

## *Digital Image Receptor*



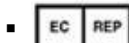
The PaxScan 2530W is a radiographic  
digital x-ray imaging sub-system

**Abstract**

The Operating Instructions (P/N 82510-000) covers safety, setup, operation, and maintenance of the PaxScan 2530W digital radiography image receptor. The imager is a component sub-system intended for integration by a qualified systems integrator.



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**Updates**

For updates to these instructions, please refer to the *Release Notes*.

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## How To Reach Us

### Technical Support

In order to provide you with the most comprehensive technical support, (hardware or software), please complete the problem report in Chapter 11 of this manual and email to: PAXSAN.RMA@varian.com before contacting your Varian representative.

To speak with our technical support personnel call:

- Call (800) 432-4422 dial 8.

For Warranty and Returns please refer to:

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## General Safety Information



**PLEASE READ THIS ENTIRE MANUAL BEFORE USING. PRIOR TO USING PLEASE READ AND UNDERSTAND THE WARNING, PRECAUTIONS AND ADVERSE EFFECTS RELATING TO THIS DEVICE.**

## Safety Warnings, Precautions and Contraindications



**Warning:**

For portable applications, the operator and end-user must take precautions to protect themselves against dangerous X-ray exposure when using the flat panel imager in the X-ray beam path of an X-ray source.



**Warning:**

The 2530W is not intended to be used as a primary barrier to X-rays. The user is responsible for ensuring the safety of the operator, bystanders, and the subjects being radiographed.



**Warning:**

To avoid risk of electric shock, this equipment must only be connected to a supply main with protective earth when not in wireless configuration.



**Warning:**

To reduce the potential of electrical shock, the operator should not simultaneously touch the patient, cable connections, ex-sync serial connector, fuse holders, and the power supply.



**Warning:**

Equipment must be connected to an uninterruptible power source for which it was designed.



**Warning:**

The equipment is not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.



**Warning:**

Do not exceed maximum load weight of 100kg over a diameter of 40mm and 150kg distributed around the entire surface of the panel.



This device is not intended to supply heat to a patient. However, during normal use surfaces will become heated due to power dissipation in the imager.



Temperature increases based on frequency of image acquisitions taken. Patient contact surfaces will not exceed 6 degrees C above the manufacturer's recommended normal operation temperature. See Figure 1-0 for the view of patient contact surfaces. Internal temperature sensor data is provided in the diagnostic data attached to each image. These temperature measurements are well correlated with the panel external surface temperature. It is advisable to monitor this diagnostic data as an additional safety precaution.

The operator should monitor and evaluate how much and how long the patient is in contact with these surfaces. Exposure beyond limitations may result in, but not limited to, the surface layer of the skin to become reddened, welted, and swollen with pain.



**Note:**


















*System Integrators:* At a system level, it is possible to apply for UL approval without the patient contact limitations discussed below. If the imaging system monitors the internal temperature data supplied by the panel, mechanisms can be put in place at the OEM system level to control panel surface temperature so that it does not exceed 41°C.



**Note:**

There are no contraindication situations.

## Explanation of Symbols

	On (power: connection to the mains)		Caution / Warning / Important: Describes action or conditions that could result in equipment damage, data loss, or personal injury		Protective Earth Ground
	Alternating Current		Off (power: disconnection from the mains)		Direct Current
	Handle With Care		Indicates step-by-step description of the respective function follows		Useful / Important information
	Authorized Representative in the European Community/European Union		Manufacturer		Consult Instruction for Use
<b>IPX1</b>	Moisture Resistance Level Tested		Heated Surface		Type B Applied Part
	Load Weight Restriction		Temperature Limits		Non-ionizing radiation

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### Introduction

The PaxScan 2530W model family of radiographic digital image receptors is commonly referred to as a flat panel detector (FPD). The detector together with image processing and command software called Virtual Command Processor (VCP) is designed for integration into a complete X-ray system. The imaging system has two main system components: The flat panel sensor and VCP software. The imaging system provides a wireless communication link between the Receptor and either one of the three options described below:

- 1) Varian I/O Box (External Power Supply) that provides in addition the possibility to power the unit, recharge the receptor battery, provide a wire GB Ethernet connection, wire I/O interface to the X-Ray generator and a wireless service mode if the tether cable is used.
- 2) Off the shelf Access Point
- 3) Laptop or Tablet

### Shipment Contents

Flat Panel Receptor Assembly

PaxScan Receptor Install CD

(Files specific to the receptor in the shipment)

PaxScan Software CD

Virtual CP/ViVA System Software L.08 Release 1

PaxScan 2530W Operating Instruction

## Optional Parts

I/O Interface Box

Detachable receptor cable for wired operation or battery recharging

Battery – Varian model

Battery Charger – Varian model

Laptop Style Power Supply for 3-Bay Battery Charger (includes power cable)

Laptop Style Power Supply for 1-Bay Battery Charger (includes power cable)

Customer Specific Overlay

Extension Cable

GigE Cable

Immediately upon receipt, inspect the shipment and its contents against the Delivery Note enclosed with the shipment for evidence of damage or missing components. Save all shipping containers in case a return is warranted. If there is any discrepancy, please call the PaxScan Service Center at (800) 432-4422 or (801) 972-5000.

## Intend Use

The PaxScan 2530W model family is designed to meet the needs of general radiography diagnostic for medical and veterinary use in portable applications utilizing multiple sensitive and extend dynamic range modes. This family model will acquire image over a wide range of dosage, while providing maximum access to the patient, with a minimum possible border on the active imaging area. This device is designed to communicate either wirelessly or tethered, using the optional combination cable.

Figure 1-0 Patient Contact Surfaces – 2530W

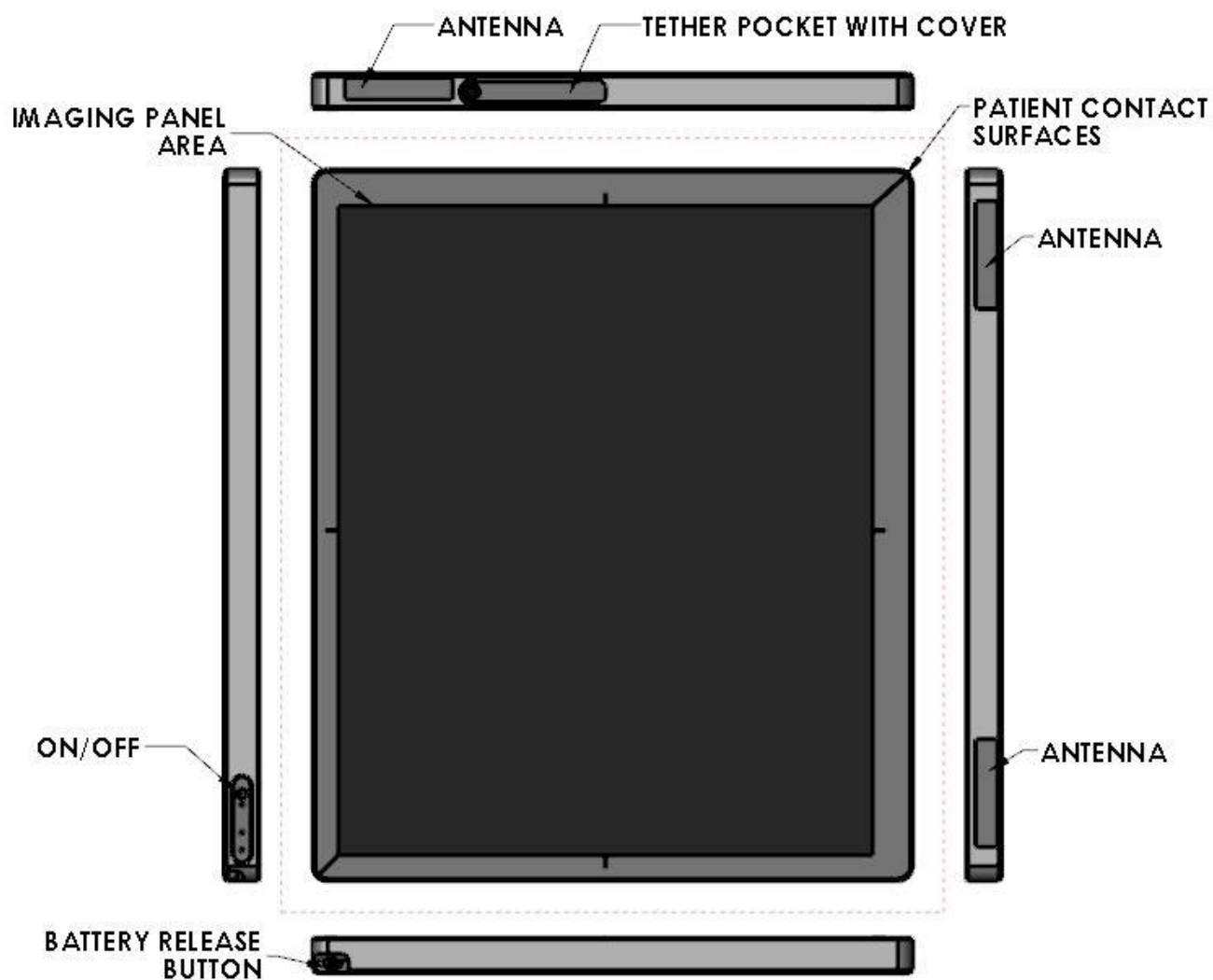
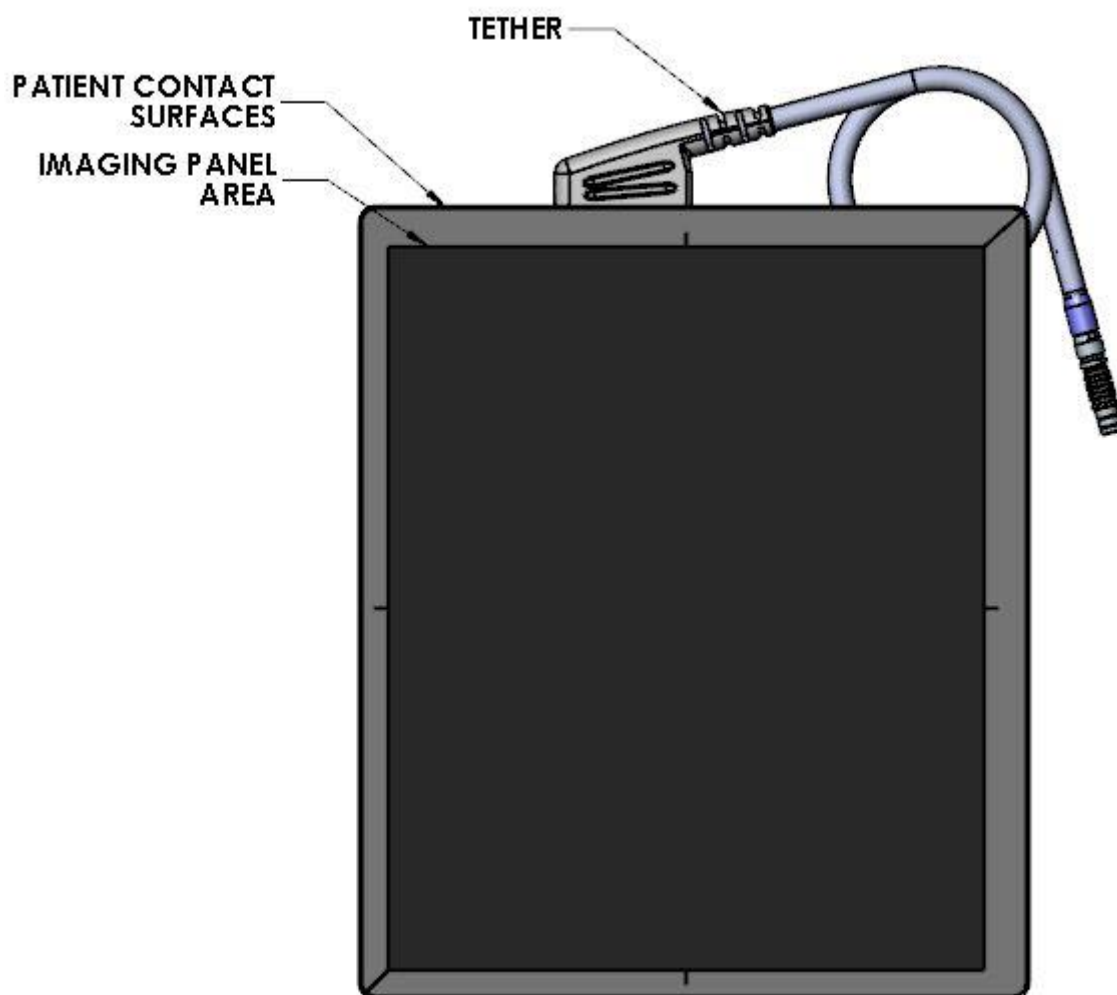


Figure 2-0 Patient Contact Surfaces – 2530W



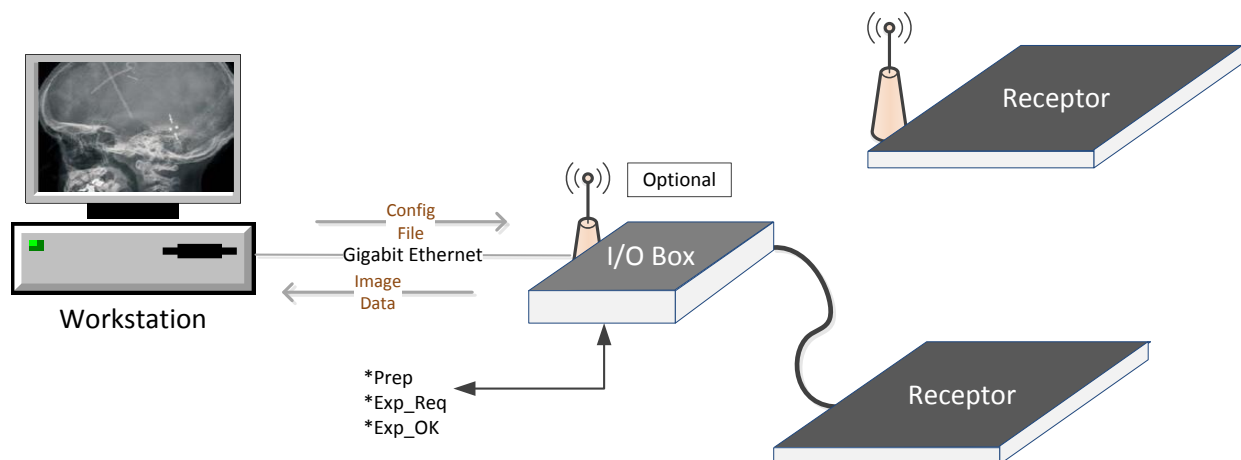
## Getting Started

### System Overview

In medical applications, the function of the 2530W FPD is to absorb the X-rays that pass through the patient's anatomy and convert them into a digital image. In the case of using the I/O Box as a wireless interface, it may be mounted in an equipment enclosure, or it may also be wall or ceiling mounted to maximize wireless signal strength. The same installation consideration should be taking if there either an off-the-shelf access point or tablet/laptop at the other end of the wireless connection. The Receptor is intended to be in patient contact and is provided with a software application package, Virtual Command Processor (VCP), which performs all the interface functions with the receptor; such as, communication and respective calibration. During operation, the Receptor is often draped or bagged to ensure cleanliness and sterilization, and is manipulated such that the Receptor's input window is located near, but on the opposite side of the patient, from the X-ray source.

Figure 3-0 shows the configuration of the Receptor in the context of the overall imaging system. The dimensions for receptor are 331.5mm x 279.8mm x 16.5mm.

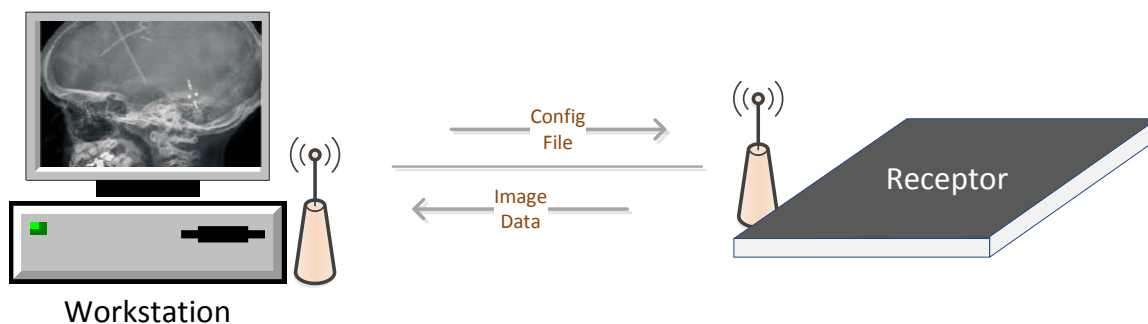
**Figure 3-0 Imager Configuration**  
(Receptor 1 – Wireless, Receptor 2 – Wired)





**Figure 3-1 Imager Configuration**

(Receptor – Wireless Access Point – No Synchronization signals)



The Receptor operation is controlled using software commands via UART which use an Ethernet link as a physical layer. The set of possible Receptor control operations are supplied to system integrators in a C++ library of callable functions, in the form of a Win32 DLL. The control of the Receptor is platform-independent.

The I/O Box (Optional) provides all hardware interfaces for the PaxScan 2530W using an external hardware interface connection. The laptop style power supply, which is optional equipment, provides the I/O Box with +24V DC power. The receptor is battery powered but can operate in wired mode through the tether, which can also be used to recharge the battery. The I/O Box has a footprint of 182mm x 167mm and a height of 192mm.

**Warning**

If an operation with the tether cable (wire) is intended all regulatory approvals, including UL and CE mark, are contingent on the use of the I/O Box with the external power supply specified by the Varian Medical Systems. If substitutions are made, these approvals are void and the image quality cannot be guaranteed.

**Warning:**

Equipment must be connected to an uninterruptible power source for which it was designed.

**Warning:**

Equipment should not be used adjacent to or stacked with other equipment; and that if adjacent or stacked use is necessary, the equipment should be observed to verify normal operation in the configuration in which it will be used.

## Connecting the Cables – I/O Box Setup Only

Connect the cables as described below in Table 1-0 and shown in Figure 4-0 and 5.0. ►

**Table 1-0 Cable Connection Details**

Step	Action / Description
<b>If the imager is integrated with Varian I/O Box there are four (4) cable connections for the 2530W Flat Panel Receptor: (a) The laptop style power supply cable , (b) external sync cable, (c) Category 5 or better Ethernet cable, and (d) tether cable. The cable connections are described below.</b>	
1.	<b>Laptop Style Power Supply</b> This provides +24V to the I/O box. Connect the laptop style power supply to the I/O box at the +24V input. Plug the laptop style power supply into the main AC supply.
2.	<b>External Sync Cable Connection</b> This connector is intended to provide the user with a means to synchronize the end-user system-level application with the imager. This connector provides the connections for four opto-isolated signals, (two outputs, and two inputs). The one output signal named “Expose OK” is intended to signal that the receptor is ready for the generator to produce X-rays and the input named “Expose Req” allows the user to trigger the panel readout. See Appendix A, diagram 1.0 for “Expose OK” and “Expose Req” signal schematic. Connect this cable to the external sync connector on the I/O Box.
3.	<b>Gigabit Ethernet Connection</b> Connect the Ethernet cable to the I/O Box connector and to a gigabit capable interface in the user’s host computer.
4.	<b>Tether Cable</b> This cable functions as an interface between the receptor and the I/O Box by providing power and synchronization signals to the receptor (X model and tethered W configuration). Connect the tether cable between the imager and I/O box. Plug the Laptop Style Power Supply into the +24V outlet on the I/O Box. <i>When using the X model or tethered W configuration, the panel should be installed and operated as far as possible from the Laptop Power Supply.</i>
5.	<b>Ground Lug</b> Connect I/O box chassis ground lug to acceptable ground connection

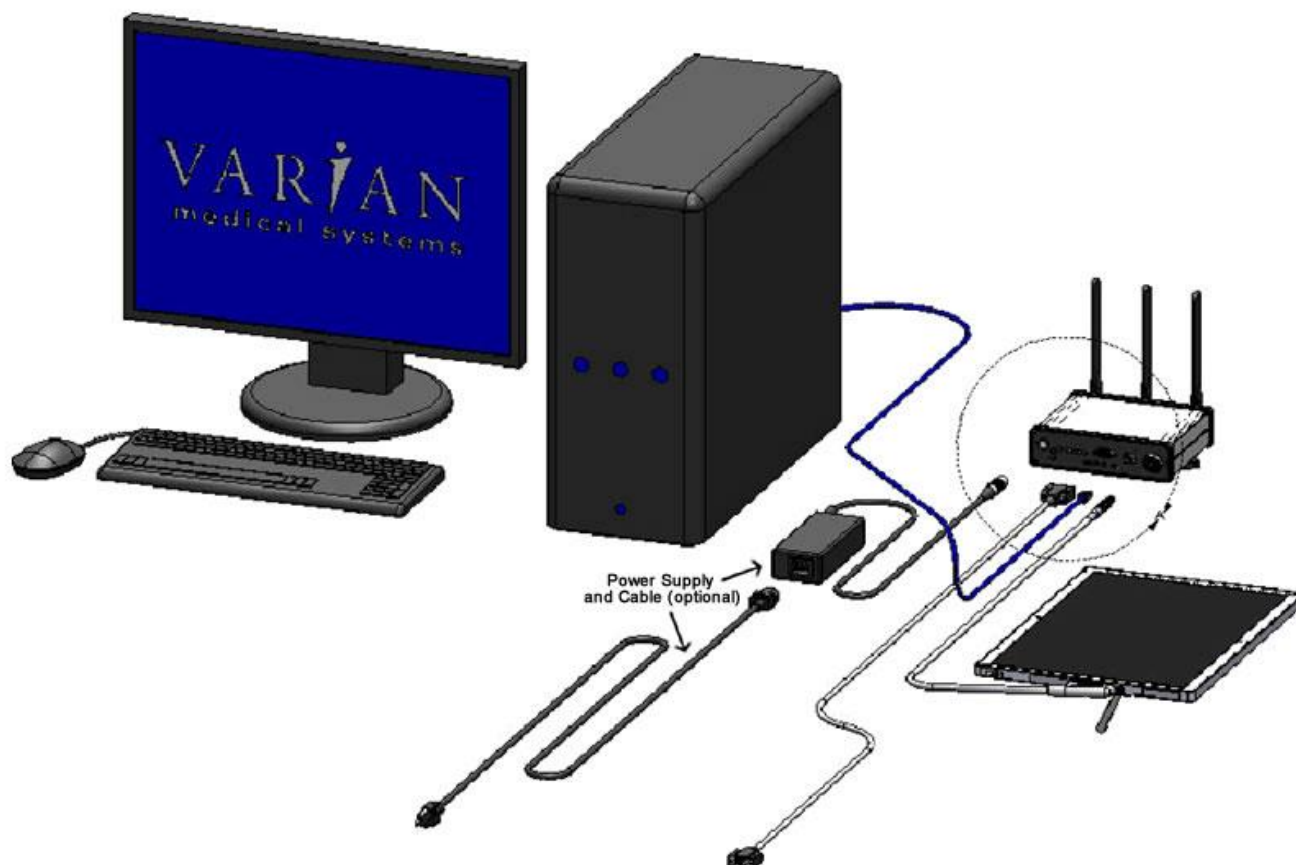


### Important:

The External Sync Cable Connection is user supplied equipment.

*This connection shall only be handled by the service personnel.*

Figure 4-0 Cable Connection Varian I/O Box Mode - Overview

**Important:**

Use minimum 18 AWG wire for connection to the external PE terminal on the I/O Box

**Figure 5-0 Cable Connection I/O Box Mode - Detail**

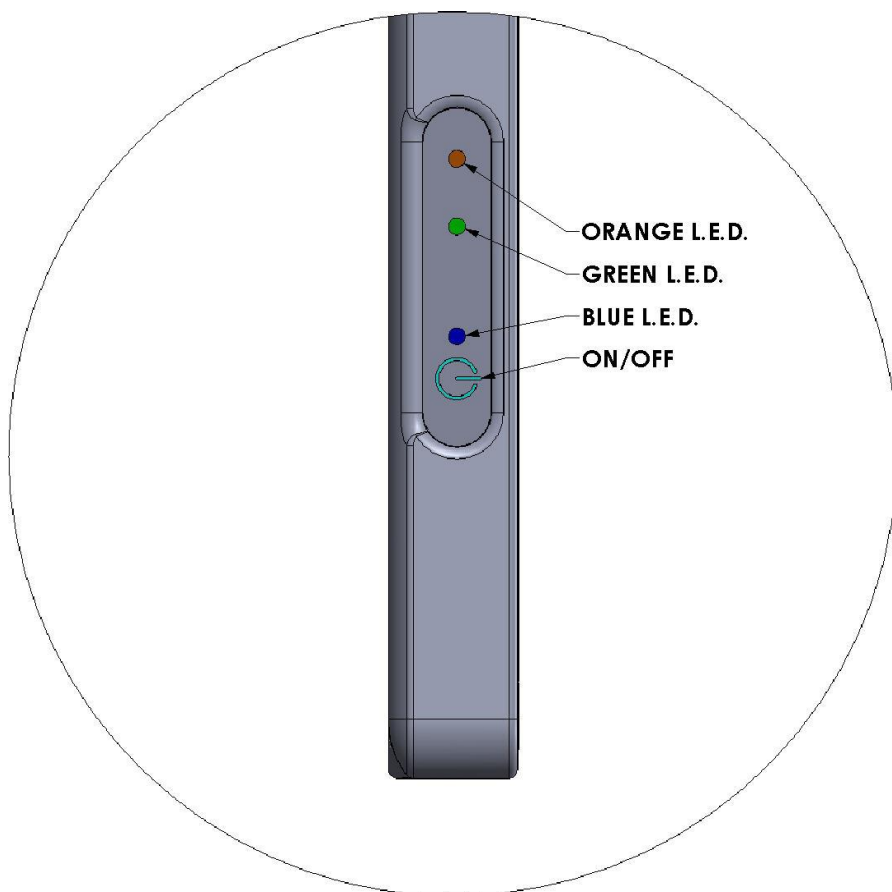
## Power on Sequence – without I/O Box

Wireless mode (W)

Step	Action / Results
1.	<p>I/O Box – Wireless Mode.</p> <ol style="list-style-type: none"> <li>Install the battery in the receptor and it will automatically turn ON. The blue LED will light indicating the receptor is ON            Note: if the receptor already has battery installed; but it is off, please press the receptor ON/Off button for one second to turn the receptor on.</li> <li>After 30 seconds the receptor will attempt to connect to the I/O Box.            Note: The receptor Configuration Disk must be installed; as well the correct Viva version and an open link performed in order for the receptor to connect to an I/O box – see Chapter 4 for installation instructions.</li> <li>If the receptor is configure to work as access point wireless client device, such as laptop or tablet after 30 seconds the receptor will broadcast its SSID.</li> </ol>
2	<p>Once the connection has been established, the Green LED on the receptor will light indicating there is a wireless connection and will also detail connection strength. (see Appendix C for additional information on panel association)</p> <ul style="list-style-type: none"> <li>The receptor will keep trying to connect until a successful association takes place.</li> </ul>
3.	<p>The Orange LED, when lit, indicates a Ready-to-Expose State. See Figure 6.1 for details.</p>



**Note:** For wireless mode, Pleora eBUS Universal Pro driver must be used

**Figure 6-0 2530W Receptor Power/LED**

**Figure 6-1 2530W Power/LED - Details**
**Receptor LED's**

LED	LED State	Mode	Description
Green	Solid	Wireless	Wireless connection has been established
	Blinking	Wireless	Poor link quality
Orange	Solid	Wireless/Tether	Receptor is ready for X-Ray
Blue	Solid	Tether (With Battery)	Battery is fully charged
	Blinking	Tether (With Battery)	Battery is been charging
	Blue	Wireless	Receptor is ON

## Tethered mode

The receptor will turn on as soon as power is present by either connecting the tether cable to a powered I/O box or by powering on the I/O box after the tether connection is made. The power button on the W model may still be used to turn the panel on and off after this initial power-up.

**Step****Action / Results**

1. Plug in the LEMO connection from the external power supply to the I/O Box.

There are 6 (six) LEDs located on the front of the I/O Box. The “POWER” LED is illuminated when power is supplied to the I/O Box. The other LEDs indicate when external signals are active at the time image acquisitions are taking place.

2. Wait at least 1 (one) minute after powering up the I/O box before any operations.

Figure 7-0 I/O Box Power On Connection



Figure 7-1 I/O Box LED – Details

**I/O Box LED**

LED	Description
Power	Battery Full
R.F. Quality	On - wireless connection is established
	Blinking - poor wireless connection
Prepare	Not in Use
Exposed Req.	Request for X-Ray
Exposed Okay	X-Ray has been triggered
SPARE	The spare will only be ON when the I/O box is booting UP

**IPX1****Warning:**

PaxScan 2530W Moisture Resistance Level Tested, horizontal position, x-ray window face up, without Tether Cable attached and rubber connector cover in place.

Receptor protected against falling water equivalent to 3-5mm rainfall per minute for duration of 10 minutes.

**Caution:**

Accessory or optional equipment connected to the analog and digital interfaces must be certified to the respective IEC standards (i.e., IEC 60950-1 for data processing equipment and IEC 60601-1 for medical equipment). Furthermore, all configurations shall comply with the system standard IEC 60601-1-1. Anyone connecting additional or optional equipment to the signal inputs or signal outputs as part of a configuration for medical equipment is therefore responsible for compliance with the equipment standard IEC 60601-1. If in doubt, consult our technical support personnel

**Warning:**

Precautions should be taken to not open the receptor module. Depending upon the type of scintillator used, opening the receptor module may expose the user to potentially toxic materials.

**Warning:**

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.



### Additional Features

#### Auto Trigger

PaxScan 2530W auto trigger feature allows the user to acquire images without the necessity of any hardware synchronization; the receptor automatically reacts to X-ray exposure and delivery an image to the workstation.

#### Wireless

- 3x3 MIMO antenna for a better reliability.
- Wireless Connection up to 450mbps.
- Enhanced wireless security WPA2
- 802.11n technology for top performance
- Dual band frequency
- Flow Control
  - Flow control detects the current Wifi network loading between client and access point and uses this information to adjust the data transfer rate for a more reliable wireless communication.

Varian recommends the following Wireless Cards for access point use:

- Cisco Linksys AE3000 Dual Band Wireless-N USB WiFi External Adapter – 450 Mbps
- Tp-Link PCIe TL-WDN4800 Network Adapter – 450 Mbps

#### Hot Swappable

This feature allows the customer to disconnect the primary cable from the Varian I/O Box to the receptor without powering down the unit. After this disconnection occurs, the user shall re-establish the link for future acquisitions by either re-connecting the tether or through a wireless connection, depending on desired acquisition type or receptor version being used. This feature is supported by the *Paxscan Virtual CP revision L08* system software and available upon request.

### Paxscan System Software


There are two CDs supplied with this product. The Software CD allows installation of the Virtual Command Processor (VCP) that provides the API to the receptor, allowing control and image transfer functionality; see the Virtual CP Interface Specification for more information. The Software CD also includes ViVA™ software which is the viewing application used to perform detector calibration, detector set-up, image acquisition, and image corrections in a Windows PC environment. NOTE: ViVA™ is intended to be used for development, testing, and maintenance purposes only. ViVA™ includes file translators for saving image files in .viv, .raw, .jpg, .bmp file formats and is Windows® XP and Windows® 7 32 bit compatible. A Software Developer Kit (SDK) including sample code notes are located in the directory:

**PaxscanL08\DeveloperFiles\SampleCode**

The Receptor software CD is specific to the panel providing calibration and configuration files. Installation of the *Software* and *Receptor* files is briefly discussed in the following sections. Refer to the ViVA Online help documentation for complete details on installation and assistance operating ViVA™.

The 2530W model family is compatible with the Paxscan System Software version L08. Please consult your Varian representative.

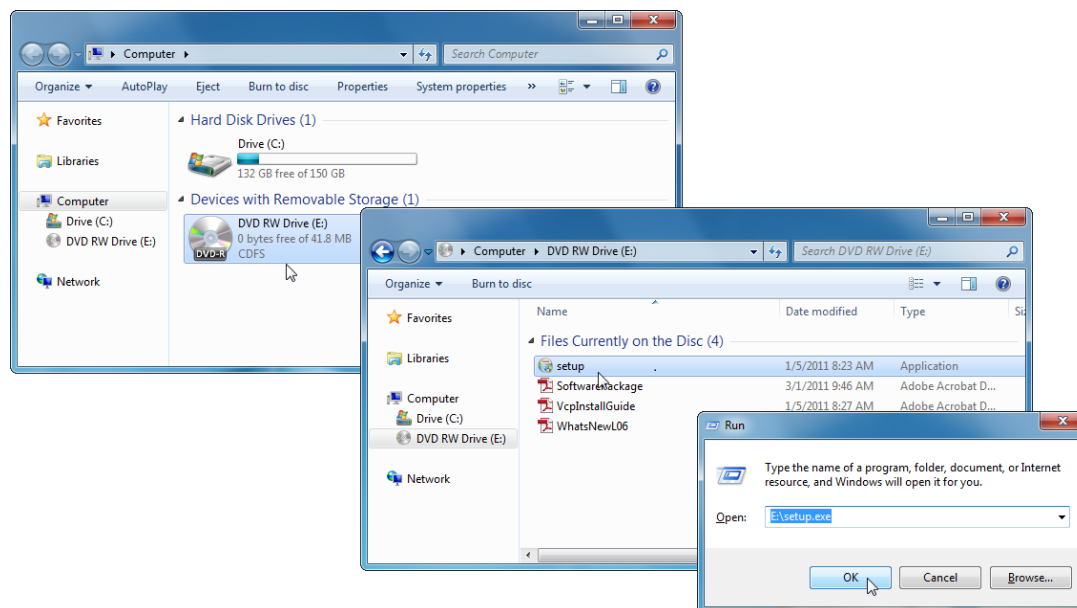
### Software Installation

Begin software installation by using the run command under the Windows Start button, select Browse, My Computer, and your DVD/CD ROM Drive that contains the PaxScan CD. Select the icon  Setup.exe or alternatively at the run command window enter drive location and file name, select **OK** – will launch the PaxScan ViVA System Software Install Shield Wizard. ►

#### Step

#### Action / Results

1. For a normal install, follow example shown in below screenshots.



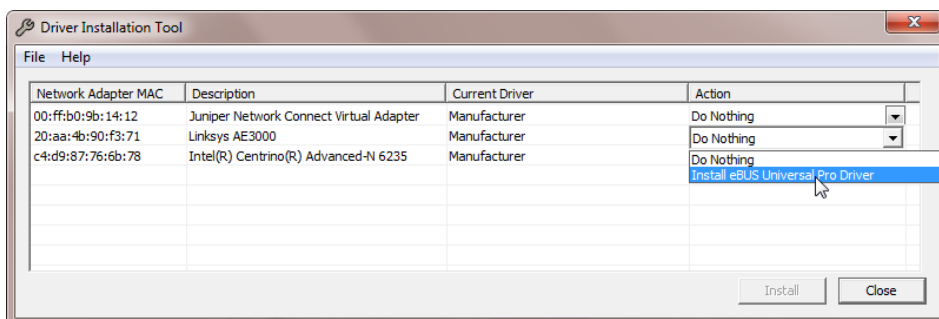
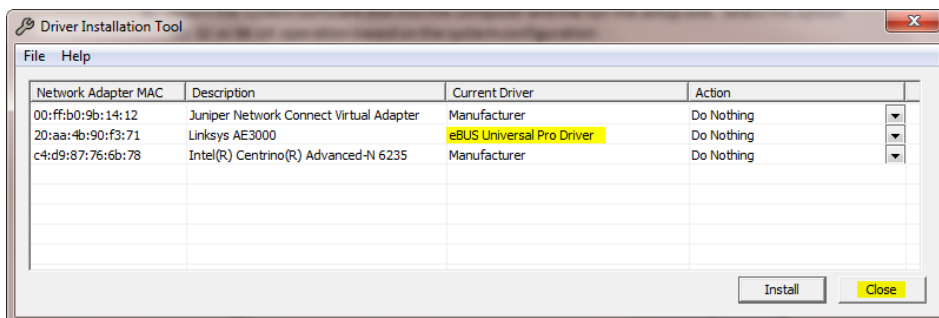
**Step****Action / Results****2.** Install Ebus driver as follows:

- a. For 64 bit installation use the following path:

C:\Program Files\Common Files\Pleora\eBUS SDK\EBusDriverInstallationTool64.exe

- b. For 32 bit installation use the following path:

C:\Program Files (x86)\Common Files\Pleora\eBUS SDK\EBusDriverInstallationTool.exe

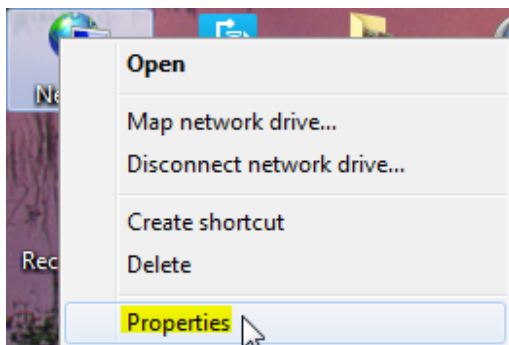
**3.** After running the executable the following window will display.**4.** Select the install eBUS Universal Driver and click *install button*, verify that the eBUS Universal Pro Driver is installed and click Close**Note:**

It is critical to turn OFF any firewall on the workstation otherwise the system will not connect.

## Step

## Action / Results

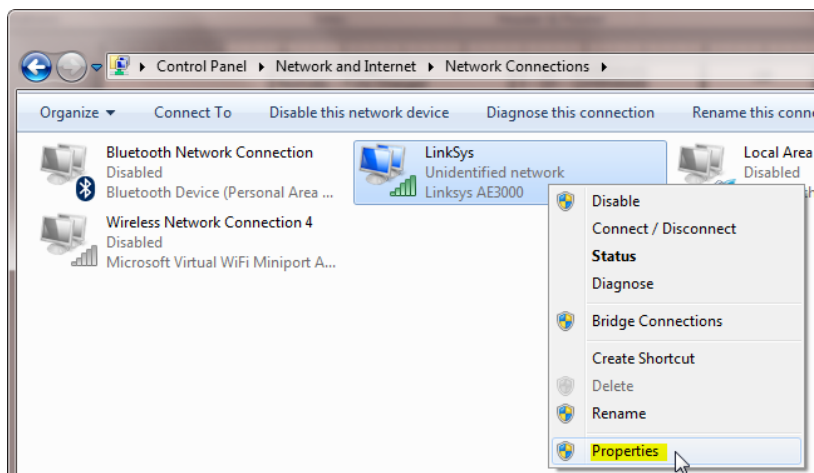
5. Set Network card IP address as follows:
- a. Right click on Network Icon and Select Properties



- b. Select “Change adapter settings”



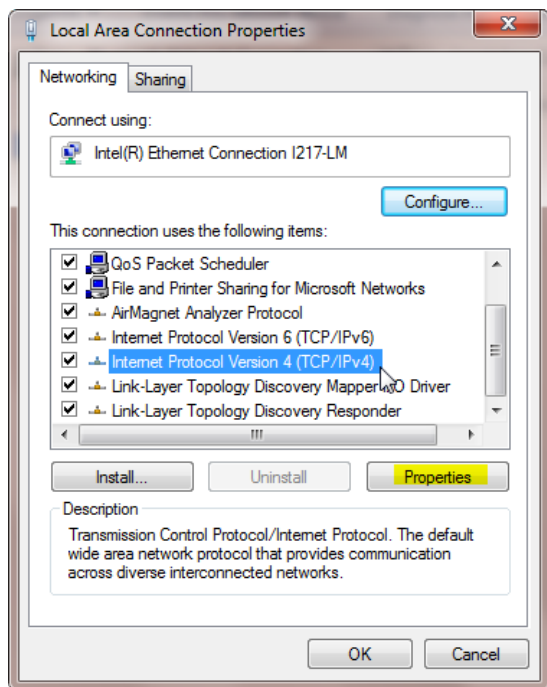
- c. Select “Properties”



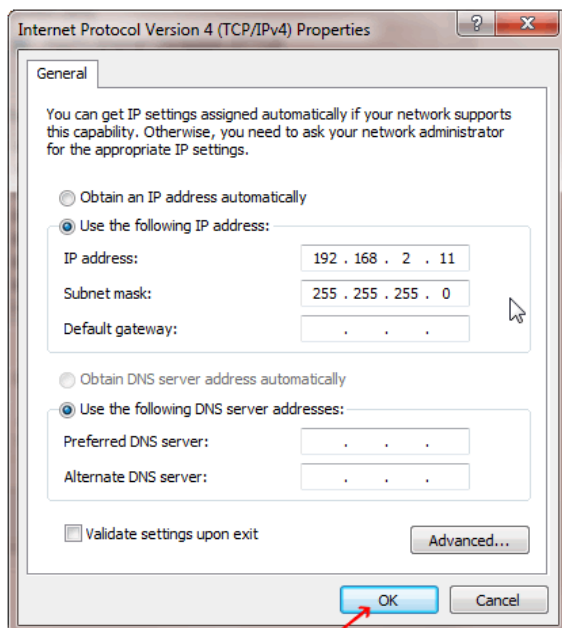
## Step

## Action / Results

- d. Click on “Internet Protocol Version 4 (TCP/IPv4)” and click “Properties”



6. The subnet mask will automatically be set to the one described below. Click “Ok”.  
If a network interface card is already using 192.168.2.0/255.255.255.0, contact your Varian representative for instructions.



Click “Ok”

## Receptor Files Installation

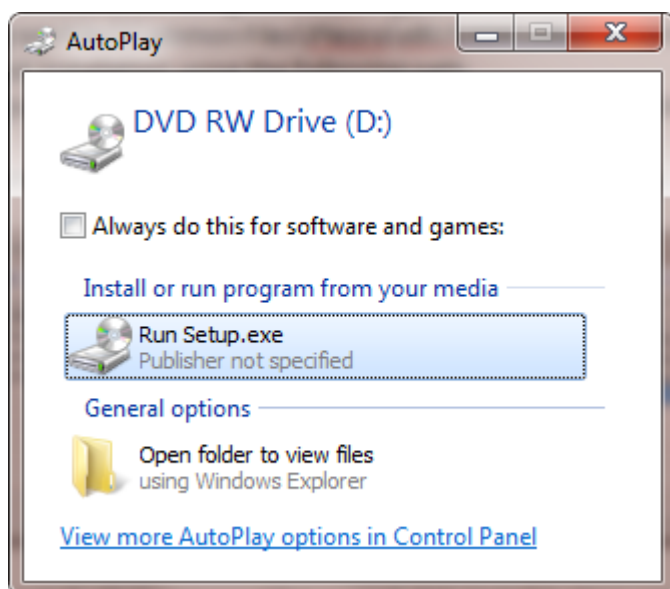
Follow through the Install Shield Wizard screens to complete the PaxScan Receptor installation. You must restart your computer for installation to take effect. ►

### Step

### Action / Results

- 2530W – follow the prompt sequence

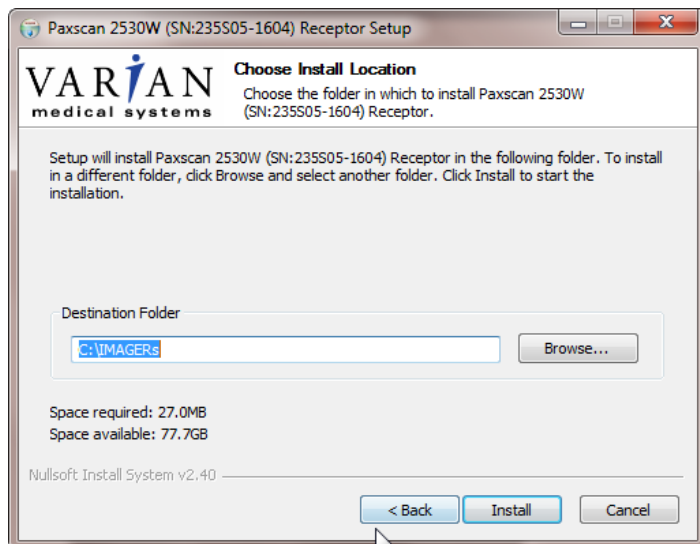
#### 1. Install Receptor installation Disk



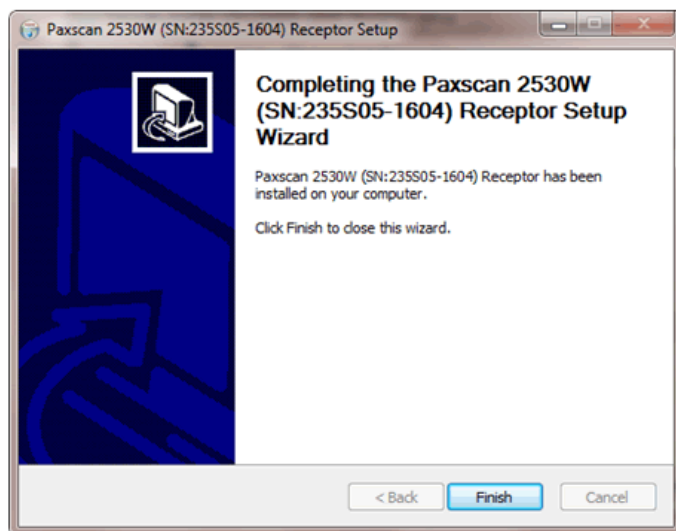
## Step

## Action / Results

- a. Run Setup.exec and follow the instructions. When you get the prompt to verify where the receptor data is located, use the default shown below or specify the file location; then click install.



- b. Select “Finish”



### Modes of Operation

The PaxScan 2530W supports two modes of operation as defined in Table 2-0. In general, there is a tradeoff between varying operation modes of resolution, or field of view, or cycle time, or noise. The sensitivity of the imager is optimized to match the X-ray dose used in each mode.

The purpose of each mode is to configure the detector to achieve optimal performance during specific imaging procedures. Modes are defined by a combination of factors, such as pixel binning, cycle time, analog gain, and continuous versus single acquisition. Each mode requires a unique set of calibration files. Refer to the ViVA Online help documentation for complete details.

The user can select the mode of operation based on image performance and cycle time. Multiple Sample Readout (MSR) is one of the possible settings that can be offer in the configuration.



#### Note:

The system may be in only one mode at a given moment.

Not every mode will be available with every system. The OEM should work with PaxScan technical support for configuration of the mode(s) which best suit the customers intended application

**Table 2-0 PaxScan 2530W Operational Modes**

Mode	Acq Time	Pixel Binning	Panel Scan Time	X-Ray Window Time	Image Area	Frame Size	Acquisition Type
Radiography – Full Resolution MSR1 2pF	<3 sec	1 x 1	300ms	550 to 2000 ms	Full Field	2,560 x 3,072	Accumulation
Auto Trigger – Full Resolution MSR2 4pF	<3 sec	1 x 1	300ms	550 to 2000 ms	Full Field	2,560 x 3,072	Accumulation



## Default Mode

Mode 0 is the default. The default mode will be invoked automatically upon system power-up when a link is opened or receipt of a reset state command. ViVA will normally remember the last mode used and select it for future launches.

## Operation States

The operational states of the imager can be categorized as follows:

- **Radiography acquisition:** (Radiography-type)
- **Offset Calibration:** (OEM-initiated)
- **Gain calibration:** (always-OEM initiated)
- **Analog offset calibration:** (always OEM-initiated)

## Auto Trigger

The operational states of the imager can be categorized as follows:

- **Auto Trigger acquisition:** (Autosense-type)
- **Offset Calibration:** (OEM-initiated)
- **Gain calibration:** (always-OEM initiated)

Each operating mode employs all types of calibration. In radiography-type acquisitions, the PaxScan 2530W will acquire one frame with its respective offset.

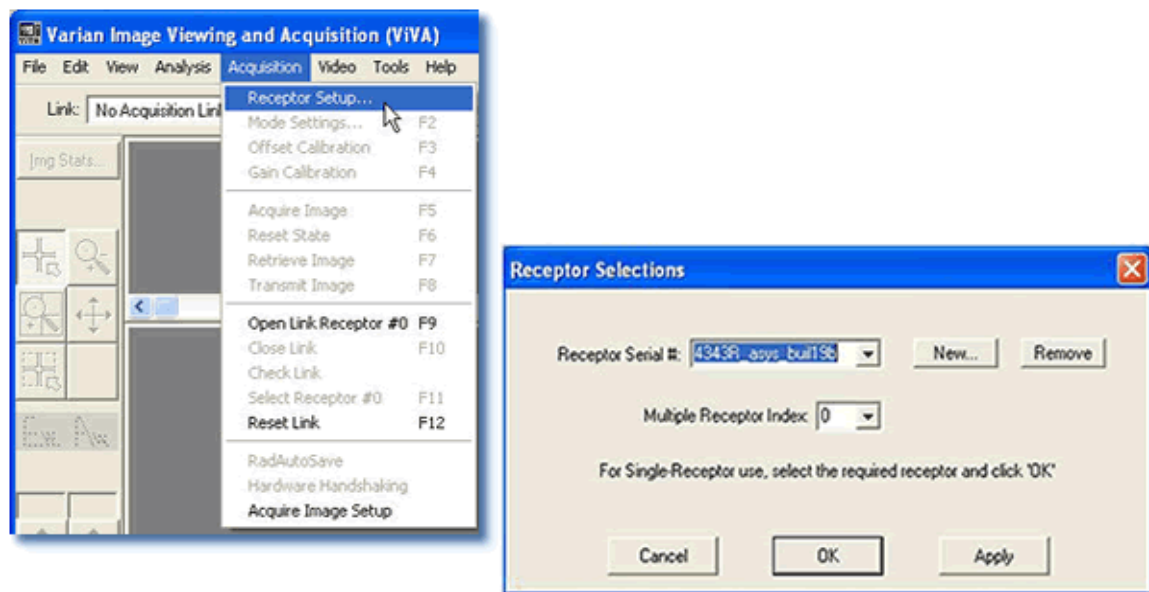
## Multiple Receptor

The Virtual Command Processor software supports multiple connections to two or more receptors of the same type; however, ViVA controls one receptor at a time. The receptor selection is changed from the *Acquisition* drop down menu. This feature is typically useful in a testing environment. ►

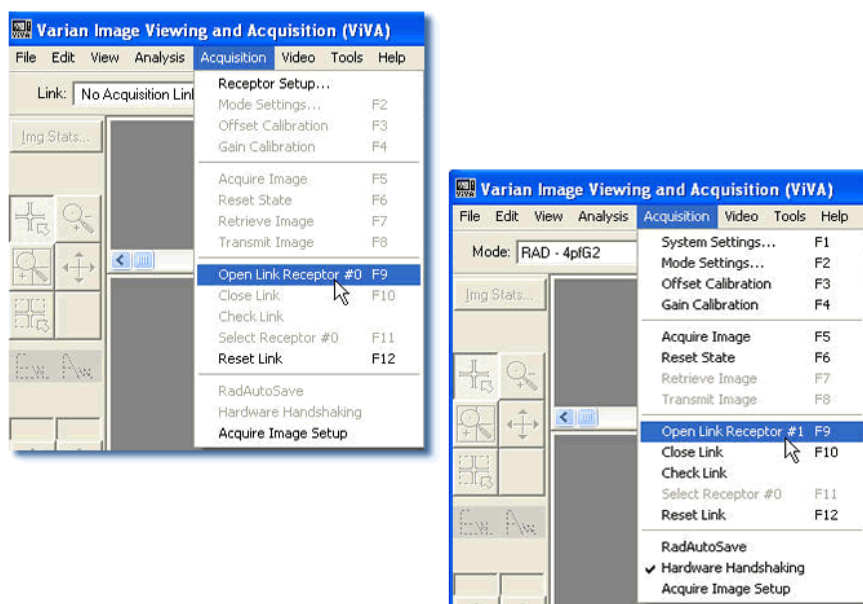
## Step

## Action / Results

1. Select receptor setup from the menu bar under Acquisition. Then select the specific receptor from the receptor serial # drop down and click ok.



2. Select *Open link Receptor* under the Acquisition drop down menu bar to establish connection to the PaxScan imaging system. For multiple receptors, completion of the single receptor setup is required before additional receptors are available for setup in the serial # drop down.



## Calibration Procedures

### Offset Calibration


Offset calibration compensates for fixed pattern pixel intensity variations in the image associated with the dark current and electronic offsets. The Offset reference image is an average of a series of frames acquired without X-ray illumination and referred to as dark fields. ►

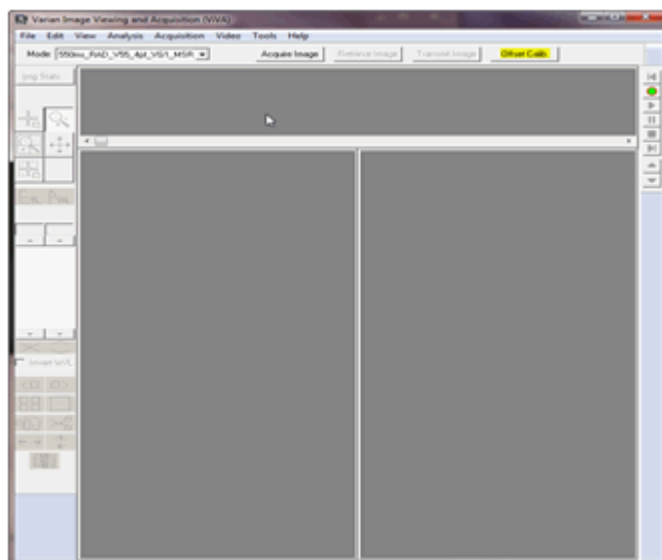
- Offset calibration should not be performed during X-ray.
- The X-ray-to-digital conversion factor does not change as a result of calibration.

### Preview Offset Calibration

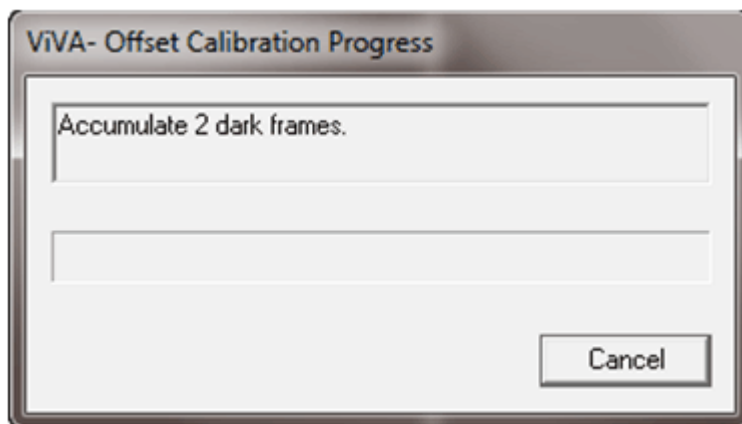
There are two types of offset calibration; one is used for the preview image and the other to calibrate the final image. Prior to acquiring images, an offset calibration must be performed in each mode. This offset calibration is used for the preview image. In addition, an offset calibration is automatically performed after each single acquisition.

Step	Action / Results
------	------------------

1. To perform offset calibration, click the ViVA icon  launches the application
2. Ensure required receptor appears in the *Mode* drop down. The 2530W currently supports Rad or Auto Trigger 1x1 4pf. Click Offset Calibration button or select from the menu bar under Acquisition.



Step	Action / Results
3.	An accumulating Dark Frames window appears followed by an offset calibration acquisition completion.



## Gain Calibration

To compensate for non-uniformities in the Receptor, a gain reference image (flat field) is used by the Corrections module as required to correct all images. The flat field image must be captured by the Virtual Command Processor (VCP) prior to acquiring images. The process of capturing the flat field image is known as Gain Calibration.

Gain calibration is based upon the linear response of the Receptor to dose. Normalization is achieved by applying the flat field image acquired during the Gain calibration to all images corrected by the VCP. Normalization will fail with pixels that are responding to dose in a non-linear manner. Pixels responding to dose in a non-linear manner are usually caused by the saturation of the Receptor, or a low signal-to-noise ratio.



### Note:

It is critical to acquire the flat field image within a range that is large enough to be higher than the background noise created by the X-ray source and readout electronics of the Receptor, but lower than the saturation point of the imager.

Flat field images acquired near or exceeding the saturation point will cause normalization failures with all images acquired until a Gain calibration with the correct dose is performed. We recommend that flat field images be acquired with a median count of approximately 9000 +/- 1000. This range will ensure that Gain calibration will meet both the upper and lower dose requirements under all modes of operation.

To reduce the effects of noise, the average of each pixel in the flat field image is calculated by accumulating a number of frames into an internal memory buffer, then dividing the sum of each pixel by the number of frames acquired.



**Note:** Using larger numbers of calibration frames to capture the flat field image will result in more accurate calibration.

The number of calibration frames used during Gain and Offset calibrations can be adjusted under the *Mode Settings* pull down menu. We recommend accumulating 32 frames for gain calibration and 8 frames for offset calibration for optimal image quality. However, the actual number of calibration frames used must be determined solely by the system integrator depending upon their specific performance requirements.



**Important:** Gain calibration requires the production of X-rays and therefore certain precautions must be taken by the human operator.

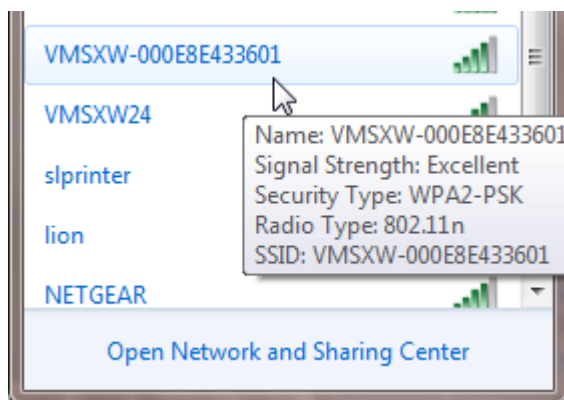
The general procedure for Gain calibration for all modes is as follows in Table 3-0 and described below. Detailed instructions on performing gain calibrations are covered in the ViVA Online help documentation.

**Table3-0 Gain Calibration - All Modes**

Step	Action	Results
1.	Warm Up	To ensure proper warm up, the PaxScan 2530W Receptor must be operational for a least two (2) hours prior to Gain calibration.
2.	Offset Calibration	Software performs a new Offset calibration referred to as dark field acquisition.  Note: X-Rays must not be used for this part of the calibration.
3.	X-Ray Radiation	A uniform flat field with no obstructions in the path of the X-Ray beam. The radiation should ideally be at a level and technique representative of the typical radiation dose for the Receptor during typical procedures, keeping in mind the general consideration outlined above.
4.	Repeat	The above procedure must be repeated for each of the stored imaging modes.

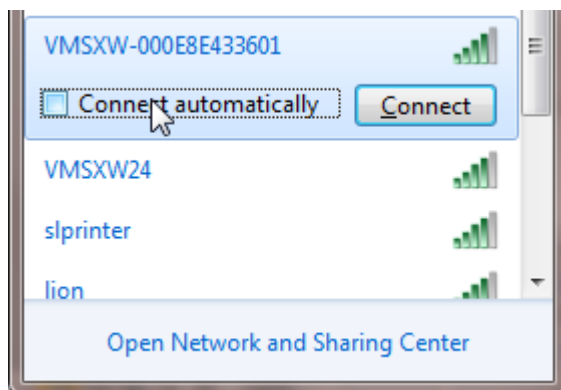
## Connect To the Panel as Access Point

Step	Action / Results
1.	Turn on the receptor with a battery in approximately 20 second the receptor SSID will be broadcast and can be identified in the Wifi display of the workstation. As identified below the access point (AP) will display “VMSXW-000E8E433601” where the 12 digit suffix is the receptor MAC address that is also identified on the receptor lab.



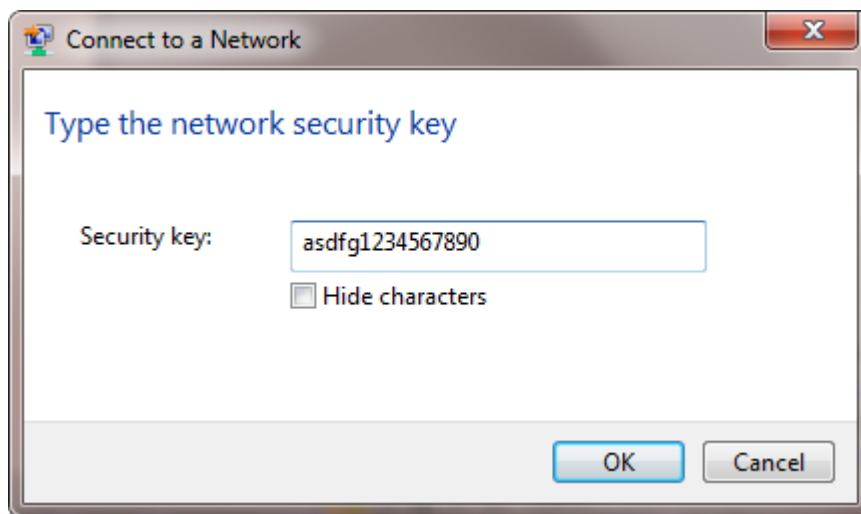
Step	Action / Results
------	------------------

2. Connect to the receptor Access Point

**Warning:**

It is recommended to deselect the “connect automatically” option so that there is no risk for the panel to associate with an unexpected workstation.

3. Types in the security key identified below and click OK.



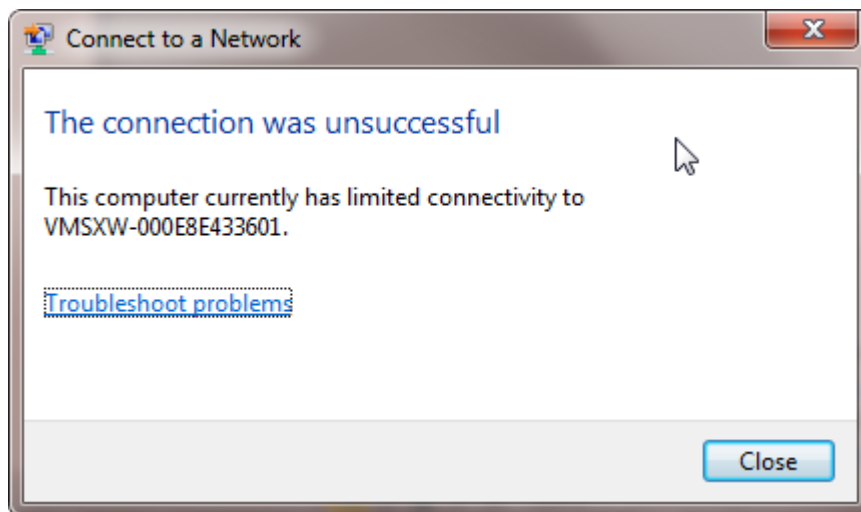
Illuminated green LED on the receptor indicates that the workstation and receptor are associated.

**Warning:**

If the WiFi connection is lost on the workstation the green LED will stay illuminated. *Before an exposure is allowed, it is the responsibility of the system integrator to verify the WiFi connection via Windows and also battery level via Virtual CP (VCP).*

Step	Action / Results
------	------------------

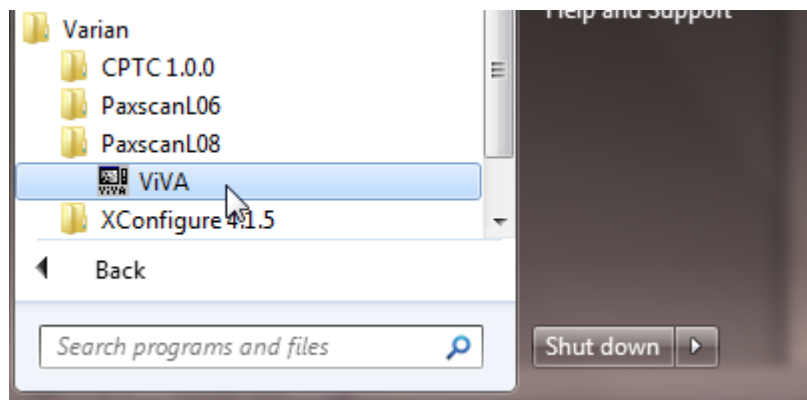
4. When you are establishing the connection, Windows may sometimes return the following error message; only because it is expecting to see an internet connection. Click close and the connection remains



The wireless window will display limited access although a proper connection has been made



- 5 Launch VCP L08 – Viva.exec



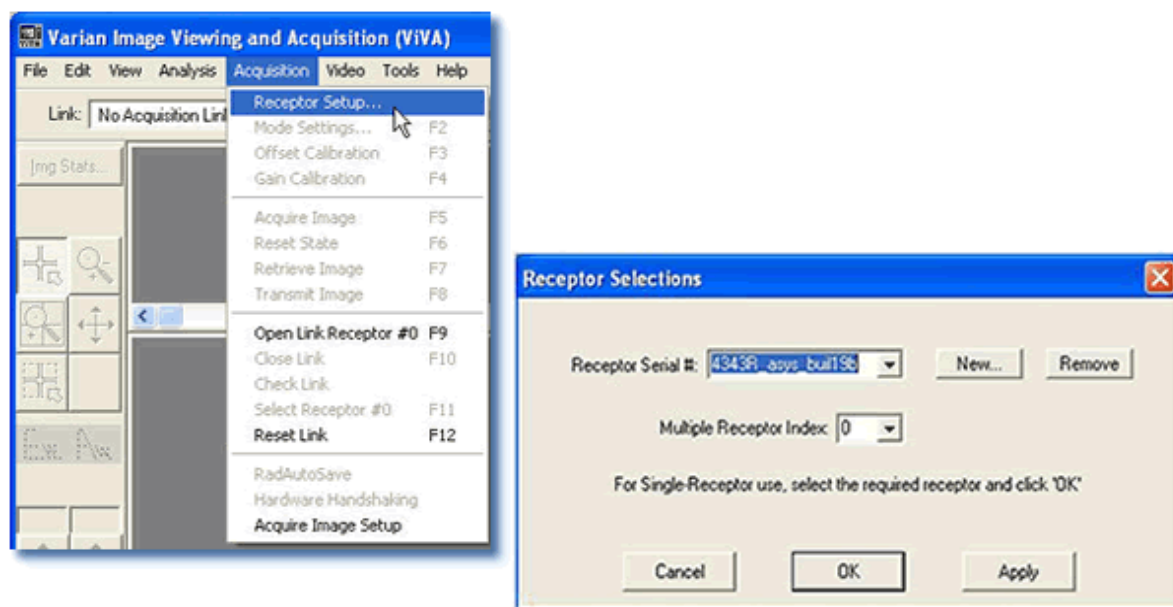
If Viva is launched and only one receptor is installed, Viva will automatically open the link to the receptor. If multiple receptor files are on the workstation the following steps are needed to select the proper receptor by serial number.



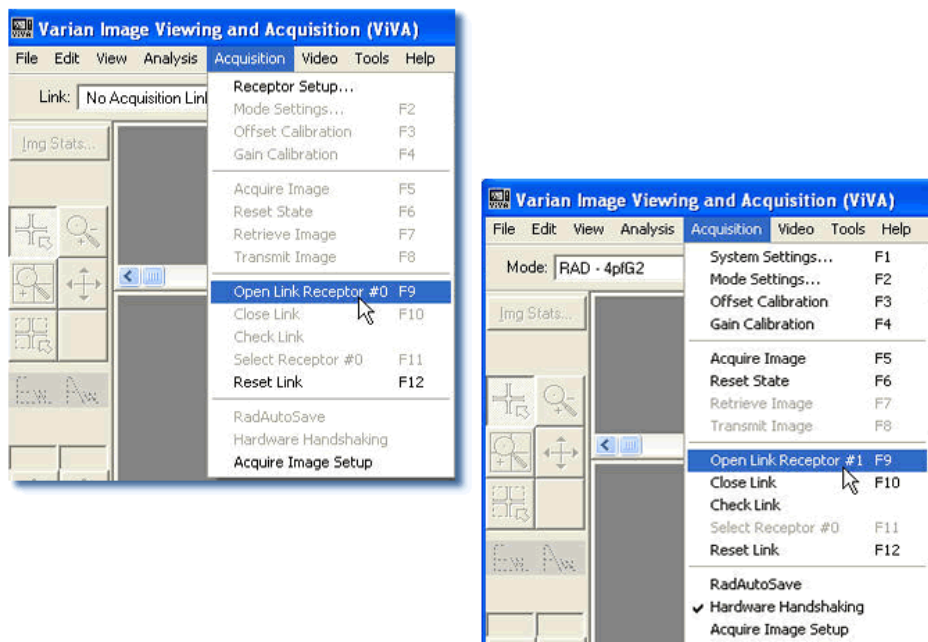
## Step

## Action / Results

6. Select receptor setup from the menu bar under Acquisition. Then select the specific receptor from the receptor serial # drop down and click ok.



7. Select *Open link Receptor* under the Acquisition drop down menu bar to establish connection to the PaxScan imaging system. For multiple receptors, completion of the single receptor setup is required before additional receptors are available for setup in the serial # drop down.



## Radiographic or Auto Trigger Mode Gain Calibration

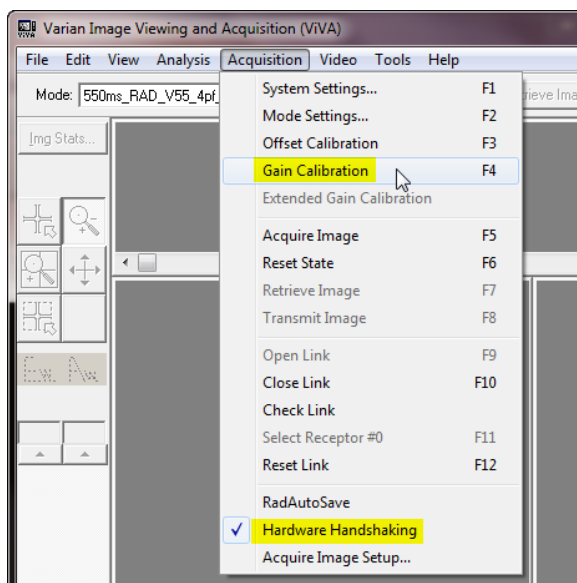
Radiography Gain calibration requires an Offset calibration performed prior to collecting the Flat Field image. X-Ray illuminated frames are then offset-corrected and accumulated in the VCP internal buffer.

A series of accumulated frames equals one radiographic X-ray exposure. Exposures are averaged to obtain the Flat Field image used by the VCP correction module. The number of exposures acquired can be varied by clicking the **Finish** button after collecting the desired number of exposures.

Take the following steps to complete radiographic gain calibration. ►

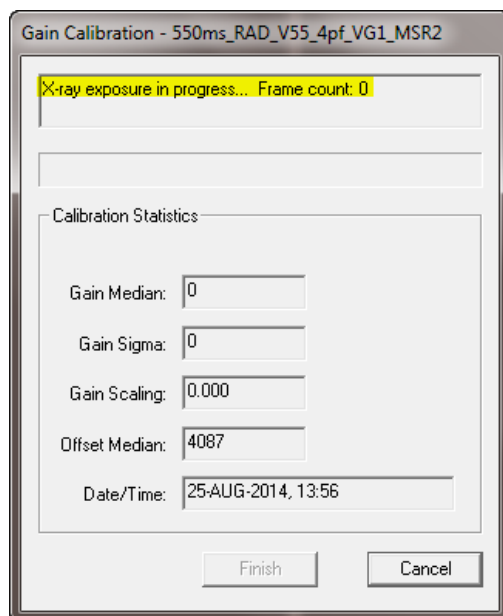
Step	Action / Results
------	------------------

1. Ensure the desired receptor and imaging mode appears in the *Mode* drop down.
2. Click Gain Calibration from the menu bar under *Acquisition* invokes hardware handshaking for dark field calibration.

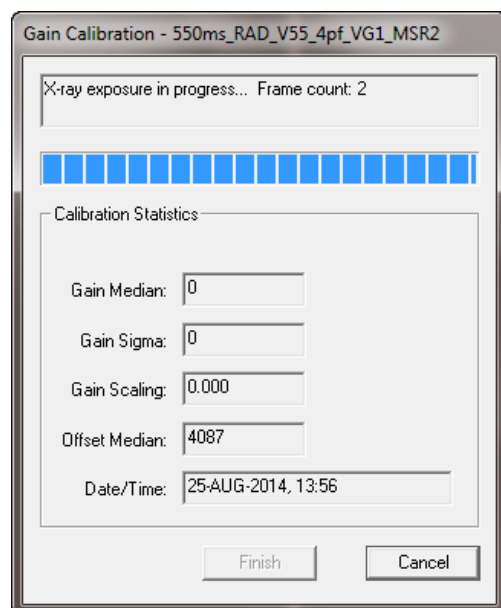


**Step****Action / Results**

3. Start an Exposure when the Gain Calibration windows display “X-ray exposure in progress... Frame count: 0”.

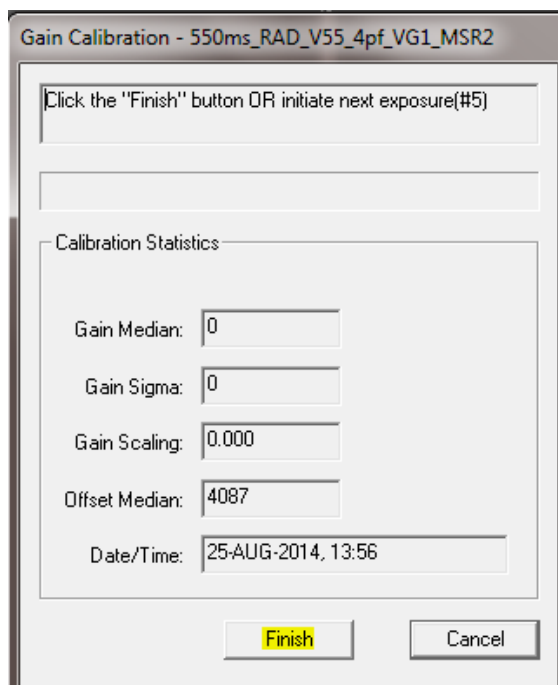


The software will accumulate 2 frames right after the panel is exposed to an X-ray, when the current image process is completed the “Gain Calibration” window will display “X-ray exposure in progress... Frame count: 0”.



**Step****Action / Results**

4. Once all X-ray frames have been acquired, click “Finish” to complete the calibration.



Gain Calibration - 550ms\_RAD\_V55\_4pf\_VG1\_MSR2

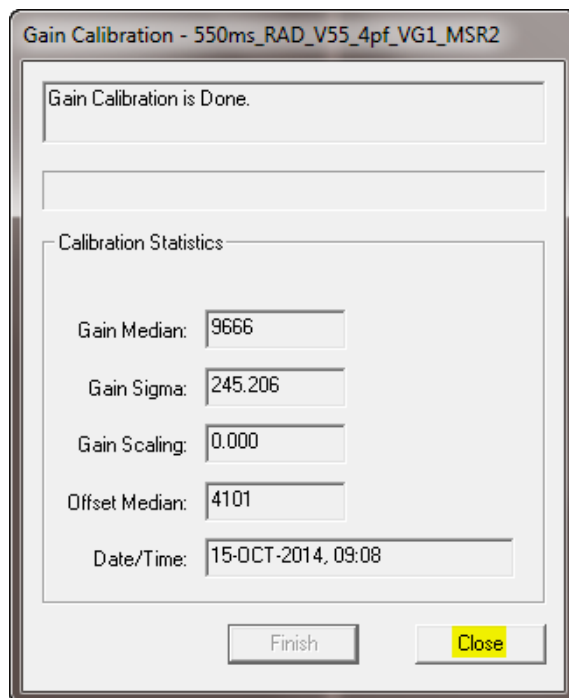
Click the "Finish" button OR initiate next exposure(#5)

Calibration Statistics

Gain Median:	0
Gain Sigma:	0
Gain Scaling:	0.000
Offset Median:	4087
Date/Time:	25-AUG-2014, 13:56

**Finish** Cancel

The Gain Media should be 9000 +/- 1000 counts, click “Close” to complete gain calibration.:



Gain Calibration - 550ms\_RAD\_V55\_4pf\_VG1\_MSR2

Gain Calibration is Done.

Calibration Statistics

Gain Median:	9666
Gain Sigma:	245.206
Gain Scaling:	0.000
Offset Median:	4101
Date/Time:	15-OCT-2014, 09:08

Finish **Close**



**Note:** *Operator Control* is user supplied equipment.



**Note:**

Gain calibration should be performed at regular intervals, typically once every three (3) months, or whenever the central beam of the X-ray source has been moved relative to the Receptor.

Replacement of the X-ray tube will require a new gain calibration to be performed.



**Note:**

Varian recommends accumulating 32 frames for gain calibration for optimal image quality. However, the actual number of calibration frames used must be determined solely by the system integrator depending upon their specific performance requirements.



**Note:**

For additional assistance operating ViVA™, use the ViVA Online help documentation.

### Image Acquisition

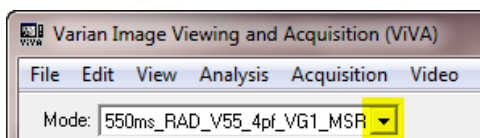
Once Offset and Gain Calibration is performed, you are ready to acquire images.

#### Radiography or Auto Trigger Mode

The Radiography mode provides the technician with superior single-shot, higher resolution images, for diagnosis. ►

Step	Action / Results
------	------------------

1. Select required receptor from *Mode* drop down menu.

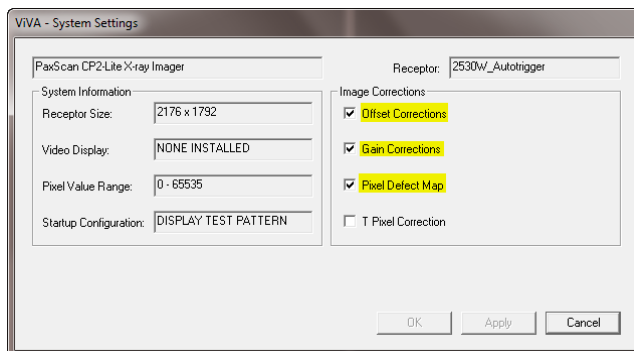
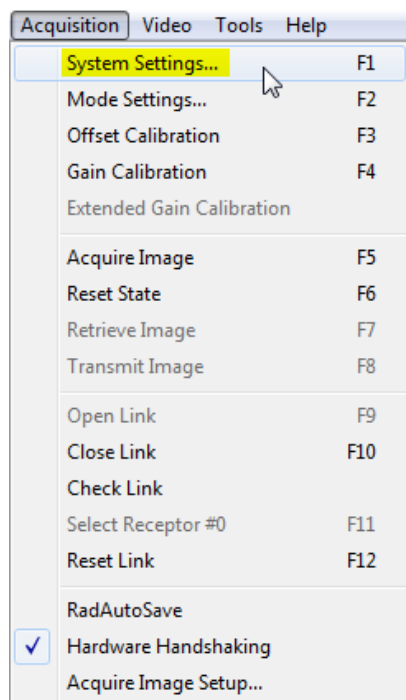


Acquisition	Video	Tools	Help
System Settings...		F1	
Mode Settings...		F2	
Offset Calibration		F3	
Gain Calibration		F4	
Extended Gain Calibration			
Acquire Image		F5	
Reset State		F6	
Retrieve Image		F7	
Transmit Image		F8	
Open Link		F9	
Close Link		F10	
Check Link			
Select Receptor #0		F11	
Reset Link		F12	
RadAutoSave			
<input checked="" type="checkbox"/> Hardware Handshaking			
Acquire Image Setup...			

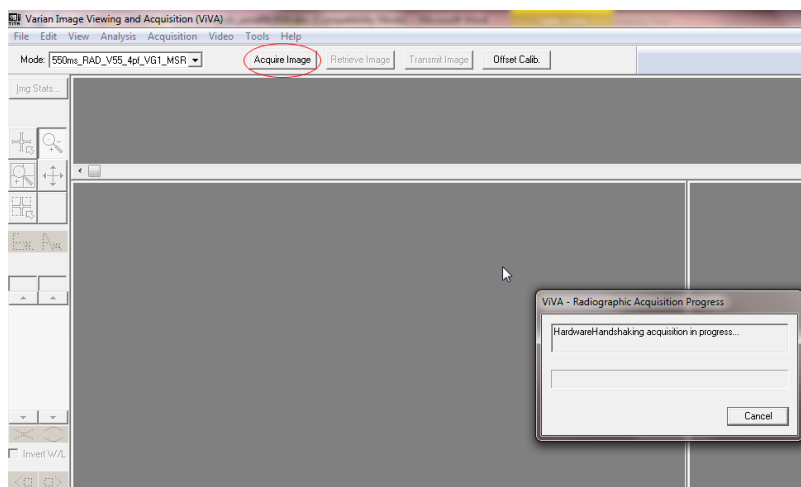
## Step

## Action / Results

2. Select “System Settings” from the menu bar under *Acquisition* to turn ON corrections for a calibrated image. Only select “Offset Corrections”, “Gain Corrections”, and “Pixel Corrections”

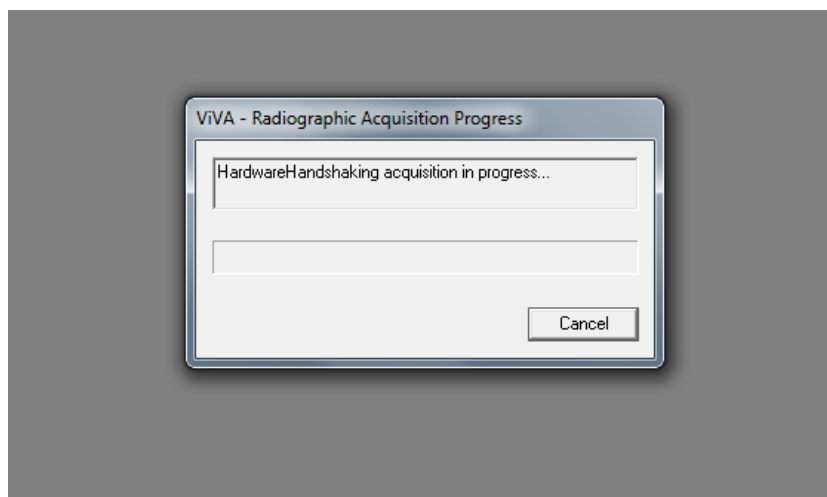


3. Select the Acquire Image button invokes imager to begin acquiring images.

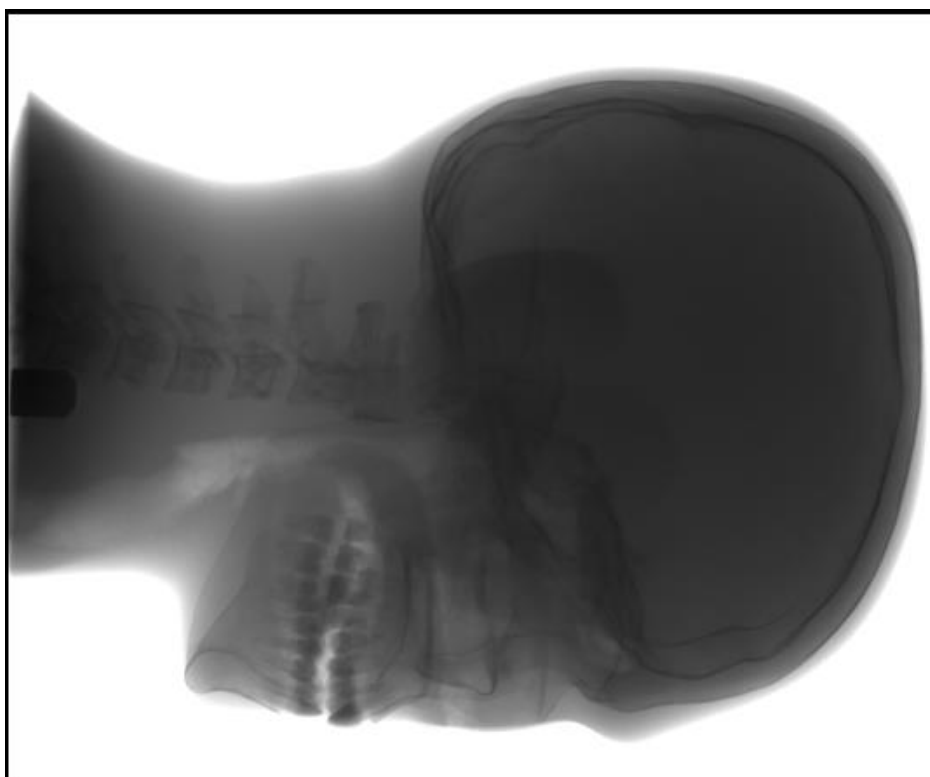


Step	Action / Results
------	------------------

4. When “Viva – Radiograph Acquisition Progress” windows appears Depress *operator control* fully to “Expose” position to complete image capture and retrieval.



5. Acquired image can be saved in the desired file format by selecting File / Save As.





## Safety

### Electro-Magnetic Interference

This equipment generates, uses and can radiate radio frequency (RF) energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity. In all circumstances; however, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the measures listed in the **Troubleshooting** section.

This equipment uses wireless LAN (WLAN) radios for transferring images. The WLAN power levels and antenna configurations have been tested and certified compliant through specific absorption rate (SAR) limit set by FCC/IC Canada (Less than 1.6W/kg) testing with separations as small as 0 cm between the panel antennas and human tissue. While compliant, it is still recommended to reduce exposure when possible by 1) positioning subject to be X-rayed away from the antennas (this also helps reduce image transfer time) and 2) removing the detector panel promptly when X-ray exposure is complete. The I/O Box shall not be used at a distance of no less than 20cm to human tissue.


**Table 4-0 Guidance and Mfgr Declaration - Electromagnetic Emissions**

The PaxScan 2530W is intended for use in the electromagnetic environment specified below. The customer or the user of the PaxScan 2530W should assure that it is used in such an environment.		
<i><b>Emissions test</b></i>	<i><b>Compliance</b></i>	<i><b>Electromagnetic environment - guidance</b></i>
RF emissions CISPR 11	Group 1	The PaxScan 2530W uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.  The PaxScan 2530W is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
RF emissions CISPR 11	Class A	
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ Flicker emissions IEC 61000-3-3	Complies	

**Table 5--0 Guidance and Mfgr Declaration - Electromagnetic Immunity**

The PaxScan 2530W is intended for use in the electromagnetic environment specified below. The customer or the user of the PaxScan 2530W should assure that it is used in such an environment.			
<b><i>Immunity test</i></b>	<b><i>IEC 60601 test level</i></b>	<b><i>Compliance level</i></b>	<b><i>Electromagnetic environment - guidance</i></b>
Electrostatic discharge (ESD) IEC 61000-4-2	$\pm 6$ kV contact $\pm 8$ kV air	$\pm 6$ kV contact $\pm 8$ kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	$\pm 2$ kV for power supply lines $\pm 1$ kV for input/output lines	$\pm 2$ kV for power supply lines NA – Only I/O is patient cable	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	$\pm 1$ kV differential mode $\pm 2$ kV common mode	$\pm 1$ kV differential mode $\pm 2$ kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines. IEC 61000-4-11	$<5\%$ $U_T$ ( $>95\%$ dip in $U_T$ ) for 0.5 cycle  $40\%$ $U_T$ ( $60\%$ dip in $U_T$ ) for 5 cycles  $70\%$ $U_T$ ( $30\%$ dip in $U_T$ ) for 25 cycles  $<5\%$ $U_T$ ( $>95\%$ dip in $U_T$ ) for 5 sec	$<5\%$ $U_T$ ( $>95\%$ dip in $U_T$ ) for 0.5 cycle  $40\%$ $U_T$ ( $60\%$ dip in $U_T$ ) for 5 cycles  $70\%$ $U_T$ ( $30\%$ dip in $U_T$ ) for 25 cycles  $<5\%$ $U_T$ ( $>95\%$ dip in $U_T$ ) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment.  The PaxScan 2530W requires continued operation during power mains interruptions, it is recommended that the PaxScan 2530W be powered from an uninterruptible power supply or battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE $U_T$ is the a.c. mains voltage prior to application of the test level.			

Table 5-0 continued

<b>Immunity test</b>	<b>IEC 60601 test level</b>	<b>Compliance level</b>	<b>Electromagnetic environment - guidance</b>
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	<p>Portable and mobile RF communications equipment should be used no closer to any part of the PaxScan 2530W including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p><b>Recommended separation distance</b></p> $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz}$ $d = 2.3\sqrt{P} \quad 800 \text{ MHz to } 2.5 \text{ GHz}$ <p>where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).<sup>b</sup></p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,<sup>a</sup> should be less than the compliance level in each frequency range.<sup>b</sup></p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
			<p>Note 1 At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p>Note 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p> <p><sup>a</sup> Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the PaxScan 2530W is used exceeds the applicable RF compliance level above, the PaxScan 2530W should be observed to verify normal operation. If abnormal operation is observed, additional measures may be necessary, such as reorienting or relocating the PaxScan 2530W</p> <p><sup>b</sup> Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [V<sub>1</sub>] V/m.</p>

**Table 6-0 Recommended Separation Distance Between  
Portable and Mobile RF Communications and the PaxScan 2530W**

The PaxScan 2530W is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the PaxScan 2530W can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the PaxScan 2530W as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter  W	Separation distance according to frequency of transmitter  m		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

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

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

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

## Electrical Protection

- External Power Supply Specification
  - type: XP Power model AHM85PS24 , ratings: Input Voltage 100 – 240V, Input Frequency 50/60Hz, Input Current 1.0 A, DC Output 24V
- 2530W model has the capability to be internally powered

## Environment Limits

Rigorous environmental testing is conducted on an engineering basis using a sample receptor.

## Temperature & Humidity

Category	Limits
Storage & Transport (ambient)	Receptor: -20° C to +70° C Battery: -20° C to +60° C
Storage Humidity Range (non-condensing)	10% to 90%
Normal Operation Temperature (measured at the center of the back cover)	10° C to 35° C
Operation Humidity (non-condensing)	10% to 90%

## Altitude Limits

The Paxscan Digital Imager Receptor is rated to operate at an altitude  $\leq 3000\text{m}$ .

## Lithium-Ion Rechargeable Battery

Please only use the lithium-ion rechargeable battery listed below that is supplied with the receptor.

Battery type: Lithium-ion

Battery model: Varian

Rated voltage: 14.8V --- 2.1Ah, 31.1 Wh



### Caution:

Risk of fire, explosion or burns. Do not short circuit, crush, heat above 100°C, incinerate, or disassemble the battery. Charge only with the receptor or battery charger supplied. Please follow local governing ordinances and recycling plans regarding proper disposal or recycling of the lithium-ion rechargeable battery.



**Note:** Lithium-ion rechargeable battery is for use with the model Paxscan 2530W.

## Lithium-Ion Battery Handling, Storage, & Shipping

### Handling

- Do not short circuit, crush, heat above 100°C, incinerate, or disassemble the battery.
- Do not dispose of battery in fire or water.
- Do not expose battery to temperatures above 60 °C (140 °F).
- Do not use a damaged battery.

### Storage

- Remove battery and store it separately from device.
- Charge or discharge the battery to approximately 50% of capacity before storage.
- Charge the battery to approximately 50% of capacity at least once every six months.
- Store the battery at temperatures between -20 °C and 60 °C (-4 °F and 140 °F).

### Shipping

- Always check all applicable local, national, and international regulations before transporting a Lithium-Ion battery.
- It is the customer's responsibility to ship battery according to local and international shipping regulations for Lithium-Ion battery in effect at the time of shipment.

## Regulatory

- The PaxScan® 2530W model family is a Type B component sub-system per Standard or Medical Electrical Equipment. The PaxScan® 2530W model family is an associated equipment x-ray medical equipment with respect to electrical shock, fire and mechanical hazards only in accordance with:

UL 60601-1 Medical Electrical Equipment, Part 1: General Requirements for Safety 1<sup>st</sup> ed.

IEC 60601-1 Medical Electrical Equipment Part 1: General Requirements for Safety 2<sup>nd</sup> ed.


IEC 60601-1 Medical Electrical Equipment Part 1: General Requirements for Basic Safety and Essential Performance 3<sup>rd</sup> ed.

ANSI/AAMI ES60601-1.

CSA-C22.2 No 60601-1 Medical Electrical Equipment, Part 1 General Requirements for Basic Safety and Essential Performance 3<sup>rd</sup> ed.

EN/IEC 60601-1-2 Medical Electrical Equipment Part 1-2: General Requirements for Basic Safety and Essential Performance Collateral Standard: Electromagnetic Compatibility 3<sup>rd</sup> ed.

RF compliant in accordance with FCC Part 15 Subpart C and Part 15 Subpart E.

- Type B Applied Part 
- 2530W model has the capability to be internally powered.
- CE Mark - Varian Medical Systems' imaging products are designed and manufactured to meet the Low Voltage Directive 2006/95/EC, MDD 93/42/EEC, and R&TTE Directive 99/5/EC
- MDD Class IIa
- A Declaration of Conformity has been filed for this product and available upon request by contacting Varian Medical Systems - X-Ray Products.
- The Varian Battery Charger is a Class 1, continuous operation device and meets the following:

IEC 61000-4-2 Electro-Static Discharge  
IEC 61000-4-3 RF Electromagnetic Fields Immunity  
IEC 61000-4-4 EFT/Burst  
IEC 61000-4-5 Surge Immunity  
IEC 61000-4-6 Conducted RF Disturbances Immunity

IEC 61000-4-8 Magnetic Field Immunity  
IEC 61000-4-11 Dips, Interruptions, and Variations  
IEC 61000-3-2 Harmonics Current Emission  
IEC 61000-3-3 Voltage Fluctuation and Flicker

## Radio Frequency (RF) Compliance Information

### FCC/IC Compliance

This device complies with Part 15 of the FCC Rules and RSS-Gen (RSS-210, etc.) of IC Rules. Operation is subject to the following two conditions:

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

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules and Canadian ICES-003. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

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

The Interference Handbook

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

In the 5150 to 5250 MHz frequency range this transmitter is restricted to indoor use only.



## Taiwan NCC Warning Statement

### Article 12

Without permission, any company, firm or user shall not alter the frequency, increase the power, or change the characteristics and functions of the original design of the certified lower power frequency electric machinery.

### Article 14

The application of lower power frequency electric machineries shall not affect the navigation safety nor interfere a legal communication, if an interference is found, the service will be suspended until improvement is made and the interference no longer exists.

Within the 5.25-5.35GHz band, U-NII devices will be restricted to indoor operations to reduce any potential for harmful interference to co-channel MSS operations.

### NCC 警語

低功率電波輻射性電機管理辦法

第十二條經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

在5.25-5.35 GHz頻帶內操作之無線資訊傳輸設備，限於室內使用。

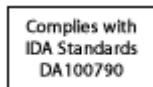
前項合法通信，指依電信規定作業之無線電信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

## Japan Telecom Certification – JATE

本装置は、第二種情報装置（住宅地域またはその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

しかし、本装置をラジオ、テレビジョン受信機に、近接してご使用になると、受信障害の原因となることがあります。本書の説明にしたがって正しい取り扱いをしてください。

## Singapore Compliance



## Philippines Compliance



**NTC**

Type Accepted  
No. ESD-CPE-1408475C

## Korean Radio Statement

Interference is likely to occur during operation of the equipment

Korean Class A

The devices are for business (A grade) EMC equipment distributors and users of this point as a caution and outside the home for the purpose of the use.

## Industry Canada Notice

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmitting antenna) that is installed outdoors is subject to licensing. The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's web site [www.hc-sc.gc.ca/rpb](http://www.hc-sc.gc.ca/rpb).

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

Avis de Conformité à la Réglementation d'Industrie Canada:

Pour empêcher toute interférence aux services faisant l'objet d'une licence, cet appareil doit être utilisé à l'intérieur seulement et devrait être placé loin des fenêtres afin de fournir un écran de blindage maximal. L'installateur du présent matériel radio doit s'assurer que l'antenne est située ou pointée de manière à ce que cette dernière n'émette pas de champs radioélectriques supérieurs aux limites spécifiées par Santé Canada pour le grand public; consulter le Code de sécurité 6, disponible sur le site Web de Santé Canada, à l'adresse suivante: [www.hc-sc.gc.ca/rpb](http://www.hc-sc.gc.ca/rpb).










## European Community – CE Notice





The CE! mark indicates compliance with the essential requirements of Directive 1999/5/EC. Such marking is indicative that this equipment meets or exceeds the following technical standards:

- EN 300 328
- EN 301 893
- EN 301 489-17
- EN 60950

Marking by the symbol: ! indicates that usage restrictions apply in countries listed on this product's packaging.

Europe - Declaration of Conformity in Languages of the European Community.

 Český [Czech]	<i>Varian Medical Systems, Inc.</i> tímto prohlašuje, že tento Radiolan je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
 Dansk [Danish]	Undertegnede <i>Varian Medical Systems, Inc.</i> erklærer herved, at følgende udstyr Radiolan overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
 Deutsch [German]	Hiermit erkläre <i>Varian Medical Systems, Inc.</i> , dass sich das Gerät Radiolan in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
 Eesti [Estonian]	Käesolevaga kinnitab <i>Varian Medical Systems, Inc.</i> seadme Radiolan vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
 English	Hereby, <i>Varian Medical Systems, Inc.</i> , declares that this Radiolan is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
 Español [Spanish]	Por medio de la presente <i>Varian Medical Systems, Inc.</i> declara que el Radiolan cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
 Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ <i>Varian Medical Systems, Inc.</i> ΔΗΛΩΝΕΙ ΟΤΙ Radiolan ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/EK.
 Français [French]	Par la présente <i>Varian Medical Systems, Inc.</i> déclare que l'appareil Radiolan est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
 Italiano [Italian]	Con la presente <i>Varian Medical Systems, Inc.</i> dichiara che questo Radiolan è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo <i>Varian Medical Systems, Inc.</i> deklarē, ka Radiolan atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo <i>Varian Medical Systems, Inc.</i> deklaruoja, kad šis Radiolan atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.

 Nederlands [Dutch]	Hierbij verklaart <i>Varian Medical Systems, Inc.</i> dat het toestel Radiolan in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
 Malti [Maltese]	Hawnhekk, <i>Varian Medical Systems, Inc.</i> , jiddikjara li dan Radiolan jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn rilevanti li hemm fid-Dirrettiva 1999/5/EC.
 Magyar [Hungarian]	Alulírott, <i>Varian Medical Systems, Inc.</i> nyilatkozom, hogy a Radiolan megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
 Polski [Polish]	Niniejszym <i>Varian Medical Systems, Inc.</i> oświadcza, że Radiolan jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
 Português [Portuguese]	<i>Varian Medical Systems, Inc.</i> declara que este Radiolan está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
 Slovensko [Slovenian]	<i>Varian Medical Systems, Inc.</i> izjavlja, da je ta Radiolan v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	<i>Varian Medical Systems, Inc.</i> týmto vyhlasuje, že Radiolan spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
 Suomi [Finnish]	<i>Varian Medical Systems, Inc.</i> vakuuttaa täten että Radiolan tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
 Svenska [Swedish]	Härmed intygar <i>Varian Medical Systems, Inc.</i> att denna Radiolan står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

## Europe - Restrictions for Use of 2.4GHZ Frequencies in European Community.

België/ Belgique:	For private usage outside buildings across public grounds over less than 300m no special registration with IBPT/BIPT is required. Registration to IBPT/BIPT is required for private usage outside buildings across public grounds over more than 300m. For registration and license please contact IBPT/BIPT.
	Voor privé-gebruik buiten gebouw over publieke grond over afstand kleiner dan 300m geen registratie bij BIPT/IBPT nodig; voor gebruik over afstand groter dan 300m is wel registratie bij BIPT/IBPT nodig. Voor registratie of licentie kunt u contact opnemen met BIPT.
	Dans le cas d'une utilisation privée, à l'extérieur d'un bâtiment, au-dessus d'un espace public, aucun enregistrement n'est nécessaire pour une distance de moins de 300m. Pour une distance supérieure à 300m un enregistrement auprès de l'IBPT est requis. Pour les enregistrements et licences, veuillez contacter l'IBPT.
Deutschland:	License required for outdoor installations. Check with reseller for procedure to follow
	Anmeldung im Outdoor-Bereich notwendig, aber nicht genehmigungspflichtig. Bitte mit Händler die Vorgehensweise abstimmen.
France:	Restricted frequency band: only channels 1 to 7 (2400 MHz and 2454 MHz respectively) may be used outdoors in France.
	Bande de fréquence restreinte : seuls les canaux 1- 7 (2400 et 2454 MHz respectivement) doivent être utilisés endroits extérieur en France. Vous pouvez contacter l'Autorité de Régulation des Télécommunications ( <a href="http://www.art-telecom.fr">http://www.art-telecom.fr</a> ) pour la procédure à suivre.
Italia:	License required for indoor use. Use with outdoor installations not allowed.
	E' necessaria la concessione ministeriale anche per l'uso interno. Verificare con i rivenditori la procedura da seguire.
Nederland	License required for outdoor installations. Check with reseller for procedure to follow.
	Licentie verplicht voor gebruik met buitenantennes. Neem contact op met verkoper voor juiste procedure.
All EU member states and EFTA countries	This device may only be used indoors in the frequency bands 5150 – 5250 MHz and 5250 – 5350 MHz.

To remain in conformance with European spectrum usage laws for Wireless LAN operation, the above 2.4GHz channel limitations apply for outdoor usage. The user should use the wireless LAN utility to check the current channel of operation. If operation is occurring outside of the allowable frequencies for outdoor use, as listed above, the user must contact the applicable national spectrum regulator to request a license for outdoor operation.

### Maintenance

#### Cleaning and Disinfection

*The flat panel receptor and connected cables* are likely to be soiled during use. The specific material most likely to become soiled is the X-ray grade carbon fiber input window and magnesium housing.

Cleaning and disinfecting of the input window should be performed as needed. Wiping the surfaces with a soft cloth dampened with soap and water will generally clean the surfaces.

Proper disinfection requires that a disinfectant solution be used; such as Sani-Cloth® Plus, a hospital grade, EPA registered low to intermediate-level product for hard, non-porous surfaces and equipment. Use disinfectants in accordance with the manufacturer's instructions.

*Cleaning and disinfecting of the battery and battery compartment* should also be performed as needed using the same practices described above. Care should be taken when cleaning the battery contacts, use a non-abrasive cleaner that will not damage the copper contact material.

*The battery charger* should be cleaned by gently wiping down with damp cloth.



**Caution:**

Do not use flowing liquid or immersion on the receptor, battery, battery compartment, or battery charger.  
Do not sterilize

#### Repairs



**Note:**

No user serviceable parts. If repairs are necessary, please see *How To Reach Us*.

The least replaceable units (LRU) are:

- Receptor Assembly
- I/O Box
- External Power Supply
- Tether Cable
- Varian Battery
- Varian Battery Charger (if applicable)

## Proper Disposal

The 2530W receptor should be returned to Varian Medical Systems for disposal. We request that you obtain an RMA number using the same procedure for warranty/returns of products.

Contact: PAXSCAN.RMA@VARIAN.COM

*Do not dispose of the lithium-ion rechargeable battery in the garbage.* Please consult local governing ordinances and recycling plans regarding proper disposal.

**Warning:**

Precautions should be taken to not open the receptor module. Depending upon the type of scintillator used, opening the receptor module may expose the user to potentially toxic materials.



### Troubleshooting

Problem	Solution
Imager fails to respond.	1. Check wireless connection or cable connections.
Imager causes Electro-Magnetic Interference.	1. Reorient or relocate the receiving device. 2. Increase the separation between the equipment. 3. Connect the other device(s) into an outlet on a different circuit. 4. Consult the manufacturer or field service technician for help.
Poor Image Quality.	1. Confirm that image corrections are all selected in the Systems Settings dialog box in ViVA . 2. Re-acquire gain and offset images. 3. Assure that the exposures are appropriate for gain calibration images (not saturated).
Software hangs up.	Restart ViVA.
Acquired image is completely dark.	Increase the exposure and acquire a new image. If the image is still dark, verify that all cables are properly connected. Turn the power “OFF” and “ON”. Acquire a new image.
Out of virtual memory.	Close some of the windows that are currently open.
Residual x-ray image from previous exposure shows in current image.	Charge on the sensor pixels from a super saturated exposure may cause a residual image. It can be erased by taking another image or multiple images without X-rays until the residual image is gone.
ViVA error message.	1. Please complete PaxScan 2530W Problem Report. 2. Email the error log file generated to: <a href="mailto:paxscan.rma@varian.com">paxscan.rma@varian.com</a> . This log file is normally found at C:\users\{username}\AppData\Local\crashdumps\ viva.log
I/O Box no power.	1. Check the external power supply module. 2. Check the internal fuse (F1) Littlefuse PN: 0229004.HXP - Fuse 125V SLO-BLO 2AG 4A CART

**PaxScan 2530W Problem Report Customer Information**

<b>Date:</b>	<b>Your Name</b>	<b>Company/Unit Name:</b>
<b>Email:</b>	<b>Phone Number:</b>	<b>Fax Number:</b>
<b>Product Information.</b>		
<b>PaxScan Part Number: Imager Serial Number: Software Revision #:</b>		
<b>Operation I was trying to perform (be as specific as possible:</b>		
<b>What happened (use additional sheets as necessary):</b>		

E-mail: [PAXSCAN.RMA@varian.com](mailto:PAXSCAN.RMA@varian.com)

## Appendix A

### Interfacing Information

All the interfacing connections for the PaxScan 2530W are at the panel itself and the Varian I/O box. The Gigabit Ethernet connection carries control information to the panel and supplies image data with diagnostic information to the customer supplied workstation. The Hardware Synchronization connection is a 9-pin D-sub type. Power for the I/O box is supplied by a medical-grade “laptop” style supply whose dc supply cable can be up to 3 meters in length. The “laptop” style power supply is optional equipment.

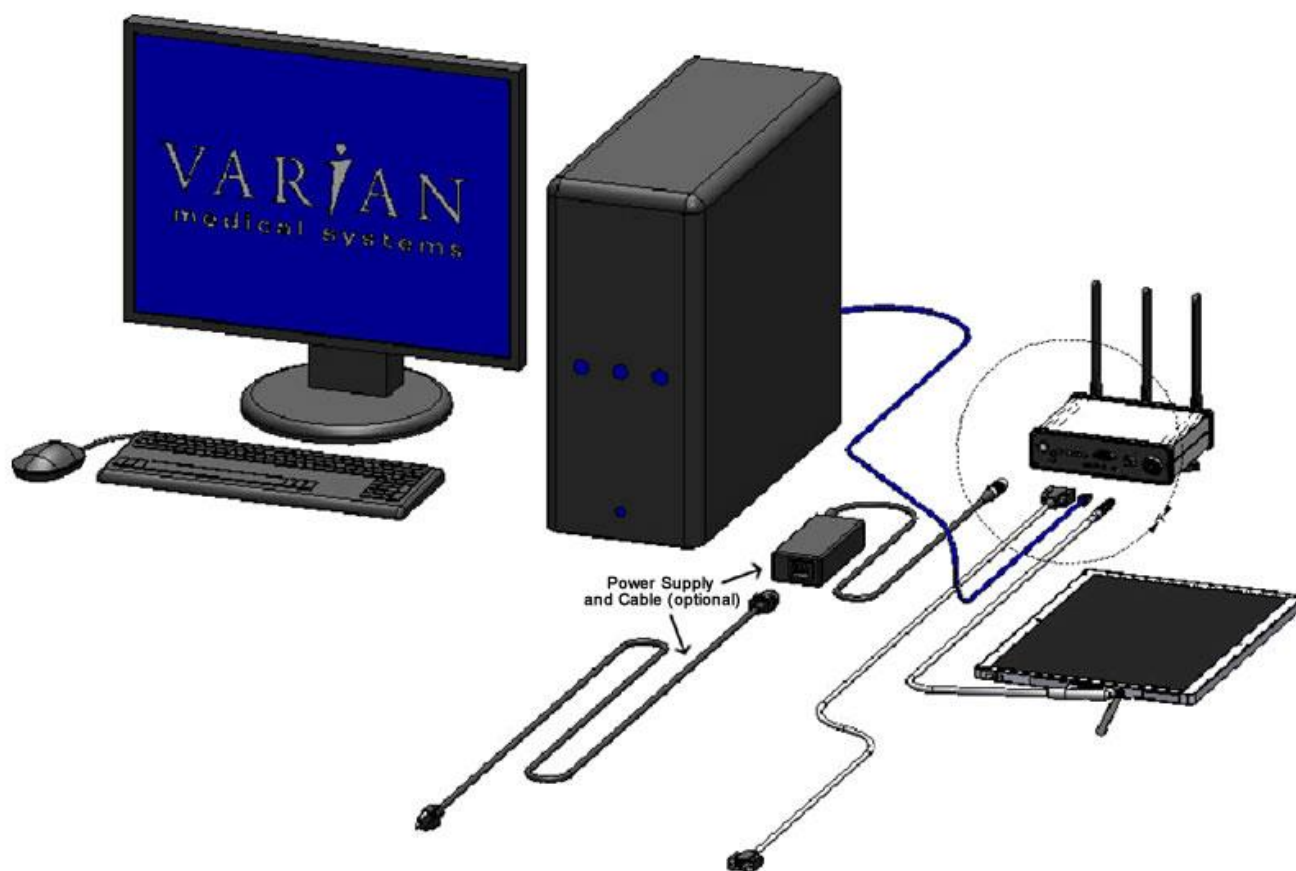
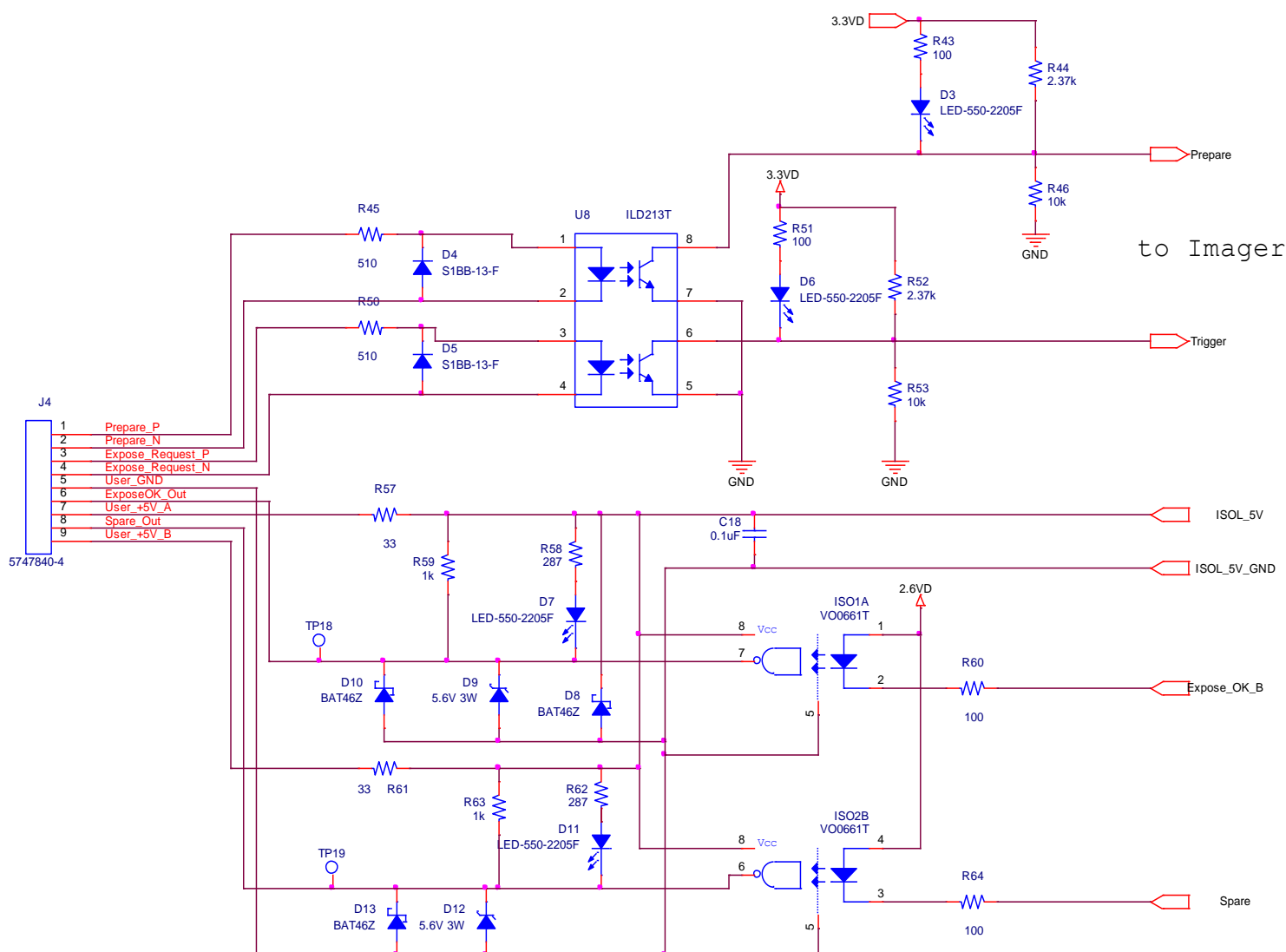


Figure A.1 Diagram of the 2530W Imager System

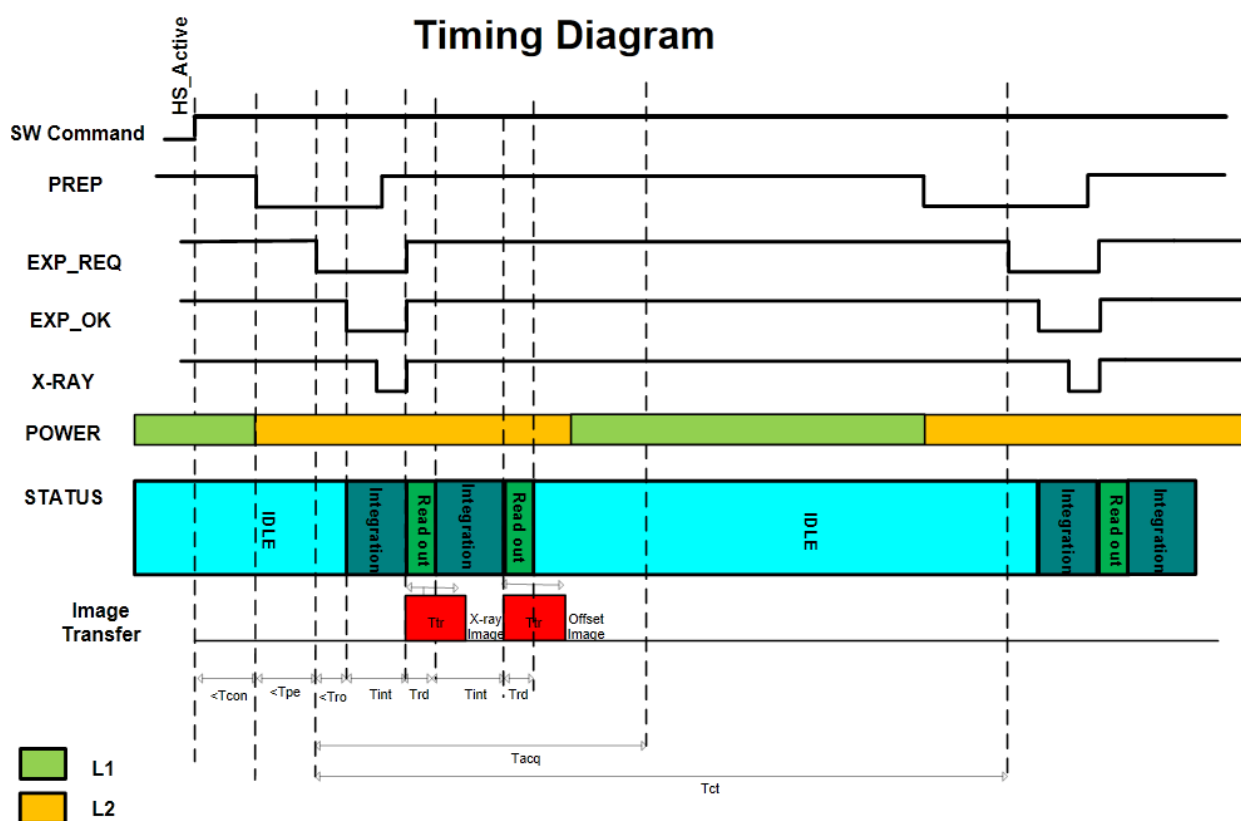
If the Varian I/O box is used the synchronization interface to the panel consists of two inputs and one output, all isolated through opto-couplers. The expected inputs to the panel are Prepare and Exposure\_Request. The output from the panel is Expose\_OK, which can be used to trigger the generator. This active low signal is used to identify when the panel is ready for exposure. The 2530W panel currently ignores Prepare and responds only to Exposure\_Request. The exposure delay is defined as the worst case time between Exposure\_Request and Expose\_OK. The interface circuit is shown below.

**NOTE: The maximum input voltage on the opto-couplers used in the 2530W is 5V. Refer to the TSM0505S datasheet for additional information.**



**Figure A.2 Schematic for “Expose Ok” and “Expose Request” Signal**

The typical timing of the synchronization interface is shown below. The panel is maintained in an idle state, until the asynchronous `Expose_Request` is received. When the panel receives the `Expose_Request`, the assumption is that the generator is ready to make an exposure when `Expose_OK` is issued.



Rev Date: 08/14/2013

CONFIDENTIAL

Preliminary

Figure A.3 2530W Timing

## Timing Diagram MSR1

### Time Description

Name	Description	Time	Unit
Tcon	Time Connection	TBD	s
Tpe	Time between "Prep" to "Exp_Req"	<1	s
Tro	Time between "Exp_Req" to "Exp_Ok"	<0.15	s
Tint	Integration Time	0.5 to 6	s
Trd	Redaout Time	<0.15	s
Ttr	Transmission Time	<0.9	s
Tacq	Acquisition time (550ms RCT)	<2.8	s
Tct	Cycle time (550ms RCT)	<7	s

Times are based in typical values

### Power Description without Charging Battery

L1	Sleep	4.35	W	0.29	A
L2	Image Transfer/Acqusition	16.05	W	1.07	A

Times are based in typical values

Battery Voltage = 15V

Rev Date: 08/14/2013

**CONFIDENTIAL**

**Preliminary**

Figure A.4 2530W Timing

## Appendix B

### Use Cases

The 2530W platform can be configured to meet several different use cases depending upon the desired application usage required by the end user. The following are potential application configurations:

#### Single Panel

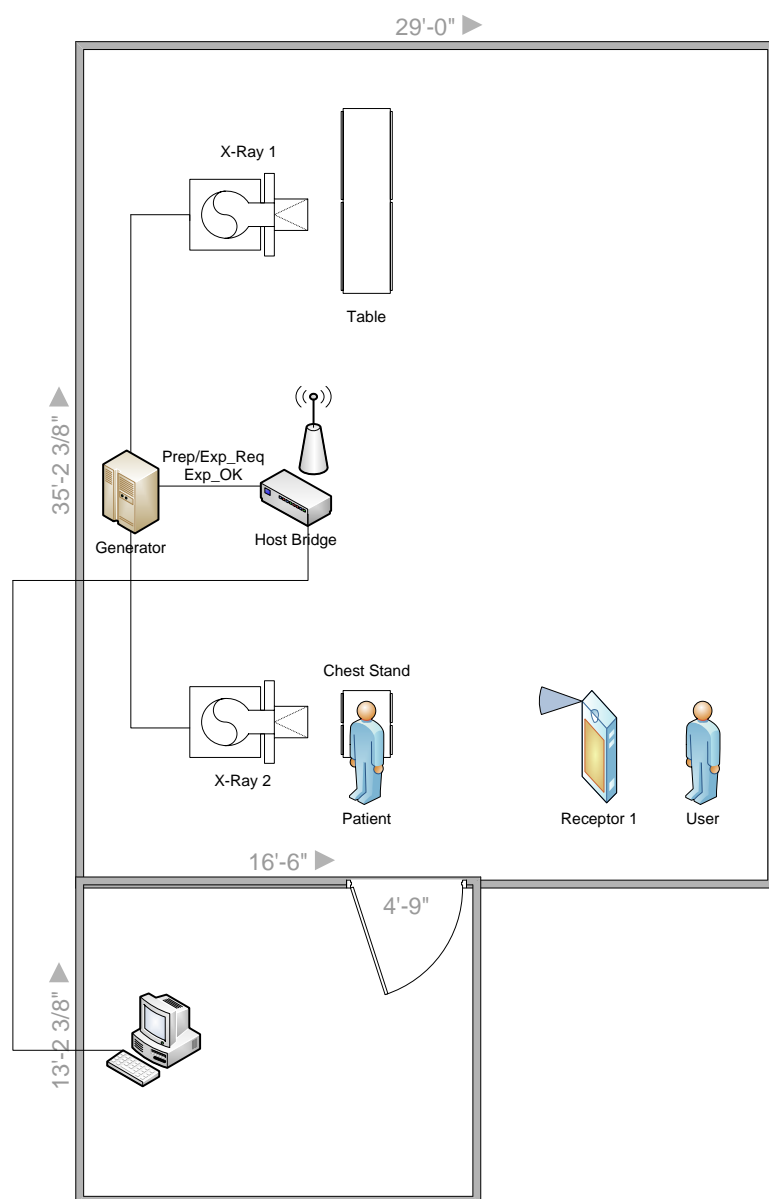
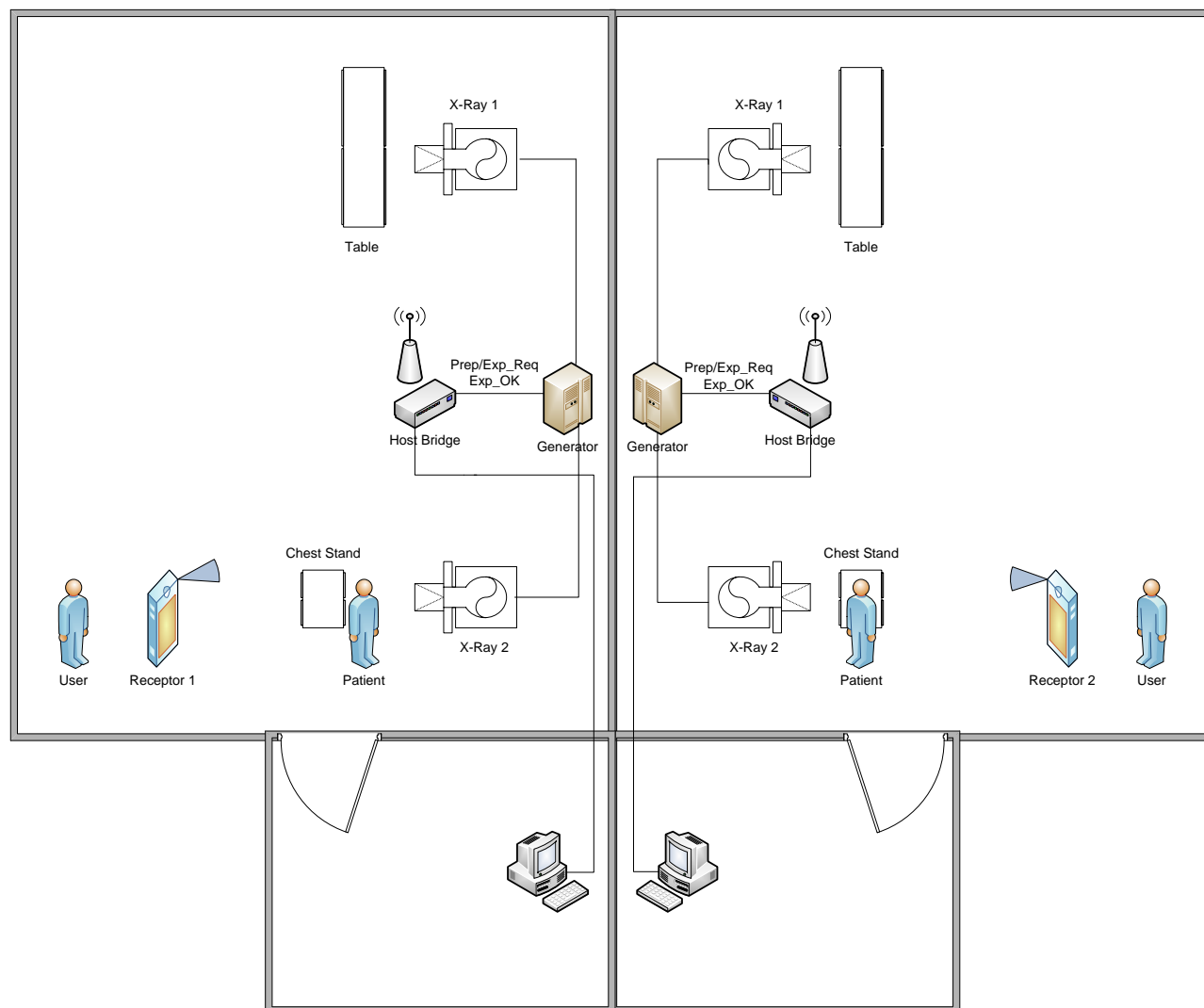


Figure B.1 Example of Single Panel Use

## One Panel Per Room

## Room 1

## Room 2



### Figure B.2 Example of One Panel Per Room Use



## Multiple Panel

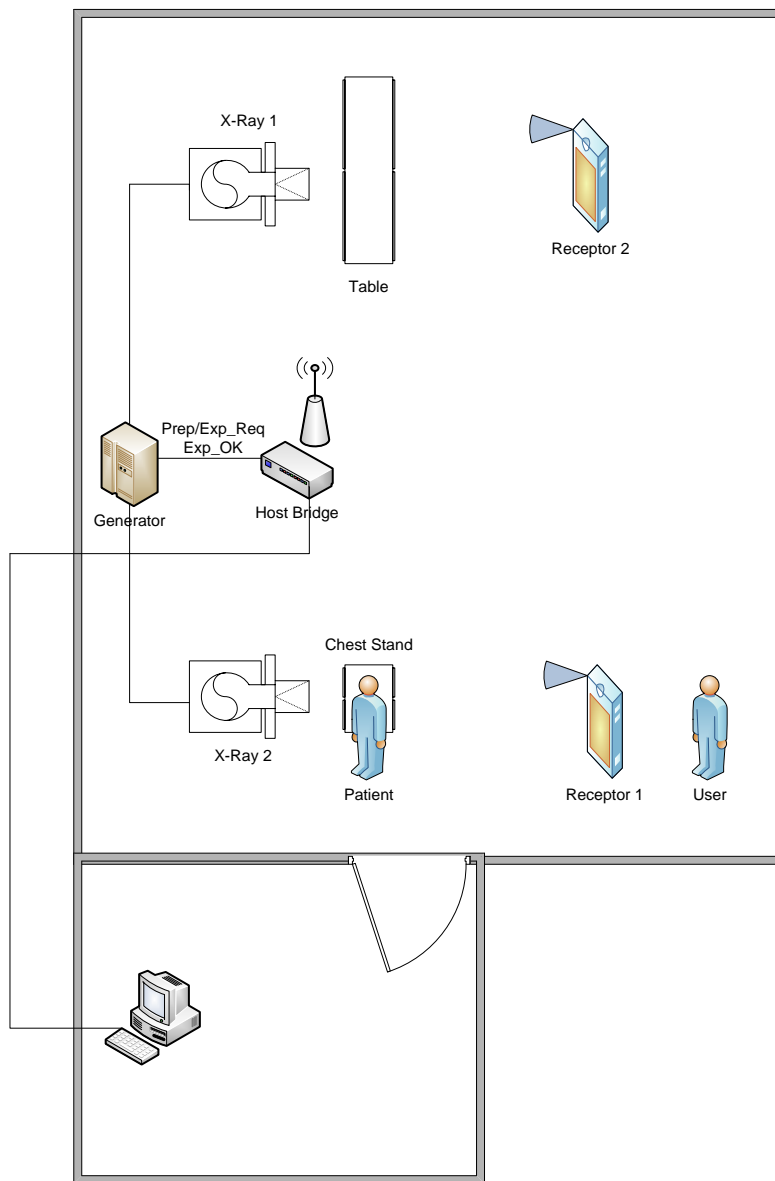


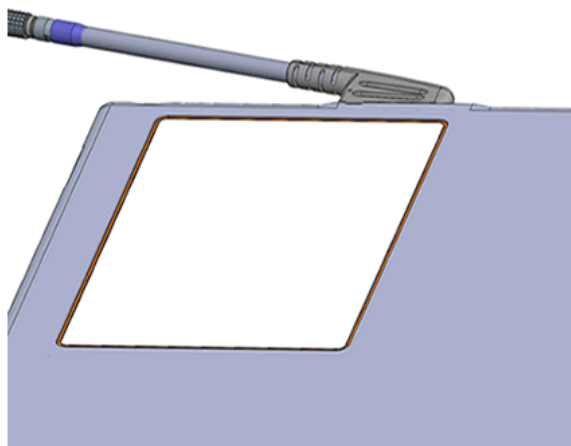
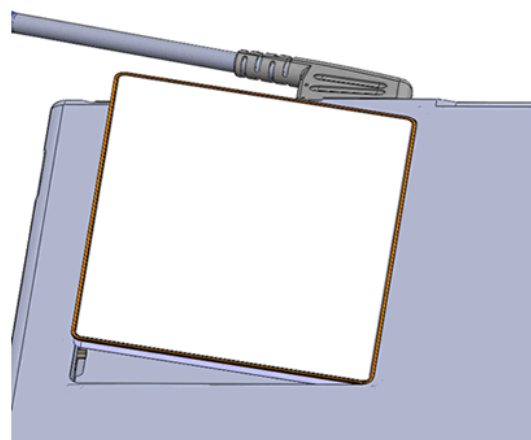
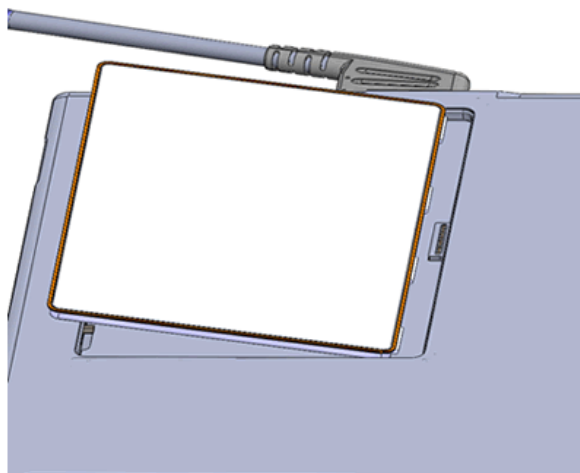
Figure B.3 Example of Multiple Panel Use

## Appendix C

### Battery Installation/Removal for 2530W

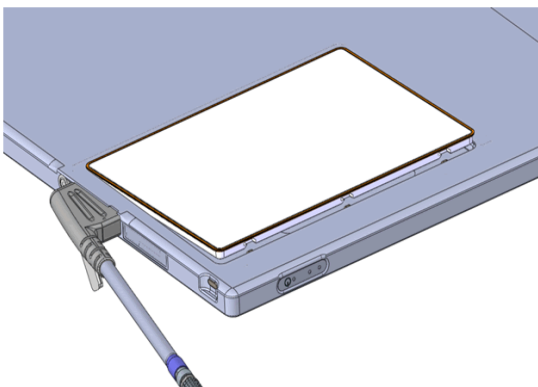
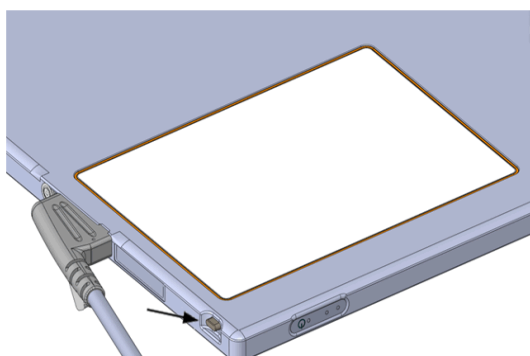
#### Battery installation

Step	Action / Results
1.	First ensure that the receptor is powered off. Insert battery at a slight angle so that the side with contacts sits over the adjoining contacts in the battery compartment.
2.	Press the battery latch button until an audible click is heard and the button remains depressed when released. If the button is already depressed from a previous battery ejection, proceed to step 3.
3.	Press down on the lifted side of battery snapping it into place in the battery compartment. Receptor is now ready for user.



## Battery removal

Step	Action / Results
1.	First ensure that the receptor is powered off. Then press the battery latch button located near the corner of the receptor until there is an audible click and the button remains depressed when released. Doing this will cause one side of the battery to lift out of the battery compartment.
2.	Grab the lifted side of the battery and finish removing.



## Battery Charger

The Varian 1 bay and 3-bay charger is intended for use with the Varian Lithium-ion Battery. The Varian charger will fully charge a Varian battery in maximum 3 hours when operating at room temperature. The charger is used with the PaxScan wireless radiographic digital image receptors.

### Setting Up the Varian Charger

Step	Action / Results
1.	The Varian Charger must be installed near the outlet to which it will be connected.
2.	Do not block the charger's ventilation slots underneath the charger.
3.	Use the charger only with Varian batteries and the provided external power supply
4.	To connect the charger to power: <ul style="list-style-type: none"><li>• Plug the DC cable from the power supply into the charger</li><li>• Plug the AC cable into the power supply</li><li>• Plug the AC cable into the appropriate power outlet</li></ul> The charger is now ready for use.

## Battery charging using the stand alone 3-Bay Battery Charger

The Varian 3-bay charger requires:

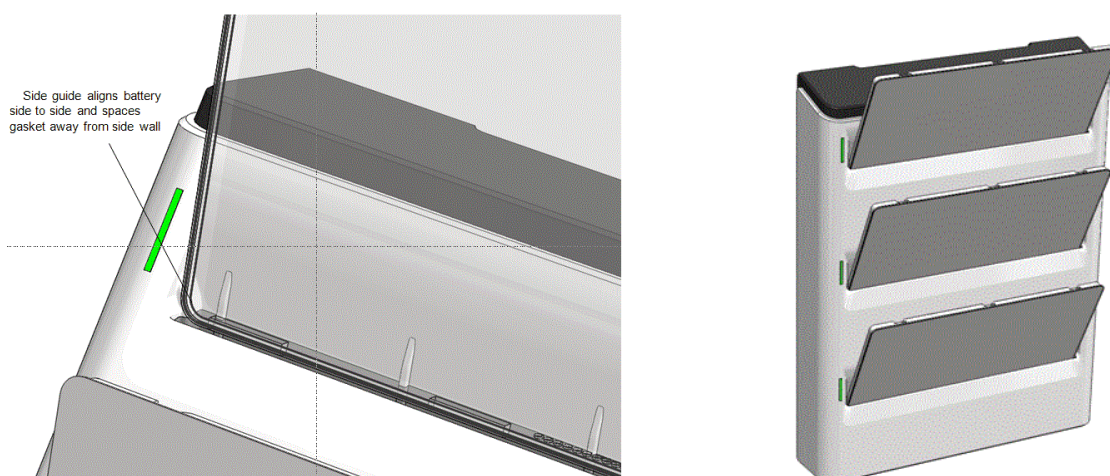
1. 24V DC, 3.3A max input.
2. The output of the charger is 16.8V DC, 1.5A max (+/- 1% and 10 Hz).

### Step

### Action / Results

1. Hold battery on end opposite of the contacts with the contacts facing toward the charger.
2. Gently slide battery into battery compartment on the charger. When properly inserted, a light next to the battery slot will turn on showing the charge status of the battery. When the battery is charging the light will be orange, when charging is complete the light will turn green and when there is a fault the light will be red.

Charging a fully discharged battery will take 3.5 hours maximum and 2.5 hours typical when operating at room temperature. Up to three batteries can be charged at a time in the Varian 3-bay battery charger.



**Battery Charger LED's**

LED	LED State	Description
Green	Solid	Battery Full
Orange	Solid	Battery is charged
Red	Solid	Charger timeout, or bad battery ID
	2 Blinks	Bad Smbus
	3 Blinks	Voltage Fault
	4 Blinks	Temperature Fault

**Figure C-1 3-Bay Battery Charger Status Indicators**

## Battery charging using the stand alone 1-bay battery charger

The Varian 1-bay charger requires:

1. 19V DC, 2.1A max input.
2. The output of the charger is 16.8V DC, 1.4A max (+/- 1% and 10 Hz)..

### Step

### Action / Results

1. The Varian battery communicates with the Varian 1-bay charger when it is plugged into the charger. The battery monitors its readiness state and is mechanically keyed to charger for easy installation.
2. The charger provides the following LED indicators to identify charge process and charge faults (see below Figure B-2).
  - When all four (4) green LEDs are continuously illuminated (with the red LED off), the battery has reached maximum charge. It can either be removed or left in the charger to maintain full charge. Charging time typically is typically 2.5 hours, maximum 3.5 hours.

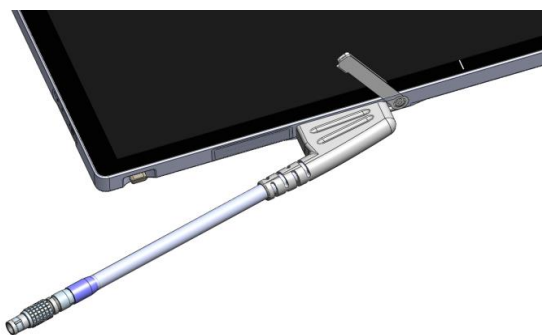
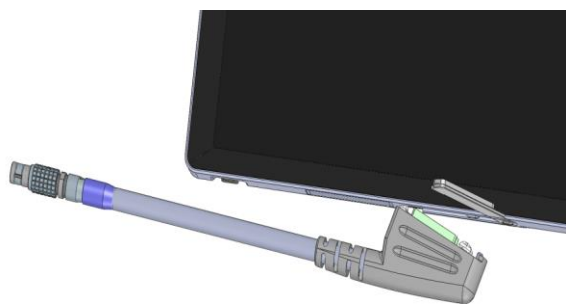
Description	Green LEDs	Red LED	Example
Battery Charging Normally – up to 25%	1 – On – Blinking 2 – Off 3 – Off 4 – Off	Off	
Battery Charging Normally – 26% to 50%	1 – On – Continuously 2 – On – Blinking 3 – Off 4 – Off	Off	
Battery Charging Normally – 51% to 75%	1 – On – Continuously 2 – On – Continuously 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	

Figure C-2 1-Bay Battery Charger Status Indicators

## Battery charging using the 2530W Receptor

Step	Action / Results
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- |    |   |
|----|---|
| 1. | Ensure that the battery is properly attached to the back of the receptor. |
| 2. | Attach the receptor side tether cable and then connect the I/O Box.       |



Attaching the tether cable will cause the receptor to turn on if it is in the off state. If the receptor is in the on state the power state will not change. When the receptor is charging the battery in the power on state, the blue power LED will blink to notify the user that the battery is charging. If the receptor is not powered on, the battery will still charge, however, there will be no indicator to the user.

Charging a fully discharged battery will take a maximum of 3 hours.



**Warning:** Do not remove the charger cover. The Charger has no internal user serviceable parts.



**Warning:** Do not use in operating room or other oxygen rich environment.  
Do not use in conjunction with flammable agents.  
Do not use in an environment with condensing moisture.

**Caution:**

Do not use flowing liquid or immersion on the receptor, battery, battery compartment, or battery charger.

Do not sterilize.

**Caution:**

Do not attempt to insert objects other than the Varian battery into the charger bay.

**Important:**

Use the Varian Battery Charger only with the Varian supplied power supply and power cord.

**Important:**

Use only the Varian supplied batteries in the battery charger and receptor. The systems are not designed to work in conjunction with any other battery type or design.