







### **Revision History**

Revision	Date	Descriptions
1.0	2012-06-08 Initial Release	
		Added
		2. Product Description
	2012-08-31	6. System Interface
1.1		7. System Connection
		8. Functional Description
	2012-09-05	Removed
	2012-09-05	11.2 Generator Configuration
		Modified
	2012-09-12	10.2.2 Gigabit Controller Setting on Windows XP
		10.2.3 Gigabit Controller Setting on Windows 7



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# Safety and Regulatory

## **Safety Notice**

The following safety notices are used to emphasize certain safety instructions. Follow the safety instructions in this manual along with warnings and cautions symbols. Ignoring such warnings or cautions while handling the product may results in serious injury or accident. It is important for you to read and understand the contents of this manual before attempting to use the product.

Symbols	Descriptions	
WARNING	Indicates a potentially hazardous situation which will cause death, severe personal injury or substantial property damage if the instructions are ignored.	
CAUTION	Indicates a potentially hazardous situation which may cause minor personal injury or property damage if the instructions are ignored.	
i	Provides additional information that is helpful to you. It may emphasize certain information regarding special tools or items to check before operating the product.	



## **Safety Information**

This product is designed and manufactured to ensure maximum safety of operation and to meet all the safety requirements applicable to electronic medical equipment. However, anyone attempting to operate the system must be fully aware of potential safety hazards. It should be operated and maintained in strict compliance with the following safety precautions and operating instruments contained herein:

CAUTION	<b>Caution</b> : Federal law restricts this device to sale by or on the order of a physician or a licensed practitioner.	
WARNING	Always be alert when operating this device. If a malfunction occurs, do not use this device until qualified personnel correct the problems.	
WARNING	The product should be installed, maintained and serviced according to Vieworks maintenance procedures and by Vieworks personnel or other qualified maintenance personnel approved in writing by Vieworks. Operation and maintenance should be done in strict compliance with the operation instructions contained in the manuals.	
WARNING	The system, in whole or in part, cannot be modified in any way without written approval from Vieworks.	
CAUTION	Before authorizing any person to operate the system, verify that the person has read and fully understand the Service Manual. The owner should make certain that only properly trained and fully qualified personnel are authorized to operate the equipment. An authorized operators list should be maintained.	
WARNING	Prevent unauthorized personnel from access to the system.	
CAUTION	It is important that this Service Manual be kept at hand, studied carefully and reviewed periodically by the authorized operators.	
CAUTION	The owner should ensure continuous power supply to the system, with voltage and current according to the product specifications. If power failures are frequent, an Uninterrupted Power Supply (UPS) should be installed to avoid loss of data.	
CAUTION	If the product does not operate properly or if it fails to respond to the controls described in this manual, the operator should immediately contact Vieworks field service representative.	
CAUTION	User must not contact a fuse holder or contacts of connector (ex: Inlet connector) with a patient simultaneously during operating the equipment and not allow patient to touch the fuse holder or contacts of connector.	



CAUTION	The images and calculations provided by this system are intended to be used as tools for the competent user. They are explicitly not to be regarded as a sole incontrovertible basis for clinical diagnosis. Users are encouraged to study the literature and reach their own professional conclusions regarding the clinical utility of the system.
CAUTION	The user should be aware of the product specifications and of the system's accuracy and stability limitations. These limitations must be considered before making any decision based on quantitative values, in case of doubt, please consult a Vieworks representative.
CAUTION	<ul> <li>Do not install the equipment in a location with the conditions listed below. Otherwise, it may result in failure or malfunction, fall or cause fire or injury.</li> <li>Close to facilities where water is used.</li> <li>Locations exposed to direct sunlight.</li> <li>Close to air-conditioner or ventilation equipment.</li> <li>Close to heat source such as a heater.</li> <li>Prone to vibration.</li> <li>Insecure place.</li> <li>Dusty environment.</li> <li>Saline or sulfurous environment.</li> <li>High humidity.</li> <li>Ambient temperature is higher than the operating temperature stated in this Service Manual.</li> </ul>
CAUTION	Occasionally, this product may have defect pixels caused by TFT characteristics. When the defect pixels are found, perform the Defect detection. For details about how to correct defect pixels, refer to <u>11.4.3 Defect Correction</u> .
CAUTION	Do not inflict excessive shock and mechanical vibration. Otherwise, it may result in poor image quality caused by noise.
CAUTION	Do not unscrew or loosen the screws on the detector surface since all the screws are secured properly at the time of shipment. Otherwise, it may result in poor image quality or damage to equipment.
CAUTION	This product may malfunction due to electromagnetic interference (EMI) caused by telecommunication devices, transceivers, electronic devices, etc. To prevent the electromagnetic wave from badly influencing the product, be sure to avoid placing it in close proximity to the product. Or, change direction or position of the product or move into the shielded place to reduce electromagnetic interference.
CAUTION	To reduce the risk of electric shock, do not remove cover. No user-serviceable part inside. Refer servicing to qualified service personnel.



## **Battery Pack and Battery Charger Safety Information**

Before using the battery pack and battery charger dedicated to ViVIX-S Wireless, read all applicable warnings and cautions.

Not following these instructions could result in electrical shock, fire, explosion or other conditions which may cause death, injury or property damages.

WARNING	Do not use the battery pack as a power source for equipment other than ViVIX-S Wireless detectors. Be sure to use only the dedicated battery pack for the ViVIX-S Wireless detector.
WARNING	The battery charger is designed for the dedicated battery pack. Do not use the battery charger other than the dedicated one. Otherwise, a battery explosion or a battery leak may occur, resulting in fire or electrical shock.
WARNING	Do not operate the battery charger using any type of power supply other than the one indicated on the rating label.
WARNING	Do not handle the product with wet hands.
WARNING	Do not place heavy objects such as medical equipment on cables and cords, or do not pull, bend, bundle, or step on them to prevent their sheath from being damaged.
WARNING	Do not attempt to disassemble, alter, or apply heat to the product.
WARNING	Avoid dropping or subjecting the product to severe impacts. To avoid the risk of injury, do not touch the internal parts of the battery if it has been cracked or otherwise damaged.
WARNING	Stop using the battery pack immediately if it emits smoke, a strange smell, or otherwise behaves abnormally.
WARNING	Do not let the battery pack and battery charger come into contact with water or other liquids and do not allow them to get wet.
WARNING	Do not clean with substances containing organic solvents such as alcohol, benzene, thinner, or other chemicals. Otherwise, fire or electrical shock may result.



WARNING	Do not allow dirt or metal objects (such as hair pins, clips, staples or keys) to contact the terminals. Otherwise, battery explosion or leakage of electrolyte may occur, resulting in fire, injury or pollution of surrounding area. If the battery leaks and the electrolytes come into contact with your eyes, mouth, skin or clothing, immediately wash it away with running water and seek medical attention.
CAUTION	Do not leave, store, or place the product in a location near heat sources, or in a place subject to direct sunlight, high temperature, high humidity, excessive dust, or mechanical shock. Otherwise, battery leakage, overheating or damage to the product may occur, resulting in electrical shock, burns, injury or fire.
CAUTION	Do not attempt to use a battery pack that has deteriorated. Using a battery pack that has exceeded its life cycle may lead to overheating, fire or explosion.
CAUTION	The Lithium ion/polymer battery is recyclable. Battery slowly discharges even if not in use. The battery pack may have expired if it discharges immediately after being fully charged. You can purchase an optional battery pack to replace an exhausted one. The battery pack is a consumable item. If a fully charged battery is consumed quickly, use a new and fully charged battery pack.
CAUTION	Be sure to charge the battery periodically (once a year) if it is not used for an extended period of time. The battery pack cannot be charged if it has been over discharged.
CAUTION	Before discarding the battery pack, cover the terminals with adhesive tape or other insulators. Contact with other metal materials may cause fire or explosion.

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## **General Hazards**

#### **Radiation Hazards**

This system can be connected to x-ray generating equipment. Be certain to follow the safety instructions and specifications for wearing proper lead apron when x-ray exposures are planned or possible. All personnel should wear protective equipment including dosimeters during all phases of installation, operation and maintenance of the system.

#### **Electric Shock Hazards**

To reduce the electric shock hazard, the system must be connected to an electrical ground. A three conductor AC power cable is supplied with this system to provide the proper electrical grounding. The power cable must be plugged into an UL-approved three-contact electrical outlet.

Do not disassemble or modify the product as it may result in fire or electric shock. There are no operator serviceable parts or adjustments inside the systems. Only trained and qualified personnel should be permitted access to the internal parts of the system.

#### **Explosion Hazards**

Do not operate the equipment in the presence of flammable or explosive liquids, vapors or gases. Do not plug in or turn on the system where hazardous substances are detected.

If flammable substances are detected after the system has been turned on, do not attempt to turn off the system or unplug it. Evacuate and ventilate the area before turning the system off.

#### **Implosion Hazards**

Do not hit or drop the equipment. The equipment may be damaged if it receives a strong jolt, which may result in fire or electric shock if the equipment is used without it being repaired.

## **Owner's Responsibility**

The owner is responsible for ensuring that anyone using the system reads and understands the Service Manual and other relevant literature, and fully understands them. Vieworks makes no representation, however, that the act of reading this manual renders the reader qualified to operate, test and calibrate the system.



Do not use the system if unsafe conditions are known to exist. In case of hardware failure that could cause hazardous conditions (smoke, fire and etc), turn the power OFF and unplug the power cords of all sub-systems.



## Notes for Using the Equipment

#### System Diagnostic

The *VXSetup* software runs a system diagnostic. Run *VXSetup* software after installing the system and at least once a year. If an error occurs, report the detailed error information to Vieworks local dealer or distributor.



The owner is responsible for ensuring that the system diagnostic is performed every year. Do not try to use the system if the system diagnostic is failed.

#### Calibration

To ensure optimal performance of the system, it is important to verify that the system is calibrated.



The owner is responsible for ensuring that the system calibration is performed after the system installation is completed or the system is repaired. Do not try to use the system if system calibration is not performed.

#### **Distances measurements**

Distances measurements in millimeters are possible only after distance calibration has been performed using a reference object (refer to VXvue User Manual).



The operator is responsible for performing distance calibration with a reference object and verifying the results of the distance calibration before taking any distance measurements on an image.

#### Left/Right Marker

The operator is responsible for the correct and clear marking on the left or right side of the image to eliminate possible errors.

The software includes an option to mark the image with L (left) or R (right) indicator from acquisition phase through printing and archiving. If the operator chose, for any reason, not to use L/R markers, he must use an alternative way to eliminate any possible mistake.



#### Image Backup

To avoid missing images which might result in patient being exposed to additional doses of radiation, it is important to send the images to PACS or back up the images by filming or by using external storage devices such as CD, DVD, HDD, USB, etc. This should be done as a routine operation for every patient. If the hard disk of your workstation is about to full, the operator should backup images and manually delete the images under administrator privilege to make room on the hard disk for new patient.

#### **User Limitations**

The VXvue software has the service mode which could only be operated with the inputting PASSWORD. The service mode should be operated by the personnel who are qualified by Vieworks.

#### **Cleaning the System**

Use a dry cloth to clean surfaces of the system. Do not use detergents or organic solvents to clean the system. Strong detergent, and organic cleaners may damage the finish and cause structural weakening. Do not clean the system with turning the power on.

#### Disposal

Disposal of this product in an unlawful manner may have negative effects on health and on the environment. When disposing of this product, therefore, be absolutely sure to follow the procedure which is in conformity with the laws and regulations applicable in your area.



The expected life span of ViVIX-S Wireless system is about 3 years.

#### Overheating

Do not block the ventilation ports of the detector to prevent overheating of the detector. Overheating can cause system malfunction and damages.

#### **Electrical fire**

- This equipment is not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
- Conductive fluids that drain into the active circuit components of the system may cause short circuits that can result in electrical fire. Therefore, do not place fluids or food on any part of the system.
- To avoid electric shocks and burns caused by use of the wrong type of fire extinguisher, make sure that the fire extinguisher at the site has been approved for use on electrical fires.



#### Handling the Equipment

The Equipment must be handled with care to avoid personal injury damage to the internal image sensor.

	•	Do not put pressure on the detector locally since it will cause permanent damage to
$\mathbf{A}$		the internal image sensor.
	•	Excessive weight on the equipment may damage the internal image sensor.
CAUTION	•	It is recommended to use the case, in case if a patient should be positioned to put
		pressure on the detector while acquiring images.

Load Limit	Specifications	
Uniform Load	150 kg over the whole area of the detector surface	
Local Load	100 kg on an area 40 mm in diameter	

#### **Pediatric Application**

- Every request should be reviewed by the pediatric radiologist prior to beginning the examination to insure correct study is being performed.
- If the technologist notices an unusual request, they should contact the pediatric radiologist. An example should be from pediatric clinic where they order a Full Cervical, Thoracic, and Lumbar Spine series. The pediatric radiologist should contact ordering physician and decide which study is the best for this pediatric patient.
- The technologist should use the proper technique for the patient's size to decrease the radiation dose when the technologist acquires diagnostic images.
- ALL Pediatric patients shall be shielded for their x-ray examinations, except for when the shield will
  obscure the region of interest, as in a pelvic or SI joint xray for trauma or arthritis, or when it is physically
  or clinically unreasonable to shield the patient. For routine Hip X-Rays, ALL male children shall have
  their scrotum shielded using the small gonadal shield, females may not be shielded as this would
  obscure the hips.
- To minimize motion in infants and young children, swaddle the infant. Use distraction tools to improve cooperation and projectors with child-friendly themes, music, toys with flashing lights or music, child-friendly images on the ceiling or walls, singing, counting, and a parent reading and talking to the child through the console all can help reduce anxiety and comfort the child.
- A Scoliosis series will consist of a single frontal standing view of the spine. No lateral view or supine view is needed, unless specifically asked for by the Orthopedist or Radiologist. If the female's breasts can be shielded without obscuring the spine, breast shields should be used.



## Regulatory

## **Medical Equipment Classifications**

Type of protection against electrical shock	Class I equipment
Degree of protection against ingress of water	IPXO
Mode of operation	Continuous operation
Flammable anesthetics	NOT suitable for use in the presence of a flammable
	anesthetic mixture with air or with oxygen or nitrous oxide.

## **Equipment Standards**

IEC/EN/UL 60601-1	Medical Electrical Equipment
CSA C22.2 No. 601.1	Part 1: General Requirements for Safety
EN60601-1-1	Medical Electrical Equipment Part 1: General Requirements for the Safety Collateral Standard
	Safety Requirements for Medical Electrical Systems
IEC/EN 60601-1-2	Medical Electrical Equipment Part 2: Electromagnetic Compatibility–Requirements and Tests
IEEE 802.11a/b/g/n	Wireless Communications
Radio Frequency (RF) compli	ance information
U.S.A	FCC Part 15 Subpart B Class B and Part 15 Subpart C
European Union	EN 300 328 V1.7.1 EN 301 489-1 V1.8.1 EN 301 489-17 V2.1.1 EN 301 893 V1.5.1 EN 62311[2008]
Japan	MIC Ordinance Regulating Radio Equipment Article 49.20



#### **FCC Compliance**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following tow 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 B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment dose cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encourage 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 that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operated the equipment.

5.15-5.35GHz band is restricted to indoor operations only.



#### Guidance and Manufacturer's Declaration for EMC Directive

This device has been tested for EMI/EMC compliance, but interference can still occur in an electromagnetically noisy location. Attempt to maintain a suitable distance between electrical devices to prevent malfunction.

#### **Electromagnetic Emissions**

The Equipment Under Test (EUT) is intended for use in the electromagnetic environment specified below. The customer or user of the EUT should assure that it is used in such an environment.

Immunity Test	Compliance	Electromagnetic Environment – Guidance
RF Emissions	Group 1	The EUT uses RF energy only for its internal function. Therefore, its
CISPR 11		RF emissions are very low and are not likely to cause any
		interference in nearby electronic equipment.
RF Emissions	Class B	The EUT is suitable for use in all establishments other than
CISPR 11		domestic and those directly connected to the public low-voltage
Harmonic emissions	Class A	power supply network that supplies buildings used for domestic
IEC 61000-3-2		purposes.
Voltage fluctuations/	Complies	
Flicker emissions		
IEC 61000-3-3		



#### **Electromagnetic Immunity**

The EUT is intended for use in the electromagnetic environment specified below.

The customer or user of the EUT should assure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Electrostatic	±6 kV	±6 kV	Floors should be wood, concrete or ceramic tile. If
discharge (ESD)	contact	contact	floors are covered with synthetic material, the relative
IEC 61000-4-2	±8 kV air	±8 kV air	humidity should be at least 30%.
Electrical fast	±2 kV for	±2 kV for	Mains power quality should be that of a typical
transient/burst	power supply lines	power supply lines	commercial or hospital environment.
IEC 61000-4-4	± 1 kV for input/output lines	± 1 kV for input/output lines	
Surge	±1 kV differential	±1 kV differential	Mains power quality should be that of a typical
IEC 61000-4-5	mode	mode	commercial or hospital environment.
	±2 kV common mode	±2 kV common mode	
Voltage dips, short	<5% UT	<5% UT	Mains power quality should be that of a typical
interruptions and	(>95% dip in Uт) for 0.5	(>95% dip in Uт) for 0.5	commercial or hospital environment. If the user of the
voltage variations	cycle.	cycle.	EUT image intensifier requires continued operation
on power supply	40% Uт (60% dip in	40% Uт (60% dip in	during power mains interruptions, it is recommended
input lines	Ūτ) for 5	Ŭт ) for 5	that the EUT image intensifier be powered from an
IEC 61000-4-11	cycles.	cycles.	uninterruptible power supply or a battery.
	70% Uт (30% dip in Uт) for 25 cycles.	70% Uτ (30% dip in Uτ) for 25 cycles.	
	<5% Uт (<95% dip in Uт) for 5 sec.	<5% Uт (<95% dip in Uт) for 5 sec.	
Power frequency	3 A/m	3 A/m	Power frequency magnetic fields should be at levels
(50/60 Hz)			characteristic of a typical location in a typical
magnetic field			commercial or hospital environment.
IEC 61000-4-8			

NOTE:  $U\tau$  is the a.c. mains voltage prior to application of the test level.



Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Conducted RF	3 Vrms 150 kHz to 80 MHz	3 Vrms 150 kHz to 80 MHz	Portable and mobile RF communications equipment
IEC 61000-4-6			should be used no closer to any part of the EUT,
			including cables, than the recommended separation
			distance calculated from the equation applicable to the
Radiated RF	3 V/m 80 MHz	3 V/m 80 MHz	frequency of the transmitter.
IEC 61000-4-3	to 2.5 GHz to 2.5 GHz	to 2.5 GHz	Recommended separation distance $\mathbf{d} = [\frac{3.5}{V_1}]\sqrt{P}$
			$d = \left[\frac{3.5}{V_1}\right] \sqrt{P}$ 80 MHz to 800 MHz
			$d = \left[\frac{7}{E_1}\right] \sqrt{P} 80 \text{ MHz to } 800 \text{ MHz}$
			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).
			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.
			Interference may occur in the vicinity of equipment
			marked with the following symbol:

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.

<sup>b</sup> Over the frequency range 150 kHz to 80 MHz, field strengths should be less than  $[V_1]$  V/m.

<sup>&</sup>lt;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 EUT is used exceeds the applicable RF compliance level above, the EUT should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the EUT.



### Label and Symbols

#### Detectors

#### FXRD-1417WA



#### FXRD-1417WB

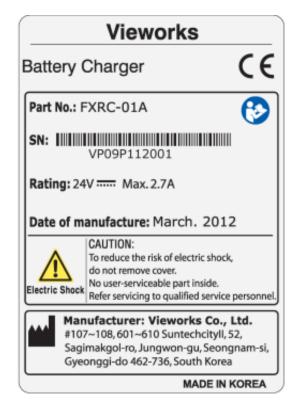




#### System Control Unit



#### **Battery Charger**







### Symbols

Symbol	Description
	Direct Current
$\sim$	Alternating Current
	Protective Earth (Ground)
Å	Equipotentiality
0	Power Off
$\triangle$	Attention, consult accompanying documents
	Power On
ASSIFIA	Medical Equipment
Ĩ.	With Respect to electric shock, fire, and mechanical hazards only
	In accordance with UL60601-1 and CAN/CSA C22.2 No. 601.1.
<b>C €</b> 0434 <b>①</b>	This mark shows compliance of the essential requirement and other relevant
	provisions of Directive 1999/5/EC and 93/42/EEC.
((••))	Non-ionizing radiation
	Read and understand all instructions and warning labels in the product
<b>1</b>	documentation before using the equipment.
	Keep manual for future reference.



# 1. Overview

The *ViVIX-S Wireless* is advanced wireless flat panel X-ray imaging system designed for digital radiography. The lightweight wireless digital radiography is designed to be compatible with conventional X-ray film cassettes so that the users who are not familiar with Digital Radiography (DR) can easily understand and use the *ViVIX-S* system. In addition, the wireless communication (IEEE 802.11a/b/g/n) feature improves the operability and high-speed processing.

### 1.1 Features

- Wireless LAN communication (IEEE 802.11a/b/g/n) feature
- Supporting Conventional 35  $\times$  43 X-ray film cassette
- Compatible with not only new X-ray generators based on DR interface but also conventional X-ray generators
- Designed with simple wiring and lightweight for portable applications
- Image digitization, image inversion, image processing, zooming, panning, window level adjustment, contrast adjustment, and various features enable the operator to see diagnostic details that is difficult to see by using conventional non-digital techniques.
- Depending on the operating environment, the Ether Con Cable (optional) enables the device to be used through expansion to a wired connection.

## 1.2 Intended Use

The *ViVIX-S* Digital X-ray detector is indicated for digital imaging solution designed for providing general radiographic diagnosis of human anatomy. This device is intended to replace film or screen based radiographic systems in all general purpose diagnostic procedures. This device is not intended for mammography applications.



## **1.3 Standard Configuration**

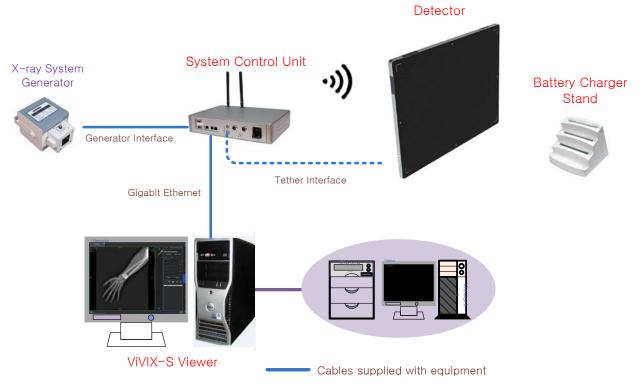


Figure 1.1 ViVIX-S Wireless System Configuration

Wireless communication is established between the ViVIX-S Wireless detector and System Control Unit. The ViVIX-S system is compliant with IEEE 802.11a/b/g/n (2.4 GHz / 5 GHz). The available frequency band may vary depending on local radio laws and system requirements. Consult your local dealer for the frequency available in your area.

i	Use of multiple WLAN devices within the same frequency band may interfere with each wireless communication and cause a decline in transmission speed.
i	Do not cover or block the wireless module of the detector. Otherwise, the transmission speed or operable distance may be reduced.
i	Recommended maximum operating distance of wireless communication between the detector and System Control Unit is 8 meters.



# 2. Product Description

*ViVIX-S Wireless* system consists of detector, system control unit (SCU), battery charger, battery pack, software and its accessories.

## 2.1 Product Components

Item	Product Name	
Detector	FXRD-1417WA (scintillator: CsI (TI)): 3.3kg	
	FXRD-1417WB (scintillator: Gadox): 3.1kg	
System Control Unit (SCU)	FXRS-03A: 2.5kg	
Battery Charger and Battery Pack	FXRC-01A (charger): 1.2kg	
	FXRB-01A (battery pack): 0.2kg	
	Viewer: VXvue	
Software	Calibration and Diagnostic: VXSetup	
	Calibration Data	
	AC Power Cable (2m)	
Accessories (Cables)	Generator Interface Cable (15m)	
	LAN Cable (15m, Direct, 1000BASE-T)	
	Tether Interface Cable (3m)	

#### Table 2.1Product Components

	The use of accessories and cables other than those specified, with the exception of
	ViVIX-S Wireless accessories and cables sold by Vieworks Co., LTD. as replacement
	parts for internal components, may result in increased emissions or decreased immunity
	of the equipment.
$\wedge$	Accessory equipment connected to the analog and digital interfaces must be certified
	according to the respective IEC standards. All combinations of equipment must be in
CAUTION	compliance with IEC 60601-1-1 system requirements. Any person who connects
	additional equipment to the signal input or signal output ports configures a medical
	system, and is therefore responsible for ensuring that the system complies with the
	requirements of the system standard IEC 60601-1. If in doubt, consult Vieworks technical
	support representative.



### Workstation (Recommended and minimum but NOT included)

ltem	Specification
Operating System	Windows 7 64 bit SP1 (Professional Edition or higher)
CPU	Intel Core i5 2600 or higher (or compatible CPU)
Memory	4GB or higher
Hard Disk	1TB or higher
	Intel® PRO 1000 Series (Gigabit LAN Card)
LAN Card	Min. Requirements: 1Gbps, Jumbo Frames: 9K
	Receive Descriptors: 2K
Monitor	1024 $ imes$ 768 or higher
CD-ROM	CD or DVD R/W

Table 2.2 Workstation



## 2.2 Environment

ltem	Operation	Storage & Transportation
Temperature	+10 ~ +35 ℃	<b>-15 ~ +55</b> ℃
Humidity	30 ~ 85%(*1)	10 ~ 90(*1)
Atmospheric Pressure	70 ~ 106kPa	50 ~ 106kPa
Shock	1.6G	20G
Vibration	0.7G	0.7G

Table 2.3Environmental Requirements

\*1: Non-condensing

## 2.3 X-ray Imaging Condition

#### X-ray Energy Range

40kVp ~ 150kVp

#### Reliability (Lifetime Dose)

More than 74Gy (35uGy x 365days x 24hours x 60minutes x 60seconds/15sec)

## 2.4 Medical Equipment: Reference to Standards

Standards	Contents
IEC/EN/UL 60601-1	Medical Electrical Equipment
CSA C22.2 No. 601.1	Part 1: General Requirements for Safety
EN60601-1-1	Medical Electrical Equipment
	Part 1: General Requirement for the Safety Collateral Standard:
	Safety Requirement for Medical Electrical Systems
IEC/EN 60601-1-2	Medical Electrical Equipment
	Part 2: Electromagnetic Compatibility–Requirements and Tests
IEEE 802.11a/b/g/n	Wireless Communications

#### Table 2.4 Medical Equipment Standards



## 3. Detector

## **3.1 Detector Specifications**

ltem	Description	
Model	FXRD-1417WA(B)	
Purpose	General radiography	
Image Matrix Size	2560 × 3072 pixels	
Pixel Pitch	140 µm	
Effective Imaging Area	358 mm × 430 mm	
Grayscale	14 bit, 16,384 grayscale	
Scintillator	CsI (Cesium Iodide) or Gadox (Gadolinium Oxysulfide)	
Image Acquire and Transfer Time	Preview: 2 s, Image Processing: 6.5 s (2 s when using Tether Interface)	
Spatial Resolution	Min. 3.5 line pair/mm	
Rated Power Supply	DC +24 V, Max. 0.5 A	
• Wireless	• Powered by the battery pack (4,000 mA h)	
• Wired	Powered by the SCU using tether interface	
Power Consumption	Max. 12 W	
Wireless Communications	IEEE 802.11a/b/g/n (2.4 GHz / 5 GHz)	
<sup>†</sup> Tether Interface	Gigabit Ethernet (1000BASE-T) via <sup>‡</sup> PoE	
Imaging Plate	Carbon Fiber Plate	
Cooling	Air cooling	
Dimensions ( $H \times W \times D$ )	384 mm × 460 mm × 15 mm	
Weight(including battery pack)	3.1 kg (FXRD-1417WB), 3.3 kg (FXRD-1417WA)	
Environmental Requirements		
Operation	Temperature: +10 $\sim$ +35 $^{\circ}$ C	
	Humidity: 30 $\sim$ 85% (Non-Condensing)	
	Atmospheric pressure: $70 \sim 106 \text{ kPa}$	
	Altitude: Maximum 2000 meters	
Storage and transportation	Temperature: -15 $\sim$ +55 $^{\circ}$ C	
	Humidity: 10 $\sim$ 90% (Non-Condensing)	
	Atmospheric pressure: 50 $\sim$ 106 kPa	
	Altitude: Maximum 2000 meters	

#### Table 2.1Detector Specifications

<sup>†</sup>Tether Interface: Allows the detector to communicate with SCU via Ethernet cabling when wireless communications is

not available or higher speed data transfer is necessary.

<sup>‡</sup>**PoE (Power over Ethernet)**: Delivers electrical power over LAN cabling to the networked device.



# **3.2 Detector Components**

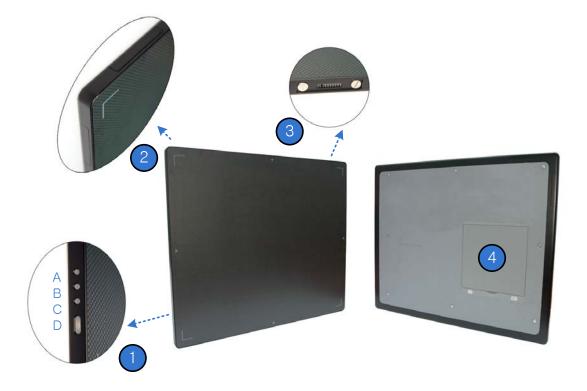


Figure 3.	<b>Detector</b>	Components
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No.	Name	Description
1	Status Indicators	A: Data LED, Indicates communication and transmission status Blue
		B: Active LED, Indicates the detector is ready to work Orange
		C: Power LED, Indicates power on/off status Green
	Power button	D: Power button, Press to power on or off the detector.
2	Wireless Module	Transmits data with wireless communications (IEEE 802.11a/b/g/n).
3	Tether Interface	Allows the detector to communicate with SCU via PoE cabling (Gigabit Ethernet
		1000BASE-T)
4	Battery Pack	Supplies electrical power to the detector while communicating wirelessly.

 Table 3.2
 Detector Components Description



## 3.3 Detector Dimension



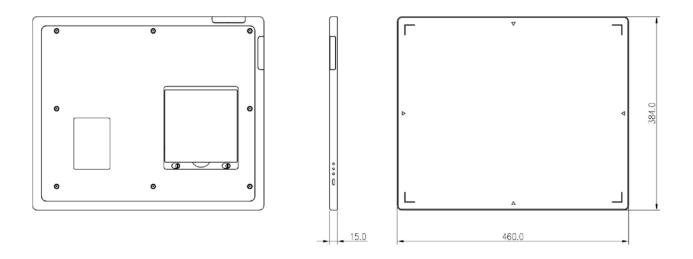


Figure 3.2 Detector Dimension



# 4. SCU (System Control Unit)

## 4.1 SCU Specifications

Item		Description
Model	FXRS-03A	
Power Supply	Input: AC100 to 240	V, 50/60 Hz, Max. 200VA
	Output: DC +24V 3.3/	4, 80W
Cabling Ports	Gigabit Ethernet Ports	– 3EA
	Power over Ethernet P	orts – 2EA (Only for FXRD-1417)
Wireless Communications	IEEE 802.11a/b/g/n (2.4	4 GHz / 5 GHz)
Dimensions (W $\times$ H $\times$ D)	300 mm × 235.8 mm × 5	58 mm, Antenna Height – 105 mm
Weight	2.5 kg	
Environmental Requirements		
Operation	Temperature:	+10 ~ +35℃
	Humidity:	30 $\sim$ 85% (Non-Condensing)
	Atmospheric pressure:	$70~\sim~106~$ kPa
	Altitude:	Maximum 2000 meters
Storage and transportation	Temperature:	-15 ~ +55 ℃
	Humidity:	10 $\sim$ 90% (Non-Condensing)
	Atmospheric pressure:	$50~\sim~106~$ kPa
	Altitude:	Maximum 2000 meters

 Table 4.1
 System Control Unit Specifications



## 4.2 System Control Unit Components

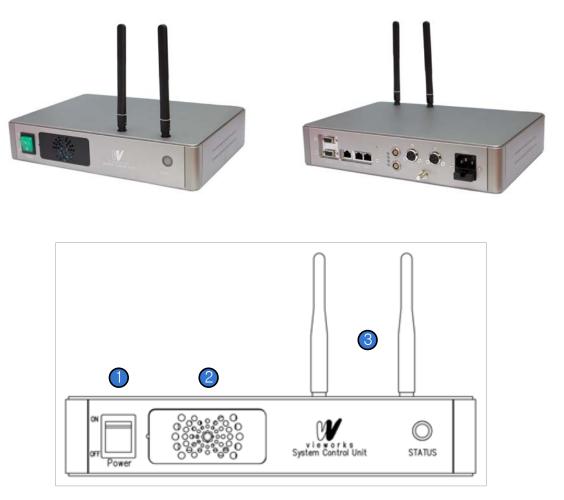


Figure 4.1 System Control Unit (Front)

No.	Name	Description	
1	Power Switch	Turns on or off the SCU.	
2	Fan	Expels heated air inside of the SCU.	
3	Antenna	Assists communications between the detector and SCU.	
4	Status LED	Indicates status of SCU operation and connection.	
		Blinking Green: Startup in progress	
		Blue: Connected to Wi-Fi network	

 Table 4.2
 System Control Unit Components (Front)



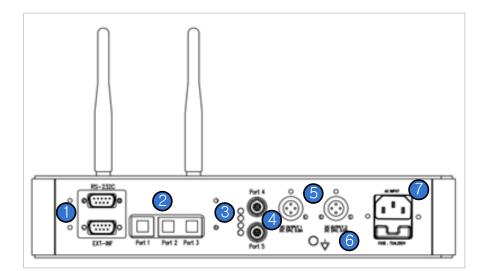


Figure 4.2 System Control Unit (Back)

No.	Name	Description
1	EXT_INF	Provides connection to the X-ray generator.
2	Port 1	Provides Gigabit Ethernet (1000BASE – T) communication
		between the workstation and SCU.
		Gigabit Ethernet (1000BASE – T) Port
	Port 2, Port 3	Provides communication between FXRD-1717 and SCU when
		configuring multiple detectors.
_		Gigabit Ethernet (1000BASE – T) Port
3	Status LED	Indicates Port 4 and Port 5 status (Green: 1Gbps, Orange:
_		100Mbps)
4	Port 4, Port 5	Connection interface to communicate with the detector and to
		supply electrical power to the detector (Only for FXRD-1417).
_		Power over Ethernet Port (1000BASE-T)
5	Detector Power Supply	Connection interface to supply power to a FXRD-1717 detector.
	Port	• Max. DC +24V/24W (×2 ports)
6	P.E	Provides connection to equipotential ground.
7	AC Input	Connect the power cable to the power socket.
		• 100 ~ 240V, 50/60 Hz, T2AL250V Fuse (2 EA)

#### Table 4.3 System Control Unit Components (Back)



P.E (Potential Equalization) of SCU is used to keep equipotential between SCU and an equipment to be used with ViVIX-S Wireless. To connect to P.E of equipment, use a ground cable.



## 4.3 SCU Dimension

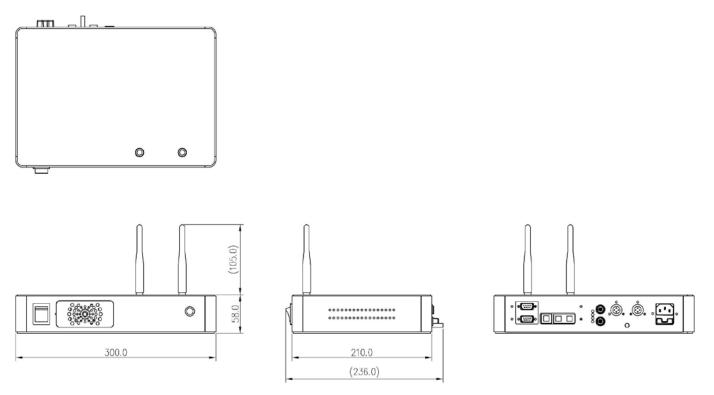


Figure 4.3 SCU Dimension



### 4.4 Fuse

Two fuses are installed inside of SCU to prevent electrical accidents due to an error such as over current occurred in the AC Input. Stop immediately using SCU when fuses break.

Item	Description
Model	Littlefuse <sup>®</sup> 218002 (2 EA)
Туре	Time Lag Cartridge Fuse
Amp Rating	2 A
Voltage Rating	250 V

Table 4.4 Fuse

#### **Replacing Fuses**

	• Turn off SCU and its peripheral equipment, and pull the plug out of the power socket
	before replacing fuses.
	• When fuses break, resolve the cause of overcurrent first, and then replace the fuses
WARNING	with extra fuses (optional items, one set of two) or equivalent rating fuses.
	• User must not contact a fuse holder with a patient simultaneously during operating
	the equipment and not allow patient to touch the fuse holder.

1. Pull the fuse holder out from its receptacle under AC Input on the back panel of SCU.



2. Check the fuse(s) and replace it if necessary, using the fuse type and rating specified above.



3. Push the fuse holder back.



# 5. Battery Charger and Battery Pack

## 5.1 Battery Charger Specifications

Item	Description
Model	FXRC-01A
Simultaneous Charging	Battery Pack 3 EA
Charging Time	2 hours
Rated Power Supply	DC +24V, 2.7 A Max.
Dimension (W $\times$ H $\times$ D)	192.0 mm × 167.5 mm × 223.4 mm
Weight	1.2 kg

 Table 5.1
 Battery Charger Specifications

## 5.2 Battery Charger Components



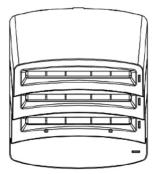
Figure 5.1 Battery Charger

No.	Name	Description
1	Battery Compartment	Insert the battery pack to charge.
2	Charging Indicator	Indicates the charging status.
		(Orange: Charging, Green: Fully Charged)
3	Power Indicator	Indicates the power on/off status.
4	DC Input	Connect the DC adapter to supply electrical power to the battery
_		charger.

#### Table 5.2 Battery Charger Components



# 5.3 Battery Charger Dimension



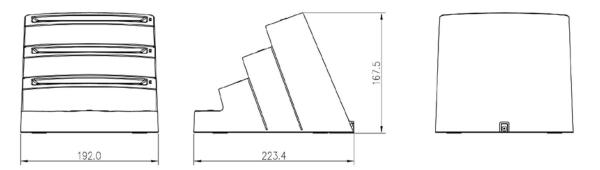


Figure 5.2 Battery Charger Dimension



# 5.4 Battery Pack Specification

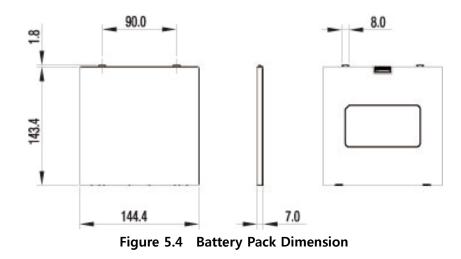
ltem	Description
Model	FXRB-01A
Туре	Lithium Polymer
Rated Power Supply	Output: DC +7.4V
Capacity	4000 mA h
Number of Cell	2S1P (2 Series 1 Parallel)
Dimension (W $\times$ H $\times$ D)	144.4 mm × 143.4 mm × 7.0 mm
Weight	220 g

Table 5.3 Battery Pack Specifications	Table 5.3	Battery	Pack	<b>Specifications</b>
---------------------------------------	-----------	---------	------	-----------------------



Figure 5.3 Battery Pack

## 5.5 Battery Pack Dimension





## **5.6 Charging Battery Pack**

The battery pack supplies power to the detector during wireless connection. Be sure to use only the dedicated battery pack and fully charge it before use.

- 1 Connect the power cable (adapter not included) to the DC Input port of the battery charger and the power cord to the power source to supply power. The power LED lights in green indicating the presence of direct current (DC) power.
- 2 Insert the battery pack into the battery charger. Charging starts automatically. The charge LED lights orange when the battery pack is being charged. After the battery pack is charged completely, the charge LED lights in green.
- 3 Gently pull the charged battery pack to remove from the battery charger.

	Securely plug the power cord into the power source. If contact failure occurs, or if dust or
	metal objects come into contact with the exposed metal prongs of the plug, fire or
WARNING	electrical shock may occur.
	Be sure to stop charging the battery pack when the charge LED lights in green beyond the
	specified charging time. Not doing so may result in battery pack overheating or smoking or
CAUTION	in explosion or fire.
CAUTION	You must use the power adaptor that is certified with IEC 60950 or IEC 60601-1.

i	Three batteries can be charged at the same time.
i	It takes approximately two hours to fully charge a battery pack. The required charging time may vary depending on the temperature and remaining battery level.



# 6. System Interface

## 6.1 Block Diagram

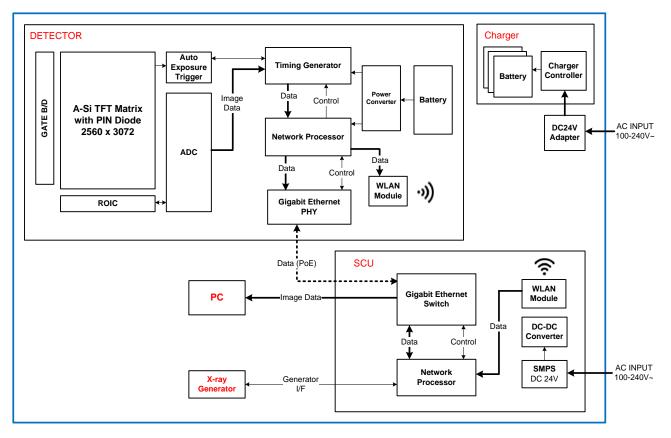


Figure 6.1 ViVIX-S Wireless Block Diagram



VIVIX-S Wireless Service Manual

## 6.2 Wiring Diagram

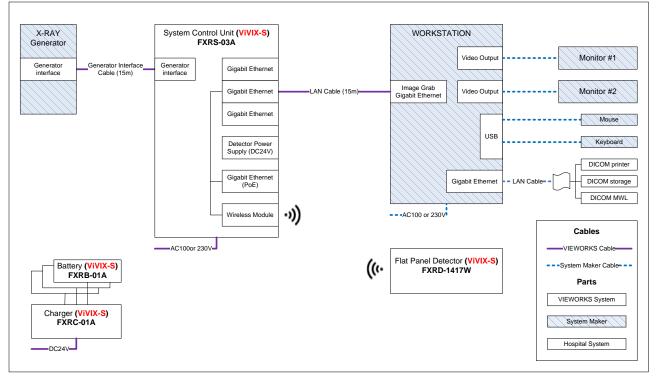


Figure 6.2 ViVIX-S Wireless Wiring Diagram



## 6.3 X-ray Generator Interface

### 6.3.1 X-ray Exposure Mode

Mode		Description
DR Trigger Mode	1	The detector receives EXP_REQ signal that X-ray generator is prepared to
		generate X-rays.
	2	The detector prepares image acquiring and then responds EXP_OK signal to the
		X-ray generator.
	3	The X-ray generator confirms EXP_OK signal and generates X-rays, then the
		detector performs image acquiring according to Image Acquisition Time and
		transmits the image data.
	•	EXP_REQ (Generator $\rightarrow$ Detector), EXP_OK (Detector $\rightarrow$ Generator)
AED Mode	•	The detector detects actual amount of X-rays without any connection to the X-ray
		generator, and then performs image acquiring according to Image Acquisition Time
		and transmits the image data.
	•	No signal used (No need to connect Generator Interface Cable.)

Table 6.1Exposure Mode

#### 6.3.1.1 DR Trigger Mode

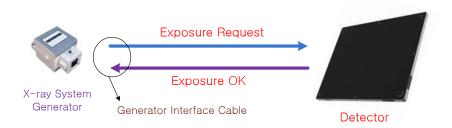


Figure 6.3 DR Trigger Mode Configuration

• DR Trigger is the most common and recommended exposure mode. User can achieve the best quality images with DR Trigger Mode.



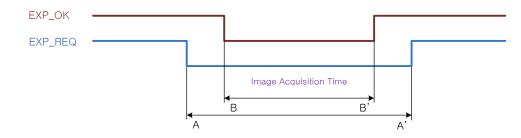


Figure 6.4 Timing of Exposure Signal

- Image Acquisition Time+
  - Exposure request signal A (EXP\_REQ) should be approved first, and then exposure responds signal B (EXP\_OK) is out.
  - Image Acquisition Time can be set from 40 ms to 4,000 ms with 1 ms increment, and the initial value is 500 ms.

#### 6.3.1.2 AED Mode



Figure 6.5 AED Configuration

• AED is available for acquiring images without any connection to X-ray generator with a generator interface cable

	• Make sure to follow operating environmental requirements (Temp: +10 $^{\circ}$ ~ +35 $^{\circ}$ ).
	• If you use AED Mode out of operating environmental requirements, unwanted image
	can be acquired without X-ray image acquiring.
•	• Do not hit or drop the equipment. Unwanted images may be acquired in the AED
	Mode if it receives strong jolt.
	• If you use a Grid under general imaging condition (Dose) or image a thick object in
CAUTION	the AED Mode, the efficiency of X-ray transformation may be reduced about 0% ~ 2%
	compared to the DR Trigger Mode according to the thickness of the target.
	• If you image a thick object in the AED Mode with low X-ray tube voltage, an image
	may not be acquired or horizontal line noise may occur.



## 6.3.2 EXT\_INF Port Pin Assignment

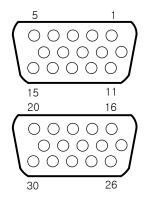


Figure 6.6 EXT\_INF port pin assignments (SCU Side – Female Connector)





No.	Signal Name	I/O	Color	Description	
				Detector receives signal that X-ray generator is     prepared to generate X rays	
1	EXP_REQ+_A	Input	Red	<ul> <li>prepared to generate X-rays.</li> <li>Contact Type – On: Closed, Off: Open</li> </ul>	
				<ul> <li>For the 1st DR Interface of Generator</li> </ul>	
2	EXP_REQA	Input	Black	Return signal from EXP_REQ+_A.	
		input	DIACK	Detector receives signal that X-ray generator is	
3		Innut	Orango	<ul> <li>prepared to generate X-rays.</li> <li>TTL (Voltage) Type – On: VCC, Off: GND</li> </ul>	
3	EXP_REQ_TTL_A	Input	Orange		
				<ul> <li>Current (5 mA ~ 10 mA), Voltage (12 V ~ 24 V)</li> <li>For the 1st DR Interface of Generator</li> </ul>	
4		Innut	Crov	Return signal from EXP_REQ_TTL_A	
4	EXP_REQ_GND_A	Input	Gray	Power of TTL signal coming from X-ray generator	
5	EXP OK POWER A	Innut	Yellow	<ul> <li>This is for the 1st DR Interface of Generator, but</li> </ul>	
5	EXF_OK_FOWER_A	Input	renow	it can be shared with the 2nd DR Interface.	
				Botodol roopondo to X hay gonorator about X	
	EXP_OK+_A			<ul><li>ray generation.</li><li>The X-ray generator generates X-rays according</li></ul>	
6		Output	Green	to this signal and then the detector performs X-	
				ray image acquiring.	
				<ul> <li>For the 1st DR Interface of Generator</li> </ul>	
7	EXP_OKA	Output	Brown	Return signal from EXP_OK+_A	
8		Ouput	Brown	Same as "EXP_OK+_A" for the 2nd DR Interface of	
0	EXP_OK+_B	Output	Blue	Generator.	
9				Same as "EXP_OKA" for the 2nd DR Interface of	
Ū	EXP_OKB	Output	Pink	Generator.	
10	Reserved	-	-	Do not connect. Reserved for testing.	
11				Same as "EXP_REQ+_A" for the 2nd DR Interface of	
	EXP_REQ+_B	Input	White	Generator.	
12				Same as "EXP_REQA" for the 2nd DR Interface of	
	EXP_REQB	Input	Purple	Generator.	
13		ا بيمور	M/bite/Ded	Same as "EXP_REQ_TTL_A" for the 2nd DR	
	EXP_REQ_TTL_B	Input	White/Red	Interface of Generator.	
14		100.14	M/bito/Dlock	Same as "EXP_REQ_GND_A" for the 2nd DR	
	EXP_REQ_GND_B	Input	White/Black	Interface of Generator.	
			-	Do not connect. Reserved for testing.	

#### Table 6.2EXT\_INF1 port pin description (1 ~ 15)



No.	Signal Name	I/O	Color	Description
16		loout	Ded	Same as "EXP_ REQ+_A" for the 3rd DR
16	EXP_REQ+_C	Input	Red	Interface of Generator.
17	EXP_REQC	Input	Black	Same as "EXP_ REQA" for the 3rd DR Interface of
17	EXF_REQC	Input	DIACK	Generator.
18	EXP_REQ_TTL_C	Input	Orange	Same as "EXP_REQ_TTL_A" for the 3rd DR
		input	Orange	Interface of Generator.
19	EXP_REQ_GND_C	Input	Gray	Same as "EXP_REQ_GND_A" for the 3rd DR
		mput	Clay	Interface of Generator.
20	EXP_OK_POWER_C	Input	Yellow	Same as "EXP_OK_POWER _A" for the 3rd DR
		mput	Tenow	Interface of Generator.
21	EXP_OK+_C	Output	Green	• Same as "EXP_OK+_A" for the 3rd DR Interface
		Output		of Generator.
22	EXP OK- C	Output	Brown	Same as "EXP_OKA" for the 3rd DR Interface of
		Calpar	Diomi	Generator.
				Detector receives the 1st status signal that it is
23	EXT_A+	Input	-	equipped on/in the table or in the wall stand.
				Contact Type – On: Closed, Off: Open
24	EXT_A-	Input	-	Return signal from EXT_A+
25	EXT_B+	Input	-	Same as "EXT_A+" for the 2nd status signal
26	EXT_B-	Input	-	Same as "EXT_A-" for the 2nd status signal
27	EXT_C+	Input	-	Same as "EXT_A+" for the 3rd status signal
28	EXT_C-	Input	-	Same as "EXT_A-" for the 3rd status signal
29	EXT_D+	Input	-	Same as "EXT_A+" for the 4th status signal
30	EXT_D-	Input	-	Same as "EXT_A-" for the 4th status signal

Table 6.3EXT\_INF2 port pin description (16 ~ 30)



### 6.3.3 Trigger Interface

#### 6.3.3.1 Packet Trigger



Figure 6.7 Packet Trigger Connection

- Connects a generator cable to Port A of EXT\_INF1 in SCU when there is one X-ray generator interface.
- Only a selected detector can exchange EXP\_REQ and EXP\_OK signals, and the detector can be selected only in Viewer since detectors share a signal together.



#### 6.3.3.2 Line Trigger

Figure 6.8 Line Trigger Connection

- Connects generator cables to Port A, Port B of EXT\_INF1 and Port C of EXT\_INF2 in SCU when there
  are two X-ray generator interfaces.
- Connecting detectors for each generator signal can be configured in VX Setup, and only selected detectors can exchange EXP\_REQ and EXP\_OK signals.



### 6.3.4 Input and Output Circuits

The following diagrams describe exposure request and exposure OK circuits.

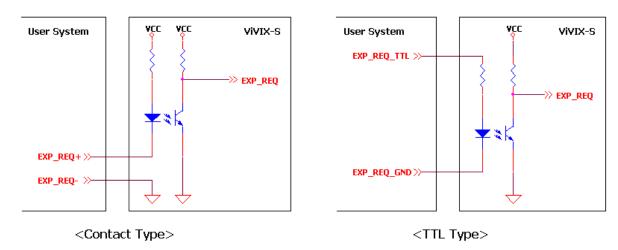


Figure 6.9 Exposure Request Input Circuit

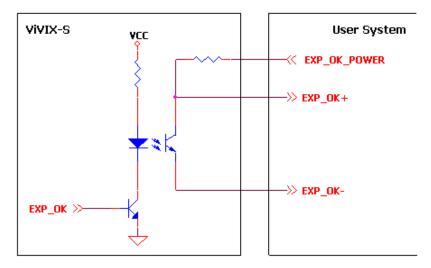


Figure 6.10 Exposure Respond Output Circuit



# 7. System Connection

## 7.1 AP Mode

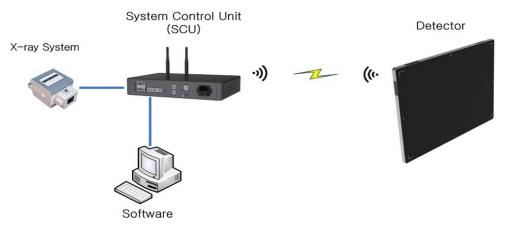


Figure 7.1 AP Mode Connection

- AP Mode is used for basic connection. SCU and Detector can be utilized as AP (Access Point) and Station each.
- As SCU is connected to the system, it can use DR Trigger mode and organize X-ray diagnosis environment with multi detectors.

### 7.2 External AP Mode

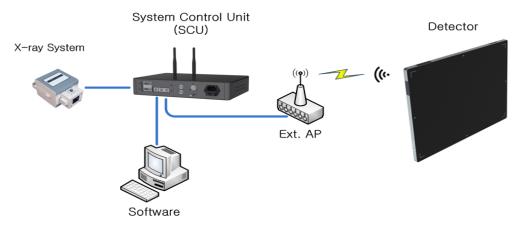


Figure 7.2 External AP Mode Connection

- External AP Mode organizes X-ray diagnosis environment using external AP without AP of SCU. Wireless connection and its performance may be varied by specification of external AP.
- As SCU is connected to the system, it can use DR Trigger mode and organize X-ray diagnosis environment with multi detectors.



## 7.3 Detector AP Mode

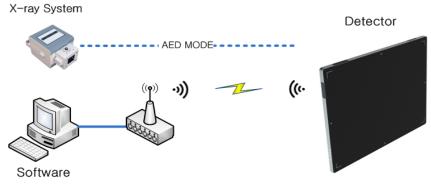


Figure 7.3 Detector AP Mode Connection

- The detector and PC with a wireless LAN card can communicate without SCU if the detector is used as AP. Wireless connection and its performance may be varied by specification of a wireless LAN card.
- As SCU is not connected to the system, it cannot use DR Trigger mode and should organize X-ray diagnosis environment with one detector.

### 7.4 Portable Mode

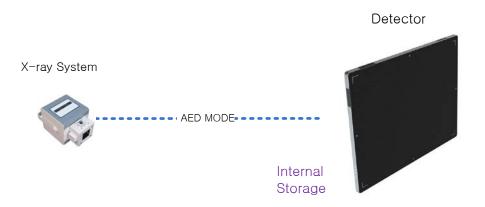


Figure 7.4 Portable Mode Connection

- Portable Mode can make exposure as using internal storage in the detector without a wireless connection.
- The images can be transmitted to a PC and used by connecting the detector to Viewer. The transmitting images in the detector are removed automatically.
- Image processing and correction are available after connecting the detector to Viewer.
- As SCU is not connected to the system, DR Trigger in X-ray Interface cannot be used.



## 7.5 Tether Interface Mode

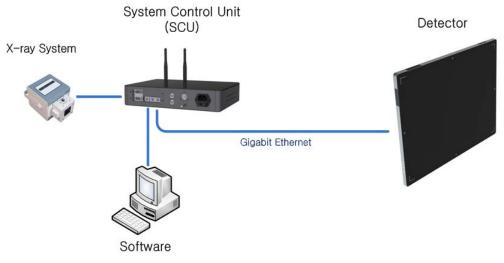


Figure 7.5 Tether Interface Connection

- Tether Interface is a wired connection with tether interface cables. It is used for consistent power supply and faster image transmission compared to a wireless connection as well as for setting a wireless connection.
- When the detector is connected to tether interface cables, it is not consumed battery but powered by SCU.
- A wireless module in the detector is deactivated since communication is made through wired connection.
- As SCU is connected to the system, it can use DR Trigger mode and organize X-ray diagnosis environment with multi detectors.



# 8. Functional Description

## 8.1 Wireless Communication

### 8.1.1 Specification

Description
IEEE802.11a/b/g/n
2.412 ~ 2.472GHz (13 Channels)
5.18 ~ 5.24GHz (4 Channels), 5.745 ~ 5.805GHz (4 Channels)
802.11b: Max. 11Mbps
802.11a/g: Max. 54Mbps
802.11n: Max. 300Mbps (MIMO 2X2)
OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
DSSS (CCK, DBPSK, DQPSK)
Max. 17dBm
WPA-PSK, WPA2-PSK
Two Dual Band Antennas (Detector: Internal, SCU: External)
-

Table 8.1 Wireless LAN Specification



## 8.1.2 Setting Parameters

Item	Description
AP ON/OFF	ON: Turns on Access Point function.
	The detector can use Detector AP Mode.
	OFF: Turns off the Access Point function.
	Only a wired communication is available to operate for SCU.
Frequency	2.4 Hz: Uses 2.4 Hz frequency band (13 channels)
	5 GHz: Uses 5 GHz frequency band (9 channels)
Country	KR, US, EU, JP, CN
	Serviceable channels are limited according to the countries you set.
Band	20 MHz: Basic frequency band.
	40 MHz: Enlarged frequency band through channel bonding.
	(Channel bonding is used for improving speed, but it can be lowered by the
	surrounding channels according to user environment)
Channel	Displays and sets a serviceable channel list.
	(+/-): Activated when using 40 Mb in frequency band. You can decide whether
	channel bonding is set to the upper or lower channel.
SSID / Key	Access identifier and password for wireless communication.
	The value of SSID/Key of the detector and SCU should be same, and avoid
	overlapping with other systems for preventing confusion.
Security	Security protocol for wireless communication
	WPA-PSK: Use TKIP encryption algorithm. 802.11n is not supported.
	WPA2-PSK: Use AES .encryption algorithm. 802.11n is supported.
	$\rightarrow$ For fast transmission, WPA2-PSK with intensified encryption algorithm is
	recommended since WPA-PSK cannot support 802.11n.
Guard Interval	802.11n provides 400ns option for time interval among transmission symbols in
	specification.
TX Power	Set RF power of the transmitter.

#### Table 8.2 Wireless LAN Setting Parameter



### 8.1.3 Wireless LAN Diagnostics

Item	Description
Interface	• Tether: Displays a wired connection status through tether interface.
	Wireless: Displays a wireless connection status.
Quality	The signal level of a wireless connection.
	• Displays 5 levels (max. 5 / min. 1), and if a warning sign is showed on
	Viewer at the 1 <sup>st</sup> level where communication is not stable, check the user
	environment.

Table 8.3 W	ireless LAN	Diagnostics
-------------	-------------	-------------

### 8.1.4 Initialization of Wireless Setup

#### 8.1.4.1 Initial Setting Value

Item	Component	Setting Values
ID Address (Subset Mask/Cotoway	Detector	169.254.1.10 / 255.255.0.0 / 169.254.0.1
IP Address/Subnet Mask/Gateway	SCU	169.254.2.100 / 255.255.0.0 / 169.254.0.1
AP ON/OFF	Detector	OFF
AP ON/OFF	SCU	ON
Frequency		2.4GHz
Band		20MHz
Channel		6
SSID		vivix
Кеу	SCU	1234567890
Security		WPA2-PSK
GI (Guard Interval)		800
IP Address/Subnet Mask/Gateway		100%



#### 8.1.4.2 Initial setup

#### Detector

- How to use VX Setup: When you execute Factory Reset in Configuration, the program starts up automatically after initialization.
- How to use a power button: If you press and hold the power button for 20 seconds when the detector equipped with a battery pack is turned off, the initialization process will begin with blinking orange LED. When the initialization is completed, the detector will be turned off. To use the detector, turn on the power again.



#### SCU

 When you execute Factory Reset in Configuration by using VXSetup, SCU starts up automatically after initialization.

### 8.2 Power Management

### 8.2.1 Power Supply

#### Battery

- Powered by batteries
- Operation Time: 4 Hours (Sleep Mode Off)
- Operation time increases in sleep mode depending on the operational condition and environment.

#### **Tether Interface**

- Powered by SCU. No battery consumption.
- Operation Time: Unlimited
- Power down option

You can set **Detector Power Off** in VXSetup through Tether Interface. The setting values are **SCU** and **Detector**. By default, **Detector** is set for the **Detector Power Off** mode.

- **SCU**: The detector will be turned off when SCU is turned off.
- Detector: The equipped battery pack will supply power to the detector when SCU is turned off.
   Press and hold the Power button on the detector for 3 seconds to turn off the detector.
   If you connect Tether Interface to the detector in wireless transmission mode, you can use it for a long time without battery consumption. At this time, even if you disconnect Tether Interface, the Detector setting allows you to use the detector without any boot time.

### 8.2.2 Battery Charging

Charging Source	Simultaneous Charging	Charging Time
Charger	3 battery packs	2hrs
Tether Interface	1 battery pack	4hrs

#### Table 8.5 Battery Charging

• You can use the detector while charging a battery by connecting tether interface.



### 8.2.3 Power Save Mode

- Power Save Mode is set for reducing battery consumption according to the user configuration.
- The mode is not operated when the detector is connected to tether interface. See the following description for each level.

Mode	Normal	Sleep	Shut Down
			A certain period of time has
		It has not been used for a	passed in Sleep Mode or
Entry Condition	Normal	certain period of time (idle state)	an idle state has been kept
	Norma		for a certain period of time
			when Sleep Mode is set to
			OFF.
Status Display	All LED on	POWER LED (green) blinking	All LED off
	All LED on	Status notification from Viewer	
		ON/OFF	ON/OFF
Setting Item	-	Entry time	Entry time
		(10/15/20/25/30min.)	(30/60/90/120min.)
Initial Value	_	OFF	OFF
	-	10min.	60min.
Return Condition	n - User input through Viewer	Normal operating condition	
			(button)
Return Time	-	Average 5 sec.	Average 40 sec.
Rower Consumption	24V,	24 / Mox 180m	
Power Consumption	Max.500mA	24V, Max.180mA	-

Table 8.6Power Save Mode

### 8.2.4 Battery Diagnostics

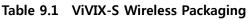
Item	Description
Voltage	Displays the current battery voltage.
Level	Displays battery remaining.
	Displays 5 levels (max. 5 / min. 1), and a warning sign shows on Viewer for
	battery replacement at the 1 <sup>st</sup> level. The power is shut off automatically after a
	certain period of time to protect the system.

#### Table 8.7 Battery Diagnostics



# 9. Packaging and Contents

Detector (FXRD-1417WA/B)	System Control Unit (FXRS-03A)
Battery Charger	Battery Pack
Generator Interface Cable (15M)	LAN Cable (Gigabit LAN, 15M)
AC Power Cable	Tether Interface
C .	
Insta	allation Software CD
Viewer:	VXvue
Calibration SW:	VXSetup
Calibration Data	





# 10. How to Install

## **10.1** Hardware Installation

This section describes how to connect the flat panel imaging system (detector) whose model name is FXRD-1417WA(B).



Installation of this equipment should be made by licensed and authorized personnel.

### 10.1.1 FXRD-1417WA (B)

1 Connect the one end of the generator interface cable to the EXT\_INF port of SCU, and the other to the port of the X-ray generator.



2 Connect the one end of the LAN cable to Port 1 of SCU, and the other to the LAN Card Connector of workstation assigned for the Data Transfer.





3 Make an antenna of SCU stand upright.



4 To transmit image data using Tether Interface, connect the one end of the Tether Interface cable to Port 4 or Port 5 of SCU.







5 Connect the power cable to the AC port of the SCU to supply power.



This equipment must only be connected to a supply mains with protective earth.



6 Turn on the power switch in front of the SCU.





7 Attach a fully charged battery pack to the detector. To attach the battery pack, slide the battery pack into the battery compartment of the detector. Make sure that the claws on the battery pack are aligned with the groove on the battery compartment. Slide the battery lock lever until it clicks into place.



8 Press the power button of the detector for 1 second to turn on the detector. Press and hold the power button of the detector for 3 seconds to turn off the detector.



9 When you have finished using the detector, press and hold the power button for 3 seconds to turn off the detector. Remove the battery pack if the detector will not be used for some time. To remove the battery pack, slide the battery lock lever to release it, put your fingers on the battery compartment groove that lifts up, and then pull out the battery pack.



When the detector is not be used for some time, remove the battery pack. Otherwise, over discharge may occur, resulting in shortened battery life.



## **10.2 Software Installation**

### **10.2.1** Intel Gigabit Controller Driver Installation and Setting

Before installing Intel Gigabit Controller Driver, make sure your Ethernet Card is properly
 installed on the workstation.
The recommended Ethernet Card is $Intel^{ extsf{B}}$ Gigabit CT or later. And also, Ethernet Card
supporting 1 Gbps or above is available.
Gigabit LAN card must support the following requirements.
[Jumbo Frames: 9014 Byte], [Receive Descriptors: 2048]



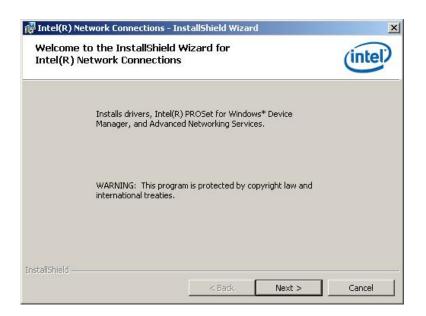
This is not a component of ViVIX-S but recommend component. So, you have to use installation package designed for your Gigabit Controller.
1~8 steps may differ according to Gigabit Controller to use.
Following procedures are provided as an example to refer to.

1 Click **PROXP.exe** to start InstallShield Wizard, and then click the **Run** button.





#### 2 Click the **Next** button.



3 Accept the license agreement and click the **Next** button.

License Agreement Please read the following license agree	ement carefully.	(intel
INTEL SOFTWARE LICE	NSE AGREEMENT (Final,	License)
IMPORTANT - READ BEFOR	RE COPYING, INSTALLIN	G OR USING.
'Software") until you have carefully	read the following term	
"Software") until you have carefully oading or using the Software, you a do not wish to so agree, do not insta	read the following term agree to the terms of thi	is and conditions. By
"Software") until you have carefully oading or using the Software, you a do not wish to so agree, do not insta _ICENSES: Please Note:	rread the following term agree to the terms of this all or use the Software.	is and conditions. By
"Software") until you have carefully loading or using the Software, you a do not wish to so agree, do not insta LICENSES: Please Note: I accept the terms in the license agreer I do not accept the terms in the license	rread the following term agree to the terms of this all or use the Software.	as and conditions. By s Agreement. If you



4 Select the components to install and click the **Next** button.

Intel(R) Network Connections	×
Setup Options Select the program features you want installed.	(intel)
Install:	
<ul> <li>✓ Drivers</li> <li>✓ Intel(R) PROSet for Windows* Device Manager</li> <li>✓ Advanced Network Services</li> <li>✓ Intel(R) Network Connections SNMP Agent</li> </ul>	
Feature Description	
< Back	

5 Click the **Install** button.

eady to Install the Program The wizard is ready to begin installation.	(intel
Click Install to begin the installation.	
If you want to review or change any of your installation exit the wizard.	n settings, click Back. Click Cancel to



6 When the following message appears, click the **Continue Anyway** button.



7 Installation status bar appears in Installing Intel® Network Connections dialog box.

🙀 Intel(R) I	Network Connections - InstallShield Wizard	
	Intel(R) Network Connections ram features you selected are being installed.	(intel)
P	Please wait while the InstallShield Wizard installs Intel(R) Network Connections. This may take several minutes.	
	Status:	
	Compiling MOFs	
InstallShield -		
Tuzranomero -		
	< <u>Back</u> <u>N</u> ext >	Cancel



ViVIX-S Wireless Service Manual

8 Click the **Finish** button.



#### 10.2.2 Gigabit Controller Setting on Windows XP

1 Click Start > Setting > Control Panel > Network Connections to open the Network Connections dialog box, and then rename Local Area Connection with GigE.

Network Connections					
e <u>E</u> dit <u>V</u> iew F <u>a</u> vorites (	[ools	Advanced	Help		2
) Back 🔹 🕥 🖌 🏂 🎾	Sear	ch 📂 Fold	iers 🛄 🕶		
dress 💊 Network Connections					💌 🄁 Go
		Name	Туре	Status	Device Name
Network Tasks *		LAN or Hig	gh-Speed In	ternet	
Create a new connection		L SCU	LAN or	Network cabl	Broadcom NetXtreme Gigabit Ethernet
Set up a home or small office network		📥 DICOM	LAN or LAN or	Connected Limited or no	Broadcom NetXtreme 57xx Gigabit Con Intel(R) PRO/1000 GT Desktop Adapte
Change Windows Firewall settings					
See Also *					
🔱 Network Troubleshooter					
	-	•			•



It is not necessary to change name with GigE. It just distinguishes between that connection and other connections.

2 Right-click the **GigE** and then click the **Properties**.



3 Uncheck all checkboxes except Vieworks Image Filter Driver or GigaLinx Image Filter Driver and Internet Protocol [TCP/IP].

	00 GT Desktop Adap	<u>C</u> onfigure
his c <u>o</u> nnection uses th	Location: Slot 5 ne f(MAC Address: 00	-1B-21-19-4E-9F
■ Over the second s	col (TCP/IP)	
Install	<u>U</u> ninstall	Properties
	acket Scheduler. This ffic control, including r	
prioritization services		
prioritization services	ation area when conn	ected

4 Click the **Internet Protocol [TCP/IP]** and set the IP as shown below, and then click the **Advanced** button.

ou can get IP settings assigned is capability. Otherwise, you ne e appropriate IP settings.							
C <u>O</u> btain an IP address autor	natically						
Use the following IP addres	ss:						
<u>I</u> P address:	1	69.2	54.	0	. 50		
S <u>u</u> bnet mask:	255 . 255 . 0 . 0						
<u>D</u> efault gateway:		9		_	12		
C Obtain DNS server addres:	s automatio	ally					
Use the following DNS service	ver addres	ses: —					
Preferred DNS server:		÷	•		•		
<u>A</u> lternate DNS server:					•		
					A.4.	anced.	



5 Click the **OK** button to close the dialog box.

🔓 GigE Properties	? ×
General Advanced	
Connect using:	
Intel(R) PRO/1000 GT Desktop Adap	onfigure
Location: Slot 5 This connection uses the f(MAC Address: 00-1B-21-1	9-4E-9F
Client for Microsoft Networks     Elie and Printer Sharing for Microsoft Network     Elie and Printer Scheduler     Cos Packet Scheduler     S Thternet Protocol (TCP/IP)	\$
Install Uninstall Pr	operties
Description Quality of Service Packet Scheduler. This compone provides network traffic control, including rate-of-flow prioritization services.	
<ul> <li>Show icon in notification area when connected</li> <li>Notify me when this connection has limited or no connection</li></ul>	onnectivity
OK	Cancel

6 Click Start > Setting > Control Panel > Network Connections to open the Network Connections dialog box, and right-click GigE, and then click Properties to open the GigE Properties dialog box. Click the Configure button to open the following dialog box, and then go to the Advanced tab.

	0/1000 GT Des	sktop Adapter #2 Properties				
Teaming General	VLANs	Boot Options Driver Resources d Advanced Power Management				
	ntel(R) PRO/100	00 GT Desktop Adapter #2				
[	Device type:	Network adapters				
ħ	Manufacturer:	Intel PCI Slot 5 (PCI bus 5, device 4, function 0)				
L	_ocation:					
	re having proble e troubleshooter.	ms with this device, click Troubleshoot to				
		ms with this device, click Troubleshoot to				
start the	e troubleshooter. age:	×				
	e troubleshooter.					



7 Set the **Jumbo Frames** to the maximum value.

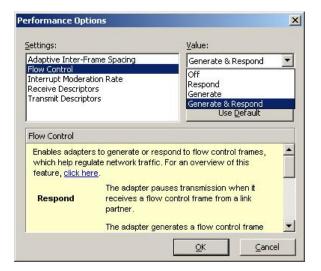
l(R) Gigabit CT Deskto	p Adapter	Prope	rties	3
Teaming VLA			Options	Driver
General Link Speed	h Ad	lvanced	Power	Management
Advanced	Adapter Se	:ttings		
ettings:		7	/alue:	
Gigabit Master Slave Mode	8	•	Disabled	-
lumbo Packet _ocally Administered Addre:			Disabled	
Log Link State Event	20		4088 Bytes	
Performance Options			9014 Bytes	
Priority & VLAN [CP/IP Offloading Options]				
Vait for Link		-	Use <u>D</u>	efault
lumbo Packet				
Enables Jumbo Packet ca where large packets mak latency can be tolerated, utilization and improve wi	e up the ma Jumbo Pacl	ajority of kets can	traffic and a	
Jumbo Packets are larger are approximately 1.5k in		ard Ethe	rnet frames,	which
are approximately 1.5k in				
Note: Changing loss of connecti	8390 <b>T</b>	may ca	use a momen	tary

8 Choose **Performance Options** in the list of Settings and click the **Properties** button on the right.

tel(R) PRO/1	000 GT Desktop	Adapter #2 P	roperties	<u>? ×</u>
Teaming General	VLANs B Link Speed	oot Options   Advanced	Driver R Power Man	esources   agement   
Settings:	Advanced Ada;	oter Settings		
Jumbo Fram Locally Admi Log Link Sta Performance QoS Packet	nistered Address te Event Coptions Tagging Dading Options		<u>P</u> roperties	
Performanc Configures performan	the adapter to use	e settings that ca	n improve adapte	er 🗡
			ОК	Cancel



9 Choose Flow Control in the list of Settings and Rx & Tx Enabled in the list of Value as shown below.

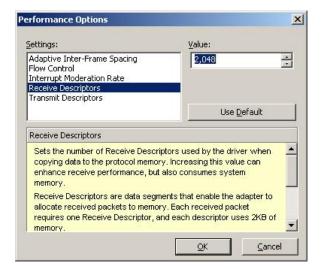


10 Choose **Interrupt Moderation Rate** in the list of Settings and **Extreme** in the list of Value as shown below.

jettings:	<u>V</u> alue:
Adaptive Inter-Frame Spacing Flow Control	Extreme 💌
Interrupt Moderation Rate Receive Descriptors Transmit Descriptors	Off Minimal Low Medium High
Interrupt Moderation Rate	Extreme Adaptive
This sets the rate at which the cor generation of interrupts making it p throughput and CPU utilization. The adjusts the interrupt rates dynamic and network usage. Choosing a di petwork and system performance	oossible to optimize network e default setting (Adaptive) cally depending on traffic type
network and system performance	utilization increases at higher



11 Choose **Receive Descriptors** and set to the maximum value.



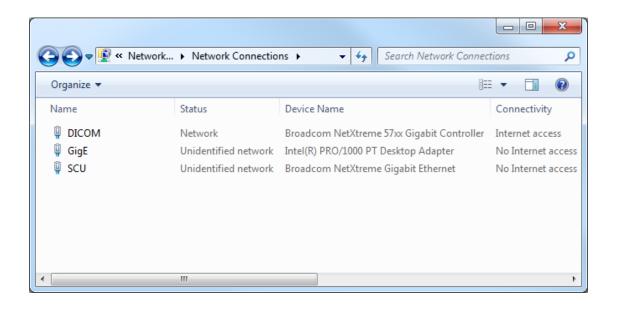
12 Click the **OK** button.



### **10.2.3 Gigabit Controller Setting on Windows 7**

## 1 Click Start > Control Panel > Network and Internet > Network and Sharing Center > Change

Adapter Setting and then rename Local Area Connection with GigE.





It is not necessary to change name with GigE. It just distinguishes between that connection and other connections.

2 Right-click the **GigE** and then click the **Properties**.



3 Uncheck all checkboxes except Vieworks Image Filter Driver or GigaLinx Image Filter Driver and Internet Protocol [TCP/IP].

Connect using:		
Intel(R) Gi	gabit CT Desktop Adapter	
		Configure
This connection	uses the following items:	
Viework	s Image Filter Driver	
🗆 📮 QoS Pa	cket Scheduler	
🗆 🔒 File and	Printer Sharing for Microsoft	Networks
🗹 🔺 Internet	Protocol Version 6 (TCP/IP)	/6)
🗹 📥 Internet	Protocol Version 4 (TCP/IP)	(4)
🗌 🔺 Link-La	yer Topology Discovery Map	per I/O Driver
🗌 🔺 Link-La	ver Topology Discovery Res	oonder
•	III	,
Install	<u>U</u> ninstall	Properties
		<u></u>
Description		component
Description	rice Packet Scheduler This	
Quality of Serv	rice Packet Scheduler. This ork traffic control, including re	

4 Click the **Internet Protocol [TCP/IP]** and set the IP as shown below, and then click the **Advanced** button.

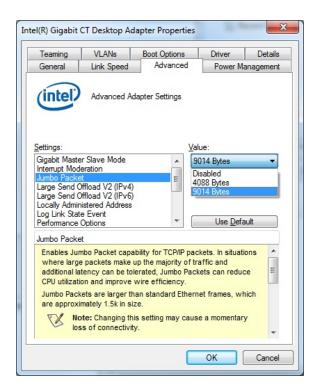
Internet Protocol Version 4 (TCP/IPv4) F	Properties ? X
General	
You can get IP settings assigned autom this capability. Otherwise, you need to for the appropriate IP settings.	
Obtain an IP address automatically	ly
Use the following IP address:	
IP address:	169.254.0.55
Subnet mask:	255.255.0.0
Default gateway:	· · ·
Obtain DNS server address autom	natically
• Use the following DNS server addr	resses:
Preferred DNS server:	
Alternate DNS server:	· · ·
🔲 Validate settings upon exit	Ad <u>v</u> anced
	OK Cancel



5 Click Start > Control Panel > Network and Internet > Network and Sharing Center > Change
 Adapter Setting, right-click GigE, and then click Properties to open the GigE Properties dialog box.
 Click the Configure button to open the following dialog box, and then go to the Advanced tab.

General         Link Speed         Advanced         Power Mana           Intel(R) Gigabit CT Desktop Adapter         Device type:         Network adapters           Manufacturer:         Intel         Location:         PCI bus 3, device 0, function 0           Device status         Intel cevice is working property.         Intel cevice is working property.	anageme
Device type: Network adapters     Manufacturer: Intel     Location: PCI bus 3, device 0, function 0  Device status	
Manufacturer: Intel Location: PCI bus 3, device 0, function 0 Device status	
Location: PCI bus 3, device 0, function 0 Device status	
Device status	
	Ŧ

6 Set **Jumbo Packet** to the maximum value.





7 Choose **Performance Options** in the list of **Advanced** and click the **Properties** button on the right side.

intel(R) Gigabit CT Desktop Adap	oter Properties		X
Teaming         VLANs         Boot Options         Driver         Details           General         Link Speed         Advanced         Power Management			
Advanced Adap	oter Settings		
<u>S</u> ettings:			
Interrupt Moderation Jumbo Packet Large Send Offload V2 (IPv4) Large Send Offload V2 (IPv6) Locally Administered Address Log Link State Event	-	<u>P</u> ropertie	S
Performance Options Priority & VLAN Performance Options	-		
Configures the adapter to use performance.	settings that can	improve adap	ter 🔶
			Ŧ
		ОК	Cancel

8 Choose Flow Control in the list of Settings and choose Rx & Tx Enabled in the list of Value as shown below.

Performance Opti	ons	x	
Settings: Adaptive Inter-F	rame Spacing	Value:	
Flow Control		Disabled	
Interrupt Moderation Rate Tx Enabled Receive Buffers Rx Enabled		Tx Enabled	
	Use Default		
Flow Control			
· · · · · · · · · · · · · · · · · · ·	ers to generate or respone ulate network traffic. For <u>ere</u> .		
Tx Enabled	The adapter pauses tra receives a flow control	nsmission when it frame from a link partner.	
Rx Enabled	The adapter generates a flow control frame d when its receive queue reaches a pre-defined		
	(	OK <u>C</u> ancel	



9 Choose **Interrupt Moderation Rate** in the list of **Settings** and choose **Extreme** in the list of **Value** as shown below.

Settings:	<u>V</u> alue:
Adaptive Inter-Frame Spacing Flow Control Interrupt Moderation Rate Receive Buffers Transmit Buffers	Extreme Off Minimal Low Medium High Extreme
Interrupt Moderation Rate	Adaptive
This sets the rate at which the cor generation of interrupts making it p throughput and CPU utilization. The adjusts the interrupt rates dynamic and network usage. Choosing a di network and system performance	ossible to optimize network default setting (Adaptive) ally depending on traffic type fferent setting may improve
	utilization increases at higher

10 Set **Receive Descriptors** to the maximum value.

Settings:	<u>V</u> alue:
Adaptive Inter-Frame Spacing Flow Control Interrupt Moderation Rate	2048
Receive Buffers Transmit Buffers	
Transmit burrers	Use Default
	Osc <u>D</u> eridan
Receive Buffers	
Sets the number of Receive Buffer copying data to memory. Increasing receive performance, but also cons	this value can enhance sumes system memory.
You might choose to increase the r	number of Receive Buffers if the performance of received

11 Click the **OK** button.



## **10.2.4** VXvue Installation

User must follow instructions below to protect against cyber security threats such as virus and worms.

- Prior to installing and using VXvue, scan the computer system with anti-virus software to make sure the system is virus free.
- Install, setup and enable adequate anti-virus software.
- The operating system should be updated frequently to protect VXvue against harmful activities.
- If you have a cyber security problem, contact the manufacturer on the phone or by email referring to the contact information in this manual.
- 1 Insert the CD/DVD into the CD Drive.
- 2 Run **Setup.exe**.
- 3 Click the **Yes** button when the following dialog appears. The dialog may not appear depending on your Windows settings.

😗 Use	er Account Control	
1		to allow the following program from an blisher to make changes to this computer?
	Program name: Publisher: File origin:	setup.exe <b>Unknown</b> Hard drive on this computer
ي چ	Show details	Yes No
		Change when these notifications appear



4 The prerequisites for VXvue installation are displayed in the **VXvue – InstallShield Wizard** dialog, then click the **Install** button. The installation may take several minutes depending on your system environment.

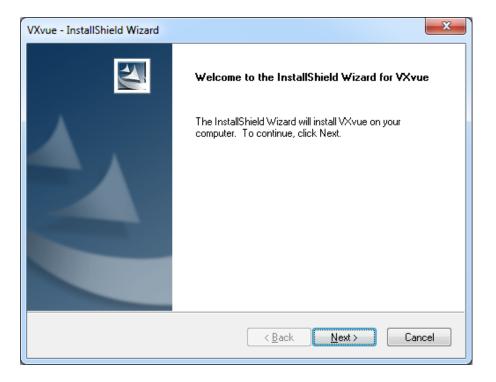
owing items to be installed on your computer. Click Install to begin nents.
2008 Express R2 (x86)
Install Cancel



The items listed under the **Requirement** may from the above figure depending on your system environment.



5 When the prerequisites for VXvue installation have been installed, click the **Next** button.



6 A driver for recognizing license hardware key will be installed on your system during setup process. If the window installing the driver appears, do not close the window and wait for the installation to complete.





7 Choose the application type and click the **Next** button.

VXvue - InstallShield Wizard	×
Setup Type Select the setup type that best suits your needs.	
Select the application type.	
VXvue for Human.	
○ VXvue for Vet.	
InstallShield	
< <u>B</u> ack <u>N</u> ext	> Cancel

8 Choose the folder location where you want to save VXvue data. The default destination is D:\Database. To change the folder location, click the **Browse** button to locate the folder.

VXvue - InstallShield W	lizard			×
Choose Database I	Folder			12
Select the applicatio	n type.			
- Destination Folder				
D:\Database			B	iowse
InstallShield				
		< <u>B</u> ack	<u>N</u> ext ≻	Cancel



9 Click the **Install** button to begin VXvue installation.

VXvue - InstallShield Wizard
Ready to Install the Program The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield

10 The installation process will continue and a progress bar will be displayed in the **Setup Status** window.

VXvue - InstallShield Wizard	×
Setup Status	No.
The InstallShield Wizard is installing VXvue	
Generating script operations for action:	
InstallShield	Cancel



11 When Filter Driver installation dialog appears after installing VXvue, choose BroadLinx Universal Filter Driver and click the Next button.

Vieworks Imaging Solution GigE Driver Manager				
Please select the type of the driver to install, uninstall or configure				
- Can be installed over any network adapter card - Provides excellent performance				
< Back Next > Cancel				



12 Select the network interface card connected to SCU and click the **Next** button.

Vieworks Ir	maging Solution GigE Driver Manager
<b></b>	Configure BroadLinx Universal Filter Driver
(	Install BroadLinx Universal Filter Driver on these network interfaces:
	Intel(R) Gigabit CT Desktop Adapter     Intel(R) 82579LM Gigabit Network Connection
	VMware Virtual Ethernet Adapter for VMnet1 VMware Virtual Ethernet Adapter for VMnet8
	Uninstall BroadLinx Universal Filter Driver
	< <u>B</u> ack <u>N</u> ext > Cancel



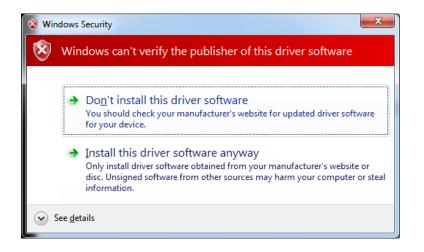
The above figure may vary depending on your system environment.

13 The progress of Filter Driver installation will be displayed.

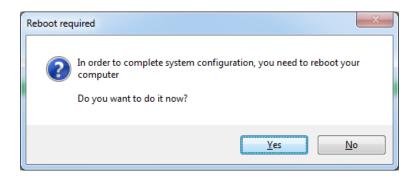
Vieworks Imaging Solution GigE Driver Manager
Please wait while Driver Manager configures your system
Installing BroadLinx Universal Filter Driver
< Back Next > Cancel



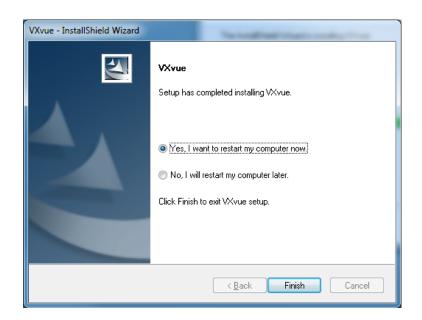
14 Click Install this driver software anyway when the following dialog appears.



15 After completing installation, click the **No** button to continue with the VXvue installation.



16 Click the **Finish** button to restart the computer.







- 17 Now the VXvue software and data are successfully installed in each directory as shown below.
  - Software: C:\program files\VXvue
  - Image and other data: D:\Database or user defined folder
  - Executable File
  - VXvue.exe: Image Viewer
  - VXSetup.exe: Calibration Software

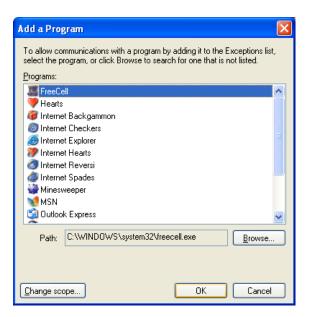


# 10.2.5 Allowing VXvue to communicate through Windows Firewall on Windows XP

- 1 Click Start > Setting > Control Panel > Windows Firewall and then click the Exceptions tab.
- 2 Click the **Add Program...** button.

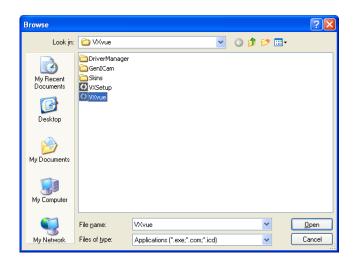
🐱 Windows Firewall 🛛 🔀
General Exceptions Advanced
Windows Firewall is blocking incoming network connections, except for the programs and services selected below. Adding exceptions allows some programs to work better but might increase your security risk.
Programs and Services:
Name
File and Printer Sharing
Network Diagnostics for Windows XP
Remote Assistance     Remote Desktop
Add Program Add Port Edit Delete
☑ Display a <u>n</u> otification when Windows Firewall blocks a program
What are the risks of allowing exceptions?
OK Cancel

3 Click the **Browse** button and locate C:\Program files\VXvue\VXvue.





4 Click the **Open** button.



5 Select the **VXvue** and then click the **OK** button.

Add a Program
To allow communications with a program by adding it to the Exceptions list, select the program, or click Browse to search for one that is not listed. Programs:
<ul> <li>Internet Reversi</li> <li>Internet Spades</li> <li>Minesweeper</li> <li>MSN</li> <li>Duttook Express</li> <li>Pinball</li> <li>Solitaire</li> <li>Spider Solitaire</li> <li>VXvue</li> </ul>
🔏 Windows Messenger 🎕 Windows Movie Maker 🗸 🗸 🗸
Path: C:\Program Files\WXvue\WXvue.exe Browse
Change scope OK Cancel



6 Check the **VXvue** to select and then click the **OK** button.

🖗 Windows Firewall
General Exceptions Advanced
Windows Firewall is blocking incoming network connections, except for the programs and services selected below. Adding exceptions allows some programs to work better but might increase your security risk.
Programs and Services:
Name
☐ File and Printer Sharing ☑ Network Diagnostics for Windows XP
✓ VXvue
Remote Assistance
Remote Desktop     UPnP Framework
Add Program Add Port <u>E</u> dit <u>D</u> elete
Display a notification when Windows Firewall blocks a program
What are the risks of allowing exceptions?
OK Cancel



# 10.2.6 Allowing VXvue to communicate through Windows Firewall on Windows 7

- 1 Click Start > Control Panel > Windows Firewall.
- 2 Click Allow a program or feature through Windows Firewall.

			_ • • • •
😋 🕞 🗢 🔐 🕨 Control Panel 🔸	All Control Panel Items    Windows Firewall		✓ 49 Search Con
Control Panel Home	Help protect your computer with	Windows Firewall	0
Allow a program or feature through Windows Firewall	Windows Firewall can help prevent hackers through the Internet or a network.	or malicious software from gaining access to your computer	
😵 Change notification settings	How does a firewall help protect my comp	uter?	
Turn Windows Firewall on or off	What are network locations?		
Restore defaults	Home or work (private) r	networks Not Connected 😒	
Advanced settings Troubleshoot my network	Public networks	Connected 🛞	
Troubleshoot my network	Networks in public places such as airports	or coffee shops	
	Windows Firewall state:	On	
	Incoming connections:	Block all connections to programs that are not on the list of allowed programs	
	Active public networks:	Unidentified network	
	Notification state:	Notify me when Windows Firewall blocks a new program	
See also			
Action Center			
Network and Sharing Center			

3 Click the **Change settings** button if it is enabled and then click the **Allow another program** button.

Control Panel + All Control Panel Items + Windows Firewall + Allowed Programs Control Panel + All Control Panel Items + Windows Firewall To add, change, or remove allowed programs and pots, click Change settings. What are the risks of allowing a program to communicate?   What are the risks of allowing a program to communicate?   What are the risks of allowing a program to communicate?   Image: State Control Panel Items   What are the risks of allowing a program to communicate?   Image: State Control Panel Items   What are the risks of allowing a program to communicate?   Image: State Control Panel Items   Image: State Control Items   Image: State Control Panel Items   Image: State Control Items   Image: State Control Panel Items   Image: State Control Panel Items   Image: State Control Panel Items   Image: State Contrel Items   I						C
To add, change, or remove allowed programs and ports, click Change settings:          What are the risks of allowing a program to communicate?       @Change settings         Allowed programs and features:          Name       Home/Work (Private)       Public         Øllowed programs and features:           Manuab Report           BranchCache - Content Retrieval (Uses HTTP)           BranchCache - Hosted Cache Client (Uses HTTPS)           BranchCache - Hosted Cache Server (Uses HTTPS)           ChameleonSetup           ChameleonSetup            Connect to a Network Projector            Daemonu.exe	🔾 🕞 🚽 🕨 Control Panel 🕨	All Control Panel Items   Windows Firewall  Allowed Program	5		▼ 4 Sear	rch
To add, change, or remove allowed programs and ports, click Change settings:          What are the risks of allowing a program to communicate?         Allowed programs and features:         Name       Home/Work (Private)         Public C         PanchCache - Conternt Retrieval (Uses HTTP)         BranchCache - Hosted Cache Client (Uses HTTPS)         BranchCache - Hosted Cache Server (Uses HTTPS)         BranchCache - Pero Discover (Uses HTTPS)         ChameleonSetup         ChameleonSetup Zee         Connect to a Network Projector         Connect to a Network Projector         Daemonu.exe         Daemonu.exe						
To add, change, or remove allowed programs and ports, click Change settings. What are the risks of allowing a program to communicate?  Allowed programs and features:  Name Home/Work (Private) Public MAInLab Report BranchCache - Content Retrieval (Uses HTTP) BranchCache - Hosted Cache Client (Uses HTTP) BranchCache - Hosted Cache Server (Uses HTTP) BranchCache - Peer Discovery (Uses WSD) ChameleonSetup ChameleonSetup Ze Connect to a Network Projector Connect to a Network Projector Daemonu.exe Details Remove		Allow programs to communicate through Window	s Firewall			
What are the risks of allowing a program to communicate?       Change settings         Allowed programs and features:       Image: Change settings         Marne       Home/Work (Private)       Public         BranchCache - Content Retrieval (Uses HTTP)       Image: Change settings         BranchCache - Hosted Cache Server (Uses HTTPS)       Image: Change settings         ChameleonSetup       Image: Change settings         ChameleonSetup       Image: Change settings         Connect to a Network Projector       Image: Change settings         Daemonu.exe       Image: Change settings						
Allowed programs and features:         Name       Home/Work (Private)       Public         Ø AhmLab Report       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)         BranchCache - Hosted Cache Client (Uses HTTPS)       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)         BranchCache - Hosted Cache Server (Uses HTTPS)       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)         BranchCache - Hosted Cache Server (Uses HTTPS)       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)         ChameleonSetup       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)         ChameleonSetup       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)         ChameleonSetup       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)         ChameleonSetup       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)         ChameleonSetup       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)         Daemonu.cex       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)       Image: Carlow (Uses HTTP)         Daemonu.cex       Image: Carlow (Uses HTTP)       Image: Carlow						
Name     Home/Work (Private)     Public       Ø AhnLab Report     Ø       BranchCache - Content Retrieval (Uses HTTP)     Ø       BranchCache - Hosted Cache Client (Uses HTTPS)     Ø       BranchCache - Peor Discovery (Uses MTDS)     Ø       Ø ChameleonSetup     Ø       Ø chameleonSetup     Ø       Ø chameleonSetup     Ø       Ø concect to a Network Projector     Ø       Ø Daemonu.cee     Ø       Ø Daemonu.cee     Ø		what are the risks of allowing a program to communicate:	() Cha	nge settings		
AhnLab Report       Image: Carlos - Content Retrieval (Uses HTTP)       Image: Carlos - Hosted Cache Client (Uses HTTP)         BranchCache - Hosted Cache Server (Uses HTTPS)       Image: Cache Client (Uses HTTP)         BranchCache - Hosted Cache Server (Uses HTTPS)       Image: Cache Client (Uses HTTP)         BranchCache - Hosted Cache Server (Uses HTTP)       Image: Cache Client (Uses HTTP)         ChameleonSetup       Image: Cache Client (Uses HTTP)         ChameleonSetup       Image: Cache Client (Uses HTTP)         ChameleonSetup       Image: Cache Client (Uses HTTP)         Connect to a Network Projector       Image: Cache Client (Uses HTTP)         Daemonu.coe       Image: Cache Client (Uses HTTP)         Deamonu.coe       Image: Cache Client (Uses HTTP)         Cache Client (Uses HTTP)       Image: Cache Client (Uses HTTP)         Deamonu.coe       Image: Cache Client (Uses HTTP)         Cache Client (Uses HTTP)       Image: Cache Client (Uses HTTP)         Deamonu.coe       Image: Cache Client (Uses HTTP)		Allowed programs and features:				
BranchCache - Content Retrieval (Uses HTTP)		Name	Home/Work (Private)	Public 🖍		
BranchCache - Content Retrieval (Uses HTTPS)		AhnLab Report		<b>=</b>		
BranchCache - Hosted Cache Server (Uses HTTPS)		BranchCache - Content Retrieval (Uses HTTP)				
BranchCache - Peer Discovery (Uses WSD)       Image: Construction of the set of t		BranchCache - Hosted Cache Client (Uses HTTPS)				
ChameleonSetup       Image: ChameleonSetup         ChameleonSetup.exe       Image: ChameleonSetup         Connect to a Network Projector       Image: ChameleonSetup         Core Networking       Image: ChameleonSetup         Daemonu.exe       Image: ChameleonSetup         Deamonu.exe       Image: ChameleonSetup         Details       Remove		BranchCache - Hosted Cache Server (Uses HTTPS)				
ChameleonSetup ChameleonSetup Connect to a Network Projector Connect to a Network Projector Core Networking Daemonu.exe Daemonu.exe Details Remove		BranchCache - Peer Discovery (Uses WSD)				
Image: Chameleonstup.exe     Image: Chameleonstup.exe       Image: Connect to a Network Projector     Image: Connect to a Network Projector       Image: Connect to a Network Projector     Image: Connect to a Network Projector       Image: Connect to a Network Projector     Image: Connect to a Network Projector       Image: Connect to a Network Projector     Image: Connect to a Network Projector       Image: Connect to a Network Projector     Image: Connect to a Network Projector       Image: Connect to a Network Projector     Image: Connect to a Network Projector       Image: Connect to a Network Projector     Image: Connect to a Network Projector       Image: Connect to a Network Projector     Image: Connect to a Network Projector       Image: Connect to a Network Projector     Image: Connect to a Network Projector       Image: Connect to a Network Projector     Image: Connect to a Network Projector       Image: Connect to a Network Projector <td></td> <td>ChameleonSetup</td> <td></td> <td></td> <td></td> <td></td>		ChameleonSetup				
Connect to a Network Projector		□ ChameleonSetup				
Core Networking Deemonu.exe Deemonu.exe Remove Remove						
Daemonu.exe Z v Deemonu.exe Detaijs Remove		Connect to a Network Projector				
Deemonu.exe						
Detaijs Remove						
		Daemonu.exe		<b>V</b> -		
Allow another program			Detai <u>l</u> s	Re <u>m</u> ove		
Anot of other programme			Allow anothe	er program		
			, more direction	i programm		
			ОК	Cancel		
OK Cancel						



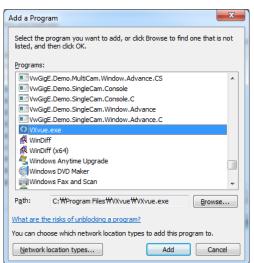
4 Click the **Browse** button and locate C:\Program files\VXvue\VXvue.exe.

Add a Program
Select the program you want to add, or click Browse to find one that is not listed, and then click OK.
Programs:
AhnLab Report
AhnLab V3 Internet Security 8.0
🚰 Araxis Merge v6.5
Build Notifications
CD & DVD Copy Demo
Configure HHD Device Monitoring Studio 6.35
Create a System Repair Disc
Data CD.DVD Burner Full Demo
Data CD.DVD Burning MFC Demo (Unicode)
Data Profile Viewer
Device Monitoring Studio
Path: C:\Program Files\AhnLab\V3IS80\AhnRp Browse
What are the risks of unblocking a program?
You can choose which network location types to add this program to.
Network location types Add Cancel

5 Click the **Open** button.

Organize • New fold	er				担 •	
🛊 Favorites	Name	Date modified	Туре	Size		
E Desktop	DriverManager	2012-04-10 오후 1:	File folder			
Downloads	📕 GeniCam	2012-04-10 9.0 1:	File folder			
Secent Places	A Skins	2012-04-22 오후 5:	File folder			
	VXSetup.exe	2012-04-19 오루 1	Application	490 KB		
Libraries	VXvue.exe	2012-04-19 오= 1	Application	824 KB		
Documents	1.0					
Music						
Pictures						
Videos						
Videos						
Videos						
<ul> <li>Videos</li> <li>Computer</li> <li>Local Disk (C:)</li> </ul>						
Videos						
Videos Computer Local Disk (C:) DATAL (D:)						
Videos Computer Local Disk (C) DATAL (D:) DATA2 (E:)						

6 Select the **VXvue** and then click the **Add** button.





Add **VXSetup** (located in C:\Program files\VXvue\VXSetup.exe) in the same manner as described above.

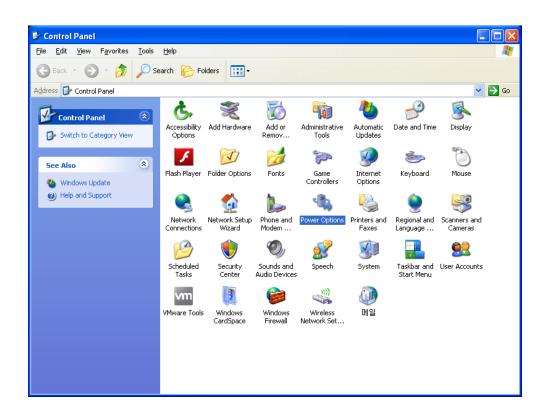


## **10.2.7** Disabling Standby Mode in Windows XP



If you use standby mode in Windows XP, Viewer may not work normally.

1 Click Start > Control Panel > Power Options.





2 Click the **Power Schemes** tab and then select **Never** in **System standby**.

Power Options Prope	rties 🔹 🤶 🔀				
Power Schemes Advan	ced Hibernate UPS				
this computer.	Select the power scheme with the most appropriate settings for this computer. Note that changing the settings below will modify the selected scheme.				
Power schemes					
Max Battery	×				
	Save As Delete				
Settings for Max Batter	ry power scheme				
Turn off <u>m</u> onitor:	After 15 mins				
Turn off hard disks:	Never				
System standby:	Never				
	OK Cancel Apply				

3 Click the **Apply** button.

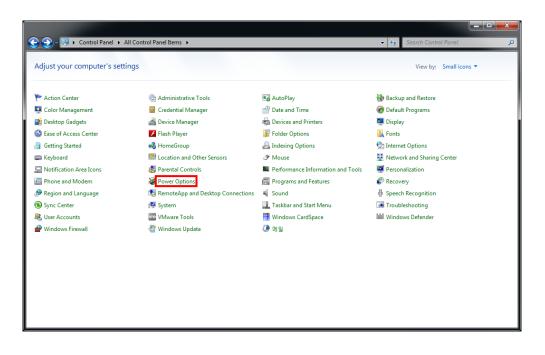


## 10.2.8 Disabling Sleep Mode in Windows 7



If you use sleep mode in Windows 7, Viewer may not work normally.

1 Click Start > Control Panel > Power Options.





2 Click the **Choose when to turn off the display** tab.

😋 🕘 – 🗟 🕨 Control Panel 🕨	All Control Panel Items + Power Options - 4	Search Control Panel	Q
Control Panel Home Require a password on wakeup Choose what the power button does Create a power plan	Select a power plan Power plans can help you maximize your computer's performance or conserve energy. Make a plan activu selecting it, or choose a plan and customize it by changing its power settings. <u>Tell me more about power</u> plans Preferred plans	e by	0
<ul> <li>Choose when to turn off the display</li> <li>Change when the computer sleeps</li> </ul>	Banced (recommended)     Change plan setting     Automatically balances performance with energy consumption on capable hardware.     Power saver     Saves energy by reducing your computer's performance where possible.     Change plan setting		
	Show additional plans	• •	
See also Personalization User Accounts			

3 Select Never in Put the computer to sleep.

					_ <b>D X</b>
Control Panel + All	Control Panel Items   Power Op	tions 🕨 Edit Plan Settings	▼ \$	Search Control Panel	٩
	Change settings for the pl Choose the sleep and display setti	an: Balanced ings that you want your computer to use.			
	Turn off the display:	10 minutes 💌			
	Put the computer to sleep:	Never			
	Change advanced power settings				
	Restore default settings for this pl	an			
		(	Save changes Cancel		

4 Click the **Save changes** button.



# **11. Prerequisite for Operation**

## **11.1 Preparing the SCU and the Detector**

1 Turn on the System Control Unit (SCU).



- 2 Make sure the LED lamp (power and status) is lit green. It means SCU is ready to work normally.
- 3 Press the power button of the detector for 1 second.
- 4 The Power LED is lit green and Active LED is lit orange on the detector simultaneously when the detector is ready to operate.
- 5 Blinking green status LED indicates the startup process is in progress. Then status LED turns blue indicating Wi-Fi network is connected.



## **11.2 Detector Configuration**

In this phase, defect pixels are corrected and gained pixels are calibrated using installed x-ray generator and x-ray tube. The detector needs to warm up at least 30 minutes before performing the calibration. The calibration should be performed on the following cases.

- Detector installation
- X-ray generator replacement
- X-ray tube replacement
- Exposure section Value change
- Gain Type change



## **11.2.1** Detector Setting

1 Run VXSetup.

CU	Model No.	Serial No.	IP Address	MAC Addre	ss	Port
	FXRS-03A	S2-ABH-E001	169.254.2.100	84:EA:99:A0:0	)1:14	5001
ID 1 2	Model No. FXRD-1717SB FXRD-1417WB	Serial No. V09D11600H Z9-V5DABF021	IP Address 169.254.1.4 169.254.1.13	MAC Address 00:1E:13:40:FF:14 84:EA:99:A0:03:09		gger Discovery Found Found
					Refresh Devi	

2 The connected detectors will be displayed under **Detectors**. If all the detectors are not displayed, click the **Refresh device list** button to refresh the list.

i	Color used in indicating status	
	Green background:	Connected normally and selected detectors
	• White background, black texts:	Connected but not selected detectors
	• White background, gray texts:	Recorded in the used history but not connected
		detectors

3 To register connected detector to the system, double click the detector or select the detector and then click the **Select** button activated on the bottom left.

Select	Refresh device list



4 To deselect the registered detector, double click the detector or select the detector and then click the **Release** button activated on the bottom left.

)etect	ors					
ID	Model No,	Serial No,	IP Address	Mac Address	Line Trigger	Discovery
1	FXRD-1717SA	V09D11802P	169, 254, 1, 14	00:1E:13:40:FF:19		Found
	FXRD-1417WA	D3CABH-D004	169, 254, 1, 15	00:0E:8E:27:E0:BD		Found
Re	elease 1	Ļ			Refresh dev	rice list

- 5 To sort the registered detectors, select the detector and then click the arrow button activated on the bottom left.
- 6 To change the settings of connected detector or SCU, select the item and then click the right mouse button.
  - SCU

Configure
Change IP
Remove Registry

- Configure: Changes the settings related to SCU described in chapter <u>11.3.2.1</u>.
- Change IP: Changes the SCU IP.
- Remove Registry: Removes the data stored in the registry.
- Detector

Release
Change IP

- Release: Deregisters the selected detector.
- Change IP: Changes the detector IP.
- 7 After completing configuration of detectors, click the **Next** button to synchronize the registered detectors with SCU and proceed to next phase.



## 11.2.2 Configuring Devices

VXSetup	x
SCU : FXRS-03A (S2-ABH-E001) [84:EA:99:A0:01:14]           Status : Connected         Configuration	
Detector 1: FXRD-1717SB (V09D11600H) [00: 1E: 13:40:FF: 14]         Status : Initialization OK         Last Calibration Time : [ 2012/08/31 10:10 ]    Configuration Diagnosis	
Detector 2 : FXRD-1417WB (29-V5DABF021) [84:EA:99:A0:03:09]         Status : Initialization OK         Last Calibration Time : [2012/08/31 10:10]    Configuration Diagnosis Wireless Test	
< <u>B</u> ack Finish Cancel	—

- 1 The list of connected SCU and registered detectors will be displayed.
- 2 Click the **Configuration** button on the right side of SCU to display the **SCU Configuration** window described in chapter <u>11.3.2.1</u>.
- 3 Click the **AP info** button on the right side of SCU to check the AP information described in chapter <u>11.3.2.2</u>.
- 4 Click the **Configuration** button on the right side of Detector to display the **Detector Configuration** window described in chapter <u>11.3.2.3</u>.
- 5 Click the **Calibration** button on the right side of Detector to display the **Calibration** window described in chapter <u>11.4</u>.
- 6 After completing calibration of the detector, the **Diagnosis** button will be activated. Click the button to move to **Diagnosis Mode** described in chapter <u>11.5</u>.
- 7 Click the **Wireless Test** button on the right side of Detector to move to the Wireless Throughput Test described in chapter <u>11.6.</u>



### 11.2.2.1 Configuring SCU

System			AP		
Model No.	FXRS-03A	-	AP On/Off	On	Off
FirmWare	V01.03	Upgrade	Frequency	2.4 GHz	9 5 GHz
Serial No.	S2-ABH-E001		Country	US	
BootLoader	V01.00	Upgrade	Band	40 MHz	
Kernel	V01.02	Upgrade	Channel	+ •	36
		opgrade	SSID	vivix	
letwork					
IP Address	169 . 254 . 3	2.100	Key	12345678	90
Net Mask	255 . 255 . 0	0.0	Security	WPA2-PSK	(
THE CT HERE			Gi	400	0800
Gateway	169 . 254 . 3	2 . 100	Tx Power(%)	100	
est Mode					
On/Off	🔘 On 🛛 🔞	Off	Trigger		
Period	15	Sec.	Pack	et	Line
Set Co		actory Reset	Log		Cancel

The **SCU Configuration** window allows you to check or configure the following items.

System

Model No.:	Model number of SCU

• F/W: Version of firmware.

Click the **Upgrade** button on the right side to upgrade Firmware.

- Serial No.: Serial number of SCU
- Boot loader: Version of Boot loader
- Kernel: Version of Kernel
- Network
  - IP Address: IP address of SCU
  - Net Mask: Netmask of SCU
  - Gateway: Gateway address of SCU
- Test Mode
  - On/Off: Configures whether SCU transmits Trigger Packet within specified period.
  - Period: Configures the period of transmitting Trigger Packet in a second unit.





- AP
  - AP On/Off: Configures whether to run SCU as AP mode.
  - Frequency: Frequency channel of wireless network
  - Country: Country code of wireless network
  - Band: Wireless network bandwidth
  - Channel: Wireless network channel
  - SSID: Wireless network ID
  - Key: Wireless network key value
  - Security: Authentication protocol for wireless network
  - Gi: Guard Interval of wireless network
  - Tx Power(%): Configures Wireless network signal strength.
- Trigger

	Packet:	Use SW Trigger.
--	---------	-----------------

- Line: Use HW Trigger.
- Set Config. Transmits configuration values to SCU.
- Factory Reset: Reset SCU to factory default settings.
- Log: Import the logs of SCU.
- Cancel: Close the window without transmitting configurations to SCU.



### 11.2.2.2 Checking AP Information

AP Information					×	
AP Information						
Inactive Time	970	ms	Tx Retries	12		
Rx Bytes	103667		Rx Packets	409		
Tx Bytes	25720		Tx Packets	310		
Signal	-39	dBm	Signal Avg	-39	dBm	
Tx Bitrate	135	Mbps	Rx Bitrate	135	Mbps	
Tx MCS	6		Rx MCS	7		
ОК						

- Inactive Time Time during which transmission and reception are not processed.
- Tx Retries Number of retransmission
- Rx Bytes Total bytes received through Ethernet interface.
- Rx packet Total packets received through Ethernet interface.
- Tx Bytes Total bytes transmitted through Ethernet interface.
- Tx packet Total packets transmitted through Ethernet interface.
- Signal Current signal strength
- Signal Avg The average signal strength up to now.
- Tx Bitrate Transfer rate of transmission
- Rx Bitrate Transfer rate of reception
- Tx MCS MCS index based on Tx bitrate, channel, coding rate, modulation type.
- Rx MCS MCS index based on Rx bitrate, channel, coding rate, modulation type.



### 11.2.2.3 Configuring Detector

Detector Confi	guration			<b>—</b> ×
System		AP		
Model No.	FXRD-1417WB 👻	AP	🔘 On	Off
FirmWare	V00.06 Upgrade	Frequency	② 2.4 GHz	🔘 5 GHz
5004	V00.02	Country	KR	
FPGA	V00.02	Band	20 MHz	
Serial	Z9-V5DABF021	Channel		6 -
BootLoader	V01.00 Upgrade	SSID	vivix	
Kernel	V01.02 Upgrade	Кеу	123456789	0
Network		Security	WPA-PSK	-
IP	169 . 254 . 1 . 13	Gi	400	@ 800
NetMask	255 . 255 . 0 . 0	Tx Power(%)	100	
Gateway	169 . 254 . 1 . 1	Test Pattern		
WNetwork		Туре	Off	
SSID	vivix	Image TimeOut		
Кеу	1234567890	Time	60	sec.
Power Manag	jement			
Sleep	On Off	Shut Down	On	Off
Sleep after	10 🔹 min	Shut Down aff	er 30	▼ min
Power Off	Detector 🔻			
Set Co	nfig Factory Reset	Log		Cancel

The Detector Configuration window allows you to check or configure the following items.

- System
  - Model No.: Name of device
  - FirmWare: Version of detector's firmware. Click the Upgrade button on the right side to upgrade firmware.
  - FPGA: Version of detector's FPGA
  - Serial: Serial number of detector
  - BootLoader: Version of detector's Boot loader
  - Kernel: Version of detector's Kernel
- Network
  - IP: Network IP address of detector
  - NetMask: Network Netmask of detector
  - Gateway: Network Gateway address of detector





WNetwork

	SSID:	Wireless network ID of detector
--	-------	---------------------------------

- Key: Wireless network key value of detector
- Sleep Mode
  - On/Off: Configures whether the detector uses Sleep Mode.
  - Period: Configures the time of entering Sleep Mode.
- AP
  - AP On/Off: Configures whether to run detector as AP mode.
  - Frequency: Frequency channel of wireless network
  - Country: Country code of wireless network
  - Band: Wireless network bandwidth
  - Channel: Wireless network channel
  - SSID: Wireless network ID
  - Key Wireless network key value
  - Security: Authentication protocol for wireless network
  - Gi: Guard Interval of wireless network
  - Tx Power(%): Configures wireless network signal strength.
- Test Pattern
  - Type: Type of detector's test pattern image
- Image TimeOut
  - Time Set timeout not to request transmission when acquired image is not transmitted within specified time.
- Set Config. Transmits setting values to the detector.
- Sleep Mode
  - On/Off: Configures whether to use Sleep Mode in the detector.
  - Sleep after: Configures the time after which the detector goes into Sleep Mode.
     If the detector does not acquire images during the time, the detector will go into Sleep Mode.
- Shut Down
  - On/Off: Configures whether to use auto Shut Down in the detector.



- Shut Down after: The detector turns off automatically when Sleep Mode is not disabled within the configured time.
- Power Off
  - Detector: The equipped battery pack will supply power to the detector when SCU is off.
     Press and hold the Power button on the detector for 3 seconds to turn off the detector. If you connect Tether interface to the detector in wireless transmission mode, you can use it for a long time without battery consumption. At this time, even if you disconnect Tether interface, the Detector setting allows you to use the detector without any boot time.
  - SCU: The detector will be turned off when SCU is turned off.



# **11.3 Detector Calibration**

## 11.3.1 Configuring the Detector

1 Select **System Configuration** in the left Step item.

Step	Status
System Configuration	
Offset Calibration - Normal	Done
Defect Calibration - Normal	Done
Gain Calibration - Normal	Done
Detector Configuration	
ОК	Cancel

2 The information for the selected detector will be displayed.

Step	Status	Exposure Mode	
System Configuration		DR Trigger	C AED
Offset Calibration - Normal Defect Calibration - Normal Gain Calibration - Normal Detector Configuration	Done Done Done	Exposure Timing Exposure Section : Pre Exposure Section : EXP OK Delay Section : Debounce DR :	: 501 Set : 0 2 Set : 3 Set : 0 Set
		Debounce AED : Gain Type 0	



#### 11.3.1.1 Setting Exposure Mode

User can set the detector to three different exposure modes according to the connection type to the X-ray generator. Select the desired mode on **System configuration**.

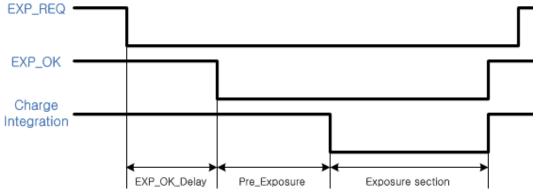
i	For detailed information on X-ray exposure mode, refer to 6.3.1 X-ray Exposure Mode.
	Exposure Mode

Exposure Mode	
OR Trigger	AED

#### 11.3.1.2 Timing Setting

To acquire correct images, exact timing setting must be made according to the characteristics of the X-ray generator.

Exposure section :	500	Set
Pre Exposure section :	14 0	Set
EXP OK Delay section :	1	Set
Debounce_DR :	3	Set
Debounce_AED :	3	Set





#### **Exposure section**

Exposure section : 500 Set
----------------------------

Exposure section indicates the period (unit: ms) that the detector converts X-rays to image signals. This value needs to be set longer than the exposure time of X-ray generator to prevent X-rays loss while converting X-rays to image signals. If you change the time settings, refresh the Post-offset data and generate new GAIN data to acquire optimized images.



The recommended Exposure section value is 500 ms (Standard).

#### **Pre Exposure section**

Pre Exposure section :	14	0	Set
------------------------	----	---	-----

The Pre Exposure section is allowed to use when delay is occurred until the generator receives EXP-OK signal from the detector and prepares X-ray generation. Pre Exposure section is set as 0 ms normally, however, it is recommend to set the actual delay time of generator's X-ray generation with measurements to achieve the best performance of the detector. The detector sends EXP\_OK signal to the generator, then transforms X-ray into image signal after the time set in the Pre Exposure section.

#### **EXP OK Delay section**

EXP OK Delay section :	1	Set
------------------------	---	-----

EXP OK Delay section is delay time from when the detector detects exposure request signal (EXP\_REQ) from the X-ray generator to when the detector sends exposure respond signal (EXP\_OK) to the X-ray generator. Some X-ray generators need some time to prepare detecting EXP\_OK signal after sending EXP\_REQ signal. This value is determined according to the specifications of X-ray generator. The default value is 1 ms.



#### Debounce\_DR

Debounce_DR : 3	Debounce_DR :	3	Set
-----------------	---------------	---	-----

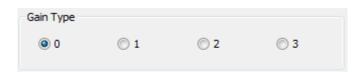
Debounce\_DR is used to remove unwanted trigger signal occurred due to external noise when DR Trigger is set as Exposure Mode. It is recommended to use the Debounce\_DR setting value as default 3 ms. We recommend setting the minimum exposure time of X-ray generator to more than 3 ms. If the value is set to less than 3 ms, the detector may not acquire images.

#### Debounce\_AED



Debounce\_AED is used to prevent unwanted imaging occurred due to external noise when AED is set as Exposure Mode. It is recommended to use the default values set by manufacturer. We recommend setting the minimum exposure time of X-ray generator to more than the value set in the Debounce\_AED. If the value is set to less than the settings in the Debounce\_AED, the detector may not acquire images. If unwanted images are acquired without X-ray exposure while operating the equipment, set Debounce\_AED with 1 ms increments. However, make sure not to exceed 5 ms since an image degradation may appear in the image if Debounce AED exceeds 5 ms.

#### 11.3.1.3 Gain Type Setting



To acquire X-ray image with proper brightness, adjust the Gain Type setting. You can select the Gain Type to adjust the sensitivity of the detector, then you can acquire X-ray images with desired brightness according to the specifications of X-ray generator or the type of objects. The default gain type is 1. The following table describes each Gain Type of the sensitivity ratio.

Gain	Туре	0	1	2	3
Gadox Detector	Sensitivity ratio	0.86	1	1.2	1.5
Csl Detector	Sensitivity ratio	0.62	1	1.14	1.33



The owner is responsible for ensuring that the Gain Pixel Correction is performed after adjusting the Gain Type.



### 11.3.2 Offset Calibration

#### 11.3.2.1 Pre-offset Calibration

1 Select **Dark acquisition–Normal** and click the **Load pre-offset** button to apply pre-offset data which is provided with the flat panel detector.

itep	Status	Pre-offset Calibration
ystem Configuration Offset Calibration - Normal		Current Value :
Defect Calibration - Normal Gain Calibration - Normal Detector Configuration		Stage:         of         10         Run Pre-offset Calibration           Load Pre-offset         Offset Path :         N/A
		Post-offset Calibration Current Value : Stage : of [10] Run Post-offset Calibration
		Upload post-offset Get Post offset Offset path : FXRD-1417W8(C3-YSDABF021)
		Copy to : N/A
ок	Cancel	

- 2 When you create new pre-offset data, input the number of images to be acquired to **Stage** in the Preoffset calibration item and then click the **Run pre-offset calibration** button.
- 3 Acquiring image process will be processed automatically, then the average value of acquired images will be displayed in **Current Value** and the current status will be displayed in **Stage**.
- 4 After acquiring images, a window for saving created pre-offset data appears, then specify a directory to save the data.

다른 이름으로 저장						x
() ▼ ) ≥ 2	퓨터 🕨 Working (D:) 🕨	CalibrationData + FXRD	-1717S	<ul> <li>✓ </li> <li></li></ul>	717S 검색	٩
구성 ▼ 새 폴더	ł				8⊞ ▼	0
이를	^	수정한 날짜	유형	크기		
		일치하는 3	항목이 없습니다.			
파일 이름( <u>N</u> ):	pre.dat					-
파일 형식([]):	Pre-offset data files (*.	dat)				•
🔿 폴더 숨기기				저장(	5) 취소	



#### 11.3.2.2 Post-offset Calibration

- 1 Click the Get Post offset button to locally save the offset file that is backed up on the detector.
- 2 When you create new post-offset data, input the number of images to be acquired to **Stage** in the Post-offset calibration and click the **Run post-offset calibration** button.

Step	Status Pre-offset Calibration	
Step Offset Calibration - Normal Defect Calibration - Normal Gan Calibration - Normal Detector Configuration	Current Value : Stage : of 10 Run Pre-offset Calibration Load Pre-offset Offset Path : D:W[CalibrationOsta]/W1417WW29-V5DABF021Wpre.dat Post-offset Calibration Current Value : Stage : of 10 Run Post-offset Calibration Upload post-offset is Offset path : PXRD-1417WB(29-V5DABF021) Copy to : N/A	
ок	Cancel	

- 3 Acquiring image process will be proceeded automatically, then the average value of acquired images will be displayed in **Current Value** and the current status will be displayed in **Stage**.
- 4 After acquiring images, a window for saving created post-offset data appears, then specify a directory to save the data.
- 5 To save the previously created post-offset file to the detector, click the **Upload post offset** button and then select the file to upload.



The offset data that is already uploaded to the detector will be used for acquiring images with wireless detector instead of the data stored in the local.



### **11.3.3 Defect Correction**

#### 11.3.3.1 Load defect map

1 Select **Defect detection – Normal** in the left Step item.

Step	Status	Defect Map				
ystem Configuration Offset Calibration - Normal		Load Defect Map	Auto Defect Detection	Manual Defect Detection		
efect Calibration - Normal		Defect Map Path : N/A				
Sain Calibration - Normal						
etector Configuration						
["""	1					
ок	Cancel					

2 Click the **Load defect map** button to apply the defect data which is provided with the flat panel detector.



#### 11.3.3.2 Auto defect detection

1 To create new defect map, apply the Defect data which is provided with the flat panel detector and then click the **Auto defect detection** button.

	neration		<b>—</b> X
Current value		st	age: of 5
Get flat data			
Target Va	alue	Save acquire	ed data
Flat30 : 250	Get Flat30	Load Flat30	Not ready
Flat60 : 500	Get Flat60	Load Flat60	Not ready
No.	(x, y)		
10.	(4, 9)	(Level, Avg)	
110.	(4, 1)	(LEVEI, AVg)	
10.		(Level, Avg)	
100.	(A, y)	(LEVEI, AVG)	
	(A, y)	(LEVEI, AVG)	

2 Acquire X-ray images and adjust the doses of radiation to match the Current value to the Target Value of Flat30. When the Current value reaches within 10% of Target Value, keep the doses of radiation at that point.



For Flat30 and Flat60 the recommended Target Values are respectively 250 and 500.

- 3 To save the collected image data, check the **Save acquired data** checkbox. Once the images of Flat30 and Flat 60 are acquired, it is allowed to save as a file.
- 4 Click the **Get Flat30** button to acquire as many images as the number set at the top of the Stage. Or, load the Flat30 image which is previously saved by clicking the **Load Flat30** button.



- 5 Acquire X-ray images and adjust the doses of radiation to match the Current Value to the Target Value of Flat60. When the Current value reaches within 10% of Target Value, keep the doses of radiation at that point.
- 6 Click the **Get Flat60** button and acquire as many images as the number set at the top of the Stage. Or, load the Flat60 image which is previously saved by clicking the **Load Flat60** button.
- 7 Enter the detection range of Defect data into the **Tolerance** field based on the acquired images.



The recommended Tolerance value is 3%.

8 Click the **Generate Defect Map** button, create the new Defect Map Data file, and then save it.



No need to click the **Load defect map** button since the Defect Map file is automatically created and loaded.



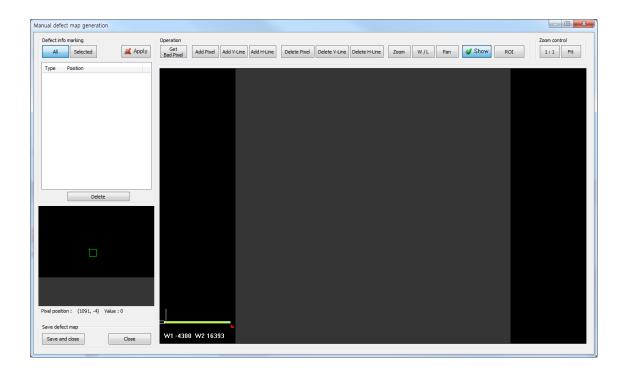
#### 11.3.3.3 Manual defect detection

1 To create the new defect map manually, click the **Manual defect detection** button after applying Defect data provided accordingly.



To use the Manual defect detection feature, the previously acquired dark image is needed. The dark image can be acquired in the Diagnosis Mode.

2 Select the original image file of the detector to find the defect data.





### Defect info marking

Defect in All	fo marking Selected	\pply
Туре	Position	-
Pixel	x=199, y=204	
Pixel	x=431, y=236	
Pixel	x=241, y=552	
Pixel	x=252, y=1157	
Pixel	x=1420, y=541	
Pixel	x=1073, y=1599	
Pixel	x=699, y=2062	=
Pixel	x=1510, y=2515	
Pixel	x=1936, y=2215	
Pixel	x=2778, y=1120	
Pixel	x=1605, y=715	
Pixel	x=1836, y=1720	
Pixel	x=2583, y=2062	
Pixel	x=2362, y=2615	
V-Line	x=1783, y1=431, y2=1252	-
	Delete	

- Apply: Apply Defect information of selected items from the list to image.
- All: Apply all items from the list.
- Selected: Apply the only selected items from the list.
- Delete: Delete the selected items from the list.



#### **Operation / Zoom control**

-F	Zoom con	101
Get Bad Pixel Add Pixel Add V-Line Add H-Line Delete Pixel Delete V-Line Delete H-Line Zoom W / L Pan 💕 Show F	ROI 1:1	Fit

• Get Bad Pixel: Automatically detect the defect pixel from the currently displayed image.



When you select the **Get Bad Pixel** feature, all items of the Defect info marking list are automatically applied to the image.

Pixe	el List		×	ſ
	х	Y	Value	
Т	hreshold: 3	8 %	Offset: 0	
	Se	arch	Add	

- 1 Enter the value of threshold and offset to detect the defect pixel.
- 2 Click the **Search** button to search the automatically detected list.





- 3 Select an item to add to the Defect list, and then click the **Add** button.
  - Add Pixel: Add one pixel unit of defect pixel.
  - Add V-Line: Add line type of defect pixels vertically.
  - Add H-Line: Add line type of defect pixels horizontally.
  - Delete Pixel: Delete one pixel unit of defect pixel.
  - Delete V-Line: Delete line type of defect pixels vertically.
  - Delete H-Line: Delete line type of defect pixels horizontally.
  - Zoom: Zoom in or out the image.
  - W/L: Adjust the window level of the image.
  - Pan: Move the image.
  - Show: Determine whether to display the selected defect pixel on the image.
  - ROI: Automatically adjust the window level based on the Min. and Max. value of the selected area.
  - 1:1: Display the image at one to one ratio.
  - Fit: Display the image to fit into the screen.
- 4 Once it is finished to display the defect pixels in the image, save the newly created defect map file and complete the process by clicking the **Save and close** button. To cancel it, click the **Close** button.



### **11.3.4 Gain Pixel Correction**

Before performing Gain Pixel Correction, consider followings:

- Recommended SID is 150 cm (distance between X-ray tube and Detector).
- Open the collimator of X-ray tube completely.
- Align the center of the detector with the center of collimator.
- Keep everything away from the detector surface.
- Select Gain acquisition Normal in the left Step item. Expose X-rays and adjust dose of X-rays so that Current Value reaches TargetValue. Keep the quantity of X-rays when Current Value remains within 10% difference of TargetValue.



Recommended TargetValue is 2000.

Calibration Detector 2 : FXRD-14	17WB (Z9-V5DAB	BF021) [00:0E:8E:39:B5:03] (Temp : 40.5)	x
Calibration Detector 2 : FXRD-14 Step System Configuration Offset Calibration - Normal Defect Calibration - Normal Detector - Normal Detector Configuration	17WB (29-V5DAB	BF021) (00.0E3E:39:85:03) (Temp : 40.5)         Gain Calibration         Target Value :         Current Value :         Stage :       of 10         Get       Cancel         Load Gain         Gain Path : N/A	
ОК	Cancel		

- 2 Click the **Get** button and expose X-rays ten times.
- 3 Save the Gain data to the desired folder.
- 4 Once all the procedures are completed, the OK button will be activated. Click the **OK** button to close the dialog box.



## 11.3.5 Detector Preference

- 1 If you need to rotate the detector, select the value of Detector direction compensation.
- 2 To exclude the particular area of an image, select the desired area by clicking the **Show Area** button after acquiring an image, or click the **Select Area** button after entering the size of image in the **Effective Area** field.
- 3 To renew the automatic offset of the detector, check the **Use offset refresh** checkbox and set time interval, temperature, the number of acquiring images.



Once the **Use offset refresh** checkbox is checked, the temperature of detector is monitored at the time interval specified. If there is difference between the current temperature and the specified one, images are acquired according to the number of acquiring images which you have already set, and then the offset is renewed.

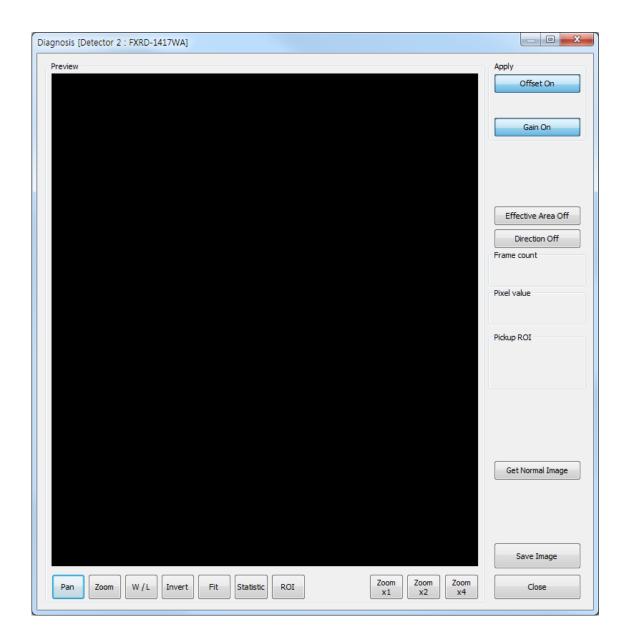
- 4 Acquire the object image that you know the length to calibrate Pixel Pitch, measure the length of it after clicking the **Ruler** button, and then enter the value in mm.
- 5 Enter all the data you need, and then save the setting by clicking the **Set** button at the bottom.



## 11.4 Diagnosis Mode

In Diagnosis Mode you can review the images acquired by using the trigger or clicking the **Normal Grab** button. The number of images, pixel value and ROI value will be displayed on the right side of the **Diagnosis** window.

Click the **Save Image** button to save the acquired image.





The **Diagnosis** window provides the following function buttons to manipulate the acquired image.

•	Pan:	Move an image.
•	Zoom:	Press and hold the left mouse button and then drag to zoom in or out.
•	W/L:	Press and hold the left mouse button and then move the mouse up, down, left or
		down to adjust Window Level. Basically this function is also available by using the
		right mouse button without clicking the W/L button.
•	Fit:	Fit the panned image to the center.
•	Statistic:	Press and hold the left mouse button and then drag to specify a region.
		The coordinates of image, Min/Max value, mean deviation, standard deviation,
		etc will be displayed in the Pickup ROI.
•	ROI:	Press and hold the left mouse button and then drag to specify a region.
		The Window Level will be adjusted automatically based on Min and Max value of
		the region.
•	Zoom ×1 ~ ×16:	Magnify the image $\times 1$ to $\times 16$ .

- Effective Area Off/On: Apply the region of effective area configured in **Detector Preference** to the image.
- Direction Off/On: Apply the detector direction configured in **Detector Preference** to the image.
- Get Normal Image: Acquire a dark image.



## 11.5 Transfer Throughput Test Mode

Wireless Throughput Test			<b>×</b>
Wi-Fi Information			
Link Quality		Tx-Power	dBm
Signal-level	dBm	Bit rate	Mbps
Frequency	Ghz		
AP Information			
Inactive Time	ms	Tx Retries	
Rx Bytes		Rx Packets	
Tx Bytes		Tx Packets	
Signal	dBm	Signal Avg	dBm
Tx Bitrate	Mbps	Rx Bitrate	Mbps
Tx MCS		Rx MCS	
Performance Test			
Image Transmission Time			
Download	ms	Upload	IS
Progress			
Throughput Measurement			
Time 💌 10	sec.	Bit rate Mb	ps
Start			
	0	К	

- link quality: General quality of link
- Tx-Power: Transmission strength
- Signal-level: Signal strength
- Bit rate: Transmission speed
- Frequency: Frequency of connected AP
- Inactive Time: Time during which transmission and reception are not processed
- Tx Retries: Number of retransmission
- Rx Bytes: Total bytes received through Ethernet interface
- Rx packet: Total packets received through Ethernet interface
- Tx Bytes: Total bytes transmitted through Ethernet interface
- Tx packet: Total packets transmitted through Ethernet interface
- Signal: Current signal strength
- Signal Avg: The average signal strength up to now
- Tx Bitrate: Transfer rate of transmission
- Rx Bitrate: Transfer rate of reception
- Tx MCS: MCS index based on Tx bitrate, channel, coding rate, modulation type
- Rx MCS: MCS index based on Rx bitrate, channel, coding rate, modulation type
- Image Transmission Time: Measures the download and upload speed.
- Throughput Measurement: Measures transfer speed within the configured time.

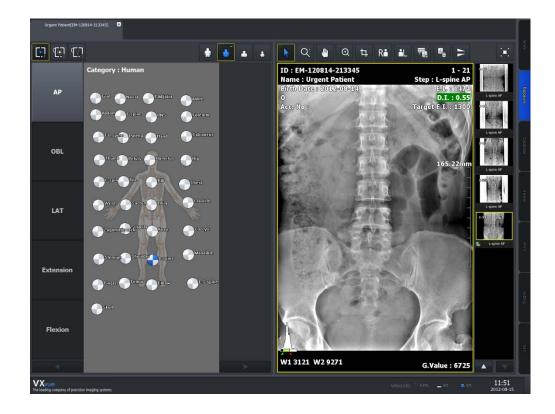


## 12. Operation



For the detailed operation, refer to the VXvue User Manual.

- 1 Register a patient.
- 2 Register Body parts.
- 3 Arrange the patient in the correct position to have detector aligned with the target body part.
- 4 Position the X-ray generator to adjust the exposure field.
- 5 Adjust kVp, mA, ms and mAs for best condition depending on body part and projection.
- 6 Press the exposure switch of the X-ray generator. You can check the images on the monitor after image processing.





## 13. Maintenance

## 13.1 Function Test

ltem	Period	Description
Power consumption	Daily	Confirm that the power operation of detector is normal.
Temperature	Daily	Check the monitoring in order to minimize the characteristic
		changes of Flat panel caused by external temperature changes.
Hard disk space	Deily	Check if the hard disk is enough to save images and allow the
	Daily	consecutive shootings.
Worklist connection	Daily	Check the worklist connection to allow consecutive shootings.
PACS server connection	Daily	Check the PACS server connection to send images.
Printing Test	Daily	Check the printer connection and print images
Auto offset	Daily	Check that Flat panel's offset changes caused by the increased
		heat are automatically corrected.
Resolution	Monthly	Confirm the resolution of the detector.
Image Acquisition Time	Monthly	Confirm the acquisition of time required to get image designed
		with optimal specifications.
Linearity	Quarterly	Evaluate the distinct characteristics of detector through the
		amount of radiation coming into Flat Panel Detector, resolution
		and contrast of images/projections, and the unification of noises
		of projection.
DQE	Quarterly	Evaluate the distinct characteristics of detector through the
		amount of radiation coming into Flat Panel Detector, resolution
		and contrast of images/projections, and the unification of noises
		of projection.
MTF	Quarterly	Evaluate the distinct characteristics of detector through the
		amount of radiation coming into Flat Panel Detector, resolution
		and contrast of images/projections, and the unification of noises
		of projection.
Calibration	Annually	Compensates defect pixels and calibrates pixel gain using the
		installed X-ray generator and X-ray tube.



## **13.2 Maintenance Guidelines for Users and Test Forms**

#### Maintenance

If you have any inquiries about trouble shooting or the product seems to have a problem, please contact Vieworks. For optimal performance, we recommend that the working area be kept clean.



Federal law restricts this device to be dealt or operated by a physician or medical assistant.

#### **Contact Information**

Address:	Vieworks Co., Ltd
	#107-108, 601-610 Suntechcity II
	52, Sagimakgol-ro (307-2 Sangdaewon-dong),
	Jungwon-gu, Seongnam-si, Gyeonggi-do
	462-736 South Korea
Phone:	+82-70-7011-6161
Fax:	+82-31-737-4954
email:	vieworks@vieworks.com

#### Cleaning

Use a dry cloth to clean surfaces of the system. Do not use detergents or organic solvents to clean the system.



Do not use abrasive brush, scraper, or acid/alkaline cleaner when cleaning your product.



### **Test Forms**

	Power Consum	ption		
Test ITEM (1)	Frequency	D: Daily	M: Monthly	
		Q: Quarterly	A: Annually	
Objective:				
Confirm that the power oper	ration of detector is no	rmal.		
Equipment:				
Workstation, VXvue S/W				
Power supply, Power Meter				
Inspection Report Form,				
Procedure:				
Turn on the power of the sy	stem.			
Run VXvue.				
Read the data indicated by	Power Meter.			
	<i></i>			
Performance and Correc				
Power Consumption of Max				
Light green colored LED sh				
If the power consumption ex			e is necessary.	
If the LED is not turned on,		ecessary.		
Record result on Inspection	Report Form.			
Result:				
Frequency: D:	0: □, A: □ Date	: 20**-**-** Op	erator:	
Limit of Acceptability: Max. 2	200VA			
Remarks:				



	Temperature				
Test ITEM (2)	Frequency	D: Daily		M: Monthly	
		Q: Quarterly		A: Annually	
Objective:		·			
Check the monitoring in order to	minimize the charact	eristic changes	s of F	Tat panel cause	d by external
temperature changes.					
Equipment:					
Workstation, VXvue S/W					
Power supply, Power Meter					
Inspection Report Form					
Procedure:					
Turn on the power of the system	1.				
Run VXvue.					
Check the temperature.					
Performance and Corrective	Action:				
Confirm that the detector and ar	nbient temperature is	lower or highe	r tha	n the operating t	emperature stated
in this Service Manual. If the det	ector and ambient ten	nperature devia	ates	from the operati	ng range, adjust
the detector and ambient tempe	rature properly to prev	ent poor imag	e qu	ality. If the image	e quality is reduced
after adjusting the temperature,	service assistance is	necessary.			
Record result on Inspection Rep	oort Form.				
Result:					
Frequency: D: $\Box$ , M: $\Box$ , Q: $\Box$ ,	A:  Date: 20	**_**_**	Ope	rator:	
Limit of Acceptability: +10 ~ +35℃					
Remarks:					



	Black Level / noise			
Test ITEM (3)	Frequency	D: Daily  M: Monthly		
		Q : Quarterly  A: Annually		
Objective:				
To confirm the dark level of ima	age			
Equipment:				
Workstation, VXvue S/W				
Power supply, Power Meter				
X-ray GEN., X-ray Tube				
MaxIm				
Inspection Report Form				
Procedure:				
Turn on the power of system.				
Run VXvue.				
Get 2 Flat images of same con	•	).		
Pixels match the 2 flat images	at maxlm.			
Performance and Corrective				
Confirm that the pixel matched				
If the value is off the limit, chec				
	ease the surround	ng temperature until it becomes the ideal		
temperature.				
If it is still off the limit, get servi				
Record result on Inspection Re	eport Form.			
Result:				
Frequency: D: □, M: □, Q:	п <b>А</b> ·п	Date: 20**-**-** Operator:		
	., ,,			
Limit of Acceptability: 1000+/-	100			
Remark:				



Test ITEM (4)FrequencyD: DailyM: Monthly					
Q: Quarterly D A: Annually D					
Objective:					
Confirm that new study can be performed and stored to hard disk drive of workstation.					
Equipment:					
Workstation, VXvue S/W					
Power supply, Power Meter					
Inspection Report Form					
Procedure:					
Turn on the power of the system.					
Run VXvue.					
Check hard disk free space indication is not red light.					
Performance and Corrective Action:					
If the hard disk free space indication is not red, new study can be performed.					
If the hard disk free space indication is red, delete old study to make free hard disk space enough to					
perform new study.					
Record result on Inspection Report Form.					
Result:					
Frequency: D:  _, M:  _, Q:  _, A:  _ Date: 20**-** Operator:					
Limit of Acceptability: N/A					
Remarks:					



	Work list connection				
Test ITEM (5)	Frequency	D: Daily		M: Monthly	
		Q: Quarterly		A: Annually	
Objective:					
Confirm that VXvue is connecte	d normally with Work	dist and can regi	ister	study by querying	from Worklist
server.					
Equipment:					
Workstation, VXvue S/W, Work	List Server				
Power supply, Power Meter					
Inspection Report Form					
Procedure:					
Turn on the power of the system	1.				
Run VXvue.					
Select Setting Mode.					
Select DICOM tab.					
Select MWL tab.					
Select Worklist server.					
Click the Echo button.					
Performance and Corrective A	Action:				
Check the connection status that	t is displayed in test	result window.			
If connection test failed, check V	Vorklist server is ope	erating and config	gurat	ion of Worklist ser	ver connection
is correct.					
If still Worklist connection fails, s	service assistance is	necessary.			
Record result on Inspection Rep	oort Form.				
Result:					
Frequency: D: $\Box$ , M: $\Box$ , Q: $\Box$ ,	A: Date: 2	0**-**- (	Opera	ator:	
Limit of Acceptability: N/A					
Remarks:					



	PACS Server connection				
Test ITEM (6)	Frequency	D: Daily	M: Monthly		
		Q: Quarterly	A: Annually		
Objective:					
Confirm that VXvue is connected	d normally with PAC	S Server and can se	end performed study data to PA	CS	
server.					
Equipment:					
Workstation, VXvue S/W, PACS	Server				
Power supply, Power Meter					
Inspection Report Form					
Procedure:					
Turn on the power of the system	).				
Run VXvue.					
Select Setting Mode.					
Select DICOM tab.					
Select Storage tab.					
Select Storage Server.					
Click the Echo button.					
Performance and Corrective	Action:				
Check the connection status that	t is displayed in test	result window.			
If connection test failed, check F	PACS server is opera	ating and configurati	on of PACS server connection	is	
correct.					
If still PACS server connection fa		ice is necessary.			
Record result on Inspection Rep	oort Form.				
Result:					
Frequency: D: $\Box$ , M: $\Box$ , Q: $\Box$ ,	A: Date: 2	20**-**- Ope	erator:		
Limit of Acceptability: N/A					
Remarks:					



	Printing Test				
Test ITEM (7)	Frequency	D: Daily M: Monthly			
		Q: Quarterly   A: Annually			
Objective:					
Confirm that VXvue is connected	d normally with Printe	r and can print images.			
Equipment:					
Workstation, VXvue S/W,					
DICOM Printer or Paper Printer	that is installed.				
Power supply, Power Meter					
Inspection Report Form					
Procedure:					
Turn on the power of the system	l.				
Run VXvue.					
Select Database Mode.					
Search database and open stud	у.				
Click the Print button.					
Select Print Mode.					
Click the Print button to print ima	age.				
Performance and Corrective	Action:				
Confirm that the image is printed	d normally.				
If printing failed, check the printe	er is operating and is o	configured correctly.			
If still printing fail, service assista	ance is necessary.				
Record result on Daily Report Fo	orm.				
Result:					
Frequency: D: $\Box$ , M: $\Box$ , Q: $\Box$ ,	A:  Date: 20	**-**-** Operator:			
Limit of Acceptability: N/A					
Remarks:					



	Auto offset				
Test ITEM (8)	Frequency	D: Daily M: Mc	onthly 🗆		
		Q: Quarterly   A: Anr	nually 🗆		
Objective:					
Check that Flat panel's offset ch	anges caused by the	ncreased heat are automa	tically corrected.		
Equipment:					
Workstation, VXvue S/W					
Power supply, Power Meter					
Stop watch					
Inspection Report Form					
Procedure:					
Turn on the power of the system	1.				
Run VXSetup.					
Set the period of offset or tempe	erature change.				
Run VXvue.					
Performance and Corrective A	Action:				
Check if Auto offset is set and pe	erformed when operat	ing VXvue.			
Check if Auto offset operates aft	er the chosen time se	tting is over.			
If offset is not set automatically a	and does not perform,	ask for service assistance			
If the chosen time setting is exce	eeded, recheck the tin	ne setting.			
If the image is not normal due to	the dislocation of offs	et, send the image and as	k for service assistance.		
Record result on Inspection Rep	oort Form.				
Result:					
Frequency: D: $\Box$ , M: $\Box$ , Q: $\Box$ ,	A: □ Date: 20	**-**-** Operator:			
Limit of Acceptability: N/A					
Remarks:	Remarks:				



	Resolution			
Test ITEM (9)	Frequency	D: Daily   M: Monthly		
		Q: Quarterly   A: Annually		
Objective:				
Confirm the resolution of the det	ector.			
Equipment:				
Workstation, VXSetup S/W				
Power supply, Power Meter				
Resolution Chart (Nuclear Assoc	ciate, model 07-523-2	or Line pair CHART 0.05mmPb CN37076)		
X-ray GEN., X-ray Tube				
Inspection Report Form				
Procedure:				
Turn on the power of the system				
Run VXSetup.				
Open the Diagnosis window.				
Attach resolution chart (Line pair	CHART 0.05 mm Pb 0	CN37076, model 07-523-2) on the center of th	e	
detector with diagonal direction.				
Set X-ray generator to 50kVp, 2	mAs and SID to 1m.			
Expose X-rays.				
Confirm that the resolution is over	er 3.5lp/mm.			
Performance and Corrective A	ction:			
Confirm that the resolution is over	er 3.51p/mm.			
If the resolution is under 3.5lp/mm	n, then test again by a	djusting mAs from 1mAs to 5mAs.		
If still resolution is under 3.5lp/mm	n, service assistance i	s necessary.		
Record result on Inspection Rep	ort Form.			
Result:				
Frequency: D: $\Box$ , M: $\Box$ , Q: $\Box$ ,	A:  Date: 20	**-** Operator:		
Limit of Acceptability: 3. 5lp/mm				
Remarks:				



	Image Acquisition	on Time		
Test ITEM (10)	Frequency	D: Daily	M: Monthly	•
		Q: Quarterly	A: Annually	
Objective:				
Confirm the acquisition of time	required to get imag	ge designed with opti	mal specification	S.
Equipment:				
Workstation, VXvue S/W				
Power supply, Power Meter				
X-ray GEN., X-ray Tube				
Stop watch				
Inspection Report Form				
Procedure:				
Turn on the power of the syste	m.			
Run VXvue.				
Select Exposure Mode.				
Register patient.				
Expose X-rays with the conditi	on of 50kVp and 5 m	nAs.		
Check flat Image is acquired a	nd displayed on mor	nitor.		
Performance and Corrective	Action:			
Check if the image is acquired	in 5 to 7 seconds (ir	ncluding the processi	ng time).	
If image acquisition failed, che	ck the X-ray is expo	sed normally and the	triggering with X	-ray generator is
properly configured.				
If still image acquisition fail, se	rvice assistance is n	ecessary.		
Record result on Inspection Re	eport Form.			
Result:				
Frequency: D: $\Box$ , M: $\Box$ , Q: $\Box$		20**-**- Op	erator:	
	$\mathbf{A}, \mathbf{A}, \mathbf{C} \qquad Date.$	20 Op		
Image Acquisition Time : 4.5s				
Processing Time n: 2s				
Remarks:				



	Flat Field test		
Test ITEM (11)	Frequency	D: Daily 🛛	M: Monthly
		Q: Quarterly	A: Annually
Objective:			
To confirm the flat image is capt	ured and the artifact is	compensated	
Equipment:			
Workstation, VXvue S/W			
Power supply, Power Meter			
X-ray GEN., X-ray Tube			
Inspection Report Form,			
Procedure:			
Turn on the power of system			
Run VXvue			
Expose X-ray with the condition	of 60Kv, 5mAs		
Confirm that flat image is capture	ed and artifact is not a	ppeared	
Performance and Corrective A	ction:		
Confirm that flat image is capture	ed and artifact is com	pensated.	
If flat image is not captured then	confirm cable connect	ction.	
If still flat image is not captured,	require service assist	ance.	
If artifact is appeared, then do ca	alibration and test aga	in.	
If still artifact is appeared, then r	equire service assista	nce.	
Record result on Inspection Rep	ort Form.		
Result:			
Frequency: D:	), A: 🛛 🛛 Da	ite: 20**-**-**	Operator:
Limit of Acceptability: N/A			
Remark:			



	Linearity				
Test ITEM (12)	Frequency	D: Daily		M: Monthly	
		Q: Quarterly		A: Annually	
Objective:					
Evaluate the image quality acco	rding to the amount of	radiation comin	ng int	to Flat Panel De	etector.
Equipment:					
Workstation, VXvue S/W					
Power supply, Power Meter					
X-ray GEN., X-ray Tube					
Inspection Report Form					
Procedure:					
No Target					
Gain: 1					
Performance and Corrective A	ction:				
When SID is 150 cm, 1900-2200	Graylevel properties/	qualities should	be o	btained under 7	0kVp and 2mAs.
When SID is 100 cm, 1900-2200	Graylevel properties/	qualities should	be o	btained under 5	5kVp and 2mAs.
If properties/qualities are not obt	tained, reset the cond	itions and test ag	gain		
If properties/qualities are still no	t obtained after the se	cond test, servic	ce as	ssistance is nece	essary.
Record result on Inspection Rep	oort Form.				
Result:					
Frequency: D:	A: Date: 20	**-**- O	pera	ator:	
Limit of Acceptability: SID: 150 cm, 70kVp, 2mAs → 1900 ~ 2200 Graylevel					
SID: 100 c	cm, 55kVp, 2mAs → 1	900 ~ 2200 Gra	ylev	el	
Remark:					



	DQE				
Test ITEM (13)	Frequency	D: Daily		M: Monthly	
		Q: Quarterly	•	A: Annually	
Objective:					
Evaluate the distinct characteris	stics of detector throug	h the amount	of rad	diation coming in	nto Flat Panel
Detector, resolution and contras	st of images/projection	s, and the unif	icatio	on of noises of p	rojection.
Equipment:					
Workstation, VXvue S/W					
Power supply, Power Meter					
X-ray GEN., X-ray Tube					
Inspection Report Form					
Procedure:					
IEC62220-1(RQA 5) in accorda	nce with the condition	S			
Performance and Corrective A			_		
In case of CSI type, properties/o	-			-	
In case of Gadox type, propertie					
If properties/qualities are not ob			-		
If properties/qualities are still no		econd test, serv	/ice a	assistance is ne	cessary.
Record result on Inspection Rep					
Result:					
Frequency: D:	A: □ Date: 20	)**_**_	One	rator:	
			Ope		
Limit of Acceptability: : CSI:	1lp/mm, more than 56	%			
Gadox:	11p/mm, more than 30 <sup>o</sup>				
Remarks:					



Test ITEM (14)       Frequency       D: Daily       M: Monthly         Objective:       Q: Quarterly       A: Annually       Distribute         Evaluate the distinct characteristics of detector through the amount of radiation coming into Flat Panel Detector, resolution and contrast of images/projections, and the unification of noises of projection.         Equipment:       Workstation, VXvue S/W         D.Q.E Program (Matlab)       Power supply, Power Meter         X-ray GEN, X-ray Tube       Inspection Report Form         Procedure:       IEC62220-1(RQA 5) in accordance with the conditions         Performance and Corrective Action:       Properties/qualities are not obtained more than 56% at 11/p mm.         If properties/qualities are not obtained more than 56% at 11/p mm.       If properties/qualities are still not obtained after the second test, service assistance is necessary.         Record result on Inspection Report Form.       Result:       Prequency: D: n, M: n, Q: n, A: n       Date: 20**-**-**       Operator:         Limit of Acceptability: 11/p mm, more than 56%       Date: 20**-**-**       Operator:       Demoder:		MTF				
Objective:         Evaluate the distinct characteristics of detector through the amount of radiation coming into Flat Panel Detector, resolution and contrast of images/projections, and the unification of noises of projection.         Equipment:         Workstation, VXvue S/W         D.Q.E Program (Matlab)         Power supply, Power Meter         X-ray GEN., X-ray Tube         Inspection Report Form         Procedure:         IEC62220-1(RQA 5) in accordance with the conditions         Pripremance and Corrective Action:         Properties/qualities should be obtained more than 56% at 11/p mm.         If properties/qualities are not obtained, reset the conditions and test again.         If properties/qualities are still not obtained after the second test, service assistance is necessary.         Record result on Inspection Report Form.         Result:         Frequency: D: □, M: □, Q: □, A: □       Date: 20**.*** Operator:         Limit of Acceptability: 11/p mm, more than 56%	Test ITEM (14)	Frequency	D: Daily		M: Monthly	
Evaluate the distinct characteristics of detector through the amount of radiation coming into Flat Panel Detector, resolution and contrast of images/projections, and the unification of noises of projection.          Equipment:         Workstation, VXvue S/W         D.Q.E Program (Matlab)         Power supply, Power Meter         X-ray GEN., X-ray Tube         Inspection Report Form         Procedure:         IEC62220-1 (RQA 5) in accordance with the conditions         Properties/qualities should be obtained more than 56% at 11/p mm.         If properties/qualities are not obtained, reset the conditions and test again.         If properties/qualities are still not obtained after the second test, service assistance is necessary.         Record result on Inspection Report Form.         Prefuence:         Frequency: D: D, M: D, Q: D, A: D       Date: 20**-**-**         Operator:         Limit of Acceptability: 11/p mm, more than 56%			Q: Quarterly	/ ■	A: Annually	
Detector, resolution and contrast of images/projections, and the unification of noises of projection.  Equipment: Workstation, VXvue S/W D.Q.E Program (Matlab) Power supply, Power Meter X-ray GEN., X-ray Tube Inspection Report Form  Procedure: IEC62220-1(RQA 5) in accordance with the conditions  Performance and Corrective Action: Properties/qualities should be obtained more than 56% at 11/p mm. If properties/qualities are not obtained, reset the conditions and test again. If properties/qualities are still not obtained after the second test, service assistance is necessary. Record result on Inspection Report Form.  Result: Frequency: D: n, M: n, Q: n, A: n Date: 20**-**- Operator: Limit of Acceptability: 11/p mm, more than 56%	Objective:		·			
Equipment:         Workstation, VXvue S/W         D.Q.E Program (Matlab)         Power supply, Power Meter         X-ray GEN., X-ray Tube         Inspection Report Form         Procedure:         IEC62220-1(RQA 5) in accordance with the conditions         Properties/qualities should be obtained more than 56% at 11/p mm.         If properties/qualities are not obtained, reset the conditions and test again.         If properties/qualities are still not obtained after the second test, service assistance is necessary.         Record result on Inspection Report Form.         Result:         Frequency: D: M: Q: A: Date: 20**-**-**       Operator:         Limit of Acceptability: 11/p mm, more than 56%	Evaluate the distinct characteris	tics of detector throug	gh the amount	of rad	diation coming i	nto Flat Panel
Workstation, VXvue S/W         D.Q.E Program (Matlab)         Power supply, Power Meter         X-ray GEN., X-ray Tube         Inspection Report Form         Procedure:         IEC62220-1(RQA 5) in accordance with the conditions         Properties/qualities should be obtained more than 56% at 11/p mm.         If properties/qualities are not obtained, reset the conditions and test again.         If properties/qualities are still not obtained after the second test, service assistance is necessary.         Record result on Inspection Report Form.         Result:         Frequency: D: D, M: D, Q: D, A: D       Date: 20**_**_**         Upperties/instruction of the second test, service assistance is necessary.         Result:         If in the second test, service assistance is necessary.         Record result on Inspection Report Form.         If in the second test is necessary.         Record result on Inspection Report Form.         If in the second test is necessary.         Record result on Inspection Report Form.         If in the second test is necessary.         Record result on Inspection Report Form.         It in the second test is necessary.         If in the second test is necessary.         If in the second test is necessary.         Record result on Inspection Report Form.	Detector, resolution and contrast	t of images/projectior	ns, and the uni	ficatio	on of noises of p	projection.
Workstation, VXvue S/W         D.Q.E Program (Matlab)         Power supply, Power Meter         X-ray GEN., X-ray Tube         Inspection Report Form         Procedure:         IEC62220-1(RQA 5) in accordance with the conditions         Properties/qualities should be obtained more than 56% at 11/p mm.         If properties/qualities are not obtained, reset the conditions and test again.         If properties/qualities are still not obtained after the second test, service assistance is necessary.         Record result on Inspection Report Form.         Result:         Frequency: D: D, M: D, Q: D, A: D       Date: 20**_**_**         Upperties/instruction of the second test, service assistance is necessary.         Result:         If in the second test, service assistance is necessary.         Record result on Inspection Report Form.         If in the second test is necessary.         Record result on Inspection Report Form.         If in the second test is necessary.         Record result on Inspection Report Form.         If in the second test is necessary.         Record result on Inspection Report Form.         It in the second test is necessary.         If in the second test is necessary.         If in the second test is necessary.         Record result on Inspection Report Form.						
D.Q.E Program (Matlab) Power supply, Power Meter X-ray GEN., X-ray Tube Inspection Report Form Procedure: IEC62220-1(RQA 5) in accordance with the conditions Performance and Corrective Action: Properties/qualities should be obtained more than 56% at 11/p mm. If properties/qualities are not obtained, reset the conditions and test again. If properties/qualities are still not obtained after the second test, service assistance is necessary. Record result on Inspection Report Form. Result: Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**- Operator: Limit of Acceptability: 11/p mm, more than 56%						
Power supply, Power Meter         X-ray GEN., X-ray Tube         Inspection Report Form         Procedure:         IEC62220-1(RQA 5) in accordance with the conditions         Performance and Corrective Action:         Properties/qualities should be obtained more than 56% at 11/pmm.         If properties/qualities are not obtained, reset the conditions and test again.         If properties/qualities are still not obtained after the second test, service assistance is necessary.         Record result on Inspection Report Form.         Result:         Frequency: D: □, M: □, Q: □, A: □       Date: 20**-**- More Parter:         Limit of Acceptability: 11/pmm, more than 56%						
X-ray GEN., X-ray Tube Inspection Report Form Procedure: IEC62220-1(RQA 5) in accordance with the conditions Performance and Corrective Action: Properties/qualities should be obtained more than 56% at 11/p mm. If properties/qualities are not obtained, reset the conditions and test again. If properties/qualities are still not obtained after the second test, service assistance is necessary. Record result on Inspection Report Form. Result: Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**- Operator: Limit of Acceptability: 11/p mm, more than 56%	,					
Inspection Report Form  Procedure: IEC62220-1(RQA 5) in accordance with the conditions  Performance and Corrective Action: Properties/qualities should be obtained more than 56% at 11/p mm. If properties/qualities are not obtained, reset the conditions and test again. If properties/qualities are still not obtained after the second test, service assistance is necessary. Record result on Inspection Report Form.  Result: Frequency: D:  , M:  , Q:  , A:  Date: 20**-**-* Operator: Limit of Acceptability: 11/p mm, more than 56%						
Procedure:         IEC62220-1(RQA 5) in accordance with the conditions         Performance and Corrective Action:         Properties/qualities should be obtained more than 56% at 11/p mm.         If properties/qualities are not obtained, reset the conditions and test again.         If properties/qualities are still not obtained after the second test, service assistance is necessary.         Record result on Inspection Report Form.         Result:         Frequency: D:, M:, Q:, A: Date: 20**_*** Operator:         Limit of Acceptability: 11/p mm, more than 56%						
IEC62220-1(RQA 5) in accordance with the conditions  Performance and Corrective Action:  Properties/qualities should be obtained more than 56% at 11/p mm.  If properties/qualities are not obtained, reset the conditions and test again.  If properties/qualities are still not obtained after the second test, service assistance is necessary.  Record result on Inspection Report Form.  Prequency: D: □, M: □, Q: □, A: □ Date: 20**_**_* Operator:  Limit of Acceptability: 11/p mm, more than 56%	Inspection Report Form					
IEC62220-1(RQA 5) in accordance with the conditions  Performance and Corrective Action:  Properties/qualities should be obtained more than 56% at 11/p mm.  If properties/qualities are not obtained, reset the conditions and test again.  If properties/qualities are still not obtained after the second test, service assistance is necessary.  Record result on Inspection Report Form.  Prequency: D: □, M: □, Q: □, A: □ Date: 20**_**_* Operator:  Limit of Acceptability: 11/p mm, more than 56%	Dressdure					
Performance and Corrective Action:         Properties/qualities should be obtained more than 56% at 1l/p mm.         If properties/qualities are not obtained, reset the conditions and test again.         If properties/qualities are still not obtained after the second test, service assistance is necessary.         Record result on Inspection Report Form.         Result:         Frequency: D: □, M: □, Q: □, A: □       Date: 20**_**_* Operator:         Limit of Acceptability: 1l/p mm, more than 56%		an with the condition	•			
Properties/qualities should be obtained more than 56% at 11/p mm. If properties/qualities are not obtained, reset the conditions and test again. If properties/qualities are still not obtained after the second test, service assistance is necessary. Record result on Inspection Report Form. <b>Result:</b> Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**- Operator: Limit of Acceptability: 11/p mm, more than 56%			5			
Properties/qualities should be obtained more than 56% at 11/p mm. If properties/qualities are not obtained, reset the conditions and test again. If properties/qualities are still not obtained after the second test, service assistance is necessary. Record result on Inspection Report Form. <b>Result:</b> Frequency: D: □, M: □, Q: □, A: □ Date: 20**-**- Operator: Limit of Acceptability: 11/p mm, more than 56%						
If properties/qualities are not obtained, reset the conditions and test again. If properties/qualities are still not obtained after the second test, service assistance is necessary. Record result on Inspection Report Form.	Performance and Corrective A	ction:				
If properties/qualities are not obtained, reset the conditions and test again. If properties/qualities are still not obtained after the second test, service assistance is necessary. Record result on Inspection Report Form.	Properties/qualities should be of	otained more than 56	% at 11/p mm.			
Record result on Inspection Report Form.         Result:         Frequency: D: □, M: □, Q: □, A: □         Date: 20**-**-         Operator:         Limit of Acceptability: 11/p mm, more than 56%						
Result:         Frequency: D: □, M: □, Q: □, A: □       Date: 20**-**- Operator:         Limit of Acceptability: 1I/p mm, more than 56%	If properties/qualities are still not	obtained after the se	econd test, sei	vice a	assistance is ne	cessary.
Frequency: D:  , M:  , Q:  , A:  Date: 20**-** Operator: Limit of Acceptability: 1I/p mm, more than 56%	Record result on Inspection Rep	ort Form.				
Frequency: D:  , M:  , Q:  , A:  Date: 20**-** Operator: Limit of Acceptability: 1I/p mm, more than 56%						
Limit of Acceptability: 1I/p mm, more than 56%	Result:					
	Frequency: D: $\Box$ , M: $\Box$ , Q: $\Box$ ,	A: D Date: 20	)**-**-**	Ope	rator:	
Demodul	Limit of Acceptability: 11/p mm, m	ore than 56%				
Demostra						
Remarks:	Remarks:					



Calibration		
Test ITEM (15)	Frequency	D: Daily   M: Monthly
		Q: Quarterly D A: Annually
Objective:		
Compensates defect pixels and	calibrates pixel gain (	using the installed x-ray generator and x-ray tube.
Equipment:		
Workstation, VXSetup S/W		
Power supply, Power Meter		
X-ray GEN., X-ray Tube		
Inspection Report Form		
Procedure:		
Turn on the power of the system	I.	
Run VXSetup.		
Operation of calibration: Enter 1	0 in the Stage of Pred	offset and perform the calibration.
Operation of calibration: Enter 1	0 in the Stage of Post	offset and perform the calibration.
Operation of calibration: Perform	n Defect defection.	
Operation of calibration: Perform	n Gain correction.	
Performance and Corrective A	ction:	
Featured artifacts are not found	-	
If many artifacts are found, perfo	orm calibration again.	
If many artifacts are still found, s	service assistance is r	necessary.
Record result on Inspection Rep	ort Form.	
Result:		
Frequency: D: $\Box$ , M: $\Box$ , Q: $\Box$ ,	A: Date: 20	)**-** Operator:
Limit of Acceptability: N/A		
Remarks:		
L		



Charger(Charging Indicator)		
Test ITEM (16)	Frequency	D: Daily  M: Monthly
		Q : Quarterly  A: Annually
Objective:		
Confirm that the charging is no	rmally operated.	
Equipment:		
Charger, Battery Pack		
Procedure:		
Put battery packs in the charge	er	
Turn on the charger		
Performance and Corrective	e Action:	
Charging indicator (LED) shoul	ld be showed "Green	Color" after the power is turned on in 2 hours.
If the LED is not on, service as	sistance is necessar	у.
Record result on Inspection Re	port Form.	
Result:		
Frequency: D:		20**-**_** Operator:
Limit of Acceptability: Pass/Fai	I(The status of LED)	
Remarks:		



	Battery Pack(Charge, Discharge)		
Test ITEM (17)	Frequency	D: Daily  M: Monthly	
		Q : Quarterly  A: Annually	
Objective:			
Confirm that the battery pack is	s properly charged ar	nd discharged.	
Equipment:			
Charger, Battery Pack			
DC Electronic Load			
Procedure:			
<charge></charge>			
Charge the battery pack in 2ho	ours.		
Check the rated voltage of the	battery pack by DC E	Electronic Load.	
<discharge></discharge>			
Prepare the full charged batter			
Load 2A to the battery pack by	DC Electronic.		
Derformence and Corrective	• Action:		
Performance and Corrective The full charged battery pack s			
The discharged batter pack sho			
If properties/qualities are not of			
		second test, service assistance is necessary.	
Record result on Inspection Re			
Result:			
Frequency: D:	, A: □ Date:	20**-**-** Operator:	
Limit of Acceptability: Pass/Fail	l		
Remarks:			
	Γ		
Test ITEM (18)	RF Distance betwe	een SCU & Detector	





	Frequency	D: Daily ■ M: Monthly □
	riequency	Q : Quarterly $\square$ A: Annually $\square$
Objective		
Objective:	f DE is properly on	erated
Confirm that the performance of	i KF is property op	eraleu.
Equipment:		
Workstation, VXSetup S/W		
Procedure:		
Run VXSetup S/W.		
Select "wireless test tap"		
Check the data on "wireless tes	st tap"	
Performance and Corrective	e Action:	
Tx Power should be 15dBm.		
Bit rate should be more than 50	)Mbps.	
If properties/qualities are not of	otained, reset the c	onditions and test again.
If properties/qualities are still no	ot obtained after the	e second test, service assistance is necessary.
Record result on Inspection Re	port Form.	
Result:		
Frequency: D: $\Box$ , M: $\Box$ , Q: $\Box$	, A: □ Date	e: 20**-**- Operator:
Limit of Acceptability: 15dBm(T	x Power)	
≥ 50Mbp	os (Bit rate)	
Remarks:		



## System Discrepancy Form

Installation Site Information:
Date: Published by:
System Information
X-ray Generator:
X-ray Tube:
X-ray grid Information:
Detector Model: FXRD-1417WA(B)
Serial Number of Detector:
Serial Number of System Control Unit:
Version of VXvue:
Version of VXSetup:
Comment:
System Discrepancy
Date of finding:
Operator:
How is it found:
Comment:

#### **Contact Information**

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VIVIX-S Wireless Service Manual

## **Modification Request Form**

Date:	Published by:
System Information	
X-ray Generator:	
X-ray Tube:	
X-ray grid Information:	
Detector Model: FXRD-1417WA(B)	
Serial Number of Detector:	
Serial Number of System Control Unit:	
Version of VXvue:	
Version of VXSetup:	
Comment:	
Modification Request	
Software Name:	
Request:	
Comment:	

#### **Contact Information**

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	Jungwon-gu, Seongnam-si, Gyeonggi-do	
	462-736 South Korea	
Phone:	+82-70-7011-6161	
Fax:	+82-31-737-4954	
email:	vieworks@vieworks.com	



## 14. Troubleshooting



Trouble shooting must be performed by technician who is trained by the Vieworks Co., Ltd or an organization certified by Vieworks Co., Ltd. If an unqualified person performs troubleshooting on the system resulting in damaging the detector, software or hardware, then the Vieworks Co., Ltd or its representative is not responsible for the detector repair regardless of remain warranty. For more detailed information, refer to the 9. Warranty section.

## 14.1 Failure Case

Failure Case	Solution
Failed to turn on the power of SCU.	Refer to 8.1.1
Power LED isn't lit up.	Refer to 8.1.2
Status LED isn't lit up with green.	Refer to 8.1.3
Communication Test Failure	Refer to 8.1.4

## 14.1.1 Repairing SCU

Check if AC power cable of System Control Unit is securely plugged. If it still does not work, replace the SCU.

### 14.1.2 Repairing Power Failure

Check if DC power cable is securely plugged and power switch is turned on. If it still does not work, replace the detector.

### 14.1.3 Configuration Failure

Turn off the SCU and turn it on again. If it still does not work, replace the detector.

## 14.1.4 Repairing Communication Failure

Check if LAN cable is securely plugged. If it does not work, do the first step of the following and check again. If it still does not work, do the next step.

- Restart VXvue.
- Turn off the SCU and turn it on again.
- Replace the LAN cable.



## 15. Warranty

Vieworks Co., Ltd warrants that this product will be free from defects in materials and workmanship for a period of twelve (12) months from the date of delivery. If any such product proves defective during this warranty period, Vieworks Co., Ltd at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product. In order to obtain service under this warranty, Customer must notify Vieworks Co., Ltd of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Vieworks Co., Ltd with shipping charges prepaid. Vieworks Co., Ltd shall pay for the return of the product to customer if the shipment is to a location within the country in which the Vieworks Co., Ltd designated service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure, or damage caused by improper or inadequate maintenance and care. Vieworks shall not be obligated to furnish service under this warranty to repair damage resulting from attempts by personnel other than Vieworks Co., Ltd or its representatives to install, repair, or service this product, to repair damage resulting from improper use or connection to incompatible equipment or power source; or to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

THIS WARRANTY IS GIVEN BY VIEWORKS CO., LTD WITH RESPECT TO THIS PRODUCT IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. VIEWORKS CO., LTD AND ITS VENDOR DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABLILITY OR FITNESS FOR A PARTICULAR PURPOSE. VIEWORKS CO., LTD RESPONSIBILITY TO REPAIR OR REPLACE DEFECTIVE PRODUCTS IS THE SOLE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY. VIEWORKS AND ITS VENDORS WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER VIEWORKS CO., LTD OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

There are no warranties which extend beyond the description mentioned in this document.



# Vieworks



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