User Manual

Supports the PaxScan 4336R, 4343R, or 4336Wv4 panel

Supports integration with Summit HF X-ray generator

721-721-G1, Rev. K

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 Sound Technologies, Inc. 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.

Standards and compliance

CE for Low Voltage Directive 2006/95/EC, EMC Directive 2004/108/EC
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 Sound 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 equine, 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 Sound 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 Sound 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 Sound SMART DR™ . The detector converts the X-ray energy to digital image data that is then passed to the Sound 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 Sound SMART DR™ software, the images can be archived or printed 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 equine, 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 Chapter 6. *Chapter 7. Cleaning the X-ray System*, for information about maintaining and cleaning the system components.

Trademarks

Sound™ and Sound SMART DR™ are trademarks 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; PaxScan 4336R, 4343R, 2530W panel, and ViVA™ are trademarks or brand names 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: Caution | Prudence: Please read and follow the safety and equipment handling practices in this manual.

S'il vous plaît lire et suivre les pratiques de sécurité et de manutention 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: Document revisions

Revision letter	Issue date	ECO number	Changes made
A	2015-07-17	1066325	Initial release.
B	2015-07-21	1066819	Minor improvements for clarity.
C	2015-09-29	1067655	Updated footer to read, "Sound Smart DR."
D	2016-05-26	1070025, ECO-00029 (EtQ)	Updated logos, trademarks, and support contact information.
E	2016-08-15	1070604, ECO-0007 (EtQ)	Updated content to reflect software version 3.5. Includes software changes for version 3.0, MR2, included in release 3.5. New or revised topics include: System Components, System Overview, Create a New Patient, Edit Patient Information, Create a New Study, Add a Study, Acquire an Image, Edit an Image, Shot List Screen, Batch Send Export, and Email a Study. Added topic Pause a Study to accommodate new pause feature. Also updated content for auto-scroll of shotlist.

Revision letter	Issue date	ECO number	Changes made
F	2016-12-16	SAP:1071837, EtQ: ECO-00049	Updated content to reflect software version 3.6. Includes changes to support use of integrated generator (Summit HF), Dell 7440 tablet PC, and 4336Wv4 panel.
G	2017-05-31	SAP: 1073461; EtQ: ECO-00119	Updated content to reflect system version 3.7. Includes support for system configurations containing PaxScan 4336R v2, 4343R v2/3, 4030E, and 4336Wv4.
H	2017-12-18	SAP: 1074896; EtQ: ECO-00171	Updated software version to 3.8. Updated Annotation Toolbar and modified descriptions of calibration and line measurement tools. Added Cobb angle and copy image tools.
J	2019-04-19	ECO-00202	Added section to System Overview for the Planar monitor. Updates for IEC testing. Added section about Help options. Indicated that the number of results returned in a MWL search are configured in Service Mode.

Revision letter	Issue date	ECO number	Changes made
K	2021-2-12	ECO-EC-0001756	New features added in the v3.9 release: Search by accession number, Region and Anatomy are now translated, Zoom Magnification overlay tag added, add study to existing patient record from Add Patient screen, ability to select multiple vets and techs in Acquisition screen, buttons added to DICOM queue, report log shows MA and Sec in separate fields, "Owner Name" has been added to the overlay for Responsible Person for clarification, Clear All button added to shotlist, panel ready state times out after extended period of disuse, detailed billing report is now an option in reports, patient IDs can be reused when a patient record is soft-deleted. can manually enter or change kVp and mAs for an acquired image on a non-integrated system, Rejected Images report type added, if configured, the reject reason can be associated with the rejected image, Coonhound has been added to the list of breeds, pause study indicator added to Patient List, patient weight can be displayed in KG and up to 3 decimal places, EI values added to overlay tags.

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
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.	721-721-G1
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.	721-722-G1
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	Standard/Reference
	Notice. An important aspect of Sound Technologies, Inc. imaging system operation is presented.	N/A. Used in operator and service manuals to note important information
	Caution. On product, indicates need to consult instructions for use for important cautionary information.	ISO 15223-1:2012/5.4.4
	Warning. General warning.	IEC 60601-1:2012/Table D.2 No. 2
	Read accompanying documents or instructions for use.	IEC 60601-1:2005/Table D.2, No. 10
	The date of manufacture is adjacent to this symbol.	ISO 15223-1:2012/5.1.3
	The manufacturer’s serial number is displayed with this symbol.	ISO 15223-1:2012/5.1.7
	The procedure requires making X-ray exposures and producing radiation. Follow safety precautions when operating the X-ray system.	Warning: IEC 60601-1:2012/Table D.2 No. 2; Ionizing Radiation: IEC TR 60878, No. ISO 361; ISO 7010-W003
	Earthing terminal Grounding terminal	IEC 60417-5019; IEC 60601-1/7219
	Warning. Warning, electricity	IEC-60601-1:2012, Table D-2, No. 3; IEC 60601-1/7.2.14, 7.3.2

Symbol	Title/Meaning	Standard/Reference
	Dangerous voltage. Indicates hazard from dangerous voltages.	IEC 60417-5036
	Non-ionizing electromagnetic radiation. Indicates elevated or potentially hazardous levels on non-ionizing electromagnetic radiation.	IEC 60417-5140
	The manufacturer’s catalog number (model number) is displayed with this symbol.	ISO 15223-1:2012/5.1.6
	The name and address of the manufacturer is displayed with this symbol. The date of manufacture may also be included with this information.	ISO 15223-1:2012/5.1.1
	Authorized representative in the European Community	ISO 15223-1:2012/5.1.2

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Chapter

1

System Overview

Contents

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 overview diagram with PaxScan 4336R detector

The following diagrams show a high-level overview of the x-ray system with a single PaxScan 4336R flat panel detector.

Figure 1: Single PaxScan 4336R detector with Dell desktop PC

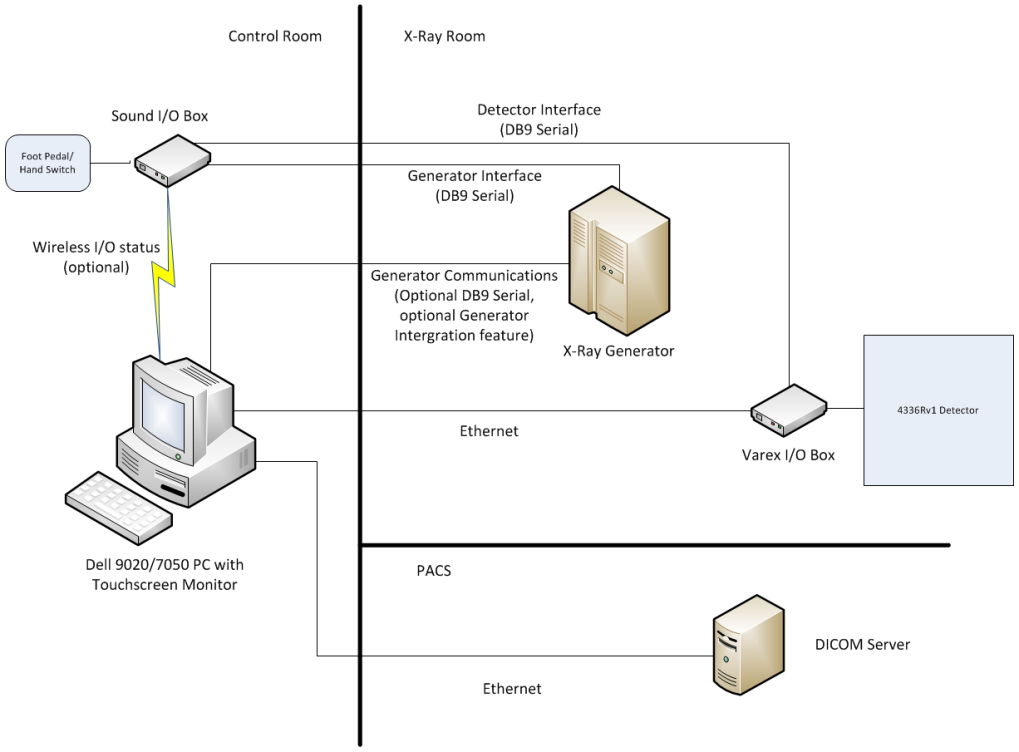


Figure 2: Single PaxScan 4336Rv2 detector with Dell 7440 All-in-One PC

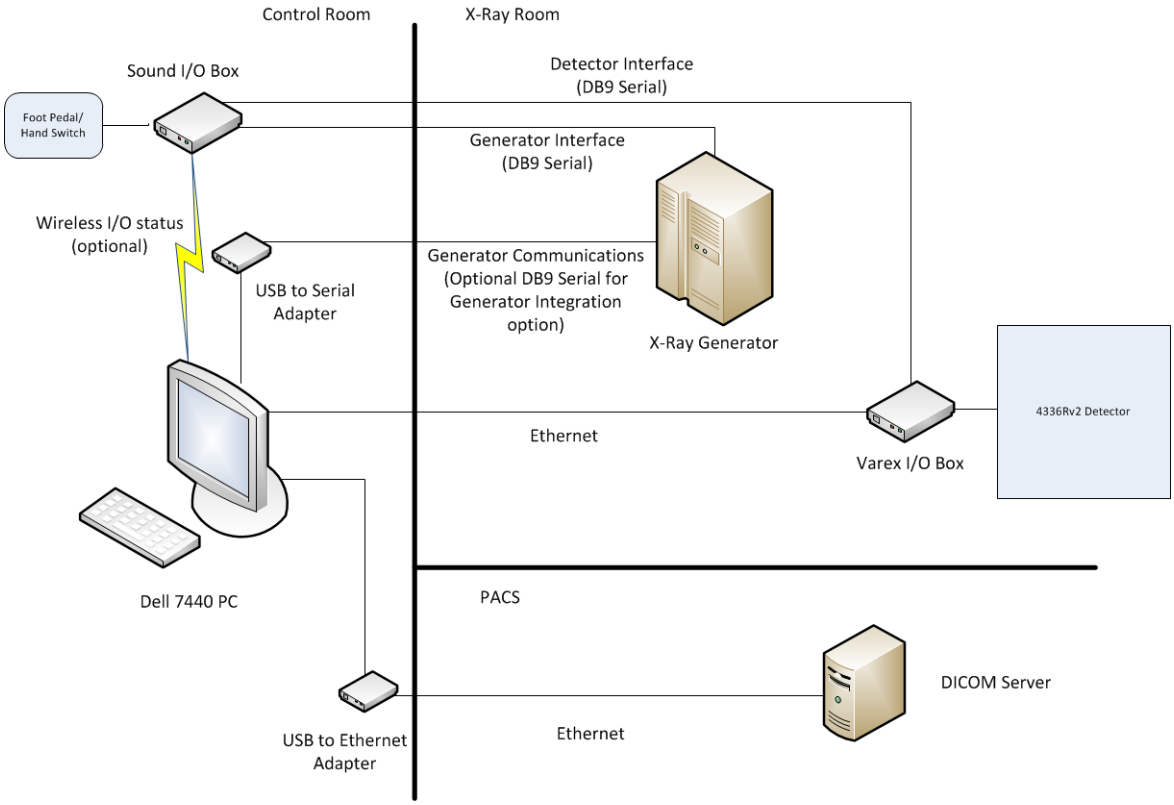


Figure 3: Single PaxScan 4336Rv2 detector configuration with Logic AIO PC

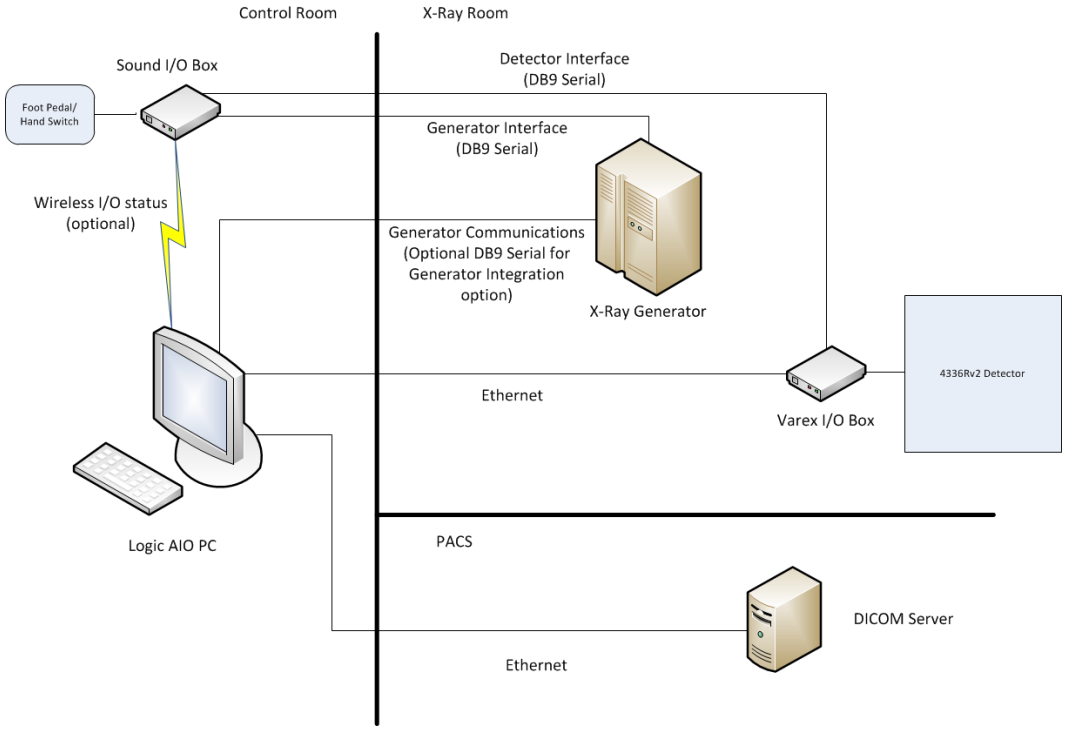
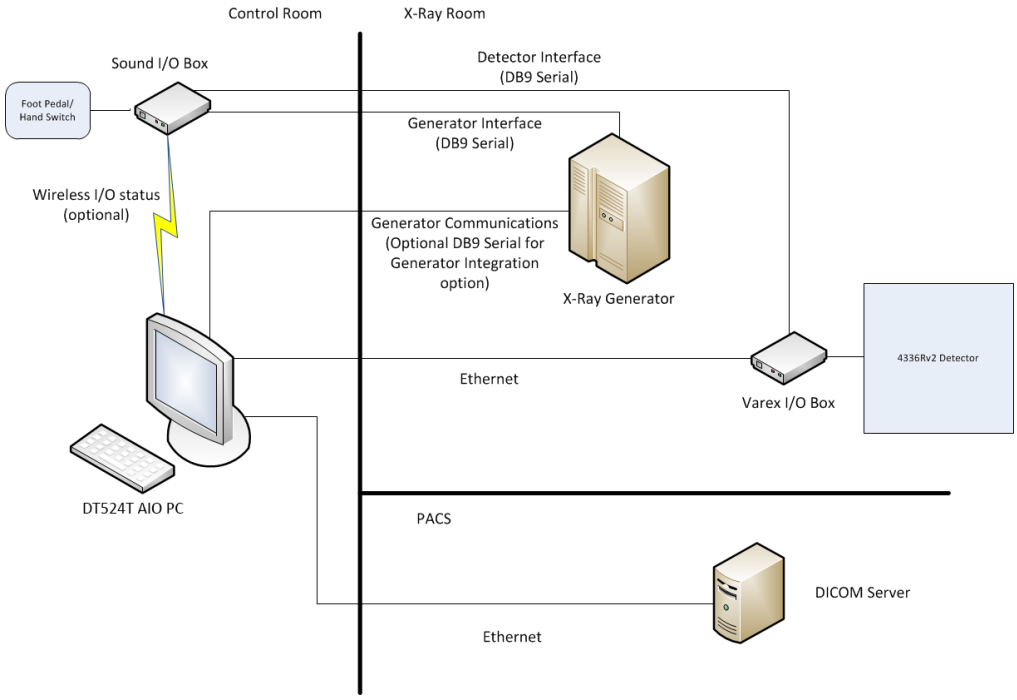


Figure 4: Single PaxScan 4336Rv2 detector configuration with DT524T AIO PC



System overview diagram with PaxScan 4343R detector

The following diagram shows a high-level overview of the cable connections between the components of a non-integrated x-ray system with a single PaxScan 4343R flat panel detector.

Figure 5: Single PaxScan 4343R panel configuration with Dell 9020 PC

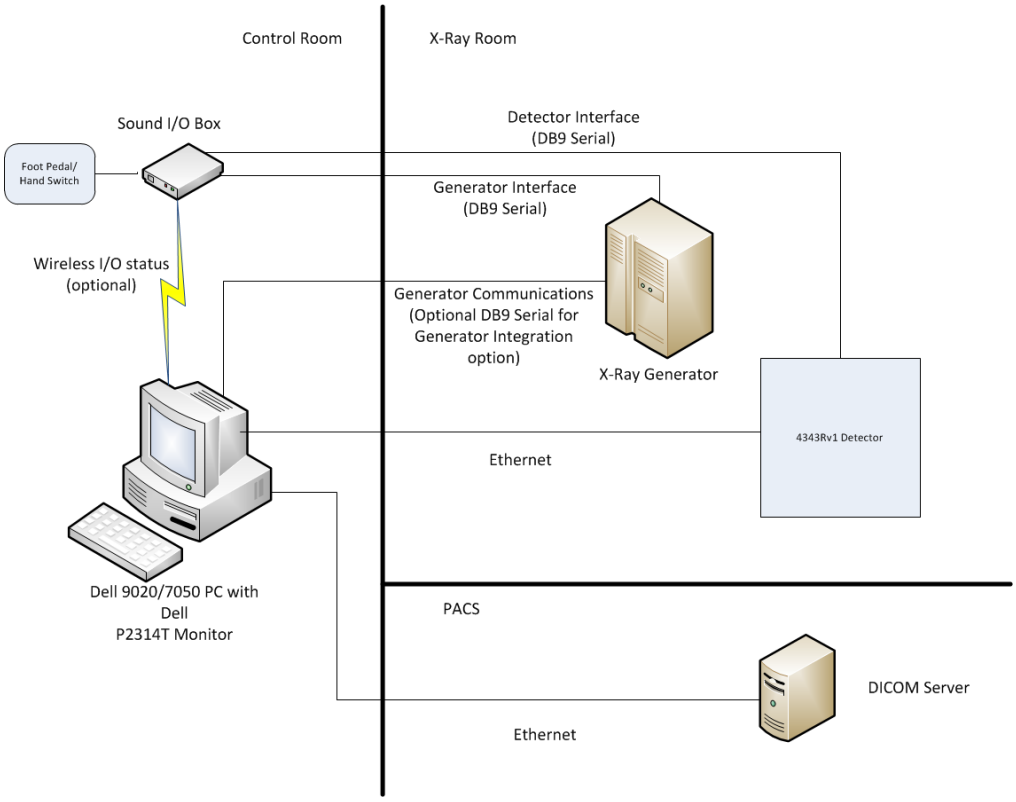


Figure 6: Single PaxScan 4343R detector with Dell 7440 All-in-One PC

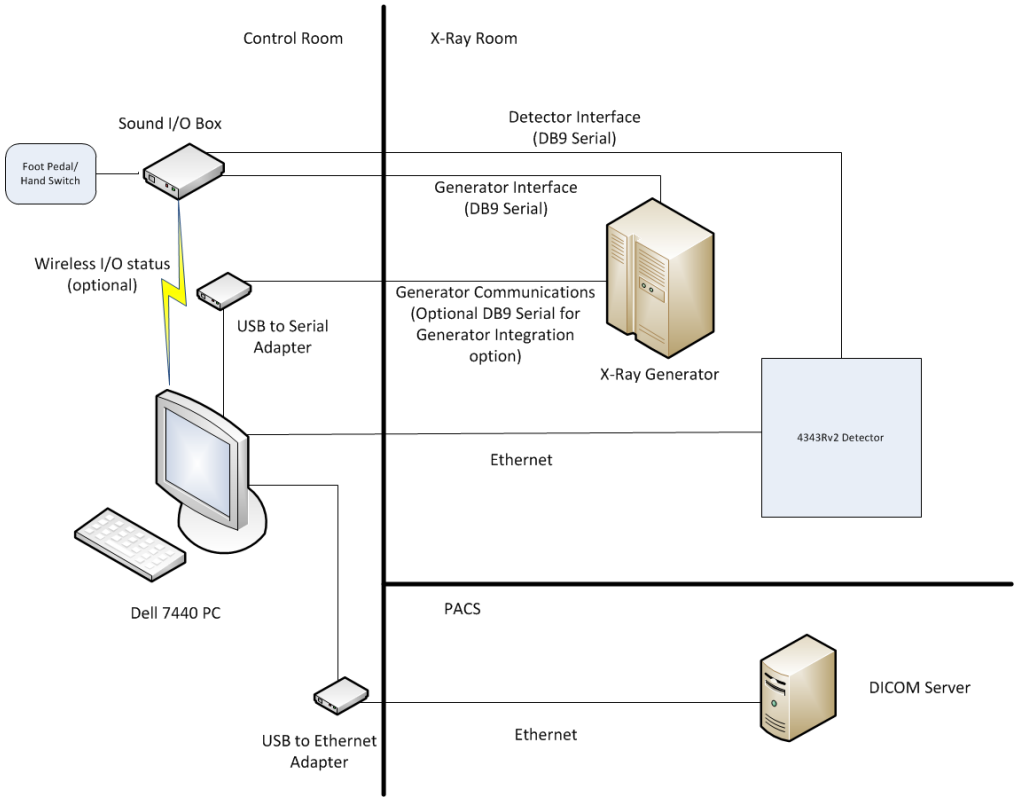


Figure 7: Single PaxScan 4343Rv2 detector with Logic AIO PC

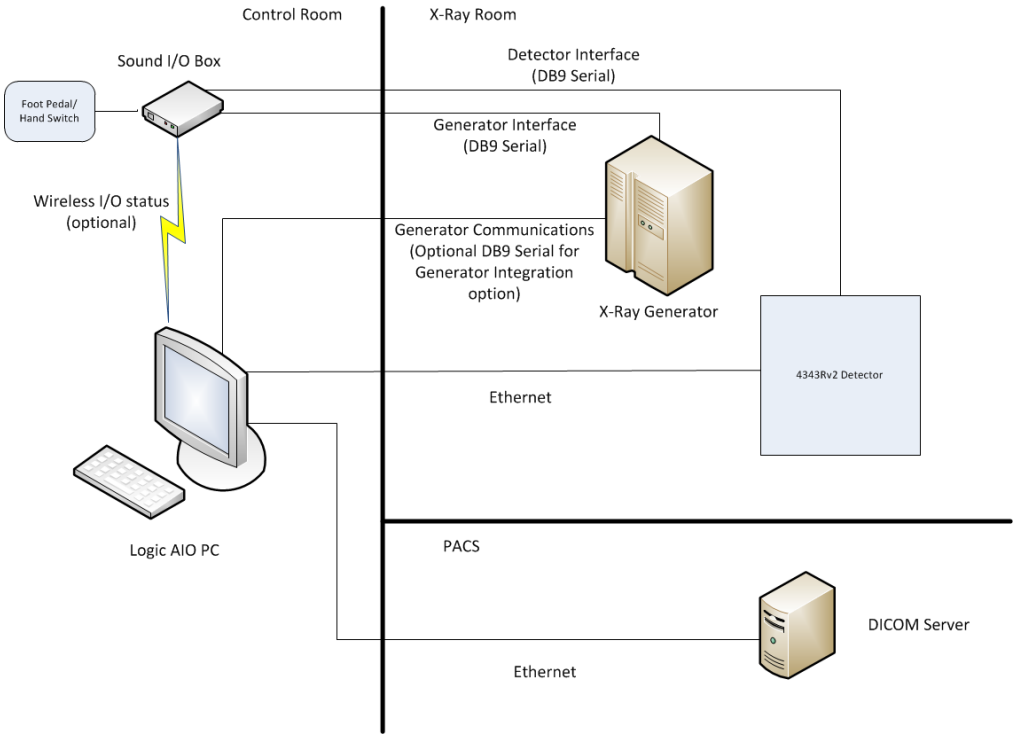


Figure 8: Single PaxScan 4343Rv2 detector with DT524T AIO PC

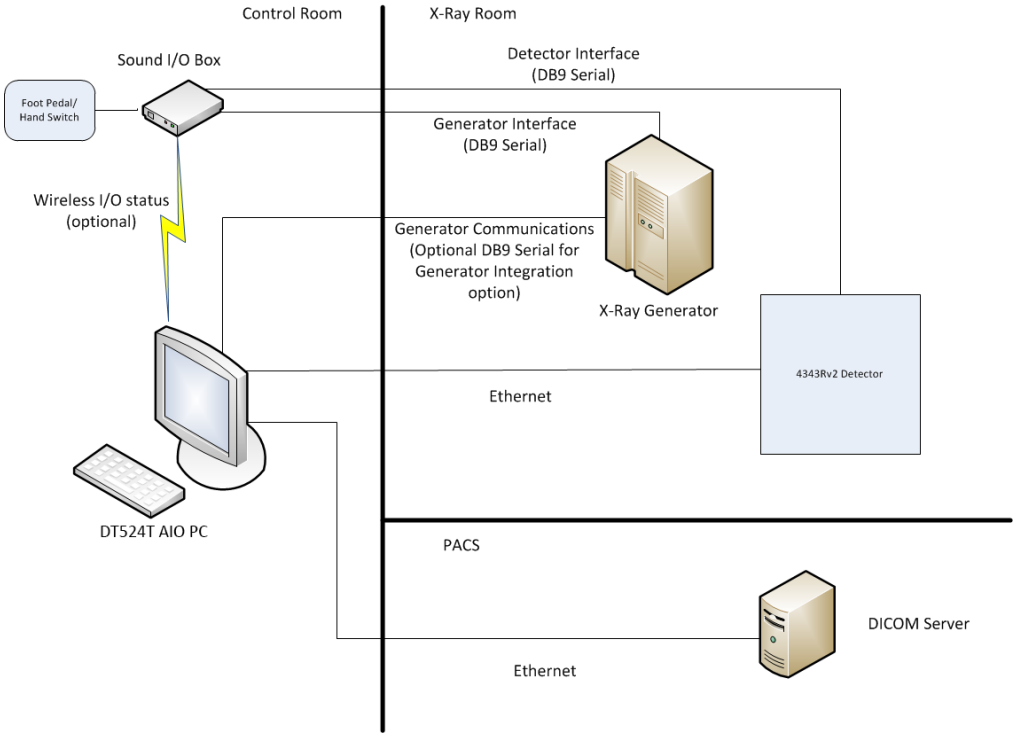


Figure 9: Single PaxScan 4343Rv3 detector with Logic AIO PC

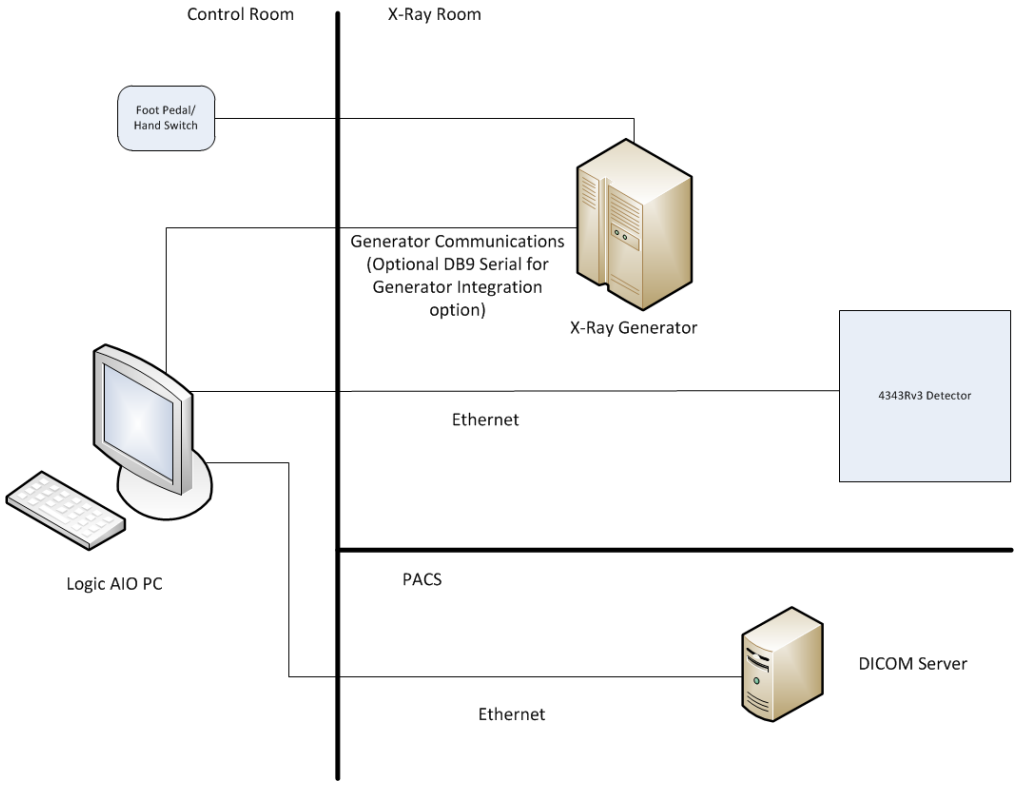


Figure 10: Single PaxScan 4343Rv3 detector with DT524T AIO PC

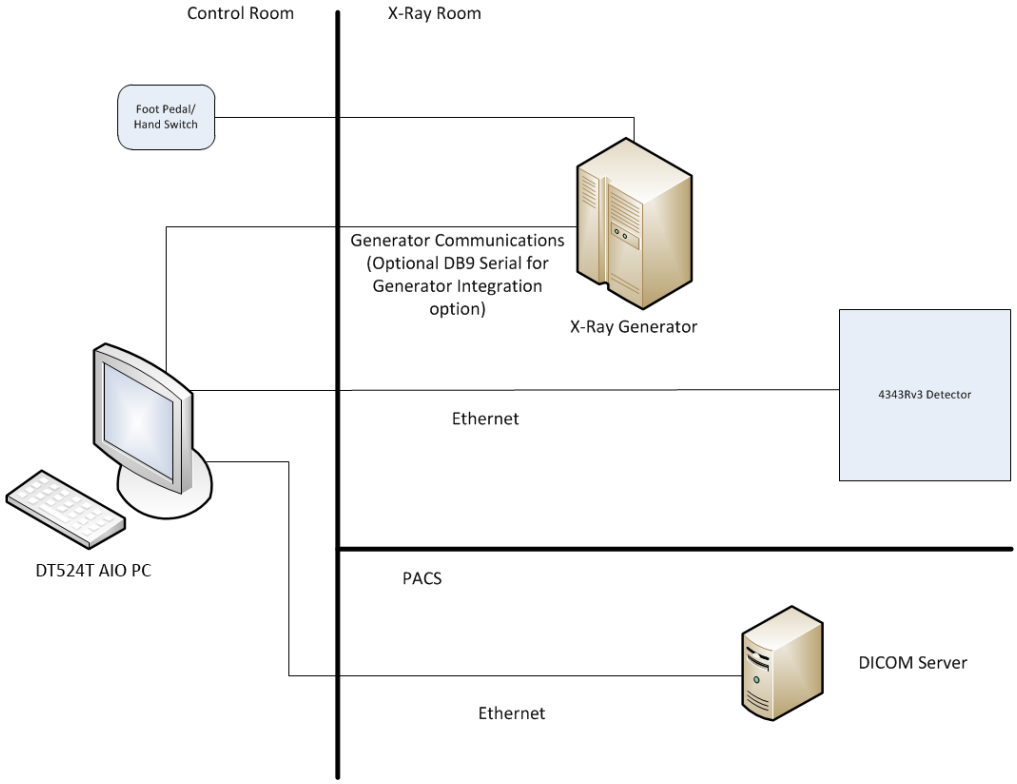


Figure 11: Single PaxScan 4343RC detector with Logic AIO PC

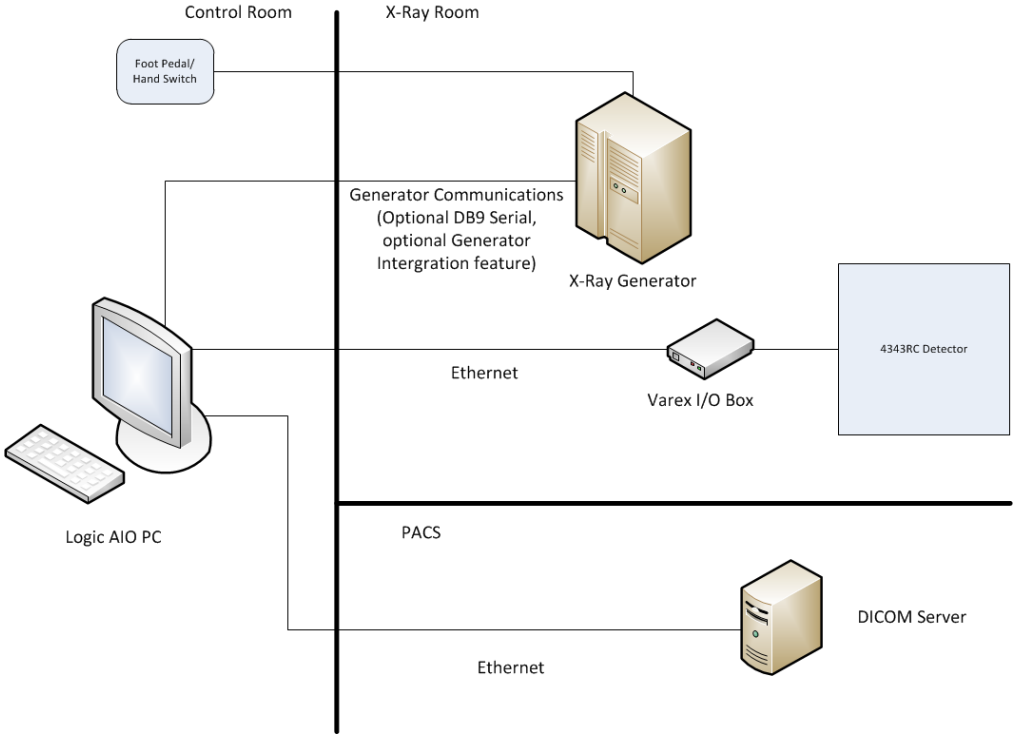
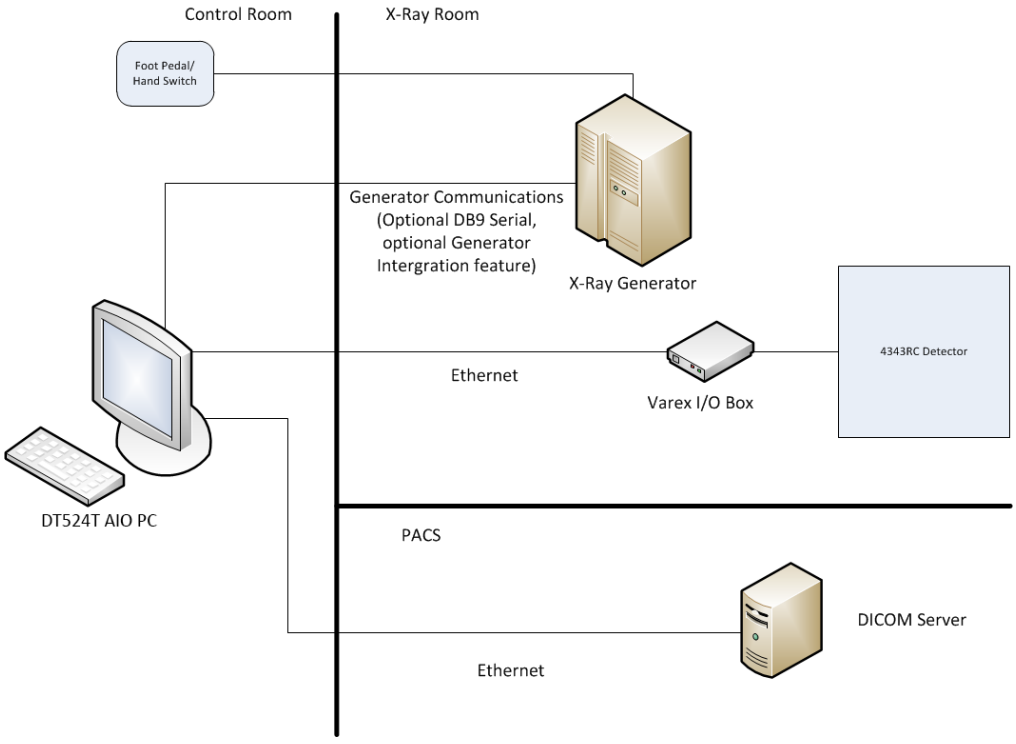


Figure 12: Single PaxScan 4343RC detector with DT524T AIO PC



System overview diagram with PaxScan 4336Wv4 detector

The following diagram shows a high-level overview of the system with a PaxScan 4336Wv4 detector.

Figure 13: Single PaxScan 4336Wv4 detector with Dell 7440 PC

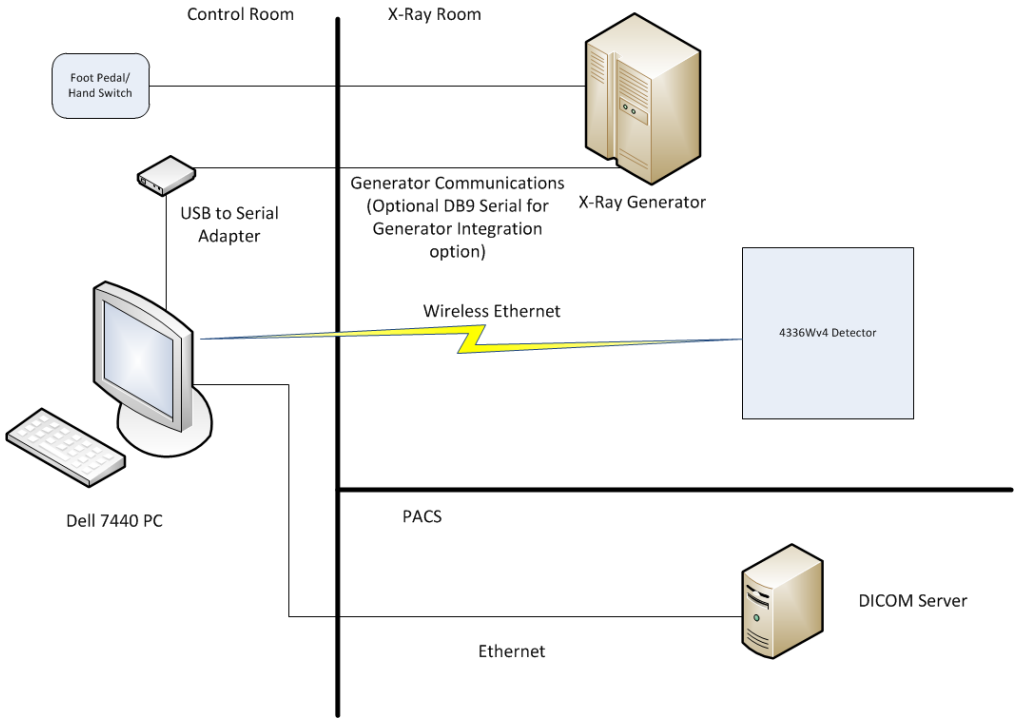


Figure 14: Single PaxScan 4336Wv4 detector with Logic AIO PC

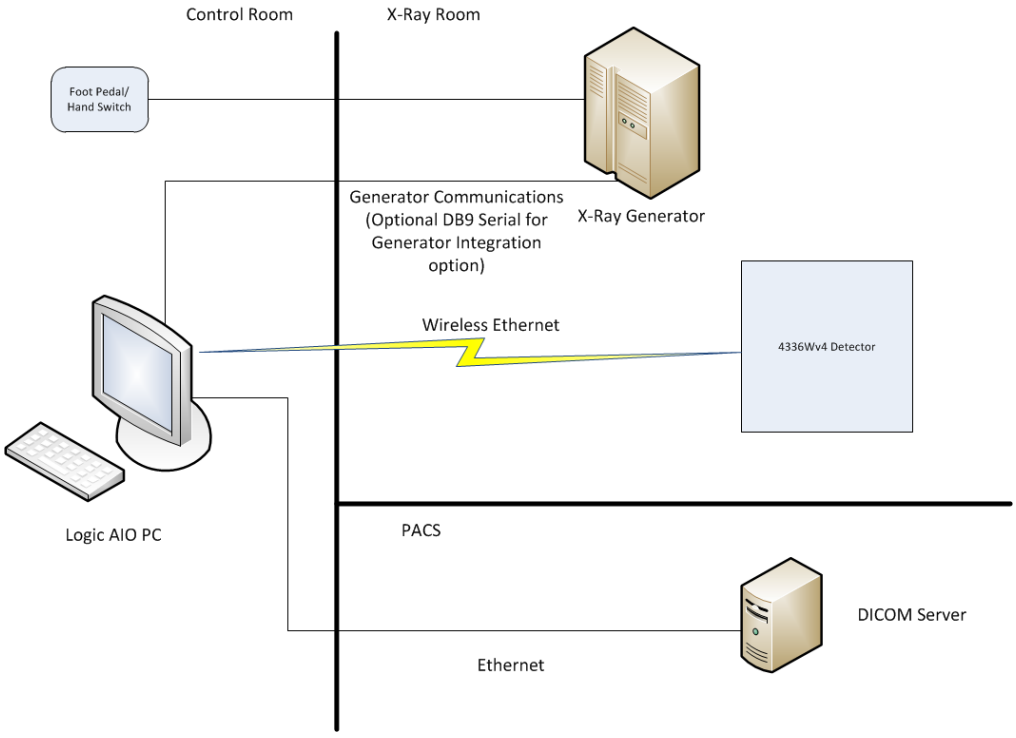
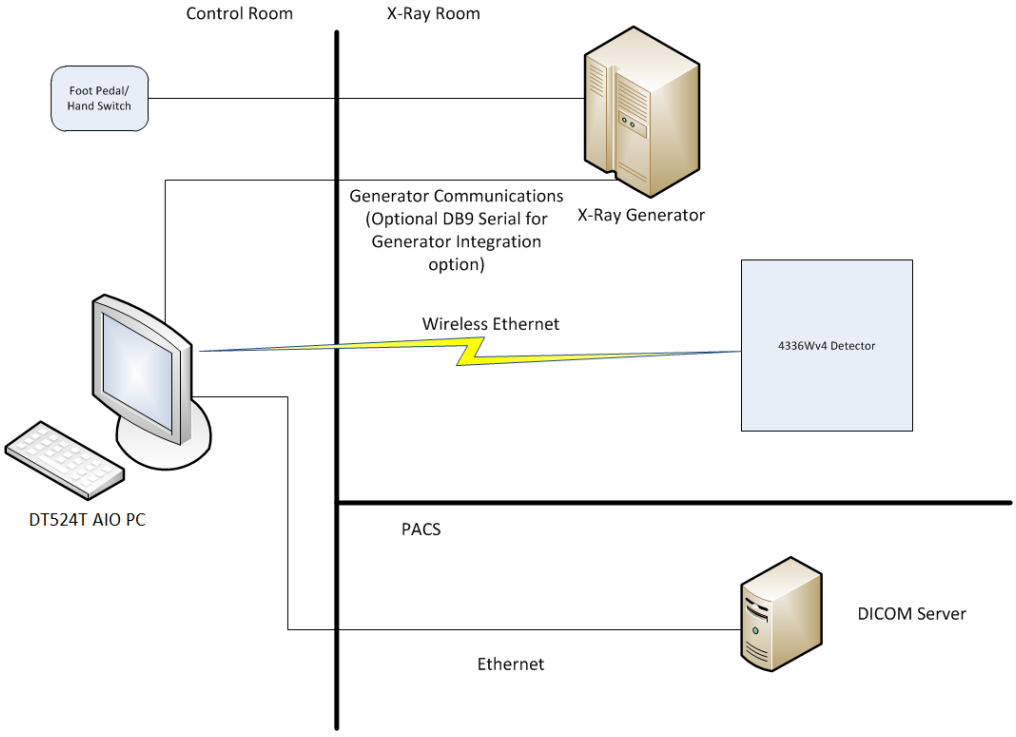


Figure 15: Single PaxScan 4336Wv4 detector with DT524T AIO PC



PaxScan 4336R detector specifications

The following table shows the specifications for the PaxScan 4336R v2 detector.

This topic discusses the specifications of the Varex PaxScan 4336R v3 x-ray detector. The detector has an amorphous silicon digital x-ray imager. It is a portable x-ray flat panel detector designed for mobile digital radiographic x-ray systems. It fits 14 x 17 inch standard Bucky trays (36 x 43 cm). The rugged outer shell has a handle. The detector can be used with or without the outer case.

Table 4: PaxScan 4336R v2 detector specifications

Attribute	Description
Manufacturer	Varex Imaging Corporation
Model	PaxScan 4336R v2
Detector technology (array/scintillator)	aSi TFT
Conversion screen	Direct Deposit CsI, Detached CsI, DRZ +
Weight with cables	8.6 lbs (3.9 kg)
Detector size (v x h x d)	18 in x 15 in x 5.9 in (46 cm x 38.4 cm x 15 cm)
Active area (v x h)	16.8 in x 14 in (42.7 cm x 35.6 cm)
Pixel matrix (v x h)	Total: 2560 px x 3072 px Active: 2540 px x 3052 px
Image size	2540 px x 3052 px
Pixel pitch	139µm
Limiting resolution	3.6 lp/mm
Scan method	Progressive
Data output	Gigabit Ethernet
A/D conversion	14-bit
Cycle time (min./ stand.)	4 / 5 sec.
Exposure control	Inputs: Prepare, Expose-Request Output: Expose-OK
Environment	Operating: 10°-35°C (50°-95°F), 10-90% RH non-condensing Storage: -20°-70°C (-4°-158°F), 10-90% RH non-condensing
Input voltage	100-240 VAC
Input frequency	50 to 60 Hz
Input current	1.5 A
Power dissipation	Cont.: 30 W; Max: 35 W

Figure 16: PaxScan 4336R detector

PaxScan 4343R detector specifications

The following table provides the specifications for the PaxScan 4343R v2 and v3 detector.

Figure 17: PaxScan 4343R detector

Table 5: PaxScan 4343R v2, v3 detector specifications

Attribute	Description
Manufacturer	Varex Imaging Corporation
Model	PaxScan 4343R v2, v3
Receptor type	Amorphous Silicon with PIN technology
Conversion screen	CsI, DRz+
Detector dimensions	18.5 in x 18.5 in x 1.4 in (46.9 cm x 46.9 cm x 3.6 cm)
Weight with cables	DRZ: 13.4 lbs (6.1 kg); CsI: 13.6 lbs (6.2 kg)
Active area (h x v)	16.7 in x 16.7 in (42.4 cm x 42.4 cm)
Pixel area	total: 3072 px x 3072 px; effective: 3052 px x 3052 px
Pixel pitch	139 µm
Limiting resolution	3.6 lp/mm
Cycle time with 550 ms	4.1 sec (RCT)
X-ray window	350 - 4000 ms
Linear dose (maximum)	DRz+:131 µGy; CsI 50 µGy
Noise equivalent dose	DRz+: 324nGy; CsI: 165 nGy
Fill factor	63%
Scan method	Progressive

Attribute	Description
Data output	Gigabit Ethernet
A/D conversion	16-bit
Workstation interface	Ethernet port
Exposure control	Inputs: Expose-Request and Prep; Outputs: Expose-OK
AED:	vTrigger
Power dissipation	14 watts (max)
Power supply/adaptor	9-240 VAC, 47-63 Hz
Temperature range (at back cover)	Operating: 10 deg. C to 40 deg. C (max); Storage: -20deg. C to +70 deg. C
Humidity (non-condensing)	10% to 90%
Regulatory	US: ANSI/AAMI ES 60601-1; Canada: CAN/CSA C22.2 No. 60601-1:08

PaxScan 4343RC detector specifications

The following table provides the specifications for the PaxScan 4343RC detector.

Figure 18: PaxScan 4343RC detector

Table 6: PaxScan 4343RC detector specifications

Attribute	Description
Manufacturer	Varex Imaging Corporation
Model	PaxScan 4343RC
Receptor type	Amorphous Silicon with PIN technology
Conversion screen	CsI, DRz+
Detector dimensions	18.1 in x 18.1 in x 0.6 in (46.0 cm x 46.0 cm x 1.52 cm)
Weight with cables	DRZ: 7.7 lbs (3.5 kg); CsI: 8.3 lbs (3.76kg)
Pixel area (h x v)	total: 16.8 in x 16.8 in (42.7 cm x 42.7 cm); active: 16.7 in x 16.7 in (42.4 cm x 42.4 cm)
Pixel matrix (effective)	3052 px x 3052 px
Pixel pitch	139 µm
Limiting resolution	3.6 lp/mm
Cycle time with 550 ms	3.4 sec
X-ray window	350 - 4000 ms
Linear dose (maximum)	DRz+:132 µGy; CsI 59 µGy
Noise equivalent dose	DRz+: 367 nGy; CsI: 179 nGy
Energy range	40-150 kVp
Fill factor	63%

Attribute	Description
Scan method	Progressive
Data output	Gigabit Ethernet
A/D conversion	16-bit
Workstation interface	Ethernet port
Exposure control	Inputs: Expose-Request and Prep; Outputs: Expose-OK
AED:	vTrigger
Power dissipation	14 watts (max)
Power supply/adaptor	9-240 VAC, 47-63 Hz
Temperature range (at back cover)	Operating: 10 deg. C to 40 deg. C (max); Storage: -20 deg. C to +70 deg. C
Humidity (non-condensing)	10% to 90%
Regulatory	US: ANSI/AAMI ES 60601-1; Canada: CAN/CSA C22.2 No. 60601-1:08

PaxScan 4336Wv4 detector specifications

Review the specifications for the detector before installing, configuring, or using the detector.

Figure 19: PaxScan 4336Wv4

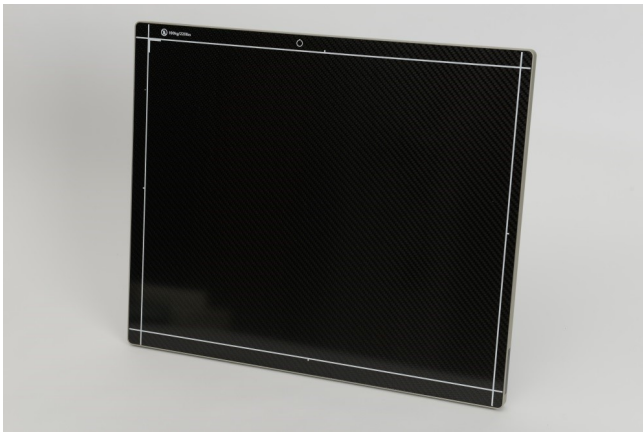


Table 7: Specifications of the PaxScan 4336Wv4 X-ray detector

Characteristics	Specifications
Receptor type	Amorphous silicon with TFT PIN diode technology
Technology (panel converter)	CsI, DRZ+
Detector size	46 x 38 x 1.5 cm (18 x 15 x .6 in)
Detector weight (with battery)	DRZ+: 3.6 kg 7.9 lbs ± 0.25 kg, 0.55 lbs. CsI: 3.8 kg (8.4 lbs.) ± 0.25 kg (0.55 lbs)
Housing material	Aluminum/Magnesium
Sensor protection material	Carbon fiber plate
Weight limit	Uniform load across carbon surface: 150 kg (330 lbs.) Concentrated 40 mm (1.6 in) diameter load at center of imager: 100 kg (220 lbs.)
Active area (h x v)	DRZ+: 42.4 x 34.1 cm (16.7 x 13.4 in) () CsI: 42.4 x 33.9 cm (16.6 x 13.3 in) ()
Pixel matrix (active)	DRZ+ 2456 (h) x 3052 (v) pixels CsI: 2436 (h) x 3032 (v) pixels
Pixel pitch	139 µm
Limiting resolution	3.6 lp/mm
Cycle time @ 550 ms	7 sec (MSR2, RCT)

Characteristics	Specifications
X-ray window	350 – 3500 ms
Dose range — Maximum linear dose	DRZ+: 100 µGy CsI: 69 µGy
Dose range— NED	DRZ+: 0.65 µGy () CsI: 0.4 µGy
Fill factor	60%
Scan method	Progressive
Data output	Wireless
A/D conversion	16 bits
Exposure control	Inputs: Prepare, Expose-Request Outputs: Expose-OK
Minimum signal strength required	->80 dBm (or no image acquired)
Wireless	802.11 a/b/g/n/ac 2 x 2 MIMO Wireless modes: STA or AP

Table 8: PaxScan 4336Wv4 power specifications

Characteristics	Specifications
Power, energy rating	Standard, 40 – 150kVp
Power consumption	Idle: 3.3 Watts Acquisition: 7.8 Watts Image Transfer: 10.2 Watts

Table 9: PaxScan 4336Wv4 power specifications

Characteristics	Specifications
Battery charge capability	1000 images over 6 hrs
Battery life (expected)	300 cycles of charge/discharge
Battery weight	0.66 lbs; 0.3 kg

Table 10: RF Power Output (PS4336Wv4, 802.11a mode)

Operating Ch.	e.i.r.p. Limit (dBm)	Ch0 (dBm)	Ch1 (dBm)	Max Power (dBm)	e.i.r.p. Power (dBm)	Margin (dBm)
802.11a mode for module						
5180.00	22.48	16.96	15.78	17.06	19.96	2.52
5200.00	22.48	16.27	15.64	17.06	19.27	3.21
5240.00	22.48	17.06	15.48	17.06	20.06	2.42
802.11a mode for module inside receptor						
5180.00	22.48	16.07	15.78	16.07	19.07	3.41
5200.00	22.48	16.27	15.64	16.27	19.27	3.21
5240.00	22.48	16.20	15.48	16.20	19.20	3.28

Conditions:

- Antenna type: Patch
- Max. Direction Gain: +3 dBi (5.2 GHz)
- Beam Forming Gain: +6 dBi (5.2 GHz)
- Signal state: Modulated at 100%
- Ambient temperature: 24 degrees C
- Relative humidity: 39%

Notes:

1. Highest output power observed at 802.11a mode, 6.0 Mbps, 1 data stream.
2. The measured emission bandwidth for 802.11a is 17.71 MHz. The calculated output power limit is 22.48 dBm.
3. The power levels at Ch0 were adjusted to SAR valuation when module installed inside the PS4336Wv4.

Table 11: RF Power Output (PS4336Wv4. 802.11n mode)

Operating Ch	e.i.r.p. Limit (dBm)	Ch0 (dBm)	Ch1 (dBm)	Max Power (dBm)	e.i.r.p. Power (dBm)	Margin (dBm)
802.11n mode for module						
5180.00	22.69	16.93	15.81	16.93	19.93	2.76
5200.00	22.69	17.40	15.55	17.40	20.40	2.29
5240.00	22.69	17.51	15.97	17.51	20.51	2.18
802.11n mode for module inside receptor						
5180.00	22.69	16.18	15.81	16.18	19.18	3.51
5200.00	22.69	16.32	15.55	16.32	19.32	3.37

Operating Ch	e.i.r.p. Limit (dBm)	Ch0 (dBm)	Ch1 (dBm)	Max Power (dBm)	e.i.r.p. Power (dBm)	Margin (dBm)
5240.00	22.69	16.28	15.97	16.28	19.28	3.41

Conditions:

- Antenna type: Patch
- Max. Direction Gain: +3 dBi (5.2 GHz)
- Beam Forming Gain: +6 dBi (5.2 GHz)
- Signal state: Modulated at 100%
- Ambient temperature: 24 degrees C
- Relative humidity: 39%

Notes:

1. Highest output power observed at HT20 MCSO, 1 data stream.
2. The measured emission bandwidth for 802.11n HT20 MCSO is 18.59 MHz. The calculated output power limit is 22.69 dBm.
3. The power levels at Ch0 were adjusted to SAR valuation when module installed inside the PS4336Wv4.

Table 12: RF Power Output (PS4336Wv4, 802.11n 2x2 mode)

Operating Ch	e.i.r.p. Limit (dBm)	Ch0 (dBm)	Ch1 (dBm)	Max Power (dBm)	e.i.r.p. Power (dBm)	Margin (dBm)
5180.00	22.53	11.33	10.31	13.86	19.86	2.67
5200.00	22.53	11.58	10.63	14.14	20.14	2.39
5240.00	22.53	11.68	10.75	14.23	20.23	2.30

Conditions:

- Antenna type: Patch
- Max. Direction Gain: +3 dBi (5.2 GHz)
- Beam Forming Gain: +6 dBi (5.2 GHz)
- Signal state: Modulated at 100%
- Ambient temperature: 24 degrees C
- Relative humidity: 39%

Notes:

1. Highest output power observed at HT20 MCSO, 2 data streams.
2. The measured emission bandwidth for 802.11n HT20 MCSO is 17.91 MHz. The calculated output power limit is 22.53 dBm.
3. Beam forming antenna gain is less than 6dBi; therefore no adjustment to power limit.

Table 13: RF Power Output (PS4336Wv4, 802.11ac mode)

Operating Ch	e.i.r.p. Limit (dBm)	Ch0 (dBm)	Ch1 (dBm)	Max Power (dBm)	e.i.r.p. Power (dBm)	Margin (dBm)
802.11ac mode for module						
5180.00	22.74	17.19	16.09	17.19	20.19	2.55
5200.00	22.74	17.81	15.73	17.81	20.81	1.93
5240.00	22.74	17.19	16.43	17.19	20.19	2.55
802.11ac mode for module inside receptor						
5180.00	22.74	16.21	16.09	16.21	19.21	3.53
5200.00	22.74	16.42	15.73	16.42	19.42	3.32
5240.00	22.74	16.18	16.43	16.43	19.43	3.31

Conditions:

- Antenna type: Patch
- Max. Direction Gain: +3 dBi (5.2 GHz)
- Beam Forming Gain: +6 dBi (5.2 GHz)
- Signal state: Modulated at 100%
- Ambient temperature: 24 degrees C
- Relative humidity: 39%

Notes:

1. Highest output power observed at VHT20 Nss2 MCSO, 1 data stream.
2. The measured emission bandwidth for 802.11ac VHT20 Nss2 MCSO, is 17.92 MHz. The calculated output power limit is 22.53 dBm.
3. The power levels at Ch0 were adjusted to SAR valuation when module installed inside the PS4336Wv4.

Table 14: RF Power Output (PS4336Wv4, 802.11ac 2x2 mode)

Operating Ch	e.i.r.p. Limit (dBm)	Ch0 (dBm)	Ch1 (dBm)	Max Power (dBm)	e.i.r.p. Power (dBm)	Margin (dBm)
5180.00	22.53	11.87	10.47	14.24	20.24	2.29
5200.00	22.53	12.07	10.50	14.37	20.37	2.16
5240.00	22.53	11.74	11.38	14.57	20.57	1.96

Conditions:

- Antenna type: Patch
- Max. Direction Gain: +3 dBi (5.2 GHz)
- Beam Forming Gain: +6 dBi (5.2 GHz)

- Signal state: Modulated at 100%
- Ambient temperature: 24 degrees C
- Relative humidity: 39%

Notes:

1. Highest output power observed at VHT20 Nss2 MCSO, 2 data streams.
2. The measured emission bandwidth for 802.11ac VHT20 Nss2 MCSO, is 17.92 MHz. The calculated output power limit is 22.53 dBm.
3. Beam forming antenna gain is less than 6dBi; therefore no adjustment to power limit.

Regulatory compliances

The following regulatory compliances also apply:

- US: UL 60601-1
- Canada: CSA 22.2 No. 601.1-M90
- Electromagnetic Capability: IEC60601-1.2

Remove a battery from the PaxScan 4336Wv4 detector

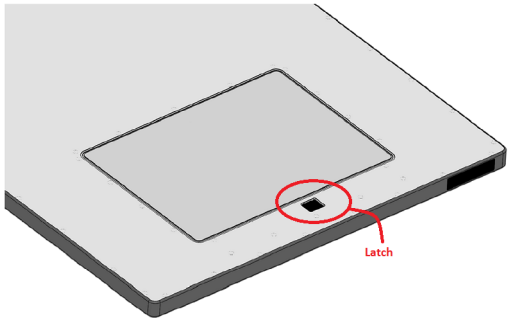
The PaxScan 4336Wv4 flat panel detector is a wireless detector powered by a battery. The flat panel detector in powered when you insert a charged battery into the battery compartment.

About this task

This topic describes how to remove a battery.

Remove battery

Figure 20: PaxScan 4336Wv4 battery compartment and latch



Procedure

1. Locate the battery compartment, on the rear of the panel.
2. Slide the battery latch to the side, which lifts out one side of the battery.
3. Lift out and remove the battery.

Install a battery into the PaxScan 4336Wv4 detector

The PaxScan 4336Wv4 flat panel detector is a wireless detector powered by a battery. The flat panel detector in powered when you insert a charged battery into the battery compartment.

About this task

This topic describes how to install a charged battery.

Remove battery

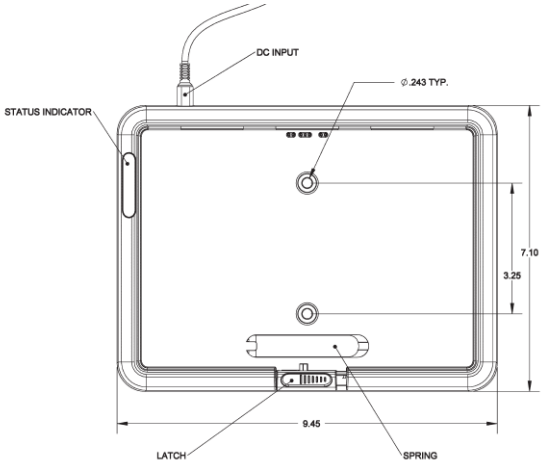
Figure 21: PaxScan 4336Wv4 battery compartment and latch

Procedure

1. Insert a charged battery at a slight angle so that the side with contacts sits over the adjoining contacts in the battery compartment.
2. Press down on the lifted side of the battery, snapping it into place in the compartment. The panel automatically powers up once the battery is installed.
3. Allow up to 90 seconds for the detector to initialize and connect to the wireless network.

Charge the battery (single bay charger)

Follow this procedure to charge the Varex batteries with a Varex single-bay charger.



Procedure

1. Insert the battery into the battery compartment of the charger. The battery compartment is mechanically keyed for easy installation.
2. Monitor the LED status indicators to track the charging process. The battery is fully charged when all four green LEDs are continuously illuminated and the red LED is off. The battery retains its full charge whether you remove it or leave it in the charger. Charging usually requires between 2.5 and 3.5 hours.

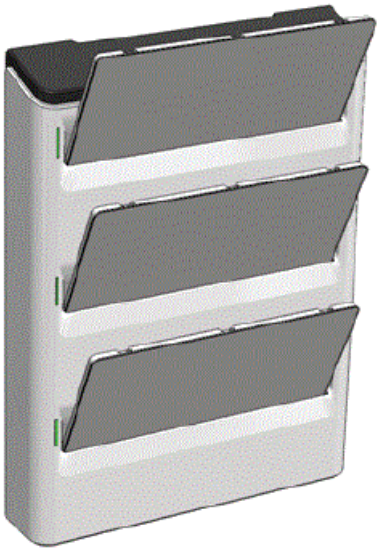
3. When lit, the red LED indicates a fault in the charging process. Do not use the battery if the red LED displays during the charging process. The figure below provides information about the status indicators. Contact technical support for help with status indicators.

Description	Green LEDs	Red LED	Example
Battery Charging Normally – up to 25%	1 – On – Blinking 2 – Off 3 – Off 4 – Off	Off	
Battery Charging Normally – 26% to 50%	1 – On – Continuously 2 – On – Blinking 3 – Off 4 – Off	Off	
Battery Charging Normally – 51% to 75%	1 – On – Continuously 2 – On – Continuously 3 – On – Blinking 4 – Off	Off	
Battery Charging Normally – 76% to 99%	1 – On – Continuously 2 – On – Continuously 3 – On – Continuously 4 – On – Blinking	Off	
Battery Charging Normally – Fully Charged	1 – On – Continuously 2 – On – Continuously 3 – On – Continuously 4 – On – Continuously	Off	
Fault – No Charge Current accepted or Battery Voltage too high	1 – On – Blinking 2 – Off 3 – Off 4 – Off	On	
Fault – Battery Over-discharged cannot wakeup in less than 210 seconds	1 – On – Blinking 2 – On – Blinking 3 – Off 4 – Off	On	
Fault – Battery exceeds allowable charge time	1 – On – Blinking 2 – On – Blinking 3 – On – Blinking 4 – Off	On	
Fault – Battery ID does not match V4336W or non-recoverable over-discharged battery	1 – On – Blinking 2 – On – Blinking 3 – On – Blinking 4 – On – Blinking	On	
Fault – Battery Temperature either too high or too low	1 – Off 2 – Off 3 – Off 4 – Off	On	
Fault – SMBus between the charger and battery is not operating properly	1 – On – Blinking 2 – Off 3 – On – Blinking 4 – Off	On	
Fault – Battery Permanent Fault	1 – Off 2 – On – Blinking 3 – Off 4 – On – Blinking	On	

Do not use the battery if a fault indication displays.

Charge the battery (3-bay charger)

Follow this procedure to charge the Varex batteries with a Varex 3-bay charger.



Procedure

1. Hold the battery on the opposite the contacts, with the contacts facing the charger.
2. Gently slide the battery into the battery compartment of the charger. When inserted correctly, the light next to the slot displays the charge status of the battery: orange indicates charging, green indicates charge complete, and red indicates a charging fault.

   Do not use the battery if a fault indication displays.

Dell OptiPlex 9020 Desktop PC

The Dell OptiPlex 9020 Small Form Factor (SFF) is desktop PC. Use with the Dell P2314T touchscreen monitor. For use in systems employing the PaxScan 4336R and, 4343R detector panels.

The PC contains the following components:

- Intel i5-3550S 3.00GHz CPU
- 8GB RAM
- 250 GB HD
- 4 USB 3.0 ports (2 rear, 2 front)
- 6 USB 2.0 ports (4 rear, 2 front)
- 2 DisplayPort connectors, 1 VGA connector

- power cord

Figure 22: Dell OptiPlex 9020 desktop PC

A wired keyboard and mouse are included with the PC. The use of the physical keyboard and mouse is optional. The computer displays an on-screen keyboard whenever you open a screen where text can be entered, or when you touch an area of the screen where text can be entered. Use with the Dell P2314T touchscreen monitor.

The following technical specifications apply.

Table 15: Specifications: Dell OptiPlex 9020 desktop PC

Parameter	Value
Processor	Intel Core i5-3550S
Memory type	DDR3
Memory capacity	8 GB
Video controller (integrated)	Integrated Intel HD graphics
Video memory	shared memory
Network adapter	Intel 10/100/1000 Mbps RJ-45 Ethernet
Serial port	9-pin connect; 16550 C compatible
Hard drive	250 GB SATA drive
DVD drive	slim optical drive bay

Parameter	Value
USB 2.0 ports	2 front, 4 rear
USB 3.0 ports	2 front, 2 rear
Video port	2 20-pin DisplayPort connectors, one 15-pin VGA connector
Power Supply	255 Watt
Frequency	50 Hz - 60 Hz
Voltage	100 VAC - 240 VAC
Input current	4.6 A
Dimensions	3.66 in (w) x 11.42 in. (h) x 12.28 in. (d); 93 mm (w) x 290 mm (h) x 312 mm (d)
Weight	13.22 lbs (6 kgs)
Operating temperature	41 degrees F to 95 degrees F (5 degrees C to 35 degrees C)
Storage temperature	-40 degrees F to 149 degrees F (-40 degrees C to 65 degrees C)
Humidity (operating, max.)	20% to 80% (non-condensing)
Humidity (storage, max.)	5% to 95% (non-condensing)

Points of Connection

The follow figure shows the ports on the Dell 9020 PC. You will use these ports to connect the PC to the Sound SMART DR™ system.

Figure 23: Dell 9020 Desktop, Points of Connection

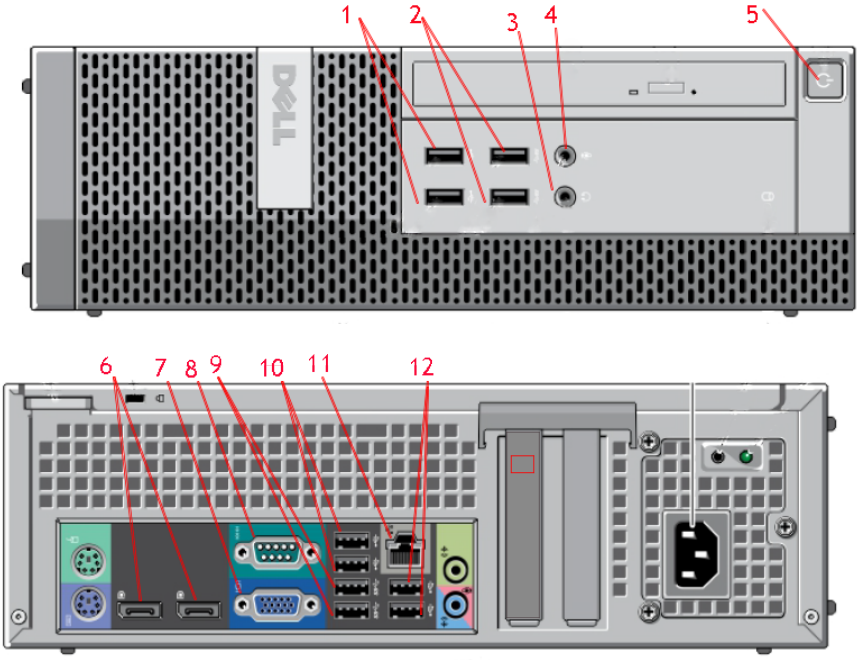


Table 16: Dell 9020 Desktop, Points of Connection

Item	Description
1	USB 2.0 connectors
2	USB 3.0 connectors
3	Microphone connector
4	Headphone connector
5	Power button
6	DisplayPort connectors (2)
7	VGA connector
8	Serial connector
9	USB 3.0 connectors (2)
10	USB 2.0 connectors (2)
11	Network/LAN connection
12	USB 2.0 connectors (2)

Dell OptiPlex 7050 Desktop PC

The Dell OptiPlex 7050 Small Form Factor (SFF) is a desktop PC. Use with the Dell P2314T touchscreen monitor. For use in systems employing the PaxScan 4336Rv1 and 4343Rv1 detectors.

The PC contains the following components:

- Intel i5-7500 processor
- 8GB 2400MHz DDR4 memory
- 500 GB HD
- 6 USB 3.1 ports (2 rear, 4 front)
- 4 USB 2.0 ports (2 rear, 2 front)
- 2 DisplayPort connectors, 1 serial connector, 1 HDMI port
- power cord

Figure 24: Dell OptiPlex 7050 desktop PC

A wired keyboard and mouse are included with the PC. The use of the physical keyboard and mouse is optional. The computer displays an on-screen keyboard whenever you open a screen where text can be entered, or when you touch an area of the screen where text can be entered. Use with the Dell P2314T touchscreen monitor.

The following technical specifications apply.

Table 17: Specifications: Dell OptiPlex 7050 desktop PC

Parameter	Value
Processor	Intel Core i5-7050
Memory type	DDR4
Memory capacity	8 GB
Video controller (integrated)	CPU-GPU combination
Network adapter	Intel i219 Gigabit Ethernet LAN 10/100/1000
Serial port	9-pin connect; 16550 C compatible
Hard drive	500GB SATA drive
DVD drive	slim optical drive bay
USB 2.0 ports	2 front, 2 rear
USB 3.1 ports	4 front, 2 rear
Video ports	2 20-pin DisplayPort connectors, 1 HDMI
Power Supply	180 Watt
Frequency	47 Hz - 63 Hz
Voltage	90 VAC - 264 VAC
Input current	3 A / 1.5 A
Dimensions	3.65 in (w) x 11.42 in. (h) x 11.50 in. (d); 93 mm (w) x 290 mm (h) x 292 mm (d)
Weight	11.42 lbs (5.14 kgs)
Operating temperature	32 degrees F to 95 degrees F (0 degrees C to 35 degrees C)
Storage temperature	-40 degrees F to 149 degrees F (-40 degrees C to 65 degrees C)
Humidity (operating, max.)	10% to 90% (non-condensing)
Humidity (storage, max.)	5% to 95% (non-condensing)

Points of Connection

The follow figure shows the ports on the Dell 7050 PC. You will use these ports to connect the PC to the Sound SMART DR™ system.

Figure 25: Dell 7050 Desktop, Points of Connection

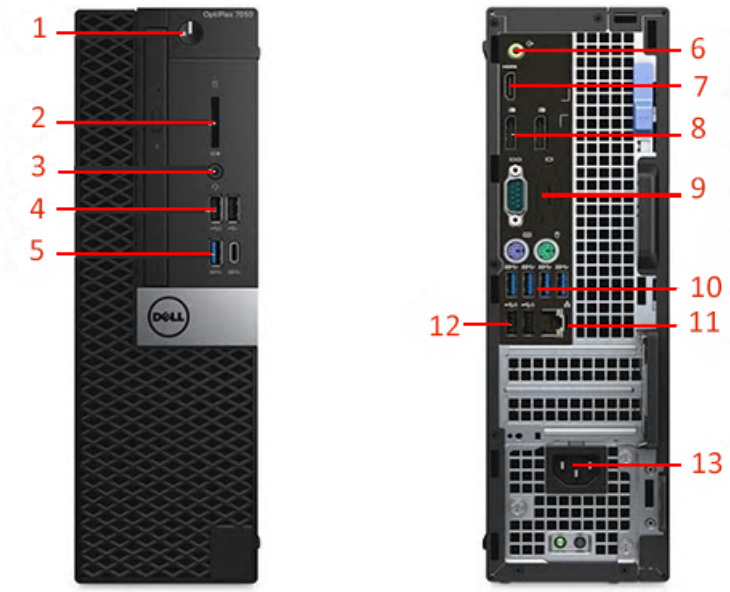


Table 18: Dell 7050 Desktop, Points of Connection

Item	Description
1	Power button
2	SD Media Cart slot
3	Universal audio jack
4	USB 2.0 ports
5	USB 3.1 ports
6	Line out
7	HDMI port
8	DisplayPort connectors
9	Accessory port
10	USB 3.1 ports
11	Network/LAN connection
12	USB 2.0 ports
13	Power supply connection

Dell OptiPlex 7440 All-in-One PC

The Dell OptiPlex 7440 is 24-inch all-in-one PC with a touchscreen interface. Use the Dell 7440 AIO in systems employing the PaxScan 4336Wv4 panel.

The PC contains the following components:

- Intel i5-6500 Processor
- 3.2 GHz CPU
- 8GB RAM
- 500 GB HD
- 6 USB 3.0 ports (2 side, 4 rear)
- 2 USB 2.0 ports (rear)
- 1 HDMI 1.4 (in/out_ port
- 1 DisplayPort 1.2
- Intel Dual Band Wireless 8260 (802.11ac) + Bluetooth
- power cord

Figure 26: Dell OptiPlex 7440 touchscreen PC with optional mouse and keyboard

A wireless keyboard and mouse are included with the PC. The use of the physical keyboard and mouse is optional. The computer displays an on-screen keyboard whenever you open a screen where text can be entered, or when you touch an area of the screen where text can be entered.

The following technical specifications apply.

Table 19: Specifications: Dell OptiPlex 7440 All-in-One PC

Parameter	Value
Processor	Intel Core i5-6500
Chipset	Intel Q170

Parameter	Value
Memory type	unbuffered non-ECC, dual-channel DDR4 2213 configuration
Memory capacity	8 GB
Video controller (integrated)	Integrated Intel HD graphics (Gen 9 Gfx), 2 GB GDDR5 for dGPU
Video memory	shared memory
External display	Display port, HDMI in and HDMI out
Network adapter	Intel 10/100/1000 Mbps RJ-45 Ethernet
Wireless	Intel dual band wireless 8260 (802.11ac) + Bluetooth
Display type	23.8 in., FHD and UHD (4K0
Maximum resolution	3840 x 2160
Refresh rate	60 Hz
Operating angle	178 horizontal/178 vertical
Pixel pitch	0.2475 mm
Hard drive	2.5 in. SATA drive
DVD drive	8X Slimline DVD +/-RW
USB 2.0 ports	2 rear
USB 3.0 ports	2 side, 4 rear
USB port with PowerShare	1 side USB 3.0
Video port	one display port
HDMI port	one 19-pin input port/one 19-pin output port
Media card reader	one 4-in-1 slot
Power Supply	155 Watt for UMA, 200 Watt dGPU and UHD (4K)
Frequency	47 Hz - 63 Hz
Voltage	90 VAC - 264 VAC
Input current	2.6 A max. (low AC range); 1.3 A max. (high AC range)
Camera - image resolution	2.0 megapixel
Camera - video resolution	FHD (1080 p)
Stand	Tilt: -5 degrees to 30 degrees

Parameter	Value
Dimensions	22.65 in (w) x 15.47 in. (h) x 2.47 in. (d); 575. 24 mm (w) x 392.90 mm (h) x 62.79 mm (d)
Weight with stand	24.25 lbs (11 kgs)
Operating temperature	32 degrees F to 95 degrees F (0 degrees C to 35 degrees C)
Storage temperature	-40 degrees F to 149 degrees F (-40 degrees C to 65 degrees C)
Humidity (operating, max.)	20% to 80% (non-condensing)
Humidity (storage, max.)	20% to 80% (non-condensing)

Ports

The follow figure shows the ports on the Dell 7440 All-in-One PC. You will use these ports to connect the PC to the Sound SMART DR™ system.

Figure 27: Dell 7440 AIO, Points of Connection

Table 20: Dell 7440 AIO, Points of Connection

Item	Description
1	Memory card reader
2	USB 3.0 connector
3	USB 3.0 connector with PowerShare
4	Headset connector
5	DisplayPort connector
6	HDMI out connector

Item	Description
7	USB 3.0 connectors (4)
8	HDMI in connector
9	USB 2.0 connectors (2)
10	Network connection
11	Input power connection

Logic All-in-One (AIO) PC

The Logic All-in-One is a 21.5-inch touch panel PC. For use in systems employing the PaxScan 4336Wv4, 4336Rv2, 4343Rv2, 4343Rv3, and 4343RC detectors.

The PC contains the following components:

- Intel Core i5-6300U processor
- 8GB DDR4 memory
- 500 GB HD
- 4 USB 3.0 ports
- 1 USB 2.0 port
- 1 VGA port, 1 DVI-D port, 2 GbE LAN ports, 6 COM ports
- power supply

Figure 28: Logic All-in-One PC

The Logic AIO comes with an integrated touchscreen monitor. The computer displays an on-screen keyboard whenever you open a screen where text can be entered, or when you touch an area of the screen where text can be entered.

The following technical specifications apply.

Table 21: Specifications: Logic AIO PC

Parameter	Value
Display type	LCD
Display size	21.5" (16:9)
Brightness (cd/m2)	300
Contrast ratio	5000:1
LCD colors	16.7M
Pixel pitch (mm)	0.24825 (h) x 024825 (v)
Viewing angle (h/v)	178/178

Parameter	Value
Backlight MTBF	50,000 hrs (LED backlight)
Processor	Intel Core i5-6300U
Memory type	DDR4
Memory capacity	8 GB
Graphics	Intel HD Graphics 520
Network adapter	Intel i219 Gigabit Ethernet LAN 10/100/1000
Hard drive	512GB SATA drive
DVD drive	slim optical drive bay
USB 2.0 ports	1
USB 3.0 ports	4
Video ports	2 20-pin DisplayPort connectors, 1 HDMI
Input Voltage	9~48VDC
Dimensions	21.65 in (w) x 13.01 in. (h) x 3.48 in. (d); 550 mm (w) x 330.5 mm (h) x 88.5 mm (d)
Weight	18.7 lbs (8.48 kgs)
Operating temperature	32 degrees F to 140 degrees F (0 degrees C to 60 degrees C)
Storage temperature	-4 degrees F to 140 degrees F (-20 degrees C to 60 degrees C)
Humidity	20% to 80% (non-condensing)

Points of Connection

The follow figure shows the ports on the Logic AIO PC. You will use these ports to connect the PC to the Sound SMART DR™ system.

Figure 29: Logic AIO PC, Points of Connection

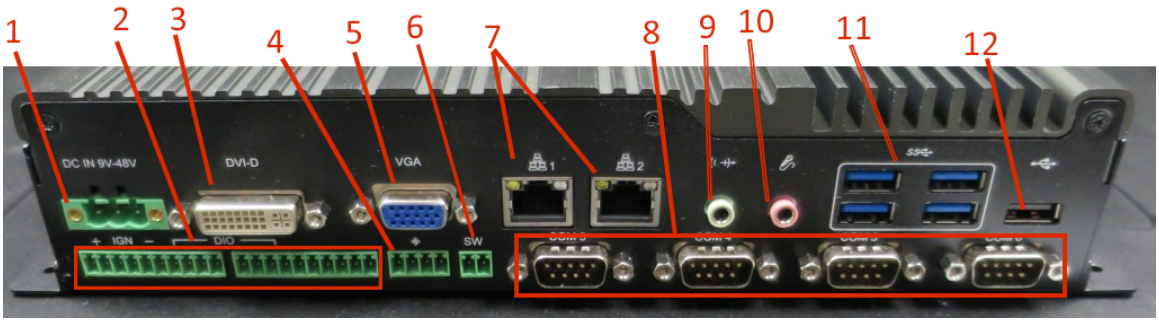


Table 22: Logic AIO PC, Points of Connection

Item	Description
1	DC input
2	Digital I/O terminal block
3	DVI-D port. Used to connect to a monitor with digital signal interface.
4	Fan power terminal block
5	VGA port
6	Connection to remote power on/off switch
7	LAN 1, LAN 2
8	COM ports for connection to serial devices
9	Line-out for connection to external speakers
10	Connection to microphone
11	USB 3.0 ports
12	USB 2.0 port

DT524T All-in-One PC

The 524T medical grade all-in-one system integrates a 24-inch TFT-LCD with an energy efficient Intel® Core™ i platform in a fanless, slim, bacteria-resistant enclosure. Designed for medical and healthcare applications, this LCD-integrated system provides space-saving solutions for health professionals to monitor, record and retrieve patient information as well as other point-of-care applications. The built-in Wi-Fi and Bluetooth connections also make data access efficient and optimizes staff workflow.

Features

Figure 30: DT524T All-In-One PC Front Without Stand

Figure 31: DT524T All-In-One Back With Stand

The DT524T All-in-One PC has the following features:

- 24in capacitive touch screen
- Intel® 7th Generation Core™ i5 processor
- Microsoft® Windows® 10 IoT enterprise or Ubuntu operating system
- Slim, all-in-one, fanless design
- Optional integrated UPS battery
- IP65-rated front panel with IPX2-rated enclosure
- VESA-mountable for flexibility in mounting and placement

Specifications

Table 23: DT524T system specifications

Components	Specifications
CPU	Intel® Core™ i5-7500T, 2.7GHz (up to 3.3GHz)
RAM	8GB to 16GB
Storage	256GB to 512GB Flash
Operating System	Microsoft® Windows® 10 IoT Enterprise or Ubuntu

Components	Specifications
Display	23.6in/59.9cm capacitive touch screen
Display Resolution	1920 x 1080 (Full-HD)
Battery Pack	Optional integrated UPS battery x 1
Bluetooth	Bluetooth 4.2 LE
Network Interface	WLAN: Wi-Fi 802.11ac, 2.4GHz/ 5GHz dual band Bluetooth: 4.2 LE

Figure 32: DT524T AIO ports and buttons

Table 24: DT524T I/O ports specifications

Port	Specification
USB 2.0	2 (ESD protection: ±18KV by air, ±12KV by contact)
USB 3.0	4 (ESD protection: ±17KV by air, ±12KV by contact)
COM Port	3
Audio-out	1
HDMI-out	1 (ESD protection: ±17KV by air, ±12KV by contact)
Ethernet	RJ45 connector for Ethernet x 2 (ESD protection: ±30KV by air, ±30KV by contact)
DC-in	1
Potential Equalization Conductor	1 (optional)

Table 25: DT524T mechanical and environmental specifications

Item	Specification
Fan/Fanless	Fanless
AC/DC Adapter	Input: 100-240V AC; Output: 19V DC, 6.31A
Enclosure	Aluminum alloy, antimicrobial enclosure
VESA-compliant Mounting	100mm × 100mm VESA standard
Dimensions (H x W x D)	13.7 x 22.3 x 1.8 in/ 350 x 567 x 45 mm
Weight	17.6 lbs/ 8 kg

Item	Specification
Water Resistance	Front panel: IP65 Enclosure: IPX2
Regulatory	UL60601-1, FCC Part 18 Class B, CE, CCC compliant
Temperature	Operation: 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

Dell P2314T Color Touchscreen Monitor

The Dell OptiPlex 9020 Small Form Factor (SFF) uses the Dell P2314T touchscreen monitor. For use in systems employing the PaxScan 4336R and 4343R detector panels.

Figure 33: Dell P2314T color touchscreen monitor

The following technical specifications apply.

Table 26: Specifications: Dell P2314T Monitor

Parameter	Value
Diagonally viewable size	23 in. (584 mm)
Horizontal	20.5 in. (509.18 mm)
Vertical	11.28 in (286.42 mm)
Maximum resolution	1920 x 1080 at 60 Hz
Aspect ratio	16:9
Brightness (typical)	cd/m^2
Color support	Color gamut (typical): 83% (CIE 1976); color depth: 16.7 million colors
Contrast ratio	1000:1 (typical); 8 million: 1 (dynamic contrast ratio)
Maximum viewing angle (typical)	178 degrees vertical/ 178 degrees horizontal

Parameter	Value
Response time (typical)	8 ms (gray to gray)
Panel type	In-plane switching
Panel backlight	LED
Touch technology	Projected capacitive system
Sensor stack thickness	0.019685 in. (1.1 mm)
Touch method	Fingers, thin gloves
Touch point	10 touch-points
Response point	<10 ms
Tilt	Up to 60 degrees
Security	Security lock slot

Points of Connection

The Dell P2314T provides the following ports: a DisplayPort 1.2, HDMI (MHL), VGA, USB upstream port (for touch capability), USE 2.0/3.0 downstream port, and an audio line out.

Planar PCT 2485 Color Touchscreen Monitor

The Dell OptiPlex 7050 Small Form Factor (SFF) uses the Planar PCT 2485 touchscreen monitor. For use in systems employing the PaxScan 4336R and 4343R detector panels.

Figure 34: Planar PCT 2485 Color Touchscreen Monitor

The following technical specifications apply.

Table 27: Planar PCT 2485 Monitor Specifications

Parameter	Value
Viewable size	23.6" diagonal (20.52" horizontal x 11.54" vertical)
Touchscreen type	Multi-touch Projected Capacitive (up to 10 points)
Number of touch points	10
Interface	USB
Contrast ratio (typical)	1000:1
Viewing angle (typical)	178° H, V
Response time (typical)	14 ms
Brightness	220 cd/m^2(w/touchscreen); 250 cd/m^2 (w/o touchscreen)
Display type	Edge-lit LED LCD
Display resolution	1920 x 1080, full HD
Aspect ratio	16:9
Tilt range	+15° to +70° and flat
Palette	16.7 million colors
Pixel pitch	0.2715 mm

Parameter	Value
Refresh rate	56 to 75 Hz, 60 Hz recommended
Panel depth	1.8' (44.5 mm)
Dimensions (W x H x D)	22.5" x 13.7" x 1.8" (571.8 mm x 347.0 mm x 44.6 mm)
Display weight	13.7 lb (6.2 kg)
Video inputs	Analog, HDMI, DisplayPort (w/HDCP)
Audio output	2 speakers, 1 w/ch, headphone out
Compatibility	Windows®7, 8, 10 - HID compliant
External connections	VGA 15-pin, HDMI 19-pin, DisplayPort 20-pin, 3.5 mm audio in, 3.5 mm headphone out, USB (A to B), USB 2.0 A type x 2, AC power in
Power supply	Internal
Power requirements	100-240 VAC, 50/60 Hz
Power consumption (max)	35W typical (<1.0W standby, off)
Operating temperature	0 to +70°C
VESA	Built-in 100 mm VESA, back
Recommended usage	Up to 16 hours per day
Product approvals	UL/c-UL, FCC-Class B, CE, TUV/Bauart, RoHS

Points of Connection

This monitor provides the following connections: VGA 15-pin, HDMI 19-pin, DisplayPort 20-pin, 3.5 mm audio in, 3.5 mm headphone out, USB (A to B), USB 2.0 A type x 2, and AC power in.

Sound Technologies, Inc. I/O Box

Sound SMART DR™ uses the Sound Technologies, Inc. I/O box to interface with the x-ray generator.

The PaxScan 4336R detector connects to the Varex I/O box which then connects to the Sound Technologies, Inc. I/O box. The PaxScan 4343R connects directly to the Sound Technologies, Inc. I/O box. The following image shows how the cables connect to the back of the box.

Figure 35: Sound Technologies, Inc. I/O box

Table 28: Connections - Sound I/O box

Port (Label)	Connection
Power	Connect to power supply.
Foot Switch	Connect to foot/hand switch.
Receptor Interface	4336R panel: Connect to Ext Synch port on Varex I/O (controller) for 4336R using DB9 serial cable. 4343R panel: Connect to Receptor Interface on panel using DB9 serial cable.
Generator Interface	Connect to Generator using DB9 serial cable.

Varex Imaging Corporation I/O Boxes

The PaxScan 4336R and 4343RC detectors connect to the x-ray system through a Varex Imaging Corporation I/O box.

The following images show where the cables connect to the back of the I/O box.

Figure 36: Varex I/O box for the PaxScan 4336R detector

Table 29: Connections - I/O Box (Controller) for the 4336R detector

Connection (Label)	
Power (no label)	Connect to power source
External Synch	Connect to Sound I/O box using DB9 serial cable.
Imager	Connect to 4336R panel
Ethernet	Connect to PC

Figure 37: Varex I/O box for the PaxScan 4343RC detector

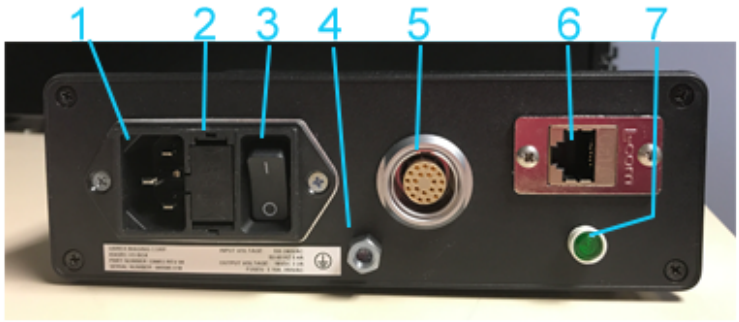


Table 30: Connections on Varex 4343RC I/O Box

Callout	Description
1	AC power input for I/O box. Input voltage: 100-240VAC

Callout	Description
2	Fuse. 3.15A, 250 VAC
3	Power switch
4	Ground
5	Point of connection for tether cable
6	Ethernet port. Connect to PC.
7	Power LED. Lights when unit is powered.

Adapters

The USB to serial port adapter allows you to connect the imaging PC to a serial cable.
The USB to Gigabit Ethernet adapter allows you to use a USB port on the imaging PC for connection to an Ethernet cable.

USB to Serial Port Adapter

Connect this adapter to a USB 3.0 port on the Dell 7440 tablet PC in systems with the integrated generator feature enabled. This adapter allows connection to the serial cable, which is connected to the generator.

Figure 38: USB to Serial Adapter

USB to Gigabit Ethernet Adapter

Connect this adapter to a USB 3.0 port on the Dell 7440 tablet PC and then use the Gigabit Ethernet connection to connect to the DICOM server.

Figure 39: USB to Gigabit Ethernet Adapter

System backup thumb drive

The system backup thumb drive (64 GB) is used to create a ghost backup of the system after it has been configured with the site's settings. It can then be used to restore a system to the desired settings when necessary.

The thumb drive contains bootable Ghost backup files.

Software

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

- Windows 8.1 or 10 PRO
- PaxScan Virtual CP L06 5.2 R3 (for 4336R and 4343R), L08 2.1 (for 4336R V2 and 4343R V2), and M01R1.6 (for 4336Wv4)
- Musica2 v1.12.10.1
- Sound SMART DR™ 3.9

Chapter

2

Safety, Warranty, and Licensing Information

Contents

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.

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

Pre-installation Site Survey

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

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, *Technical Support* on page 111, 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 Sound SMART DR™ .

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 base request.

Electromagnetic compatibility

The system complies with EN 60601-1-2 fourth edition (2014) Section 5. 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 system 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: Medical 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 doit 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 Sound 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 Sound 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.

Emissions, immunity, and separation distances

The tables in this topic provide guidance for emissions, immunity, and separation distances. Follow these guidelines when installing and maintaining the X-ray system.

Warning: Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the Sound SMART DR™ system, including cables specified by the manufacturer.

Les équipements portatifs de communications RF (y compris les périphériques tels que les câbles d'antenne et les antennes externes) ne doivent pas être utilisés à plus de 30 cm (12 pouces) de n'importe quelle partie du prochain système Sound SMART DR™ , y compris les câbles spécifiés par le fabricant

Use the following guidance tables for emissions and separation distances:

Table 31: Emissions — Sound SMART DR™ equipment and systems

Emissions test	Compliance	Electromagnetic environment guidance
RF emissions CISPR 11	Group 1	Sound SMART DR™ uses RF energy only for its internal function; therefore, its RF emissions are very low and unlikely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A or B	Class A
Harmonics IEC 61000-3-2	Class A, B, C, D or NA	Class A
Flicker IEC 61000-3-3	Complies or NA	Complies
		Sound SMART DR™ is suitable for use in all establishments other than domestic and those directly connected to public low-voltage power supply network that supplies buildings used for domestic purposes.

Table 32: Electromagnetic Immunity — All equipment and systems not life-supporting

Immunity test	EN/IEC 60601 test level	Compliance level	Electromagnetic environment — guidance
ESD EN/IEC 61000-4-2	±8 kV contact ±15 kV air	±8 kV contact ±15 kV air	Floors should be wood, concrete, or ceramic tile. If floors are synthetic, relative humidity should be at least 30%.
EFT EN/IEC 61000-4-4	±2 kV mains ±1 kV I/Os	±2 kV mains ±1 kV I/Os	Mains power quality should be that of a typical

Immunity test	EN/IEC 60601 test level	Compliance level	Electromagnetic environment — guidance
			commercial or hospital environment
Surge EN/IEC 61000-4-5	±1 kV differential ±2 kV common	±1 kV differential ±2 kV common	Mains power quality should be that of a typical commercial or hospital environment
Voltage dips/ dropout EN/IEC 61000-4-11	>100% drop for 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°: 100% dip for 1 cycles 30% dip for 25/30 cycles >100% dip for 5 s	>100% drop for 0.5 cycle At 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°: 100% dip for 1 cycles 30% dip for 25/30 cycles >100% dip for 5 s	Mains power quality should be that of a typical commercial or hospital environment If the user of the system requires continued operation during power mains interruptions, it is recommended that the system be powered from an uninterruptible power supply or battery.
Power frequency 50/60 Hz magnetic field EN/IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be that of a typical commercial or hospital environment.

Table 33: Immunity — All equipment and systems not life-supporting

Emissions test	EN/IEC 60601 test level	Compliance level	Electromagnetic environment — guidance
Conducted RF EN/IEC 61000-4-6	3 Vrms 150 kHz – 80 MHz	(V1)=3Vrms	D=(3.5/V1)(√P)
Radiated RF EN/IEC 61000-4-3	3 V/m 80 MHz – 2.5 GHz	(E1)=3V/m	D=(3.5/E1)(√P) 80 to 800 MHz

Emissions test	EN/IEC 60601 test level	Compliance level	Electromagnetic environment — guidance
			D=(7/E1)(√P) 800 MHz to 2.5 GHz Where P = max power in watts and D = recommended separation distance in meters. Field strengths from fixed transmitters, as determined by an electromagnetic site survey, should be less than the compliance levels (V1 and E1). Interference may occur in the vicinity of equipment containing a transmitter.

Note: Portable and mobile communications equipment should be separated from the system by no less than the distances calculated or listed in *Table 33: Immunity — All equipment and systems not life-supporting* on page 57.

Table 34: Separation — Equipment not life-supporting

Max output power (watts)	Separation (m) at specified frequencies:		
	Separation (m) 150 kHz to 80 MHz D=(3.5/V1)(√P)	Separation (m) 80 to 800 MHz D=(3.5/E1)(√P)	Separation (m) 800 MHz to 2.5.0 GHz D=(7/E1)(√P)
0.01	0.11667	0.11667	0.23333
0.1	0.36894	0.36894	0.73785
1.	1.1667	1.1667	2.3333
10.	3.6894	3.6894	7.3785
100.	11.667	11.667	23.3333

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

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 display monitor 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

To avoid the risk of electric shock, this equipment must only be connected to a supply main with protective earth.

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.

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.

- Electronic components can be damaged by electrostatic discharges. Sound Technologies, Inc. has tested the exposed components for ESD, and it 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. 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.
- Use rated electrical components to forestall single fault conditions.

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 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 in 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 pent unnecessary or unintentional radiation exposure.

Observe all cautions and warnings in this manual and in 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.

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 pent 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 pent 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.

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, the detector control unit (CP2), 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.

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

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

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.

Licensing

This application is a collection of several special functions. In the unlikely event that the license for one of the functions is unavailable, the software alerts you. The alert asks if you want to enter a license key, ignore the matter for this instance, or ignore always.

We recommend 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.

Warranty

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

- Modification, abuse, misuse, or operation of Sound SMART DR™ 's 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 the Sound SMART DR™ system without authorization by the seller.

Faire aucune tentative pour connecter d'autres équipements ou de pièces de Sound SMART DR™ système sans autorisation par le 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.

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.

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.

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.

Table 36: Environmental parameters for transportation, storage, and operation of computer and peripherals

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

Chapter

3

Patients

Contents

This chapter describes how to navigate the **Patient** screen and create patient records.

Main Patient Screen

This is the first screen you will see when the application is launched. From this screen, you can add new patients, create emergency patients, and search for existing patients. Search results are displayed in the main body of the screen in vertically stacked tiles, which offer various functions that can be applied at both the patient and study levels.

In addition to these primary functions, you can load the **Reporting** screen, the **Management** screen, or the help files. Additionally, you can initiate batch send exports or access the Plate Connection icon's dynamic information form using the controls in the upper right corner of the screen.

Create a New Patient

To create a new patient, simply tap the **Add Patient** icon, which looks like an encircled plus sign in the upper left corner of the screen, to open the Add Patient form.

Fill in all of the required fields (shown with a red border) and any other fields as desired. The Species field automatically displays the default value set on the **Management** screen. You can update this field if needed. The units assigned to the Weight field, KGs or LBs, is also set on the **Management** screen. If enabled on the **Management** screen, you can enter an accession number. Once you have completed the form, click the **Next** arrow in the lower right corner of the screen; this will open the **Shot List** screen where you will select the anatomies and views to be acquired for the study.

If a patient already exists in the system, you will be provided the option of adding the new study into the existing patient record.

Create an Emergency Patient

To create an emergency patient, simply tap the **Emergency Patient** icon (which looks like a Caduceus or Rod of Hermes - commonly seen on paramedic badges and ambulances) in the upper left corner of the screen.

Ensure that the Species field is correct as it will auto-populate with the default species that is configured in the management screen. Fill in the **Weight**, in KG or LBS, and tap the **Save** button control. This will open the **Shot List** screen where the user will select the anatomies and views to be acquired for the study.

Create a Patient from an MWL Study Request

Creating a patient and study from a Modality Worklist Server request can be accomplished right on the **Main Patient Screen**.

To get started, simply select the desired search options and then tap the MWL Search Icon in the search field.

Figure 40: Search controls

This will display all of the MWL requests on the server which meet the selected search criteria, as seen in the video placeholder. The system will create patient records from the list of MWL requests. If you import a patient record that contains the same patient information as another record already in the system, Sound SMART DR™ will add the requested study to the existing patient rather than create a new patient record. If any patient information differs, the system creates a new record.

Edit Patient Information

You can edit patient information while remaining in the Shot List screen using the Edit Patient Information control, found above the Study Description in the upper right corner of the screen.

Tapping the **Edit Patient Information** control (which looks like a pencil) opens the **Edit Patient Information** form, which is basically the same as the **Add Patient** form which is accessed from the **Main Patient Screen**. The form opens on top of and partially covers the **Shot List** screen. Once open, simply make changes to the desired fields and then tap the **Save** icon in the lower right corner of the form. If enabled on the **Management** screen, this form also includes a field for accession number. This will close the form revealing all of the **Shot List** screen again.

Create a New Study

On entering the Shot List screen, you will need to select an anatomical region from the Select Region list, which will populate the Select Anatomy list with options specific to that anatomical region.

You will then select the desired anatomy from the Select Anatomy list, which will populate the Select Shots list with shots specific to the chosen anatomy. The selected shots will be displayed in the shot-list on the right side of the screen.

You can enter a study description or allow the application to provide a default value for that DICOM Tag.

You can add **Slang Terms** to the clinical names for any shot. These slang terms will only display in the Sound SMART DR™ user interface. They are never inserted into **DICOM Tags**.

There are two locations where you can enter slang terms, one in the **Management** screen and the other in the **Shot List** screen. To enter a slang term, simply tap and hold the tile. Then, type the name in the field that appears.

To begin acquiring images, simply tap the right arrow in the lower right corner of the screen and the **Acquire** screen is displayed.

Add a Study to an Existing Patient

To add a new study to an existing patient, simply tap the patient tile for the desired patient, and then tap the **New Study** control found in the upper left corner of the patient tile.

The next action depends on the configuration. If configured, tapping the new study control opens an **Add Study Information** form, where you will enter a **Study Description**, weight value and sex. If configured on the **Management** screen, this form also includes a field for accession number. Tapping the **Save** control will take you to the **Shot Selection** Screen where you can select individual shots and shot protocols, make study description changes, edit patient information and initiate image acquisition.

The system can also be configured to skip the **Add Study Information** form. In this case, tapping the New Study control adds a study populated with the same values as the last study added to the patient tile. Tap the Shot list control to open the **Shot Selection** screen and make changes as needed. If no previous study exists, the **Add Study Information** form displays.

In addition, when creating a new patient, if the patient already exists in the system, you have the option of adding a study to the existing patient from the **New Patient** screen.

If a patient already exists in the system, you will see the following message when you attempt to save the new patient:

Click the checkmark to add a new study ot the existing patient or the X to cancel.

Patient Tile Controls

Patient Level Export Control - You can export one or more studies for any patient directly from that **Patient Tile**. To export a single study simply tap the study tile, which will highlight the study to show that it has been selected, then tap the export control in the upper right corner of the **Patient Tile**. This will open the **Export** form, where you can select between **Local** or **Network** export options, which are covered in the **Export Studies and Images** section of these **Help Files**.

Delete Patient - You can delete the patient and its studies by tapping the **Delete** icon in the **Patient Tile**. The Patient IDs for both deleted and soft deleted patient records are reusable.

Study Tiles - Each study that exists under a patient is represented by a **Study Tile** in the expanded **Patient Tile** . Each of the **Study Tiles** consists of the **Study Description, Study Date, Send Status** and five controls, which are covered in the next section, **Study Tile Controls**.

Edit Patient - To edit patient information, simply tap the **Edit Patient** icon, which looks like a pencil, in the upper right corner of the **Patient Tile**.

Study Tile Controls

Resume Study Control - To resume a study that has been closed, simply tap the Resume Study control, found in the lower left corner of the Study Tile.

Move Study Control - To move a study to a selected patient or owner, tap the Move Study control, found on the study tile to the right of the Resume Study control. In the selection window, search for a patient record to which you wish to add this study. Search options include: patient, owner, and patient ID. Click the Search icon. In the list of studies that display, tap the desired record. The study moves to the selected record and no longer appears on the previous record.

Add Shots Control - To add shots to a study simply tap the Add Shots control, found on the study tile to the right of the Move Study control. This will take you to the Shot List screen, where you can add individual shots or protocols to the study.

AIS (Antech Imaging Services) Control - To submit a consult to AIS for this study, simply tap the AIS control. This will initiate a DICOM send of the images to the configured AIS DICOM device, while launching a browser and taking you to the AIS Consultation Submission page.

Note: This control will appear inactive if there is no AIS device configured or if the selected study has no images.

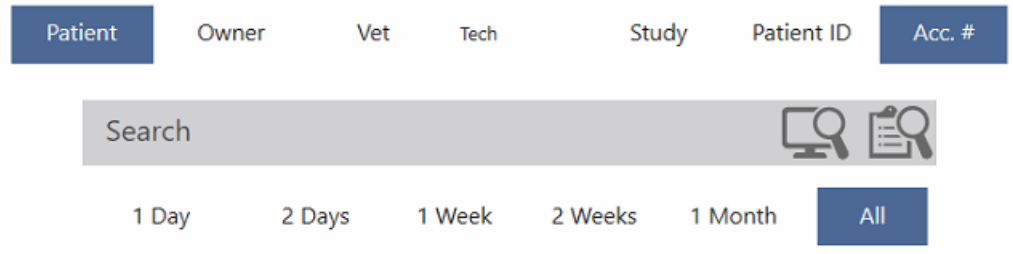
Delete Study Control - To delete any study, simply tap the Delete icon on that Study Tile

Patient Search — Local

You can search for existing patients in the local database from the **Main Patient Screen**. This is accomplished using the search field in the top center of the **Main Patient Screen**.

First, select the search options that fit the search criteria which will be entered in the search field. You can search by Patient, Accession Number, Owner, Vet, Tech, Study, and Patient ID, either alone or in combination. For example, in the following image, Patient and Accession number are highlighted indicating that they are selected.

Figure 41: Search field and criteria



Next, select a range of dates within which to search; 1 Day, 2 Days, 1 Week, 2 Weeks, 1 month or the entire data base can be searched by selecting All.

Once all of the options have been selected, tap the Local Search icon (a magnifying glass in front of a monitor) located on the right side of the search field.

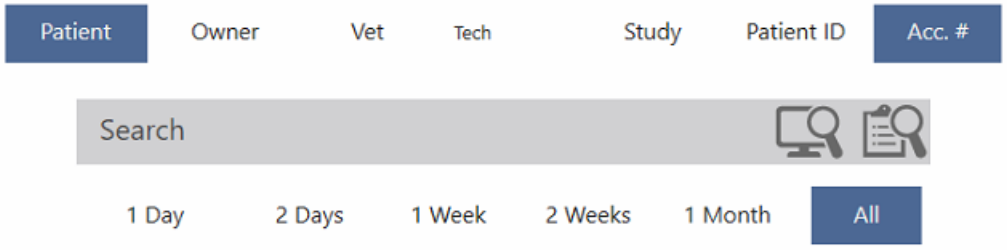
The results of the search will be displayed in horizontal Patient Tiles beneath the search field and criteria.

Patient Search — MWL

You can search for Modality Worklist Server Study Requests from the **Main Patient Screen**. This is accomplished using the search field in the top center of the **Main Patient Screen**.

First, select the search options that fit the search criteria which will be entered in the search field. You can search by Patient, Accession Number, Owner, Vet, Tech, Study, and Patient ID, either alone or in combination. For example, in the following image, Patient and Accession number are highlighted indicating that they are selected.

Figure 42: Search field and criteria



Next, select a range of dates within which to search; 1 Day, 2 Days, 1 Week, 2 Weeks, 1 month or the entire data base can be searched by selecting All.

Once all of the options have been selected, tap the MWL Search icon (which looks like a magnifying glass in front of a clipboard) located on the right side of the search field.

All study requests which fit the search criteria will be displayed in horizontal Study Request Tiles beneath the search field and criteria. The number of results returned is configured on the **Management** screen.

Chapter

4

Image Acquire/Review

Contents

The following chapter describes how to acquire and review images.

Acquire/Review Screen

The **Acquire/Review** screen is where you acquire, view and edit images. A number of image manipulation tools are available for editing the images and the screen has a number of additional controls which provide various functions and feedback information.

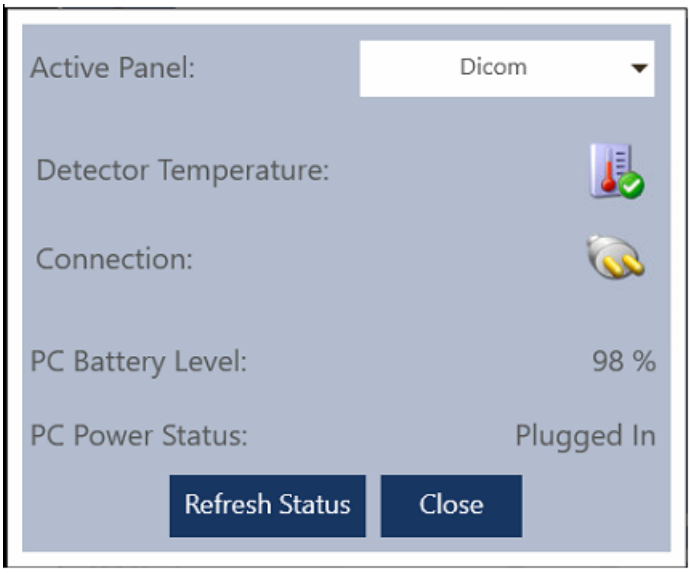
The main body of the screen is devoted to viewing images and appears as a large black area to either the right or left of the control column, depending on the configuration of the system. The control column itself is made up of several subsections which we will go over now.

Running from the top to the bottom of the screen, on the image viewing side of the control column, are the **Image Manipulation Tools**. The individual functions are covered in the **Edit Images** section of the **Acquire & Review Screen** help files.

At the top of the inside portion of the column are the **Plate Connectivity** and **Plate Temperature** controls.

After 10 minutes of inactivity, the detector is placed in standby mode. This is indicated when the **Plate Connectivity** control flashes. The following notification message is also displayed:

The detector can be reactivated by clicking the **Refresh Status** icon in the **Panel Status** window, which is opened when you select the **Plate Connectivity** icon.



When images are aquired less than 10 minutes apart, the timer is reset to 0 with each new image.

Directly beneath these controls is the **Patient Information** subsection, containing information specific to that patient, a link to the help files and an **Edit Patient Information** control like the one in the **Shot List** screen. Beneath this section are the Vet and Tech fields followed by the shot-list.

At the bottom of the column are the **Pause Study**, **Email Study**, **Emergency Send** and **Close Study** controls.

Enter X-ray generator settings manually

When the system uses a non-integrated X-ray generator, you can enter X-ray generator settings manually if it is configured in the Management settings.

Prerequisites

The Intermediate Option for manual X-ray technique entry must be configured to access this feature.

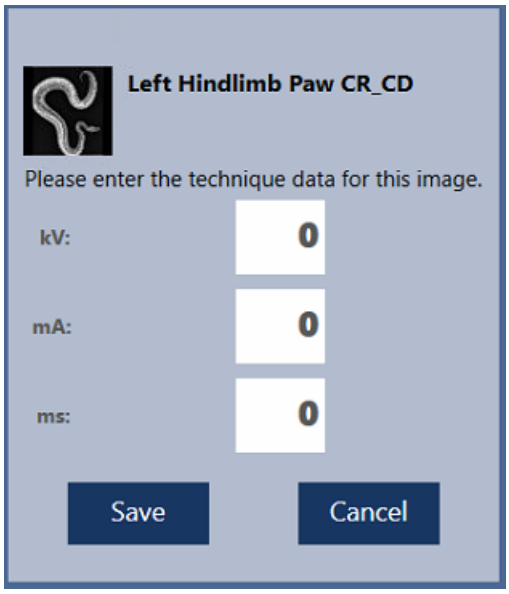
About this task

Note: A study cannot be paused or closed until all acquired, non-rejected images have techniques associated with them.

Manually entered techniques are visible in the AAHA report in the **Reporting** screen and in the overlays if applicable.

Procedure

1. In Acquire Mode, acquire an image.
   The generator settings box is displayed.



2. Enter the settings.
3. Select **Save**.
   The window closes, and the generator settings icon is displayed in the toolbar above the shot list.

   The information can be accessed again by selecting the icon.

Exposure Index

The following table shows the recommended exposure index values for acquiring quality images of small animals' anatomy.

The Exposure index (EI) is the measure of the amount of exposure received by the flat panel detector. It depends on technique, total detector area irradiated, and beam attenuation.

Important: Exposure index is only a guide. Image quality should be checked and verified prior to repeated exposures. An image with a low/high EI value should be evaluated for image quality prior to repeating.

Table 37: Small animal exposure index

Weight	0 – 20 lbs.	21 – 45 lbs.	46 – 80 lbs.	81 – 100 lbs.	100+ lbs.	Avian
Abdomen	80 kVp / 3.5 mAs	80 kVp / 3.5 mAs	80 kVp / 5 mAs	80 kVp / 10 mAs	90 kVp / 10 mAs	50 kVp / 10 mAs
Thorax	80 kVp / 3.5 mAs	80 kVp / 3.5 mAs	80 kVp / 5 mAs	80 kVp / 10 mAs	90 kVp / 10 mAs	
Extremity	80 kVp / 3.5 mAs	80 kVp / 3.5 mAs	80 kVp / 3.5 mAs	80 kVp / 3.5 mAs	80 kVp / 3.5 mAs	
Pelvis	80 kVp / 3.5 mAs	80 kVp / 5 mAs	80 kVp / 10 mAs	90 kVp / 10 mAs	100 kVp / 10 mAs	
Skull	80 kVp / 3.5 mAs	80 kVp / 3.5 mAs	80 kVp / 3.5 mAs	80 kVp / 3.5 mAs	80 kVp / 3.5 mAs	
Shoulder	80 kVp / 5 mAs	80 kVp / 5 mAs	80 kVp / 5 mAs	80 kVp / 7.5 mAs	80 kVp / 7.5 mAs	
Spine	80 kVp / 10 mAs	80 kVp / 10 mAs	80 kVp / 20 mAs	80 kVp / 20 mAs	80 kVp / 40 mAs	

For images that are grainy (under exposed) increase the mAs.

For images that are saturated (over exposed) decrease the mAs.

Note: For primate and avian species, all shots that start with "Lat Left" do not automatically apply a horizontal reverse to acquired images as is applied to all other species as part of the default acquisition profile settings.

Notice: When using 4336R and 4343R detectors with primate and avian species, all shots that start with "Lat Left" and "Lat Right" do not have automatic rotation applied to acquired images as is applied to all other species as part of the default acquisition profile settings. When using the 4336R detector, the "Lat Left" shots normally have a +90 degree rotation applied and the "Lat Right" shots normally have a -90 degree rotation applied. When using the 4343R detector, the "Lat

Left" shorts normally have a +90 degree rotation applied and the "Lat Left Obl" and "Lat Right" shots normally have a -90 degree rotation applied.

See *Edit an Image* on page 81 for information about manually applying a horizontal reverse and rotation to acquired images. See the Configuring Acquisition Profiles section of the Sound SMART DR™ service manual (PN: 721-722-G1) for instructions on changing the default settings for a shot.

Acquire an Image

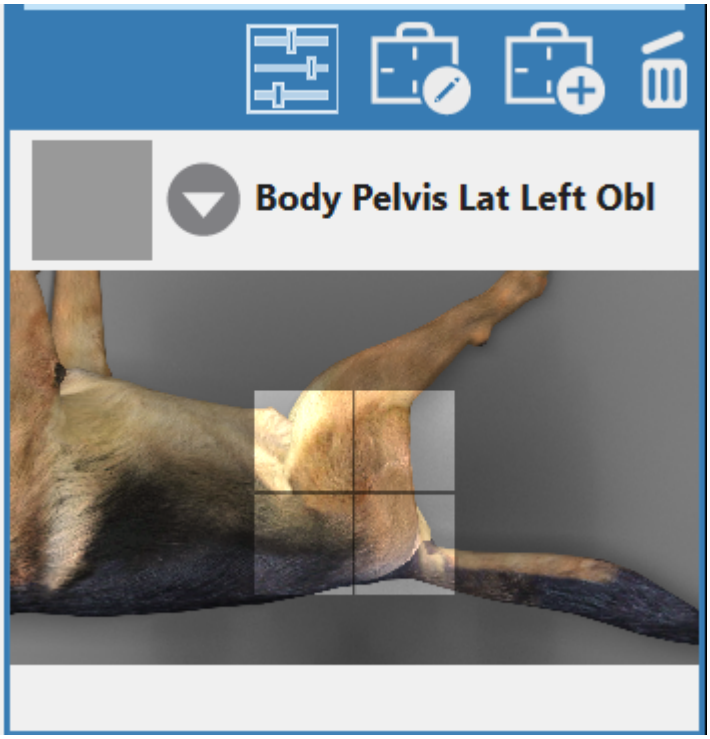
Selecting **Vet** and **Tech** — You can select both the vet and tech working on the study from the two drop —down fields located above the shot list. If you selected a default vet or tech in your user profile, it is displayed in the field when you enter the **Acquire** screen, although you can change the value as desired. The default vet and tech are denoted by a star next to the name in the drop-down list. In addition, if you have a long list of doctors or technicians, you can scroll through the list with a flick of your finger.

If needed, you can select multiple vets and techs by clicking on them in the list. The selected vets and techs are highlighted.

Also, if the default vet and/or tech is included in the overlay, they will be displayed on the Acquire screen when the overlay is visible. These values can be changed using the drop-down fields above the shot list.

Position Guide — To assist you in determining the proper positioning for your patient, based on the selected shot, we have included a **Position Guide** image with the most common views.

To access the **Position Guide** image for a shot, tap the small icon to the left of the view name on the shot-list. The shot tile will expand to reveal an image of an animal oriented in the proper position for the shot, with a highlighted target reticle centered on the correct anatomical area (as seen in the following image).



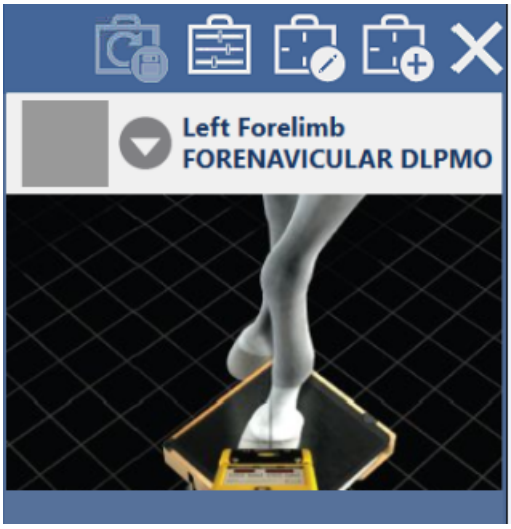


Plate Connection Radiation icon — On entering the **Acquisition/Review** screen, the first shot in the shot-list will be highlighted for acquisition. In the upper right corner of the screen, verify that the **Plate Connectivity Status** icon shows a radiation emblem with a green circle, which indicates the plate is connected and ready for use. If the radiation emblem has a red circle it means that the plate is not connected.

On prep, the radiation emblem and circle will change to a light gray. Following the prep delay, the radiation emblem and circle will change to black, indicating the system is ready to acquire an image. On

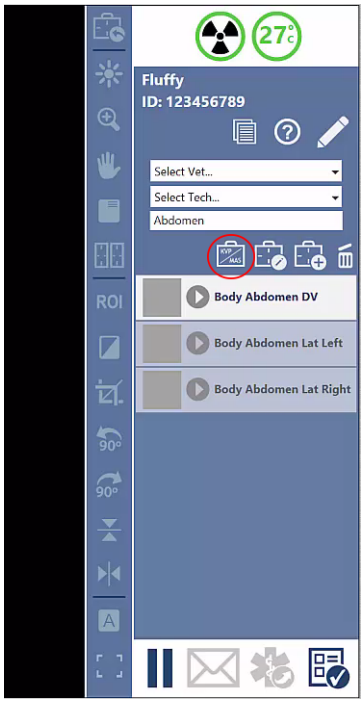
fire, a yellow background is displayed in the radiation emblem, indicating the system is exposing and processing the image.

Following the acquisition, the icon will return to a green circle to indicate the plate is ready for the next acquisition. If configured on the Management screen, the system will beep when it is ready to acquire. You can set the tone of the beep from five options.

Adjust a Technique for a Shot

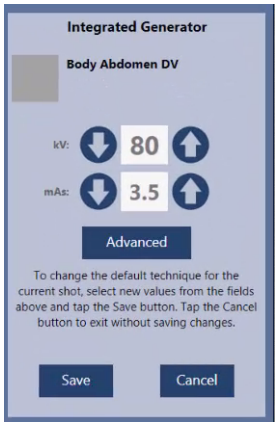
The Sound SMART DR™ software includes integration for the Summit HF generator. On systems using generator integration feature, the technique for each shot will be set automatically, based on pre-configured technique charts programmed into Sound SMART DR™ . Systems are configured to use the integrated generator feature on the **Management** screen by service technicians.

If your system is configured to use the integrated generator feature, Sound SMART DR™ provides a tool which allows you to make changes to the technique values on a shot by shot basis and save those changes for future use. This tool, the **Integrated Generator** control, is accessible from the **Acquire Review** screen.



To change the technique for specific shot, follow these steps.

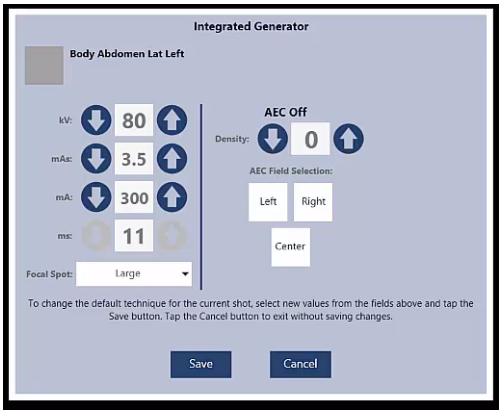
1. On the **Acquire Review** screen, select the shot to adjust.
2. Tap the **Integrated Generator** control. The Integrated Generator form slides down.
3. Adjust the values kV and mAs settings using the up or down arrows.



4. Tap the **Save** control to lock in your changes. Or, tap the **Cancel** button to exit the form without saving.

Note: Pressing **Save** will save the selected technique as the default acquisition profile (APR) for that position and patient size. You may leave the form open while acquiring to use the modified technique without changing the default APR for that position.

Advanced Integrated Generator Form



On the **Integrated Generator** form, you will see a button labeled Advanced. Tapping this control will open a form that provides controls for adjusting all of the technique variables, including **kV**, **mAs** and **mA**. In addition to these technique controls you will find controls that are used to configure the **Automatic Exposure Control** (AEC) function for those clinics where **AEC** is used.

It is recommended that if you use this advanced form, you only make adjustments to the technique settings. Modifying the **Focal Spot** or **Density** values or activating any of the **AEC Field Selection** controls will render your calibration invalid, resulting in degraded image quality. These settings should only be modified if you are directed to do so by a support technician.

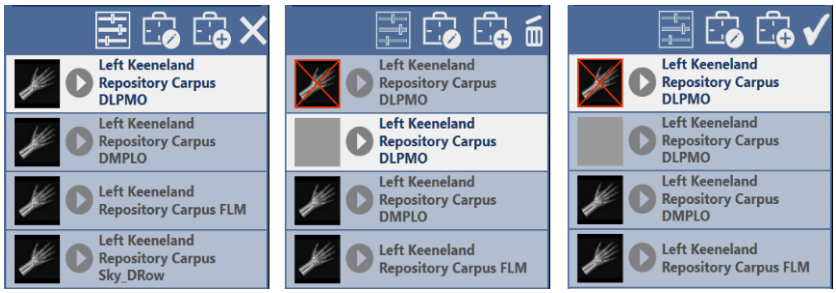
Reject an Image

You have the ability to reject an acquired image. This is accomplished by highlighting the shot for the image to be rejected and tapping the "X" next to the **Add Shots** icon. If the **Reject Reason** option has

been configured to False in the **Management** screen, a large red "X" is displayed over the rejected image and another instance of the same shot to the shot-list, placing it next in order of acquisition (as seen in the images below).

If the **Reject Reason** option has been configured to True in the **Management** screen, the **Reject Reason** dialog is displayed when you tap the "X". Select the reason from the drop-down list, and click **Save**. The dialog box closes, and a large red "X" is displayed over the rejected image and add another instance of the same shot to the shot-list, placing it next in the order of acquisition (as seen in the images below). If you select **Cancel** in the **Reject Reason** dialog, the dialog closes, and the image is NOT rejected.

A rejected image may be recalled by tapping the check mark next to the **Add Shots** icon. This check mark is only displayed if you have selected a rejected shot.

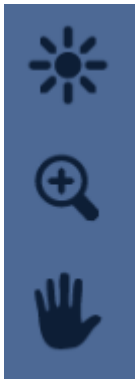


Edit an Image

The user is provided with a variety of tools to edit and manipulate the image once it has been acquired.

Primary Tools— There are three primary tools which are active by default. They are available once an image is displayed in the viewing pane.

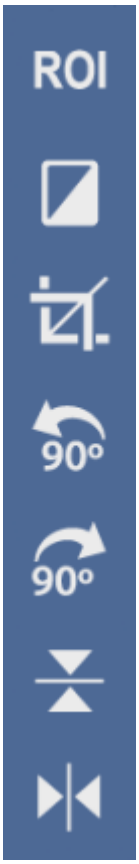
1. Window Level
2. Zoom
3. Pan



Display Tools — There are two tools available to change the display.

1. **Overlays**
2. **Two-Up Mode**

Manipulation Tools — There are a number of tools available to modify the image.



1. **Region of Interest**
2. **Invert**
3. **Crop**
4. **Rotate 90 Degrees Left**
5. **Rotate 90 Degrees Right**
6. **Flip**
7. **Reverse**

Annotation & Measurement Tools — Click the Annotation Tools icon to display the annotation tool bar. This toolbar provides access to annotation and measurement tools.

Revert — The **Revert** tool allows you to return the displayed image to its original state, prior to any modifications you have made to the image.

You can apply the **Revert** tool to selected images in Two-Up mode.

Full Screen — The **Full Screen** tool allows you to use most of the screen to view images.

Note: This function will not undo changes that have been saved by leaving the screen.

Full Screen Mode

We have added a function which allows you to view images using almost all of the available screen area.

To view images in **Full Screen** mode, simply tap the **Full Screen** icon which is located after the **Annotationss** control in the **Image Manipulation Toolbar**. This will slide the toolbar to the edge of the screen, hiding the **Shot List Column** and its various controls, leaving only the **Image Manipulation Toolbar** and the image itself visible.

Musica Tuning Bench

We have added a tool which allows you to adjust the processing of specific shots to suit your personal preferences regarding the "Taste" properties of the Musica2 processing algorithms.

To use the **Musica Tuning Bench** simply tap its icon, which is found above the **Shot List**:

.

The **Musica Tuning Bench** controls will slide down revealing sliders for each "Taste" property.

These "Taste" properties, **Sharpness**, **Control** and **Brightness**, are adjusted to higher or lower levels by moving the slider control for each property towards either the "plus" or "minus" sign for that control. You can also use the << or >> on each side of the property to increase or decrease the value. The current numeric value for the property appears in the center. You can also choose to preview the image changes, save changes to the image, or save to shot.

Crop Function

The **Crop** function allows you to trim away extraneous image elements from the actively displayed image.

To select this function tap the **Crop** icon in the **Image Manipulation Toolbar**. To apply the crop to the active image, simply touch and drag your finger across the screen over the area of the image that you wish to isolate, lifting your finger to initiate the crop.

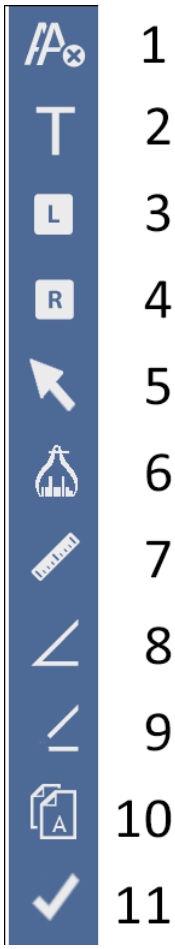
This function offers a configurable option, which allows you to choose between retaining the original size of the cropped area of the image or enlarging it to fill the display area of the **Acquire view** screen.

Annotations, Markers, and Measurement Tools

We have added several annotation tools to Sound SMART DR™ , allowing you to perform markups on your images without leaving the application.

To access the annotation controls, simply tap the **Annotation** icon, found near the bottom of the **Image Manipulation Toolbar**. This will place the system into **Annotation Mode**, which interrupts the auto-sense process wherein the system continually scans the panel for radiation, while displaying the annotation controls over the standard **Image Manipulation Toolbar**.

To select a particular annotation, simply tap the correlating icon. To apply the annotation to an image, touch and drag your finger across the area of the image to which you want to apply the annotation, lifting your finger from the screen when you are done.



Tools available on the Annotation toolbar include:

1. Clear all annotations
2. Free text
3. Left marker
4. Right marker
5. Pointer arrow
6. Calibration tool
7. Linear measurement
8. Angle tool
9. Cobb angle
10. Copy image
11. Close

See the following paragraphs for a description of each tool.

1. **Clear all annotations** - Remove all annotations on the image.
2. **Free text** — This tool will allow you to place text notations anywhere on the image. To add a **Free text** annotation, tap the icon. The words New Text appear on the image. You can drag the text and drop it anywhere on the image. To edit the text, hold your finger on the text for about a second. The Modify Free Text Annotation form displays. Use this form to modify the text and change the size of the font. Tap **Save** to apply your changes.
3. **Left** marker - Place the left marker on the image to indicate the left patient orientation.
4. **Right** marker - Place the right marker on the image to indicate the right patient orientation.
5. **Pointer arrow** — To add a pointer arrow to the image, tap the arrow icon. The arrow displays on the image. To move it, touch the center of the arrow and drag it. Touch and hold the either end of the arrow to resize or re-orient the arrow.
6. **Calibration** tool — The Calibration button allows you to calibrate line measurements for that image to a known length. To use the tool, tap the button and draw a line on the screen. You can move or change this line by moving it or one of its endpoints.

    - Each image accepts only one calibration.
    - The calibration line remains on screen after calibration is complete.
    - Initially the line length displays in pixels. Right-click or press and hold anywhere on the line to display a pop-up you can use to enter the number of centimeters or millimeters the line represents. The units that display are selected on the **Management** screen.

- The line retains its calibration value despite changes to its length or position.

7. **Linear measurement** tool — Using this tool you will be able to draw a line to measure portions of the displayed image in CM. You can resize the line by dragging either endpoint of the line to another location on the image. You can also move the line by dragging it from between the endpoints.
    - If you draw a line before adding a calibration line, the system displays a warning and the length using the detector pixel size and the number of detector pixels and the units selected in the Management screen.
    - If you modify the calibration line, other lines on the image adjust to reflect the change.
    - Deleting a calibration line deletes the other lines on the image.
8. **Angle** tool — This tool allows you to draw angles on the image. To use the control, tap the button and draw the angle on the screen. Once you draw both legs of the angle, a label displays indicating the angle between the legs. You can drag the entire angle by a line or drag the endpoints to modify the measurement.
9. **Cobb angle** tool— This tool allows you to draw two lines on the image and display the angle between the two lines or line extensions.
10. **Copy image** tool — This tool creates a copy of an image containing annotations, places the copy in the shotlist, and removes annotations from the original image. The copy is identified by the prefix: Copy of. The tool is disabled until you place annotations on an image.
11. **Close** - Close the annotation tool bar.

In addition, the following markers and tools are also available.

Automatic Orientation Marker— You can configure your system to place a small orientation marker in the upper left corner of your images on acquisition. To enable this feature, go to the **Management** screen, select the **Intermediate Options** tab, set the **Apply Orientation Marker** field to True, and tap **Save**.

Orientation Tool

There may be times when you will prefer an orientation that differs from the default orientation in Sound SMART DR™ . To address this possibility we have provided an **Orientation** tool which allows you to save changes you have made to the orientation of a shot, and apply those changes as the default orientation for that shot in future acquisitions.

To save orientation changes, orient the image as you wish to see it displayed and tap the **Orientation** tool icon, found above the Shot List. This will display the **Orientation** tool form. To save the new orientation tap the **Save Changes** button. Tapping the **Cancel** button will close the form without saving the current orientation as the new default.

Shot List Screen

You can display the **Shot List** screen from a number of locations: **Creating a New Patient**, **Resuming a Study** with no images and **Adding Shots to an Existing Study**. To help streamline your work flow, the **Shot List** screen automatically scrolls as you add shots to the list in the **Shot Selection** screen and as you acquire images in the **Acquire Review** screen.

The primary purpose of this screen is to assemble the shot-list for the currently selected study. This is done by selecting a region, an anatomy and shots for that anatomy. As the shots are selected they are displayed in a list on the right side of the screen. Shots can be deleted from the shot list at any time using the **Delete** control located near the top of the shot list.

You can also add your own slang terms to the clinical names for any shot. These slang terms only display in the Sound SMART DR™ user interface. They are never inserted into DICOM tags. To enter a name, tap and hold the tile, then type the name in the field that appears.

You can create protocols on this screen. Simply tap the **Save** control found at the top of the shot list. This will prompt the user to provide a protocol name and click **Save**, at which time a protocol tile will be added to the horizontally stacked **Protocols** list in the upper left corner of the screen. Tapping this protocol tile will add those shots to the shot list of any current study.

In small animal systems, a PennHIP protocol tile is available for canine species, as a default option in the Shot List screen. Select this protocol to add the three shots necessary for a PennHIP evaluation, the Pelvis VD Extended, Pelvis VD Compression, and Pelvis VD Distraction.

Additionally, you can apply a user-defined study description, edit patient information, launch help files specific to this screen, and view **Position Guide** images for most common shots.

Add Shots to the Study

You can add additional shots to the study from the **Acquire** screen.

Tapping the **Add Shots** icon located on top of the shot list will slide out the **Shot List** screen's selection columns, allowing you to select additional shots from any region and anatomy or from any existing protocols. To help stream line your work flow, the Shot List automatically scrolls as you add shots to the list in the **Shot Selection** screen and as you acquire images in the **Acquire Review** screen.

Once you have selected additional shots, tapping the right arrow icon in the lower right corner of the screen will close the shot selection columns, revealing the image display screen and image manipulation controls.

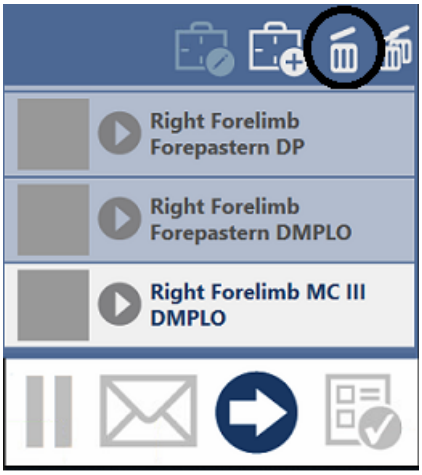
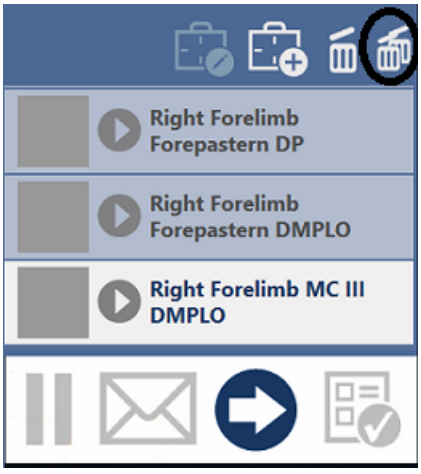
Note: If you have elected to place the shot column on the left side of the screen the arrow will face left rather than right.

Remove empty shots from the study

After you add shots to the list, you can remove individual empty shots or all empty shots.

Procedure

1. In Acquire Mode, select the Add Shots icon.
   The Protocols list is displayed.
2. Select the Region, Anatomy, and Shots.
3. Complete one of the following actions:

Options	Instructions
Delete a single empty shot.	**a.** In the shot list, select the empty shot to delete. **b.** At the top of the shot list, click the single trash can icon.  The selected shot is removed from the list.
Delete all emtpy shots.	At the top of the shot list, click the dual trash can icon.  All empty shots that were added to the shot list are removed. Note that this function is available only from the Add Shots screen.

Create a Protocol

In the **Shot List** screen you can create shot list protocols, which are used to quickly add groups of shots to any study.

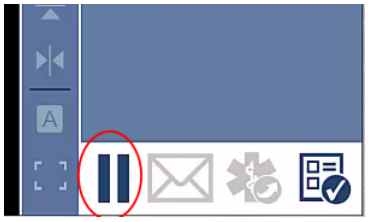
To create a protocol, first select the **Region** and **Anatomy** with the shots that are to be added to the protocol. To add shots to the shot list, simply tap each of the shots you want to add. You can change the order of the shots by dragging a shot tile up or down to the desired location in the list. The other shots will spread out, illustrating the position in which the shot will be placed when you release the shot tile.

Once all of the shots are in the list and ordered as desired, tap the **Save** icon located near the top of the shot list. This will open a dialog box wherein you will be prompted to provide a name for the protocol. Once the name is entered in the field, tap the **Save** icon to create the protocol. A new protocol tile with the provided name, will be added to the **Protocols** list in the upper left corner of the screen.

To add the shots in this protocol to a study, simply tap the protocol tile and the shots will be added to the shot list in the order they were saved.

Pause a Study

We have provided an additional control in the **Acquire Review** screen, which allows you to **Pause**, rather than **End** your study.



This control enables you to leave the **Acquire Review** screen without ending the study and triggering the auto route function. When you return to the **Acquire Review** screen and finish capturing images for the study, you can then use the familiar **"End Study"** control to exit the screen and initiate the auto-route process at that time.

The Pause symbol is displayed in the Patient List so you can see which studies are incomplete.

Rename Shot Function

In the event that an image has been captured with the wrong shot information, we have provided a function which allows you to rename the shot to match the view that was actually acquired.

To initiate this function, simply tap the **Rename** icon, located directly above the **Shot List**. This will display the **Shot Selection Columns** in the **Image Display Area**.

Select the correct **Region**, **Anatomy** and then the **Shot** which matches the acquired image.

Once you have selected the new shot, a form will slide up in the **Shot List** showing the current shot and the new shot, asking if you want to replace one with the other. Tap the **Continue** button to make the change or the **Cancel** button to leave the original shot intact.

To rename additional shots, simply select another shot by tapping it in the **Shot List** and then repeat the above process to rename the shot.

Once all shots have been renamed, simply tap the **Right Arrow** icon in the lower right corner of the screen to restore the standard image display.

Touch Fundamentals

The touch interface control gestures, which replace the familiar mouse and cursor desktop interface, will be new to many of you. We have included this tutorial to help smooth your transition to a primarily touch environment.

Tap

Similar to the click of a mouse, the tap gesture will replace the left-click for selecting objects on the screen. As the name suggests, simply tap the item you wish to select in situations where you would have clicked using the mouse.

Drag

The **Drag** gesture is now as simple as touching an object, sliding your finger across the screen and lifting your finger, rather than clicking and holding down the mouse button as you move the mouse to drag an object.

Two-Finger Drag

The **Two-finger Drag** gesture, as the name suggests, is a variation of the **Drag** function which is actuated by touching two fingers to the screen and dragging them across it.

Flick

The **Flick** gesture allows the user to scroll through a list by simply flicking a finger on the screen in the direction you wish to scroll, rather than clicking and holding on an arrow, or dragging a scroll bar with the mouse.

Pinch and Unpinch

The **Pinch** and **Unpinch** gestures allow the user to zoom an image in and out, without the need to click a control and then hold down a mouse button while dragging the cursor across the screen.

Image Manipulation Controls

Primary Image Controls

The functions for these controls are active by default when an image is displayed in the **Acquire/ Review** screen.

Win/Level

The **Window/Level** operation is performed using the **Two-finger Drag** function. Simply touch two fingers to the screen over the image display area and drag those fingers across the screen to adjust the window level values of the image. Lift the fingers from the screen to stop using the function.

Zoom

The **Zoom** operation is performed using the **Pinch** and **Unpinch** gestures. To begin, touch the thumb and index finger to the screen; move the two away from each other to enlarge the image and move them towards each other to shrink the image.

Note: To move quickly through the entire zoom range, simply touch one finger from each hand to the screen and slide them away from or toward each other.

Pan

The pan operation is performed using the **Drag** gesture. On any zoomed image, touch the screen and drag your finger in any direction to move the image in that direction. Lift the finger to stop using the function.

Secondary Image Controls

The functions for these controls must be activated by tapping the control icon for the function.

ROI

The ROI operation is performed using the **Drag** gesture. Tap the **ROI** control to activate the function, then touch the screen and drag your finger diagonally across the screen to draw a box around the region of interest. Lift your finger from the screen and the Window Level value of the image will be adjusted based on the values in the selected area.

Crop

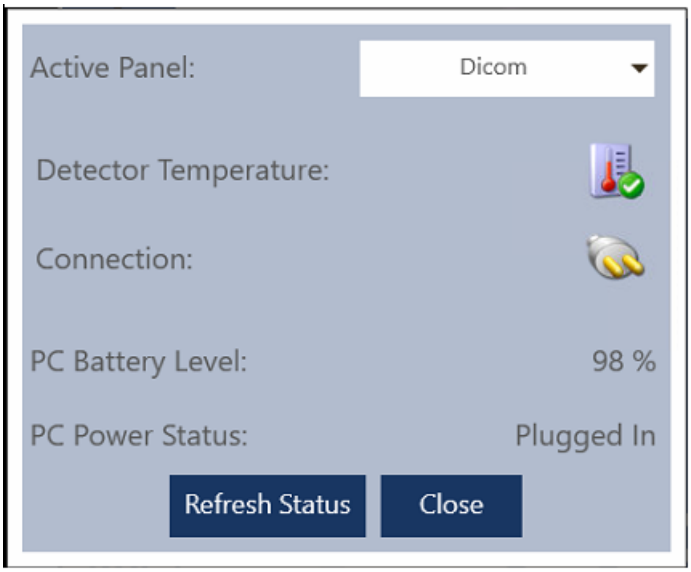
The **Crop** operation is also performed using the **Drag** gesture. Tap the **Crop** control to activate the function, then touch and drag your finger diagonally across the screen to draw a box around the cropped area. Lift your finger from the screen perform the crop.

Marker Placement

Marker placement can be performed using either the **Tap** or the **Drag** gesture. Tap the marker and then tap the image where you would like to place the marker or, drag the marker to the screen. To remove the marker, either drag it off the screen or flick it off the screen.

Active Plate Connection Icon Control

We have added a dynamic information form that can be accessed by tapping the **Plate Connection Icon**, which is now located throughout the application.



The following information is found on the form:

1. Active Panel (dual panel configuration)
2. Detector Temperature
3. Connection Strength
4. Battery Charge(Panel) Note that the battery must have a minimum of 5% charge to acquire an image.
5. Channel
6. Gain Calibration Status
7. PC Battery Level
8. PC Power Status

Active Panel Selection: In systems using a dual panel configuration, you can select the active panel from the Active Panel drop-down. The list includes only those panels configured for use in your system.

Refresh Status: Tap Refresh Status to update the status information displayed in the window.

Calendar Controls

There are several calendar controls located throughout the application; in the **Add Patient** form, the **Edit Patient Form**, the **Reporting** screen, the **Batch Send** form and the **Calibration History** screen.

When only a single date selection is required there will be a single control, but where the user will enter a date range, two of the controls will be located together.

To open the **Calendar** control, simply tap the icon that resembles a desktop calendar. On opening, the title bar in the top portion of the calendar will display the current month and year, in addition to back and forward arrow controls while the main body of the form will display the days of the month up to the current day.

Tapping the title bar will change the displayed value from the current month and year to the current year only, with the main body of the form now showing the months for the current year, up to and including the current month.

Tapping the title bar again will change the displayed value from the current year to a range of 10 years, with the main body of the form now showing the years of the range up to the current year.

Tapping the arrow controls for any of the various title bar values will move the values backward and forward in increments that are dictated by the type of data displayed in the title bar.

Tapping any values in the main body of the form will select that value and take the user up one level with that value selected in the title bar. Once the user has determined the year and month and selected a day, the calendar control will close.

To select a range, simply pick the first date of the range using the left calendar control and pick the last date of the range using the right calendar control.

Re-ordering Various Application Lists

You can change the order of the various lists found throughout the application at any time.

To change the order of a list, simply drag one of the list items from one position and drop it in another. As you move the selected item, the remaining items will slide apart to reveal the position in which the selected item will be placed when your finger is lifted from the screen.

Navigation Form Controls

There are several navigation form controls located throughout the application; in the **Local Export** form, the **Reporting** screen and throughout the **Management** screen. When the user taps one of these controls, a touch optimized navigation form is opened which allows the user to select a folder on the local system, a thumb drive or an accessible network location.

The layout of the form is typical, with a folder tree in the left pane and the contents of the selected folder in the right pane. There are forward and back controls in the upper left corner of the screen and a navigation bar showing the data path of the currently selected folder.

Chapter

5

Export

Contents

This chapter describes how to export images.

Emergency Export

You can send all of the images which have been acquired to the application's default server; typically the site storage server. This can be done directly from within the **Acquisition/Review** screen using the **Emergency Send** control (which looks like the **Emergency Patient** icon with an arrow curving upwards in the foreground) found in the lower right corner of the screen.

1. This control is inactive until an image has been acquired.

2. Once an image has been acquired, tapping the **Emergency Send** icon will automatically send all acquired images.
3. You will see a Send Status value displayed on the screen as the images are sent to the storage server and once the send is complete the message will reflect that status.

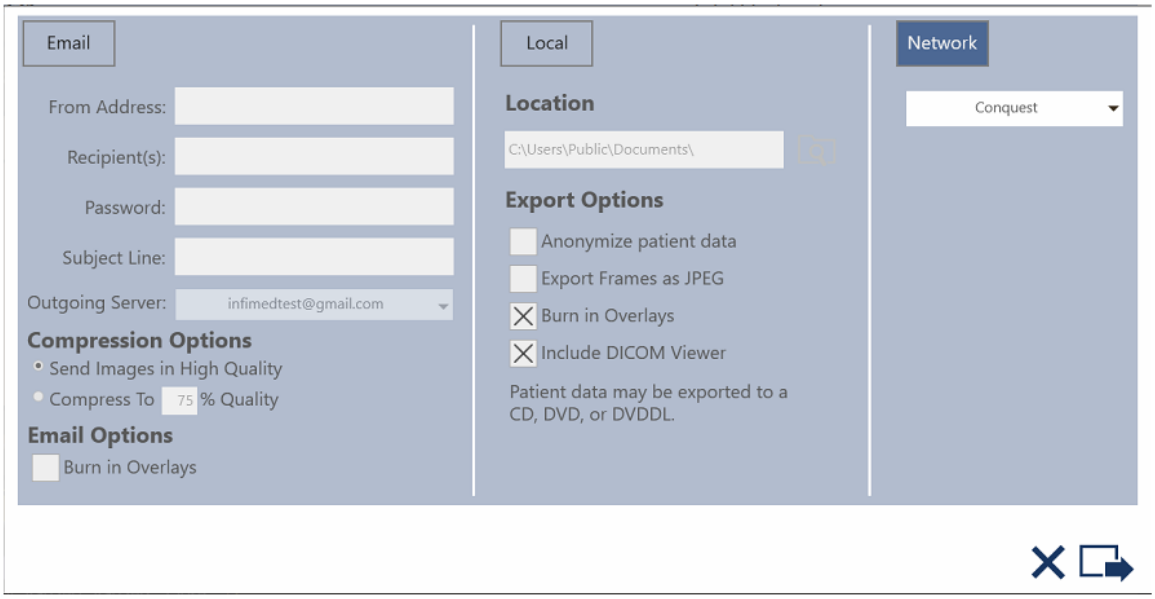
The **Emergency Export** function also recognizes which images you sent previously and ignores them, sending only the newly acquired images. If you wish to resend an entire study, you can use the export controls from the **Main Patient** screen.

Patient Tile Export

You can manually export single or multiple studies for each patient to storage servers or local media from an open Patient Tile in the **Main Patient Screen**.

To send a single study or multiple studies, simply tap the desired study(ies) and then tap the **Export Study** icon in the upper right corner of that Patient Tile.

This will display the **Export Form**, seen below. Select either the **Local** or **Network** function by tapping the appropriate button at the top of either section of the form.



For **Local** exports you will be able to select an export location and choose between the following export options: Anonymize, Export as JPG, Burn in Overlays and Include DICOM Viewer.

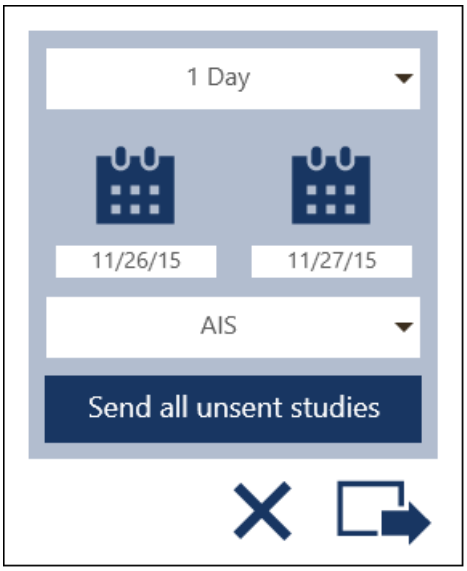
For **Server** exports, you may select from a list of available servers that have been configured in the Management screen.

When the export process has begun you will see a status indicator near the bottom of the form. When the send process completes, the **Export Form** will close automatically.

Batch Send Export

To simplify the export process, we have included a **Batch Send** function which allows you to send batches of studies based on selectable criteria.

Using the drop-down menu at the top of the form, you can select all studies from 1 day, 2 days, 1 week, 2 weeks and 1 month. Beneath the drop-down menu is a calendar control that will allow you to select all of the studies from a specific day to export.



Once you have selected your date range, choose the destination server from the drop down field, and then tap the **Send** icon.

- To send all of the unsent studies on the system, regardless of date, simply tap the **Send All Unsent Studies** button. An export status bar also displays to provide you with some feedback on the status of batch exports jobs.
- If all studies have already been sent to the selected server you will be presented with a notification stating that there are no eligible studies found.
- A status bar indicates the progress of the export process.

Using the DICOM Queue

The DICOM Queue allows you to view information about DICOM exports in progress or completed, clear the completed exports from the list, or cancel all exports.

About this task

It is available on the **Main Patient Screen**.

Procedure

1. At the top of the **Main Patient Screen**, select the **DICOM Queue** icon.

The DICOM Queue opens.

2. Complete the following actions as necessary:

Option	Instructions
Clear a completed export.	**a.** Select the patient record in the queue. **b.** Click **Clear**.
Clear all of the completed or aborted exports from the list.	In the bottom of the DICOM Queue screen, click **Clear Completed**.
Cancel all exports in progress.	In the bottom of the DICOM Queue screen, click **Cancel All**.
Retry a failed export.	**a.** Select the patient record in the queue. **b.** Click **Retry**.
Return to the Main Patient Screen.	In the bottom of the DICOM Queue screen, click the back arrow icon. 

AIS Export

You can export studies and images to the Antech Imaging Services website and submit a consultation for those images on the AIS website using the **AIS Export** control, found on each **Study Tile** in an expanded **Patient Tile**.

This process is initiated by tapping the **AIS Export** control, seen to the left. This will begin the DICOM Send of the images for that study in the background while a browser window will open to the **AIS New Consultation** page.

Once you have submitted the consultation, closing the browser window returns the system to the **Main Patient** screen of the application.

Auto-Route Export

The system can be set up to select a server to which each study will be auto-routed when a user closes a study, returning to the **Main Patient** screen. Setting up an auto-route server is done in the **Management** screen and can only be performed using the built-in administrator account.

In the **DICOM/Storage** screen, the administrator simply selects the desired server and taps the **Supports Auto Send** check box to identify the server as the auto-route destination.

Once configured, each study will be auto-routed to the selected default server when the user ends a study and returns to the **Main Patient** screen.

Email Study Feature

To provide you with additional flexibility when it comes to exporting images, we have added an email function to Sound SMART DR™ software. You can access this function from the **Main Patient** and the **Acquisition** screens.

To email a study from the **Main Patient** screen, select the desired patient and choose the study to be sent. Then, tap the **Export** icon and select the **Email** function. You will need to enter your email address, the recipient's address and the password for your email account in addition to selecting the outgoing server.

If you wish to send a compressed image, select the second radio control in the **Compression Options** section and enter a percentage to which you want the files compressed. Otherwise, leave the **Send Image in High Quality** radio button selected.

If you wish to burn overlays into the image, check that box in the **Email Options**. Tap the Send control to initiate transfer.

In the **Acquisition** screen, you will tap the email envelope icon to bring up the email study form. Here, you will enter the same information as in the **Main Patient** screen, except that you will not have the option to include overlays and the system sets a default compression of 50%.

Chapter

6

Reporting

You can generate and export AAHA, Billing, and Study reports. The reports can be generated in both PDF and Excel formats and exported to folders on the local system, or on a network or on a thumb drive.

The **Reporting** screen is reached by tapping the **Reporting** control, seen to the left, in the upper right corner of the **Main Patient** screen.

Generating a Report

Once in the **Reporting** screen, select the type of report you wish to generate. This is done by tapping one of the three options in the upper left corner of the screen. By default the AAHA Report is selected. Next select the date range to be covered in the report using the **Start Date** and **End Date** calendar controls located next to the **Report Type** selection options in the upper left corner of the screen. When you select the options, the results are automatically displayed in the main body of the screen.

Exporting a Report

To export the generated report, select a location to which the report will be exported using the **Destination** search field. If the destination data path is known it can be entered into the Destination field. Or, tap the **Destination Search** icon to open a folder navigation window. Next select either **PDF** or **Excel** from the **Export As** options in the upper right corner of the screen. Tap the **Save** control to finish the export process.

The AAHA report contains the AAHA required fields of Area, Grid, and Level of Sedation in the report. These fields are populated with information that you provide during the acquisition process using the AAHA Study Info form, which you can access tapping the Reports icon on the Acquisition screen. Fill out the fields and tap the **Save** button. The selected information will be included in your **AAHA Radiology Report**.

Chapter

7

Cleaning the X-ray System

Contents

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

- *Approved Disinfection Agents* on page 104
- *Cautions* on page 104
- *Removing Dust From Fans and Heatsinks* on page 105

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.

Chapter

8

Access Help

Contents

Sound provides options for help with the user interface. Access them from the **Help** icon on 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.

Help Options window

Figure 43: Help Options window

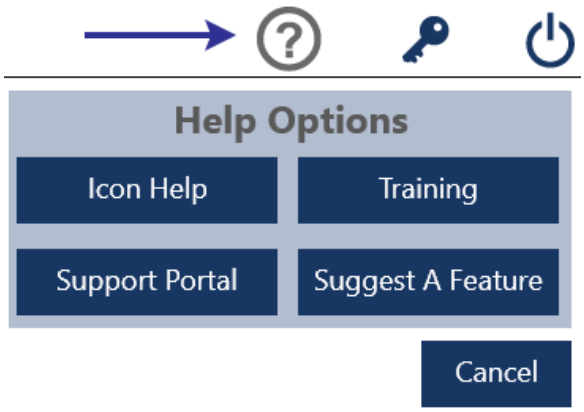


Table 38: Help Options

Item	Descriptions
	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**. See *Figure 44: Access the Sound Experience Support Portal* on page 109. • First time users click **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.

Item	Descriptions
Suggest a Feature	Accesses portal you can use to provide feedback to Sound™ about the Sound SMART DR™ software. See *Figure 45: Suggest a Feature* on page 109.
Cancel	Closes the window.

Figure 44: Access the Sound Experience Support Portal

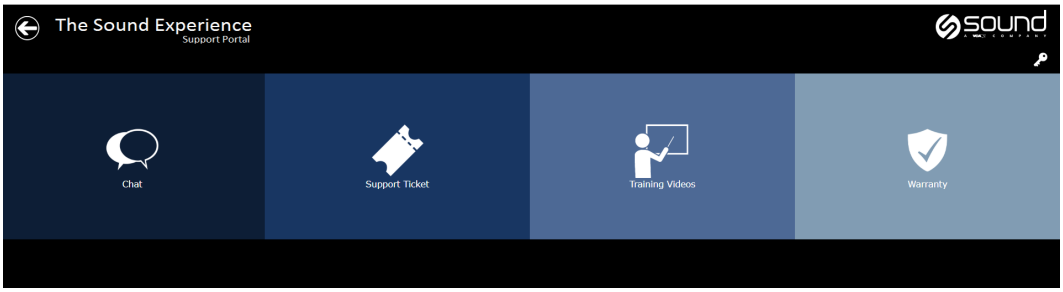
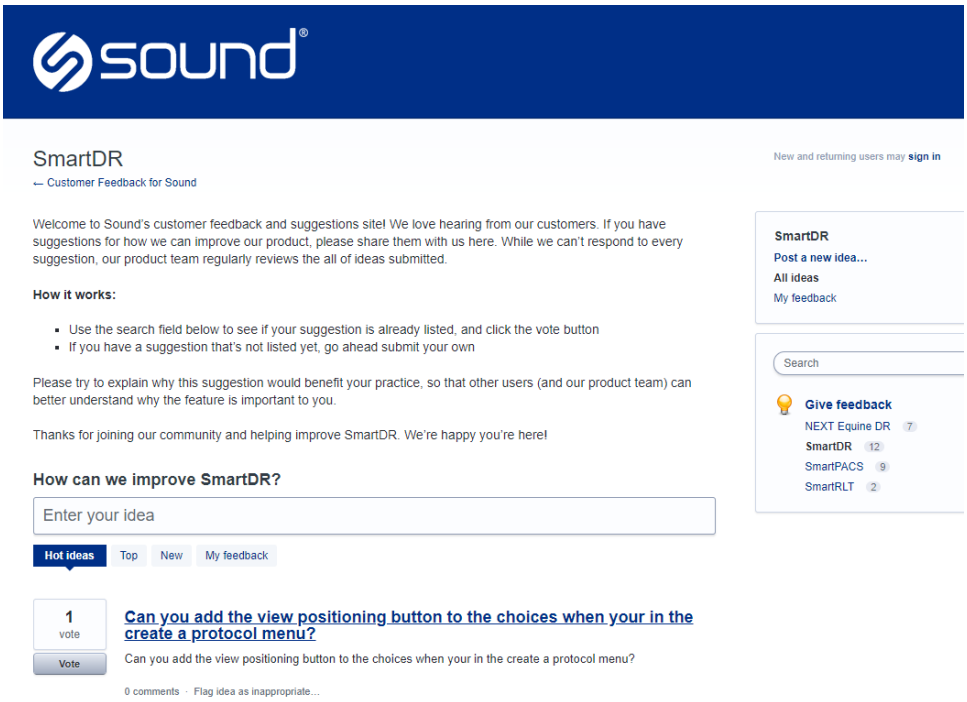


Figure 45: Suggest a Feature



Appendix A

Technical Support

Contents

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.
5810 Van Allen Way
Carlsbad, CA 92008
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

Open the **Management** screen, select **Config** > **Site Information**.

The system serial number is located in the **Model Information** section.