

## *Digital Image Receptor*



The PaxScan 4336W / 4336X is a radiographic  
digital x-ray imaging sub-system

**Abstract**

The Operating Instructions (P/N 42449-000) covers safety, setup, operation, and maintenance of the PaxScan 4336W / 4336X product family of digital radiography image receptor. The imager is a component sub-system intended for integration by a qualified systems integrator.



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

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## General Safety Information



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

## Safety Warnings, Precautions and Contraindications



**Warning:**

This device is only for use on adult patients with healthy skin; for example, free of blemishes, scars, skin rashes, irritants, disorders, discoloring and abnormal mole.



**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 4336X / 4336W 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 13 degrees C above the manufacturer's recommended normal operation temperature – **not to exceed 60 image acquisitions per hour.** 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.

Limitations for patient contact are listed in the "Patient Contact Limitation" section of this manual. It is important that the operator understand and follow these instructions to avoid possible adverse effect to patient.



**Note:**










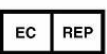







*System Integrators:* At a system level, it is possible to apply for UL approval without the patient contact limitations discussed below. If the imaging system monitors the internal temperature data supplied by the panel, mechanisms can be put in place at the OEM system level to control panel surface temperature so that it does not exceed 48°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 4336W / 4336X product family of radiographic digital image receptors is commonly referred to as a flat panel detector (FPD) or receptor. 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 three main system components: The flat panel sensor, VCP software, and the External Power Supply (I/O Box) that provides the wireless communication and power to recharge the receptor battery.

For convenience, PaxScan 4336W / 4336X product family and/or 4336W / 4336X are used throughout this manual to refer to 4336W and 4336X models *unless otherwise indicated*.

### Shipment Contents

Flat Panel Receptor Assembly (includes a detachable receptor cable for wired operation or battery recharging)

PaxScan Receptor Install DVD

(Files specific to the receptor in the shipment)

PaxScan Software DVD

Virtual CP/ViVA System Software L.06 Release 5

I/O Interface Box

Laptop Style Power Supply (P/N AHM85US24-XB0273A) with Power Cable

PaxScan 4336W / 4336X Operating Instructions

### Optional Parts

Battery

Battery Charger

Customer Specific Overlay

Extension Cable

GigE Cable

Laptop Style Power Supply (P/N AHM85US24-XB0273A) with Power 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.

## **Intended Use**

The PaxScan 4336W/ 4336X product 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.

## **Patient Contact Limitations**

1. Patient contact time between 1 and 10 minutes.
2. No more than 10% of a patient's body area should be in direct contact with surfaces.
3. No more than 10% of patient's head area should be in direct contact with the surfaces.
4. The device is intended for use on adult patients with healthy skin only.
5. No additional pressure should be applied when patient is in contact with surfaces.
6. Number of image acquisitions not to exceed 60 per hour.

Figure 1-0 Patient Contact Surfaces – 4336W

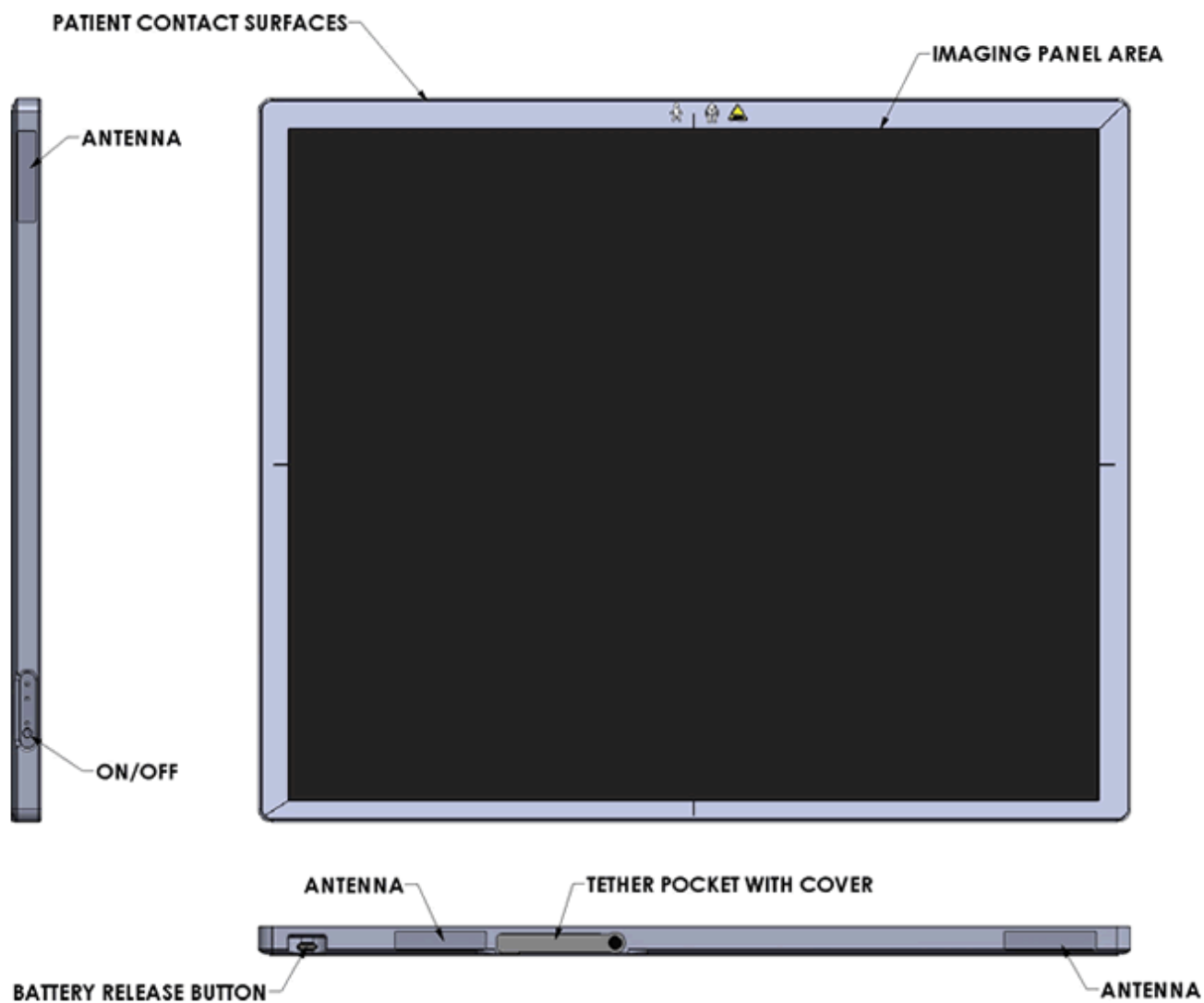
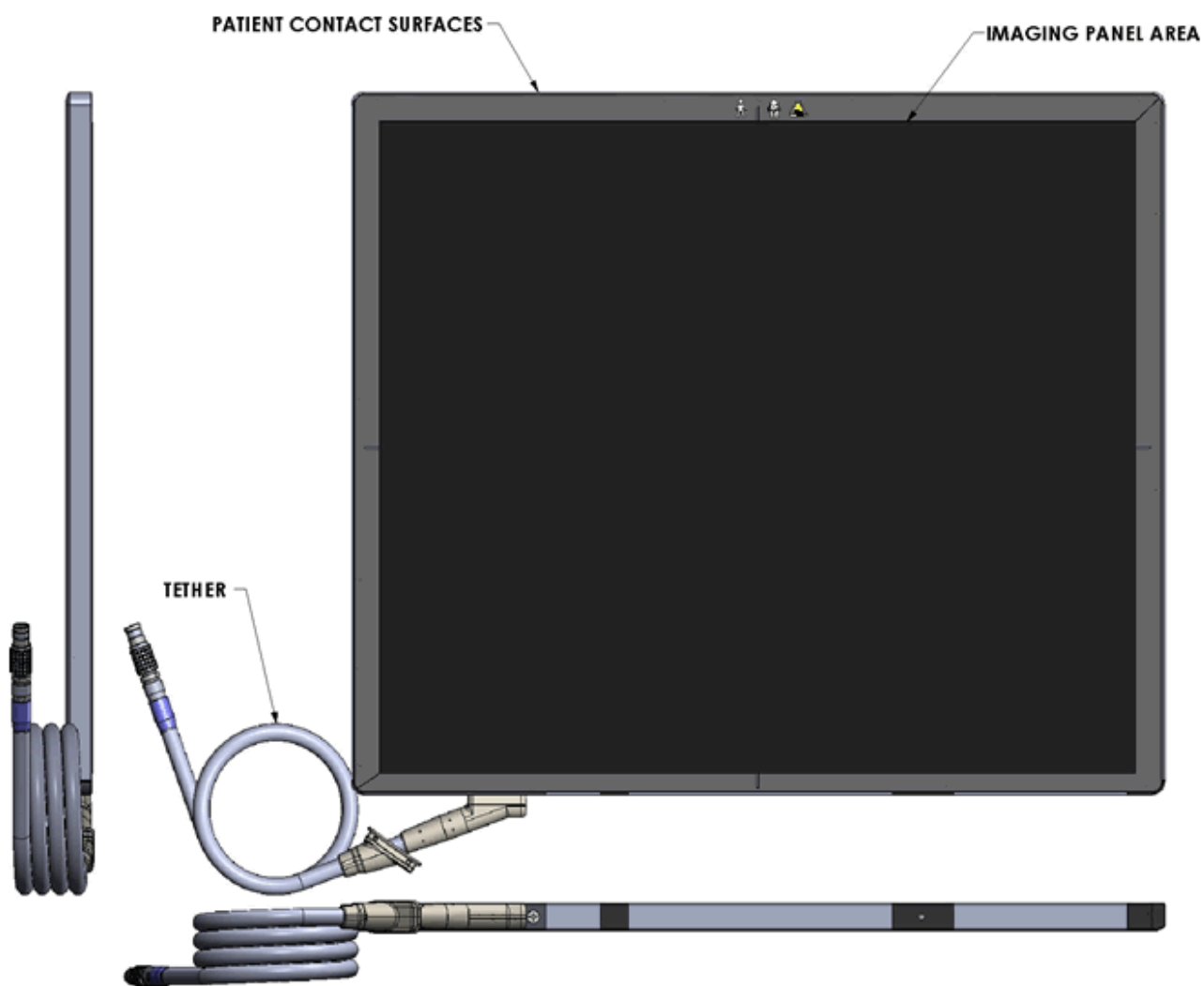


Figure 2-0 Patient Contact Surfaces – 4336X





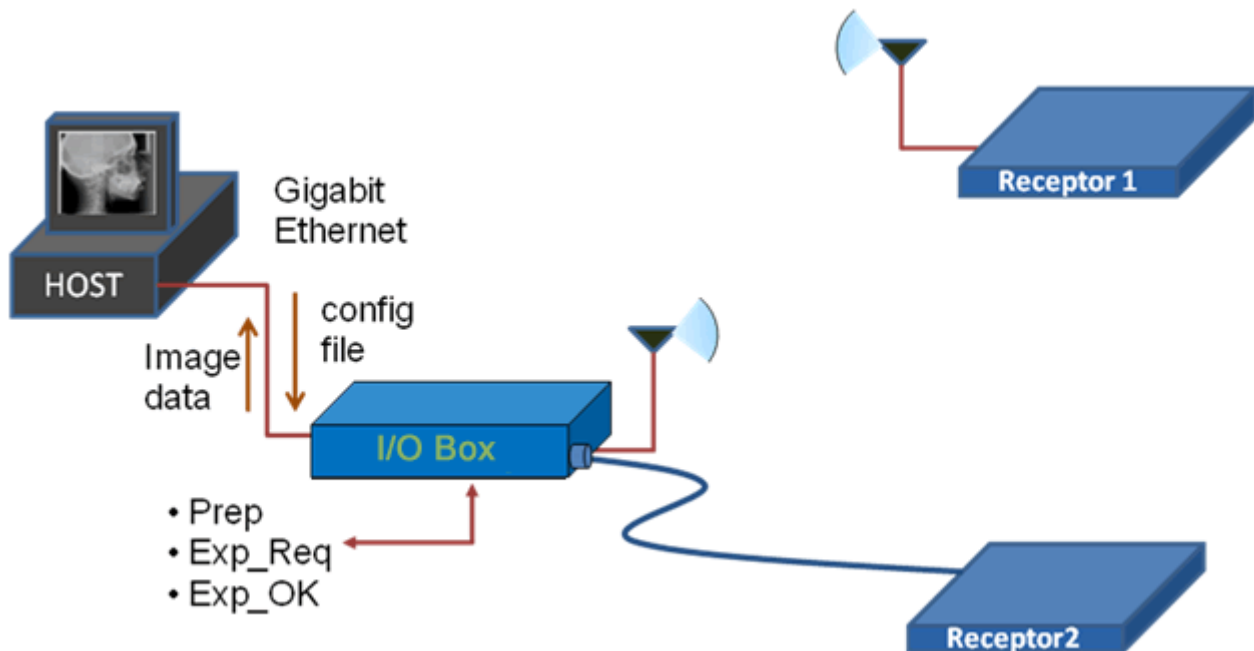
## Getting Started

### System Overview

In medical applications, the function of the 4336W / 4336X FPD is to absorb the X-rays that pass through the patient's anatomy and convert them into a digital image. The I/O Box is the interface between the FPD and the imaging system and may be mounted in an equipment enclosure, or it may also be wall or ceiling mounted to maximize wireless signal strength. 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 459.5mm x 383.5 x 15.13mm.

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



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 provides all hardware interfaces for the PaxScan 4336W / 4336X 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:**

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

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**

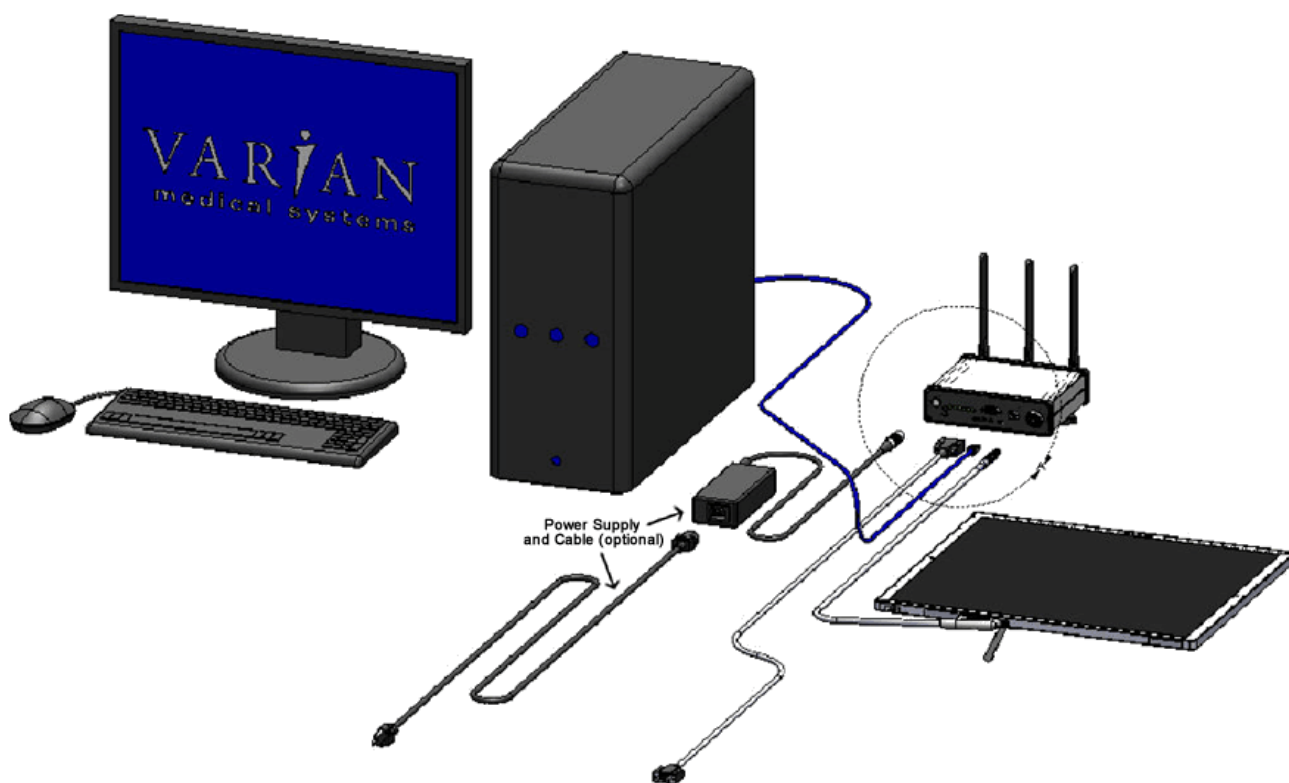
Step	Action / Description
<b>There are four (4) cable connections for the 4336W / 4336X Flat Panel Receptor: (a) The laptop style power supply cable , (b) external sync cable, (c) Category 5 or better Ethernet cable, and (d) tether cable. The cable connections are described below.</b>	
1.	<b>Laptop Style 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 - Overview

**Important:**

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

Figure 5-0 Cable Connection - Detail



## Power on Sequence

Wireless mode (W)

Step	Action / Results
1.	Press the receptor ON/Off button for one second to turn the receptor on – blue LED will light. The panel will power on and immediately attempt to connect to the I/O Box.
2.	At the computer interface, initiate connection to the receptor.
3.	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) <ul style="list-style-type: none"><li>○ The receptor will keep trying to connect until a successful association takes place.</li></ul>
4.	The Orange LED, when lit, indicates a Ready-to-Expose State.



**Note:** For wireless mode, Pleora eBUS universal driver should be used

Figure 6-0 4336W Receptor Power/LED

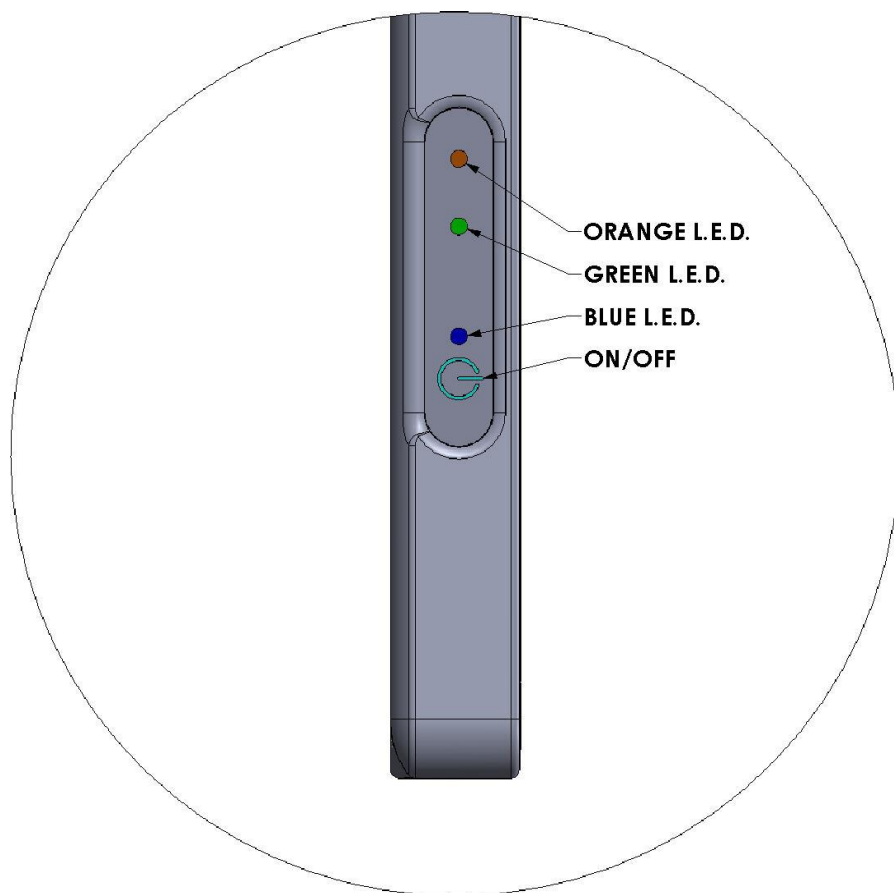


Figure 6-1 4336W Power/LED - Details

**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 (W/X)

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 6-2 I/O Box Power On Connection



Figure 6-3 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 4336X Moisture Resistance Level Tested.

PaxScan 4336W 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 a 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

#### Power Down Algorithm

The PaxScan 4336W / 4336X provides an alternative option to allow the customer to power down major voltages in the receptor as soon as an undesirable higher temperature is reached. This algorithm will prevent the receptor from working in such conditions thereby lowering its power consumption.

#### Implementation

The algorithm will TURN ON/OFF based on customer desire. As soon as it is ON the receptor will continuously check the temperature reported by sensor 2 and 4.

If either one of the temperature sensors go above the threshold established for T2 and T4 respectively, the receptor will finish any current acquisition and will TURN OFF most of its power in order to reduce its power consumption. Once the receptor is in power down, it will report its status to the system and will not allow any further acquisition.

After the temperature of both sensors drops below a lower threshold the power will return and the user will not be allowed to acquire images for the next 4.4 seconds (initialization).

After this time passes, the receptor will come back to a normal operation. Please consult your Varian representatives to set up this feature.

#### Hot Swappable

This feature allows the customer to disconnect the primary cable from the 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 L06* system software and available upon request.

### Paxscan System Software


There are two DVDs supplied with this product. The Software DVD 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 DVD 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 and 64 bit compatible. A Software Developer Kit (SDK) including sample code notes are located in the directory:

**PaxscanL06\DeveloperFiles\SampleCode**

The Receptor software DVD 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 4336W / 4336X product family is compatible with the Paxscan System Software version L06 or higher depending on the model. Please consult your Varian representative.

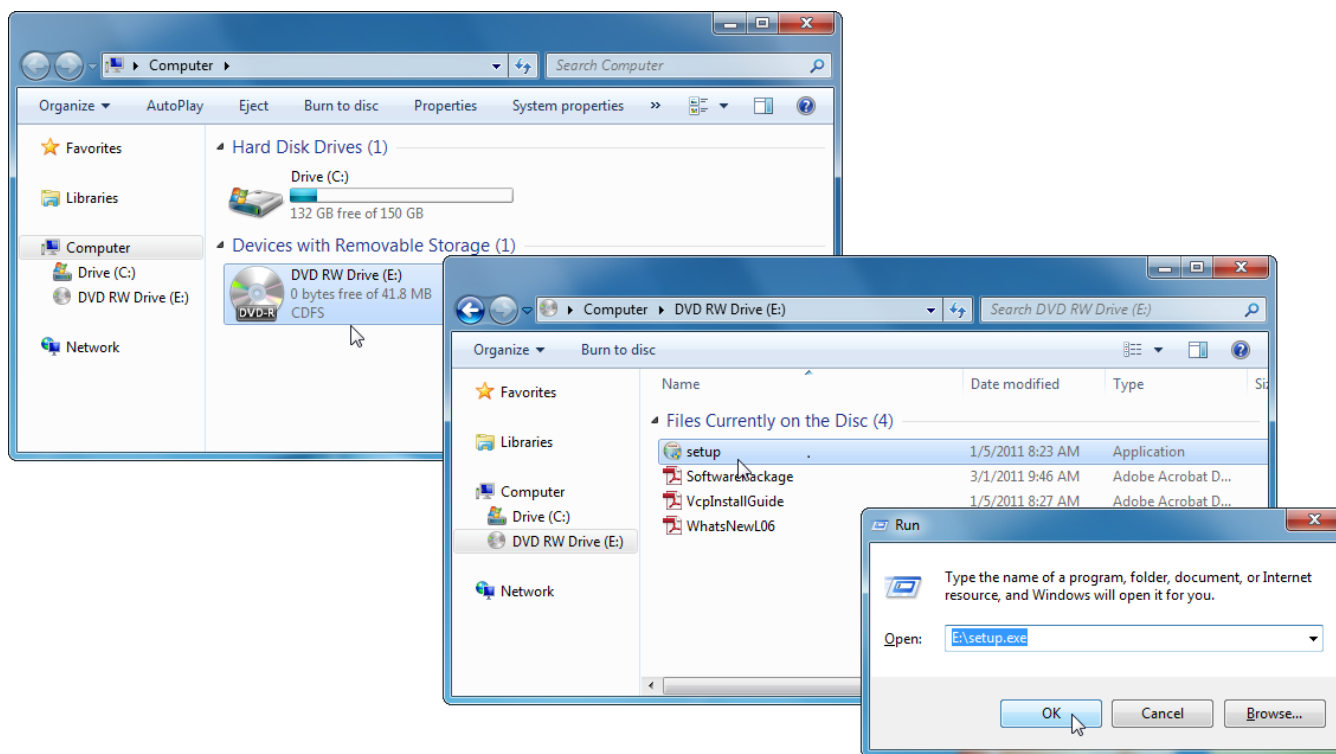
### Software Installation

Begin software installation by using the run command under the Windows Start button, select Browse, My Computer, and your CD/DVD ROM Drive that contains the PaxScan DVD. 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**

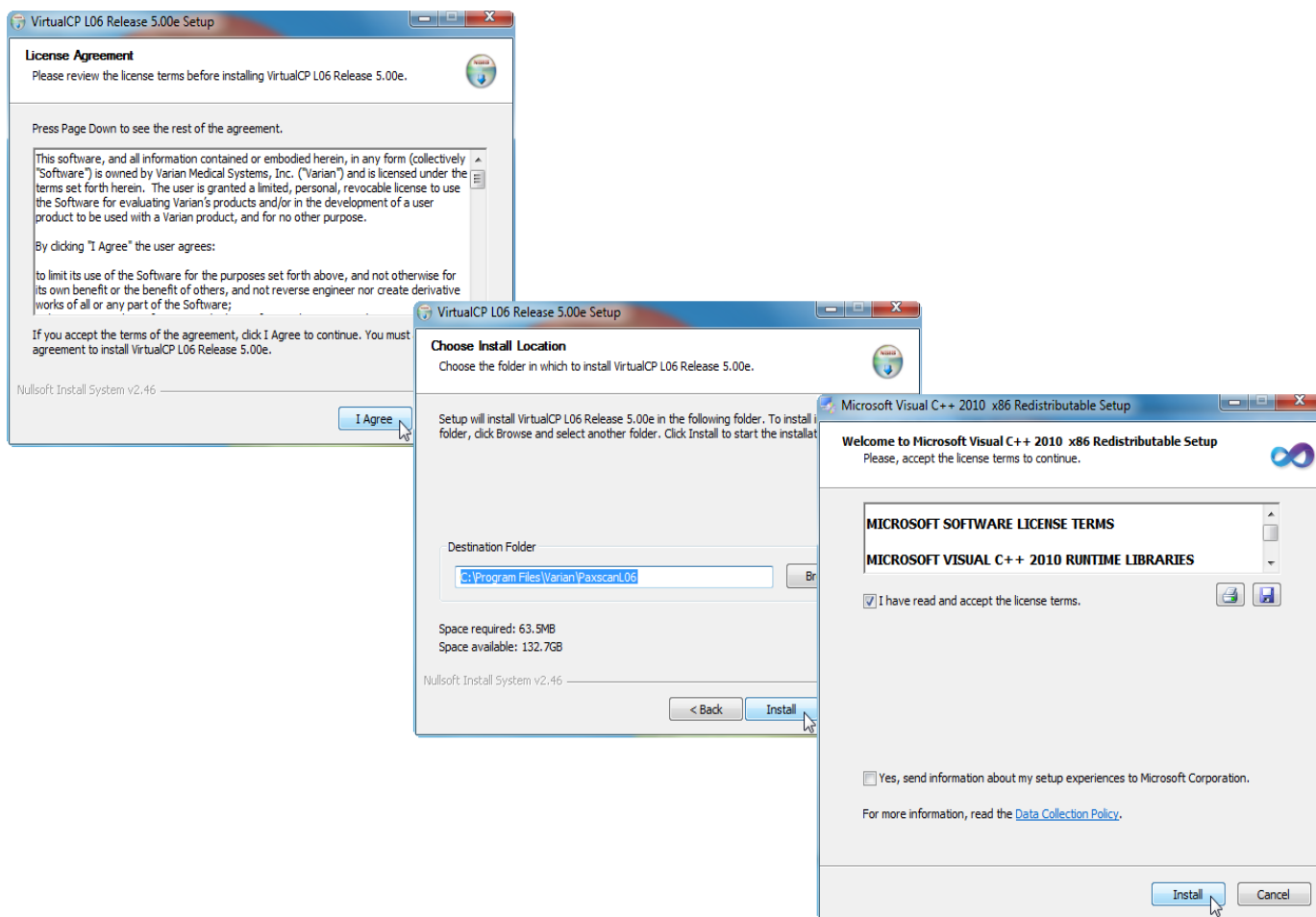
1. For a normal install, follow example shown in below screenshots.



## Step

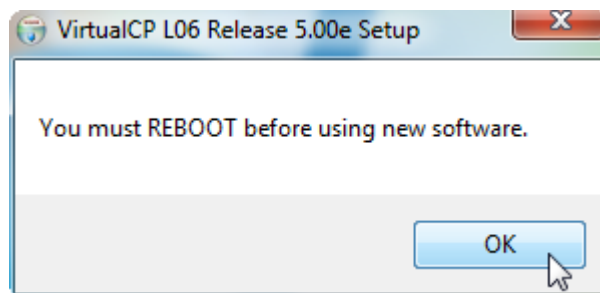
## Action / Results

1. For a normal install, you may simply accept all the defaults in progressing to the *Install Shield Wizard Complete* screen.



Step	Action / Results
2.	<i>For 4336X</i> you may install either the iPORT™ High-Performance driver, if you have the Intel Pro/1000 adapter, or the Pleora eBUS Universal driver for all adapter.

*For 4336W* you may only install the Pleora eBUS Universal Driver.

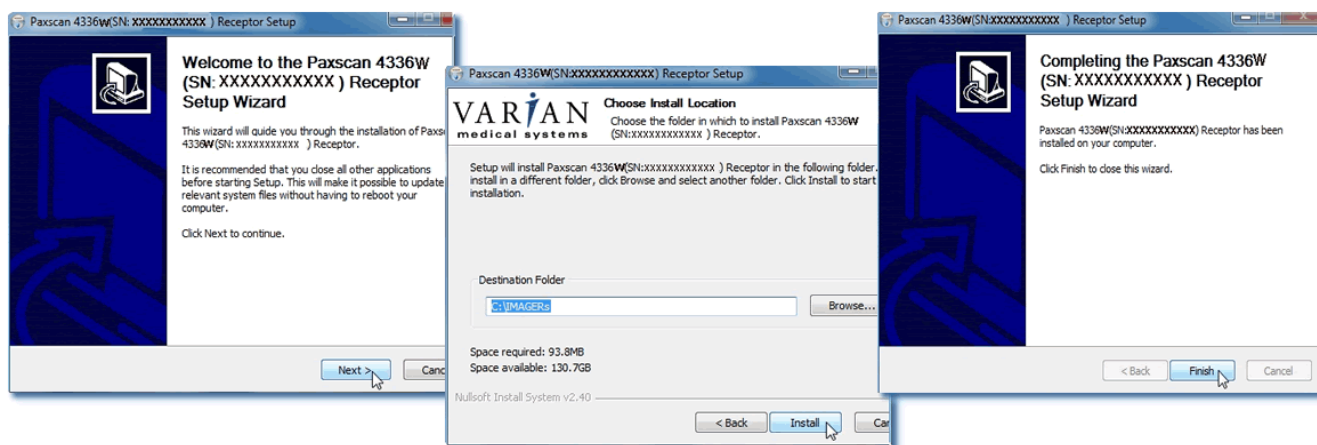
**Note:**

Pleora provides three options for the Ethernet driver. For fastest possible operation install the Pleora High Performance driver onto the Ethernet adapter of the host computer; but, – this is only possible with specific Ethernet adapter – namely, the Intel Pro/1000. Other gigabit Ethernet adapters may be used without noticeable loss of speed for radiography (single shot) modes. Operation is possible with the Manufacturer driver which requires no additional installation; however, performance will vary depending upon the computer system. The Pleora eBUS Universal driver provides a third option that gives performance intermediate between the other two. The Pleora eBUS Universal driver solution is better than the Manufacturer driver though still not nearly as good as the Pleora High Performance driver.

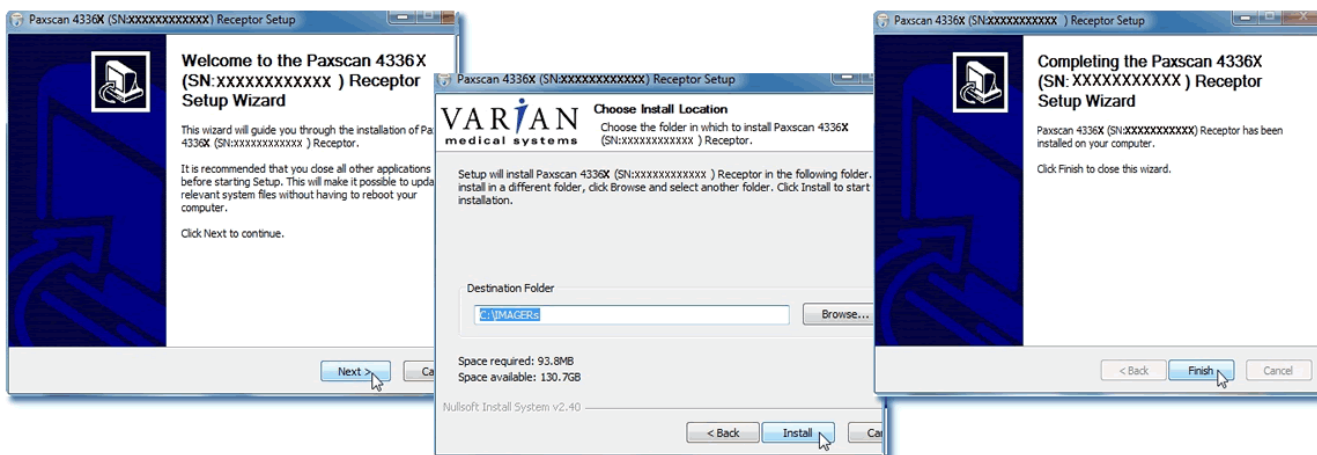
## Receptor Files Installation

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

- 4336W – follow the prompt sequence



- 4336X – follow the prompt sequence



### Modes of Operation

The PaxScan 4336W / 4336X supports the radiography mode 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. The following two (2) modes are available:

- **Reduce Cycle Time (RCT)**
- **Standard Cycle Time (SCT)**

For either RCT or SCT the user has the option to retrieve a preview image – which has the benefit of having preliminary view of the target object in reduced time.



**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 4336W / 4336X Operational Modes**

Mode	Cycle Time	Pixel Binning	Panel Scan Time	X-Ray Window Time	Image Area	Frame Size	Acquisition Type
Radiography – Full Resolution RCT	6 sec	1 x 1	600ms	547 ms	Full Field	2,560 x 3,072	Accumulation
Radiography – Full Resolution SCT	10 sec	1 x 1	600ms	547 ms	Full Field	2,560 x 3,072	Accumulation



## Configuring Modes to Optimize Battery Life

The example mode is used to optimize battery life and acquisition's time by using HS\_sleep and HS\_wakeup. This mode configuration also provides for backward compatibility to earlier software versions when installation changes are not wanted and there is no concern with the 6seconds between HS\_ACTIVE and EXP-REQ.

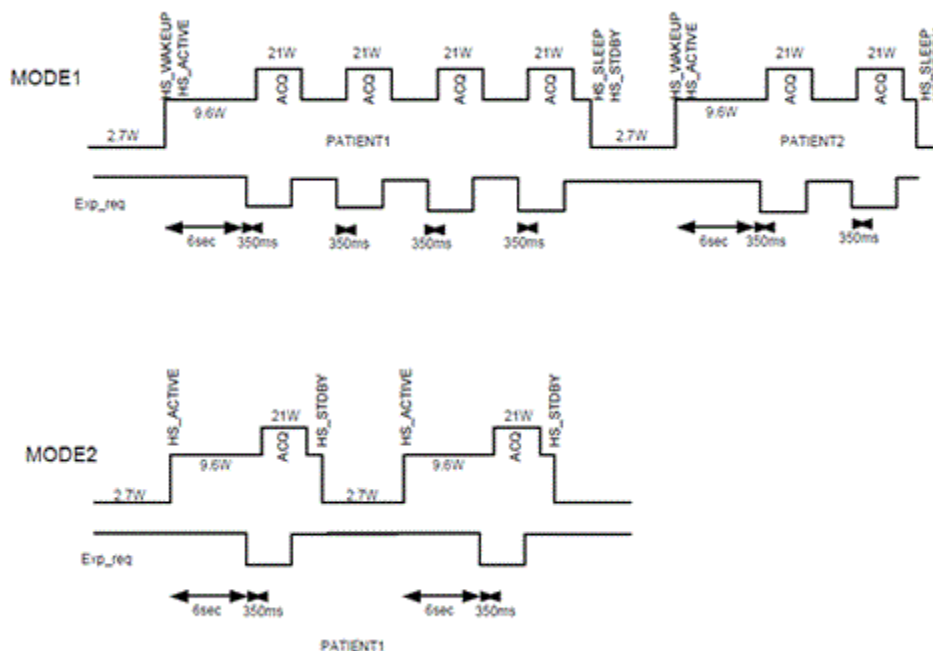
- **Example Mode 1**

This mode adds new functionality to the VCP to reduce the time (6seconds) between HS\_ACTIVE and EXP\_REQ for the following acquisitions. It adds HS\_WAKEUP and HS\_SLEEP which sets the panel mostly in standby power mode 9.6W but allows you to avoid going again into 6s every time you want to acquire an image

- **Example Mode 2**

It was designed in the way if the OEM will not like to use the new functions HS\_WAKEUP and HS\_SLEEP. The VCP will automatically call them once OEM calls for HS\_ACTIVE and HS\_STDBY.

**Figure 7-0 Software Configuration Modes**



## 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)

Each operating mode employs all types of calibration. In radiography-type acquisitions, the PaxScan 4336W / 4336X will acquire one frame with its respective offset.

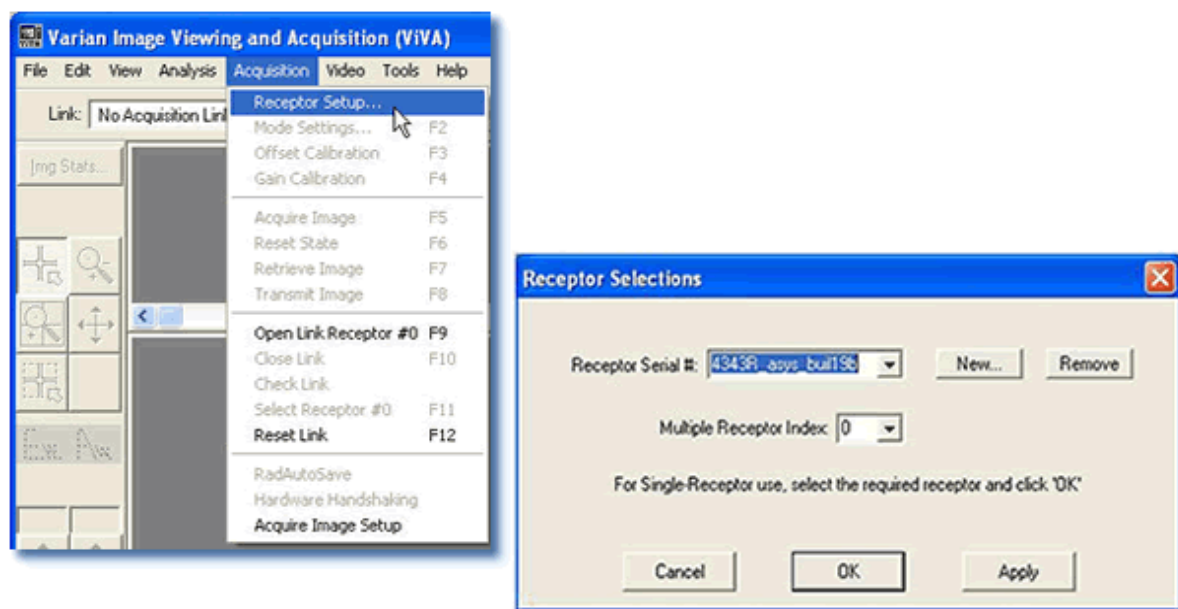
## Multiple Receptor

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. ►

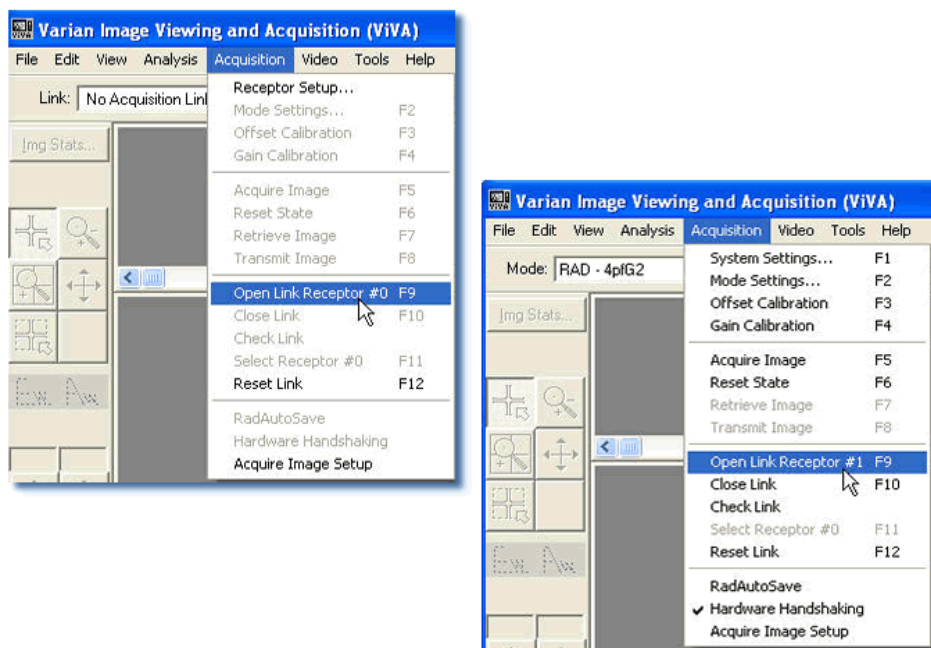
## Step

## 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.

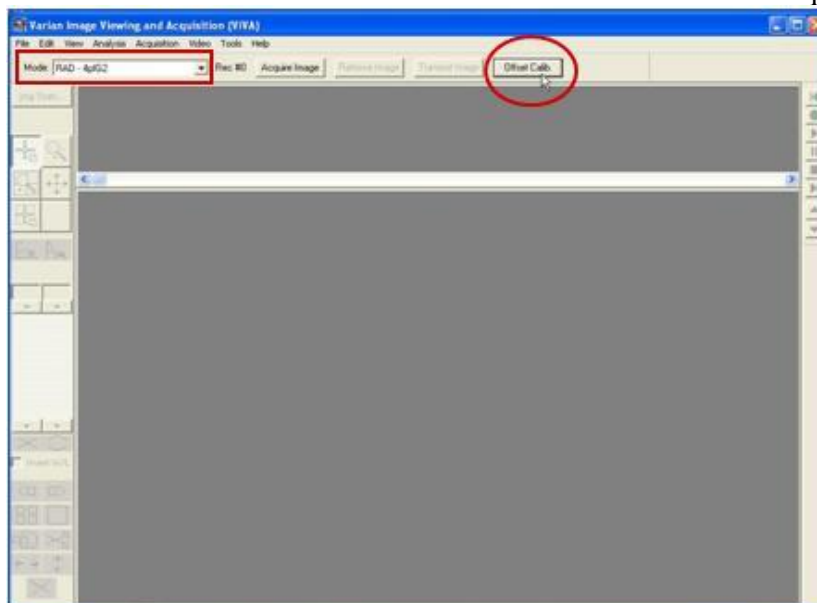
### Preview Offset Calibration

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. The number of frames used for this offset calibration is based on the mode selected – either RCT or SCT

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

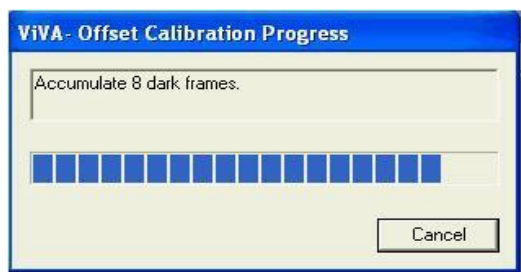
1. To perform offset calibration, click the ViVA icon  launches the application

2. Ensure required receptor appears in the *Mode* drop down. The 4336W/4336X currently supports Rad 1x1 4pf. Click Offset Calib. 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. This range will ensure that Gain calibration will meet both the upper and lower dose requirements under all modes of operation. Dose requirements are determined by the settings of the generator X-ray source.

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.

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.



**Important:**

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

**Table 3-0 Gain Calibration: All Modes**

Step	Action	Results
1.	Warm Up	To ensure proper warm up, the PaxScan 4336W / 4336X 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.

## Radiographic Mode Gain Calibration

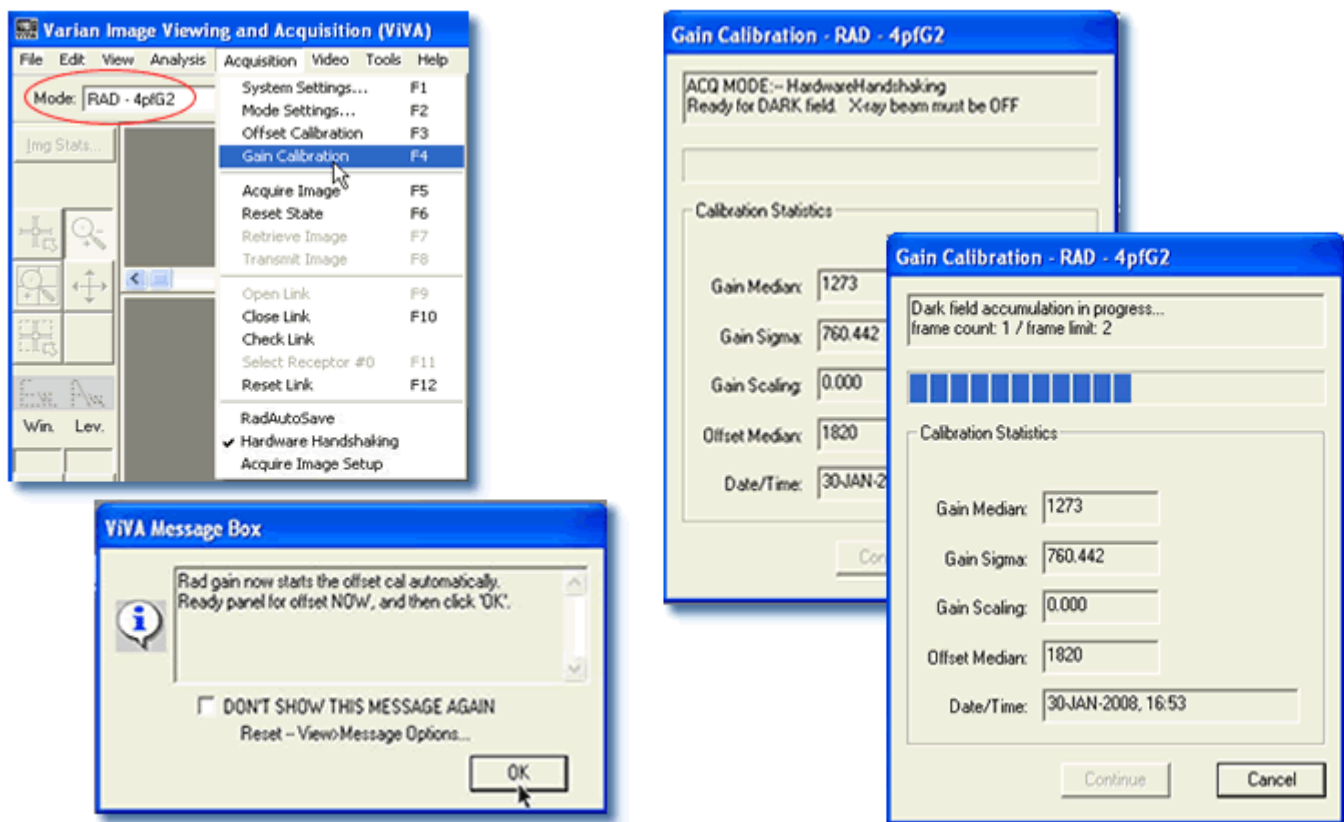
Radiography Gain calibration requires an Offset calibration performed prior to collecting the Flat Field image. X-Ray illuminated frames are then offset-corrected and accumulated in the VCP internal buffer.

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.

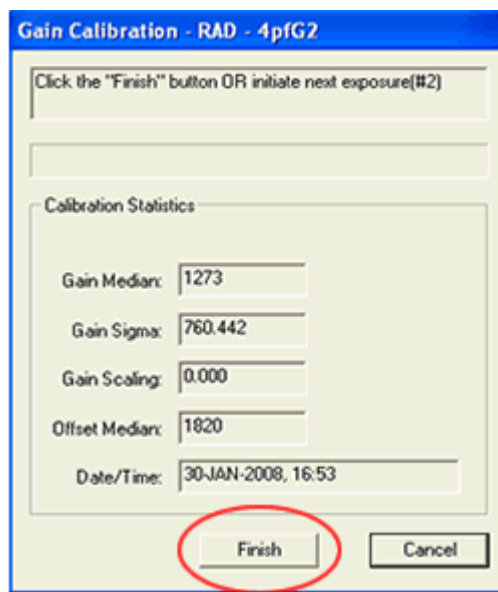
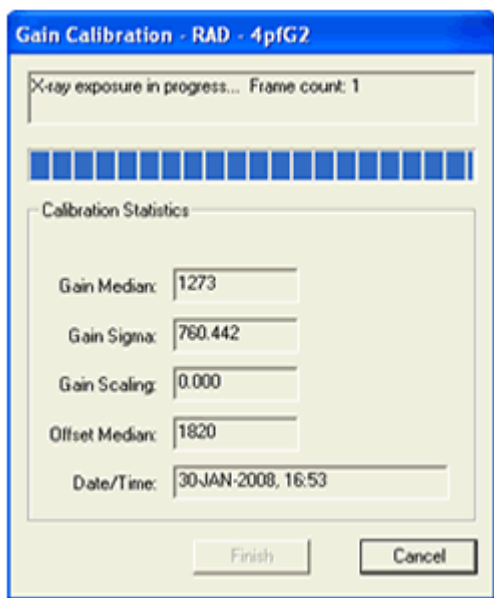




## Step

## Action / Results

- Use *operator control* to perform an exposure. Once all x-ray frames have been acquired click Finish to Complete the calibration.



**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.



**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.

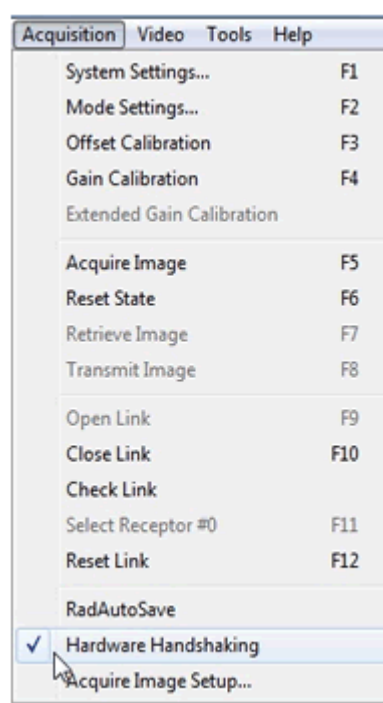
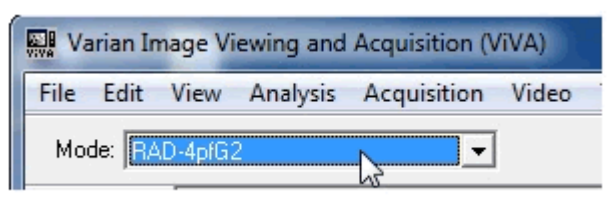
## ViVA Mode Settings

The calibration and system settings are verified as follows. ►

### Step

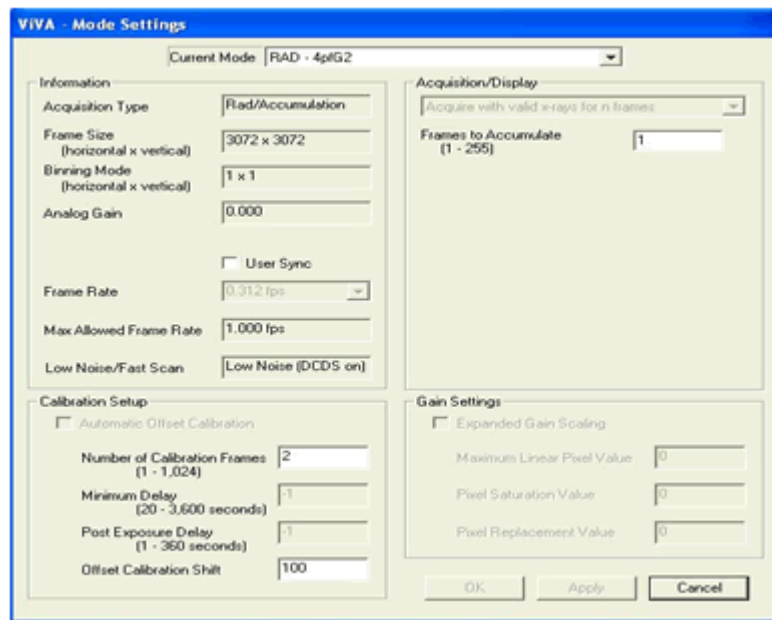
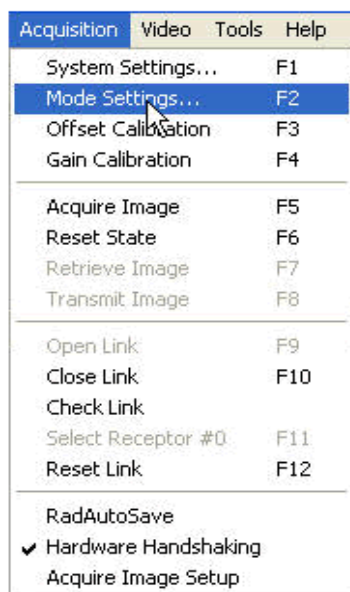
### Action / Results

1. Make sure the desired receptor is selected from the *Mode* drop down menu; and, that “**Hardware Handshaking**” is “checked” from the menu bar under *Acquisition*. ViVA will remember your preference for future launches

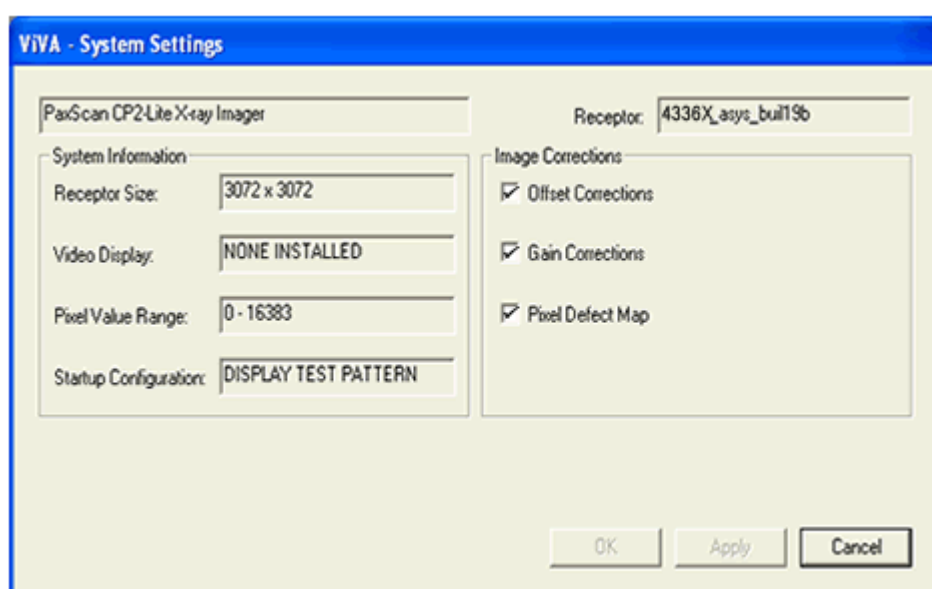
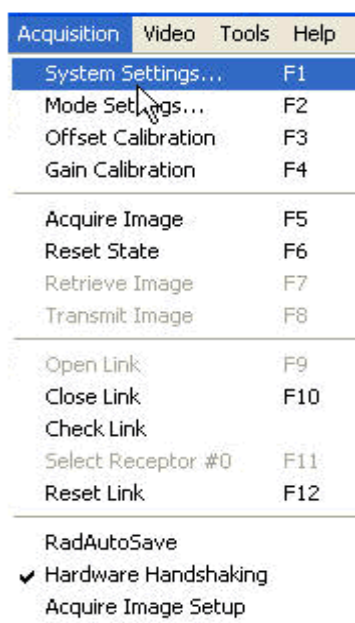


**Step****Action / Results**

2. Select *Mode Settings* from the menu bar under *Acquisition* for Calibration and Frame Rate settings. Frame rate settings are fixed. However, calibration frames can be adjusted.



3. System settings are verified as follows.



### Image Acquisition

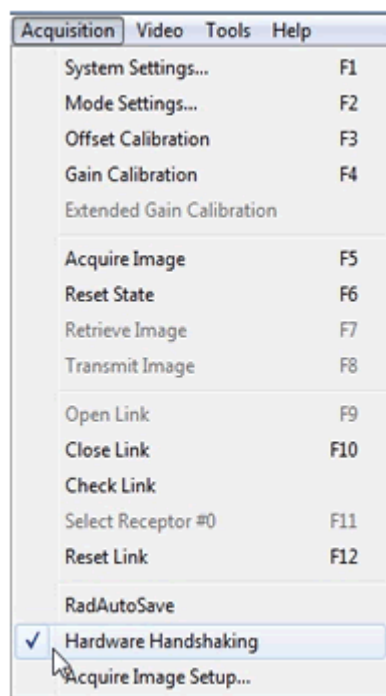
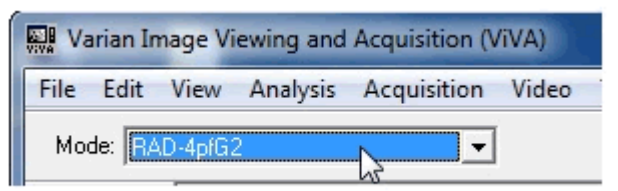
Once Offset and Gain Calibration is performed, you are ready to acquire images.

#### Radiography Mode

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

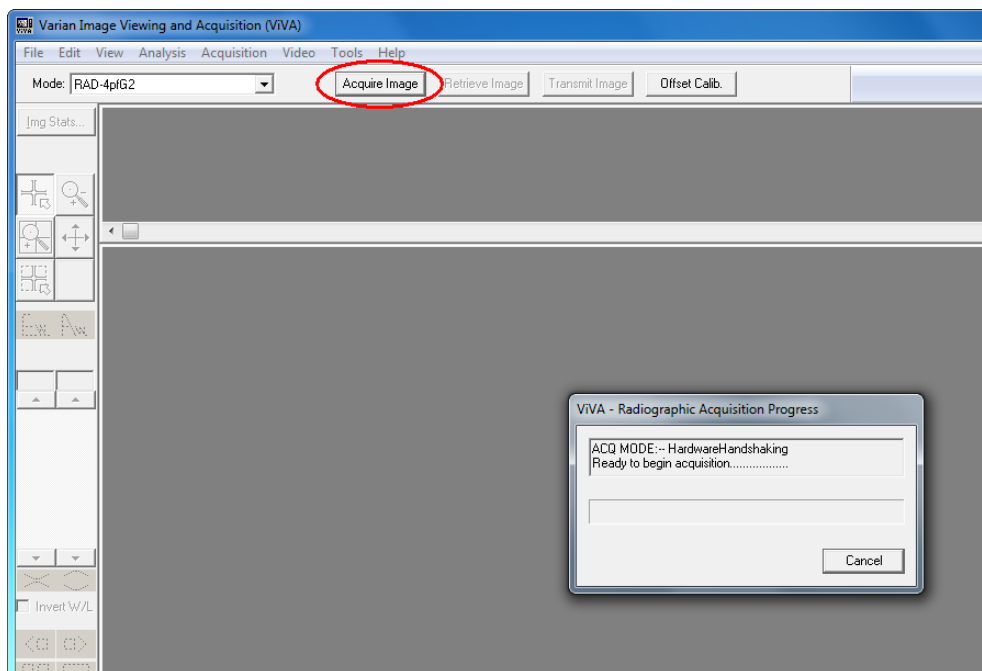
Step	Action / Results
------	------------------

1. Select required receptor from *Mode* drop down menu. The 4336W / 4336X currently supports Rad 1x1 4pf.
2. Make sure hardware handshaking is checked.

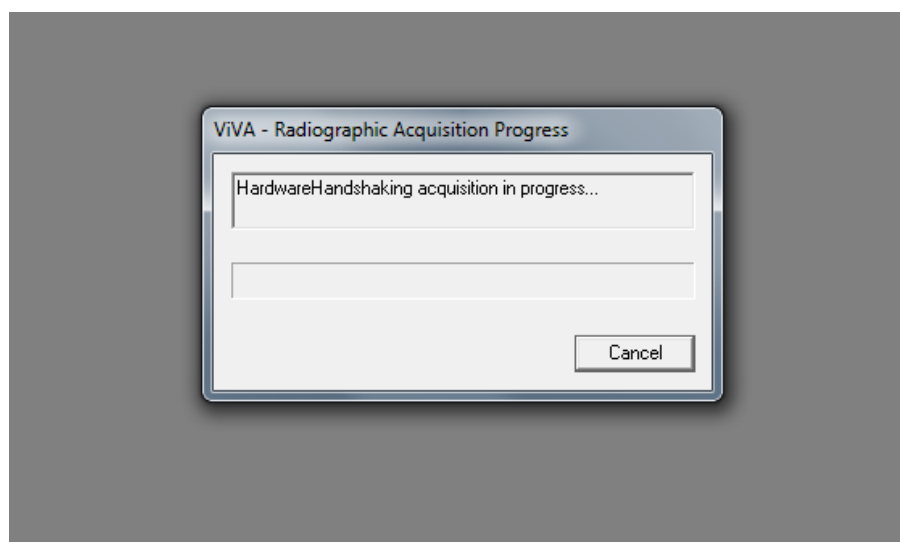


Step	Action / Results
------	------------------

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

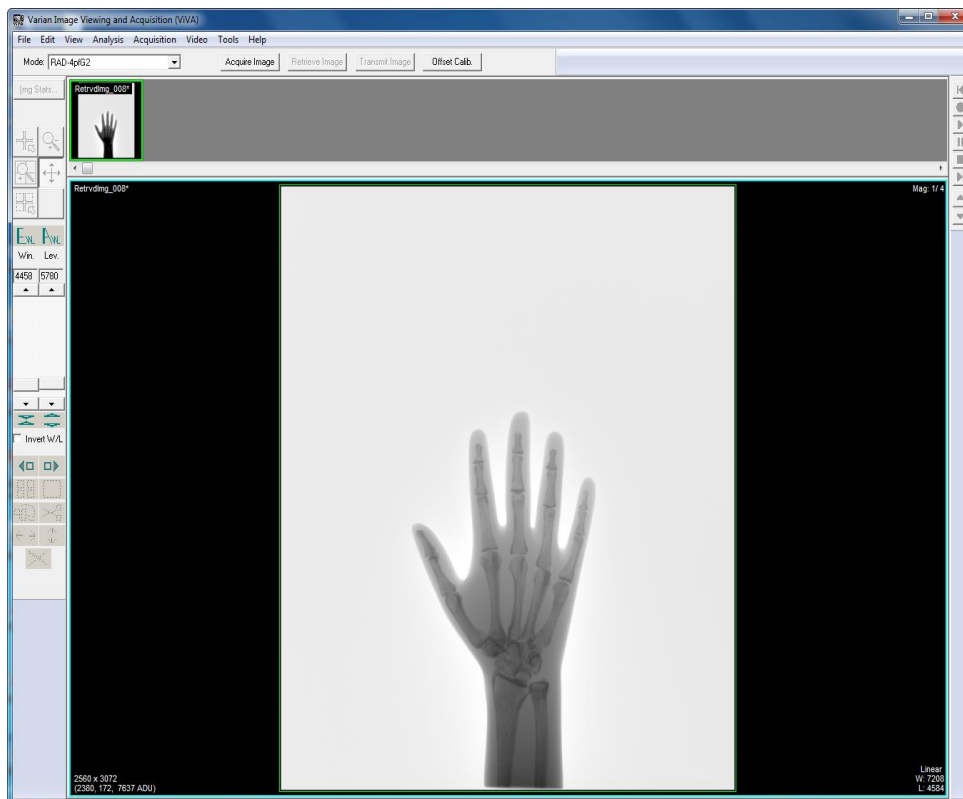


4. Depress *operator control* fully to “Expose” position to complete image capture and retrieval.



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

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 Mfg Declaration - Electromagnetic Emissions**


The PaxScan 4336W is intended for use in the electromagnetic environment specified below. The customer or the user of the PaxScan 4336W 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 4336W 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 4336W 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 4336W / 4336X is intended for use in the electromagnetic environment specified below. The customer or the user of the PaxScan 4336W / 4336X should assure that it is used in such an environment.			
<b>Immunity test</b>	<b>IEC 60601 test level</b>	<b>Compliance level</b>	<b>Electromagnetic environment - guidance</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. If the user of the PaxScan 4336W / PaxScan 4336X requires continued operation during power mains interruptions, it is recommended that the PaxScan 4336W / PaxScan 4336X 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

<i>Immunity test</i>	<i>IEC 60601 test level</i>	<i>Compliance level</i>	<i>Electromagnetic environment - guidance</i>
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 4336W / PaxScan 4336X, 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> 
Note 1 At 80 MHz and 800 MHz, the higher frequency range applies.			
Note 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
<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 4336W is used exceeds the applicable RF compliance level above, the PaxScan 4336W should be observed to verify normal operation. If abnormal operation is observed, additional measures may be necessary, such as reorienting or relocating the PaxScan 4336W</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 4336W**

The PaxScan 4336W is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the PaxScan 4336W can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the PaxScan 4336W 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
- 4336X model panel electrical rating if the power supply is not provided with the unit:
  - Continuous power rating is: 24 Watts
  - Input voltage is: 100 – 240V
- 4336W 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 & Atmospheric Pressure

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%
Atmospheric Pressure Range	700hPa to 1060hPa

## 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: Micro Power Electronics (OEM)

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 4336W.

## 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 damage 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 month.
- 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 customers responsibility to ship battery according to local and international shipping regulation for Lithium-Ion battery in effect at the time of shipment

## Regulatory

- The PaxScan® 4336W / 4336X are a Type B component sub-system per Standard or Medical Electrical Equipment. The PaxScan® 4336W product 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 (2005) Medical Electrical Equipment – Part 1: General Requirements for Basic Safety and Essential Performance.

CSA-C22.2 No 60601-1 (2008) Medical Electrical Equipment, Part 1 General Requirements for Basic Safety and Essential Performance.

CAN/CSA-C22.2 No 601.1-M90, 2005 Medical Electrical Equipment, Part 1 General Requirements for Safety.

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

The 4336W is RF compliant in accordance with FCC Part 15 Subpart C and Part 15 Subpart E.

- Type B Applied Part 
- 4336W 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.

## 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.

## Brazil Compliance

Certificate Number: 0031-15-5769



## 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。

## Korean Radio Statement

Interference is likely to occur during operation of the equipment

Korean Class A

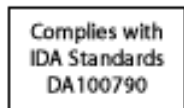
The devices are for business (A grade) EMC equipment distributors and users of this point as a caution and outside the home for the purpose of the use.

## Philippines Compliance



Type Accepted  
No. ESD-CPE-1408475C

## Singapore Compliance



## 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。

## Thailand Statement

“เครื่องโทรคมนาคมและอุปกรณ์นี้ มีความสอดคล้องตามมาตรฐานทางเทคนิค เลขที่ ...”

“เครื่องโทรคมนาคมและอุปกรณ์นี้ มีความสอดคล้องตามข้อกำหนดของ กทช.”

This telecommunication equipment conforms to the requirements of the National Telecommunications Commission.



## 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 requise. 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/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.

#### 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
- Battery
- Battery Charger (if applicable)

## Proper Disposal

The 4336W / 4336X 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 4336W / 4336X 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 4336W / PaxScan 4336X 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



### Appendix A

#### Interfacing Information

All the interfacing connections for the Paxscan 4336W / 4336X are at the panel itself and the 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.

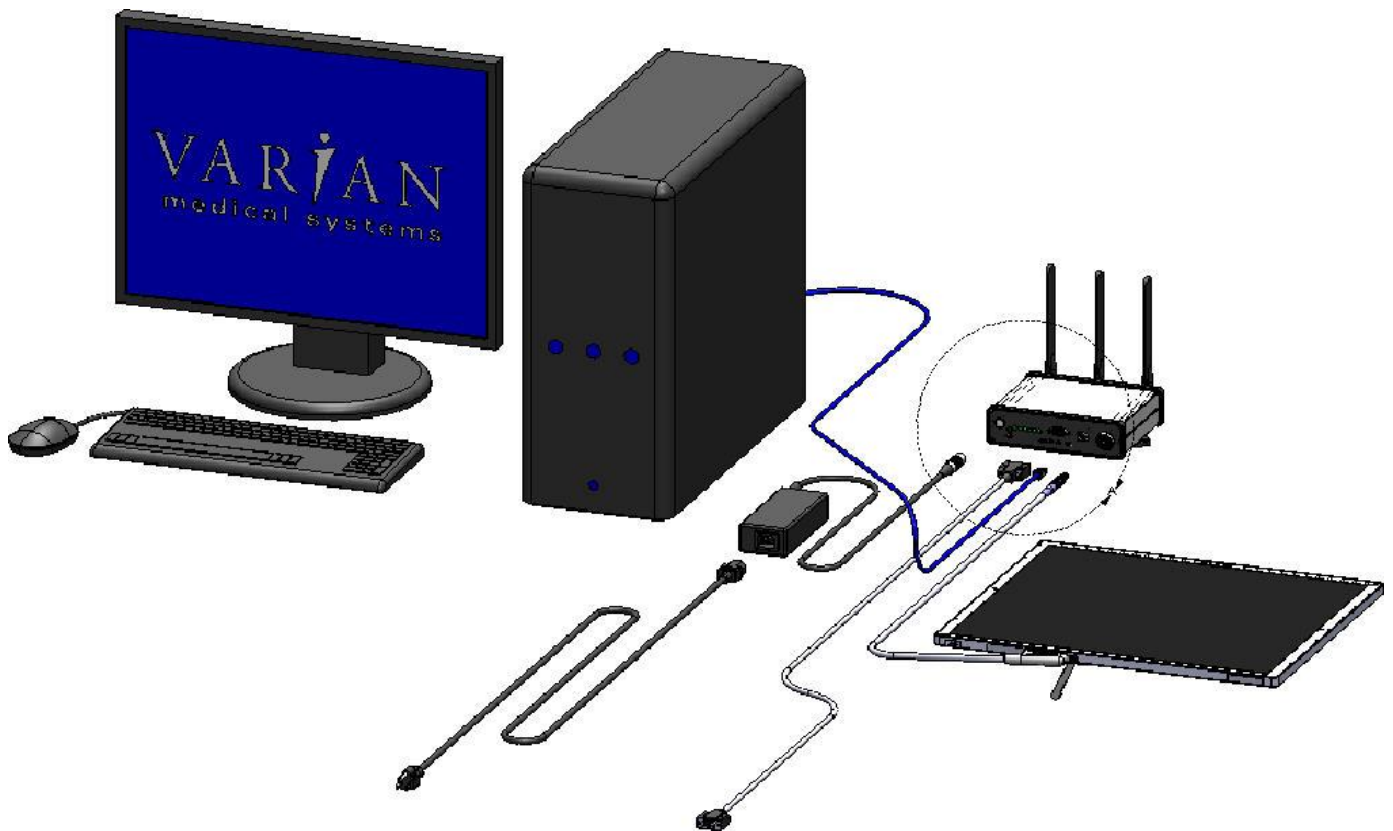


Figure A.1 Diagram of the 4336W / 4336X Imager System

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 4336W / 4336X 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 4336W / 4336X is 5V.**

Refer to the TSM0505S datasheet for additional information.

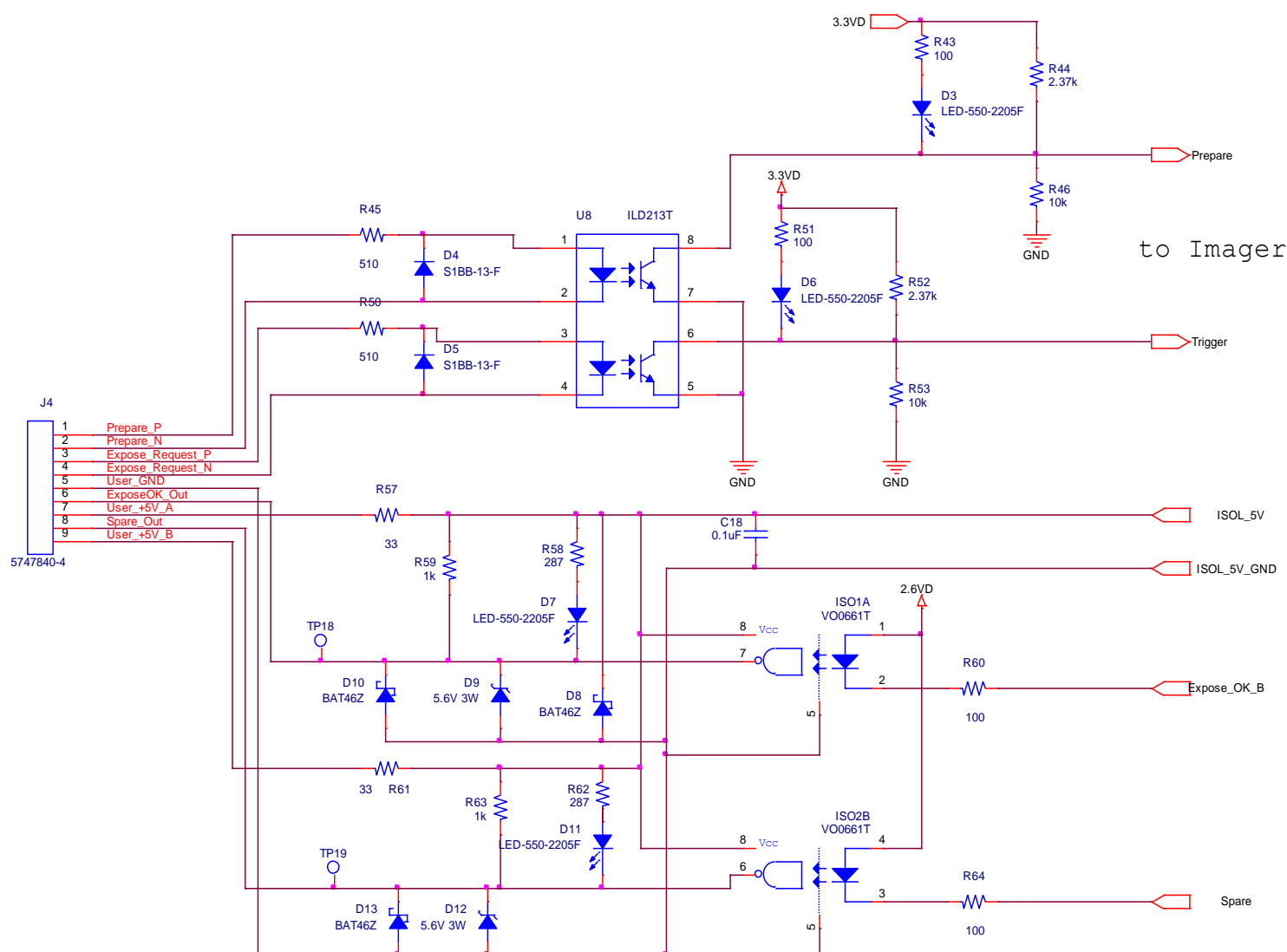


Figure A.2 Schematic for “Expose Ok” and “Expose Request” Signal

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. The Expose\_Request signal is detected as a level and so the signal must be maintained for a minimum of 360 msec. When the panel receives the Expose\_Request, the assumption is that the generator is ready to make an exposure when Expose\_OK is issued.

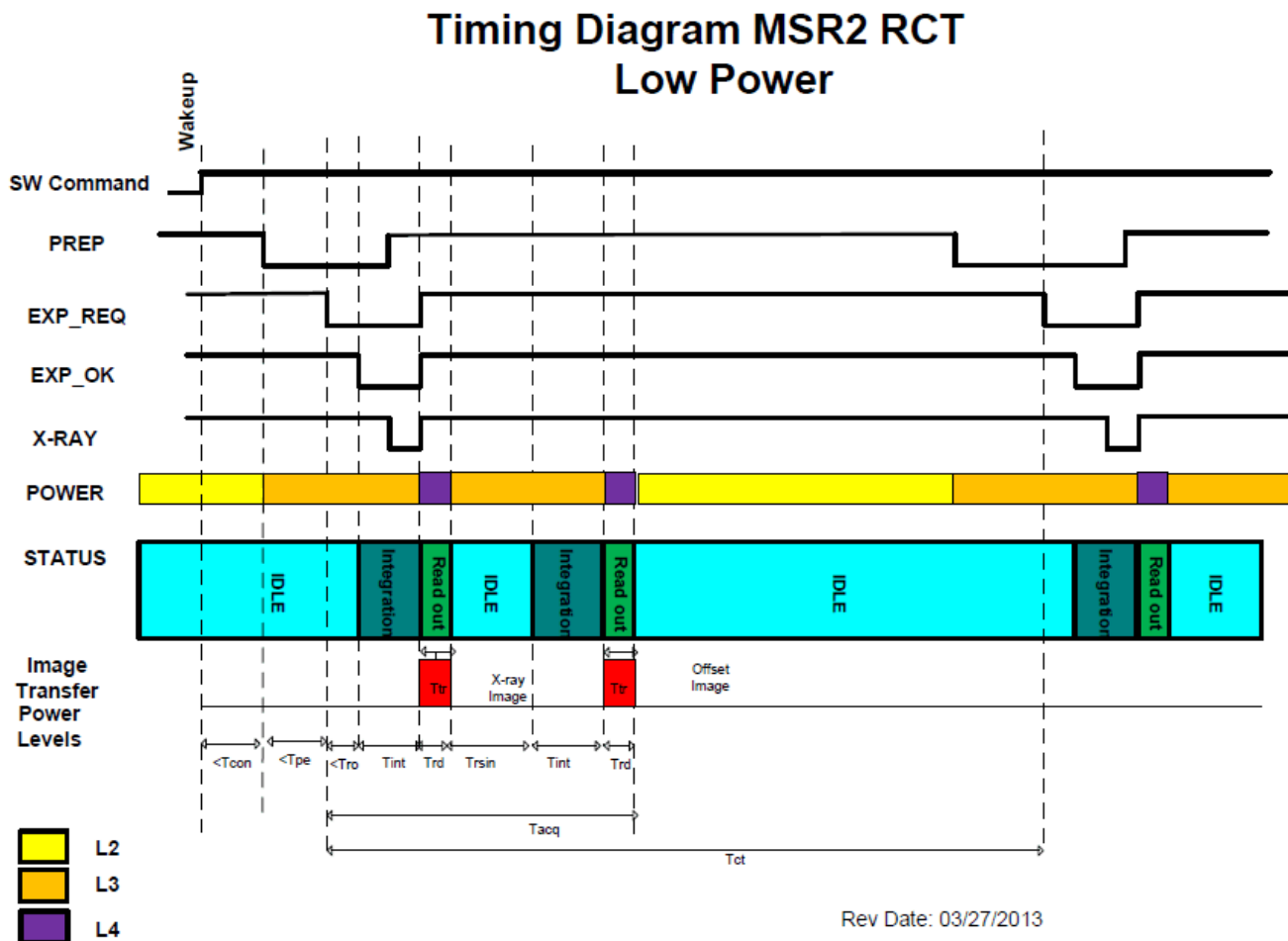


Figure A.3 4436X Timing

## TIMING Diagram MSR2 RCT

### Timing Description

Name	Description	Time	Unit
Tpe	Time between “Prep” to “Exp_Req”	1.5	s
Tro	Time between “Exp_Req” to “Exp_Ok”	<0.35	s
Tint	Integration Time	0.5 to 2	s
Trd	Readout Time	0.5	s
Ttr	Transmission Time	0.5	s
Trsin	Time for idle	1.76	s
Tacq	Acquisition time (550ms RCT)	<4.8	s
Tct	Cycle time (550ms RCT)	<8.5	s

### Power Description Without Charging Battery

Name	Description	Power	Unit	Current	Unit
L1	Stand by	6.3	W	0.42	A
L2	Acquisition	10.5	W	0.7	A
L3	Image Transsfer	16.5	W	1.1	A

Battery Voltage = 15V

Rev Date: 02/06/2013

Figure A.4 4436X Timing

## Timing Diagram MSR2 RCT Low Power

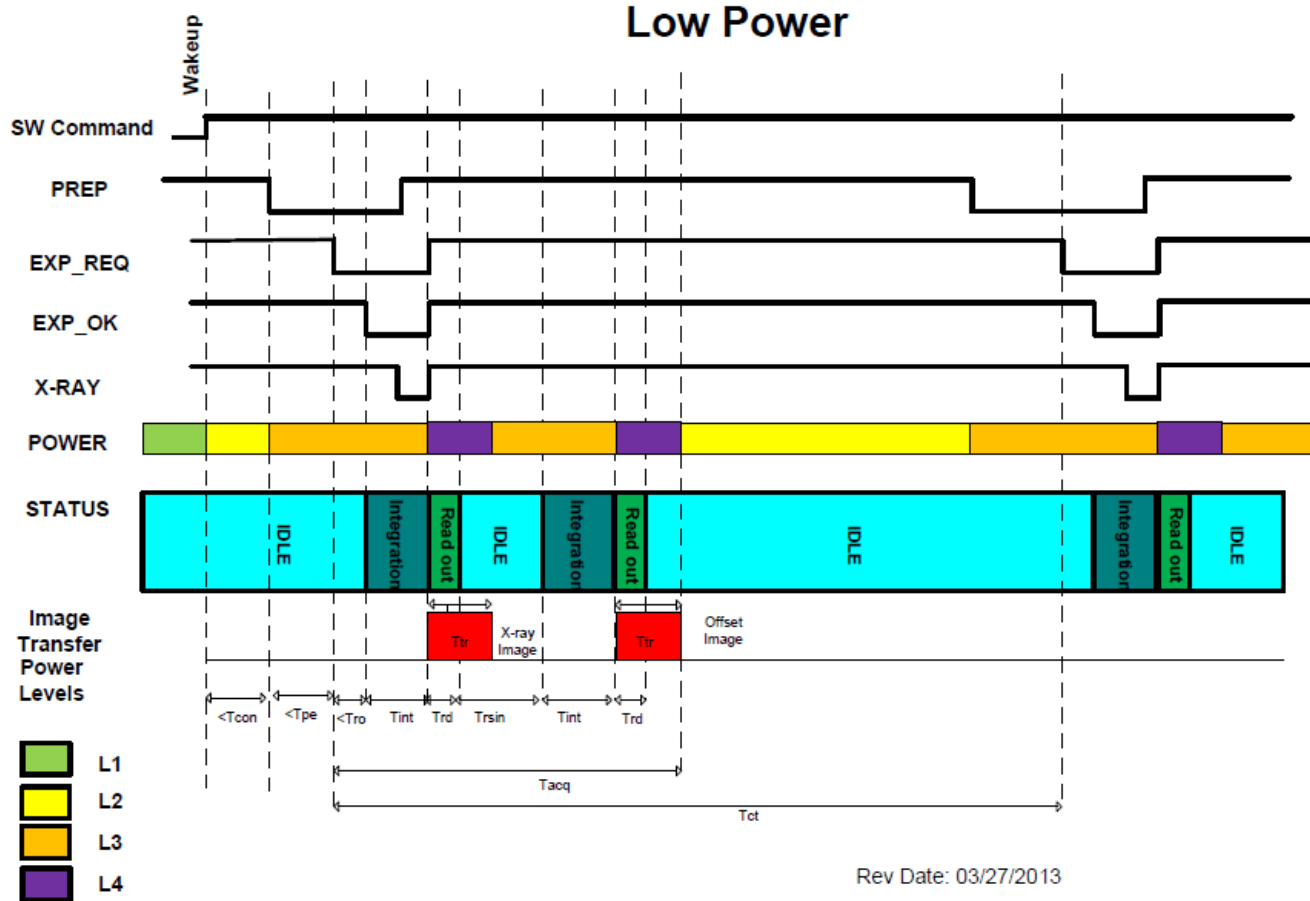


Figure A.5 4436W Timing

## TIMING Diagram MSR2 RCT

### Timing Description

Name	Description	Time	Unit
Tcon	time to establish connection	6	s
Tpe	Time between “Prep” to “Exp_Req”	1.5	s
Tro	Time between “Exp_Req” to “Exp_Ok”	<0.35	s
Tint	Integration Time	0.5 to 2	s
Trd	Readout Time	0.5	s
Ttr	Transmission Time	1.8	s
Trsin	Time for idle	1.76	s
Tacq	Acquisition time (550ms RCT)	<6	s
Tct	Cycle time (550ms RCT)	<12.5	s

### Power Description Without Charging Battery

Name	Description	Power	Unit	Current	Unit
L1	Sleep	2.7	W	0.18	A
L2	Stand by	9.6	W	0.64	A
L3	Acquisition	15.6	W	1.04	A
L4	Image Transfer	21	W	1.4	A

Battery Voltage = 15V

Rev Date: 02/06/2013

Figure A.6 4336W Timing

## Appendix B

### Use Cases

The 4336W 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

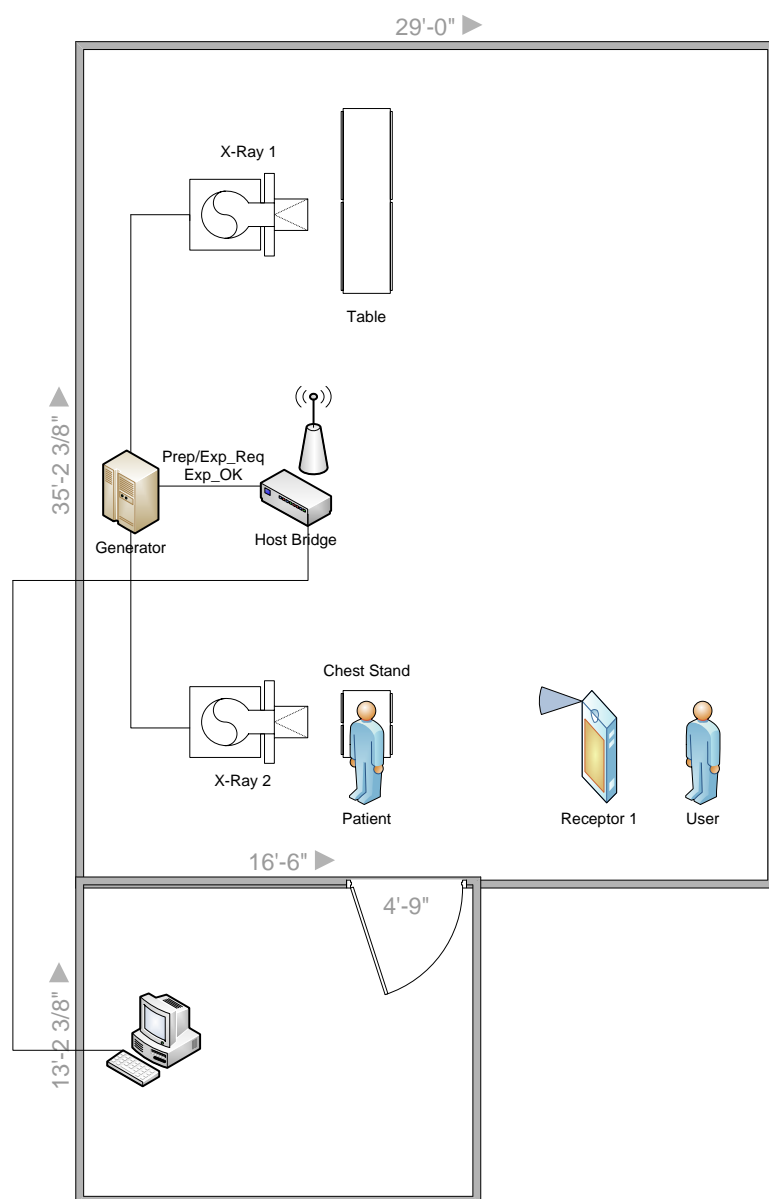


Figure B.1 Example of Single Panel Use

## One Panel Per Room

## Room 1

## Room 2

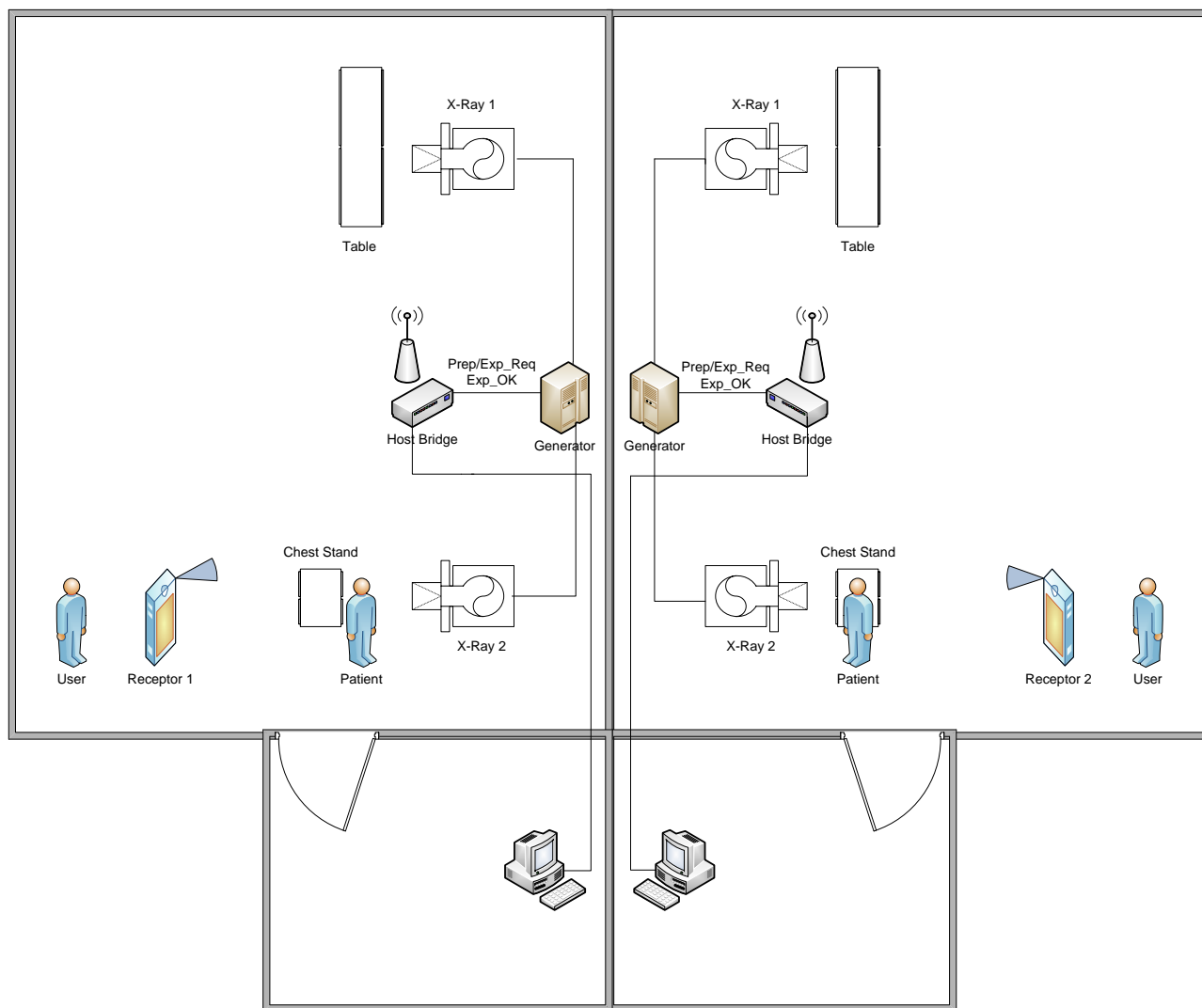


Figure B.2 Example of One Panel Per Room Use



## Multiple Panel

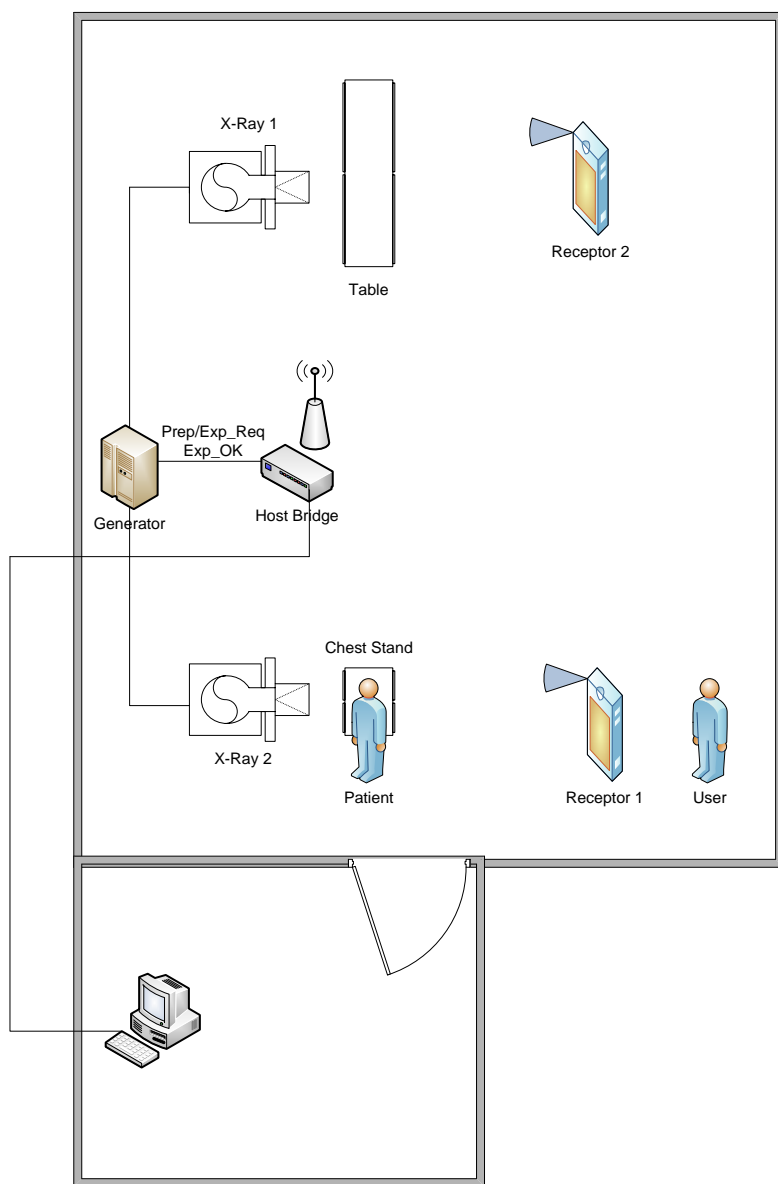


Figure B.3 Example of Multiple Panel Use

## Appendix C

### Panel Association

The 4336W receptor has three LEDs that indicate the present condition of the receptor:

Blue – Power On (lit when powered on)

Green – Wireless communication link (lit when connected)

Orange – Indicates when the receptor is ready for an exposure (lit when ready)

The 4336X receptor contains only the blue LED indicating the power status.

In addition, the sequence of interaction between the user, host computer, host bridge (I/O box), and receptor will follow certain sequences. A few of these panel associations are as follows:

### Single Panel

This case occurs under normal ideal usage and the user steps are followed in a timely manner.

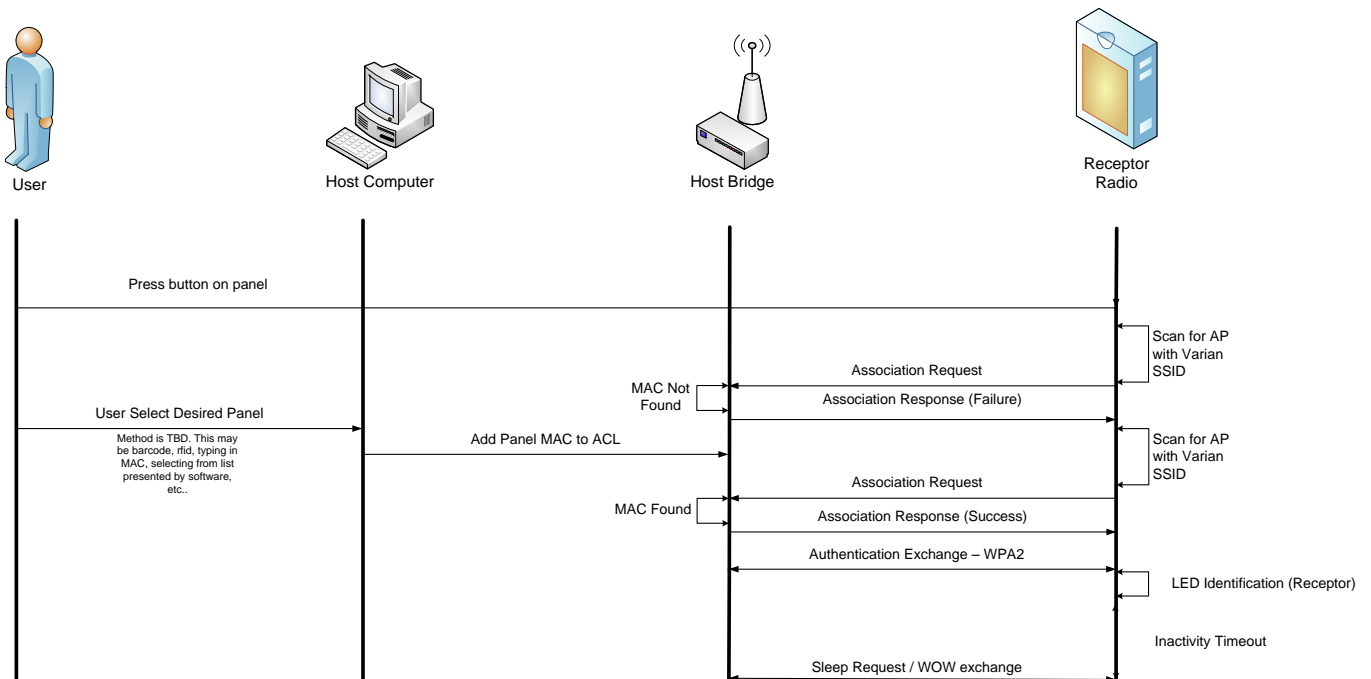
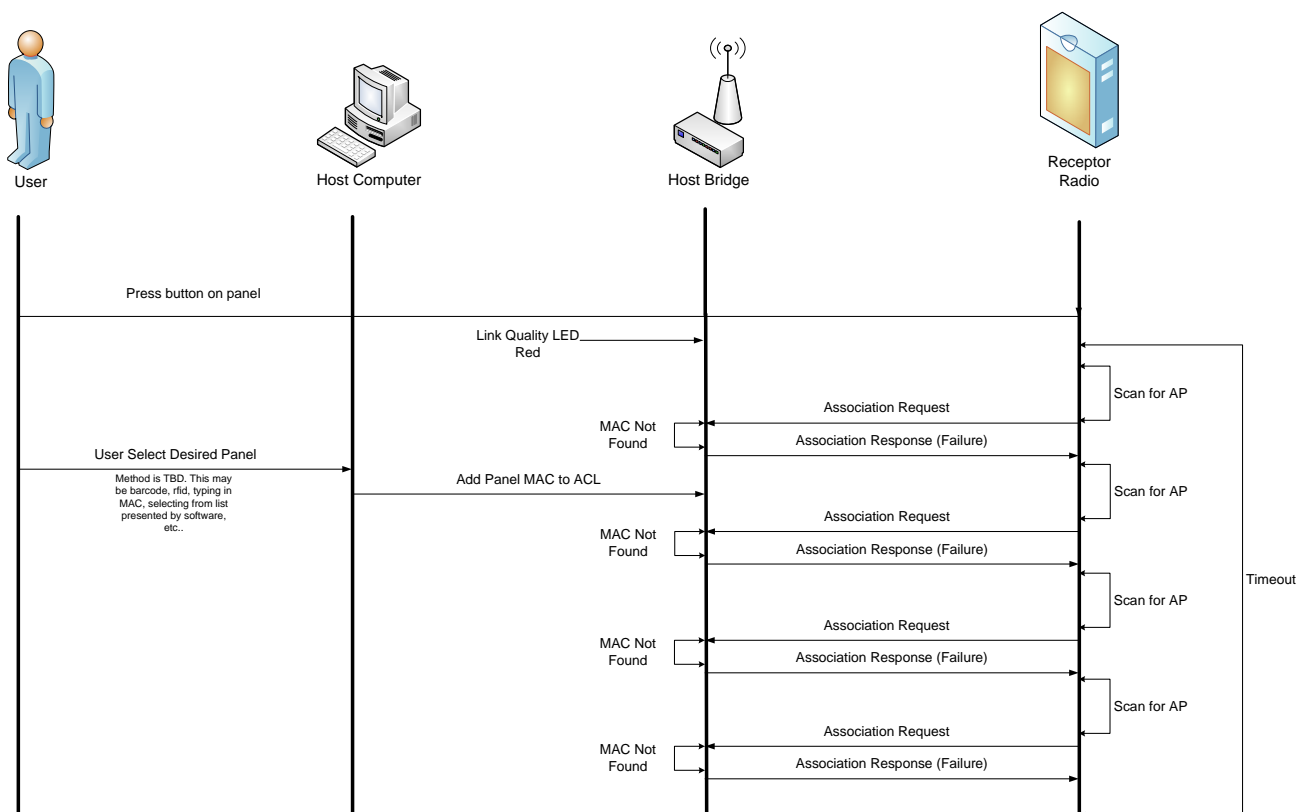


Figure C.1 Use case – Single Panel

## Wrong Panel Selected

This sequence occurs when there is a mismatch between loaded MAC address information on the receptor and the host computer. This is state will also occur if there is no connection request on the host bridge triggered by the user on the host computer. The timeout will occur after one minute.



**Figure C.2 Use case – Wrong panel selected**

## Changing Panel Battery

This case follows during a battery change on the receptor.

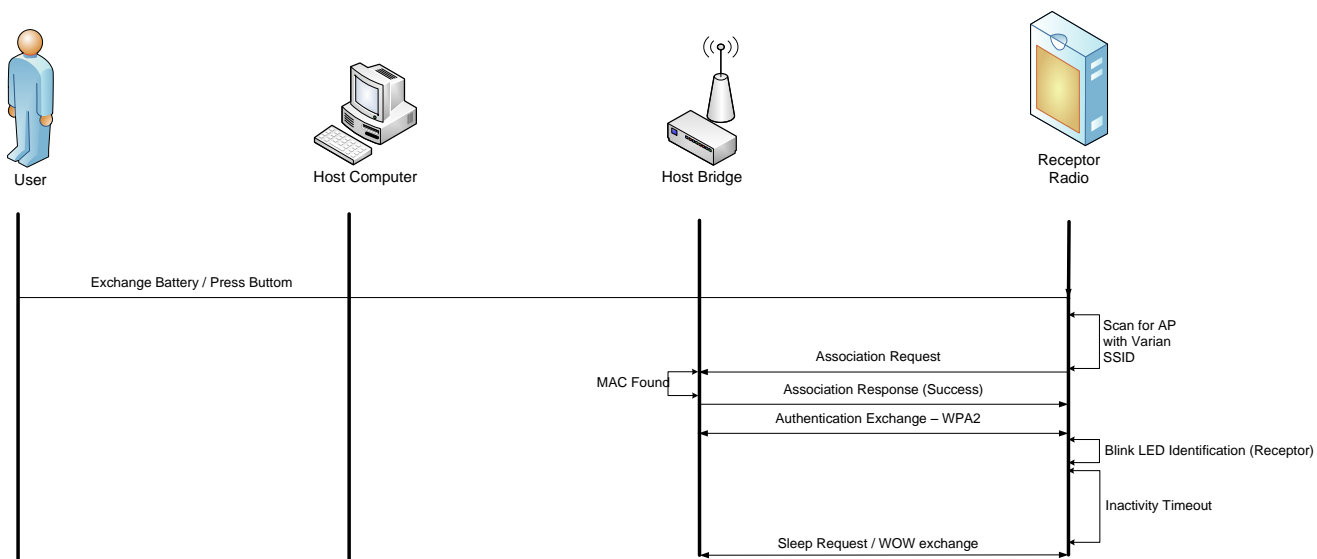


Figure C.3 Use case – Changing panel battery

## Remove Panel

This case occurs when the user desires to remove the panel from the connection loop. This may occur for maintenance purposes, standard operation, or to switch to a second receptor utilizing the same host computer and host bridge.

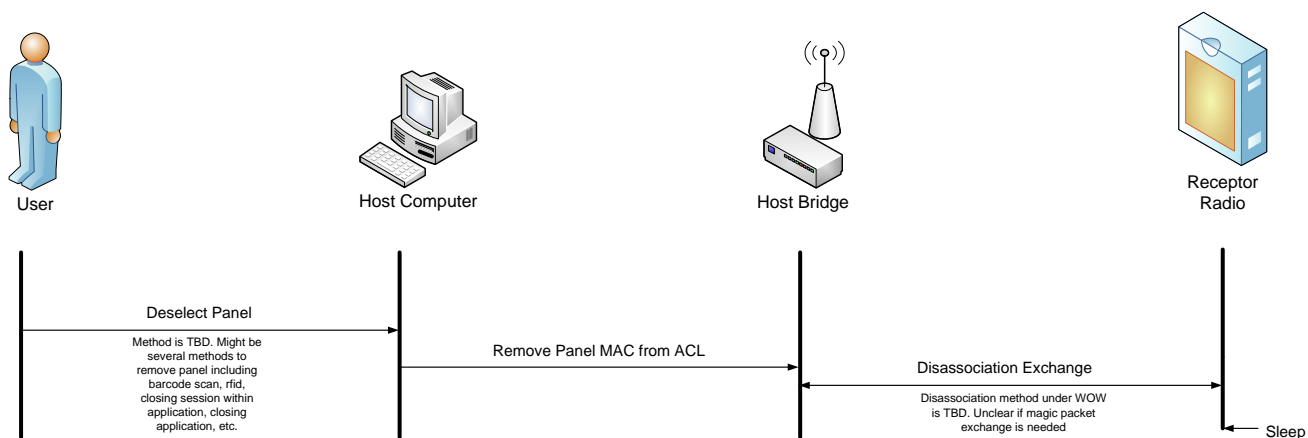


Figure C.4 Use case – Remove panel

## Appendix D

### Acquisition

The following details the sequence of events and signals during a standard acquisition cycle.

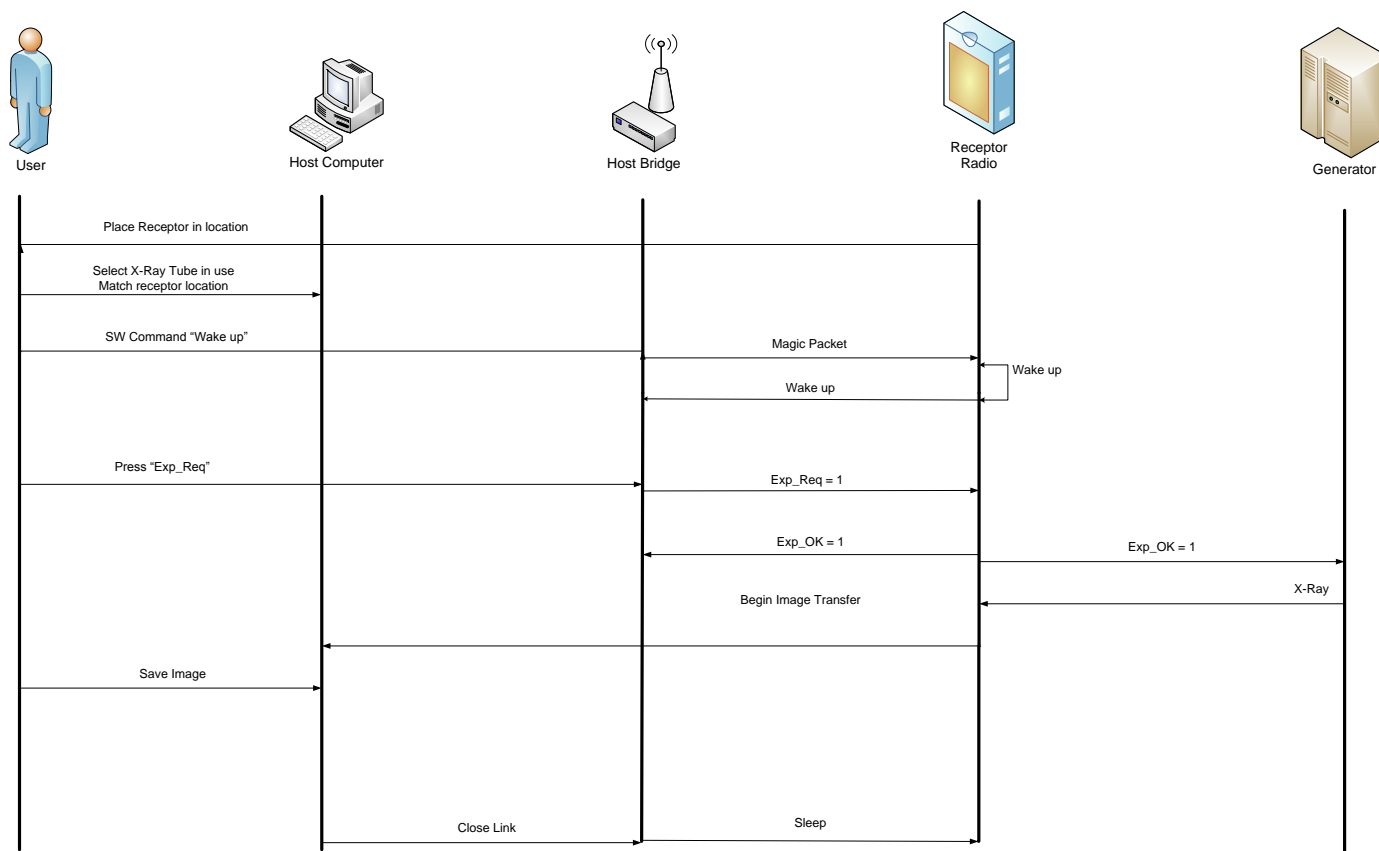


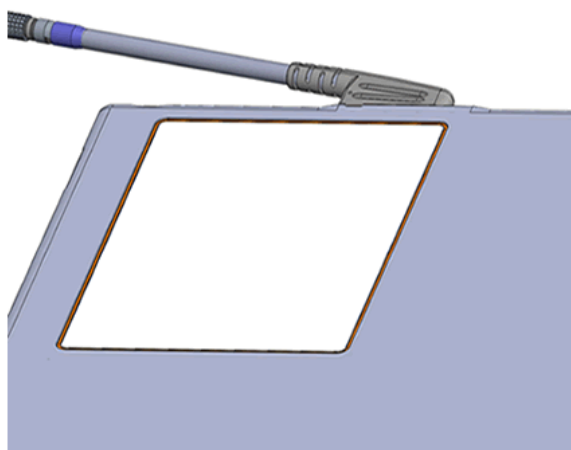
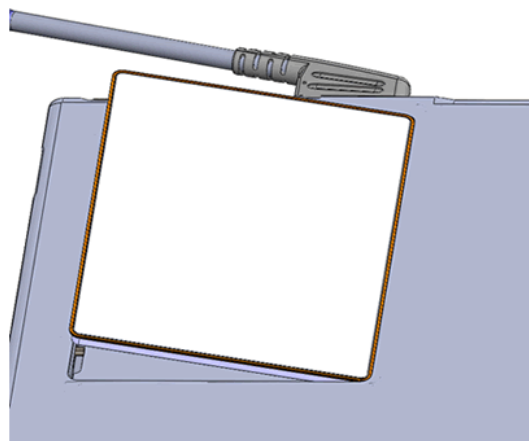
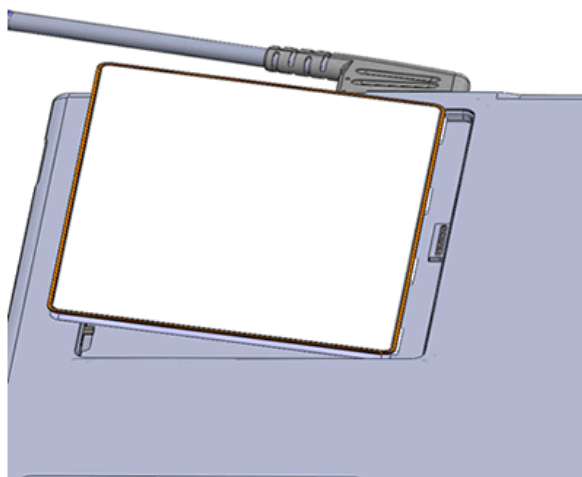
Figure D.1 Acquisition sequence

## Appendix E

### Battery Installation/Removal for 4336W

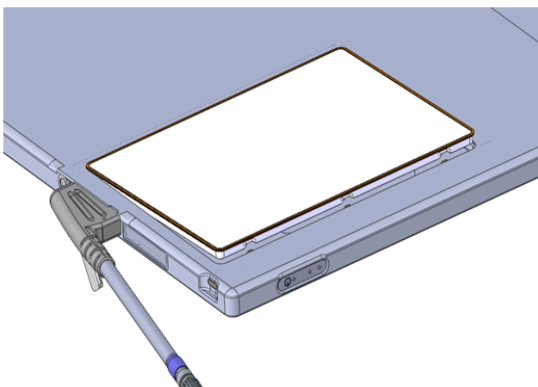
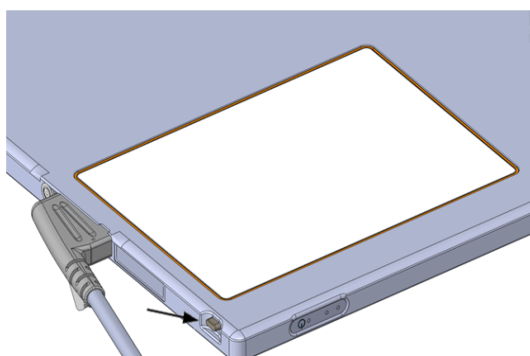
#### Battery installation

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 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 tether cable connector, 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 Charging

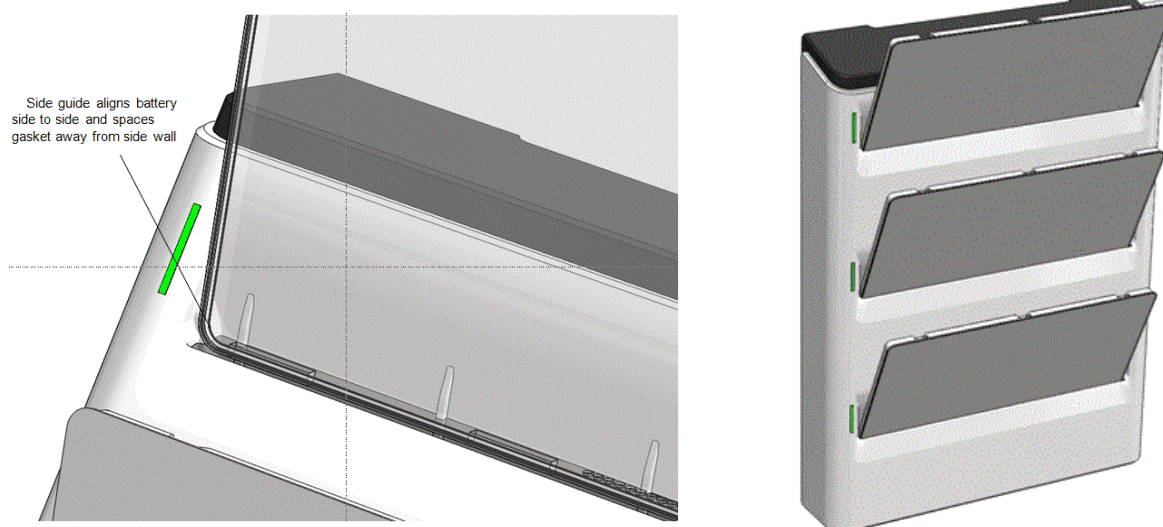
Battery charging using the stand alone battery charger

### 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 a maximum of 3.5 hours. Up to three batteries can be charged at a time.



**Battery Charger LED's**

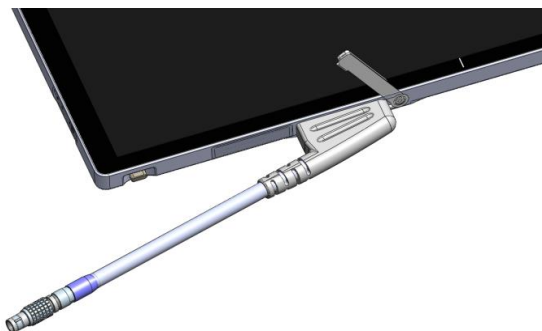
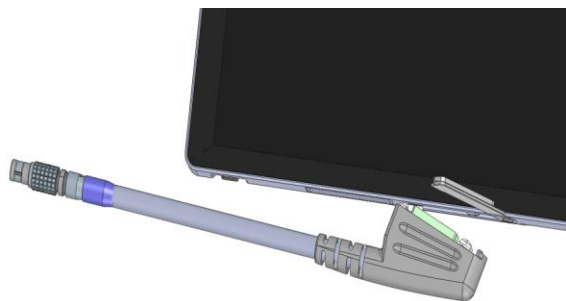
LED	LED State	Description
Green	Solid	Battery Full
Orange	Solid	Battery is charged
Red	Solid	Charger timeout, or bad battery ID
	2 Blinks	Bad Smbus
	3 Blinks	Voltage Fault
	4 Blinks	Temperature Fault

**Figure E-1 Battery Charger LED's - Detail**

## Battery charging using the 4336W Receptor

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

- |    |                                                                           |
|----|---------------------------------------------------------------------------|
| 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 4 hours.

**Important:**

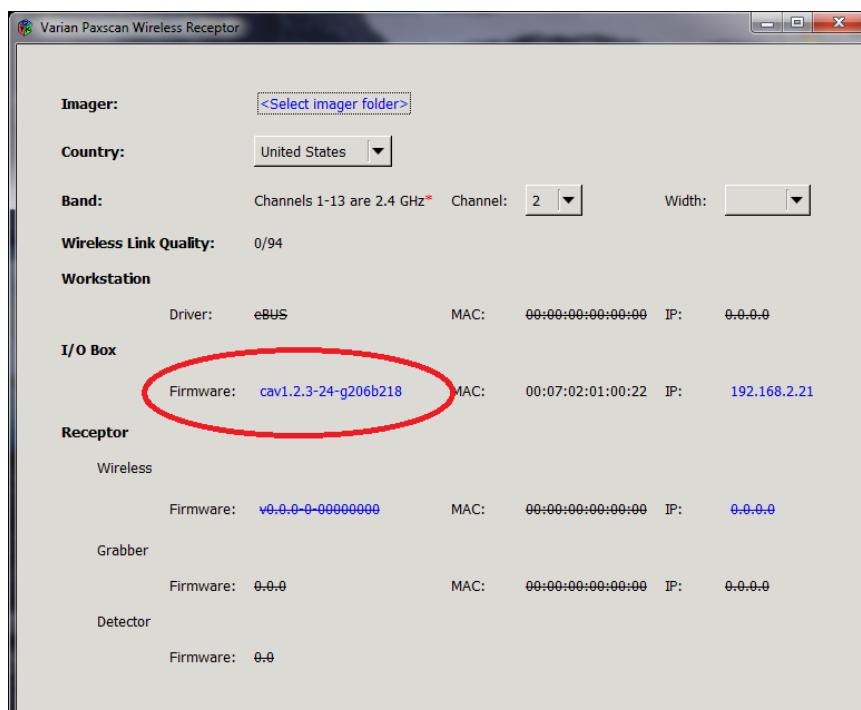
Use only the Varian supplied batteries in the battery charger and receptor. The systems are not designed to work in conjunction with any other battery type or design.

## Appendix F

### Firmware Update

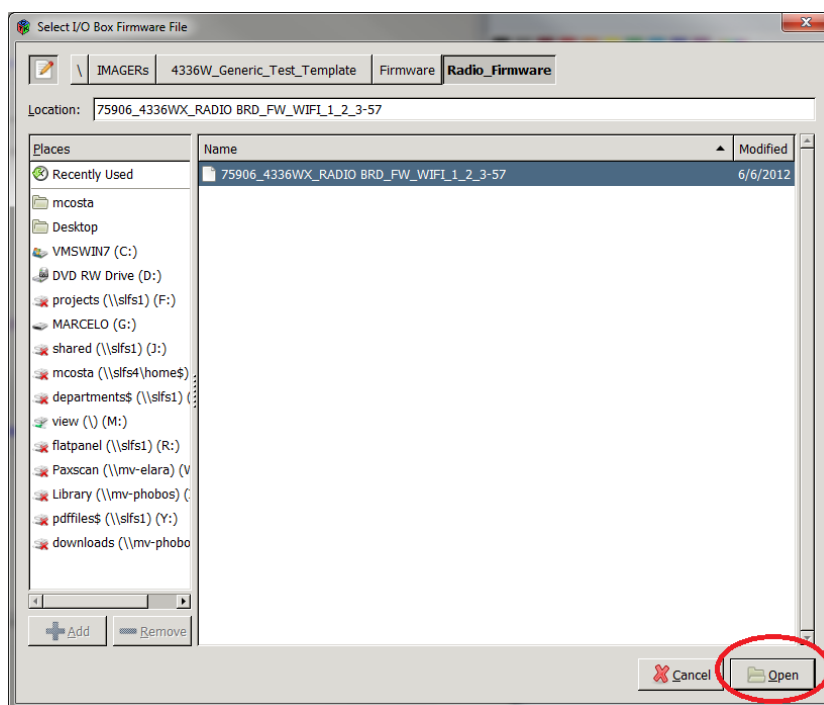
#### I/O Box WiFi Firmware Update

- | Step | Action / Results                                                                                                     |
|------|----------------------------------------------------------------------------------------------------------------------|
| 1.   | Turn ON I/O box, make sure the Ethernet cable from the computer is connected to the I/O Box and wait for 30 seconds. |
| 2.   | Using WFCConfig double click the “wific.exe”.                                                                        |
| 3.   | Click on the firmware revision for the I/O Box.                                                                      |

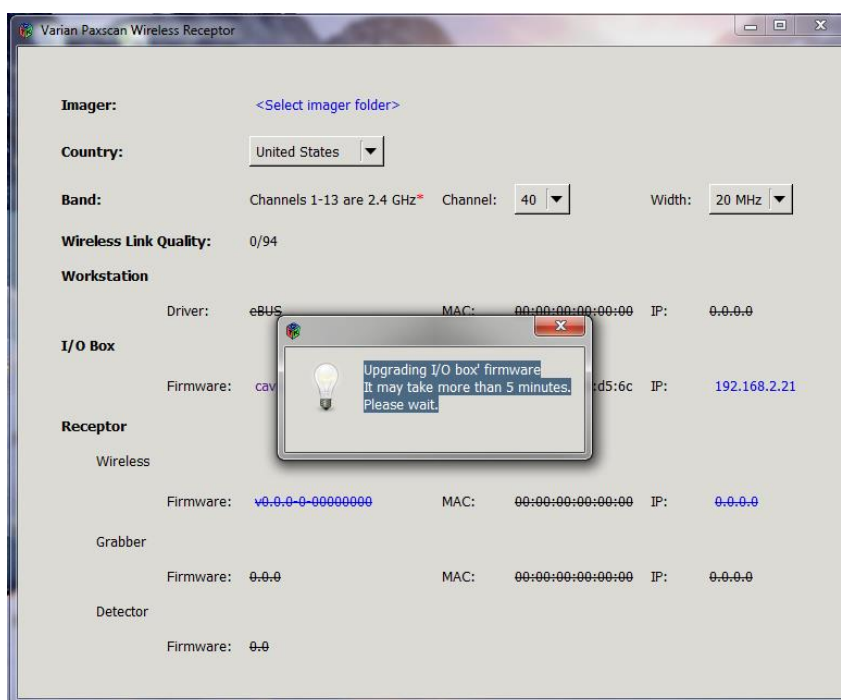


Step	Action / Results
------	------------------

- A window will open to browse for the new firmware revision. Select the desired firmware and click the “open” button.

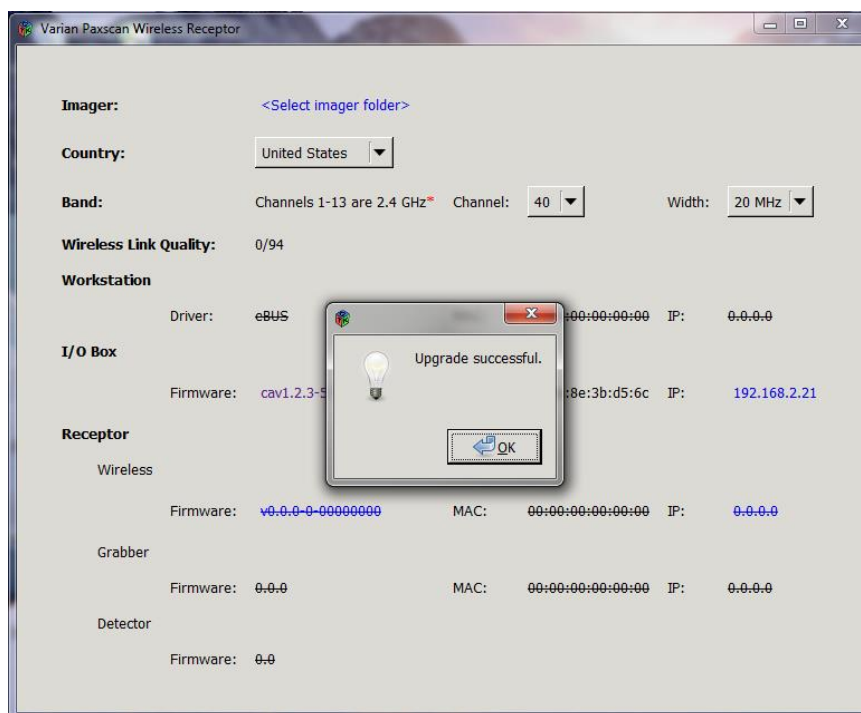


- The downloading process will start.



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

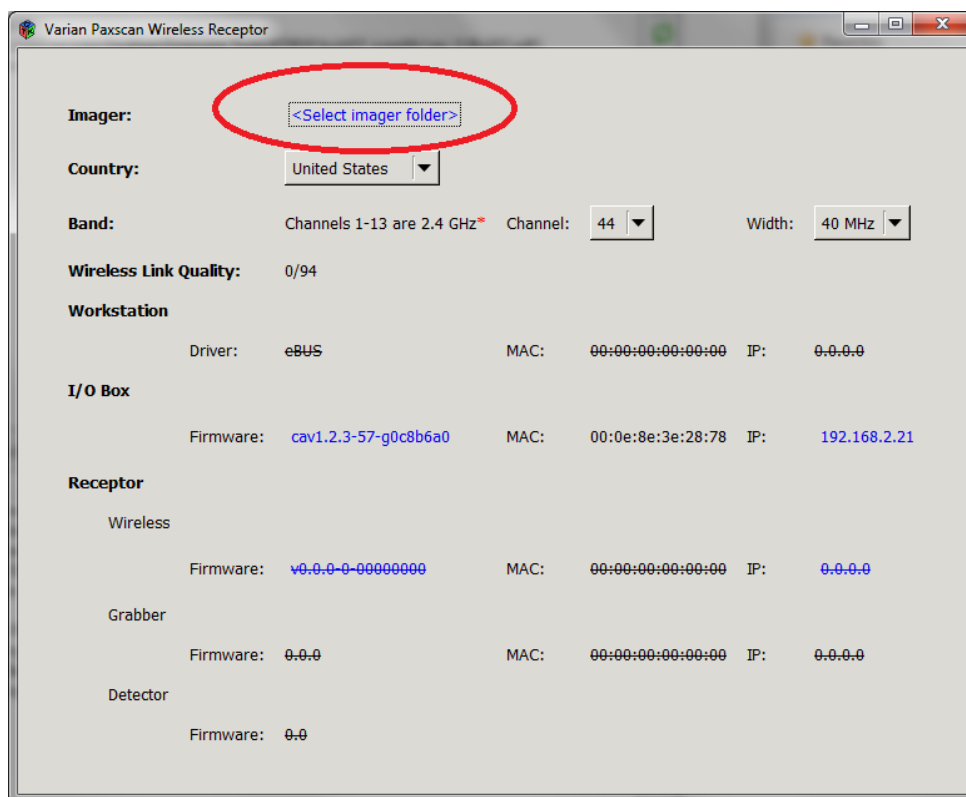
6. Once the downloading process is completed, close the application and power cycle the I/O box.



## Receptor WiFi Firmware Update

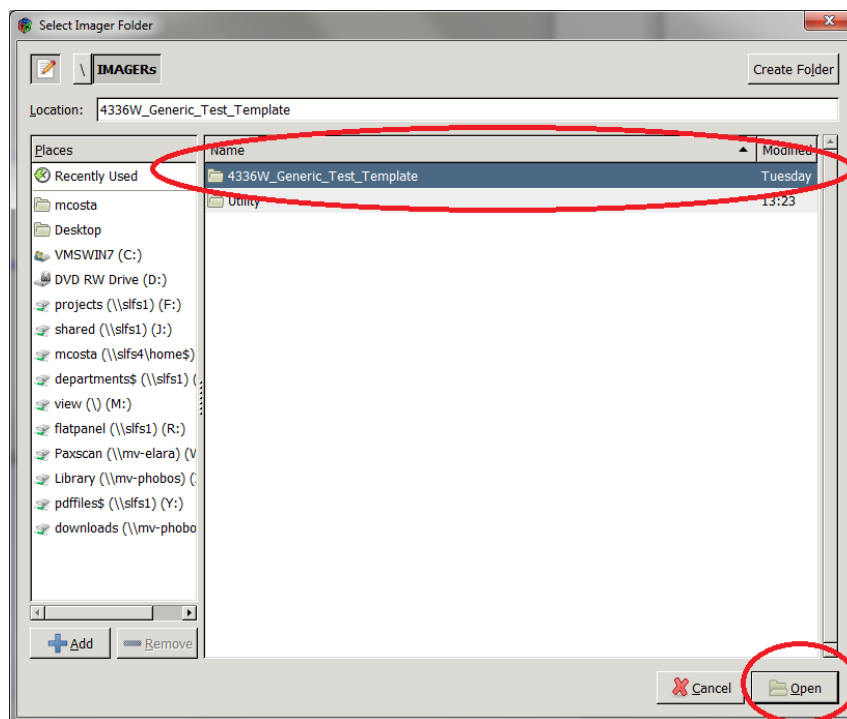
Step	Action / Results
------	------------------

1. Turn ON I/O box, make sure the Ethernet cable from the computer is connected to the I/O Box and wait for 30 seconds.
2. Turn On Receptor firmware on wireless mode (No tether cable).
3. Using WFConfig double click the “*wific.exe*”.
4. Click on <Select Imager Folder>.

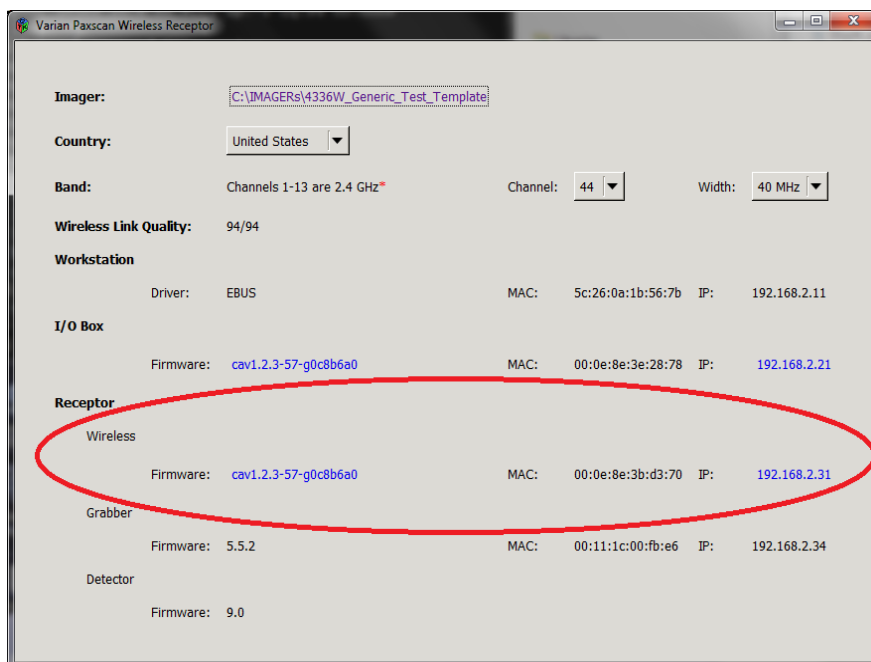


**Step****Action / Results**

5. Select the folder which contains the Receptor configuration file to link a receptor to the computer, wait until a link is established.

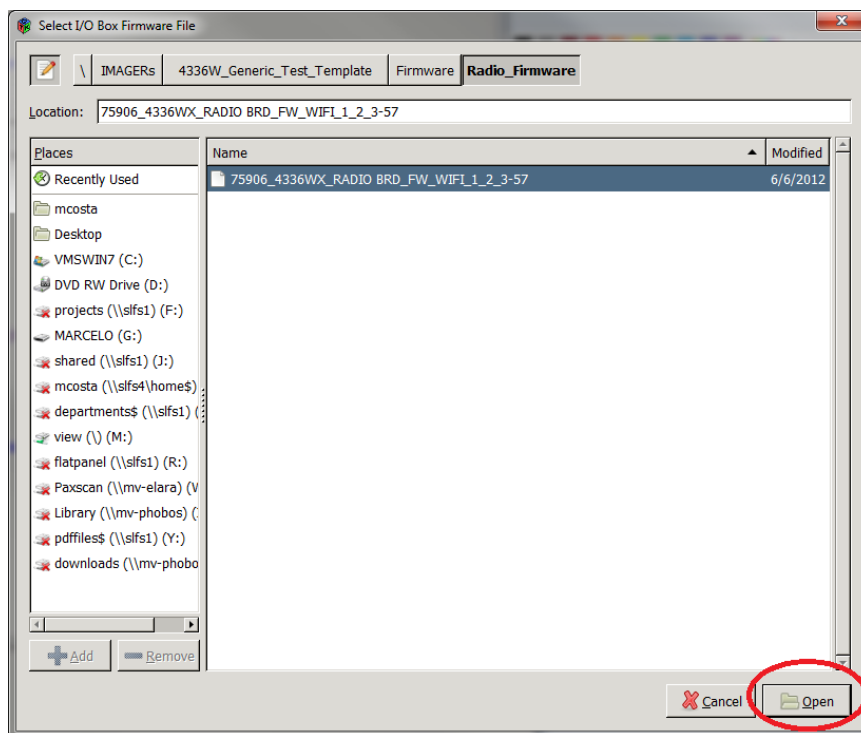
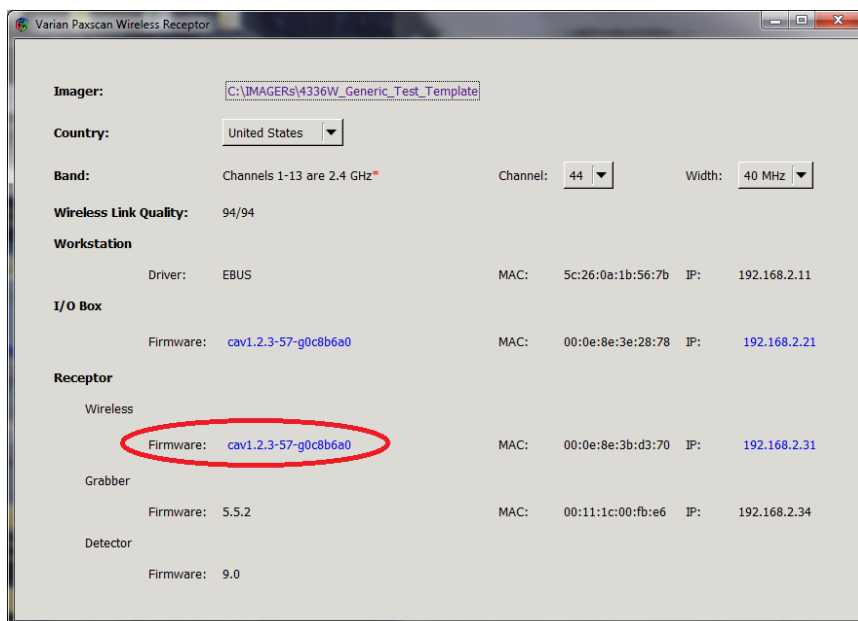


6. Once the link is established, the software will return the WiFi firmware revision of the I/O Box and receptor.



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

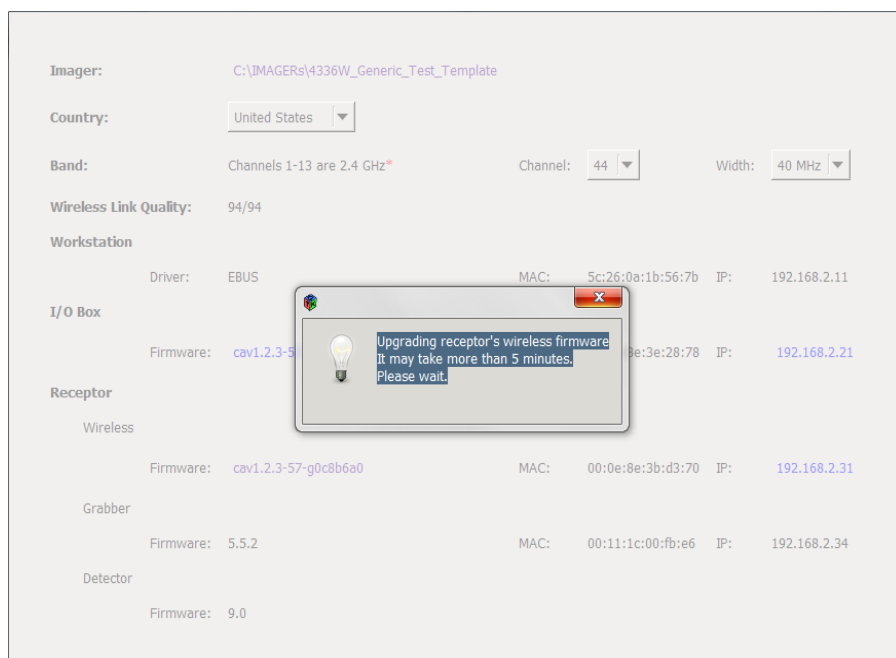
7. Click on the receptor Wifi firmware revision, a window will be opened to browse the new firmware revision, select the desired firmware and click on “open” button.



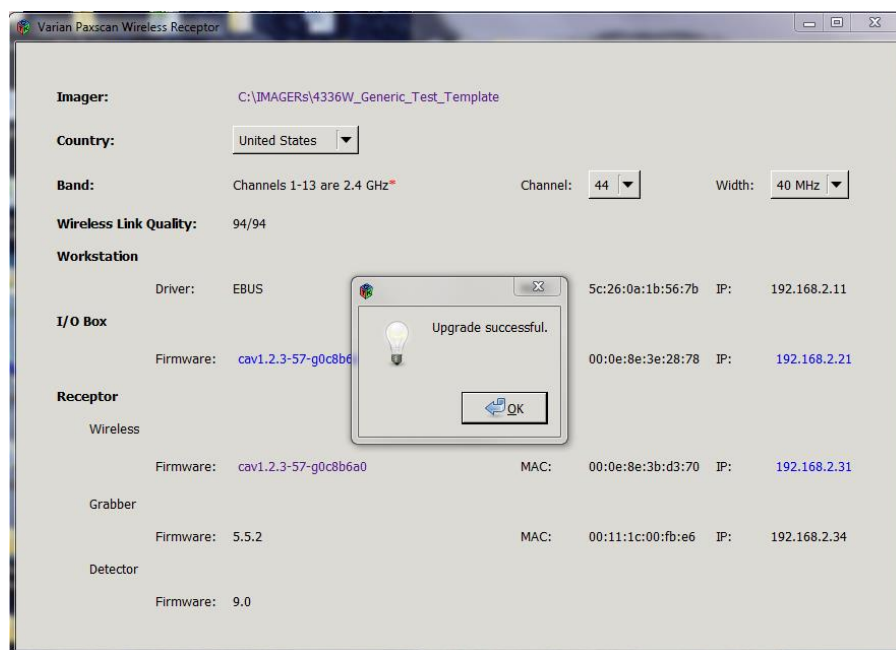


**Step****Action / Results**

8. The download process will start.



9. Once the downloading process is completed, close the application and power cycle the I/O Box.



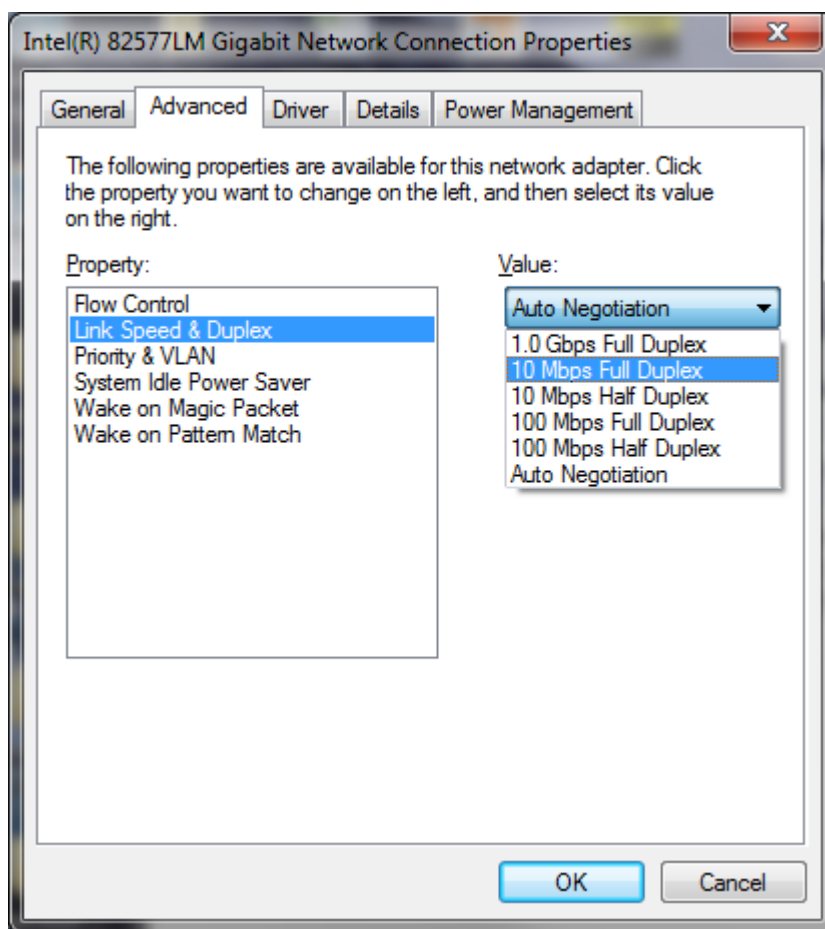
## Update Firmware using the service Mode

**Important:**

Only start receptor WiFi firmware update **after** updates to the I/O Box WiFi firmware has completed.

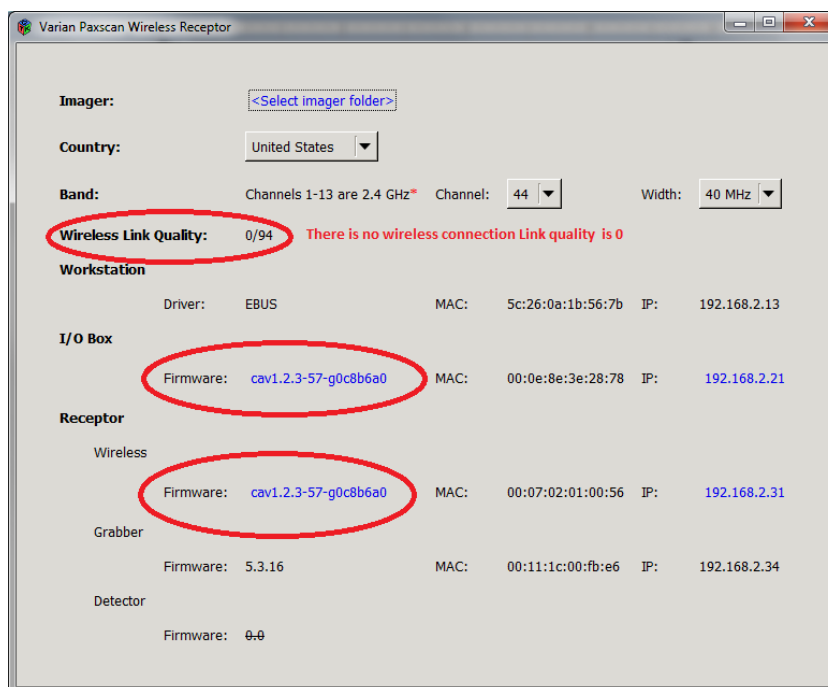
**Step****Action / Results**

1. First Turn OFF I/O Box and then turn off receptor.
2. Disconnect tether cable from the I/O Box and remove battery.
3. Change Ethernet link speed from Auto Negotiation or 1Gbps to 10 Mbps Full Duplex



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

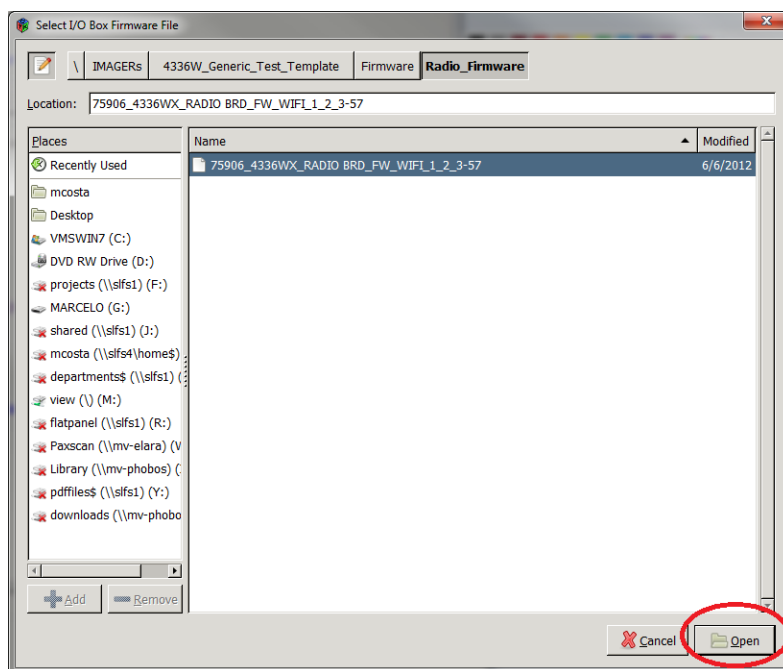
- Turn the I/O box ON and wait 1 minute.
- Plug tether cable from receptor to I/O box (the receptor should turn ON), wait 1 minute.
- Using WFCongif double click on `:wific.exe`.



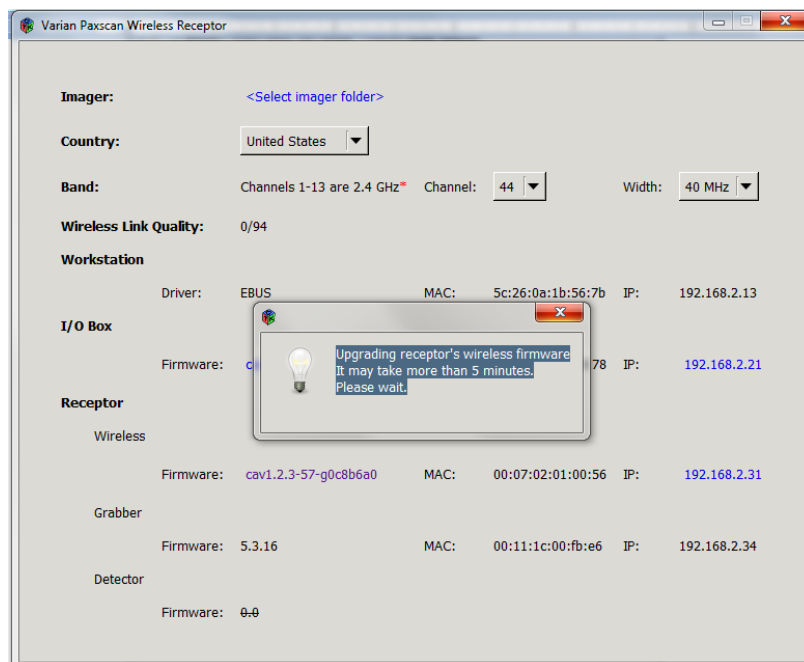
**Note:** WFCongif is listing the I/O Box and Receptor wireless firmware using the service mode. At this state there is no wireless connection.

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

7. Click on the firmware revision for the Receptor.
8. A window will be opened to browse for the new firmware revision, select the desired firmware and click on “open” button.



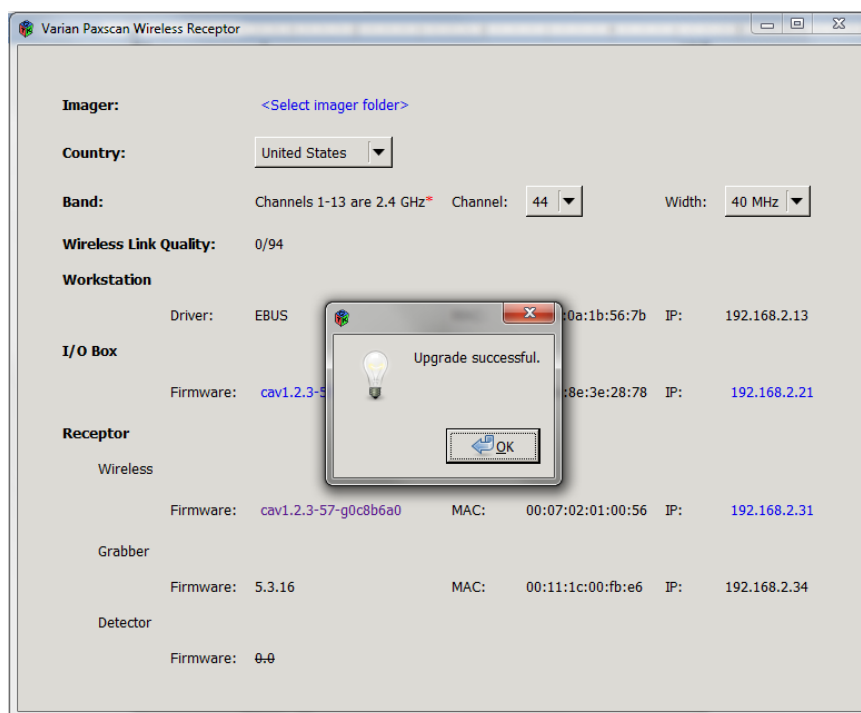
9. The downloading process will start.



## Step

## Action / Results

10. Once the firmware downloading process is completed upgrade successful window will display.



11. Click on the “OK” button and repeat steps 7 thru 10 to download the I/O box firmware.
12. Once the WFConfig returns the window informing the upgrade has completed, **change the Ethernet link speed to Auto Detect.**
13. Power cycle the receptor and I/O Box.