Digital Image Receptor

The PaxScan 1308D/1313D is a fluoroscopic High-speed imaging sub-system
Abstract

The PaxScan® 1308D/1313D Operating Instructions (P/N 43977) covers safety, setup, operation, and maintenance of the PaxScan 1308D/1313D digital x-ray imager. 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

CE Mark

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Introduction

The PaxScan® 1308D/1313D is a high-resolution, real-time digital X-ray imaging device commonly referred to as a flat panel detector (FPD). The detector together with real-time image processing software (Virtual Command Processor) incorporates the latest high speed electronics technology, used in the Varian real-time imagers, to meet the imaging requirements for new generation medical, dental, and industrial application. The imaging system has three main components: The amorphous silicon FPD, Virtual Command Processor software, and universal single-output power supply.

Shipment Contents

Flat Panel Detector Assembly
PaxScan Receptor Install CD
  (Files specific to the detector in shipment)
PaxScan Software CD
  Virtual CP/ViVA System Software L.05 (or higher)
Receptor Power Interface Cable
1308D/1313D Operating Instructions

Optional Parts

External Power Supply – (OEM)
Cable, Main 110V Hospital Grade
Cable, Main European
Gigabit Ethernet Cable
Intel Pro 1000GT NIC Card

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® 1308D/1313D is specifically designed to deliver real-time x-ray imaging with high sensitivity and optimal image quality at a maximum 30fps over a wide range of x-ray conditions. The small format of the PaxScan® 1308D/1313D is ideal for both panoramic and 3-D dental applications, specific industrial applications, as well as micro-focus applications.

The 1308D and 1313D are based on the same electronics differing only in the active imaging area. For the 1313D the active imaging is 130 x 130mm while the 1308D has an active imaging area of 130 x 81.2mm.

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

The PaxScan 1308D/1313D is designed to be integrated into a complete X-ray system by qualified system integrator. The system integrator is responsible for obtaining FDA clearance for medical use.

No part of the PaxScan 1308D/1313D is intended to be attached to a patient and/or to contact the patient.

Important:

It is possible that during normal usage the Receptor could inadvertently contact the patient. The closeness of the Receptor to the patient is dependent upon the operator and the technique being performed.

All parts of the PaxScan1308D/1313D are suitable for use within the patient environment.

WARNING:

The 1308D/1313D is not intended to be used as a primary barrier to X-rays. The user is responsible for insuring the safety of the operator, bystanders, and the subjects being radiographed.
**WARNING:** The metal enclosure of the 1308D/1313D must be connected to earth ground.

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

### Explanation of Symbols

- **On (power: connection to the mains)**
- **Alternating Current**
- **Handle With Care**
- **Authorized Representative in the European Community/European Union**
- **Caution / Warning / Important:** Describes action or conditions that could result in equipment damage, data loss, or personal injury
- **Direct Current**
- **Indicates step-by-step description of the respective function follows**
- **Useful / Important information**
- **Consult Instructions for Use**
- **Protective Earth Ground**
- **Manufacturer**
Getting Started

Connecting the Cables

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

Table 1-0 Cable Connection Details

<table>
<thead>
<tr>
<th>Step</th>
<th>Action / Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>The Flat Panel Receptor includes a cable that terminates into two separate connectors: (a) Receptor Synch Connector to Generator Interface; and (b) the Power Supply Connector. Also included is an Ethernet connection cable. The connections are described below.</strong></td>
</tr>
</tbody>
</table>
| 1.   | **Receptor Synch Connection to Generator Interface**  
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 four opto-isolated signals connections of which two are used, one configured for output and one for input. The output signal named “Expose OK” indicates when the receptor is ready for the generator to produce X-rays and the input named “User Sync” allows the user to trigger the panel readout. See Appendix A, diagram 1.0 for “Expose OK” and “User Sync” signal schematic. |
| 2.   | **Power Supply - (optional)**  
This connection provides power to the receptor. Connect the power supply connector to receptor then plug into the main AC supply. |
| 3.   | **Gigabit Ethernet Connection**  
Connect the Ethernet connector to a gigabit capable interface in the user’s host computer. Please note that the interface must use the Intel PRO/1000MT or Intel PRO/1000GT Ethernet adapter and Varian supplied driver. An optional Intel PRO/1000GT adaptor PCI-board (PN 23872) is also available from Varian |

Note: The X-Ray Generator Interface is user supplied equipment.

Warning: The Receptor should be mounted onto user supplied equipment using the holes provided in the integral flange.
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. 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.

**Caution:**

- The receptor is not sealed against dripping moisture.

**Warning:** Precautions should be taken not to open the receptor module. Depending upon the type of scintillator used, opening the receptor module may expose the user to potentially toxic materials.
Chapter 3

Paxscan System Software

There are two CDs supplied with this product. The Software CD allows installation of the Virtual CP that provides the Application Program Interface (API) to the receptor, allowing control and image transfer functionality; see the Virtual CP Interface document 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 compatible. A Software Developer Kit (SDK) including sample code is located in the default install directory:

c:\ProgramFiles\Varian\Paxscan\DeveloperFiles

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 for assistance operating ViVA™ and for complete details on software installation refer to VCP Install Guide documentation included in the software CD.

Software Installation

The Setup.exe in the root directory of the PaxScan CD provides an automated software installation process. Setup.exe automatically launches the L05 installer when the CD is inserted into a CD drives unless the Auto-Run CD option is turned off. ►

Note:

For manual installation use the run command and follow through appropriately.
1. Launch of the L05 installer may display the below two screen shots prompting start of software installation – follow through appropriately.
2. The software installer will prompt as to whether you want to update the calibration files – IMAGERS directory. Click “No” unless you have previously used L01, L02 or L03 with the calibration files. Refer to the VCP Install Guide documentation included in the software CD for complete details regarding software installation.

3. If you see a Windows security dialog such as the one below, click “Install”.

![Windows Security Dialog](image1)

![VirtualCP L05 Release 2 Setup](image2)

![Windows Security Dialog](image3)
Step | Action / Results
--- | ---
4. | Select the Intel Pro/1000 MT Desktop Adapter from the list of adapter options and select the High performance IP Device Driver from the dropdown. Select “Do Nothing” from the dropdown for the other adapter listed as shown in the below screenshots. Finally – click “Install”.

Important: Pleora detects what Ethernet adapters are present and by default selects the Universal Driver for all. **Varian Medical Systems recommends only the Pleora High Performance Driver which must be used together with the Intel Pro/1000 adapter series.**
5. When installation is complete reboot the computer if it does not do so automatically.

**Note:**

A WORD ABOUT DRIVERS ➔ Previous versions of L05 as well as any previous versions of the Pleora High Performance drivers must be removed before attempting to install L05. Assure removal of previous L05 versions by running appropriate uninstaller from the control panel. In addition, previous Pleora drivers must be removed manually since the uninstallers for prior packages do not remove drivers.

If the L05 installer is run without removing any prior driver version, it will run to completion with apparent success, but VCP (Virtual Control Panel) will not open a receptor link; it will generate a driver version error as shown by the below screen shot. In this case, run the L05 uninstaller; the L05 uninstaller will remove the driver including any older versions. Then re-install L05.
Receptor Files Installation

Follow through the install screens to complete the PaxScan Receptor installation. You must restart your computer for installation to take effect.
Modes of Operation

The PaxScan 1308D/1313D supports a number of modes of operation as defined in Table 2.0. In general, there is a trade off between varying operation modes of resolution, or field of view, or frame rate, 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, frame rates, analog gain, field-of-view, and continuous versus single acquisition. Each mode requires a unique set of calibration files. Refer to the ViVA Online help documentation for complete details.

Note: The system can only be in 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 customer’s intended application.

### Table 2-0 PaxScan 1308D Operational Modes

<table>
<thead>
<tr>
<th>Mode</th>
<th>Max Frame Rate (Hz)</th>
<th>Pixel Binning</th>
<th>Gain/ Capacitor</th>
<th>Image Area</th>
<th>Frame Size</th>
<th>Active Frame Size</th>
<th>Acquisition Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Dose Fluoroscopy</td>
<td>50</td>
<td>2 x 2</td>
<td>1 / 4.0pF</td>
<td>Full Field</td>
<td>512 x 320</td>
<td>502 x 300</td>
<td>Continuous</td>
</tr>
<tr>
<td>Normal Fluoroscopy</td>
<td>30</td>
<td>2 x 2</td>
<td>2 / 0.5pF</td>
<td>Full Field</td>
<td>512 x 320</td>
<td>502 x 300</td>
<td>Continuous</td>
</tr>
<tr>
<td>Full-Resolution Fluoroscopy</td>
<td>10</td>
<td>1x1</td>
<td>2 / 0.5pF</td>
<td>Full Field</td>
<td>1,024 x 640</td>
<td>1,004 x 620</td>
<td>Continuous</td>
</tr>
</tbody>
</table>

### Table 3-0 PaxScan 1313D Operational Modes

<table>
<thead>
<tr>
<th>Mode</th>
<th>Max Frame Rate (Hz)</th>
<th>Pixel Binning</th>
<th>Gain/ Capacitor</th>
<th>Image Area</th>
<th>Frame Size</th>
<th>Active Frame Size</th>
<th>Acquisition Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Dose Fluoroscopy</td>
<td>30</td>
<td>2 x 2</td>
<td>1 / 4.0pF</td>
<td>Full Field</td>
<td>512 x 512</td>
<td>502 x 502</td>
<td>Continuous</td>
</tr>
<tr>
<td>Normal Fluoroscopy</td>
<td>30</td>
<td>2 x 2</td>
<td>2 / 0.5pF</td>
<td>Full Field</td>
<td>512 x 512</td>
<td>502 x 502</td>
<td>Continuous</td>
</tr>
<tr>
<td>Full-Resolution Fluoroscopy</td>
<td>10</td>
<td>1x1</td>
<td>2 / 0.5pF</td>
<td>Full Field</td>
<td>1,024 x 1,024</td>
<td>1,004 x 1,004</td>
<td>Continuous</td>
</tr>
</tbody>
</table>
Default Mode

Mode 0 is the default, although this can be configured to meet the customer’s specific application requirements. 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:

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

Offset Calibration

Prior to acquiring images, an offset calibration must be performed for each mode you intend to use. 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.
- An offset calibration should be performed as often as necessary for acceptable images in the application the receptor is being used in. The offset varies as a function of panel temperature and frame rate.
- A different offset reference image is necessary for each operating mode, therefore it is important to update the offset data for each of the operating modes.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action / Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>To perform offset calibration, click the ViVA icon launches the application.</td>
</tr>
</tbody>
</table>
2. Select the *Link to Virtual CP (VCP)* option under Acquisition from the menu bar or the *Link / Mode* drop down box. The main purpose of the VCP is to establish connection to the PaxScan imaging system to control the acquisition of digital images captured.

3. Then, select desired Mode from the *Link / Mode* drop down box: The 1308D/1313D supports a number of Fluoroscopy modes of operation as defined in Table 2.0 and shown in below screenshot.

![Image of Varian Image Viewing and Acquisition (ViVA) interface]

**Note:** It is recommended that a delay of at least 20 seconds be allowed after an X-ray exposure, before commencing with offset calibration. Since there is some inherent lag in the detector, this delay avoids introduction of a latent image into the offset reference image.
4. Click Offset Calibration button or select from the menu bar under Acquisition.

3. An accumulating Dark Frames window appears followed by an offset calibration acquisition completion. Offset calibration is required for each additional receptor, respectively.
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 2,000 – 4,000. 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 a minimum of 32 frames.

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.
Table 4-0 Gain Calibration: All Modes

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Warm Up</td>
<td>To ensure proper warm up, the PaxScan 1308D/1313D Receptor must be operational for a least two (2) hours prior to Gain calibration.</td>
</tr>
<tr>
<td>2.</td>
<td>Radiation</td>
<td>A uniform flat field with no object 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 general consideration outlined above. Note: The exact level of the radiation during calibration will not influence the calibration as long as the signal level is not saturated.</td>
</tr>
<tr>
<td>3.</td>
<td>Offset Calibration</td>
<td>Software automatically performs a new Offset calibration referred to as dark field acquisition. Note: X-Rays must not be used for this part of the calibration.</td>
</tr>
<tr>
<td>4.</td>
<td>Repeat</td>
<td>The above procedure must be repeated for each of the stored imaging modes.</td>
</tr>
</tbody>
</table>
Fluoroscopic Mode Gain Calibration

Take the following steps to complete fluoroscopic gain calibration.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action / Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ensure the desire receptor and imaging mode appears in the <em>Link Mode</em> drop down box.</td>
</tr>
<tr>
<td>2.</td>
<td>Select Gain Calibration from the menu bar under <em>Acquisition</em>.</td>
</tr>
<tr>
<td>3.</td>
<td>Remove all objects from beam, initiate X-ray exposure, then press “Continue”.</td>
</tr>
<tr>
<td>Step</td>
<td>Action / Results</td>
</tr>
<tr>
<td>------</td>
<td>------------------</td>
</tr>
<tr>
<td>4.</td>
<td>The imager will now begin acquiring Flat Field images.</td>
</tr>
<tr>
<td>5.</td>
<td>With Flat Field accumulation complete, terminate X-ray beam, wait 20 seconds, and press “continue”.</td>
</tr>
</tbody>
</table>
6. Dark field accumulation begins with progress status shown in the display window.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action / Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Dark field accumulation begins with progress status shown in the display window.</td>
</tr>
</tbody>
</table>

7. Fluoroscopic gain calibration completes with display of the gain calibration statistics. Gain median count should be between 3000 +/- 1000 as shown in below screenshot.
Important: 

Points of note about Fluoroscopic Gain calibration:

• If the median value is higher than 4,000, the dose used needs to be decreased and the gain calibration repeated.

• If the median value is lower than 2,000, the dose needs to be increased and the gain calibration repeated.

• 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.

• We recommend accumulating a minimum of 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.

Note:

Operator Control is user supplied equipment.
ViVA Mode Settings

The calibration and system settings are verified as follows. To view these settings take the following steps.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action / Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Make sure the link to the VCP is established and desired receptor is selected from the <em>Link / Mode</em> drop down box. Select <em>Mode Settings</em> from the menu bar under <em>Acquisition</em> to make adjustments to Calibration settings. Frame Rate settings are changeable. If the User Sync is checked, the user must supply an external trigger which determines the frame rate.</td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
</tbody>
</table>
3. System settings are verified as follows. Select system settings from the menu bar under Acquisition which will bring up a dialog box. On the left side of the dialog box, unchangeable information about the system is displayed. On the right side are Image Correction settings. These check boxes allow the user to select which image correction algorithms are applied.
Image Acquisition

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

**Fluoroscopy 2x2 / Full-Res Fluoro 1x1 Mode**

The Fluoroscopy mode is commonly used for its ability to provide real-time moving images for positioning and verification.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action / Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Select desired mode from the <em>Link Mode</em> drop down box.</td>
</tr>
<tr>
<td>2.</td>
<td>Make sure hardware handshaking is unchecked.</td>
</tr>
</tbody>
</table>
3. Select the *Acquire Image* button or the green radio button on right invokes imager to begin acquiring images.

4. *Upon first acquisition* the following two windows will appear — the first one provides buffer allocation information and the other an area for user comments. Select the ok and cancel button, respectively to continue.
### Step | Action / Results
--- | ---
5. | The following acquisition the below window will appear providing active image capture data.  

![Image of ViVA Message Box]

6. | Acquired image can be saved in the seq/avi file format by selecting File / Save As.  

![Image of Varian Image Viewing and Acquisition (ViVA)]
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 any and 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.

Electrical Shock Protection

- External Power Supply Specifications - (optional):
  - type: XP Power model PCM50US15, ratings: Input Voltage 90 – 264 VAC, Input Frequency 47 to 63 Hz, Input Current 1.35 A max at 115 VAC, 0.7 A max at 230 VAC, DC Output 15V
- Class I – does not contain any applied parts

Environment Limits

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

Altitude Limits

The Paxscan Digital Imager Receptor is rated to operate at an altitude ≤ 3000m.

Temperature & Humidity

<table>
<thead>
<tr>
<th>Category</th>
<th>Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage &amp; Transport (ambient)</td>
<td>-20° C to +70° C</td>
</tr>
<tr>
<td>Storage &amp; Transport Humidity (non-condensing)</td>
<td>10% to 90%</td>
</tr>
<tr>
<td>Normal Operation Temperature (measured at the center of the back cover)</td>
<td>10° C to 35° C</td>
</tr>
<tr>
<td>Operation Humidity (non condensing)</td>
<td>10% to 90%</td>
</tr>
</tbody>
</table>
Chapter 8

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 aluminum 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 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.

Repairs

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

The least replaceable units (LRU) are:

- Receptor Assembly
- Main Power Cable

Proper Disposal

The 1308D/1313D 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

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

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imager fails to respond</td>
<td>1. Check cables.</td>
</tr>
</tbody>
</table>
| Loss of communication between imager and software | 1. Power cycle the imager by disconnecting the power supply and reconnecting.  
                                            | 2. Restart ViVA and reset the link.                                       |
| 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 and reset the link.                                         |
| 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 1308D/1313D Problem Report.                   
                                            | 2. Email the error log file generated to:  
                                            | paxscan.service@varian.com. This log file is normally found at C:\Documents and Settings\All Users\Documents\DrWatson\drwtsn32.log |
How To Reach Us

In order to provide you with the most comprehensive technical support, (hardware or software), please complete the problem report on following page before contacting your Varian representative. If you prefer E-mailing the information to us, a .pdf version of this form is included on the CD you received with your system. You may also fax the completed form.

To speak with our technical support personnel:

- Call (800) 432-4422 or (801) 972-5000.
- E-mail the report to paxscan.service@varian.com, or
- Fax a copy of the Problem Report to (801) 972-5023
## PaxScan 1308D/1313D Problem Report Customer Information

<table>
<thead>
<tr>
<th>Date:</th>
<th>Your Name</th>
<th>Company/Unit Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email:</td>
<td>Phone Number:</td>
<td>Fax Number:</td>
</tr>
</tbody>
</table>

### Product Information.

PaxScan Part Number: Imager Serial Number: Software Revision #: 

### Operation I was trying to perform (be as specific as possible:)

### What happened (use additional sheets as necessary):

Fax to: (801) 972-5050 or E-mail: paxscan.service@varian.com
Appendix A

The synchronization interface to the imager consists of one opto-isolated input signal and one opto-isolated output signal. Connection to these two signals can be made via the 8 pin LEMO connector on the imager or via 9 pin D-Sub connector on Varian cable Receptor Interface Cable.

The User_Sync input is used to trigger imager readout if the imager is in User Sync mode (see chapter 5, Mode Settings). In order to activate this input the customer system needs to provide a current of at least 5mA (Vin_min = 4V) to the imagers opto-coupler input. Maximum forward photodiode current is 27mA (Vin_max = 15V). The receptor can be configured from the factory to either respond to User Sync pulse width independently or can respond to user sync input pulse duration. The imager will respond with the following:

<table>
<thead>
<tr>
<th>User_Sync pulse duration</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>pulse duration &lt; 2ms</td>
<td>User Sync signal is ignored</td>
</tr>
<tr>
<td>2ms &lt; pulse duration &lt; 4ms</td>
<td>Imager readout is activated but no image data is transmitted via Ethernet</td>
</tr>
<tr>
<td>Pulse duration &gt; 4ms</td>
<td>Imager readout is activated and image data is transmitted via Ethernet</td>
</tr>
</tbody>
</table>

This is called “User Sync Video Blanking” and is enabled/disabled through a register in the receptor configuration file. In both cases, the panel readout is triggered on the falling edge of the user sync pulse. In normal mode the minimum user sync pulse width is 500 useconds.

The output from the imager is the Expose_OK signal which can be used to trigger the generator. In order to use this signal it is necessary to connect the photodiode of an opto-coupler in series with a resistor between the provided 5V output and the Expose_OK pin. Current should be limited to 25mA.
Figure A.1  Schematic for “User_Sync” and “Exposing_OK” Signal