Digital Flat Panel Detector

User Manual



Before operating, please read this user manual and pay attention to all safety precautions. Please ensure that the user manual is properly maintained so that it can be accessed at any time. Please use correctly on the basis of full understanding of the content.

About FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device must not cause harmful interference;

(2) This device must accept any interference received, including interference that may cause undesired operation.

Attention must be paid to the fact that changes or modifications not expressly approved by the party responsible for compliance can void the user's authority to operate the equipment.

Note: This product 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 product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this product does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment to 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.

This equipment complies with FCC exposure limits set forth for an uncontrolled environment.

Sterilization and Shelf Life

This does not apply.

Notes on usage and management of equipment

- 1. Read all instructions in the user guide before operation. Pay attention to all safety precautions.
- 2. Only a physician or a legally certified operator should use this product.
- 3. The equipment should be maintained in a safe and operable condition by

maintenance personnel.

- 4. Use only computers and image display monitors complying with IEC 60601-1 or IEC 60950-1. For details, consult our sales representative or local dealer.
- 5. Use dedicated cables. Do not use cables other than those supplied with the product.
- 6. Do not open the cover of the product without approval.
- 7. Request your sales representative or local dealer to install this product.

Caring for your environment



This symbol indicates that the product cannot be disposed of with your residential or commercial waste.

Recycling Equipment

Please do not dispose of this product with your residential or commercial waste. Improper handling of this type of waste will have a negative impact on health and the environment. Some countries or regions, such as the European Union, have set up systems to collect and recycle electrical or electronic waste items. Contact your local authorities for information about practices established in your region. If collection systems are not available, call official dealer for assistance.

Disclaimer

- Manufacturer shall not be liable for any damage, loss, or injury incurred to the purchaser and the third parties as a result of fire, earthquake, any accident, misuse or abuse of the product.
- Manufacturer shall not be liable for any damage, loss, or injury arising from unauthorized modifications, repairs, or alterations or failure to strictly comply with operation and maintenance instructions.
- Manufacturer shall not be liable for any damage or loss arising from use of any
 option or consumer goods other than those dedicated as original products.
- It is the responsibility of users and physicians to maintain the privacy of image data and provide a medical care service. Manufacturer shall not be responsible for the legality of image processing, reading and storage, nor shall it be responsible for loss of image data for any reason.
- Information regarding specifications, components, and appearance of the product is subject to change without prior notice.

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Trademarks

The iRay name and iRay logo are registered trademarks of iRay Technology Co. Ltd.

Symbols and Conventions

The following symbols and conventions are used throughout the user guide.

	This symbol is used to identify conditions under which improper use of the product may cause death or serious injury.
	This notice is used to identify conditions under which improper use of the product may cause minor injury.
CAUTION	This notice is used to identify conditions under which improper use of the product may cause property damage.
Prohibited	This is used to indicate a prohibited operation.
•	This is used to indicate an action that must be performed.
Important	This is used to indicate important operations and restrictions.
(i) Information	This is used to indicate operations for reference and complementary information.

Labels and markings on the equipment

The labels and markings on the product are indicated below:

\triangle	Caution: please refer to instructions in the user manual.	
CE	This symbol is used to indicate that equipment has passed CE testing, and it is followed by a CE number.	
SN	This symbol is used to identify the manufacturing series number which is after, below or adjacent to the symbol. The series number of the product is usually composed of 13 digits as shown below: <u>A1A2A3A4</u> <u>C1C2 M DD</u> Y XXX <u>Numerical Order</u> Year Date Month Version Product Code	
	This symbol is used to indicate the name and address of the manufacturer.	
EC REP	This symbol is used to indicate the name and address of authorized representatives in the European region.	
Ĩ	This symbol is used to indicate the need to consult the user guide for general information.	
8	Safety Signs: please refer to the user guide for safety instructions.	
4	Safety Signs: Dangerous voltage levels.	
(\mathbf{b})	Stand-by.	
\$	Handle with care.	

100.	FPD is allowed to withstand 100kg on its surface
5 °C	This symbol is used to indicate operation temperature range.
-20°C	This symbol is used to indicate storage temperature range.
((v))	Non-ionizing radiation
FCC	Federal Communications Commission certificate
Ĩ	Package symbol: fragile.
紊	Package symbol: keep away from sunlight.
Ť	Package symbol: keep dry.
	Package symbol: this symbol is used to indicate humidity range.
<u>11</u>	Package symbol: keep equipment upright.
渣	Package symbol: do not roll package.
	Package symbol: this symbol is used to indicate stacking limit number.

IPx4	Detector symbol: the device passes IPX4 test
Rx Only	Device is for prescription use only.

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1 Safety Information

1.1 Safety Precautions

Follow these safety guides and properly use the device to prevent injury and damage.

WARNING			
Installation and environment	Do not use or store the device near flammable chemicals such as alcohol, thinner, benzene, etc.		
Prohibited	If chemical is spilled or evaporates, it may result in fire or electric shock through contact with electric parts inside the device. Also, some disinfectants are flammable. Be sure to take care when using them.		
	Do not connect the device with anything other than those specified.		
	Doing so may result in fire or electric shock.		
	All patients with active implantable medical devices should be kept away from the device.		
Power supply	Do not operate using any type of power supply other than those indicated on rated label.		
Prohibited	Otherwise, it may result in fire or electric shock.		
	Do not handle with wet hands.		
	You may experience electric shock that could result in death or serious injury.		
	Do not place heavy objects such as medical equipment on cables and cords. Do not pull, bend, bundle, or step on the cables and cords to prevent the sheath from being damaged, and do not alter the cables and cords either.		
	Doing so may damage the cords which could result in fire or electric shock.		
	Do not supply power to more than one piece of equipment using the same AC outlet.		
	Doing so may result in fire or electric shock.		
	Do not turn on system power when condensation has formed on the device.		
	Doing so may result in fire or electric shock.		
	Do not connect multiple portable socket-outlets or extension cords to system.		
	Doing so may result in fire or electric shock.		
	To avoid the risk of electric shock, the device must be connected to a power supply with a protective earth.		
	Not doing so may result in fire or electric shock.		

•	Securely plug power cord into AC outlet.	
Y	If contact failure occurs or metal objects contact with exposed metal prongs of the plug, this may result in fire or electric shock.	
	Be sure to turn off power to each piece of the device before connecting or disconnecting cords.	
	Otherwise, you may get electric shock that could result in death or serious injury.	
	Be sure to hold plug or connector to disconnect cord.	
	If you pull cords, the core wire may be damaged, resulting in fire or electric shock.	
	WARNING	
Handling	Never disassemble or modify the device. No modification is allowed.	
Prohibited	Doing so may result in fire or electric shock. Also, since the device contains components that may cause electric shock and other hazardous parts, touching them may cause death or serious injury.	
	Do not place anything on top of the device.	
	The object may fall and cause an injury. Also, if metal objects such as needles or clips fall inside, it may result in fire or electric shock.	
	Do not hit or drop the device.	
	The device may be damaged if receiving a strong jolt, which may result in fire or electric shock if the device is used without being repaired.	
	Do not put the device and pointed objects together.	
	It may be damaged. The device is recommended to be used in Bucky.	
0	Have the patient take a fixed posture and only let them touch the parts of the device they need to touch.	
•	If patients touch connectors or switches, it may result in electric shock or malfunction.	
When problem occurs	Should any of the following occur, immediately unplug the power cord, and contact a sales representative or local dealer:	
•	When there is smoke, odd smell or abnormal sound. When liquid has been spilled inside or a metal object has entered through an opening. When the device has been dropped and damaged.	
Maintenance and inspection	Please turn off the power of the device and unplug the adaptor power cord before cleaning.	
Prohibited	For safety reasons, never use alcohol, ether and other flammable cleaning agent. Never use methanol, benzene, acid and base because they will erode the device.	
	Don't dip the device into liquid.	
	Please make sure that the device's surface and plug are dry before turning the device on.	
	Otherwise, it may result in fire or electric shock.	
•	Clean the plug of the power cord periodically by unplugging it from the AC outlet and removing dust or dirt from the plug, its periphery and the AC outlet with a dry cloth.	

	If the cord is kept plugged in for a long time in a dusty, humid or sooty place, dust around the plug will attract moisture; this could cause insulation failure that may result in fire. For safety reasons, be sure to turn off the power to each piece of	
	the device when performing inspections indicated in this manual.	
	Otherwise, an electric shock may occur.	
	CAUTION	
Installation and environment	Do not install the device in any of the locations listed below. Doing so may result in failure, malfunction, falling, fire or injury.	
	Close to facilities where water is used Where it will be exposed to sunlight directly Close to an air outlet of an air-conditioner or ventilation equipment Close to a heat source such as a heater Where the power supply is unstable In a dusty environment In a saline or sulfurous environment Where the temperature or humidity is high Where there is freezing water or condensation In areas prone to vibration On an incline or unstable area Take care that cables do not become tangled during use. Also, be careful not to get your feet caught by the cable. Otherwise, it may cause a malfunction of the device or injury of the user due to tripping over the cable. Non-medical equipment such as a battery charger and access point cannot be used in the patient's vicinity.	
	2.5 m	
Power supply	Always connect the three-core power cord plug to the grounded AC power outlet.	
	To make it easy to disconnect the plug at any time, avoid putting any obstacles near the outlet. Otherwise, it may be impossible to disconnect the plug in an emergency.	
	Be sure to ground the device to an indoor grounded connector. Also, be sure to connect all the grounds of the system together.	
	Do not use any power source other than that provided.	
	Otherwise, fire or electric shock may be caused due to leakage.	
Handling	Do not spill liquid or chemicals onto the device. In case the patient is injured, do not allow blood or other body fluids to contact the device.	
	Doing so may result in fire or electric shock. In such situation, protect the device with a disposable cover as necessary.	
	I urn off the power and pull out the plug to each piece of the device for safety when not used.	



	Keep the same load (the same pressure) on the detector when acquiring an image,
image will be incorrect.	or the
CAUTION	
CAUTIONDo not operate close to fire, do not use in high temperaturesDo not invert positive and negative polesDo not contact with metal in case of a short circuitDo not insert sharp objects into the batteryDo not hit the batteryDo not stand on the batteryDo not use the battery for purposes other than those stipulated in the rulesDo not dispose of the battery or change its internal structureDo not submerge the battery in water; please keep it dry in storage and do not contact with water while in usePlease charge the battery with the charger provided by ManufacturerDo not mix the battery with ones not provided by ManufacturerDo not charge the battery with a broken charger.Charge the battery regularly to avoid over-discharge failure.Do not use the battery when it is severe ballooning.	

1.2 Notes for Use

When using the device, take the following precautions. Otherwise, problems may occur and there may be a malfunction.

Before exposure

- Be sure to check the device daily and confirm that it works properly.
- Be sure there is a battery installed in the product to avoid a sudden power off

- Sudden heating of the room in cold areas will cause condensation to form on the device. In this case, wait until condensation evaporates before performing an exposure. If it is used while condensation is formed, problems may occur in the quality of captured images. When an air-conditioner is used, be sure to raise/lower the temperature slowly so that a difference in temperature in the room and the device does not occur, to prevent condensation.
- The detector should be warmed for more than 20 minutes before exposure or updating gain or defect template.

During exposure

- Do not move the power cable during exposure as it may cause image noise or artifacts, or even incorrect images.
- Do not use the equipment near detectors generating strong magnetic fields. Otherwise, it may cause image noise, artifacts or even incorrect images.
- Do not make an exposure within 60 seconds after 4 full range exposures. Otherwise, the image will be incorrect. Do not make an exposure within 30 seconds after a full-range exposure. The larger the dose used, the longer the wait should be before the next exposure.
- During image acquisition, product should not be influenced in a physical or electrical way.

After exposure

If the detector will not be used for 5 days, it is required to take out the battery. If the battery will not be used for a long time, it must be charged to 30%~50% every 3 months or 50%~70% every 6 months.

Disinfecting and Cleaning

- After every examination, wipe the patient contact surfaces with disinfectants such as Benzalkonium chloride or Benzalkonium bromide, to prevent the risk of infection. For details on how to sterilize the device, consult a specialist.
- Do not spray the detector directly with disinfectants or detergents.
- Wipe it with a slightly damp cloth with a neutral detergent. Do not use solvents such as alcohol, thinner, benzene, acid and base. Doing so may damage the surface of the detector.
- It's recommended to use a waterproof non-woven cover as an isolated layer between the detector and blooding patient.

2 General Description

The product is a cassette-size wireless X-ray flat panel detector based on amorphous silicon thinfilm transistor technologies. It is developed to provide the highest quality of radiographic images, and contains an active matrix of 2832×2836 with 150um pixel pitch. The detector's scintillator has two options: GOS (Gadolinium Sulfoxylate) and CsI (Caesium Iodide). However, the greatest improvement is wireless communication between the detectors and PC. In addition, it can be powered with a battery for portable panel use.

2.1 Scope

This manual contains information about the Mars1717XF. All operators must read and understand this manual before using the device. All information in this manual, including illustrations, is based on an equipment prototype. If your configuration does not have any of these items, information about these items in the manual does not apply to your detector.



2.2 Lineup



2.3 Characteristics

- Wireless static Flat Panel Detector used for general radiography.
- 17 × 17 inch
- AED trigger
- Easy-to-change cable and charge in tray.
- Battery rechargeable
- IPX4

2.4 Intended Use

Wireless Digital Flat Panel Detector is intended for digital imaging solutions and designed to provide general radiographic diagnosis of the human anatomy. It is intended to replace radiographic CR and DR systems in all general-purpose diagnostic procedures. This device is not intended for mammography or dental applications.

The detector can be used for general X-ray diagnosis of certain body parts. It is not intended for mammography, dental applications, neonatal and fluoroscopy. More care should be taken when making a diagnosis of people with allergies. In addition, it is also prohibited for use on pregnant women. Shielding of none-inspection body areas is necessary during X-ray exposure. There is no contraindication.

According to product's intended use and results of risk management, essential performance is identified and described as the following:

- To acquire dark images, product shall be not influenced by imaging acquisition.
- To maintain data transmission, product shall be not influenced by data and signal transmission.

2.5 Product Components

The product is configured with the components below

Item Description

Mars1717XF Detector	Mars1717XF GSI/CSI
Medical adapter for detector and battery charger	24V (DC) power adapter
Battery pack	7.6V battery pack
Gigabit ethernet cable	Ethernet cable for wireless router
AC power cable	AC cable for adapter

Battery charger	FUJIFILM	Battery charger
User Manual		Paper print
CD-ROM		User Manual Service tool

Note: The product package may be different based on requirements.

2.6 Components Description

2.6.1 Detector





External Signals Input and Control Panel



Control Panel

NO.	Item	Description
A	DC Input Interface	24V DC input
В	Reserved	Reserved
С	Status Indicator	Detector Status indicator
D	Reserved	Reserved
E	Link Indicator	Detector Link indicator
F	Power Indicator	Detector Power indicator
G	Power Button	Power button

2.6.2 Battery Pack



	NO.	Item	Description
--	-----	------	-------------

A	Battery Label	1
В	Battery Interface	7-pin battery connector
С	Guide Block	1
D	Latch	Attach the battery lock to the detector
E	Touch Display	Show battery level after touching

2.6.3 Battery Charger



ltem	Item	Description
A	Battery Slot	3 batteries inserted
В	Capacity Indicator	The indicator definition is as below
С	DC Jack	24V DC input

The battery charging capacity indicator definition:

Indicator	Lighting Status	Operating Status
-----------	-----------------	------------------

OFF	No battery insert
Green blinking	Battery insert with capacity ≤95%, charging
Green ON	Battery insert with capacity >95%
Orange blinking	Battery slot malfunction

2.7 Product Specifications

2.7.1 Detector

Item	Specification
Model	Mars1717XF-GSI (GOS)
	Mars1717XF-CSI (CsI)
Pixel Size	150 μm
Effective Array	2832 x 2836 (Note)
Effective Area (H x V)	424.8mm x 425.4mm
Greyscales	16 bit
Image Transfer	Wireless: IEEE802.11a/b/g/n
Wireless Frequency Range	2.412~2.472GHz, 5.18~5.22GHz; 5.745~5.85GHz
Data Transmission Power	13dBm (Typ.) @802.11a
	16dBm (Typ.) @802.11b

	14dBm (Typ.) @802.11g
	13dBm (Typ.) @802.11n HT20
	11dBm (Typ.) @802.11n HT40
	16dBm@2.4GHz
	13dBm@5.8GHz
Wireless Modulation	11b: DSSS (DBPSK, DQPSK and CCK)
	11a/g/n: OFDM (BPSK, QPSK,16QAM, 64QAM)
Wireless Band	2.4GHz≤40MHz
	5.19GHz≤40MHz
	5.8GHz≤40MHz

Note: The Mars1717XF-GSI's active area and defect calculation area is 2832 x 2836; the TFT

module size is 2848 x 2840. Please see figure below



The Mars1717XF-CSI defect calculation area is 2826 x 2818, the active area is 2832 x 2836 and the



TFT module size is 2848 x 2840

2.7.2 Battery



Item	Specifications
Model	Battery-KX
Rated Capacity	Min. 3500mAh, Typ.3800mAh @ Discharge 0.5C
Rated Voltage	7.6V

2.7.3 Battery Charger



Item	Specifications
Model	Charger-KX

Simultaneous Charging	3 battery packs
Full Charging Time	2.5 hours

2.7.4 Environment

	Temperature	Temperature Variation	Humidity	Atmospheric Pressure	Atmospheric Pressure Variation
Operating	5~30° C	<1k/min	10%~80% RH	700~1060hPa	<10kp/min (1kp=1.0197E-5Pa)
Storage (without battery)	-20~50°⊂	<1k/min	10%~90% RH	700~1060hPa	<10kp/min (1kp=1.0197E-5Pa)

• Detectors should operate at altitudes of not more than 3,000m; the requirement is only for the detector.

● If storing with a battery, the temperature should be in the range of -20°C~45°C when the expected storage time is less than 3 months. For -20°C~25°C, the storage time is 12 months.

3 Preparation

3.1 Detector Installation

3.1.1 Attach Battery Pack

The product can be powered by both a battery pack and DC power. Once the battery pack is inserted or DC power is connected, detectors will be turned on immediately. If neither battery nor DC power is connected, panel will power off. Please see below for battery installation.



3.1.2 Booting Up

On the control panel, users can press the power button to turn on/off.

When the detector is powered down, the user presses the button for 4 seconds to turn on the detector if the battery is inserted and the capacity is not less than 15%, or DC power is connected.

When the detector is powered on, the user presses the button for 4 seconds to shut down the detector. On the other hand, it can also be used as a reset internal control IC when the button is activated for 8 seconds.



After booting up, users can check the indicator of the detector.

Power indicator

Power Indicator	Lighting Status	Status				
		Battery Capacity	DC Input	Description		
OFF	E	NO	NO	Detector is turned off		
Orange ON	Ð	≥7% & ≤15%	NO	Detector is turned on		
Green ON	R	>15%	NO			
		NO	YES	Detector is turned on		
Orange Blinking		≥7% & <15%	YES	Detector is turned on		
Green Blinking		≥15% & <95%	YES	Detector is turned on		
				mode		

Link indicator:

Link Indicator	Lighting Status	Description
OFF		Detector is turned off

Operation

		Wired connection broken and wireless connection not ready
Blue ON	(in	Wireless connection is enabled
Green ON	?	Wired connection is enabled (Service Mode)
Blue blinking		Detector InitializationWireless configuration reset
Green blinking	?	Wireless configuration reset

Mode indicator:

Mode Indicator	Lighting Status	Description
Blue ON	~	Default
OFF	24	Detector is turned off

Status indicator:

Status Indicator	Lighting Status	Description		
OFF		Detector is turned offExposure prohibited		
Green ON		Ready for exposure		
Orange blinking		Safety Mode		
Orange ON		Fatal Error		



3.1.3 Adapter

The detector supports an externally powered It gets CB certificate No. SG PSB-MD-00005 and NRTL certificate No. U8V 093768 0016. Port defined as bellowing:

No.	Definition	Voltage Range	Rated Current
P1	DC Power Negative	0~0.5V	0~0.42A
P2	DC Power Positive	23~25V	0~0.42A
P3	DC Power Positive	23~25V	0~0.42A
P4	DC Power Negative	0~0.5V	0~0.42A

In order to meet the safety and function requirements of the detector, standard components are recommended.



4 Operation

The detector provides user SDK for integration into the DR system. Additionally, it also provides application demonstration, i.e., iDetector.

4.1 Main Operation

The detector mainly acquires X-ray images. More importantly, the detector should build

synchronization with the X-ray generator, i.e., Software Mode and AED Mode.

4.1.1 Software Mode

4.1.1.1 Block Diagram

Software mode builds the first X-ray image acquisition step. Please see the figure below for general features. Software mode is configured by selecting "prep" in Trigger mode and "prepcapmode_acq2" in Prep capmode.





The workstation hosts the PC device installed with FDR SE Console or iDetector. Chapter 3.3 describes how to establish connection between detectors and the workstation. In Software mode, the workstation does not control the X-ray generator; users decide when to take an X-ray.

4.1.1.2 Work flow



4.1.1.3 Timing Setting

To get a clear view of the workflow, see the diagram below for details



- 1. Workstation receives "Acquire" request, send command "Clear" to detector.
- 2. Detector receives "clear" from workstation and begins flushing panel. Meanwhile, replies to workstation "Exposure Prohibited".
- 3. Detector finishes "Clear" and sends message "Exposure Enable"
- 4. "Exposure Enable" is shown on iDetector's bar, user takes X-ray.
- 5. User triggers X-ray generator to initialize and do anode rotation to prepare for X-ray.
- 6. X-ray generator finishes preparation and replies to user
- 7. X-ray generator begins releasing X-ray
- 8. X-ray generator finishes taking X-rays.
- 9. Workstation prepares receiving image.
- 10. Detector begins data acquisition after time limits.
- 11. Detector completes image acquisition and begins image transmission.
- 12. Workstation receives all images.

Images received will be preview images; preview images are those without much correction which causes some stripes; they cannot be used for final diagnosis.

The detector will make another dark image acquisition for offset correction. If Hardware Post offset and Hardware calibration are selected, the detector uploads the processed image to the workstation after offset, gain and defect calibration.

If Software Post offset and Software calibration are selected, the corrected image is shown on the screen after the workstation finishes offset, gain and defect calibration.

Note: If the wireless condition is bad, the detector cannot send even one package in 30s. It will stop trying to send image packages. Users have to retrieve images from the detector when the wireless condition is good enough.

4.1.2 AED Mode

4.1.2.1 Block Diagram

Please see the figure below for general features. AED mode is configured by selecting "inner" in Trigger mode and "cycleacq" in inner trigger subflow.



The workstation hosts the PC device installed with FDR SE Console or iDetector. Chapter 3.3 describes how to establish the connection between detectors and the workstation. In AED mode, the workstation does not control the X-ray generator; the user decides when to take the X-ray.

4.1.2.2 Work Flow



4.1.2.3 Timing Setting

To get a clear view of the workflow, see the diagram below for details

Operation



- 1. Workstation receives "Acquire" request and sends "Clear" to detectors.
- Detector receives "clear" from workstation and begins flushing panel. Meanwhile, replies to workstation "Exposure Prohibited".
- Detector finishes "Clear" and sends message "Exposure Enable".
- 4. "Exposure Enable" is shown on iDetector's bar, user takes X-ray.
- 5. User triggers X-ray generator to initialize and do anode rotation to prepare for X-ray.
- 6. X-ray generator finishes preparation and replies to user
- 7. X-ray generator begins releasing X-ray
- 8. X-ray generator finishes taking X-rays.
- 9. Detector begins data acquisition after time limits.
- 10. Detector completes image acquisition and begins image transmission.
- 11. Workstation begins receiving all images.
- 12. Workstation finishes receiving all images.

Images received will be preview images. Preview images are those without much correction which causes some stripes; they cannot be used for final diagnosis.

The detector will make another dark image acquisition for offset correction. If Hardware Post offset and Hardware calibration are selected, the detector uploads the processed image to the workstation after offset, gain and defect calibration.

If Software Post offset and Software calibration are selected, the corrected image is shown on the screen after the workstation finishes offset, gain and defect calibration.

Note: If the wireless condition is bad, the detector cannot even send one package in 30 seconds. It will stop trying to send an image package. Users have to retrieve images from the detector when the wireless is good enough.

4.1.2.4 Abnormal Action

If users do not want to take an X-ray, it is possible to cancel the exposure window manually.

4.1.2.5 Exposure Window

The exposure window can be configured with: 0.7s, 1.2s, 2.2s, 3.2s, 4.2s.

4.2 Connection Build



Notes:

1. Users must re-connect the detector with a different IP address when changing the connection from a different net card.

2. Switching between wired and wireless connection does not need any extra operation.

3. The rule of multi-share is based on the IP address. The second terminal with a different IP address is not allowed to operate when the first is connected. If there is no command transmission between the detector and the workstation (FDR SE Console or iDetector) over 5 minutes, the detector releases access authority.

4.3 Panel Configuration

Choose iDetector menu-related modules	Home	Acquire	SDK	Detector	Calibrate	Local File	
"Acquire" module:	e Cuincui Home Angelie SDC Delector Calibrat Loui Tile	Control					
---	--	---					
Choose offset mode, load gain and defect template Acquire images: "Prepacq", "Acquire" and so on	Consult Stage Properties Offer Wei 6527 Offer Wei 527 Offer Wei 527 Offer Wei 527 Offer Wei 6 Offer Wei 76 Offer Wei 76 Offer Wei 76 Offer Meine 76 Offer Meine 76 Meine Meine 76 Meine Meine 76	Hage (of					
	Ste ROMONIUM See Test To Tak Messey (14000 Test scened Covert	• • • • • • • • • • • • • • • • • • •					
"SDK" module:	Childram Regione Stic Defactor Calibran Local Tim WorkCV 59 KV202295394 V1200515951 Set	2016/06/20 16:10:56 Misit417y_1					
IP address, MAC address and so on	Deletar DL ERMit Connetion DL Connetiging all Contention DL Calification Contention DL Calification Ling Intel Lingtoned Jrie	e Logiand John Set					
	Hug P 192/248.138 152/26.818 Set Hug Avet 2000 5et Set Remote Part 192/248.8 Set Set						
	COL/Fer 1 Ser Prev Gravert Sing 5er 5er Wraps Covert Sing 0 5er						
	Pip Downlash Hast, JP 352.388.338 182.388.138 Set Pip Downlash Hast, Put, 2000 Set Set Pip Downlash Usin Put, 2000 Set Set Pip Downlash Usin Put, 2000 Set Set Pip Downlash Put Put Set Set Set						
	Pip Downlask Carl PuB Sec. Pip Downlask Carl PuB 3523483.386 Sec. Syst 0.00000000000000000000000000000000000	- D 05					
"Detector" module:	Concus Home, Acquire SDC. Detectors Californi Louis File	- 0 X 2016/06/20 16:11:50 Mars1417/_1					
Trigger module, wireless configuration	Pounder la Searc MA Jages Pocke No 2 Sea Poster No Searches CM Sear No Norman No Norman Searches CM Mah Yeshin 23.0	* Read Detector Read Write					
and so on	Pad Vesion 251.12 Mite Vesion 2522 Are Vesion 13134 Foreit Vesion 11656	Upplate Remains					
	Togge Mode ToggeMode/Test/pric • Segues observal Time (m) 5000 5000 Sed Dayr (min (m)) 5000 5000 Sed Dayr (min (m)) 5000 5000 Sed Dayr (min (m)) 5000 5000	ŕ					
	A Cash Dony Tree (nd) 30 Intransition (nd) 70 Se Net 27884 Coll 10						
	No. Marcalable No. No.						



4.4 Correction Template Generation

Manufacturer recommends users correction template generation after installation, any major change on system settings or hardware configuration. On the other hand, it is also recommended to do template generation every 6 months.

4.4.1 Pre-offset Template Generation

The pre-offset template is necessary for preview image. See below



4.4.2 Gain Template Generation

Before gain template generation, make sure SID=1.2m; no copper is required,







Note:

1. X-ray image has three states: green, yellow and red.

Green means image meets requirements.

Yellow means image does not meet requirements, but can generate template.

Red means image does not meet requirements, cannot generate template, must be taken again.

4.4.3 Defect Template Generation

Before defect template generation, make sure SID=1.2m, no copper is required,







. Note:

1. X-ray image has three states: green, yellow and red.

Green means image meets requirements.

Yellow means image does not meet requirements, but template can be generated.

Red means image does not meet requirements, template cannot be generated, must take another shot.

4.5 Image Check and Upload

"Local Image Check" defines the function checking image saved in the workstation (FDR SE Console or iDetector). "Panel Image Upload" defines function uploading images stored in the detector.

Choose "Local File"	Detector	
	Home Acquire SDK Detector Calibrate Local File	2016/09/05 11:34:03
		Mars1717V_1
	Operation Image Properties	
	WW: 65535	
	PosX: 0	
	PosY: 0	
	Value: 0	
	Height: 0	
	Rotate	
	Neverse .	
	Miltor	
	ROL	

4.5.1 Local Image Check

Click "Local File" to open dicom, Raw	Com	√ 4
and tif file	Opprint P More: Nore: Def monified type Nore: Marce: Nore: Def monified type Nore: Marce: Nore: Def monified type Marce: Def monified type Nore: Marce: <th>2 * 3 Ø</th>	2 * 3 Ø
	Fit some	decens Man(*,4en) are the of Anny are the of Anny are the of Anny of The(*,47) decens Size(*,410)
Click "Open"	/	

4.5.2 Panel Image Upload



Panel Image is uploaded as below.

Choose "Detector" -> "Images"	17 Detector		
Choose Deteotor - integes	Home Acquire SDK Detector Calibra	te Local File	2016/09/05 13:25:36
Click "Query Images", image info listed	Parameters Sensor Wi Images		Mars1717V_1
below	Query Images Upload Images Stop Uplo	ad	
Delow	Index FileName CreateTime DelayTime 1 1470858273 2016-08-10 19:44:33 2169	ImageAttr Status	
	2 1470858286 2016-08-10 19:44:46 2167 3 1470858293 2016-08-10 19:44:53 2167	0x00000000 0x00000000	
	4 1470858306 2016-08-10 19:45:06 2125 5 1470858313 2016-08-10 19:45:13 2125	0x00000000 0x00000010	
	6 1470858326 2016-08-10 19:45:26 1607 7 1470858332 2016-08-10 19:45:32 1607	0x00000000 0x00000010	
	8 14/0858348 2016-08-10 19:45:48 2126 9 1470858355 2016-08-10 19:45:55 2126	0x00000000	
	10 0 19/06/01/01/00/0000 0 11 1470862956 2016-08-10 21:02:36 0 12 1470862956 2016-08-10 21:02:36 0	0x0000000 0x00000000	
	13 1470862956 2016-08-10 21:02:36 0 14 1470864272 2016-08-10 21:24:32 0	0x0000000	
	15 1470864272 2016-08-10 21:24:32 0 16 1470864363 2016-08-10 21:26:03 3000	0x00000000 0x00000000	
	17 1470864363 2016-08-10 21:26:03 3000 18 1470864363 2016-08-10 21:26:03 3000 19 1470864363 2016-08-10 21:26:03 3000	0x00000001 0x00000001	
	19 14/0864363 2016-08-10 21:26:03 3000 20 1470864429 2016-08-10 21:27:09 4000 21 1470864429 2016 08 10 21:27:09 4000	0x00000000	
	21 1470804429 2016-08-10 21:27:09 4000 22 1470864429 2016-08-10 21:27:09 4000	0x00000001 *	
	SN: VE07107095002 State: Ready Task No Task	Message: 13:25:32 Task succeed: QueryHistoricalIm	ageList • 🖸 38 %
Click "Upload Images"	iDetector		
	Home Acquire SDK Detector Calibra	te Local File	2016/09/05 13:32:35 Mars1717V_1
Input the index number of images	Parameters Sensor Wifi Images		
	Query Images Upload Images Stop Uplo	ad	
Click "OK"	Index FileName CreateTime DelayTime 7 1470858332 2016-08-10 19:45:32 1607	ImageAttr Status ^	
	8 14/0858348 2016-08-10 19:45:45 9 1470858355 2016-08-10 19:45:55 2126 10 0 1970-01-01 00:00:00 0	0x0000000 =	
	11 1470862956 2016-08-10 21:02:36 0 12 1470862956 2016-08-10 21:02:36 0	0x00000000	-
	13 1470862956 2016-08-10 21:02:36 0 14 1470864272 2016-08-10 21:24:32 0	0x0000 UploadImageRangeWnd	
	15 1470864272 2016-08-10 21:24:32 0 16 1470864363 2016-08-10 21:26:03 3000	0x0000 Startindex: 1 Endindex: 10 OK	
	17 1470864363 2016-08-10 21:26:03 3000 18 1470864363 2016-08-10 21:26:03 3000 19 1470864363 2016-08-10 21:26:03 3000	0x00000001 succi 0x00000001	
	20 1470864429 2016-08-10 21:27:09 4000 21 1470864429 2016-08-10 21:27:09 4000	0x00000000 0x00000000	
	22 1470864429 2016-08-10 21:27:09 4000 23 1470864429 2016-08-10 21:27:09 4000	0x00000001 0x00000001	
	24 1470864445 2016-08-10 21:27:25 4000 25 1470864445 2016-08-10 21:27:25 4000	0x00000000 0x00000001	
	26 1470864445 2016-08-10 21:27:25 4000 27 1470864445 2016-08-10 21:27:25 4000	0x00000001 0x00000001	
	28 1470864466 2016-08-10 21:27:46 0 SN: VE07107095002 State: Ready Task: No Task	0x00000000 * Message: 13:32:09 Task succeed: UploadHistoricalIn	nages • 🗔 34 %
Maiting for status from "Pusu" into		<u></u>	
valling for status from Busy Into	iDetector		2016/09/05 13:34:35
"Ready"	Home Acquire SDK Detector Calibra	Local File	Mars1717V_1
	Parameters Sensor Wifi Images	ad	
Check upload images		Author second Author	
Click "Stop Uploading" to stop image	iDetector_Win7 ► x64 ► work_dir ► Mar	rs1717V > upload > VE07107095002	← ← Search VEQ ♀
	Help		in
upioad	Name Name	Pate modified Type	Size
	1470858273.raw	9/1/2016 :34 PM RAWfile	18,432 KB
	1470858286.raw	9/5/2016 1:34 PM RAWfile	18,432 KB
	1470858306.raw	9/5/2016 1:34 PM RAWfile	18,432 KB
	1470858313.raw 1470858326.raw	9/5/2016 1:34 PM RAWfile 9/5/2016 1:34 PM RAWfile	18,432 KB 18,432 KB
	1470858332.raw	9/5/2016 1:34 PM RAWfile	18,432 KB
	1470858355.raw	9/5/2016 1:35 PM RAWfile	18,432 KB
	1470864363-offset raw test_pretemp.raw	9/5/2016 1:32 PM RAWfile 9/5/2016 1:35 PM RAWfile	18,432 KB 18,432 KB
Images uploaded is stored in "work_dir \			
Mars1717XF Client \ upload \serial			
number"			

4.5.3 Defect Template Check and Modification

iDetector provides function checking defect template. If the defect template has updates, the user can add and delete defect pixels or lines.

-	
Select "Local File" module	Detector 2012/00/05 11:34/0
Click "Local File"	Home Acquire SDL Detector Calibrate Loss File Main 1717V_1 Operation Image Properties Main 1717V_1 Main 1717V_1 Detector Postro Postro Postro Postro Postro Postro Postro Memory No No No Rotate 0 No No Rotate 0 No No
Choose template type "*.dft", open it	Const In Benning - KE 1889 (KE LADE + Ent. + Second War + Med T2Y + Central + Solar + * * * * * * * * * * * * * * * * * *
	Gen H Cand

4.5.3.1 Defect Template Check

4.5.3.2 Defect Template Modification



If there are new defect pixels, type in coordinates, click "Add". If defect templates have dummy lines, type in coordinates, click "Delete".	Overetor (C.V.)serialgigeons tool Deaktog Valencov(do) -340-07_SOX, ReleasePackage, 40.14.2300, Tools/Delector, Win7u64Wook, dor/Mar:1717V/Correct/Deltition, Dim 20 Outroom Response Softia Delector Calibrae Lead File
If there are new defect lines, type in starting and ending coordinates, click "Add". If defect templates have dummy lines, type in coordinates, click "Delete".	Octoclor [C.W.serligingdong tao/DextopUdetector/903-340-07, SDK ReleasePackage_40.14.2390/Tools/Detector/Win7u6Rwork_dir/Mars/1717V/CorrectDetails2016/09/060 09:18:50 Detector [C.W.serligingdong tao/DextopUdetector/Win7u6Rwork_dir/Mars/1717V/CorrectDetails2016/09/060 09:18:50 Mars:1717V_1 Operation Image Properties WWI 05355 WWI 05355 Value 0 DetectMagSetWind II Poixt 1317 Value 0 DetectMagSetWind II Poixt 1317 Value 0 DetectmagSetWind II Vi 1317 Value 0 Vi 1317 Value 0 DetectmagSetWind II Vi 140 Vi
Click "Save" to save modified defect template.	Save

4.6 Correction Template Management

4.6.1 Template Synchronization

The detector supports correction template storage, which means templates can be transmitted not only from the detector to the workstation(FDR SE Console or iDetector), but also from the workstation(FDR SE Console or iDetector) to the detector.



Click the template to be downloaded		
	Create Correct Template	
Click "Download to FPD"	Modechies Greate Offiet Create Cain Greate Defect Greate Defec	dir.
	Fod template file Type Index Activity Description Upload to Work Upload to Work Upload to Work UpdateHWPreOff UpdateHWPreOff	di. Isat
Check whether information is right.	Create Correct Template	
Change Index in FPD if necessary.	Subset settings Create Offset Subset Activity Offset Gain Defect Lag	
Click "Download".	Create Gain Default enable valid valid valid absent Create Defect DownloadToFpdWnd Fipd template file Ditemp for sf test/Detector-4493/v64 (work, di/Mars177XF, 1921.083.1008,Correct Detection, 2042,643.028.04) Type Index Ditemp for sf test/Detector-4493/v64 (work, di/Mars177XF, 1921.083.008,Correct Detection, 2042,643.028.04) Ditemp for sf test/Detector-4493/v64 (work, di/Mars177XF, 1921.083.008,Correct Detection, 2043,643.043.04) Type Index Detection: Download Cancel	de 20
Wait until "Task succeed: Download CaliFile"	Create Correct Template Mode&Files Subject Activity Offset Gain Create Carle Default enable valid valid absent Import to Work Default enable valid valid absent Fpd template file Type Index Activity Description Upload to Vicio Upload to Vicio <td< th=""><th>v kdr ž</th></td<>	v kdr ž
	13:15:31 Task succeed: DownloadCaliFile	•

Click "Read Status" to read template	_		
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	Create Offret	Subset settings	
	Create Gain	Subset Activity Offset Gain Defect Lag Default enable valid valid valid absent	
	Create Defect	in	mport to Workdir
			Download to FPD
			Read Status
		Ford template file	
		Type Index Activity Description Que	ery FPD file
		Gain 1 in use Gain 2 disable Gain 3 disable	
		Defect 1 disable	Upload Lag
		Defect 3 disable	Read Status
		Up	pdateHWPreOffset
		13:22:53 Task succeed: QueryHwCaliTemplateLis	st 🗸
Choose template number according to	Create Correct	Template	
Choose template number according to requirements	Create Correct	Template Subset settings	
Choose template number according to requirements	Create Correct	Femplate Subset settings Subset Activity Offset Gain Defect Lag Default mobile valid valid absent	
Choose template number according to requirements Click "Active" to activate template	Create Correct Mode&Files Create Offset Create Gain Create Defect	Femplate Subset settings Subset Activity Offset Gain Defect Lag Default enable valid valid valid absent	moort to Workdir
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Choose template number according to requirements Click "Active" to activate template	Create Correct Mode&Files Create Offset Create Gain Create Defect	Subset settings Subset Activity Offset Gain Defect Lag Default enable valid valid absent	mport to Workdle Journlaad to FPD Reed Status
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Choose template number according to requirements Click "Active" to activate template	Create Correct Mode&Files Create Offset Create Gain Create Defect	Subset settings Subset settings Default enable valid valid absent Image: Subset settings Fpd template file Type Index Activity Description Gain 1 In use Gain 3 disable Defect 2 in use Defect 3 disable	mport to Workdie Jownlaad to FPD Read Status ery FPD file credi liplead to Workdie Upload Lag Read Status Active adatetiWPreOffset
Choose template number according to requirements Click "Active" to activate template	Create Correct Mode&Files Create Offset Create Gain Create Defect	Subset settings Subset settings Default enable valid valid absent Ppd template file Type Index Activity Description Gain 1 in use Gain 2 disable Defect 1 disable Defect 2 in use Defect 3 disable Umable Image: Defect 3 disable Image: Defect 4 disable Image: Defect 5 disable Image: Defect 6 disable Image: Defect 7 disable Image: Defect 8 disable	mport to Workdir Download to FPD Read Status ery FPD file coord Upload to Workdir Upload to Workdir Upload to Workdir Upload to Borkdir Upload to Borkdir Bead Status

Upload templates

Make sure firewall is turned off		
Make sure firewall is turned off	Control Panel I System and Security I Windows Firewall I Cutatomics Stitting: Cutatomics settings for each type of network Vo can modify the firewall settings for each type of network location that you use. Windows Firewall I Cutatomics Settings Imme or work (pinital) network location settings Imme or Windows Firewall (hot recommended) Dettain Incoming connections, including these in the list of allowed programs Imme or Windows Firewall (hot recommended) Imme or Windows Firewall (hot recommended)	- 4 Storch Cantral Panel

Choose "Calibrate"	
Choose Calibrate,	Create Correct Template Mode&Files
Click "Start Generate template" Click "Read status" besides FPD template file.	Nobescrites Subset settings Create Offset Subset settings Create Gain Default enable valid valid absent Create Defect Import to Workdin Download to FPD Read Status
Click template which needs to be uploaded.	Fpd template file Type Index: Activity Operation Query FPD file Succeed Upload to Workdin Upload to Workdin Upload to Workdin Upload to Workdin Uplett 2 in use Defect 3 disable Uplett 2 in use Uplett 3 disable UpdatettWheOffset
Click subset settings	Create Correct Template
Click "upload to Workdir".	Mode&Files Create offset Create Cain Create Defect Fpd template file Type Index Activity Description Cain 2 enable Defect 1 enable Uplead to Modulir Uplead to Workdir Description Cain 2 enable Defect 1 enable Uplead to Workdir Uplead to Workdir Read Status Active Uplead to Workdir Uplead to Workdir Workdi
If information listed is right, click "OK".	Create Correct Template
Wait until "Upload FPD file succeed!"	Subset settings Create Offet Create Offet Create Offet Create Offet Create Offet Default enable valid valid absent absent Upload for Workdir To: Default To: Default To: Default Netice: Overwrite exits file! Defett 1 OK Cancel Upload to Workdir. Upload

Check template uploaded in	See 6 ▲ ⓐ C → (1 + 100-100,100,000,000,000,000,000,000,000,
Check template uploaded in "work_dir\Mars1717XF_192.168.100.8\ Correct\Default"	Since Interface Operate Non-Notice Operate Non-Notice Determine Non-Notice Determine NOTICE NOTICE
	Serve type Advis Birly (24) (2) Note holder (2) Note holder (3) Sec. (4) (4) Sec. (4) (5) Sec. (4) (5) Sec. (4) (5) Sec. (4) (5) Sec. (5) (5) Sec. (5) Sec. (5) (5) Sec. (5) Sec. (5) (5) Sec. (5)

4.6.2 Correction Activation

The detector supports two ways to do corrections. Software correction defines a scenario in which the workstation(FDR SE Console or iDetector) finishes a correction. If the detector does itself, that is hardware correction and calibration.

4.6.2.1 Software Correction

'work_dir\Mars1717XF_192.168.100.8\	Very Tools Help Ormonia - Include information - Share with - New folder		
Correct\Default"	Image: Strate Sector Name Date modified Type Size Image: Sector Image: Sector Image: Sector Size Size Image: Sector Image: Sector Size Size Size Image: Sector		
Choose "Acquire"	I Detector Calibrate Calibrate Calibrate Calibrate 20 Home Anage Properties Operation Image Properties 20 SWW-ROTHER Wu 5335 0 100 SWW-ROTHER Pool 0 100 100 SWW-ROTHER Pool 0 100 100 100 SWW-Rother Frames 0 100	16/09/06 11:15:15 Mars1717V,1	
	SN: VE07107095002 State: Ready Task: No Task Message: 10:50:19 Task succeed: UploadCaliFile	• D 36	



4.6.2.2 Hardware Correction

Click "Read Status" to read template	Create Correct Template Mode&Files Create Correct Template Create Correct C
	Fod template file Type Indexi Activity Description Query FPD file Gain 1 in use Gain 2 disable Upload to Workdir Defect 2 disable Upload tag Read Status Defect 3 disable Upload tag Read Status Defect 3 disable Upload tag Read Status Defect 3 disable Upload tag Read Status

Choose template number according to		
	Create Correct Template	
requirements	Mode&Files Subset settings	
	Create Gain Default enable valid valid valid absent	
Click "Active" to activate template	Create Defect	Import to Workdir
		Download to FPD
		Read Status
	End template file	
	Type Index Activity Description	Query FPD file succed1
	Gain 2 disable Gain 3 disable	Lielead to Workdin
	Defect 1 disable Defect 2 in use	Upload Lag
	Defect 3 disable	Read Status
		UpdateHWPreOffset
	1	3:22:53 Task succeed: QueryHwCaliTemplateList 🔹
Offset mode "HWPostOffset"		
Gain mode "HWGain"		
Defect mode "HWDefect"		

4.7 Firmware Update

The detector supports firmware updating with the website; if the user needs to update firmware, please follow the steps below

Preparation before updating

Co to page "Detector"	-									
So to page Detector	[iDete	ctor								
	Home	Acquire	e SDK	Detector	Calibrate	Local File			2	017/12/29 15:45:24
							J			Mars1417XF_Client
	Param	eters Sens	sor Wifi	Images						121
	Produ	t No		52						Reset Detector
	Sub Pr	oduct No		SubPro	iductNo_GoS					Read
	Serial	io.		KX010	DC117025					
	Main 1	ersion		1.7.4.4						Write
	Read	ersion		0.0.0.0						Write RAM
	Mcu V	ersion		0.0.1.0						1
	Arm V	rsion		1.6.0.1	0					
	Kernel	Version		1.17.10	.11					Upgrade Hirmware
	Inner 1	ubFlow		InnerS	abFlow_ClearA	cq In	nerSubFlow_ClearAcq	•		L
	Prep C	aoMode		PrepC	oMode Cleari	kca Pr	repCapMode ClearAcq	•		-
	Self Ca	pEnable		On			in .			
	Self Ca	n Soan Tim	e (ms)	100		10	00	_		
	Trippe	Mode		Trippe	Mode Inner	Te	riggerMode Inner			
	Same	ve Interval	Time (ms)	4200		4	200			
	Set De	w Time (m	· · · · · · · · · · · · · · · · · · ·	1000		10				
	Set De	ay time (m	16.)	1000		-	000			
	Exp W	ndow lime	(ms)	2200		4	200			
	Acouit	Delay Tim	se (ms)	100	No Task	10	00	ad Canada		
	SNU		State:	Tasi	110.1054	Mess	salle: Lawrence Lase succes	en commen		0%

TriggerMode_Prep" Change Prep Capmode to PrepCapMode_Acq2" Click "Write" Click "Write" Click "Urite" Click "Urite" Click "Urite" Click "Contact Contact Contac	Findinger Higger Hidder to Trigger Mode_Prep Change Prep Capmode to PrepCapMode_Acq2" Click "Write" Click "Write"	Change Trigger mode to				
TriggerMode_Prep" Change Prep Capmode to PrepCapMode_Acq2" Click "Write" Click "Write"	TriggerMode_Prep" Shange Prep Capmode to PrepCapMode_Acq2" Shick "Write" Shick "Write"	mange mgger mode to	2 iDetector			2017/12/29 15:48:07
Change Prep Capmode to PrepCapMode_Acq2" Click "Write" Dick "Write"	PrepCapMode_Acq2" PrepCapMode_Acq2" Plick "Write" PrepCapMode_Acq2" Plick "Write" PrepCapMode_Acq2" Plick "Write" PrepCapMode_Caekq2 PrepC	TriggerMode Pren"	Home Acquire SDK	Detector Calibrate Loca	al File	2017/12/29 15:48:07 Mars1417XF_Client
Change Prep Capmode to PrepCapMode_Acq2" Click "Write" Click "Write" Click to the state of t	Change Prep Capmode to PrepCapMode_Acq2" Click "Write" An Yerinin <u>Kaudi</u> Grand Version <u>Listics</u> Write" Kerner Statics Kerner Statics Strick "Write" Kerner Statics		Parameters Sensor Wifi In	lages		
Change Prep Capmode to PrepCapMode_Acq2" Click "Write"	change Prep Capmode to PrepCapMode_Acq2" click "Write" click "Write" click "Write" click "Catalate click "Write" <		Arm Version	1.6.0.10		* Reset Detector
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IntegrateTime (ac) 100 100 Image PRI Gap Time (ac) 0 0 Sire Fort 27888 192.2469.100.8 Sire MAC 000FLARF#978 000FLARF#978 Sire MAC 000FLARF#978 000FLARF#978	Integrate Time (sc) 300 100 Integrate Time (sc) 0 0 Integrate Time (sc) 0 0 Size Port 27888 0 Size Port 1923 481 00.8 1923 461 00.8 Size NAC 00078447698 0 Full Picture Time Time 0 0 Die (NO20000110255) State Task (No Task Maxinger (154500 Task succeed: Gonnect 0		Acquire Delay Time (ms)	100	100	
Integer PML Gap Time Luci 0 0 Size Fort 2788 192.2565.00.0.8 Size Fort 192.2566.00.0.8 192.2565.00.0.8 Size Funda 000704415978 000704415978 Truth Trutor T	Smage PRE Gap Time (an) 0 0 Ser Port 2788		IntegrateTime (us)	100	100	
Ser Port 2288 Ser IP 192.546.00.8 Ser MAC 000FARF9782 Put Fruit Function 1 Fruit	Sic Port 2788 Sic IP 192.368.100.8 Sic MAC 0000F64.6F8F8 out France nut Sic INDE 502.000.000F64.0F8F8 out France nut Sic INDE Size Max Size INDE Size Index		Image Pkt Gap Time (us)	0	0	
See pr 193.288.0508 193.288.0508 See MAC 000004AP0788 00004AP0788 ************************************	Ser IP 192.264.00.0 192.240.00.0 Soverarsers converter c		Src Port	27888		
	Ser MAC 000FARFWER C-MT-un-r-s.h. One r DN 0000000137035 State Task: No Task Message [356:00 Task access? Connect • 0 01		Sec IP	192.168.100.8	192.168.100.8	
	Ford Procession Ford		Src MAC	000FEAEF6FBE	000FEAEF6FBE	
The Little Tasks Do 149 Massaca 150501 149 Doctor 100007	The function of the state of th		ent elisses the	All Task No Task	Marcante 154500 Task succeed: Connect	
			are rooted citroza statel	Taski 113 Task	message: Losson rask succeed connect	

Firmware updating



Click "browse" on the right	Image: Set in the Set in th
Choose" Mars1717XF_IMAGE_41_ALL_XXXX _XX_XX.ifrm" Click "upgrade"	Image: Section
Click "close" when "upload image success" pops up Wait until upgrade is done.	Image: Section Linear Contraction Contrection Contrection Contraction Contraction Contraction C

Note:

1. Please insert the battery (more than 25%) in the detector, in case power is down when upgrading. On the other hand, the detector should reboot after updating.

4.8 Short cut

iDetector supports some shortcuts as follows:

•Double-click left mouse: image displayed in center with maximum size.

•Press and drag left mouse: drag image displayed.

•"F3": Quickly adjust the image window width and window level.

4.9 Software

4.9.1 Main GUI

Double-click iDetector, main interface is shown on the screen. See the table below for a detailed function description.

🙋 iDetec	tor											- 6	×
Home	Acquire	Factory	SDK	Detector	Calibrate	Local File						2017/11/10 08	:48:12
												4	.0.23.3869
													-
				Name		SN	Product Type		State				
			Mars	s1417XF_1			Mars1417XF	Bind					
			Mars	s1717XF_1			Mars1717XF	Bind	l.		Connect		
											Close		
											Add		
											Remove		
											Syncbox		

ltem	Function description
Home	Connect detector, check connection status
Acquire	Image acquisition, correction mode, image storage and processing
SDK	Config.ini setting and Log level setting
Detector	Detector configuration, synchronization methods, etc.
Calibrate	Correction template generation and management
Local File	Local image check and image processing

4.9.2 Home Page

Item and button description are shown as follows.

ltem	Function description
Name	Detector name
SN	Detector SN number

Product Type	Product type
State	Three states: Bind, Unknown, Ready
Button	Function description
Connect	Build connection with specific detector
Close	Disconnect with specific detector
Add	Add additional working directory
Remove	Delete working directory

4.9.3 Acquire Page

This page works mainly for image acquisition. In the "operation" box, the user chooses the image correction method according to requirements. "image properties" shows simple information of the image acquired. "Image list" shows the last 5 images; if the user wants to check an image, then double click. The user can rotate images and do other image processing with "ROI".

Detector		
Home Acquire SDK	Detector Calibrate Local File 2016/06/13 19: Detector Calibrate Detector	20:19 ector2
Operation Image Pr	perties Image	List
Offset WW: SWPreOffset WL: HWPreOffset PosX: Gain PosY: SWGain Value: HWWGain Width: Defect Height: SWDefect FPS: PrepAcq Reverse Save Mirror SeqSaveSet ROI	5535 2767 024 024 026	
SN: State:	Ready Task: No Task Message: 19:20:08 Task succeed: SetCaliSubset	•

Figure 4.13.2

The state of the detector, SN and Message is on the bottom of the page.

ltem	Function description
SN	Connected detector SN number

State	Detector status, such as Busy or Ready
Task	What detector is doing
Message	Feedback of detector action, such as succeeded or failed

Image operation and property of SDK is shown below

Correction Menu		Function description	
	SWPreOffset	Reserved	
Offset	HWPreOffset	Reserved	
Oliset	SWPostOffset	DR Software does post offset correction	
	HWPostOffset	Detector does post offset correction	
Gain	SWGain	DR Software does gain correction	
Call	HWGain	Detector does gain correction	
Defect	SWDefect	DR Software does defect correction	
Doroot	HWDefect	Detector does gain correction	
A	cquisition	Functional description	
PrepAcq		Flush the panel and then do image acquisition	
Acquire		Start image acquisition	
Stop		Stop continuous image acquisition	
Save		Save images	
SeqSaveSet		Save image frames in continuous image acquisition mode	
		(document type and path can be set)	
Image Properties/ Image Process		Functional description	
	WW	Window width	
WL		Window level	
PosX		Cursor X coordination	
PosY		Cursor Y coordination	
Value		Value of cursor	
Width		Image width	

Height	Image height
FPS	Frame rate
Frames	Frame number
Rotate	Rotate image 90 degrees in clockwise direction
Reverse	Rotate image 90 degrees in counterclockwise direction
Mirror	Mirror image horizontally
ROI	Statistic of image such as AVG and SV
Image List	Latest 5 images

Image preview shortcut is stated below:

- Double left click: image displayed in center with maximum size.
- Double right click: window level and width adjusted to WL: 32767/WW: 65535.
- Drag left mouse: drag image displayed.
- Lateral drag right mouse: adjust window width
- Vertical drag right mouse: adjust window level
- F3: Quickly adjust window width and level.

Note: correlation between image acquired and physical panel direction

Image	Panel
А	A
В	D
С	С
D	В



4.9.4 SDK Page

The page is used to configure config.ini and set log level in real time, as shown below

iDetector	to the other the	the set of the		
Home Acquire SDK	Detector Calibrate Loca	l File		2016/06/13 19:24:01 Detector2
WorkDir Protocol Edition	4			SetLogLevel
WorkDir ProdNo	1			LogLevel_Debug 👻 Set
WorkDir SN			Set	
Detector DLL	E4.dll			E
Connection DLL	ConnGigEVision.dll			
Calibration DLL	CaliDynamic.dll			
Log Level	LogLevel_Debug			
Host IP			Set	
Host Port	0	0	Set	
Remote IP				
Remote Port	0			
COM Port	1	1	Set	
Pleora Connect String	169.254.96.136	169.254.96.136	Set	
Pleora Packet Size	1444	1444	Set	
Winpcap Connect String			Set	
Ftp Download Host IP			Set	
Ftp Download Host Port	0	0	Set	
Ftp Download User Name			Set	T
SN: State: Rea	Idy Task: No Task	Message: 19:20:08 Task succeed:	SetCaliSubset	•

4.9.5 Detector Page

4.9.5.1 Parameters

Parameter tab is activated in default. Five boxes on the page are defined as follows:

- Zone 1: parameters
- Zone 2: parameters reading from detector
- Zone 3: parameters written into detector

Zone 4: function button

Zone 5: simple message from detector and state

lome Acquire SDI	K Detector Calibrate	Local File	2015/11/17 11:25:0
arameters Sensor Wifi	Images		
Sest MAC	OEE35FDDF95C		Paul Datates
Netector Year	2015		Reset Detector
Detector Month	11		Read
Detector Day	16		Write
lynamic Mode	Enm_DynaMode_Static	Enm_DynaMode_Static •	
rigger Mode	Enm_TriggerMode_FreeSyn	Enm_TriggerMode_FreeSyn ×	
luro Sync	Enm_FluroSync_FreeRun	Enm_FluroSync_FreeRun •	E Upgrade Firmware
Sinning Mode 1	Enm_Binning_Null	2	
Zoom Mode	Enm_Zoom_Null	3	
low Pre Delay Time (us)	0	0	
low Post Delay Time (us)	0	0	4
ntegrate Time (us)	70	70	
evel Signal	Enm_LevelSignal_Low	Enm_LevelSignal_Low •	
Auto Clear	0	•	
Auto Clear Span Time (us)	5000	5000	
equence Interval Time	5000	5000	

Configuration parameter items

ParmName	Description	Modifiable
Main Version	Detector FPGA version	NO
Read Version	Detector Read version	NO
Product No	Product number	NO
SN	Serial number	NO
Trigger Mode	Static X-ray synchronization mode	YES
Fluro Sync	Dynamic X-ray synchronization mode	YES
Set Delay Time	Delay time for "prepacq"	YES
Acquire Delay	Reserved	YES
Integrate Time	Reserved	YES
Tube Ready	Reserved	YES

Function button description

Function Button	Description
Reset Detector	Reboot detector

Read	Read configuration
Write	Write configuration
Upgrade Firmware	Reserved

4.9.5.2 Sensor

This page includes temperature and humidity information.

Sensor	Description	Modifiable
Temperature	Read temperature in detector	NO
Humidity	Read humidity in detector	NO

💽 iDetector - CK1417	
Home Acquire SDK Detector Calibrate Local File	2015/11/16 10:56:05
Parameters Sensor Wifi Images	
Temperature	
Humidity Read	
SN: KV07071305021 State: Ready Task: No Task Message: Connect succeed!	•

4.9.5.3 Wireless configuration

Mode should be checked with client.

iDetector - CK1417		
Home Acquire SDK Detector Calib	rate Local File	2015/11/16 10:55:28
Parameters Sensor Wifi Images Mode © Client • AP Add Del Up Down Select Read Config Write Config	Wifi Status Info Wireless Network Interface: Unknown LinkedAP: Band: 0 SignalIntensity: 0 SSID SignalLevel LinkQuality: 0 TxPower: 0 Read Wifi Status Scan from FPD	
SN: KV07071305021 State: Ready Task: No Ta	sk Message: Connect succeed!	•

Parameters	Description
Client	
Add	Add default SSID in wifi list
Del	Delete specified SSID in wifi list
Up	Move up
Down	Move down
Select	Set specified SSID as default one which means it will be loaded automatically after powering up
SSID Key	List 10 optional SSID names
Others	
Read Config	Read wireless configuration from detector
Write Config	Write wireless configuration to detector
Read WiFi Status	Check wireless link status in detector
Scan from FPD	Scan SSID in air with FPD wifi module
Wifi Status Info	Wireless link status is shown in this area
Wireless Network	Available wireless networks are shown in this area

4.9.5.4 Images

	iDete	ector - CK1417					
	Home	Acquire	SDK Detector	Calibrat	e Local File	2015/12/30 16:11:57	
P	Parameters Sensor Wifi Images						
l	Que	ry Images	Upload Images St	top Upload			
I	index	FileName	CreateTime	DelayTime	ImageAttr	A	
	1	1451473454	2015-12-30 11:04:14	2478	0x00000000		
	2	1451473502	2015-12-30 11:05:02	0	0x00000000	-	
	3	1451473547	2015-12-30 11:05:47	1616	0x00000000		
	4	1451473635	2015-12-30 11:07:15	1483	0x00000000		
	5	1451473680	2015-12-30 11:08:00	1000	0x00000000		
	6	1451473681	2015-12-30 11:08:01	1000	0x00000000		
	7	1451473682	2015-12-30 11:08:02	1000	0x00000000		
	8	1451473737	2015-12-30 11:08:57	1000	0x00000000		
	9	1451473739	2015-12-30 11:08:59	1000	0x00000000		
	10	1451473740	2015-12-30 11:09:00	1000	0x0000000		
	11	1451473759	2015-12-30 11:09:19	1000	0x0000000		
	12	1451473760	2015-12-30 11:09:20	1000	0x0000000		
	13	1451473762	2015-12-30 11:09:22	1000	0x0000000		
	14	1451473786	2015-12-30 11:09:46	0	0x0000000		
	15	1451473801	2015-12-30 11:10:01	1358	0x0000000		
	16	1451474235	2015-12-30 11:17:15	0	0x0000000		
	17	1451474263	2015-12-30 11:17:43	2009	0x00000000		
	18	1451474423	2015-12-30 11:20:23	1000	0x00000000		
	19	1451474425	2015-12-30 11:20:25	1000	0x00000000		
	20	1451474426	2015-12-30 11:20:26	1000	0x00000000		
	21	1451474634	2015-12-30 11:23:54	1579	0x00000000		
	22	1451474660	2015-12-30 11:24:20	0	0x00000000	·	
s	SN: K	V0707130502	1 State: Ready Task	: No Task	Messa	age: 16:11:44 Task succeed: Cmd_QueryHistoric 🗸 🗔 0%	

Parameters	Description
Query images	Query image list in detector
Upload images	Upload specific images in detector
Stop upload	Stop uploading accidently
Index	Item No. which is roll counting
Filename	Image No. which is defined and saved in detector
Create time	Time image is saved
Delay time	Acquisition delay time
Image attr	Image type

Note:

1. If "HWPostoffset" is chosen, the image saved in the detector will be the corrected one. If not or "SWPostoffset" is chosen, it will be the incorrect one.

4.9.6 Calibrate Page

This page works for template management and generation.



Function Button	Description
Start to Generate Templates	Start template generation and template management

4.9.7 Local File Page

This page works for local image check.

peration	Image Properties			
Load File	WW: 65535	(+TII		
codd file	WL: 32767	π		
	PosX: 0	Correct > Mode1 >	▼ 49 搜索 Mode1	Q
	PosY: 0	组织 ▼ 新建文件夹	III • I	
	Value: 0	Subversion A 🕫	修改日期	举刑
	Width: 0	■ 视频	2016/1/27 10 11	÷/4+
	Height: 0	■ 图片 Didark	2010/1/27 18:11	文件关
		■ 文档 dttlightCor	2016/1/27 18:11	文件夹 文件夹
	Rotate	圖 迅雷下载 ☐ defect_1024x1024.dft	2016/1/27 18:11	DFT 文件
	Reverse			
	Mirror No	🦉 计算机		
	ROI	🚢 win7 (C:)		
		2 (D:)		
		🖙 data (F:) 👻 🕐 📶		1. Contraction of the second s
		文件名(N):	▼ Data file(*.raw;*.tif;*.dft)	-
				7544
			111/(0)	una
		<u></u>		

Function Button	Description
Rotate	Rotate image 90 degrees in a clockwise direction
Reverse	Rotate image 90 degrees in a counterclockwise direction
Mirror	Mirror image horizontally
ROI	Region of interest image statistic such as AVG and SV
	Right press mouse, draw a box

4.10 IT-network

4.10.1 Purpose for IT-network

Transmission between the detector and the workstation(FDR SE Console or iDetector) is image data and command/status communication.

4.10.2 Required characteristics

Wireless communication follows IEEE 802.11a/b/g/n protocol. It works on 2.4GHz and 5GHz.

It supports at least 2 routers.

4.10.3 Required configuration

The wireless card and the detector must work on the same IP segment such as 192.168.100.XXX

They must support IEEE 802.11.a/b/g/n.

4.10.4 Technical specifications(Only for CE)

Image Transfer	Wireless: IEEE802.11a/b/g/n
Wireless frequency range	2.412~2.472GHz, 5.18~5.22GHz;5.745~5.85GHz
Data Transmission Power	13dBm (Typ.) @802.11a
	16dBm (Typ.) @802.11b
	14dBm (Typ.) @802.11g
	13dBm (Typ.) @802.11n HT20
	11dBm (Typ.) @802.11n HT40

-	16dBm@2.4GHz
	13dBm@5.8GHz
Wireless Modulation	11b: DSSS (DBPSK, DQPSK and CCK)
	11a/g/n: OFDM (BPSK, QPSK,16QAM, 64QAM)
Wireless Band	2.4GHz≤40MHz
	5.19GHz≤40MHz
	5.8GHz≤40MHz

4.10.5 Intended information flow

The detector sends image data acquired to the workstation (FDR SE Console or iDetector). The workstation(FDR SE Console or iDetector) sends users' commands to the detector.

4.10.6 Hazardous Situations Resulting from Failure of the IT Network

- Failure of completing essential performance
- Failure of finishing configuration of product
- Operating system is not compatible
- Change or update software failed
- Compatibility of interface
- Data transfer protocol error
- Inconsistency of interface or format leads to data distortion;
- Data output failed;

4.10.7 Warning

Connection of the main unit to an IT-network that includes other equipment can result in

previously unidentified risks.

The manufacturer of the X-ray machine should identify, analyze, evaluate and control these risks.

Subsequent changes to the IT-network can introduce new risks and require additional

analysis.

4.10.8 Changes to IT Network Include:

- changes in IT network configuration;
- connection of additional items to IT network;
- disconnecting items from IT network;
- update of equipment connected to IT network.
5 Charger Installation



6 Regulatory Information

Product safety regulatory information includes safety of the detector, charger and other accessories.

6.1 Manufacturer's Information



COMPANY: iRay Technology Co., Ltd

ADDRESS: Rm. 202, Building 7, No. 590, Ruiqing Rd., Zhangjiang East, Pudong, Shanghai, China

ZIP CODE: 201201

TELEPHONE: +86-21-50720560

European Representative

COMPANY: iRay Europe GmbH

ADDRESS: In den Dorfwiesen 14, 71720 Oberstenfeld Germany

www.irayeurope.com

TEL: +49-7062-977 88 00

FAX: +49-7062-976 05 71

Email: S.feng@iraychina.com

6.2 Medical Equipment Safety Standards

Medical equipment classification

Protection type against electrical shock	Class I equipment, using medically approved adaptor supply Internally powered equipment, using battery power supply
Protection degree against electrical shock	B Type ^{Note1}
Protection degree against water	IPX4 (Detector)
penetration	IPX0 (Charger-KX)

Mode of operation	Continuous operation
Flammable anesthetics	Not suitable for use in situation with flammable anesthetic mixture with air, oxygen or nitrous oxide Not suitable for use in oxygen-rich situation

The detector has two power supply modes (power adaptor and battery pack) and a single way for signal transmission (wireless)

Note 1. When connected to patient, it was only allowed be powered by battery and shall disconnect adapter cord

Safety standards reference

Wireless detector safety standards cover the detector, charger, battery pack and other accessories.

MDD (93/42/EEC)	Medical Device Directive
Directive 2011/65/EU	Restriction of the use of certain hazardous substances (RoHS)
EN ISO 13485:2016	Medical devices– Quality management systems– Requirements for regulatory purposes
EN ISO14971: 2012	Medical device – Application of risk management to medical devices
<u>IEC 60601 1: 2005 + CORR. 1 (2006) + CORR. 2 (2007) + AM1</u> (2012)	Medical electrical equipment –Part 1: General requirements for basic safety and essential performance
EN 60601-1:2006+A11:2011+A1:2013+A12:2014	Medical electrical equipment – Part 1: General requirements for basic safety and essential performance
BS EN 60601-1:2006+A11:2011	Medical electrical equipment –Part 1: General requirements for basic safety and essential performance
<u>ANSI/AAMI ES60601-</u> <u>1:2005/(R)2012+A1:2012+C1:2009/(R)2012+A2:2010/(R)2012</u>	Medical electrical equipment – Part 1: General requirements for basic safety and essential performance
<u>CAN/CSA-C22.2 No.60601-1:14</u>	Medical electrical equipment –Part 1: General requirements for basic safety and essential performance

<u>KS C IEC 60601-1</u>	Medical electrical equipment –Part 1: General requirements for basic safety and essential performance
<u>JIS T0601-1:2012</u>	Medical electrical equipment– Part 1: General requirements for basic safety and essential performance
SS-EN 60601-1:2006+A11:2011+A1:2013+AC1:2014+A12:2014	Medical electrical equipment – Part 1: General requirements for basic safety and essential performance
IEC 60601-2-54:2009+A1:2015	Medical electrical equipment –Part 2-54: Particular requirements for the basic safety and essential performance of X-ray equipment for radiography and radioscopy
<u>CAN/CSA-C22.2 NO. 60601-2-54:11</u>	Medical electrical equipment –Part 2-54: Particular requirements for the basic safety and essential performance of X-ray equipment for radiography and radioscopy
<u>KS C IEC 60601-2-54:2012</u>	Medical electrical equipment –Part 2-54: Particular requirements for the basic safety and essential performance of X-ray equipment for radiography and radioscopy
SS-EN 60601-2-54:2010+A1:2015	Medical electrical equipment –Part 2-54: Particular requirements for the basic safety and essential performance of X-ray equipment for radiography and radioscopy
IEC 60601-1-6:2010+A1:2013	Medical electrical equipment Part 1-6: General requirements for basic safety and essential performance — Collateral standard: Usability
<u>CAN/CSA-C22.2 NO. 60601-1-6:11+A1:2015</u>	Medical electrical equipment Part 1-6: General requirements for basic safety and essential performance — Collateral standard: Usability
<u>KS C IEC 60601-1-6:2011</u>	Medical electrical equipment Part 1-6: General requirements for basic safety and essential performance — Collateral standard: Usability
EN 60601-1-6:2010+A1:2015	Medical electrical equipment Part 1-6: General requirements for basic safety and essential

	performance — Collateral standard: Usability
EN 60601-1-2:2015	Medical electrical equipment – Part 1-2: General requirements for basic safety and essential performance– Collateral standard: Electromagnetic disturbances– Requirements and tests
IEC 62133:2012	Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications
EN 62220-1:2004	Medical electrical equipment – Characteristics of digital X-ray imaging devices–Part 1: Determination of the detective quantum efficiency
EN 62304:2006/AC:2008	Medical device software – Software life-cycle processes
EN 62366:2008	Medical devices – Application of usability engineering to medical devices
ANSI/AAMI ES60601-1:2005+ Amendment 1:2012+ Amendment 2:2010	Medical Electrical Equipment – Part 1: General requirements for safety and essential performance
CAN/CSA C22.2 No. 60601-1-14	Medical Electrical Equipment – Part 1: General requirements for safety and essential performance
ISO 15223-1:2016	Medical devices-symbols to be used with medical device labels, labeling and information to be supplied–Part1:General requirements

6.3 Guidance and manufacture's declaration for EMC

6.3.1 EMI Compliance Table

Emissions

Phenomenon	Compliance	Electromagnetic environment
RF emissions	CISPR 11 Group 1, Class B	Professional healthcare facility environment
Harmonic distortion	IEC 61000-3-2	Professional healthcare facility environment

	Class A	
Voltage fluctuations and flicker	IEC 61000-3-3	Professional healthcare facility environment
	Compliance	

6.3.2 EMS Compliance Table

Enclosure Port

Phenomenon	Basic EMC standard	Immunity test levels	
		Professional healthcare facility environment	
Electrostatic	IEC 61000-4-2	±8 kV contact	
Discharge		$\pm 2kV$, $\pm 4kV$, $\pm 8kV$, $\pm 15kV$ air	
Radiated RF EM field	IEC 61000-4-3	3V/m	
		80MHz-2.7GHz	
		80% AM at 1kHz	
Near fields from RF	IEC 61000-4-3	Refer to table "Near fields from RF wireless	
communications		communications equipment	
equipment			
Rated power frequency magnetic	IEC 61000-4-8	30A/m	
fields		50Hz or 60Hz	

• Near fields from RF wireless communications equipment

Test frequency	Band	Immunity test levels
(MHz)	(MHz)	Professional healthcare facility environment
385	380-390	Pulse modulation 18Hz, 27V/m
450	430-470	FM, \pm 5kHz deviation, 1kHz sine, 28V/m
710	704-787	Pulse modulation 217Hz, 9V/m
745		
780		
810	800-960	Pulse modulation 18Hz, 28V/m
870		
930		

1720	1700-1990	Pulse modulation 217Hz, 28V/m
1845		
1970		
2450	2400-2570	Pulse modulation 217Hz, 28V/m
5240	5100-5800	Pulse modulation 217Hz, 9V/m
5500		
5785		

Input a.c. power port

Phenomenon	Basic EMC	Immunity test levels	
	standard	Professional healthcare facility environment	
Electrical fast	IEC 61000-4-4	$\pm 2 \text{ kV}$	
transients/burst		100kHz repetition frequency	
Surges	IEC 61000-4-5	$+0.5 \mathrm{kV} + 1 \mathrm{kV}$	
Line-to-line		±0.5 k V, ±1 k V	
Surges	IEC 61000-4-5	±0.5 kV. ±1 kV. ±2 kV	
Line-to-ground			
Conducted		3V, 0.15MHz-80MHz	
disturbances induced by RF fields	IEC 61000-4-6	6V in ISM bands between 0.15MHz and 80MHz	
		80%AM at 1kHz	
		0% U _T ; 0.5 cycle	
		At 0° , 45° , 90° , 135° , 180° , 225° , 270° and 315°	
Voltage dins	IEC 61000-4-11	0% U _T ; 1 cycle	
vonage uips		and	
		70% U _T ; 25/30 cycles	
		Single phase: at 0°	
Voltage interruptions	IEC 61000-4-11	0% U _T ; 250/300 cycles	

Recommended separation distances between portable or mobile RF communication device and detector:

Portable RF communications equipment, including antennas, can effect medical electrical equipment. The warning should include a use distance such as "be used no closer than 30 cm (12 inches) to any part of the [ME EQUIPMENT or ME SYSTEM], including cables specified by the manufacturer".

• Cable provided for EMC

Cable	Recommended length	Shield/Unshielded	Number	Cable classification
AC power cable	1.8m	Unshielded	1 piece	AC power
DC power cable	3m	Unshielded	1 piece	DC power

Electromagnetic Compatibility (EMC)

The Mars1717XF series wireless flat panel detector needs special precautions regarding EMC, and should be installed by authorized personnel and follow EMC guidance in the user manual. The Mars1717XF series product when in use may interfere with portable and mobile RF communication devices such as mobile (cellular) telephones. Electromagnetic interference may result in incorrect operation of the system and a potentially dangerous situation.

The Mars1717XF series wireless flat panel detector should not be stacked with or adjacent to other devices. If inevitable, verify the detector.

The Mars1717XF series wireless flat panel detector conforms to this EN60601-1-2:2007 standard on both immunity and emissions.

Accessories, transmitters and cables other than those specified by the user manual or sold together with product may result in increased emissions or decreased immunity of the detector.

Country	Item
U.S.A.	KDB 865664 D01
	47 CFR part 15, subpart B
	47 CFR part 15, subpart C 15.247
	47 CFR part 15, subpart C 15.407
	47 CFR §2.1091
	KDB447498 D01 General Exposure Guidance v06
European Union	EN 301 489-1 V 2.1.1
	EN 301 489-17 V 3.1.1
	EN 300 440 V 2.1.1

6.4 Radio Frequency Compliance Information

EN 300 328 V 2.1.1;
EN 301 893 V 2.1.1
EN 62311:2008
EN 62209-2:2010
EN 50566:2017
EN 62476:2010
EN 55032:2015
EN 61000-3-2:2014
EN 61000-3-3:2013

6.5 Battery Safety Standards

Standards	Description	
UL1642	Component recognition on secondary Li-ion cells	
UL 2054:2004 R9.11	Household and commercial batteries	
IEC 62133:2012	Secondary cells and batteries containing alkaline or other non- acid electrolytes	
UN38.3	United Nations Recommendations on the Transport of dangerous goods Manual of tests and Criteria ST/SG/AC.10/11/Rev.5/Amend.1&Amend.2	

6.6 Product Label

Mars1717XF-GSI Detector Label

Wireless Digital Flat Panel Detector				
Model:	Mars1717XF-GSI			
Power:	Adapter Port Input 24V=== 1.25A			
	Battery Port Input BATTERY-X/7.6V ===3500mAh	$\left \left(((\bullet)) \right) \right $		
	iRay Technology Taicang Ltd. No.33 Xinggang Road, Taicang Port Economic and			
	Technological Development Zone, Jiangsu, China www. iraygroup. com xxxx-xx			
EC RE	P iRay Europe GmbH In den Dorfwiesen 14, 71720 Oberstenfeld Germany			
F©	Contains FCC ID: 2ACHK-01070189	ΙΡγ	(F 0197	
This device complies with Part 15 of the FCC Rules. Operation is				
subject to the following two conditions:(1) this device may not cause hamful interference, and(2) this device must accept any interference received,including interference that may cause undesired operation		Rx only		
SN			c Us	
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Mars1717XF CSI Detector Label

less Digital Flat Panel Detect	tor	
Mars1717XF-CSI		
Adapter Port Input 24V === 1.25A	ſ	
Battery Port Input BATTERY-X/7.6V === 3500mAh	(())	کر
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No.33 Xinggang Road, Taicang Port Economic and		
Technological Development Zone, Jiangsu, China		
IRay Europe OmbH		Ĩ
in den Dorfwiesen 14, 71720 Oberstenfeld Germany		\sim
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	Adapter Port Input 24V == 1.25A Battery Port Input 24V == 1.25A Battery Port Input BATTERY-X/7.6V == 3500mAh iRay Technology Taicang Ltd. No.33 Xinggang Road, Taicang Port Economic and Technological Development Zone, Jiangsu, China www. Iraygroup. com x000-x02 Ray Europe GmbH In den Dorfwiesen 14, 71720 Oberstenfeld Germany Contains FCC ID: 2ACHK-01070189 e complies with Part 15 of the FCC Rules. Operation is the following two conditions:(1) this device may not cause efference, and(2) this device must accept any Interference including interference that may cause undesired operation	Wars1717XF-CSI Adapter Port Input 24V == 1.25A Battery Port Input BATTERY-X/7.6V ==3500mAh iRay Technology Taicang Lid. No.33 Xinggang Road, Taicang Port Economic and Technological Development Zone, Jiangsu, China www. Iraygroup. com xxxx. IRay Europe GrnbH In den Dorfwiesen 14, 71720 Oberstenfeld Germany Contains FCC ID: 2ACHK-01070189 e complies with Part 15 of the FCC Rules. Operation is the following two conditions:(1) this device may not cause erference, and(2) this device must accept any interference induding interference that may cause undesired operation Mathematical Contrains FCC ID: 2ACHK-01070189 externe contrains for the formula the formula the following two conditions:(1) this device may not cause induding interference that may cause undesired operation induding interference that may cause undesired operation

Battery Charger Label



Battery Label



7 Troubleshooting

Please refer to the service manual. If the problem remains unsolved, turn off the detector and contact the Fujifilm service department. We will provide the best service possible.

8 **Product Maintenance**

8.1 Expected Service Life

Estimated product lifetime is 7 years with regular inspection and maintenance.

8.2 Regular Inspection and Maintenance

The detector needs regular inspection at least once a year not only for the safety of patients, the operator and third parties, but also for performance and reliability. If necessary, contact Fujifilm service office or local dealer for regular inspection or maintenance.

There is a lithium battery in the detector whose lifetime is more than 5 years; the battery needs to be replaced when it finishes. Contact Fujifilm after-sales service departments or authorized product distributors.

8.3 Repair

If a problem cannot be solved, contact your sales representative or local dealer. Please provide the following information:

Product Name:

Series Number:

Description of Problem: as clearly as possible.