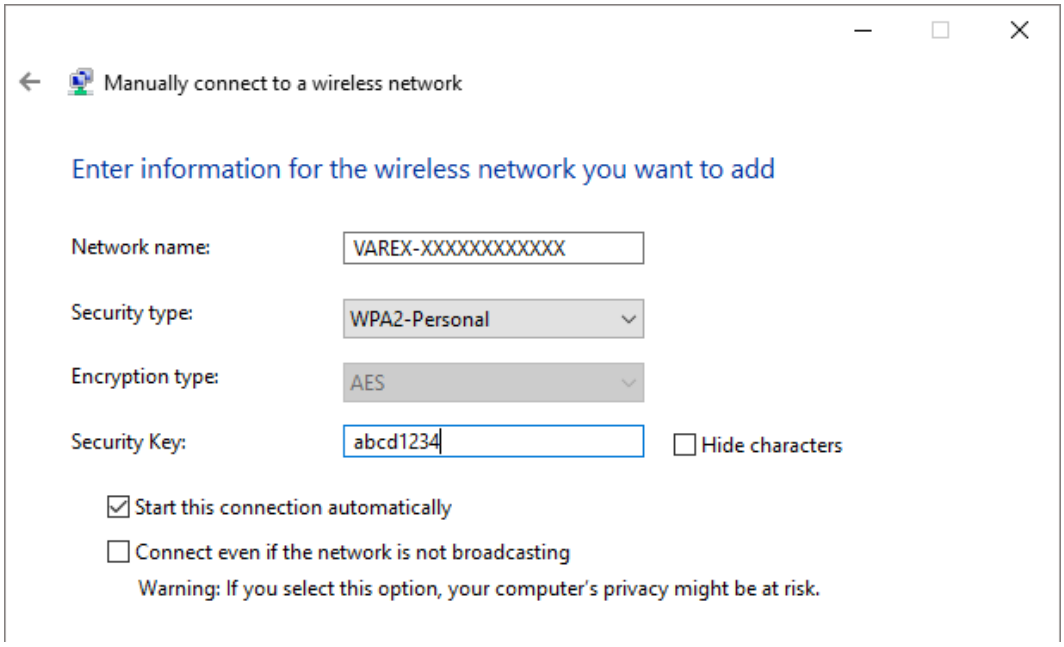


The **Manually connect to a wireless network** window is displayed.

6. Select the Wi-Fi adapter. See the topic, *Network profile settings* on page 102.

7. Select **Next** and provide the network information.

   See *Network profile settings* on page 102 for information about the settings.



   In the **Manually connect to a wireless network** window, a success message is displayed.

8. Click **Close** to close the window.

   If the panel is active and within the connection range, the PC connects automatically; however, it might take a minute or two to create the initial connection.

9. Click the wireless icon in the Windows system tray, and ensure that the network profile you created appears in the list and shows active bars.

10. Check the indicator lights on the panel. The LED is green and blinks twice per second to indicate a connection has been made.

    See *LED status indicator behavior* on page 55 for detailed information about the LED indicator light.

11. If the panel does not connect automatically, make the initial connection manually by clicking on the Wi-Fi icon in the Windows system tray, and clicking on the network profile for the panel in the list.

12. Ensure that the **Connect automatically** check box is selected, and click **Connect**.

13. In the **Enter the network security key** field, type the security key (`abcd1234`), and click **Next**.

    The PC will connect to the panel and display the connection in the Networks list.

14. Verify that the connection shows active bars, and check the LED light on the side of the panel.

    See *LED status indicator behavior* on page 55 for detailed information about the LED indicator light. The LED light is green and blinks twice per second when a connection has been made. After you have created this initial connection, the panel and the PC will connect automatically in the future.

Network profile settings

Use these settings to configure a detector for manual connection to a wireless network.

Table 47: Network profile settings

Field	Value
Network name	VAREX- If the Wi-Fi SSID for the panel does not have the VAREX- prefix, add it when you enter the network name. For example, if the Wi-Fi SSID on the sticker is 000E8E4325A9, type `VAREX-000E8E4325A9` into the **Network Name** field. If the Wi-Fi SSID includes the VAREX prefix, just enter the SSID as it appears on the sticker.
Security type	WPA2-Personal
Encryption type	AES
Security Key	abcd1234
Hide characters	(Optional) Select this if you want to prevent others from seeing what you are typing into the fields.
Start this connection automatically	Select this check box to automatically connect to the panel.
Connect even if the network is not broadcasting	Select this check box to ensure that the panel can be detected.

Removing panels

In some cases, it might be necessary to remove a panel.

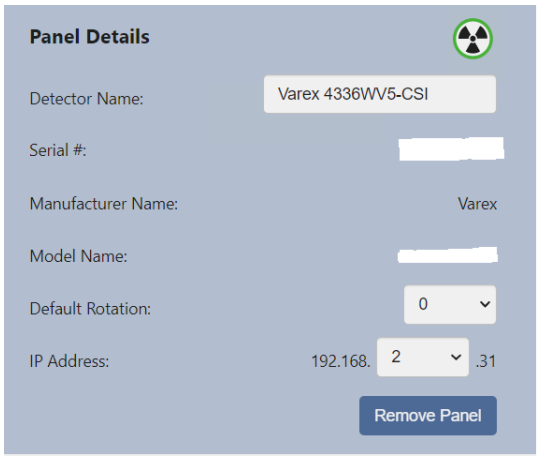
Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.

   The **Config** screen is displayed, by default.
2. Select **Config** > **Panel Configuration**.

   The panel that is currently configured with the system is displayed.

Figure 41: Config screen — Panel Configuration Remove Panel button



3. Select **Remove Panel**.
4. In the delete confirmation message, select **Delete**.

   The panel is removed. If you add the same panel again, you must restart the PC before you can connect to the panel properly.

Replacing detectors

Detectors can be replaced in the **Management** screen with another panel of the same type. The previous panel does not need to be uninstalled and the PC does not need to be restarted to replace a panel.

Procedure

1. Remove the desired detector. See *Removing panels* on page 103.
2. Add the new detector. See *Configuring panels* on page 94.

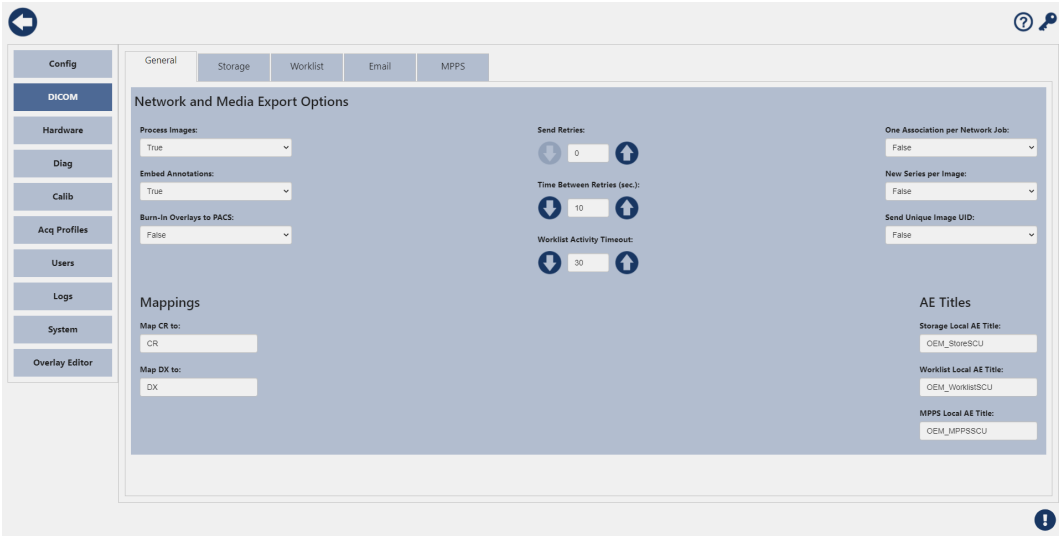
DICOM storage devices

SMART DR can communicate with DICOM devices at the site or at remote locations.

Warning: It is the responsibility of the service technician or the site network administrator to ensure that the DICOM devices and the network are configured properly to work with SMART DR. Incorrectly configured DICOM devices or network will result in failures in DICOM transferring the images acquired by SMART DR.

Warning: Il est de la responsabilité du technicien de service ou du réseau de sitesadministrateur de veiller à ce que les dispositifs de DICOM et le réseau sont correctement configurés au travail SMART DR. Mal configuré dispositifs DICOM ou réseau se traduira par des échecs dans DICOMtransférer les images acquises par SMART DR.

DICOM devices are configured in the **Management** screen within the **DICOM** tab.



DICOM consists of the following components, which must be configured for DICOM to work properly:

- General configuration
- Storage server configuration
- Worklist server configuration
- Email server configuration
- MPPS configuration

Important: Consult with the site's IT department for IP addresses and AE titles for all DICOM storage servers.

Valid configuration characters

The following table lists the characters that may be used to configure DICOM attributes.

Table 48: Valid characters for DICOM configuration

0-9	A-Z	a-z	<space>	!	"
#	$	%	&	‘	(
)	*	+	,	-	.
/	:	;	<	>	=
?	@	[	]	\	^
_	{	}	|	~	‘

Configuring general DICOM settings

The x-ray system can communicate onsite and remotely with DICOM devices such as storage devices and worklists.

About this task

Warning: It is the responsibility of the Service Tech or the site network administrator to ensure that DICOM devices and the network are configured properly to work with the x-ray system. Improper configuration can result in failures in sending images acquired by the x-ray system.

Warning: Il est de la responsabilité de la Tech de service ou à l'administrateur réseau de site pour s'assurer que les dispositifs DICOM et le réseau sont correctement configurés pour fonctionner avec le système x -ray. Une mauvaise configuration peut entraîner des défaillances dans l'envoi d'images acquises par le système x -ray.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **DICOM**.

   The **General** tab is displayed, by default.
3. Configure the settings, as necessary, for the site. See *DICOM General configuration settings* on page 106 for information.

DICOM General configuration settings

Figure 42: DICOM General tab

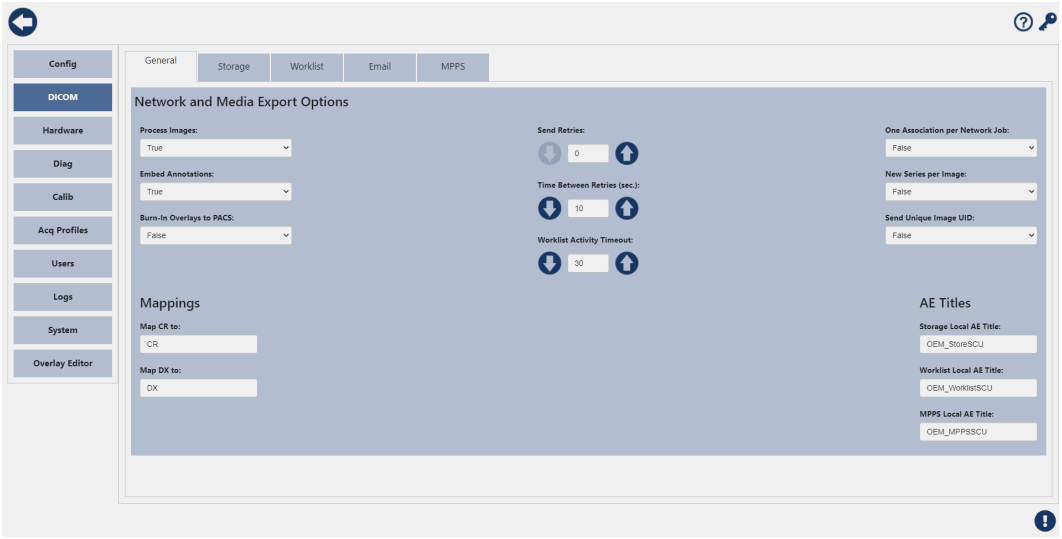


Figure 43: DICOM General tab, first column

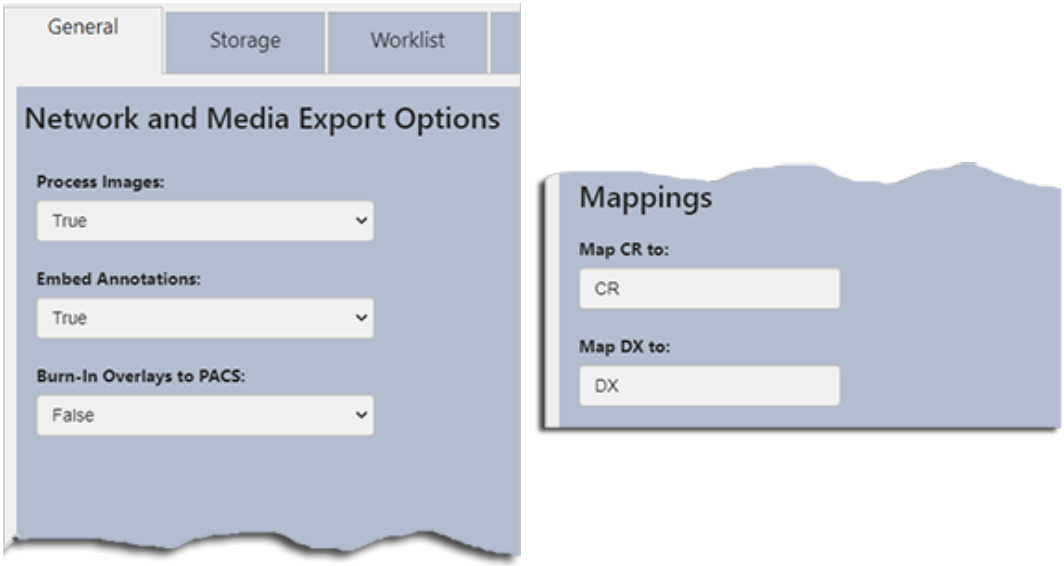


Table 49: DICOM General tab, first column

Parameter	Description
Process Images	Set the **Process Images** option to **True** or **False**. **True** is the default. When set to **True**, the images are sent to the DICOM device with image processing and all user-applied image processing.
Embed Annotations	Set the **Embed Annotations** option to **True** or **False**. **True** is the default. This option can be set to **True** only if the **Process Images** option is also set to **True**. When **Embed Annotations** is set to **True**, all annotations are sent to the DICOM device as part of the image.
Burn-In Overlays to PACS	Set the **Burn-in Overlays to PACS** option to **True** or **False**. The default is **False**. Set the parameter to **True** to embed overlays into the transferred image.
Mappings	Configure the modality mappings. When the modality mapping is set, the image type sent has the modality tag (0008,0060) value changed to the value stored in the mapping setting for that image type. By default, the modality attributes are set to the same value as the corresponding local x-ray system database modality attributes.

Figure 44: DICOM General tab, second column

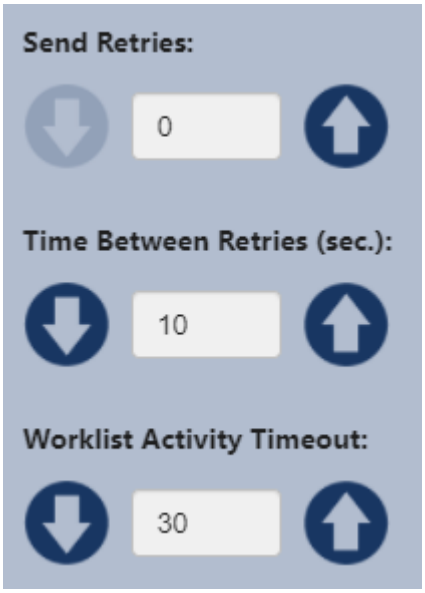


Table 50: DICOM General tab, second column

Parameter	Description

Send Retries	Set the number of **Send Retries** to a value from 0 to 10. The default setting is **0**. This setting defines how many times a failed network DICOM job will be resent to the DICOM device.
Time Between Retries (sec)	Set the **Time Between Retries (sec)** to a value from 0 to 200 seconds. The default is **10** seconds. This option defines the number of seconds between attempts to resend failed DICOM jobs to the DICOM device, with 0 meaning no wait period.
Worklist Activity Timeout	Set the **Worklist Activity Timeout** in seconds. Valid values: 1-300. The default value is **30** seconds.

Figure 45: DICOM General tab, third column

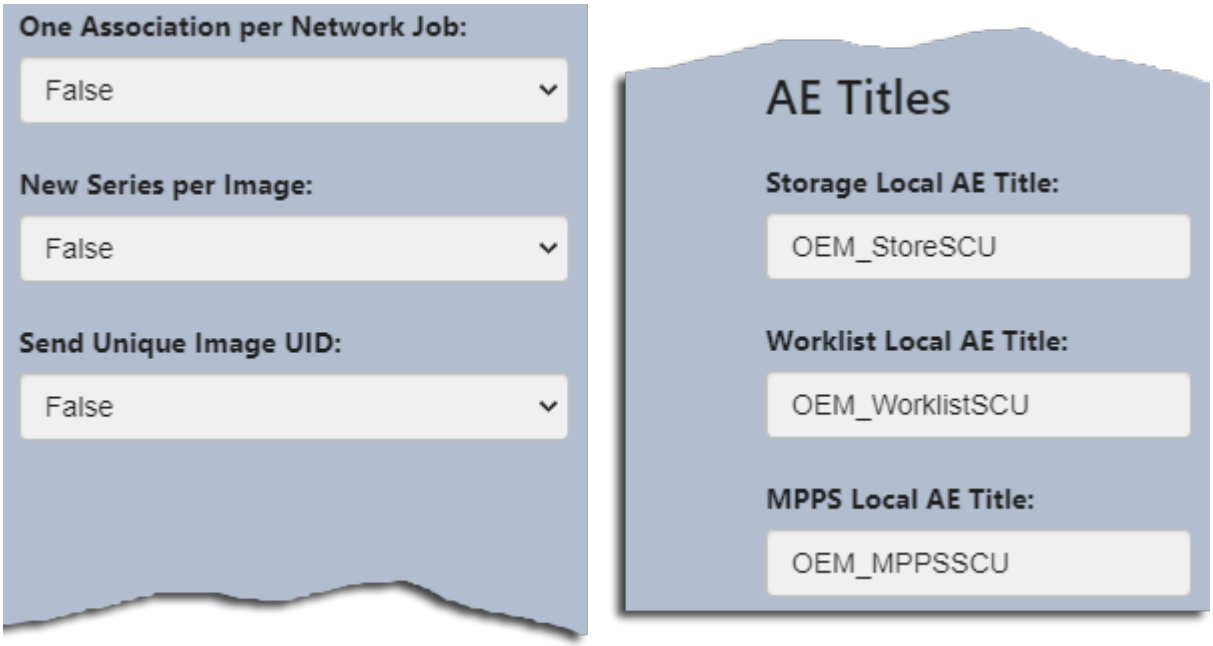


Table 51: DICOM General tab, third column

Parameter	Description
One Association per Network Job	Set the **One Association per Network Job** to **True** or **False**. **False** is the default. When set to **True**, the system creates only one network association to the PACs when sending a patient. When set to **False**, the system creates multiple associations to the PACs when sending a patient.
New Series per Image	Set the **New Series per Image** option to **True** or **False**. **False** is the default. When set to **True**, the system sends each image to the DICOM device with a new series indicator.

Send Unique Image UID	Set the **Send Unique Image UID** option to **True** or **False**. **False** is the default. When this option is set to **True**, the system sends a new image UID each time the image undergoes the DICOM export process. When this option is set to **False**, the system sends the original image UID each time the image undergoes the DICOM export process.
AE Titles	Specify the AE titles.

Adding DICOM storage servers

This section describes how to add DICOM storage servers.

About this task

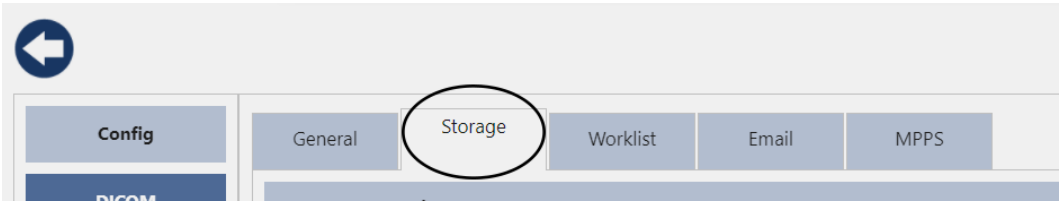
The system tracks DICOM batch sends by server.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **DICOM** > **Storage**.

   The **Storage** tab is displayed. If no storage servers have been configured, the tab is blank, as shown in the following image. Otherwise, the configured storage servers are displayed in the Storage Devices area of the **Storage** tab.

   Figure 46: DICOM Storage tab

3. Select **Add**.

   The fields for configuring a new DICOM storage server for the system are displayed. See *DICOM Storage parameters* on page 110 for information about the fields.
4. Complete the fields.

   Changes are saved automatically.
5. Optional: Select **Ping** or **Echo** to verify the connectivity between the system and the new device.

Ping	Verifies that there is network communication between the PC and the DICOM device.
Echo	Verifies that there is network communication and that the DICOM device can respond to communication from the PC.

6. Optional: If more than one storage server is configured, specify the default device by selecting the device and selecting **Default**.

DICOM Storage parameters

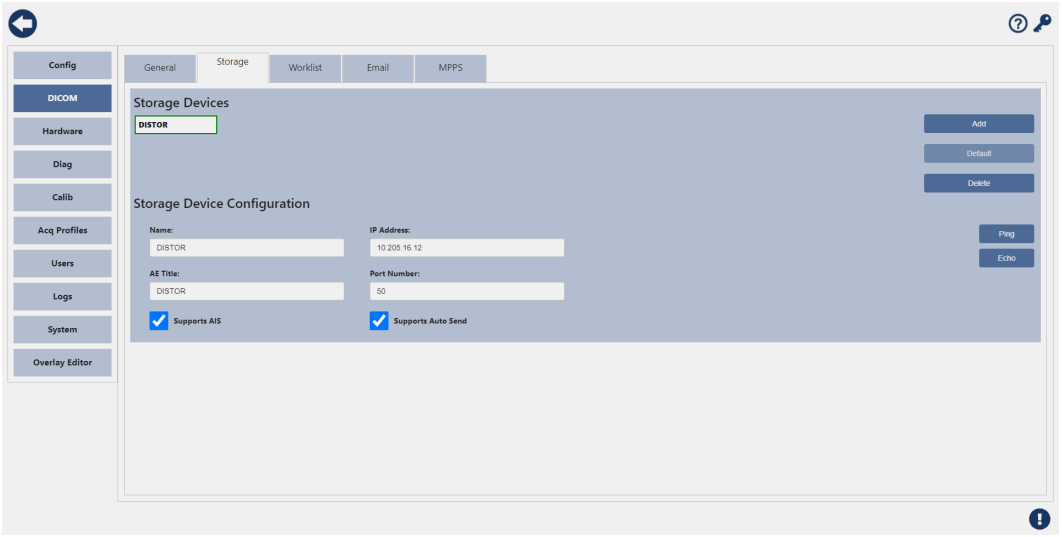


Table 52: DICOM Worklist server settings

Name	Type the name for the device. The field supports a name of up to 64 characters. The characters ^ and \ are not supported.
AE Title	The Application Entity (AE) Title of the DICOM device. This title is required for DICOM functionality. **Important:** The AE title is case-sensitive and must contain no more than 16 characters.
Support AIS	Select the check box if the server is an ANTECH Imaging Services (AIS) server. An AIS server allows authorized access to images and reports at any time from any Internet-enabled computer. The default setting is deselected.
IP Address	Type the IP address of the DICOM server where the images are sent. The IP address must conform to the standard format for IP addresses: *xxx.xxx.xxx.xxx*, where *xxx* is an integer from 0-255. Contact the site IT department or PACS administrator for the IP address of the storage server.
Port Number	Specify the port number for the DICOM server connection. The default is blank. Contact the site IT department or PACS administrator for the IP address of the storage server.

Supports Auto Send	Select this check box if you want to automatically send studies and images to the storage server. The default is deselected.

Adding DICOM worklist servers

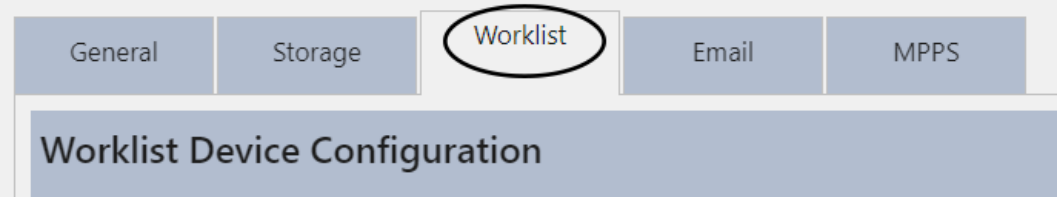
This section describes how to add worklist servers on the system.

Procedure

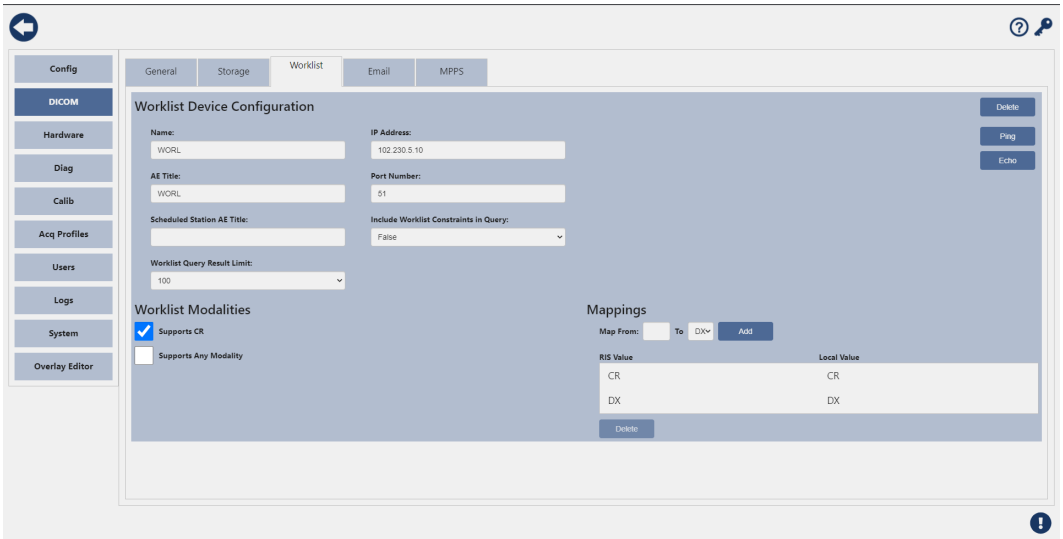
1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Click **DICOM** > **Worklist** tab.

   The **Worklist** tab is displayed. If no other worklist servers have been created, the tab is blank as shown in the following image.

Figure 47: DICOM Worklist tab



3. Select **Add**.
   The fields for configuring a new worklist server are displayed.



4. Configure the fields, as necessary, for the site. See *DICOM Worklist server parameters* on page 112 for more information.

5. Optional: Select **Ping** or **Echo** to verify the connectivity between the system and the new device.

Ping	Verifies that there is network communication between the PC and the DICOM device.
Echo	Verifies that there is network communication and that the DICOM device can respond to communication from the PC.

DICOM Worklist server parameters

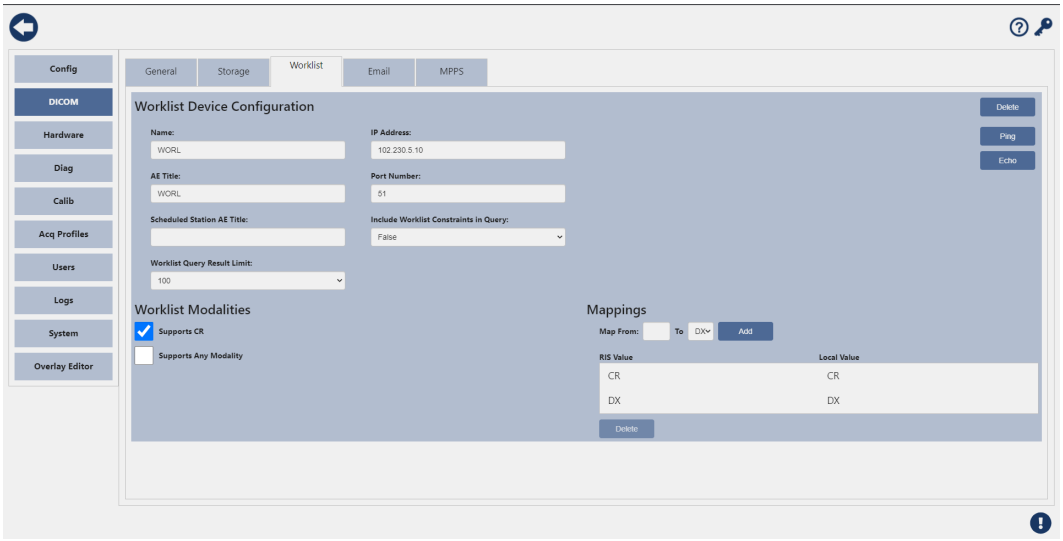


Figure 48: DICOM Worklist server parameters

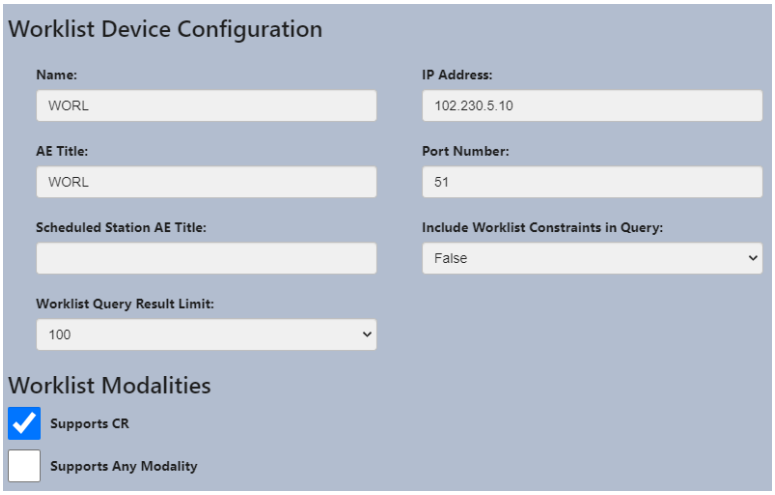
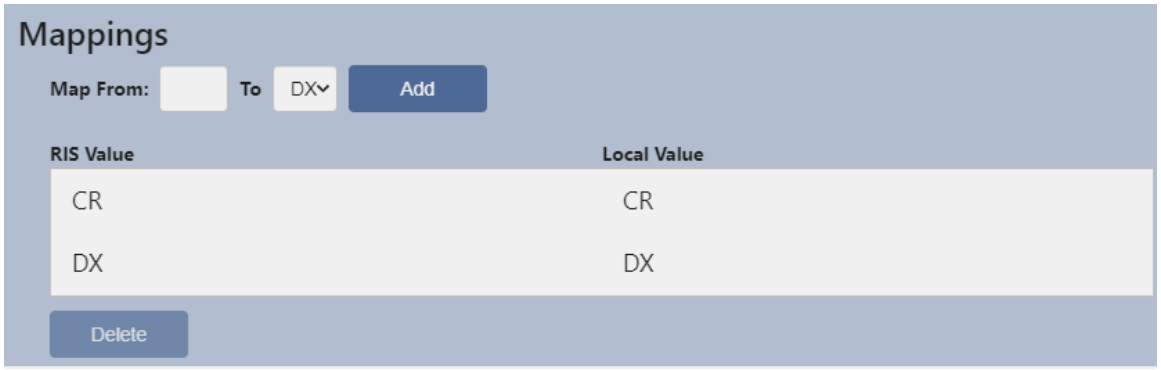


Table 53: DICOM Worklist server parameters

Name	Type the name for the device. The field supports a name of up to 64 characters. The characters ^ and \ are not supported.

AE Title	The Application Entity (AE) Title of the DICOM device. This title is required for DICOM functionality. **Important:** The AE title is case-sensitive and must contain no more than 16 characters.
Scheduled Station AE Title	Enter a value in this field to specify the **Scheduled Station AE Title**. The system uses this value to filter the results of queries to the MWL server.
Worklist Query Result Limit	Set the **Worklist Query Result Limit** to one of these values: 100, 200, 500, 1000, 2500, or 5000. **100** is the default. Increasing the number of results also increases the time required to complete the query.
IP Address	Type the IP address of the DICOM server where the images are sent. The IP address must conform to the standard format for IP addresses: xxx.xxx.xxx.xxx, where xxx is an integer from 0-255. Contact the site IT department or PACS administrator for the IP address of the storage server.
Port Number	Specify the port number for the DICOM server connection. The default is blank. Contact the site IT department or PACS administrator for the IP address of the storage server.
Include Worklist Constraints in Query	Set the **Include Worklist Constraints in Query** to **True** or **False**. The default value is **False**. Set this option to **True** to include the data range selected on the **Worklist** screen as part of the query; the RIS filters the data by date. Set this option to **False** to require the system to filter and display the worklist results based on the date range selected in the **Worklist** screen.
Supports CR	Select this check box if the CR modality is to be supported.
Supports Any Modality	Select this check box to support any modality.

Figure 49: DICOM Worklist mappings



Configure or delete the modality mappings. Use the Mappings table to specify the modality attribute the PACS applies to images it receives from the x-ray system. For example, if DX images are acquired on the x-ray system, but the PACS is not configured to support DX, you can map the DX modality to a compatible PACS-supported modality such as CR. This mapping ensures that the DX images have the CR modality attribute applied to them when received by the PACS, and that they are displayed from the PACS. By default, the PACS modality attributes are set to the same value as the corresponding local x-ray system database modality attributes

Figure 50: DICOM Worklist Delete, Ping, Echo

Delete	Deletes the worklist device.
Ping	Verifies that there is network communication between the PC and the DICOM device.
Echo	Verifies that there is network communication and that the DICOM device can respond to communication from the PC.

Adding email servers

This section describes how to add an email server to the system.

Prerequisites

Before you begin this task, gather the following information:

- Email address
- SMTP server URL
- SMTP server port number
- Credentials for logging in to the SMTP server
- PIN number for accessing the SMTP server (if used)

About this task

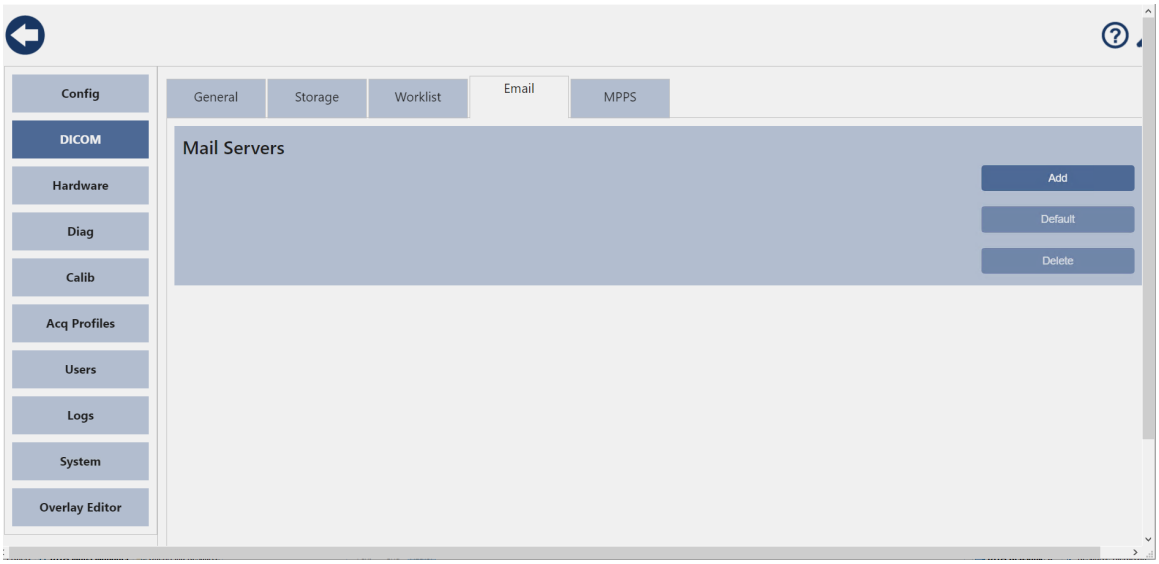
The system can send images to email addresses.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.

2. Select **DICOM** > **Email**.

   The **Email** tab displays. If no email servers have been configured, the tab is blank. Otherwise, the configured email servers are displayed.



3. Select **Add**.

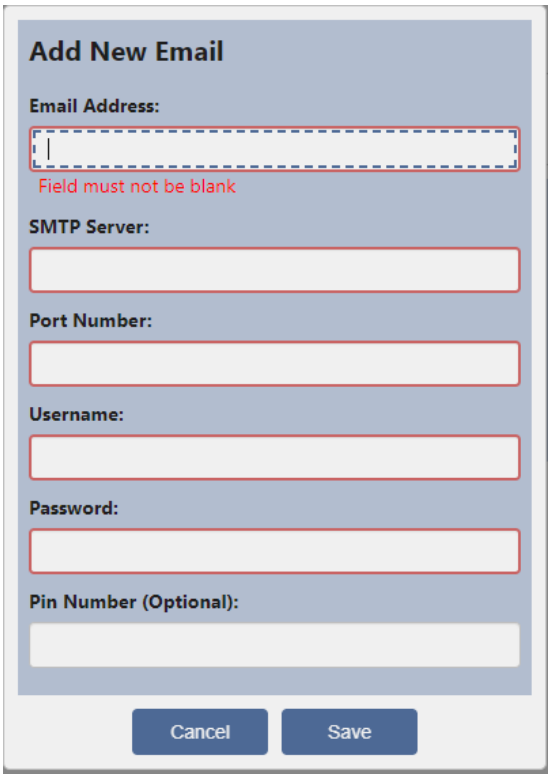
   The **Add New Email** dialog box is displayed.

4. Complete the fields, as necessary. Required fields are marked with a red border.

   See *DICOM email server parameters* on page 116 for information about the fields. All of the required fields must be filled out for an email address and server to be added.

5. Select **Save** to save the changes.

DICOM email server parameters



Control or Field	Description
Email Address	Enter email address used.
SMTP Server	Enter URL of the Simple Mail Transfer Protocol (SMTP) server.
Port Number	Enter the port number for the SMTP server.
User Name	Enter the user name for signing in to the SMTP server.
Password	Enter the password for signing in to the SMTP server.
PIN Number (Optional)	If a PIN number is used for authentication with the SMTP server, enter it here.

Adding MPPS devices

This section describes how to add an MPPS device to the system.

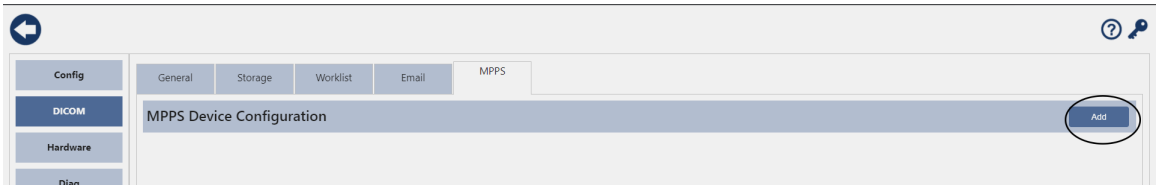
About this task

The system can send images to email addresses.

Procedure

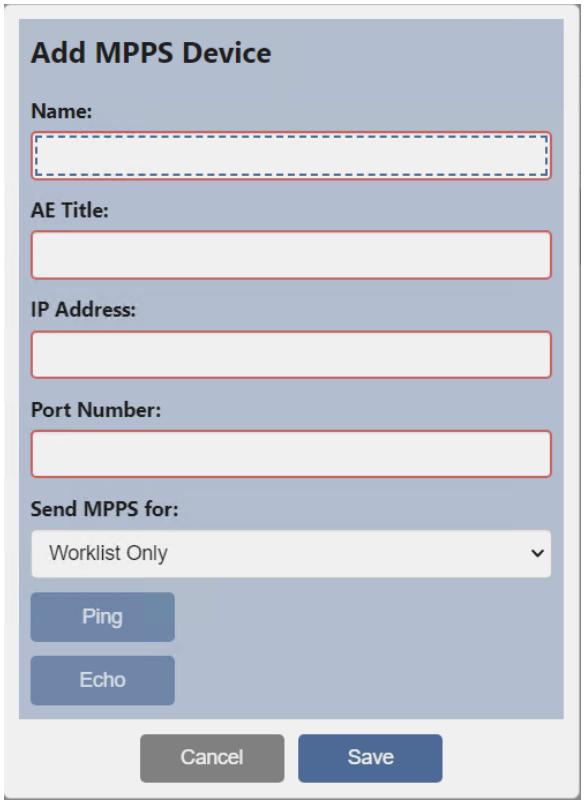
1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **DICOM** > **MPPS**.

   The **MPPS** tab displays. If no MPPS server has been configured, the tab is blank. Otherwise, the configured MPPS server is displayed.



3. Click **Add**.

   The fields for configuring an MPPS server for the system display.



4. Complete the fields, as necessary. Required fields are marked with a red border.

   See *DICOM MPPS server parameters* on page 118 for information about the fields. All of the required fields must be filled out for a MPPS server to be added.

5. Optional: Select **Ping** or **Echo** to verify the connectivity between the system and the new device.

Ping	Verifies that there is network communication between the PC and the DICOM device.
Echo	Verifies that there is network communication and that the DICOM device can respond to communication from the PC.

6. Select **Save** to save the changes.

DICOM MPPS server parameters

Figure 51: DICOM MPPS tab

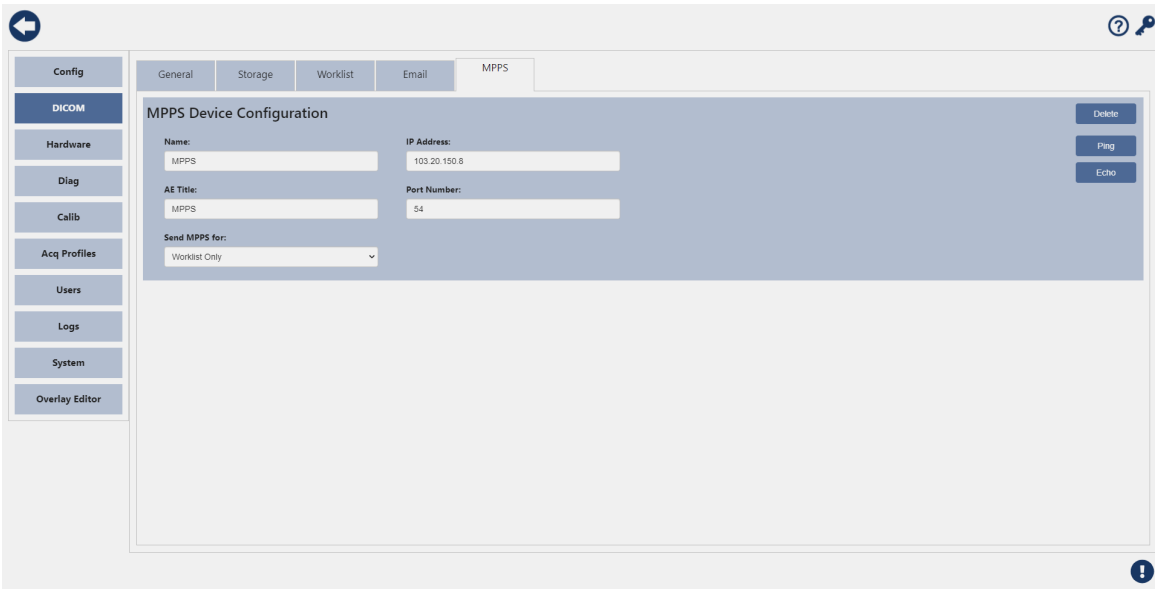
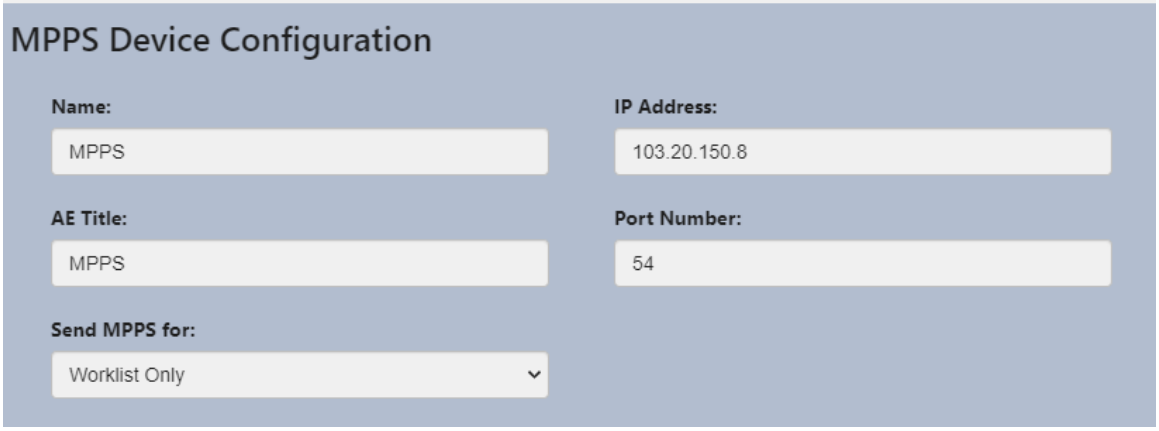


Figure 52: DICOM MPPS server configuration



Control or Field	Description
Name	Enter MPPS device name.
IP Address	Enter the IP address of the MPPS device.
AE Title	Enter the Application Entity (AE) Title of the MPPS device. This title is required for MPPS functionality.
Port Number	Enter the port number for the MPPS device.
Send MPPS for	Select **Everyone** to send MPPS data for all patients. Select **Worklist Only** to send MPPS data only for patients imported from a worklist server.

Configuring acquisition profiles

Acquisition profiles are required to take images with the x-ray system. This section describes how to configure acquisition profiles for the installation site.

About this task

Acquisition profiles consist of three parts: Profile Settings, Protocols, and Breeds.

Procedure

1. Configure profile settings. See the topic, *Configuring acquisition profile settings* on page 120, for instructions.
2. Create protocols. See the topic, *Creating protocols* on page 127, for instructions.
3. Edit protocols. See the topic, *Editing protocols* on page 129, for instructions.
4. Delete protocols. See the topic, *Deleting protocols* on page 130, for instruction.

Configuring acquisition profile settings

Generally, the default settings for acquisition profiles meet the needs of the majority of sites. Complete this task only if the default settings do not meet the needs of the site.

About this task

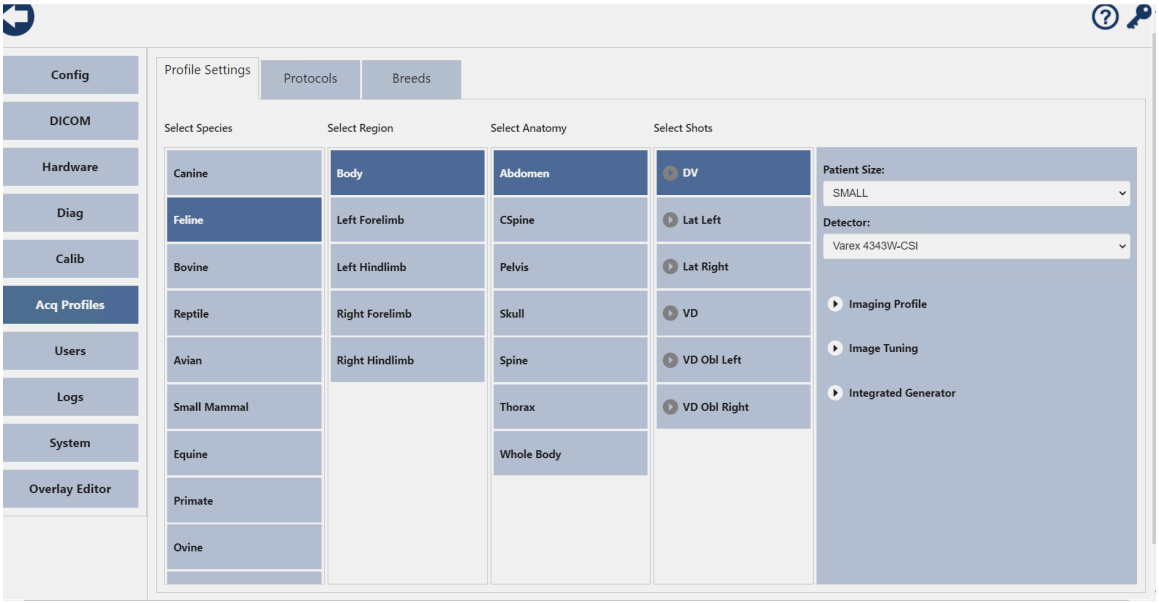
Sound™ and Vet users can modify the image profiles for acquisition profiles.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **Acq Profiles**.

   The **Profile Settings** tab is displayed, by default.

Figure 53: Acq Profiles, Profile Settings tab



3. Select the species, region, anatomy, and shots for which you want to modify the image profile.

   You can add a nickname (slang) to any region, anatomy, or view by right-clicking or tapping and holding one of these tiles. After you add the nickname, it appears in parentheses next to the original name. You can remove the nickname by right-clicking or tapping and holding the tile and then entering the nickname in the text box.

4. If desired, in the right-most column, expand the **Imaging Profile** control, and select the **Autocrop Preview** check box. When enabled, the x-ray system tries to detect the proper cropping region and allows you to make changes, as needed.
   a) Following image capture, a box drawn in dotted lines indicates the proposed cropping region.
   b) To accept, select the **Crop** button in the image control toolbar. If you prefer a different region, select and drag on the image to create a new box.
   c) Release the mouse button or lift your finger. When you capture the next image or end the study, the system sends only the part of image in the displayed crop region to PACS.
5. In the right-most column of the **Acq Profiles** screen, select the patient size for which you are modifying the profile settings, and then make the necessary modifications in the **Imaging Profile** control. Alternatively, you can modify the settings for any body size and select **Copy To All Sizes** to apply those settings to all body sizes.

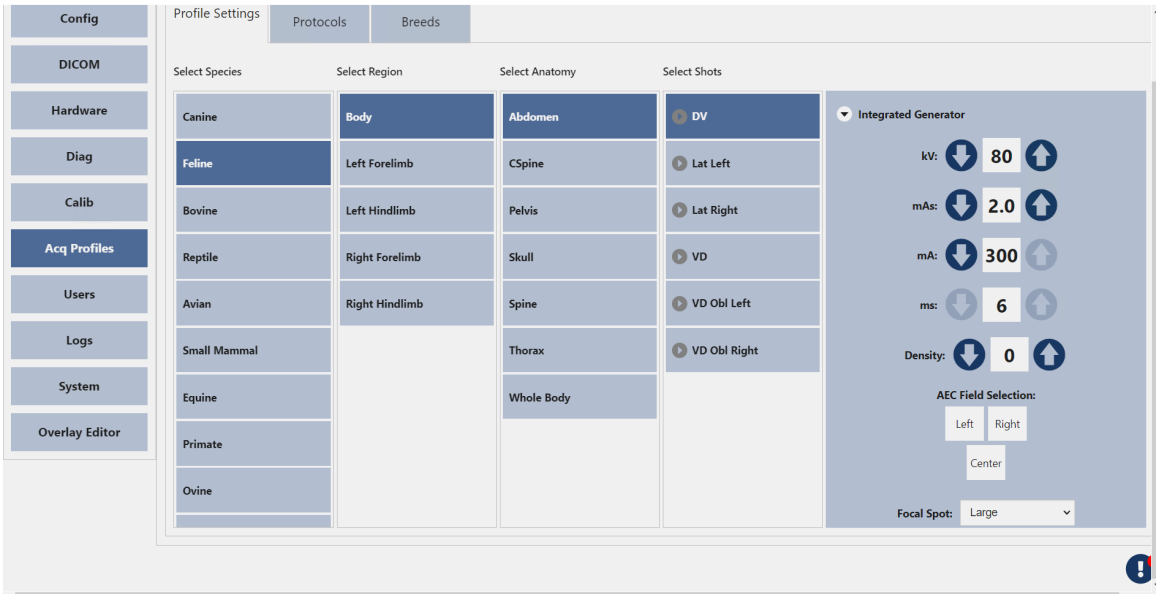
   See *Imaging profile settings* on page 124 for settings descriptions.
6. If desired, tap **Copy To All Sizes** to apply those settings to all body sizes.
7. Complete the following steps to configure image tuning.
   a) In the **Management** screen, select **Acq Profiles** > **Profile Settings**.
   b) Expand the **Image Tuning** control, in the right-most column of the screen.
   c) Complete one of the following tasks:

Options	Instructions
Set the image tuning options for individual patient sizes.	**a.** Select the **Patient Size**. **b.** Specify the image tuning settings for that specific patient size. **c.** Repeat, as necessary. Changes are saved automatically.
Set the image tuning options for all patient sizes at once.	**a.** Select the **Patient Size**. **b.** Specify the image tuning settings you want to apply to all patient sizes. **c.** Click **Copy To All Patient Sizes**. Changes are saved automatically.

8. If your system includes an integrated generator, you can modify the technique settings for a specific shot using the **Integrated Generator** control.
   a) Expand the **Integrated Generator** control, in the right-most column of the screen.
      The **Integrated Generator** control will appear on this screen only if you have configured the generator in the **Hardware** > **Generator** tab.
   b) If desired, use the up and down arrows in the Integrated Generator area to adjust the technique variables: kV, mAs, mA, and ms
   c) If your site uses Automatic Exposure Control (AEC), adjust the **Density** and **AEC Field Selection** parameters, if needed.

Important: Do not adjust **Focal Spot** or **Density** values, or activate the **AEC Field Selection** controls, unless directed by a support technician. Modifying these values can render your calibration invalid, resulting in degraded image quality.

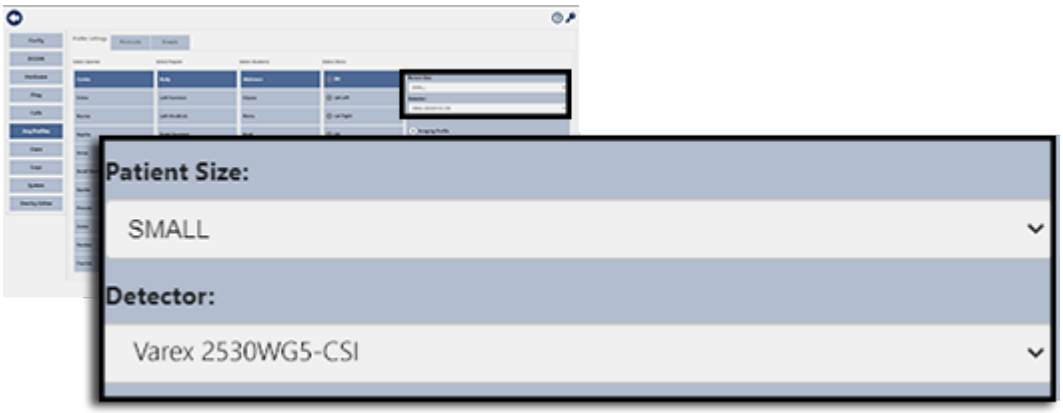
Figure 54: Acquisition Profile, Integrated Generator subtab



Changes are saved automatically.

Patient size and detector selection

Figure 55: Patient size and detector selection



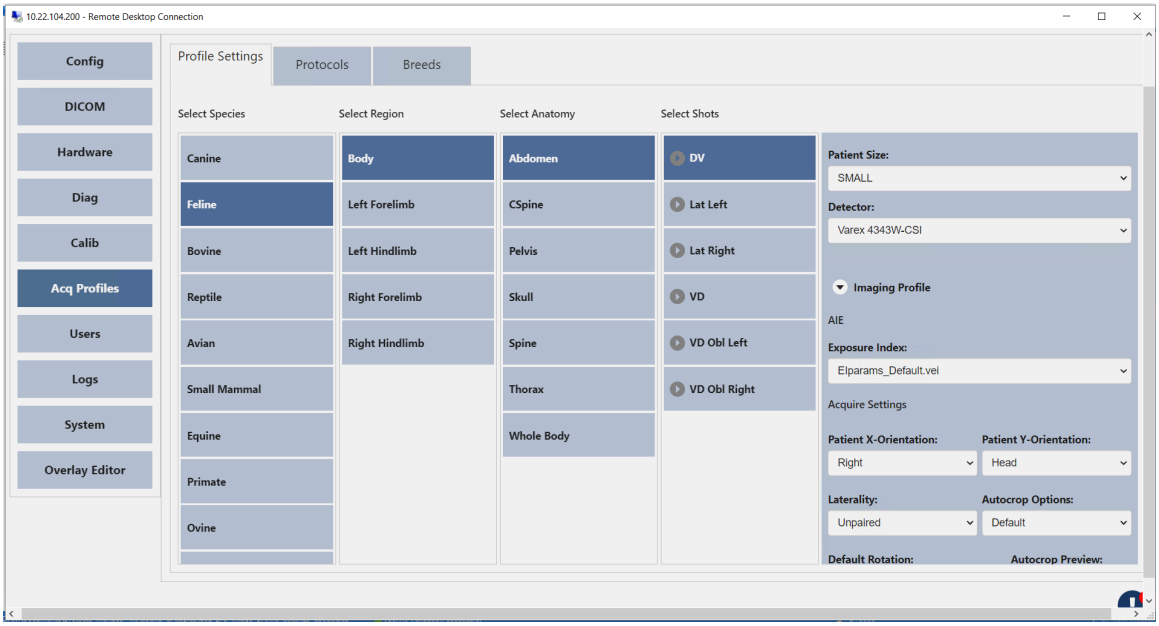
Patient Size settings and **Detector** selection are located in the **Management** screen in the **Acq Profiles** > **Profile Settings** tab.

Table 54: Patient size and detector selection

Control	Description
Patient Size	Use this drop-down list to select the desired patient size.
Detector	Use this drop-down list to select the desired detector.

Imaging profile settings

Figure 56: Imaging Profile settings



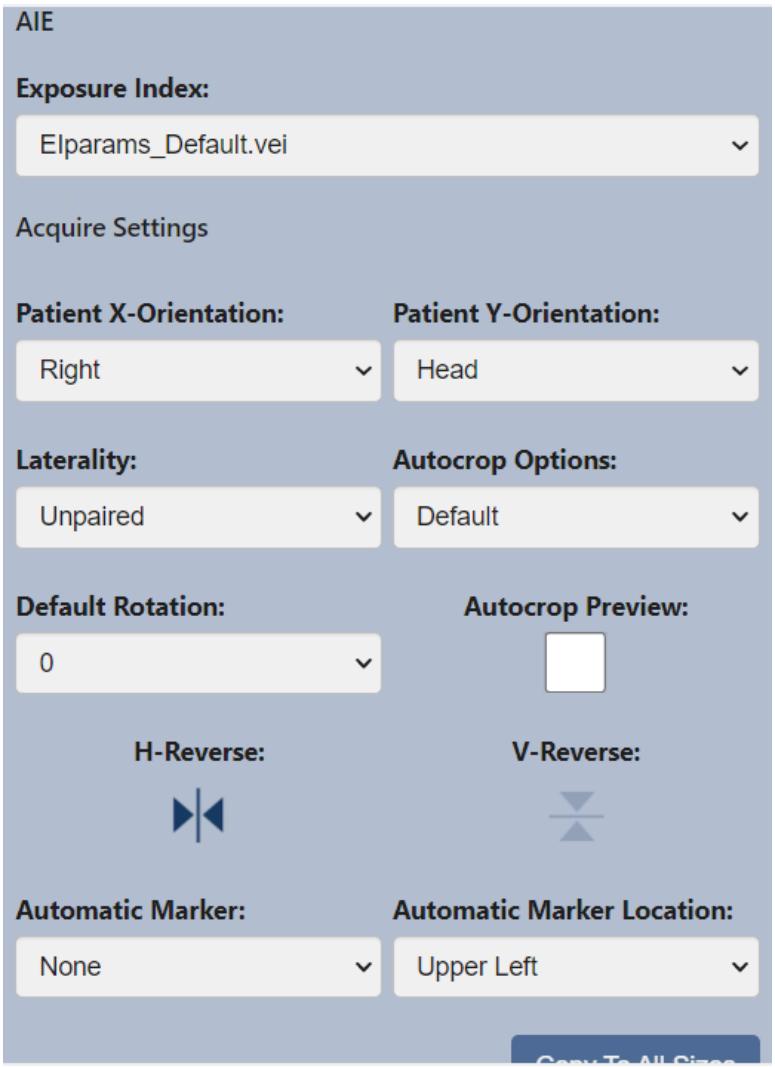


Table 55: Imaging Profile Settings

Setting	Description
Exposure Index	Allows you to select from one of the following files containing exposure index parameters: EIparams_Avian, EIparams_Body, EIparams_Default, or EIparams_HeadNeck.
Patient X-orientation	Allows you to select one of these options: anterior, posterior, left, right, head, or foot.
Patient Y-orientation	Allows you to select one of these options: anterior, posterior, left, right, head, or foot.
Laterality	Allows you to select one of these options: left, right, both, unpaired
Autocrop Options	Allows you to select one of these options: off, default, chest, C-spine, T-spine, or small ROI.
Autocrop Preview	Enable or disable a preview of the acquired image as a full panel with the crop review feature enabled with automatically detected shutters displayed.
Default Rotation	Allows you to set the default rotation to one of these options: 0, +90, +180, and -90.
H-Reverse	Set this to off or on.
V-Reverse	Set this to off or on.
Automatic Marker	Allows you to set an automatic marker from one of these options: none, L, or R. Default is **None**.
Automatic Marker Location	Allows you to set the automatic marker location for one of these options: upper left, upper middle, upper right, middle left, middle right, lower left, lower middle, or lower right. **Upper Left** is the default location.

Image tuning settings

In the **Image Tuning** control, you can view and modify the workbench settings (Sharpness, Brightness, Contrast) for any patient size, for any position in the software.

The control is displayed in the **Management** screen within the **Acq Profiles** > **Profile Settings** tab.

Figure 57: Image tuning settings

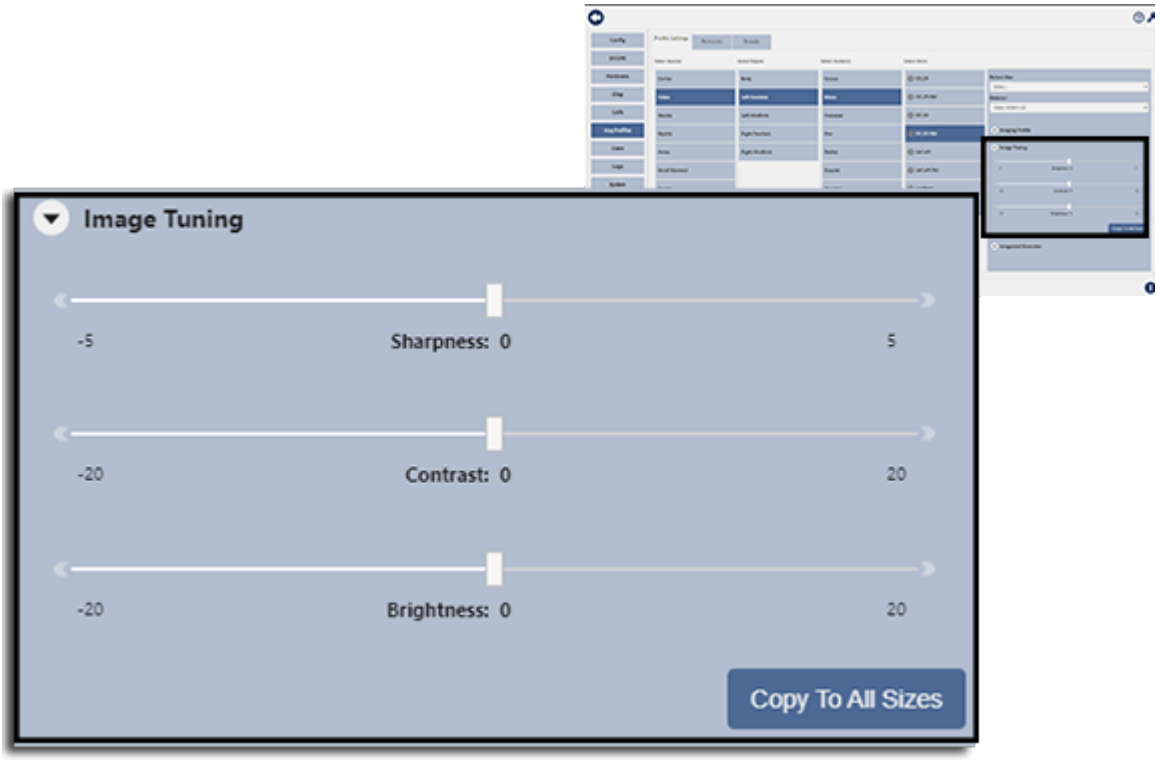


Table 56: Image tuning controls

Control	Details
Sliders	Use the sliders to configure the image tuning settings for sharpness, contrast, and brightness.
Copy To All Sizes button	Available only for species with significant variations in size. Select this button to copy the settings on the tab to all of the patient sizes. See the topic, *Configuring acquisition profile settings* on page 120.

Creating protocols

Sound™ and Vet users can create protocols for acquisition profiles in the **Management** screen. All users can create protocols when they select shots in the clinical interface.

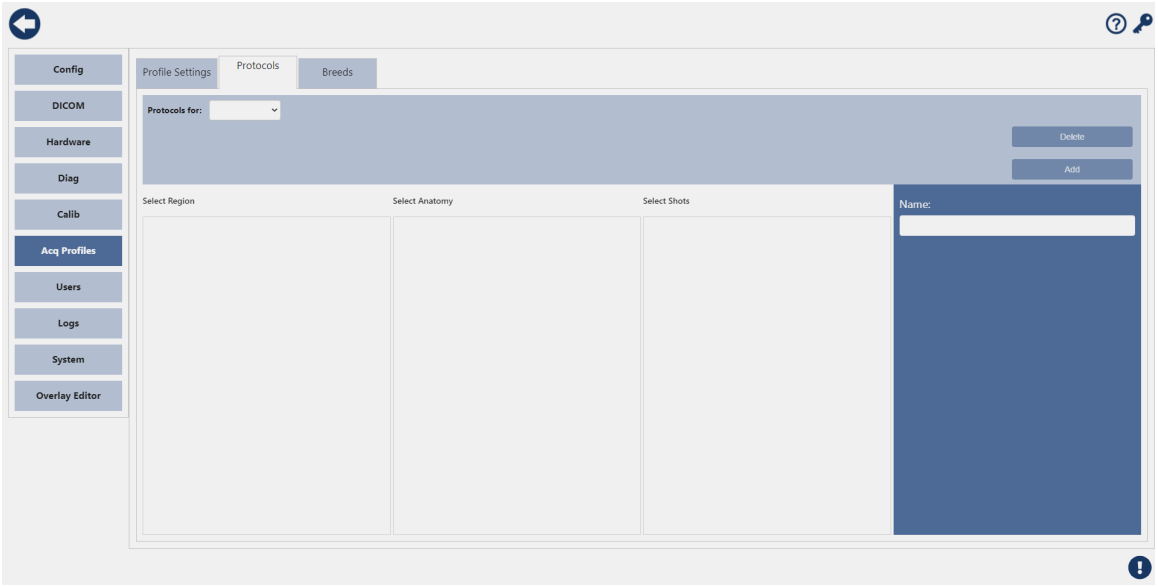
About this task

Creating protocols allows users to select the same shots in the future by selecting a Protocol tile instead of selecting all of the shots again.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select the **Acq Profiles** > **Protocols** tab.

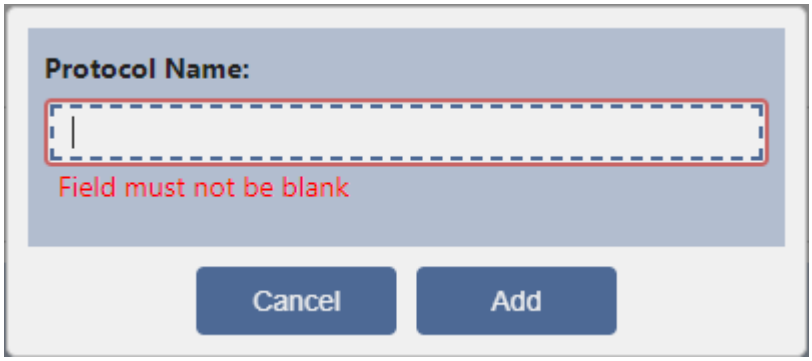
Figure 58: Acq Profiles — Protocols tab



3. Select **Add**.

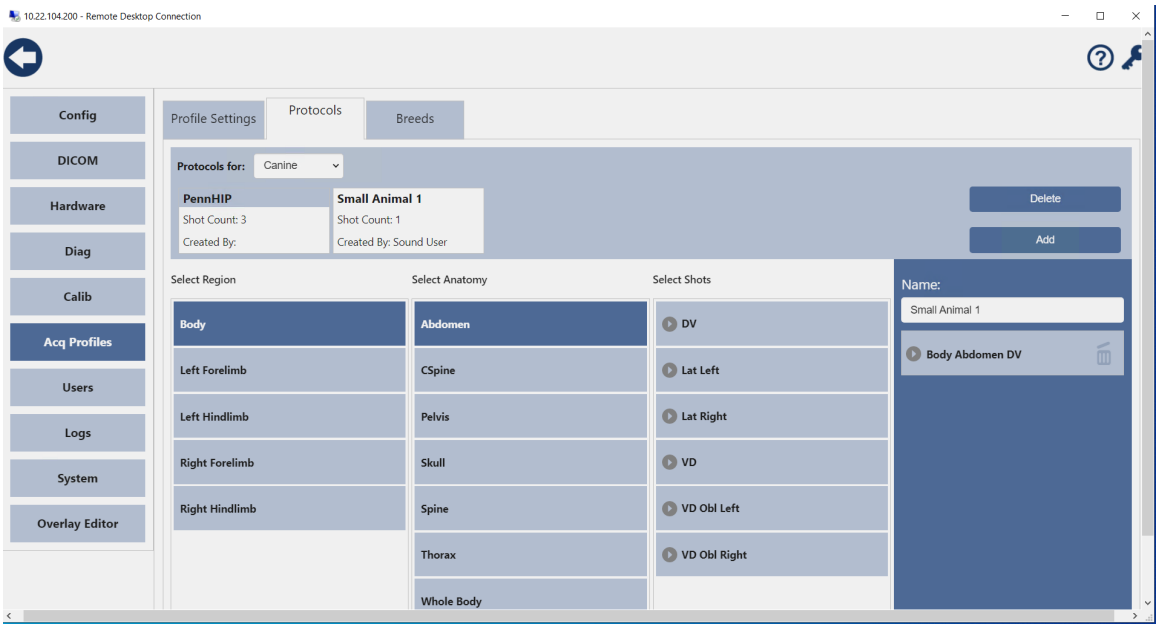
   The **Protocol Name** dialog box is displayed.

Figure 59: Acq Profiles — Protocols dialog box, new protocol



4. Enter a name for the protocol and select **Add**.
   The new protocol is added to the Protocols list.
5. Select the region, anatomy, and shots that you want to include in the protocol.
   The shots you select are added to the shot list in the protocol.

Figure 60: Acq Profiles — Protocols tab, species, region, anatomy, and shots selected



Protocols are saved automatically when they are created.

6. If you need to delete a shot from the shot list, select the shot and click the garbage can icon next to the shot.

Editing protocols

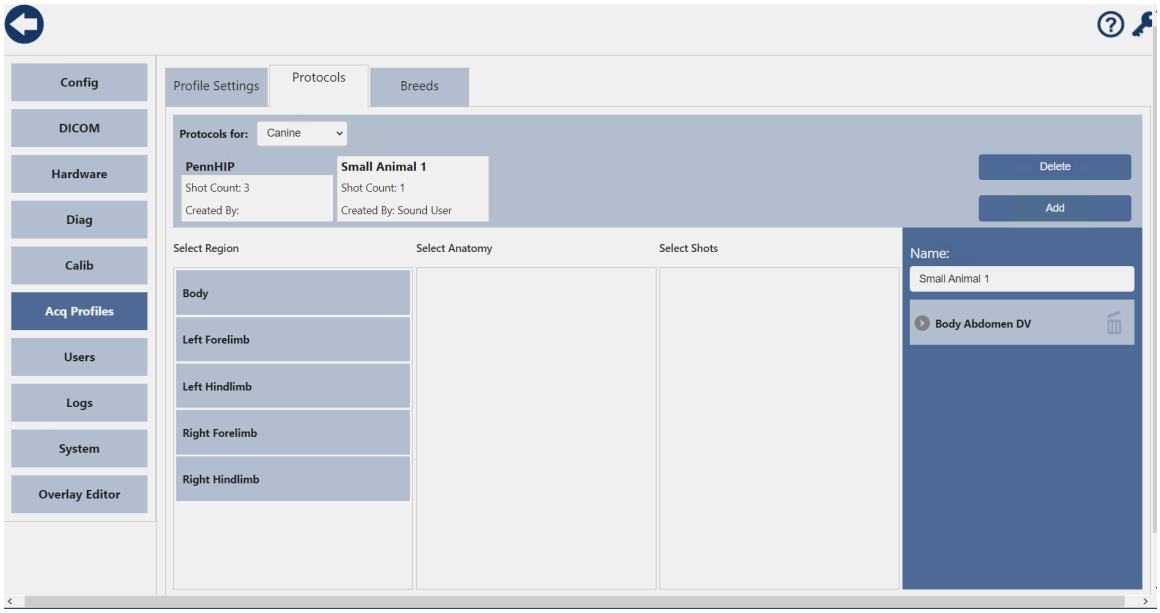
Sound™ and Vet users can edit existing protocols.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select the **Acq Profiles** > **Protocols** tab.
3. Click or tap the protocol that you want to edit.

   The protocol details are displayed. The name of the protocol can be edited, new shots can be added, and existing shots can be removed. The species cannot be changed.

Figure 61: Acq Profiles — Protocols tab, edit protocol



Changes are saved automatically.

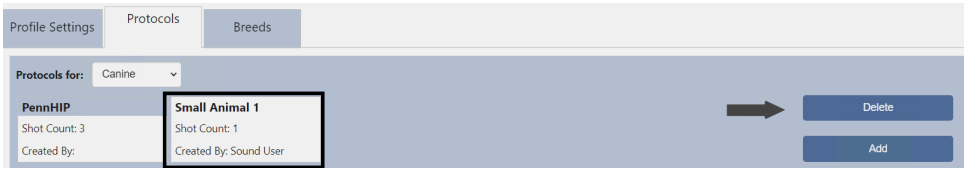
Deleting protocols

Sound™ and Vet users can delete image protocols.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select the **Acq Profiles** > **Protocols** tab.
3. In the Protocols list, click or tap the protocol that you want to delete.

Figure 62: Acq Profiles — Protocols tab, delete protocol



4. Select **Delete**.
5. In the **Are You Sure?** dialog box, select **Delete**.

   The protocol is deleted from the system. Changes are saved automatically.

Configuring the default breed

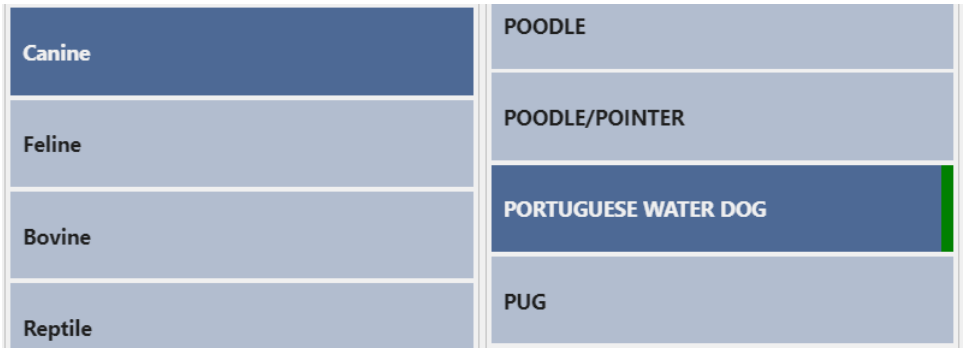
If desired, you can specify a default breed for a species in the **Acq Profiles** configuration options.

Procedure

1. In the **Management** screen, select **Acq Profiles** > **Breeds**.
2. Select the species and breed of the animal.

3. Click the **Default** check box.

The breed you selected has a green marker next to it in the Select Breed list.



4. To remove the default designation, select the default breed and deselect the **Default** check box.

   Changes are saved automatically.

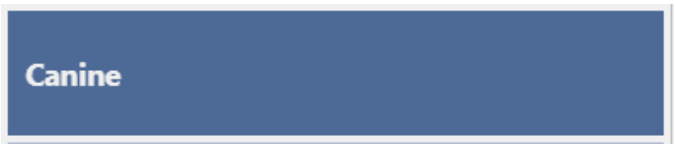
The rest of this page intentionally left blank.

Adding new breeds

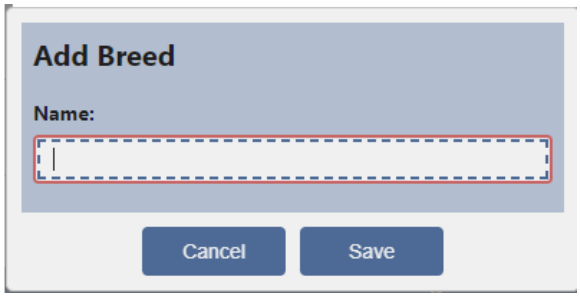
New breeds can be added to the acquisition profiles, as needed.

Procedure

1. In the **Management** screen, select the **Acq Profiles** > **Breeds** tab.
2. Select the species for the breed you want to add.



3. Select **Add**.
   The **Add Breed** dialog box is displayed.
4. In the **Name** field, type a name for the breed.



5. Select **Save**.

Results

The breed is saved to the Select Breed list.

Managing users

Sound Users can create, delete, or edit a user in the **Management** screen. All users can edit their preferences in this screen.

Prerequisites

Before you complete any of the tasks in this section, review the topic, *Access levels and privileges*.

Procedure

See one of the following topics to complete the desired task:

- *Adding users* on page 134.
- *Editing users* on page 137.
- *Resetting passwords* on page 138.
- *Deleting users* on page 139.

Users, privileges, and credentials

The tasks that you can complete with the x-ray system are controlled by the type of user that logs in to the PC.

Sound User account privileges

The PC logs into this account automatically at power-up or after restarting. The Sound User account has the following privileges:

- Is the default user.
- Has full access to the **Management** and **Clinical** (Patient) screens.
- Cannot be added or deleted.
- Has the default password: `$oundSRVC`.

Vet user account

The Vet user type:

- Can have a designated default Tech user for each user of this type created.
- Has limited access to the **Management** screen. See the following table for specific features and fields this user type can access.
- Can be added and deleted. After the user is saved, only the First Name, Last Name, Email Address, and preferences can be changed. Users must be deleted and re-created to change the password and username for an existing user.
- Can have a unique password of any length for each user.

The Vet user type has access to the following features and fields:

Table 57: Features and fields accessible to the Vet user type

Feature	Accessible fields
Config > **Basic Options**	All
Config > **Intermediate Options**	All
Diag > **Data Collector**	All
Diag > **Status**	All
Acq Profiles	All tabs, all functionality
Users	All tabs. Does not have the capability to add or delete users.
System	All tabs
Overlay Editor	All

Tech user account

The Tech user type:

- Can have a designated default Vet user for each user of this type created.
- Has limited access to the **Management** screen. See the following table for specific features and fields this user type can access.
- Can be added and deleted. After the user is saved, only the First Name, Last Name, Email Address, and preferences can be changed. Users must be deleted and re-created to change the password and username for an existing user.
- Can have a unique password of any length for each user.

The Tech user type has access to the following features and fields:

Table 58: Features and fields accessible to the Tech user type

Feature	Accessible fields
Config > **Basic Options**	All
Diag > **Data Collector**	All
Diag > **Status**	All
Users	All tabs. Does not have the capability to add or delete users.

Adding users

Users are created in the **Management** screen within the **Users** tab. The access someone has to the **Management** screen features depends on the type of user created for them.

Prerequisites

Review *Users, privileges, and credentials* on page 133 to gain a better understanding of the access levels assigned to each user type.

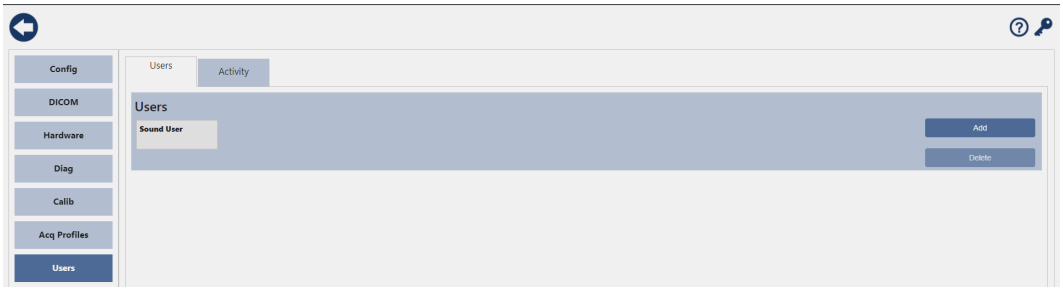
Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.

2. Select **Users**.

   The **Users** screen is displayed, showing the users that already exist in the system. The following figure shows only the Sound User because no other users have been created yet.

   Figure 63: Users screen



3. In the **Users** screen, select **Add** in the upper-right corner of the tab.

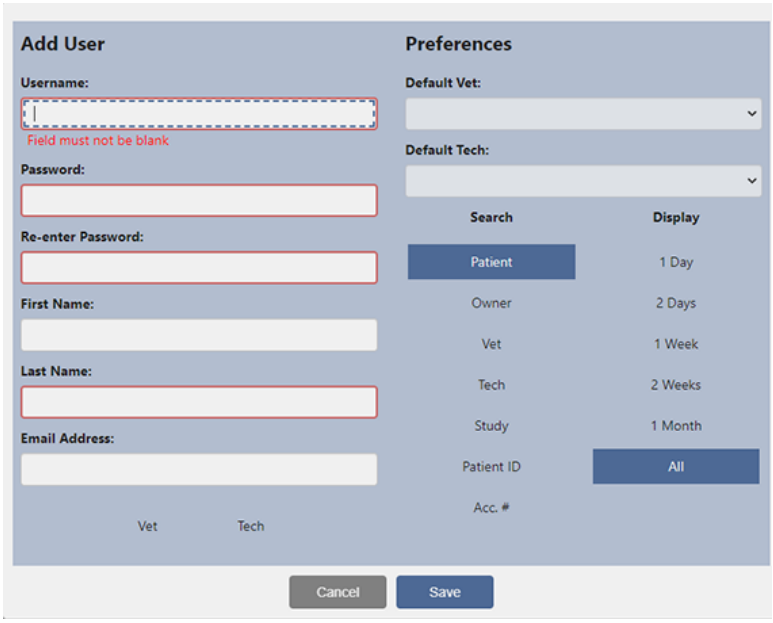
   The **Add User** dialog box is displayed. The fields outlined in red are required. See *Add User dialog box parameters* on page 135.

4. Select **Save**.

   The new user is added to the system and displayed in the Users area at the top of the **Users** window.

Add User dialog box parameters

Figure 64: Users screen — Add User dialog box



Add User	
Username	Login name of the user who will be using the system. This is a required field. Example: Vet1, Tech1, Vet2. The type of user you add enables the extent of privileges that user has in the system. See the topic, *Users, privileges, and credentials*.
Password	The password associated with the user you are adding. This is a required field. There are no password-specific requirements.
Re-enter Password	Confirmation for the password you entered in the **Password** field. This is a required field.
First Name	First name of the user. This is an optional field.
Last Name	Last name of the user. This is a required field.
Email Address	Email address of the user. This is an optional field.
Vet, **Tech** Options	User-type selection buttons at the bottom of the dialog box. You can select either **Vet** or **Tech**. When **Vet** is selected, the **Default Tech** list under Preferences is active. The **Vet** list is disabled if the selected user type is **Vet**. When **Tech** is selected, the **Default Vet** list under Preferences is active. The **Tech** list is disabled if the selected user type is **Tech**.
Preferences	
Default Vet	Drop-down list that allows you to select a vet for the selected user. This list is active only when the **Tech** option is selected at the bottom of the **Add User** dialog box.
Default Tech	Drop-down list that allows you to select a vet tech for the selected user. This list is active only when the **Vet** option is selected at the bottom of the **Add User** dialog box.
Search	Search criteria available for the user.

Display	Display options for the user.

Editing users

After a user has been created, you can edit any of the user information and preferences except the username and password.

About this task

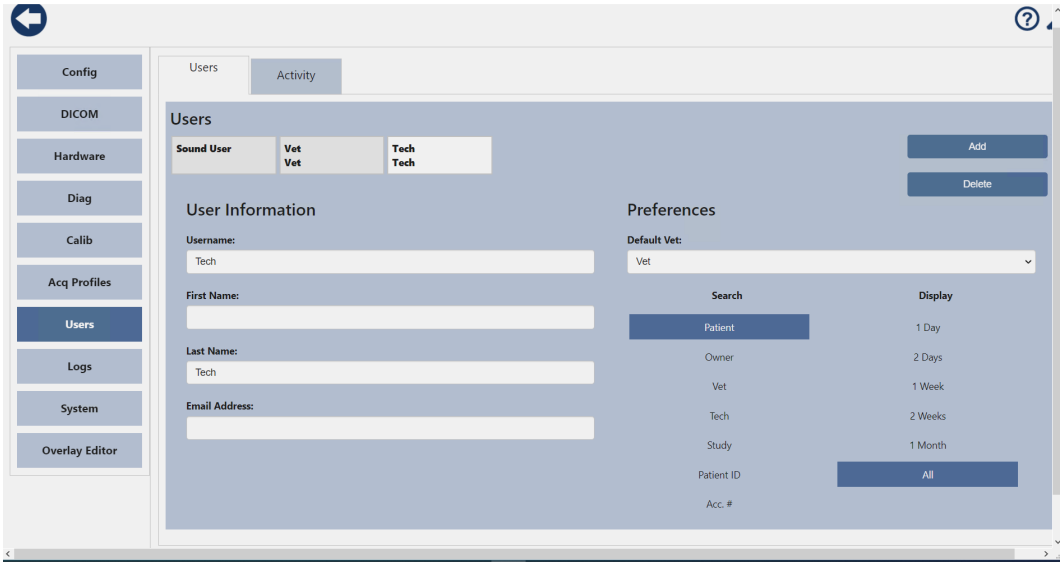
Usernames must be deleted and re-created to be changed.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **Users**.

   The **Users** screen is displayed.

Figure 65: Users screen



3. Select the user to edit.
4. Edit the fields, as necessary.

   Attention: Usernames and passwords must be edited through the Windows operating system. See *Resetting passwords* on page 138 for instructions.

   Changes are saved automatically.

Resetting passwords

User passwords can be reset and changed through the Windows operating system.

Procedure

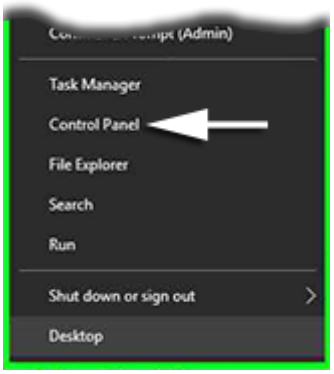
1. If you are in the Windows desktop, go to the next step. If the Sound SMART DR™ software is running, log out of the software.

   The Windows desktop is displayed.

2. Right-click or touch and hold, then let go on the Windows **Start** button and select **Control Panel**.

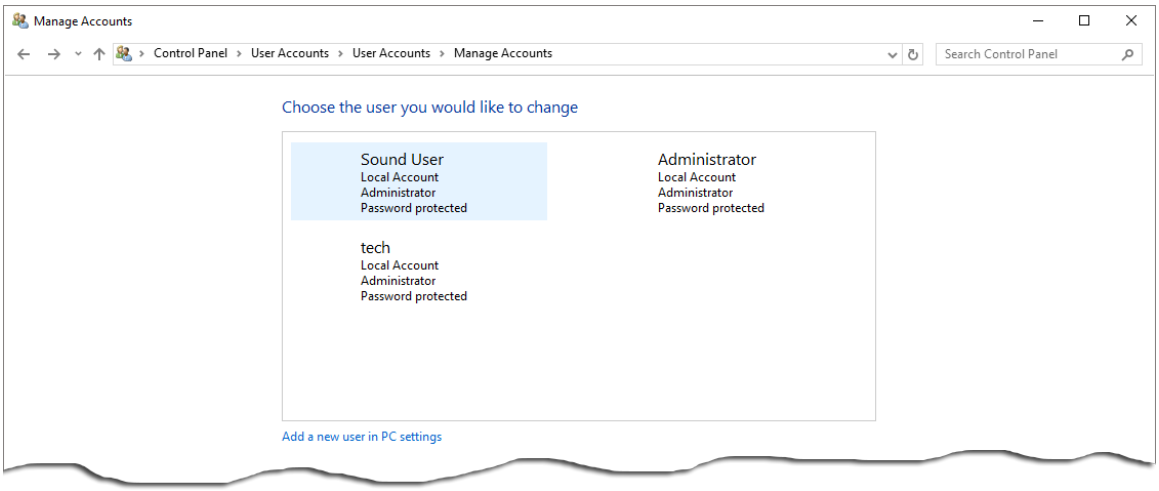
Figure 66: Windows Start button

Figure 67: Windows Start menu — Control Panel

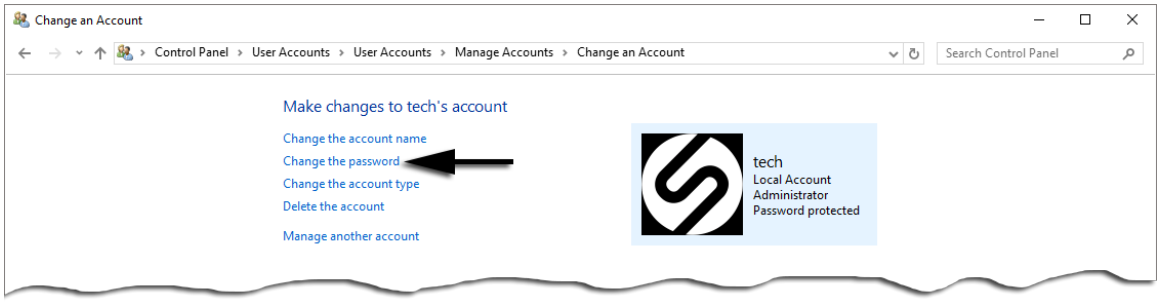


3. Under User Accounts, select **Change account type**.

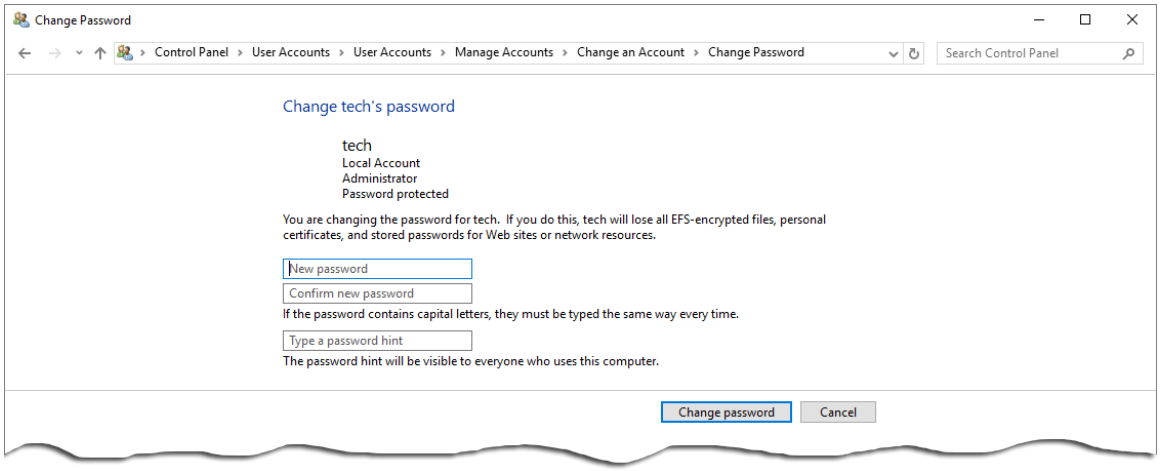
   The **Manage Accounts** window is displayed.



4. Select the user account you want to change.
   The **Change an Account** window is displayed.



5. Select **Change the password**.
   The **Change Password** window is displayed.



6. In the **New Password** field, type the new password for the user.
7. In the **Confirm new password** field, type the new password again.
8. Select **Change Password**.
   The password is changed and the **Change an Account** window is displayed.
9. Close the window.
   The user can now log in with the new password.

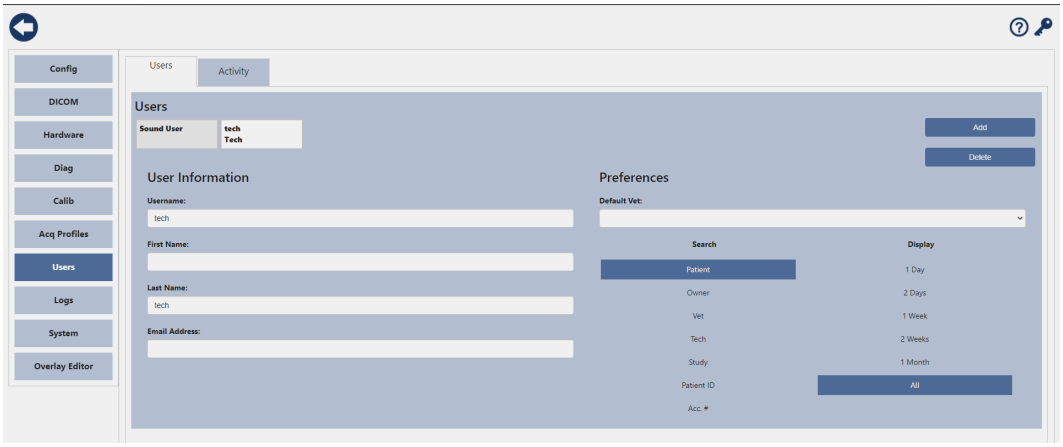
Deleting users

Users can be deleted in the **Management** screen within the **Users** tab.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **Users**.

3. In the **Users** screen, select the user that you want to delete.



4. Select **Delete**.

   A dialog with the message `Delete Selected User?` is displayed.

5. Select the **Delete** button to delete the user.

Viewing user activity

You can view the active users in the **Users** screen within the **Activity** tab.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select the **Users** > **Activity** tab.

   The users that are currently logged in to the system are displayed.

   You can see the username, name, user type, acquirer and calibrator status, and when each user was last active.

Logging users out of the system

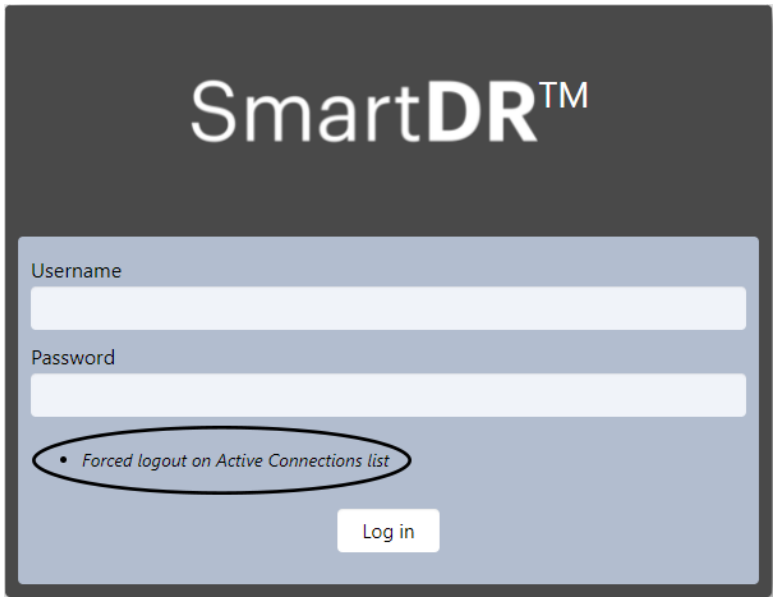
Users with appropriate access can log other users out of the system.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **Users**.
3. Select the **Users** > **Activity** tab.

   The users that are currently logged into the system are displayed.
4. Select **Log out**.

   The user is logged out of the system. The Sound SMART DR™ login screen is displayed on the user's system, and the message `Forced logout on Active Connections list` is displayed.



   The user can log back in, if desired.

Configuring logging

Application and DICOM logging can be configured to use **Normal** or **Verbose** modes.

Prerequisites

Before you begin this task, review the topic *Log files* on page 171 to familiarize yourself with the types of log files and what they capture.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.

2. Select **Logs**.
3. Select the configuration option for each of the logs you want to configure.

   Important: Set Sound (Application) or DICOM logging to **Verbose** mode only when instructed to do so by a technical support representative.
4. If desired, select the **Real Time Updates** check box.

Configuring the integrated x-ray generator

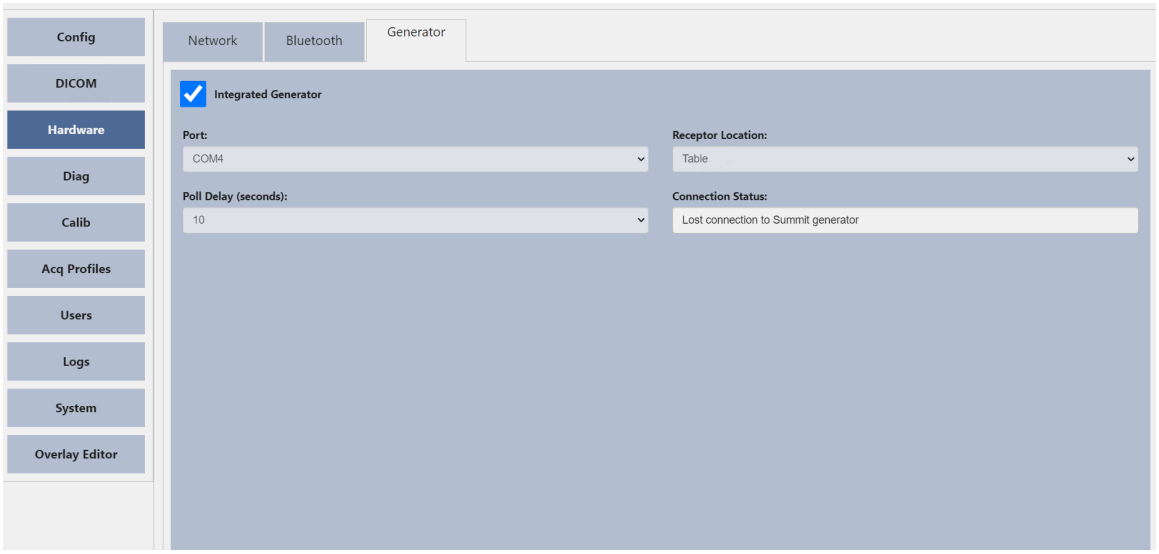
Follow this procedure to configure the system for use with an integrated x-ray generator, specifically the Summit HF generator. If your system does not use an integrated generator, configure the x-ray generator in the generator console. Refer to the documentation that accompanies the x-ray generator for instructions.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.

   Important: The x-ray generator exposure window must always be set to less than the panel integration window (1 second).
2. Select the **Hardware** > **Generator** tab.
3. Select the **Integrated Generator** check box.

   The **Connection Status** field displays whether or not the generator is connected.



4. Select a port, if needed and available.

   The **Port** field reflects the port that the system will use to communicate with the generator. You can select another port, if needed and available.

5. Do **not** change the default value in the **Poll Delay** drop-down list unless directed by a support technician.

   The **Poll Delay** field dictates how often the system communicates with the generator to monitor and change generator settings.

6. From the **Receptor Location** drop-down list, select the receptor location that reflects your system configuration:

   - **Table** if your panel is beneath the exam table.
   - **Wall Stand** if your panel is installed on a wall.
   - **Tabletop** if your panel sits on top of the exam table.

   Changes are saved automatically.

Customizing overlays

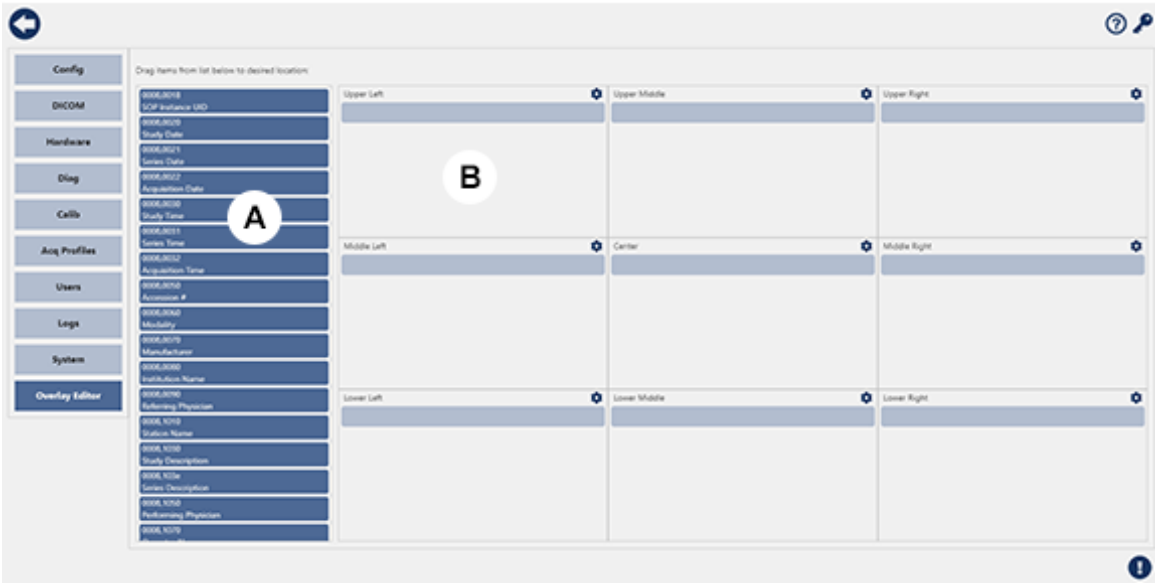
Using the **Overlay Editor**, Vet and Sound Users can customize an image overlay to display the DICOM tags that they want to display.

About this task

The **Overlay Editor** consists of two main parts: DICOM tag list and the layout grid.

The grid is made up of nine (9) boxes, each of which represent an area of the image display screen.

Figure 68: Overlay Editor



A	Overlay data elements.
B	Overlay grid.

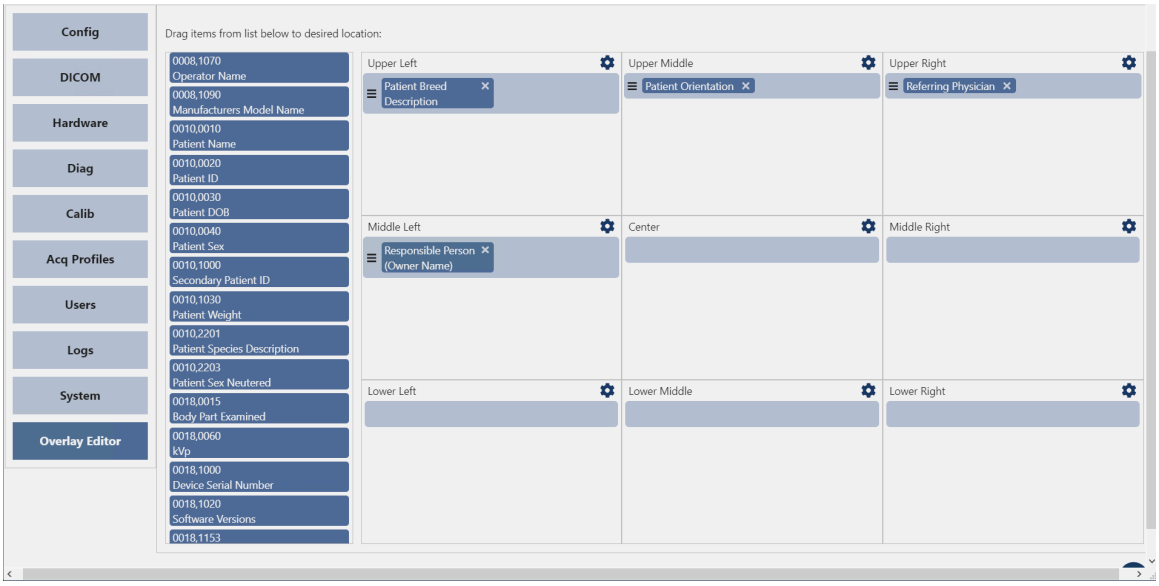
Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **Overlay Editor**.

   The overlay data elements and grid are displayed.
3. Select and drag the overlay data to the desired gray area of the grid.

Note: To scroll down the DICOM tag list, you may need to click on the blue panel and use the down arrow key on your keyboard.

You can drag as much or as little data onto the grid as you choose. For example, the following image shows the Patient Breed Description, Patient Orientation, Referring Physician, and the Responsible Person data points that have been added to the grid.

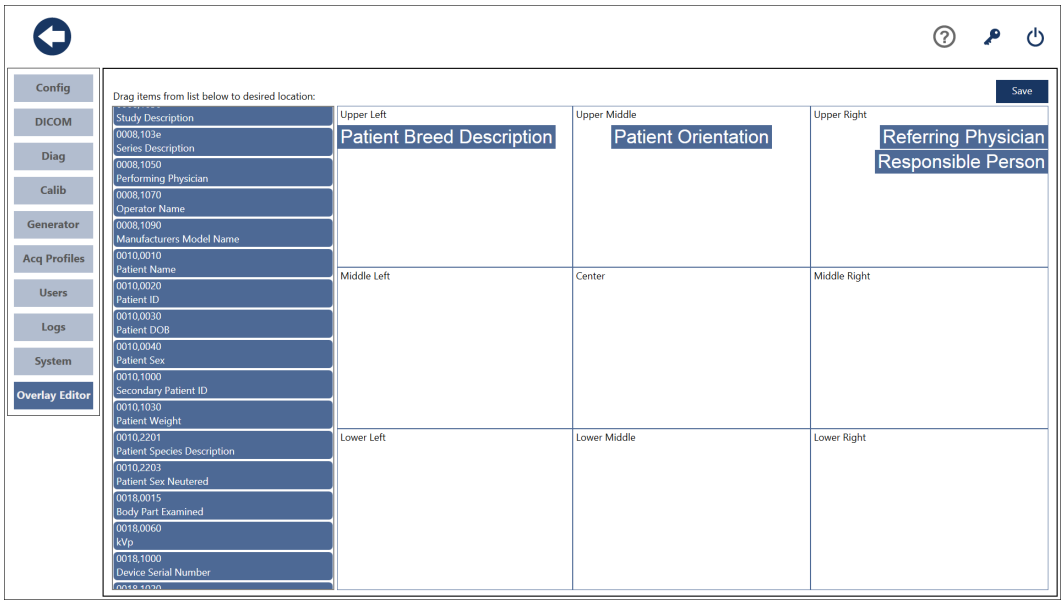


When you import a patient from a worklist, in the **Patient** screen, the **Study Description** field will be populated as described below:

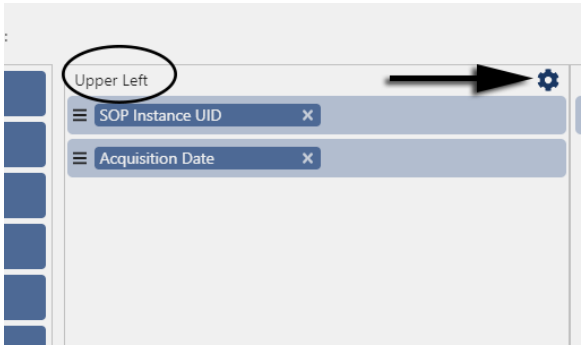
Worklist data provided	Study description contains
Requested Procedure Description tag (0032. 1060) is provided.	Requested Procedure Description data.
Study Description tag (0008,1030) is provided; Requested Procedure Description tag (0032. 1060) is not provided.	Study Description data.
Requested Procedure Tag (0032, 1060) and Study Description Tag (0008, 1030) are not provided.	Protocol Name, if a preconfigured protocol is selected, or Exam of first shot, if individual shots are selected.

For more information, see the *User Manual*.

Figure 69: Overlay with data



4. To customize the attributes of the overlay data items, select the gear icon on the screen area for the overlay.



The attributes window is displayed.

5. Edit the attributes, as desired.
6. In the attributes window, select **Save**.
The change is reflected in the Clinical (Patient) module. Depending on the attributes you select, either the font size of the overlays in the Acquire/Review screen changes and/or a black background is added to the overlays in the Acquire/Review screen.

Deleting overlay data elements

Overlay data elements can be deleted from overlays by Vet and Sound Users.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **Overlay Editor**.
3. Select the **X** next to the data element that you want to remove from the overlay grid.

   The data element is removed from the overlay.

   Changes are saved automatically.

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Chapter

6

Maintaining the SMART DR X-ray System

Contents

- *Starting the SmartDR System Configuration Tool* on page 148
- *Backing Up SMART DR data and settings* on page 158
- *Restoring the SMART DR data and settings* on page 159
- *Updating the SMART DR software with auto update* on page 161
- *Windows operating system updates* on page 162
- *Performing panel gain calibration* on page 162
- *Setting calibration parameters* on page 164
- *Viewing gain calibration history* on page 165
- *Cleaning the x-ray system* on page 165

This chapter describes how to maintain the system after it is installed and configured.

It includes information about backing up and restoring the system, updating the system, calibrating the panel, and cleaning the components of the system.

Starting the SmartDR System Configuration Tool

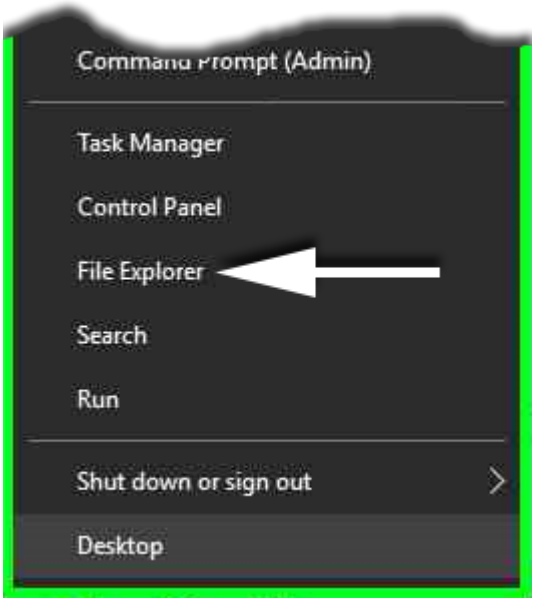
Sound SMART DR™ includes a program called the **SmartDR System Configuration Tool** that can be used for system maintenance tasks, such as exporting and importing configurations and restoring the master database.

About this task

Complete this task to start the **SmartDR System Configuration Tool**.

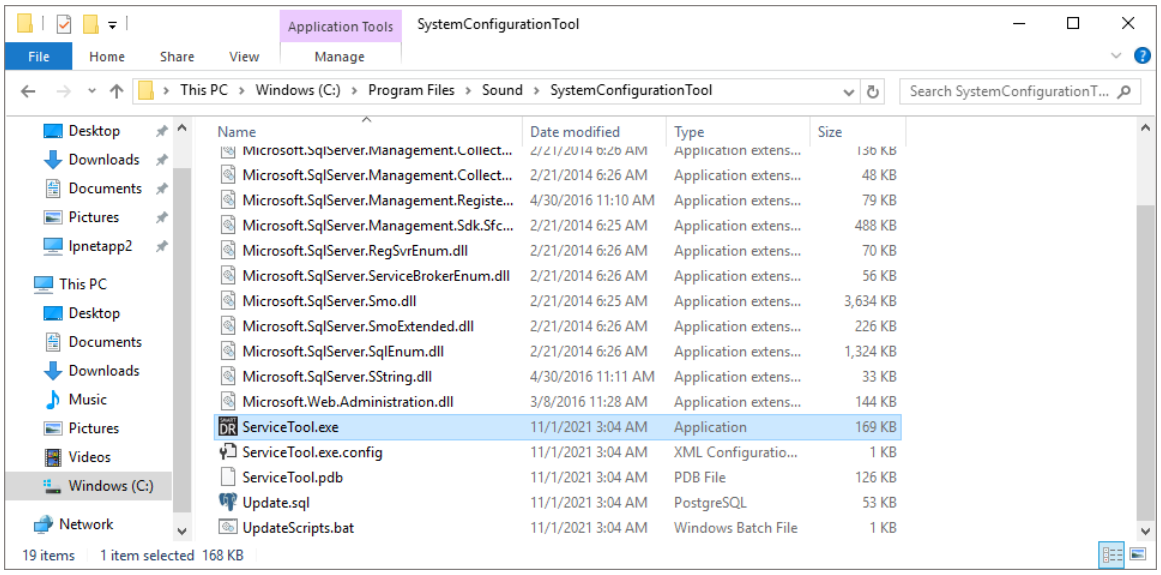
Procedure

1. Exit the Sound SMART DR™ application.
   The Windows desktop is displayed.
2. Right-click or touch and hold, then release the Windows **Start** icon, and select **File Explorer**.

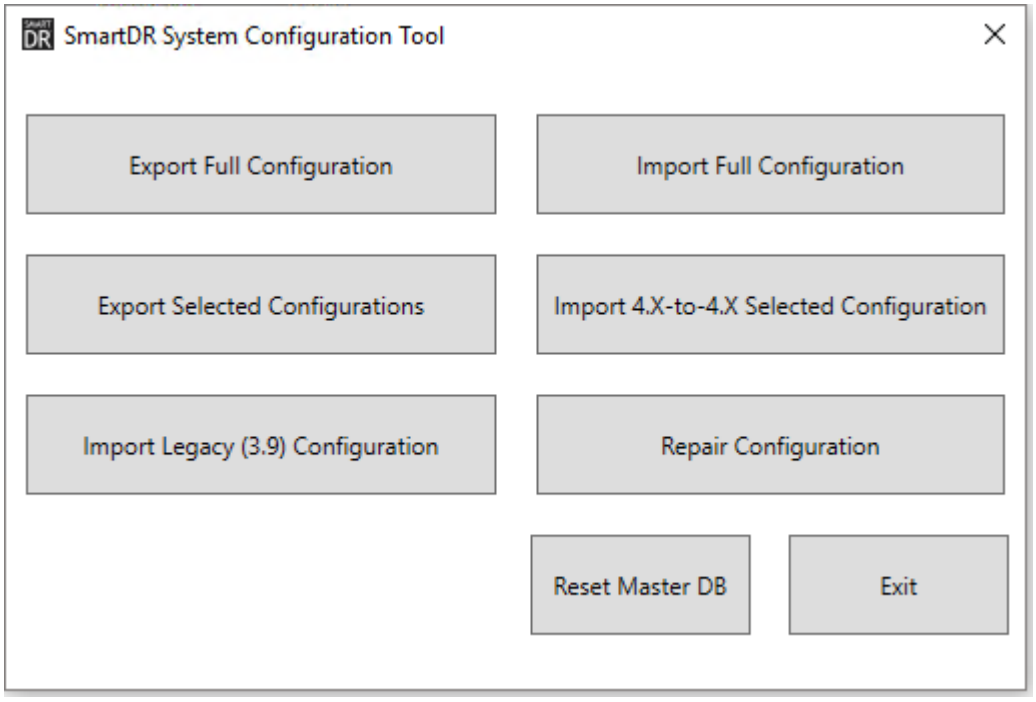


   The **File Explorer** window is displayed.
3. Navigate to: `C:\Program Files\Sound\SystemConfigurationTool`.

4. Scroll down to `ServiceTool.exe`, and double-click or double-tap to start the application.



The **SmartDR System Configuration Tool** opens.



What to do next

Complete the necessary tasks.

Exporting the full system configuration

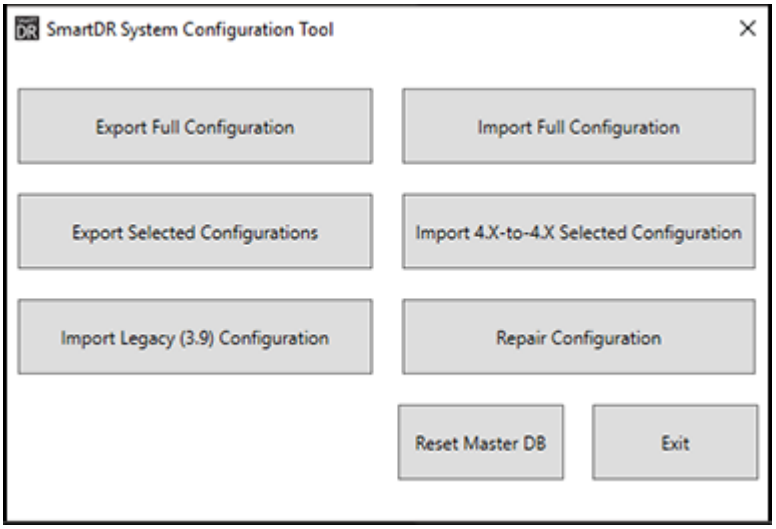
You can use the SmartDR System Configuration Tool to export the complete system configuration for use in the event that the configuration needs to be restored at some point.

Procedure

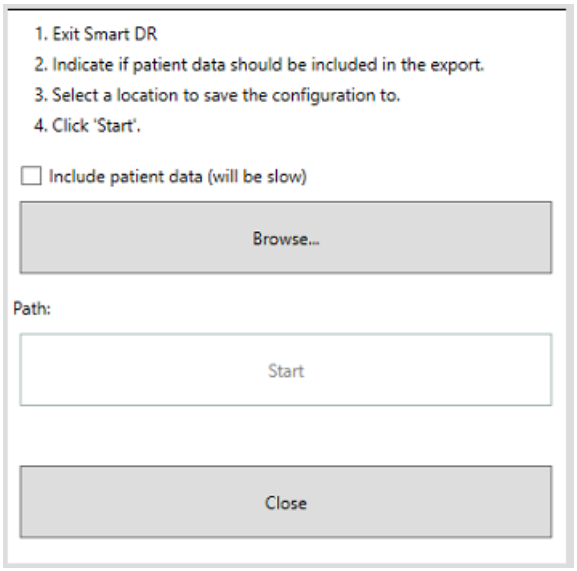
1. Start the **SmartDR System Configuration Tool**.

   See *Starting the SmartDR System Configuration Tool* on page 148 for instructions.

2. Select **Export Full Configuration**.



3. Follow the instructions in the **Export Full Configuration** window.



4. Select **Close** to close the export window.

Importing the full system configuration

You can import a full system configuration that has been previously exported.

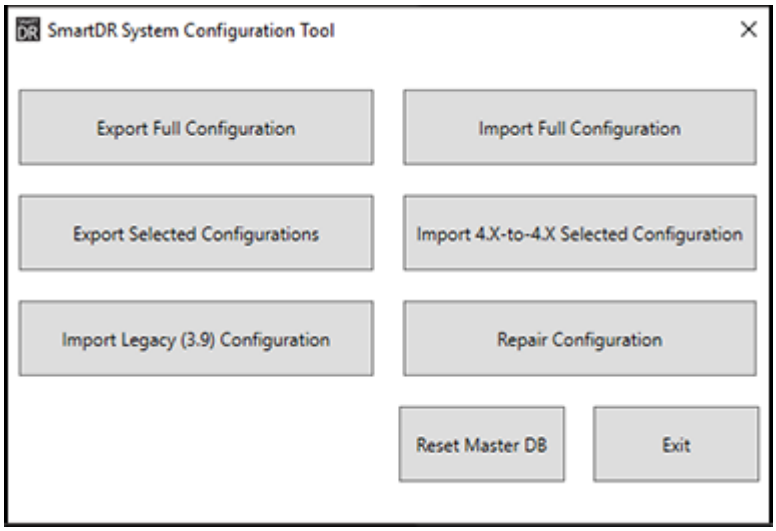
Prerequisites

A full system configuration must have been exported before this task can be started.

Procedure

1. Start the **SmartDR System Configuration Tool**.

   See *Starting the SmartDR System Configuration Tool* on page 148 for instructions.
2. Select **Import Full Configuration**.



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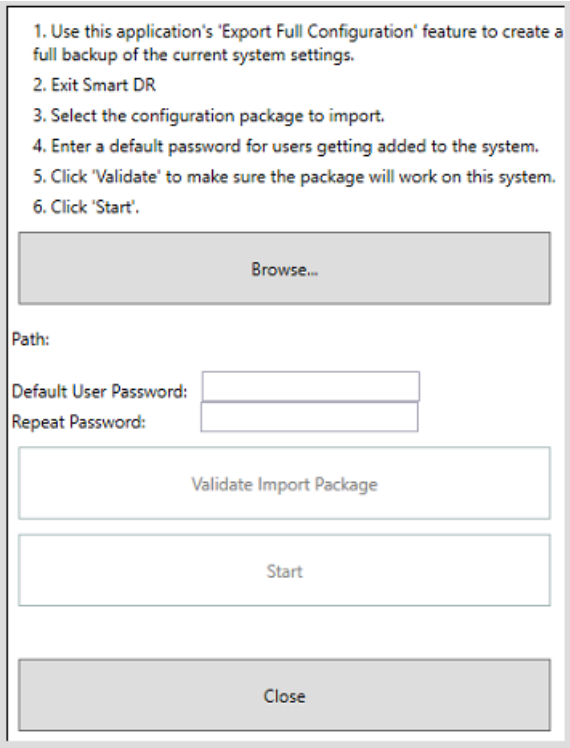
3. Follow the instructions in the import window.



4. Select **Close** when the import is complete.

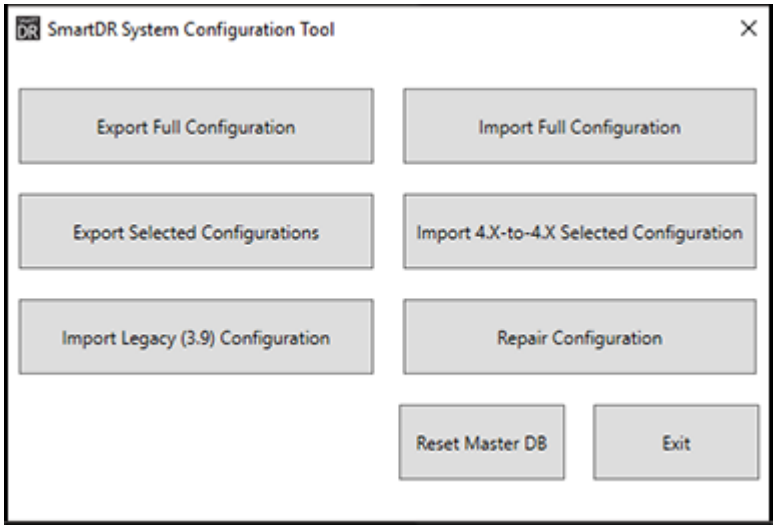
The rest of this page intentionally left blank.

Import 4.X-to-4.X Selected Configuration

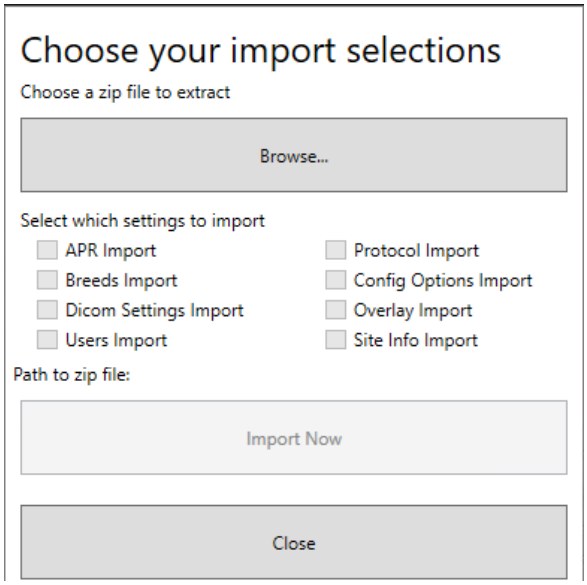
To import a Sound SMART DR™ 4.x configuration into an existing 4.x configuration, you can use the Import 4.X-to-4.X Selected Configuration feature in the SmartDR System Configuration Tool.

Procedure

1. Exit the Sound SMART DR™ application.
2. Start the SmartDR system Configuration Tool.
   See *Starting the SmartDR System Configuration Tool* on page 148 for instructions.
3. Select **Import 4.X-to-4.X Selected Configuration**.



   The **Choose your import selections** window is displayed.
4. Browse to the zip file containing the configuration you want to import.
   The configuration must be from a system with Sound SMART DR™ version 4.x installed.



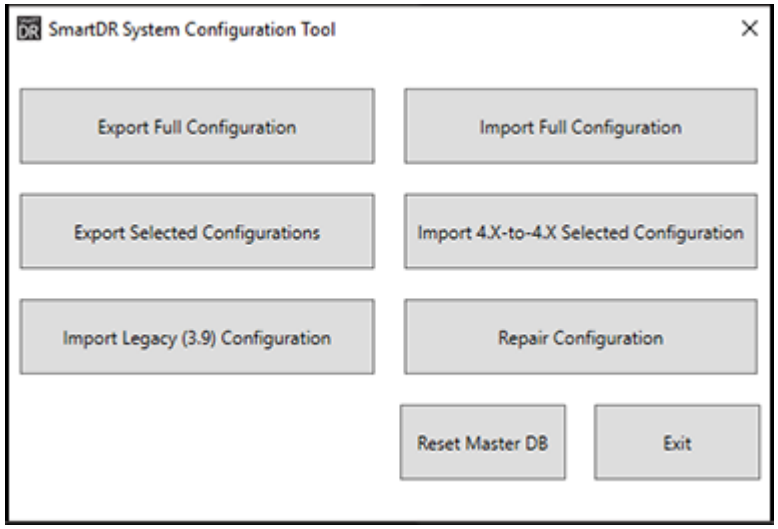
5. Under Select which settings to import section, select the import settings.
6. Under Path to zip file, select **Import Now**.
   The configuration is imported.

Import legacy (3.9) configurations

To import a Sound SMART DR™ 3.9 configuration into an existing 4.x configuration, use the Import Legacy (3.9) Configuration feature in the SmartDR System Configuration Tool.

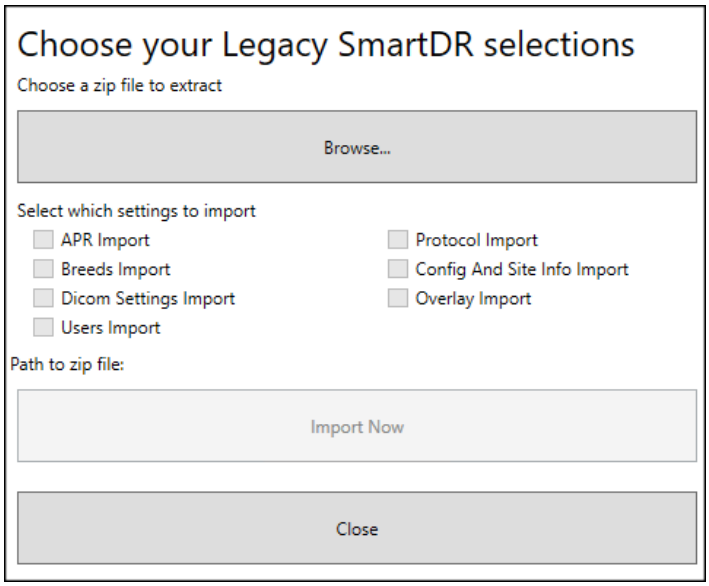
Procedure

1. Exit the Sound SMART DR™ application.
2. Start the SmartDR system Configuration Tool.
   See *Starting the SmartDR System Configuration Tool* on page 148 for instructions.
3. Select **Import Legacy (3.9) Configuration**.



The **Choose your Legacy SmartDR selections** window is displayed.

4. Under Choose a zip file to extract, select the zip file you want to import.
   The configuration must be from a system with Sound SMART DR™ version 3.9 installed.



5. Under Select which settings to import, select the import settings.
6. Under Path to zip file, select **Import Now**.
   The configuration is imported.

Repairing a configuration

In some cases, you may want to repair an existing configuration instead of replacing it.

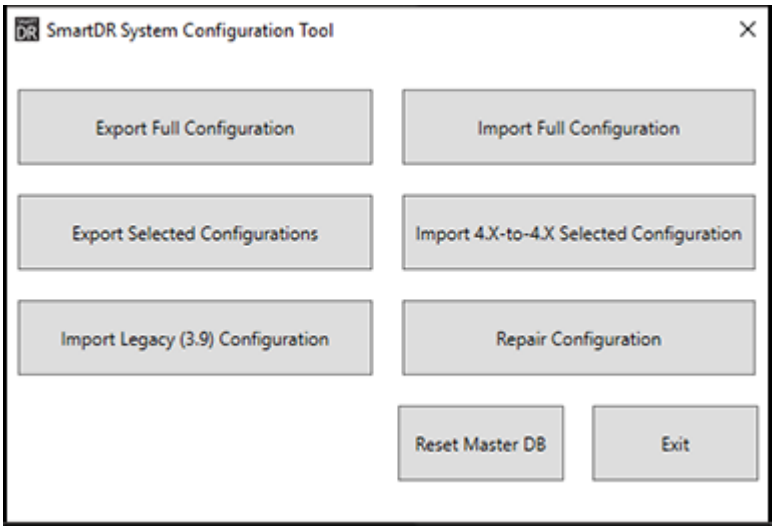
Prerequisites

A configuration must have been exported from Sound SMART DR™ before you can start this task.

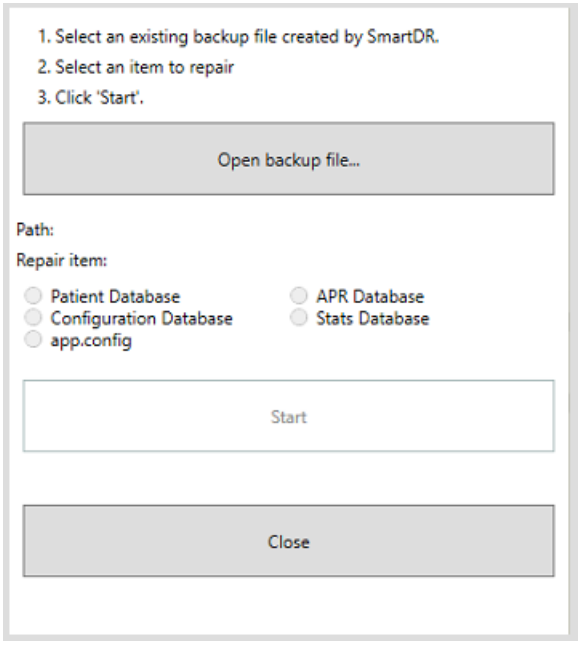
Procedure

1. Start the **SmartDR System Configuration Tool**.
   See *Starting the SmartDR System Configuration Tool* on page 148 for instructions.

2. Select **Repair Configuration**.



3. Follow the instructions in the repair dialog box.



4. After the repair is complete, select **Close**.

Resetting the master database

If the master database becomes corrupt or fails in some way, it can be reset using the **SmartDR System Configuration Tool**.

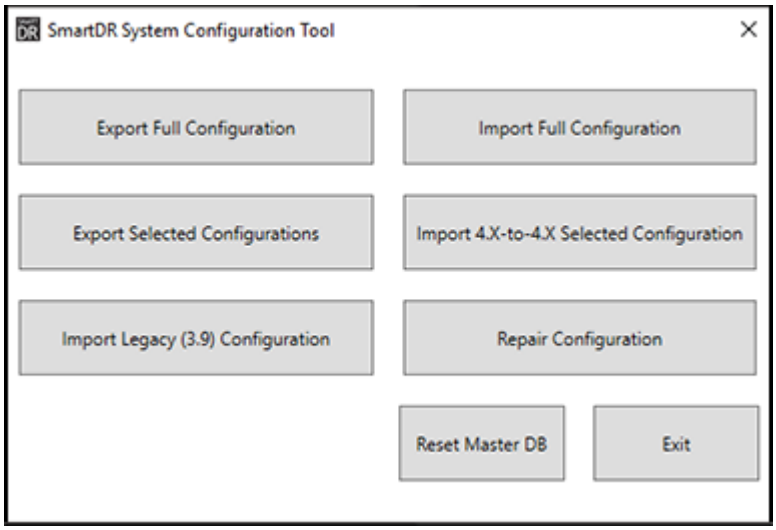
About this task

The **SmartDR System Configuration Tool** is accessible from the Windows file system.

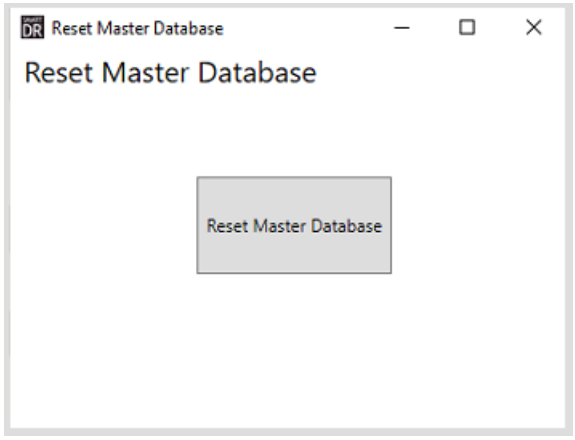
Procedure

1. Start the **SmartDR System Configuration Tool**.

   See *Starting the SmartDR System Configuration Tool* on page 148 for instructions.
2. Select **Reset Master DB**.

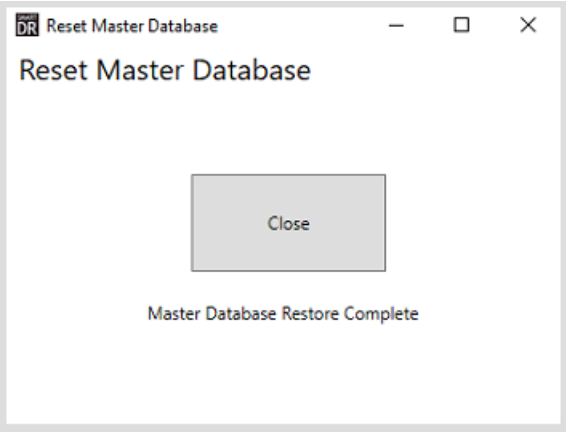


   The **Reset Master Database** window is displayed.
3. Select **Reset Master Database**.



   The database is reset.

4. After the database is reset, select **Close** to close the **Reset Master Database** window.



Backing Up SMART DR data and settings

A Sound or Vet user can back up the patient database, configuration settings, panel calibration, images, and other system files.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **System**.

   The **Backup** screen displays.

Figure 70: Backup tab

Database	Selecting this option creates the backup file `ImVetDataStore.bak`.
Images	Selecting this option backs up the `image_db` folder.

3. Under **Data To Save**, select the data that you want to back up.

   The default selection is **Database**. In addition to the data you select, the system also automatically backs up the statistics database (ImVetStats.bak) and SQL system databases (master.bak, msdb.bak, and model.bak).

4. Tap the **Backup** button.

   The backup process creates a zip file called SD2Backup_*YYMMDDHHMMSS*, where *YYMMDDHHMMSS* is the two-digit year, month, day, hour, minute, and second of the backup. The file is saved to the default downloads directory configured in the browser.

Restoring the SMART DR data and settings

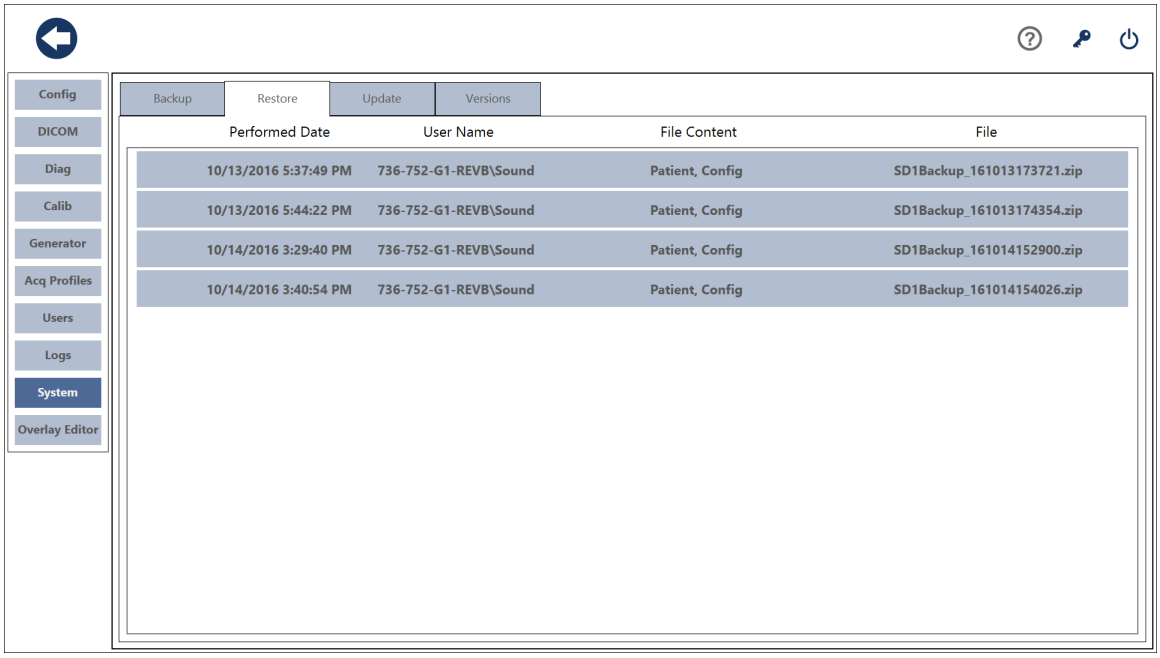
Sound and Vet users can restore a system that has been backed up.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select the **System** > **Restore** tab.

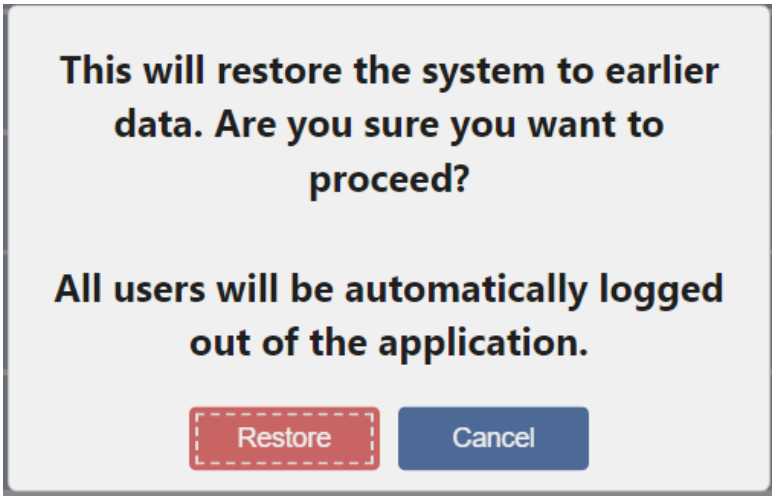
   The list of backups is displayed.

Figure 71: Restore tab



3. Select your desired backup and tap the  icon displayed next to the selected restore point.

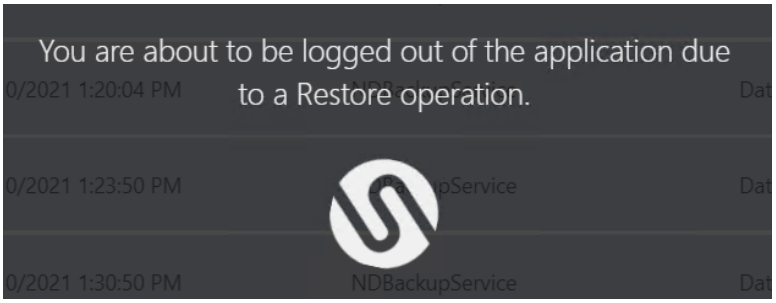
   The following message is displayed:



4. Tap the **Restore** button.

   When the backup data is being restored, the following message is displayed:

Figure 72: Restore button -- message



   When the Restore operation is complete, the system backs up to your selected restore point. The details of the restore are listed in the **Restore** screen.

5. Restart the system when you want the restoration to take effect.

Updating the SMART DR software with auto update

X-ray system updates are installed automatically.

About this task

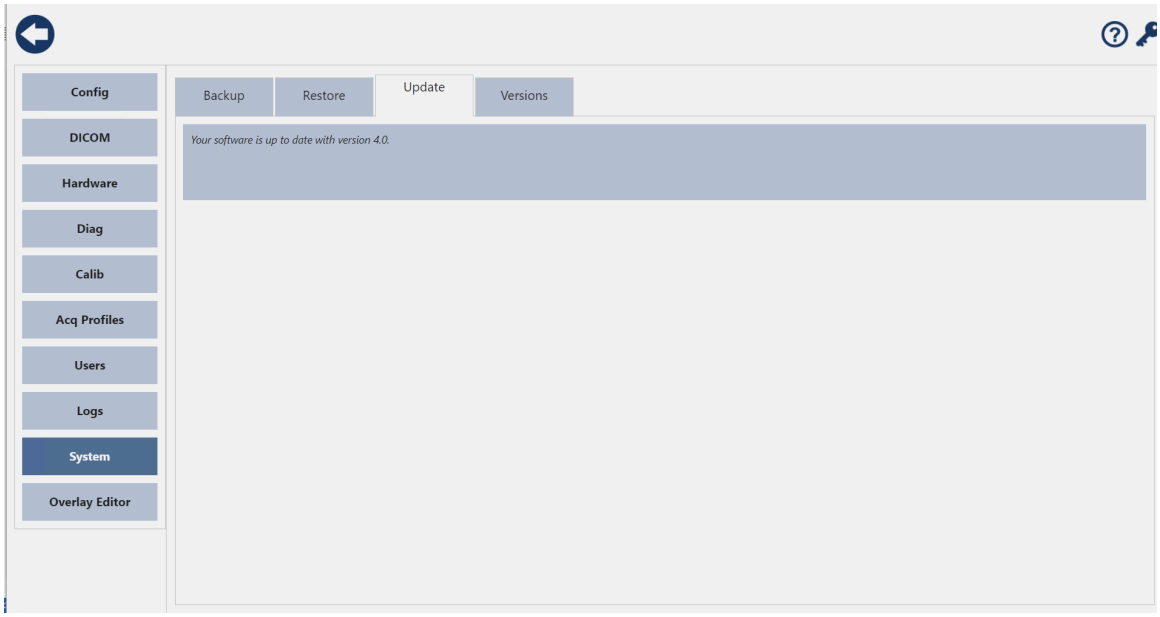
When you log in to the SMART DR™ PC, the software automatically checks for and applies the updates.

Procedure

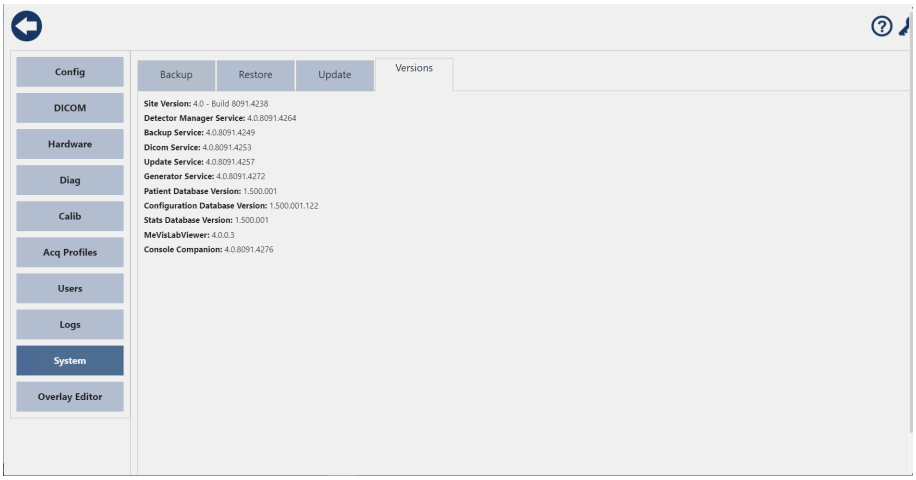
1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select the **System** > **Update** tab.

   The **Update** screen is displayed. When the software detects new updates for the system, they are displayed in the **Update** screen. The system checks for updates automatically and installs the update(s).

Figure 73: Update screen



3. Select the **System** > **Versions** tab, and verify the Site Version number to ensure that the updates were successful.



Windows operating system updates

Only install important or required Windows operating system updates.

Performing panel gain calibration

The Sound User can perform gain calibration on the active panel. The system will remind you to perform gain calibration based on the frequency you select in the **Advanced Options** tab of the **Config** screen.

Prerequisites

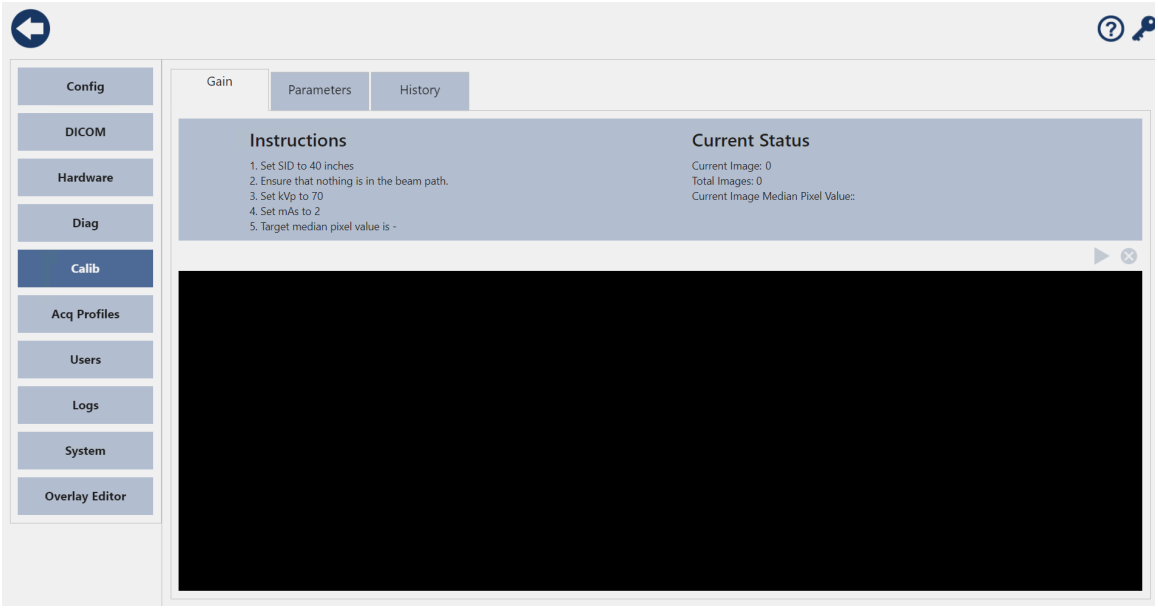
Before you begin this task, ensure that the panel is installed, configured, and active on the x-ray system. If it is not, the **Gain** tab in the **Calib** screen will not be displayed. For information about setting the frequency of gain calibration reminders, see *Configuring Advanced Options*.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.

2. Tap the **Calib** tab.

   The **Gain** screen is displayed, by default.



3. Follow the instructions on the screen, then tap the **Start Calibration** button.

   The **Start Calibration** button looks like this:

Note: The **Gain Calibration** button is inactive if no panels are installed, a calibration is running, or if another user has a patient record open.

The default backup location is `C:\Users\Current_User\Documents`.

Gain calibrations can be stopped, if necessary. If the calibration is stopped or fails, the calibration data is discarded and the previous calibration data is used.

Note: The panel will experience a timeout if you allow more than two minutes between image acquisitions during gain calibration. If the timeout occurs, cancel and restart the calibration.

When the calibration is complete, a message box is displayed, indicating success or failure. If the calibration fails due to a pixel value being outside of the recommended range, the message indicates whether to raise or lower the value.

4. Tap **OK** to close the message box.

Setting calibration parameters

Parameters for calibration can be configured in the **Management** screen.

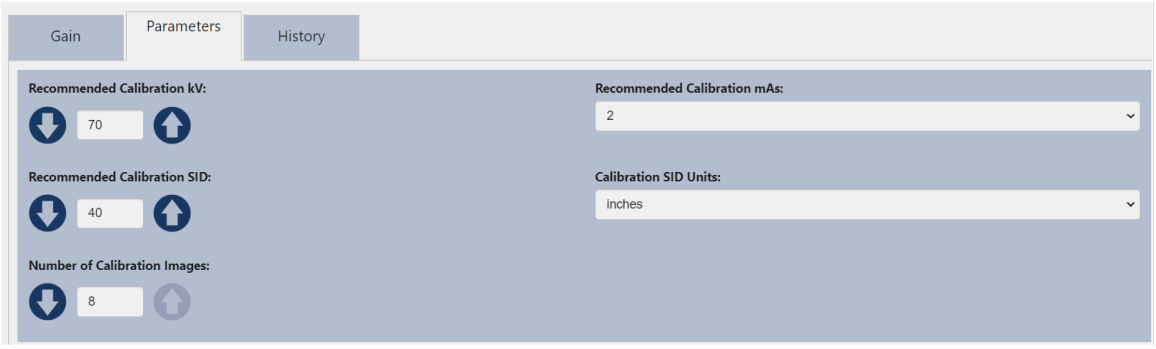
About this task

Table 59: Calibration parameter defaults

Parameter	Values
Recommended Calibration kV	Default: 70
Recommended Calibration mAs	Default: 2
Recommended Calibration SID	Default: 40
Calibration SID Units	Default: inches Options: inches or centimeters
Number of Calibration images	Default: 8 Valid values: 1-8

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select the **Calib** > **Parameters** tab.
   The **Parameters** screen displays.

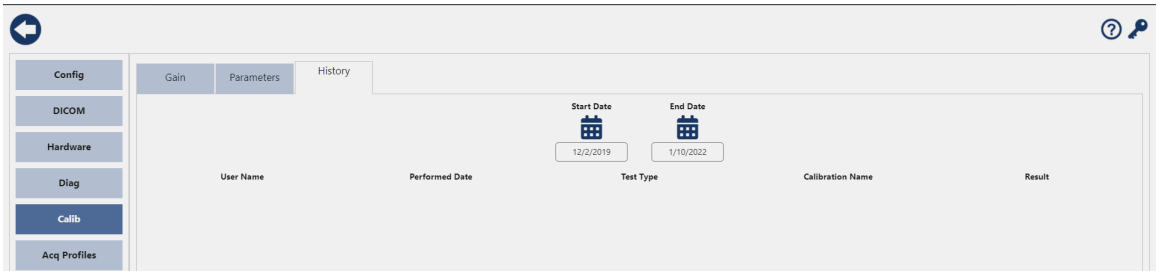


3. Set the calibration parameters, as needed.
   The median pixel range for a successful calibration is 11050 - 14950.

Viewing gain calibration history

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select the **Calib** > **History** tab.



3. Select the **Start Date** icon.
4. In the pop-up calendar, select the first date in the date range for histories that you want to view.
5. Select the **End Date** icon.
6. In the pop-up calendar, select the last date in the date range for histories that you want to view.

Results

The gain calibration history for the range of dates that you selected is displayed.

Cleaning the x-ray system

About this task

The x-ray system is designed and suitable for use in typical clinical environments. During use, the system, all peripherals, and the detector should be adequately protected against spilled or splashed fluids and should, therefore, not require disinfection beyond routine cleaning as part of preventive maintenance of the equipment.

Cleaning performed during preventative maintenance requires only compressed air and a mild soap and water solution. If disinfection is desired or becomes necessary, a disinfectant solution may be used in place of soap and water to clean the x-ray system equipment. In either case, prepare the solution in accordance with instructions provided by the manufacturer of the cleaning agent.

Warning: Do not pour or spray liquid directly onto any component of the x-ray system. Apply the cleaning agent to a clean cloth and gently wipe the equipment to clean.

Warning: Ne pas verser ou vaporiser de liquide directement sur l'un des composants du système x-ray. Appliquer l'agent de nettoyage sur un chiffon propre et essuyez doucement l'équipement à nettoyer.

Procedure

Review the information in the following topics, and perform cleaning and maintenance tasks in accordance with the information provided.

- *Approved disinfection agents* on page 166
- *Cautions* on page 166
- *Removing dust from fans and heatsinks* on page 166

Important: Cleaning and preventative maintenance should be performed approximately every six months, or as required by the site.

Approved disinfection agents

Any EPA-registered agent classified as a low- or intermediate-level product for hard, non-porous surfaces and equipment may be used. Prepare and use disinfectants in accordance with manufacturer’s instructions.

Cautions

The system must be out-of-service for the duration of cleaning. Cleaning should, therefore, be performed during scheduled maintenance unless made necessary by contamination. Do not use the x-ray system for patient imaging when cleaning the equipment.

- All system components, including the table and x-ray generator must be powered down prior to cleaning the equipment. Covers are removed and, typically, a cleaning liquid is used. The removal of power is required to protect service personnel and the equipment against injury or damage caused by unintentional or excessive application of liquid to electrical components of the system.
- Allow 15 minutes after cleaning before turning equipment back on. This period allows any residual cleaning fluid to evaporate before power is re-applied to the equipment.
- After turning equipment back on, allow at least 15 minutes for the detector subsystem to initialize before attempting to use the x-ray system for imaging or calibration.

Removing dust from fans and heatsinks

Even in a clinical environment, dust and other contaminants accumulate around fans and heatsinks inside the x-ray system computer. Special attention must be paid to these areas so that the airflow that cools the electronics can pass freely through the computer case and heatsinks. Surfaces inside the computer are typically very dry and can be blown clean with compressed air available at most retail stores that sell electronics.

- Observing ESD precautions, use the compressed air to carefully remove all dust, hair, and other impediments from the openings in the front and rear of the computer case, from in and around the CPU heatsink and fan, and from the fan in the bottom of the power supply.

- Do not use a cloth, with or without cleaning solution, to clean internal components of the computer. Cloth may be used, dampened with cleaning solution as desired, only to clean external surfaces of the computer.

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Chapter

7

Diagnostics

Contents

- *Verifying application version information* on page 170
- *Log files* on page 171
- *Collecting data* on page 173
- *Viewing panel software versions* on page 174
- *Viewing the status of application services* on page 175
- *Notifications* on page 176

This chapter describes the diagnostic tools that are available to Sound Users for troubleshooting issues that may arise after the system is installed and configured.

Verifying application version information

Sound and Vet users can verify version information for the system software and components.

About this task

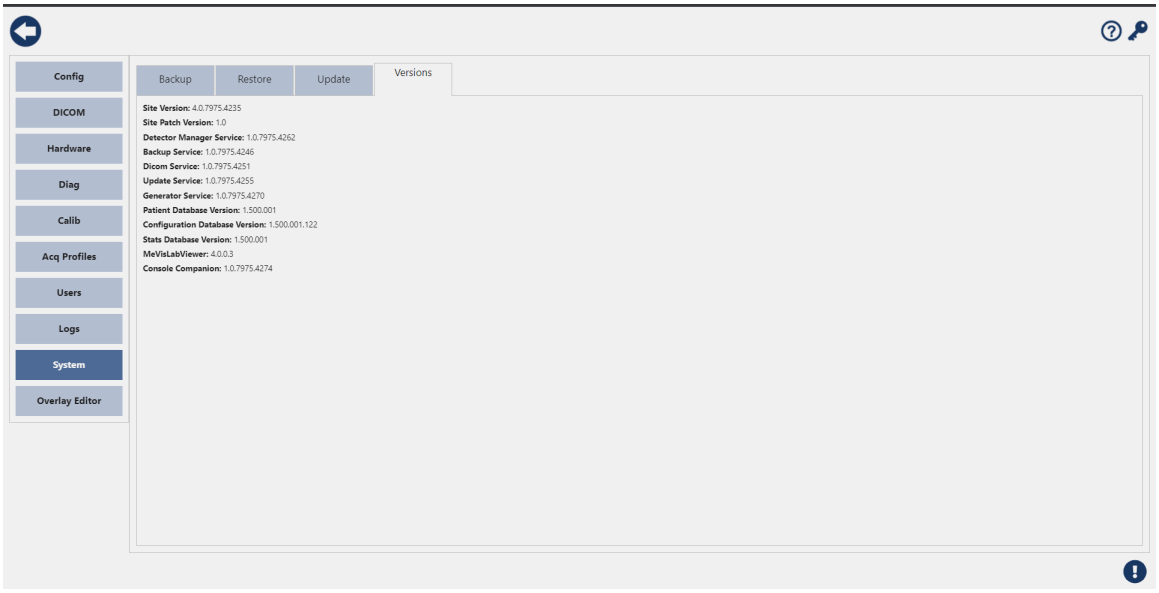
Version information can be useful for troubleshooting and updating the system.

Procedure

1. Open the **Management** screen. See *Displaying the Management screen* on page 75 for instructions.
2. Select the **System** > **Versions** tab.

   Version information for the software and system components is displayed.

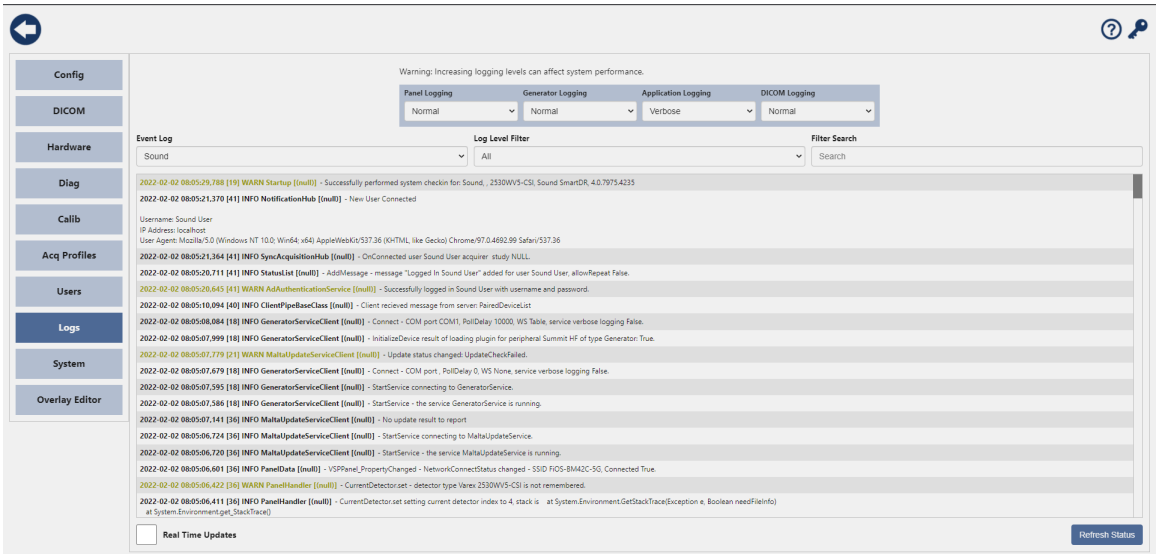
Figure 74: Versions screen



Log files

The x-ray system captures and saves information about how applications and DICOM are functioning, and saves that information to log files.

Figure 75: Logs screen



Note: The **Log Level Filter** drop-down list is displayed on the screen only when you select certain types of event logs.

The following log files can be viewed in the **Management** screen within the **Logs** tab.

Table 60: Log files

Log file	Description
AprAuditLog.txt	The `APRAditLog.txt log` records information about manual changes made to APR settings from within the software.
AuditLog.txt	The `Auditlog.txt` report records information about the PC application, such as when it was started and ended, and the initials of the technologists who log in and out of the application.
ConsoleCompanionLog.txt	The `ConsoleCompanionLog.txt` records activity from the Console Companion process.
DetectorManager.txt	The `DetectorManager.txt` log records detector communication activity.

Log file	Description
DICOMLog.txt	The `DICOMLog.txt` file records information about export and import jobs for the DICOM devices configured for this x-ray system. The logs record the start and end of the job; type of job; data file; destination; status; remote IP address; remote port; copies; and DICOM device options. **Important:** Set Application or DICOM logging to **Verbose** mode only when instructed to do so by a technical support representative.
DICOMSend	The DICOMSend log records information about DICOM sends.
Generator	The Generator log records generator communication information. The **Integrated Generator** check box in the **Hardware** > **Generator** tab must be selected for content to be written to this log file.
MemoryManagementLog.txt	The `MemoryManagementLog.txt` file records information about how the PC application is using system memory.
NDBackupService	The NDBackupService log records information from the backup service.
ProcessTimingLog.txt	The `ProcessTimingLog.txt` file records information about the amount of time x-ray system processes are taking.
Sound	This log file captures information about the performance of the PC application.
UpdateService	The UpdateService log records information from the service that looks for and performs automatic updates.
Viewer	The Viewer log records image viewing and processing information.
VSPPanel	The VSPPanel log records detailed detector messages from the PaxScan side.
VSPPanelLog.txt	The VSPPanelLog.txt is not currently supported.
Combined Event Logs	The Combined Event Logs file collects all of the event logs in chronological order so that they can be viewed all at once.

Viewing logs

About this task

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **Logs**.
3. In the **Event Log** drop-down list, select the log that you want to view.
4. In the **Log Level Filter** drop-down list, select the level of logging that you want to see.

   Note: The **Log Level Filter** drop-down list is displayed on the screen only when you select certain types of event logs.

5. In the **Filter Search** field, type the criteria for filtering the search.

   The search results display automatically.

Collecting data

The **Data Collector** feature can be used to gather information about the x-ray system for backup and diagnostic purposes.

About this task

All user types can access all of the fields in the **Data Collector** screen.

Procedure

1. Open the **Management** screen. See *Displaying the Management screen* on page 75 for instructions.
2. Select the **Diag** > **Data Collector** tab.

   The **Data Collector** screen is displayed, by default.

All of the data types are selected, by default.

3. Deselect the data you do not want to collect.

   You can select or deselect any of the data options displayed in the tab. See *Data collector parameters* on page 174 for information about the **Data Collector** check boxes.
4. Select **Collect Data** to begin the data collection process.
5. Select **Download Browser Data** to download and save the data.

   A password-protected zip file is saved to the Windows **Downloads** directory. The file uses the following file naming syntax: *username*_SD2Data_*dateTime*.zip. The zip file password is: `Gen5Logs`

Data collector parameters

Figure 76: Data Collector screen parameters

System Information	Enable this option to back up system information.
Error and Diagnostic Logs	Enable this option to back up information that can be used to troubleshoot errors and diagnose problems with the system.
Audit Log	Enable this option to back up information about audits.
Configuration Settings	Enable this option to back up the system configuration data.
Patient and APR Database	Enable this option to back up acquisition profile data and the patient database.

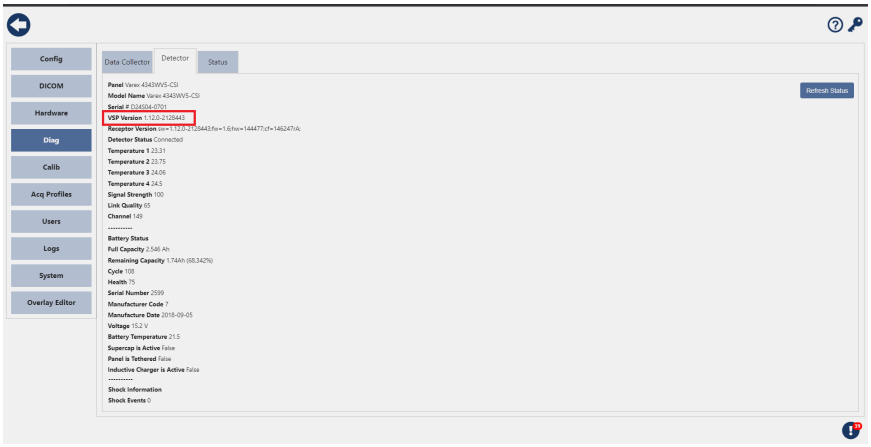
Viewing panel software versions

Panel software versions can be useful in diagnosing problems with the panel.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select **Diag**.

3. Select the **Detector** tab, and ensure that the VSP Version is: 1.12.0-2128443



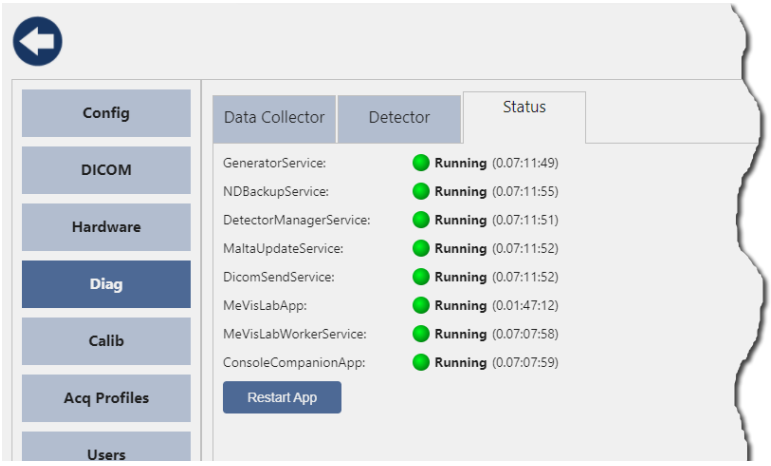
Viewing the status of application services

You can view the status of application services in the **Management** screen.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select the **Diag** > **Status** tab.

   The status of application services is displayed.



3. If needed, tap **Restart App** to restart the application.

Notifications

The Sound SMART DR™ software provides notifications for many system-generated tasks, as well as tasks you perform in the system.

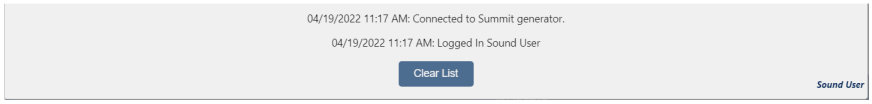
The **Show Notifications** icon, located on each of the screens of the SMART DR™ system, displays the number of notifications sent by the system to the Notifications bar, located at the top of all the screens. The number of notifications posted on the **Show Notifications** icon corresponds directly to the notifications listed in the Notifications bar, regardless of whether they are old or new notifications, or if they have been viewed.

The following **Show Notifications** icon indicates that there are 26 total notifications listed in the Notifications bar.

To view the notifications:

1. Tap the **Show Notifications** icon on any of the screens of the application.

   The notifications are displayed in the Notifications bar located at the top of all screens of the system.

   Note: The Notifications bar will appear at the top of the screen only when you tap the **Show Notifications** icon.

2. To expand the Notifications bar and view the entire list of notifications, tap inside the bar.
3. To close the Notifications bar, tap inside the bar again.

   The Notifications bar closes.

   To re-open the Notifications bar, tap the **Show Notifications** icon.
4. To clear the notifications in the Notifications bar, tap the **Clear List** button at the bottom of the bar.

   The notifications are no longer displayed in the Notifications bar. A `No messages to show` message is displayed on a blank Notifications bar.

   Note: When you clear the notifications in the Notifications bar, the number posted on the **Show Notifications** icon disappears. If you do not clear the notifications list, the number remains on the **Show Notifications** icon, even if you exit the Notifications bar.

Chapter

8

Access Help

Contents

- *Help Options window* on page 178

Sound provides options for help with the user interface. Access them from the **Help** icon on the main screen and in other locations in the application.

Help Options window

The **Help Options** window provides access to information about icons used in the Sound SMART DR™ software, training videos, and the Sound™ Support Portal.

In the Sound SMART DR™ application, select the question mark icon in the upper-right corner of the screen.

Figure 77: Help Options window

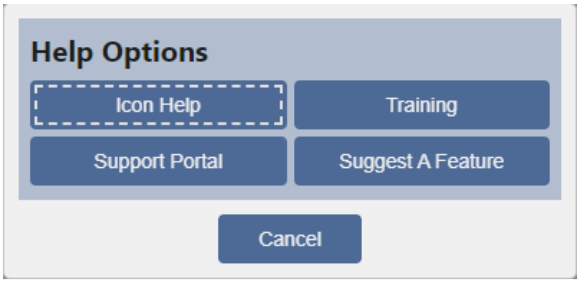
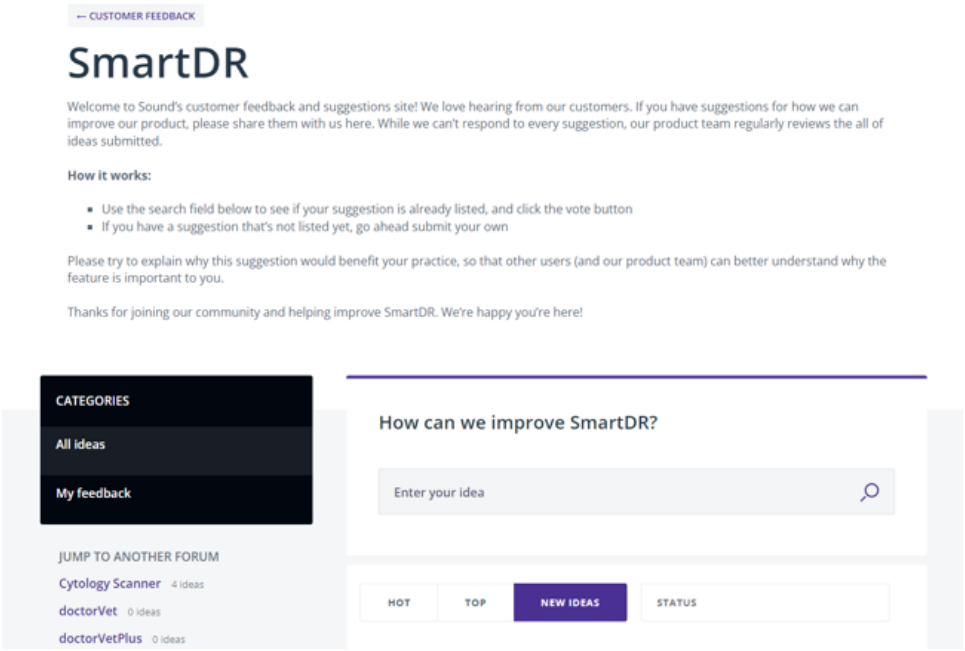


Table 61: Help Options

Option	Description
	Accesses **Help Options** window.
Icon Help	Displays tips identifying icons displayed on the current screen.
Training	Accesses training videos that demonstrate how to perform common tasks using the interface.
Support Portal	Accesses the **Support Portal**. • First-time users, select **Register New User** to set up a login and password. • Use the portal to chat with Sound™ support professionals, submit a support ticket, review training videos, and view warranty information.
Suggest a Feature	Accesses a portal you can use to provide feedback to Sound™ about the Sound SMART DR™ software. See *Figure 78: Suggest A Feature* on page 179.

Option	Description
Cancel	Closes the window.

Figure 78: Suggest A Feature



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Appendix
A

Technical Support

Contents

- *Locating the system serial number* on page 182

Use the following information for contacting customer support.

Office hours	Weekdays 8:00 A.M. - 5:00 P.M. Pacific time. Emergency 24-hour support is available.
Toll free	800-819-5538
Telephone	760.918.9626
Fax	760.918.9620
International	+1.760.918.9626

Shipping address

Sound Technologies, Inc.
3200 Lionshead Avenue
Suite 100
Carlsbad, CA 92010
USA

Website

http://www.soundvet.com/

Locating the system serial number

When you contact technical support, you must provide the serial number of the system for which you are requesting assistance.

Procedure

1. Open the **Management** screen. See the topic, *Displaying the Management screen* on page 75, for instructions.
2. Select the **Config** > **Site Information** tab.

   The system serial number is located under **Model Information**, in the **Serial Number** field.

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