



X-ray Flat Panel Detectors

CareView 750Cw/ CareView 750C

Operation Manual

Before using this detector, be sure to review this manual, as well as the manuals of other devices in the system. Store the manual in an easily accessible location.

Revision History

Version	Date	Description
A/0	2016.03.07	Initial release
	2016.11.21	Add the typical patient doses
A/1	2017.08.24	Adjust the structure and update the description
	2018.7.19	Update company name
A/2	2019.5.9	Update the chapter 11.5 EMC and EU information
A/3	2019.10.18	Update to add two power box CP- S304A and CP- S305A

Attention

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CareRay reserves the right to change the specifications, configuration and appearance of the product without prior notice.

CareRay is not liable for errors or omissions contained in this manual or for any damages incurred in connection with furnishing or use of this manual.

This manual is intended to help Original Equipment Manufacturers (OEM) in the installation and its first operation. It also provides information for service and safety operation. The figures and data given in this manual can't be considered to be a contractual specification.

CareRay does not distribute the detector to the end-users but only to OEM or retrofitters who are responsible of the installation of the detector into the radiography system. The system manufacturer or retrofitter is also responsible of the validation of the detector performance for the foreseen application.

Please read this manual carefully before performing any installation or use of the detector. Consult CareRay for additional information.

General Safety Information

Follow all safety protocol in this manual and all warnings printed on warning labels. Ignoring such protocol while handling the detector may result in accident or injury. Be sure to read and fully understand the manual before operating the detector to avoid any unnecessary damage or personal harmful.

Caution: Federal law restricts this product to sale by or on the order of a physician or a licensed practitioner.

Warning: Users are responsible for the use and maintenance of the product. The product must only be used by qualified personnel who are familiar with the operation of electrical equipment.

Warning: X-ray imaging, image processing, image acquisition, and data storage must be performed in accordance with the law of the country in which the product is used. The user is responsible for maintaining the privacy of image data.

Warning: This product may malfunction when exposed to electromagnetic waves. Keep away from the environments with strong magnetic fields.

Warning: This product must be connected to an appropriate power source recommended by CareRay to avoid unnecessary risks.

Warning: To avoid the risk of electric shock, this product must only be connected to supply mains with protective earth.

Warning: This product should only be used with the original power cords. Inspect power cords and connectors regularly. Cord and connector repairs should only be serviced by qualified personnel.

Warning: The SIP/SOPs (Signal input/output part) are to connect to certified IEC60601-1and IEC 60950-1equipment only.

Warning: In the event of any abnormal phenomenon such as smoke, fumes, strange sounds, an accident or malfunction; immediately turn off the power of each device, unplug the power cable from the AC outlet, and contact your dealer, distributor, or CareRay support. Further use may be dangerous.

Warning: Install the detector on a flat, stable surface. If the detector is installed vertically or tilted, the detector must be securely fastened in that position. It may cause injury if dropped.

Warning: Ensure that the built-in foldable handle is secured tightly when the detector is fixed into the bucky.

Warning: Do not hold the detector by hand during normal use.

Warning: No modification of this product is allowed.

Warning: Do not modify this product without authorization from the CareRay.

Warning: If this product is modified, appropriate inspection and testing must be conducted to ensure continued safety of the product.

Warning: Incorrect disposal of this product may adversely affect personal health and local environment. When disposing, be sure to follow disposal protocol in compliance with local laws and regulations.

Battery and Charging Dock Safety Information

Before using the battery and charging dock dedicated to CareRay wireless detector, 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 other batteries that are not the dedicated battery for the detector.

Warning: Do not use other charging docks that are not the dedicated charging dock. Use of nonstandard charging dock may result in battery explosion or leak.

Warning: Do not operate the charging dock using any type of power supply other than the one indicated on the rating label.

Warning: This detector configures a plug-in battery. Do not modify or change the inner battery, otherwise the battery may damage or ignite.

Warning: The change of battery must be operated by a qualified engineer.

Warning: Use the dedicated charging dock. Otherwise, a battery explosion or a battery leak may occur, resulting in fire or electrical shock.

Warning: Stop using the battery immediately if it emits smoke, a strange smell, or otherwise behaves abnormally.

Warning: Do not expose the battery or charging dock to water or other liquids.

Warning: Do not attempt to use a battery that has deteriorated. Using a battery that has exceeded its life cycle may lead to overheating, fire or explosion.

Warning: Remove the battery from the detector if the detector is not likely to be used for an extended period of time.

Warning: Be sure to charge the battery periodically (once three month) if it is not used for an extended period of time. The battery cannot be charged if it has been over discharged.

Pediatric Application

Caution: Use of equipment and exposure settings designed for adults of average size can result in excessive radiation exposure for a smaller patient. Studies have shown that pediatric patients may be more radiosensitive than adults (i.e., the cancer risk per unit dose of ionizing radiation is higher). Unnecessary radiation exposure may be harmful to pediatric patients.

Warning: Each request should be reviewed by a pediatric radiologist prior to examination to ensure the correct study is performed.

Warning: The technologist should adjust the radiation dose for the patient's size accordingly when acquiring diagnostic images.

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1 Overview

The CareView 750Cw/CareView 750C detector is a class of digital X-ray flat panel detector that has an imaging area of 244mm×307mm. The CareView 750Cw detector communicates with wireless and an optional wired communication feature (Giga-bit Ethernet communication mode via connecting the power box).

The detector functions by intercepting X-ray photons. Then the scintillator emits visible spectrum photons that illuminate an array of photo detectors (a-Si) that create electrical signals. The electrical signals are then digitally converted to display an image on the monitor.

The detector should be connected to a computer and X-ray generator to digitize X-ray images and transfer radiography diagnostics.

1.1 Features

- Supports wireless communication (IEEE 802.11a/b/g/n) and double frequency (2.4GHz/5GHz) for CareView 750Cw.
- 10"x12" cassette-size detector easily fits into standard bucky tray cabinets to upgrade old systems, while also fitting many general radiography imaging systems.
- Designed for portability and stability on uneven terrain with its lightweight design, simple wiring, rubber-insulated frame, and high-strength aluminum-alloy case.
- No not need to be connected to generator due to patented Full-Field Automatic Exposure Detection (F²AED) Technology.
- High capacity battery and low-power operation ensure hundreds of X-ray shots in a single-charge.

1.2 Intended Use

The CareView 750Cw/CareView 750C detector is indicated for digital imaging solution designed for providing general radiographic diagnosis of human anatomy. It is intended to replace radiographic film/screen systems in all general-purpose diagnostic procedures. This product is not intended for mammography applications.

1.3 Typical Patient Doses

Typical patient dosage is shown in the table on the following page. Results may vary in practical conditions.

Table 1 Typical patient doses

Body part	Average adult patient size	(with Anti-scatter grid, 40 lp/cm 10:1)		SID(m)	Dose (μ Gy)
		kV	mAs		
Chest, PA	Height: 170cm Weight: 65kg	112	4	1.5	176
L-spine, AP		75	40	1	1770
Pelvis, AP		65	32	1	910
Hand, AP		50	2.5	1	38
Knee, AP		65	5	1	150
Foot, AP		50	2.5	1	38

Note:

- PA: Postero-Anterior position; AP: Antero-Posterior position
- Dosage amount is typical for average-sized adult patients.

1.4 Configuration

CareView 750Cw detector supports both wired and wireless configurations, while CareView 750C detector only supports wired configuration, as illustrated below.

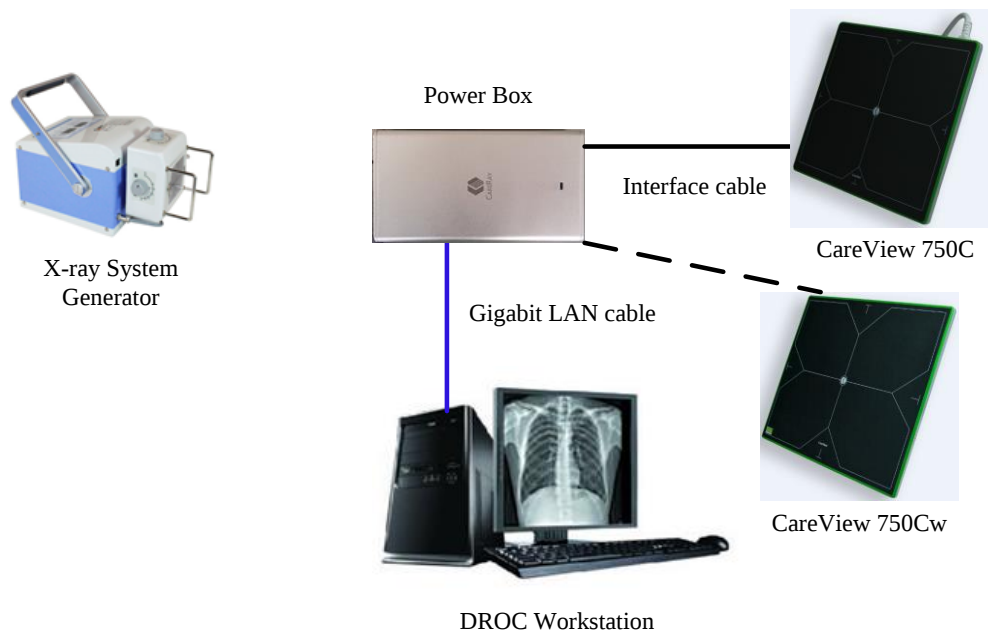


Figure 1 Wired configuration

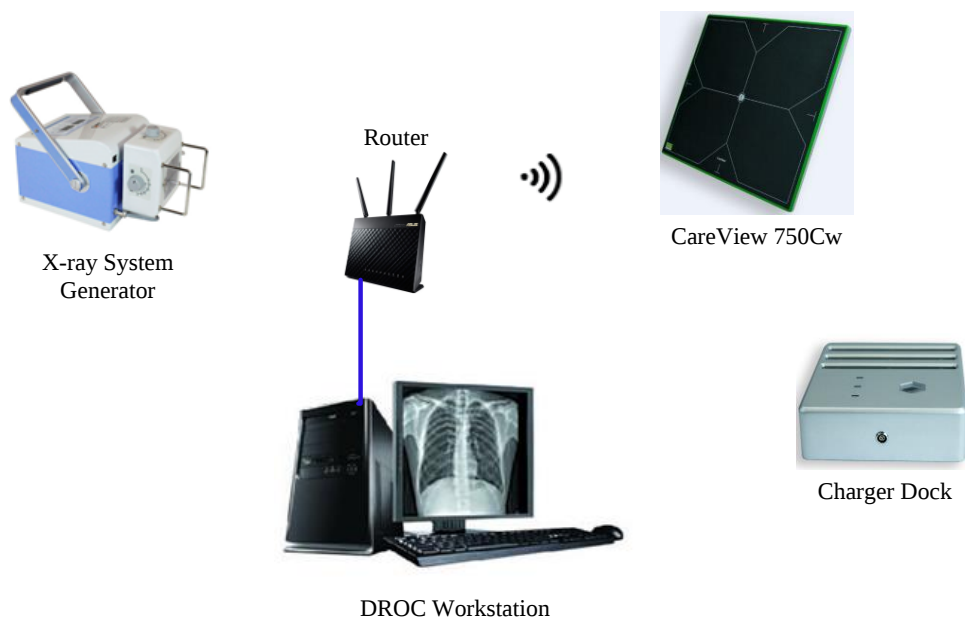


Figure 2 Wireless configuration

2 Product Description

2.1 Components

The product consists of a detector, Li-Polymer battery, power box, charging dock, software and accessories.

Table 2 Components

Item	Description
Detector	Model: CareView 750Cw
Li-Polymer battery (not connected)	Model: 4ICP/83/3/103
Power box	Model: CP-S303A or CP- S304A or CP- S305A
Charging dock	Model: CBC-ICP3B
Cables	AC Power cable (1.8m) Interface cable (7m) Gigabit LAN cable (7m) 24V DC power cable (3m)
CD, Program dongle	Software Operation manual
Others	Certification Warranty card Packing list

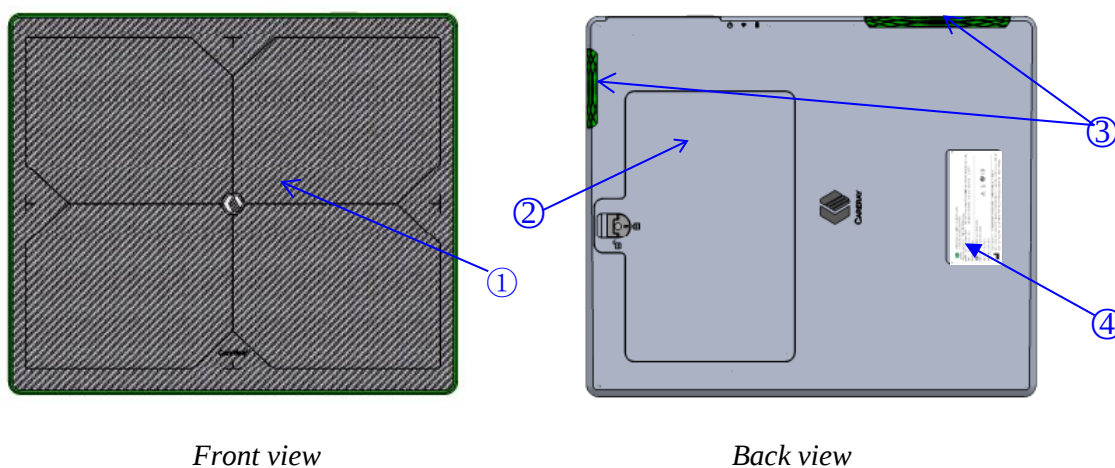
Item	Description
Detector	Model: CareView 750C
Power box	Model: CP-S303A or CP- S304A or CP- S305A
Cables	AC Power cable (1.8m) Interface cable (5.68m) Gigabit LAN cable (20m) Synchronization cable (13m)
CD, Program dongle	Software Operation manual
Others	M4 bolts (6pcs) Certification Warranty card Packing list

Note: The AC power cable must adhere to local regulations of the country where the product is used. Otherwise, a UL-approved power cable must be used.

2.2 Detector

The main task of the detector is to capture radiography images, which in turn will be transmitted to the DROC (Digital Radiography Operator Console) workstation through wired or wireless connection.

An overview of CareView 750Cw detector is shown in figure below and on the following page.



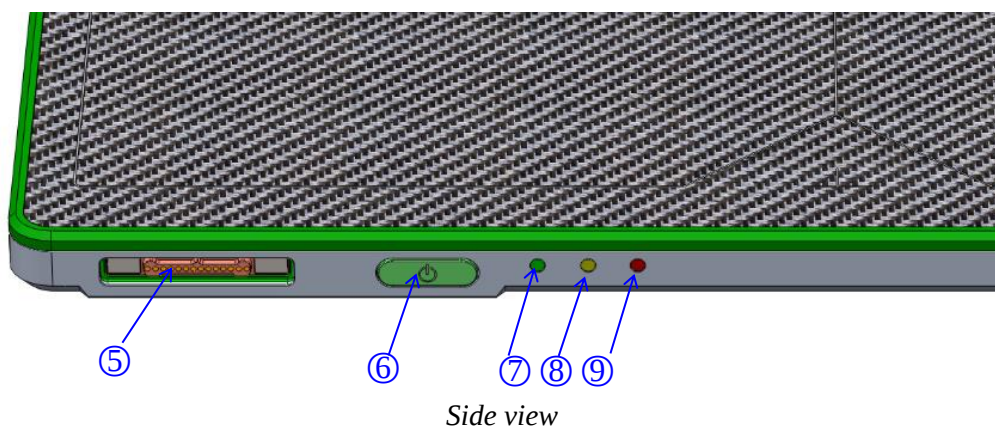


Figure 3 Detector

Table 3 Description of detector

No.	Name	Description
①	Carbon fiber plate	Low density, low X-ray absorption and high intensity protection layer
②	Battery	Supply electrical power to the detector while communicating wirelessly
③	Wifi antenna	Transmits data with wireless communications
④	Detector label	Display the information of detector
⑤	I/O interface	Allows the detector to communicate with power box via interface cable
⑥	Power button	Press to power on or off the detector
⑦		ON: Indicates power on status. (Green)
		OFF: Indicates power off status.
⑧		Blinking: 802.11 wifi mode (Blue)
		OFF: 802.3 cable mode
⑨		ON: Battery charging (Orange)
		ON: Charged complete (Green)
		Blinking: Battery discharging, but electricity isn't enough (Orange)
		OFF: Battery discharging, but electricity is enough.

The overview of CareView 750C detector is shown in the figure on the following page.

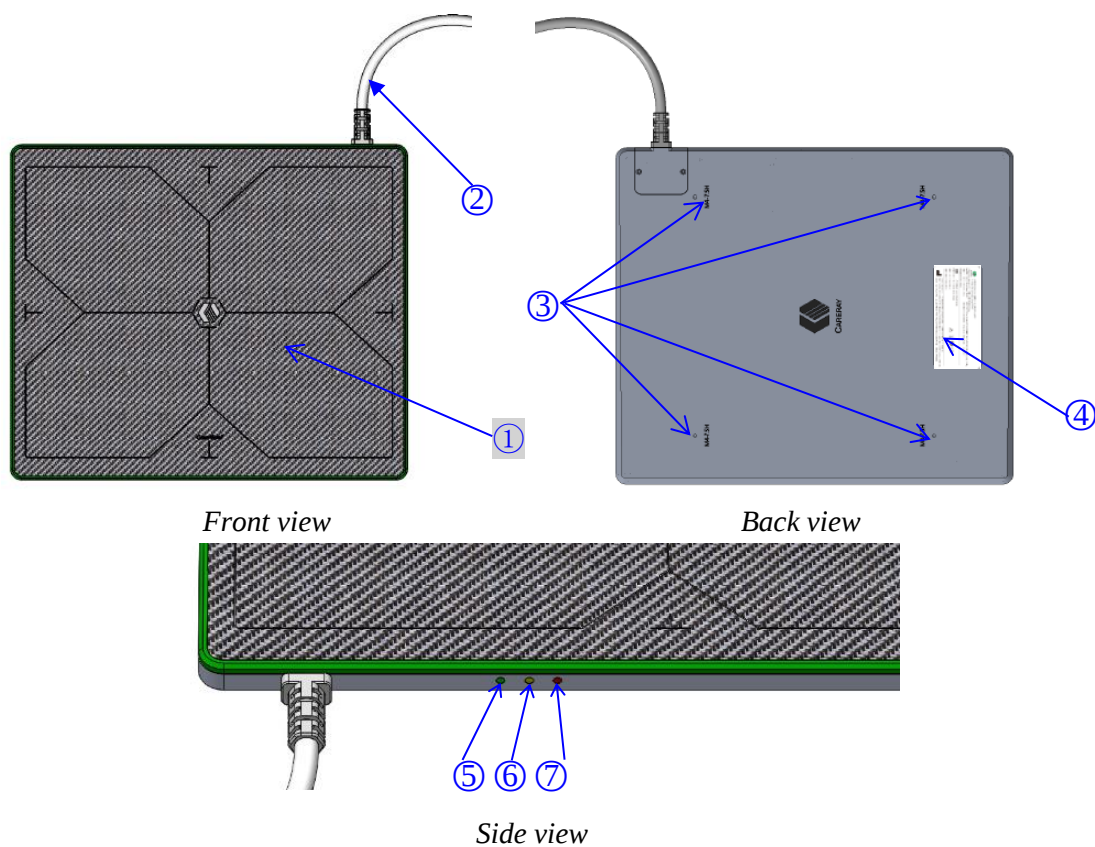


Figure 4 Detector

Table 4 Description of detector

No.	Name	Description
①	Carbon fiber plate	Low density, low X-ray absorption and high intensity protection layer
②	Detector cable	Connects to power box to communicate and supply power
③	Mounting holes	Used for fixing the detector
④	Detector label	Display the information of detector
⑤	Power LED (Green)	Indicates power on/off status. The LED will display a green light when the device is powered on.
⑥	Exposure LED (Yellow)	Indicates Exposure (X-ray on/off) status. The LED will display a yellow light during exposure.
⑦	Error LED (Red)	Indicates detector works status. The LED will display a red light when a work error occurs.

2.3 Power Box

With wired connection, the power box provides the voltage a detector needs to operate properly. Additionally, the user can connect the power box to charging dock to charge the battery.

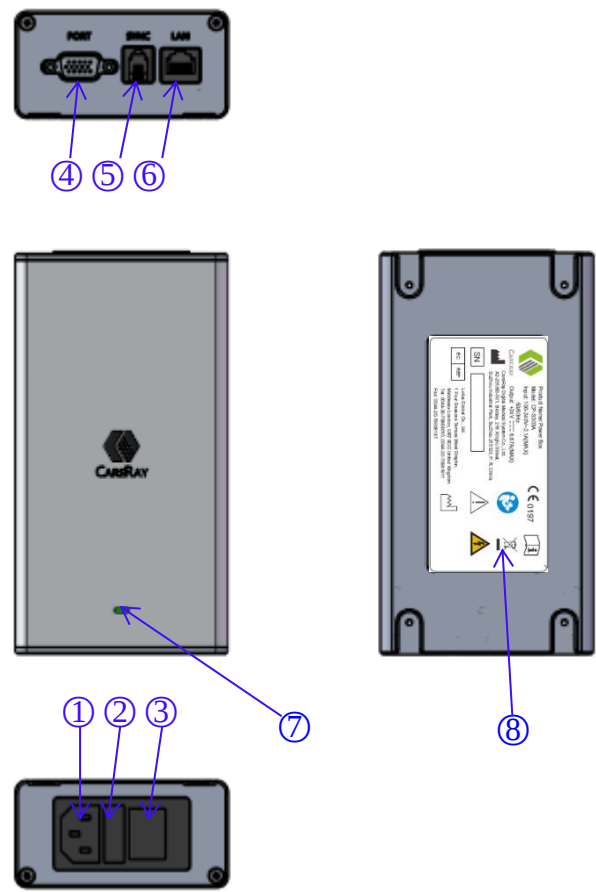


Figure 5 Power box

Table 5 Description of power box

No.	Name	Description
①	AC power inlet	Input, 100~240V, 50/60Hz
②	Fuse holder	F2.5AL250V
③	Power switch	Turn on or off the power box
④	Port	DC +24V output
⑤	Sync	Provides connection to the X-ray generator
⑥	LAN	Provides Gigabit Ethernet communication between the workstation and detector

⑦	Power LED (DC 24V)	Indicates status of power supply operation and connection
⑧	Power box label	Displays the information of power box

2.4 Charging Dock

Charging dock is connected with the power box to charge the battery. It can charge up to three batteries simultaneously.

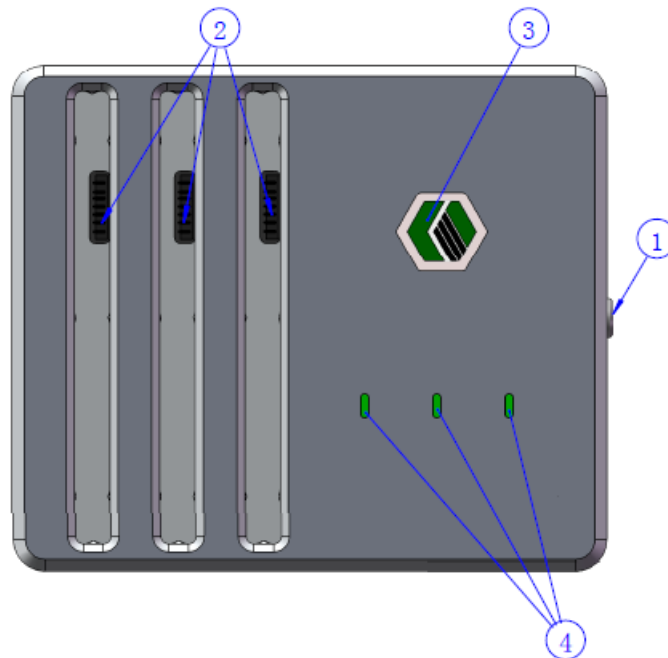


Figure 6 Charging dock

Table 6 Description of charging dock

No.	Name	Description
①	DC input	Connects the power box to supply electrical power to the battery.
②	Battery compartment	Insert the battery to charge.
③	Power indicator	Indicates the power on/off status. (Green: Power on)
④	Charging indicator	Indicates the charging status. (Blue: Charging, Green: Fully Charged)

2.5 Li-Polymer Battery



The battery supplies power to the detector while in wireless connection mode. When operating, only use the dedicated battery and charge it completely before use. To charge the battery, perform the steps below.

- 1 Connect one end of 24V DC power cable to the “PORT” of the power box, and the other end to the DC input port of the charging dock.
- 2 Connect the AC power cable with power box and power supply.
- 3 Insert the battery into the charging dock.
- 4 Open the power switch of the power box. And make sure the power LED of the power box and charging dock are green indicating the presence of direct current (DC) power.
- 5 Charging should begin automatically. Verify that the charge LED shows a blue light. Once the battery is completely charged, the charge LED should show a green light.
- 6 Once completely charged, gently pull the charged battery to remove it from the charging dock.



Figure 7 Battery charging

Warning: Remove the battery after the charge LED shows a green light. Prolonged charging after the battery is completely charged may result in overheating of the battery, causing the battery to explode or ignite.

Note: Batteries are typically completely charged after approximately 3.5 hours. Time to complete charge may vary depending on external temperature and remaining battery level.

When the battery is placed inside the detector and the detector is connected with the power box, the battery will be automatically charged with the charging LED showing orange light.

3 System Integration

3.1 System Components

A Digital Radiography (DR) system mainly contains three components.

- X-ray generator, tube and subsidiary device
- DROC image workstation and software
- CareView 750Cw/CareView 750C detector and subsidiary device

3.1.1 Typical Generator Specifications

- Energy range: 40~150kVp
- mA range: 10~1000mA (depending on the generator power)
- ms range: 10~6300ms to produce 0.1~1000mAs (depending on the generator power)

Note: To our best knowledge, the detector is compatible with X-ray generators that match the above specifications. If you have any questions or concerns regarding compatibility for other generators, please contact your distributor or CareRay support.

3.1.2 Detector Operation Conditions

➤ X-ray energy range

The detector operates at the following X-ray tube peak voltages:

- X-ray tube peak voltages: Min = 40 kVp
- X-ray tube peak voltages: Typ = 70 kVp
- X-ray tube peak voltages: Max = 150 kVp

➤ X-ray exposure range

The detector operates within the linearity specifications up to an X-ray exposure value of 100μGy.

The detector operates within the degraded linearity specifications above 100μGy and up to an X-ray exposure value of 130μGy.

➤ X-ray source position

The angle between the X-ray central propagation axis and the normal axis of the front-end entrance plane taken at the centre point of the matrix should remain within the following range:

- X-ray angle: Min = -45 deg
- X-ray angle: Typ = 0 deg
- X-ray angle: Max = +45 deg

The distance between the X-ray source focal spot and the front-end entrance plane (SID) should remain within the following range:

- SID: Min = 100 cm
- SID: Typ = 135 cm
- SID: Max = 180 cm

➤ X-ray window duration

While the X-ray window duration can be functionally settled by the system over a wide range, image quality can be directly impacted by X-ray window duration (due to leakage, noise, or lag).

The full performance of the detector is guaranteed for the following X-ray window range:

- X-ray window duration: Min = 10 ms (TBC)
- X-ray window duration: Typ = 500 ms (TBC)
- X-ray window duration: Max = 2500 ms (TBC)

3.1.3 Workstation (Recommended)

Table 7 Workstation

Item	Description
Operating system	Windows XP/Win7/Win10
Processor	Intel i5 or compatible with AMD processor
RAM	>6GByte
HDD	>80GByte
Network	Dual 1000Mbit

3.2 X-ray Sync Mode

Synchronous connection mode is the signal transfer mode between the X-ray generator, which sends the X-ray, and the detector, which receives the X-ray. The sync mode of CareRay's static detector contains external sync, software sync, manual sync and F²AED modes.

CareView 750Cw-supported typical sync mode contains software sync, manual sync and F²AED modes.

CareView 750C-supported typical sync mode contains external sync, software sync, manual sync and F²AED modes.

Note: The detector can't terminate x-ray exposure via communication with the generator.

3.2.1 External Sync Mode

The detector and X-ray generator communicates through synchronization cable to deliver a synchronized exposure signal.

The sequence chart of external sync mode for a complete cycle of image acquisition is shown in figure below.

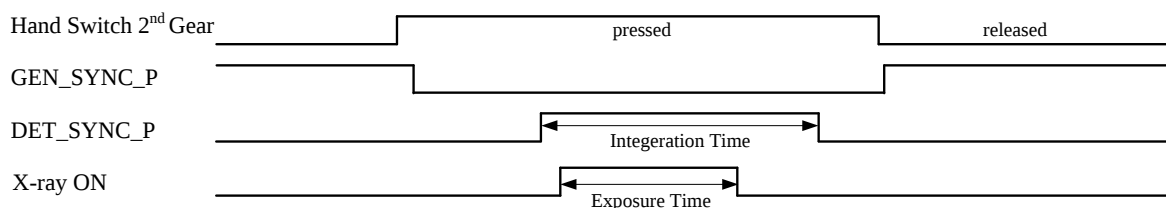


Figure 8

Sequence chart

A typical configuration for external sync mode of a DR system integrated with CareView 750C is shown in the figure on the following page.

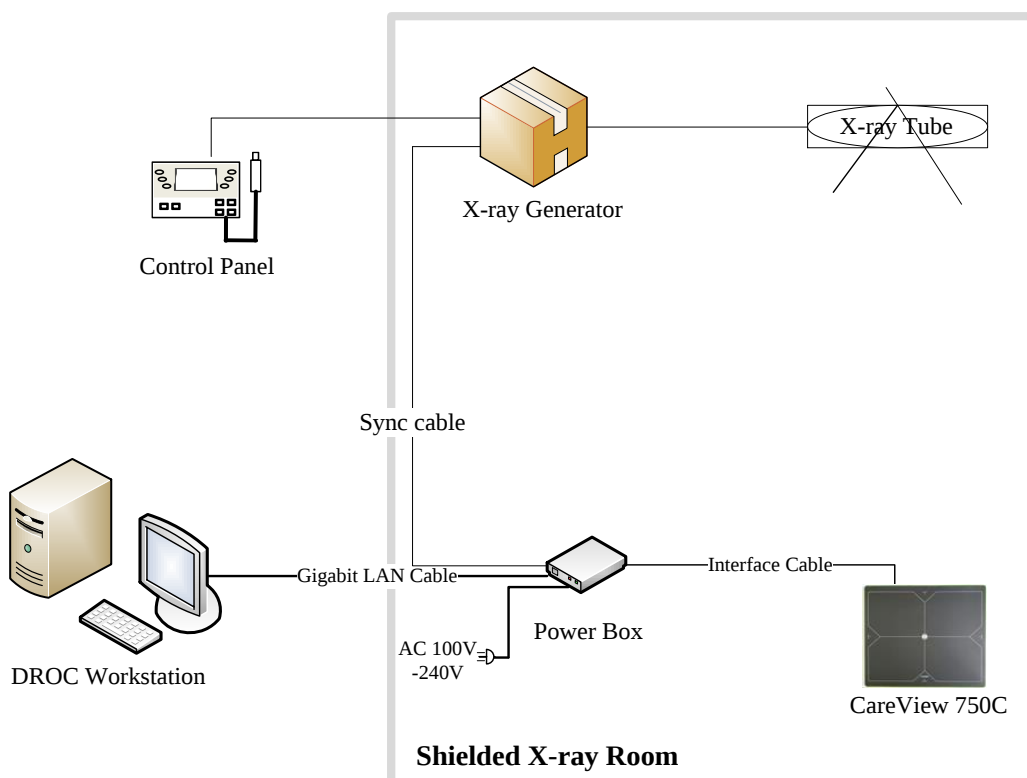


Figure 9 External sync mode

3.2.2 Software Sync Mode

The detector communicates with an X-ray generator via the DROC workstation via a wired or wireless network connection. Compared with the external sync mode, the software sync mode will cause a delayed response.

The sequence chart of software sync mode for a complete cycle of image acquisition is shown in figure below.

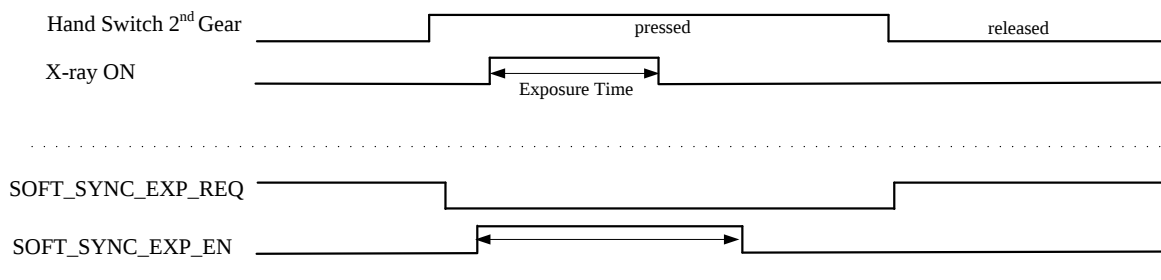


Figure 10 Sequence chart

A typical configuration for software sync mode of a DR system integrated with CareView 750Cw is shown in the figure on the following page.

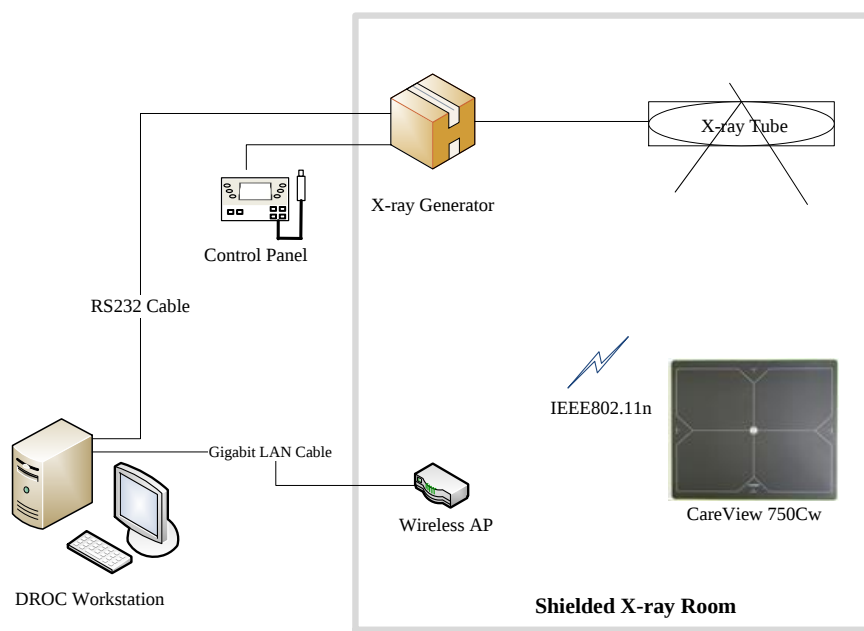


Figure 11 Software sync mode

A typical configuration for software sync mode of a DR system integrated with CareView 750C is shown in the figure below.

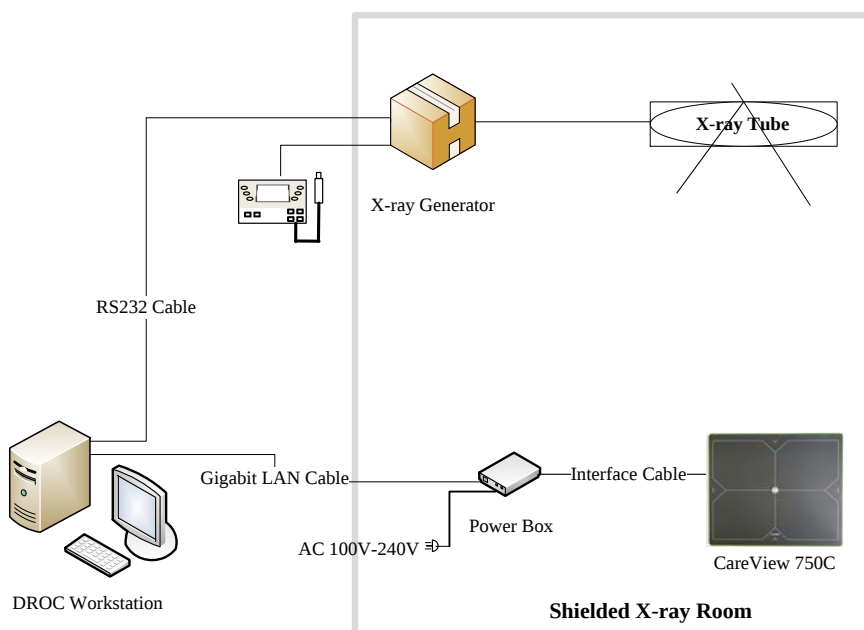


Figure 12 Software sync mode

3.2.3 Manual Sync Mode

There is no sync exposure signal interaction between the detector and an X-ray generator. Users should control exposure time manually according to exposure recommendations provided by acquisition software.

Note:

- 1) In manual sync mode, the image will be light and have an uneven shade acquired in the forbidding exposure time window.
- 2) If no goal image appears, first verify the exposure dose to see whether it is too low. Then check the tube's field of view to verify that it completely covers the plate.

The sequence chart of manual sync mode for a complete cycle of image acquisition is shown in figure below.

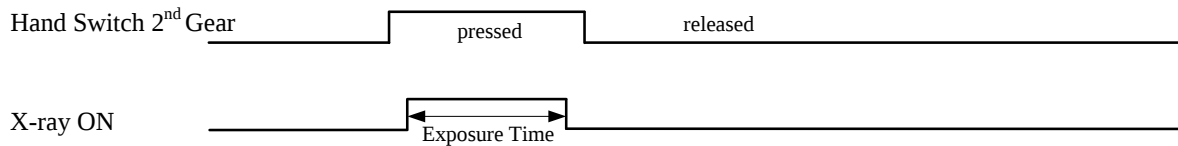


Figure 13 Sequence chart

A typical configuration for manual sync mode of a DR system integrated with the CareView 750Cw is shown in the figure below.

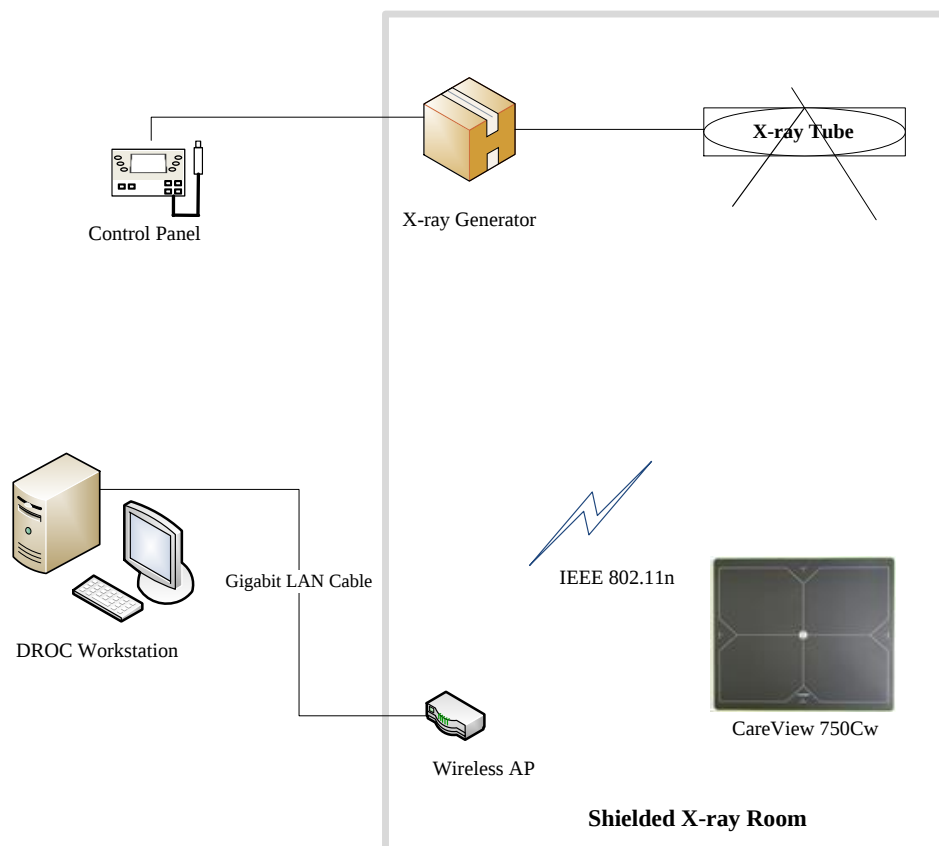


Figure 14 Manual sync mode

A typical configuration for manual sync mode of a DR system integrated with the CareView 750C is shown in the figure on the following page.

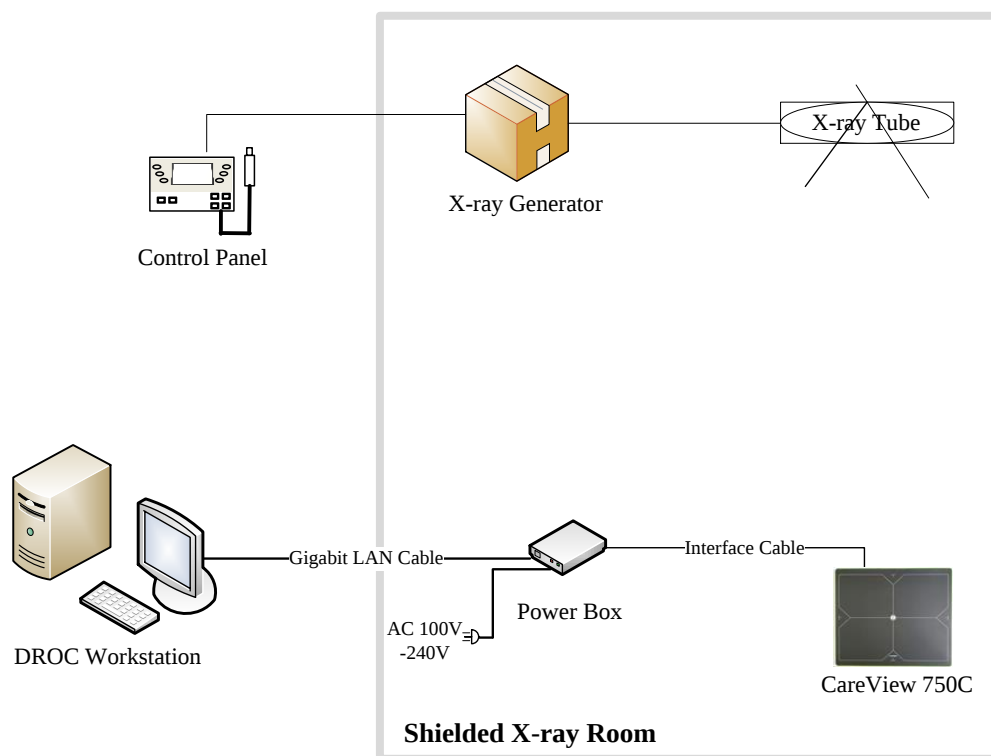


Figure 14 Manual sync mode

3.2.4 F²AED

There is no sync exposure signal interaction between the detector and an X-ray generator. Users can begin exposure at any time once the device is ready.

The DR system in auto sync mode is configured exactly like the DR system in manual sync mode.

Note: If no goal image appears, first verify the exposure dose to see whether it is too low. Then, check the tube's field of view to verify that it completely covers the plate.

3.3 Network Connection and Power Supply

CareView 750Cw and the DR station communicate either wirelessly via a wifi protocol or via a physical link by using a backup cable.

3.3.1 Wireless Connection Powered by Battery

The figure on the following page illustrates the recommended network connection setup. It can be applied in mobile DR, RAD DR, or refined DR systems.

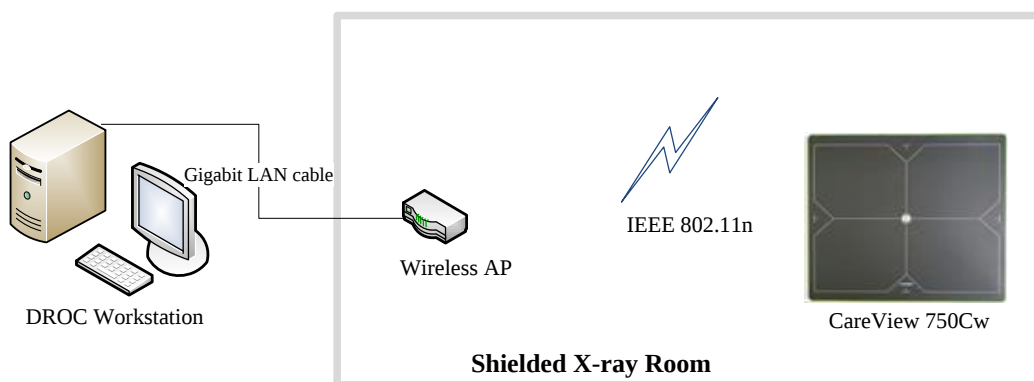


Figure 15 Wireless connection powered by battery

Note: If the X-ray generator is installed in a shielded X-ray room, it is recommended that the wireless AP is also placed in it. The shielded X-ray room may be shielding the wireless signal. A DROC station that connects with the wireless AP through a CAT-6 network cable will ensure a stable wireless network connection.

3.3.2 Wireless Connection Powered by Power Box

The second method is the same as the first connection mode except for the power mode. In this mode, the detector is powered by power box. If the battery is placed in the detector, it will be charged.

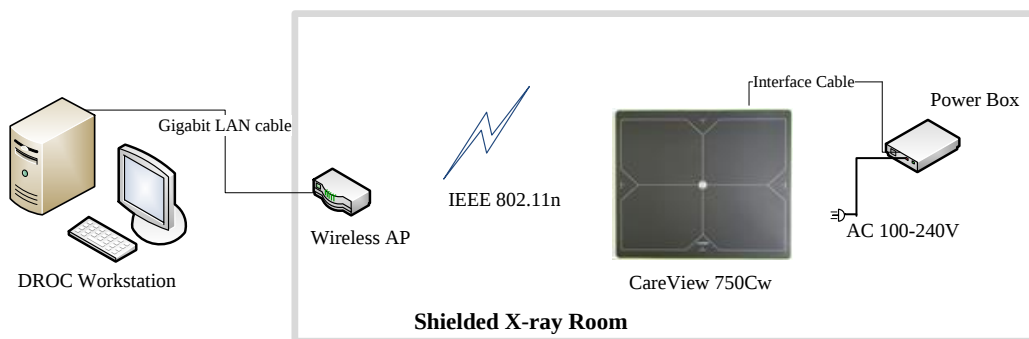


Figure 16 Wireless connection using wireless AP (Powered by power box)

3.3.3 Wired Connection

When the detector is powered by the power box, connect the CareView 750Cw/CareView 750C with power box via the interface cable. Then, connect the power box with the DROC workstation directly via a Cat5e/Cat6 network cable. See the figure on the following page for more details.

Note: When detector is powered by power box, it must be installed in the bucky.

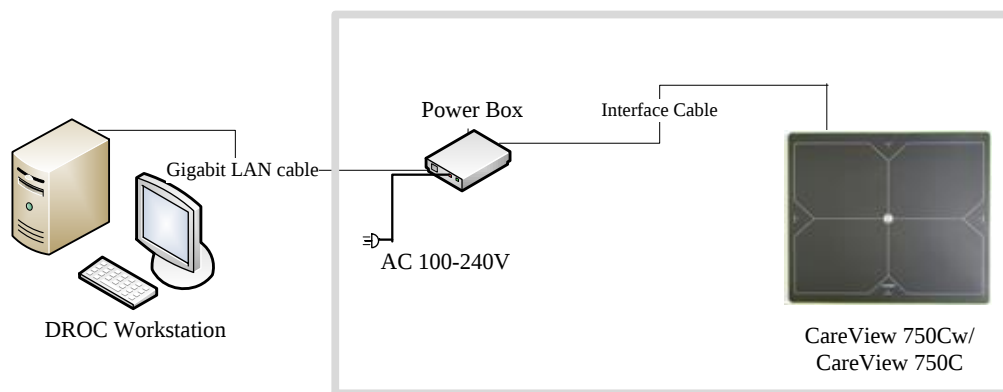


Figure 17 Wired connection (Powered by power box)

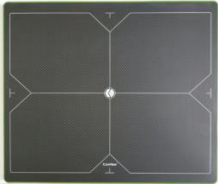
4 Installation

Installation of this product should be made by licensed and authorized personnel. If you encounter any problems during normal operation or daily inspections, consult your sales representative or distributor.

4.1 Unpacking

Make sure that there is no damage on the sealing tape or on the package box before opening the package. After opening the package box, please double-check that everything on the package list can be found inside the package box.

Table 8 Contents of CareView 750Cw

Detector	Li-Polymer battery	Power box
		
Charging dock	AC power cable	Interface cable
		
Gigabit LAN cable	24V DC power cable	CD or Program dongle

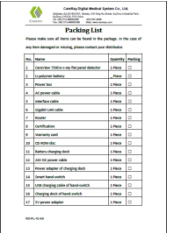
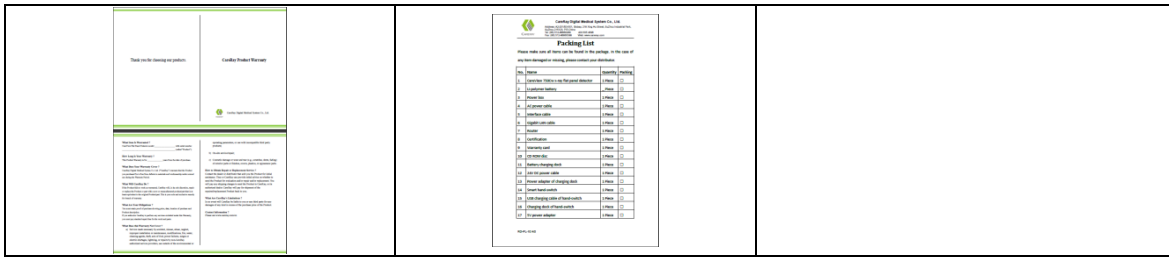
		
Certification	Warranty card	Packing list
		

Table 9 Contents of CareView 750C

Detector	Power box	AC power cable
		
Interface cable	Gigabit LAN cable	Synchronization Cable
		
M4 Bolts	CD or Program dongle	Certification
		
Warranty card	Packing list	



4.2 Hardware Installation

4.2.1 CareView 750Cw

- 1 Place a fully charged battery inside the detector

First, open the cover plate of the battery compartment on the back of the detector. Then, slide the battery into the battery compartment of the detector. Verify that the claws on the battery are aligned with the grooves on the battery compartment. Then, place the cover of battery onto the plate and securely fasten the screws in place.

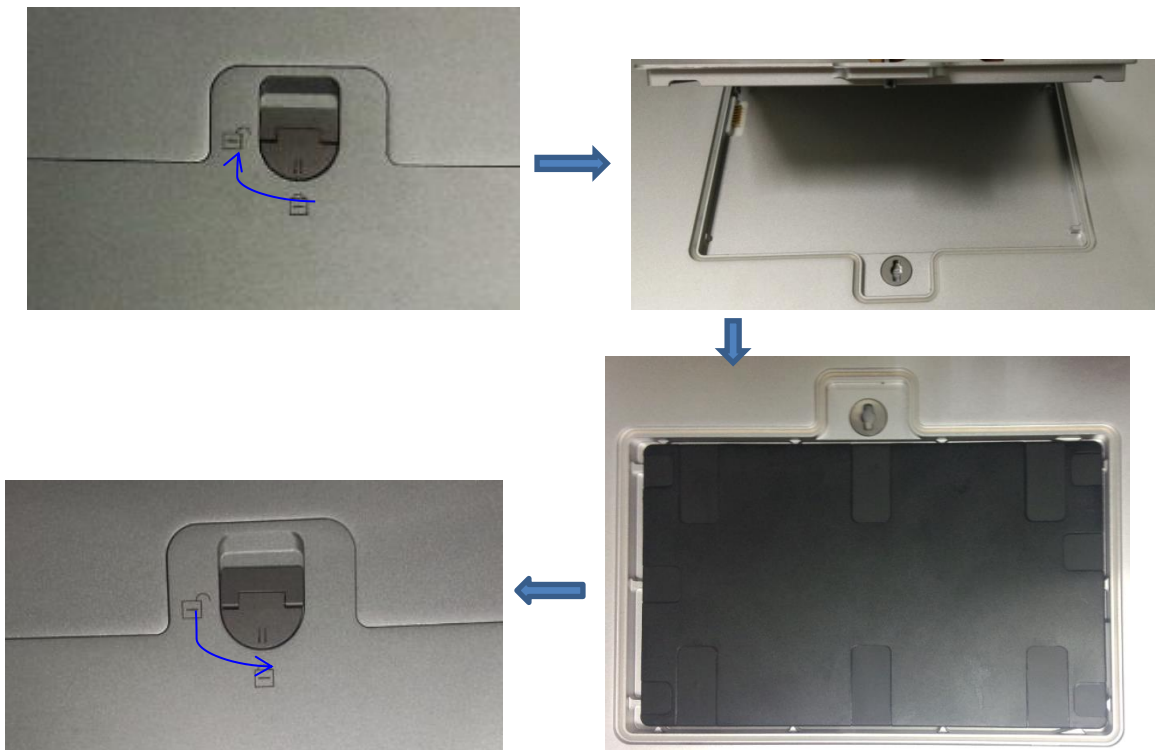


Figure 18 Place the battery

- 2 Press the power button of the detector for approximately 3 seconds to turn on the detector. Make sure the 'Power LED' displays a green light.

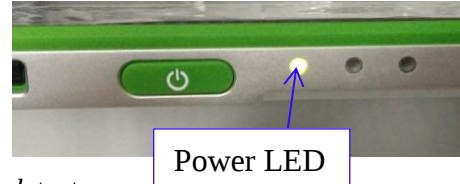


Figure 19 Turn on the detector

- 3 Connect one end of the LAN cable to the wireless AP and power it on. Connect the other end to the LAN card connector of the workstation assigned for the data transfer.



Figure 20 Connection wireless AP and workstation

- 4 When the detector and wireless AP are connected, the blue network LED light will blink, as shown in the figure below.

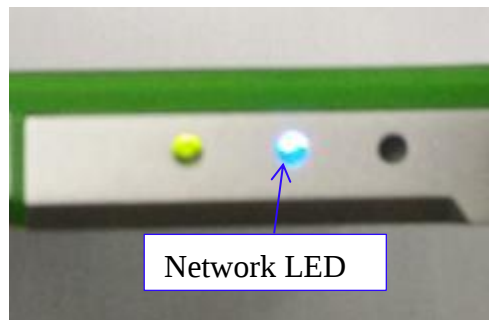


Figure 21 Network LED

- 5 When you have finished using the detector, press and hold the power button of the detector for 3 seconds to turn off the detector. Remove the battery from the detector if the detector will not be used in the near future. This is to prevent over-discharge of the battery, which may result in a shortened battery life.

4.2.2 CareView 750C

- 1 Review the figure below for the position of the four mounting holes on the back of the detector case.

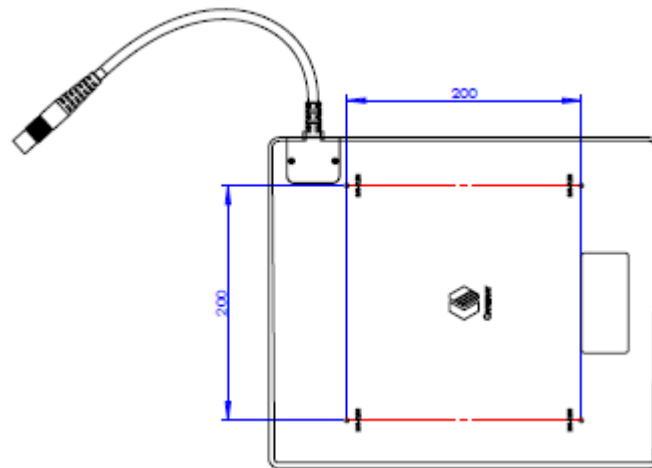


Figure 22 Mounting Holes

- 2 Install the detector into the bucky. Make sure all the mounting bolts are screwed properly and firmly.
- 3 Connect the detector to the power box.
 - Connect one end of the interface cable with detector cable and verify that the red marks are aligned.
 - Plug the other end of the interface cable into the 'PORT' on the power box and tighten the mounting screws.

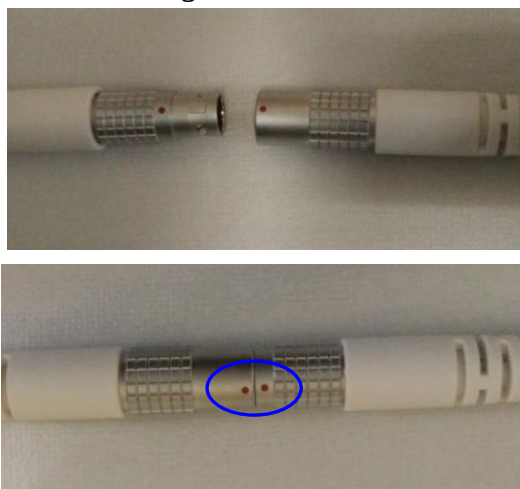


Figure 23

- 4 Connect the LAN cable into the power box and computer.

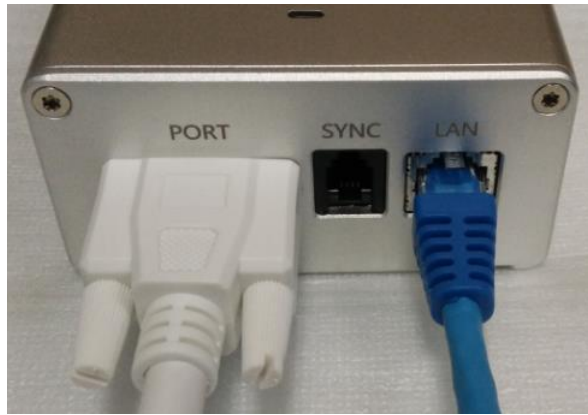


Figure 24

- 5 Connect the AC power cable with the power box and plug the power cable in the AC outlet.

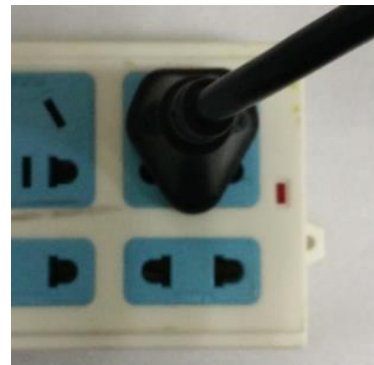


Figure 25

- 6 Verify that the other connections are correct and safely secured. Then, switch on the power supply to test electrical conductivity. Verify that the indicator lights of the power box and detector are functioning normally.

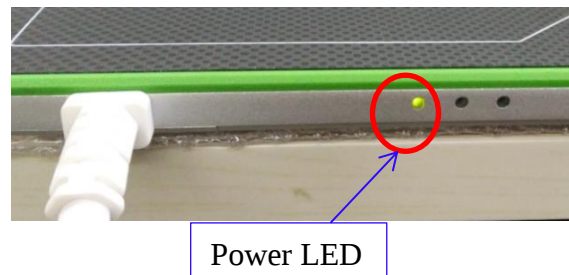


Figure 26

- 7 Connect the synchronization cable between the power box and the X-ray generator if CareView 750C works in external sync mode
 - One end of the sync cable is the 4pin RJ-11 connector; connect it with the “SYNC” port of power box.

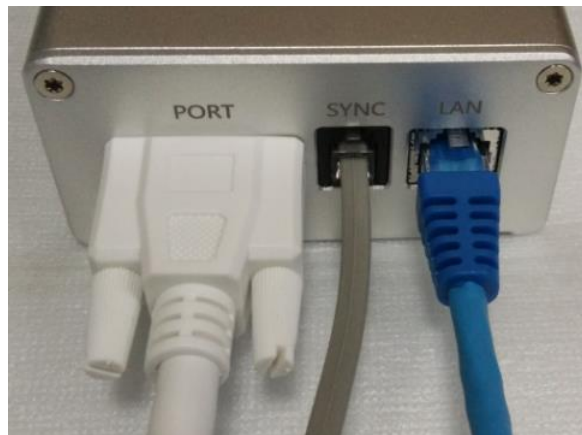


Figure 27

- The other end has three lines: yellow, red and black. Connect them to the corresponding interfaces of the X-ray generator.

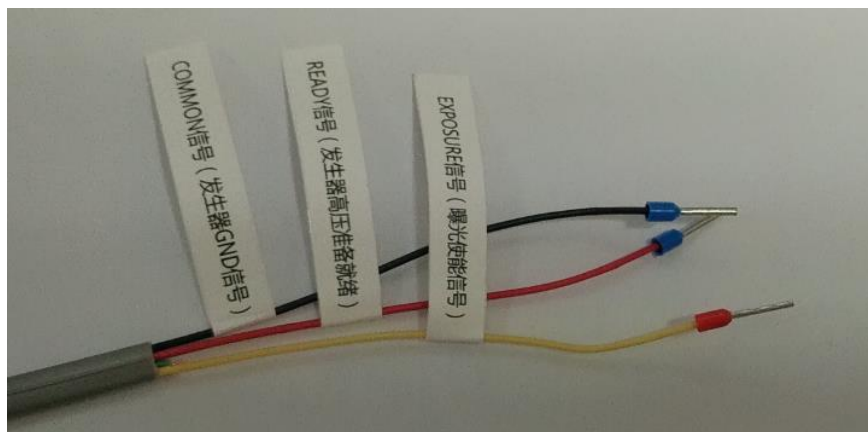


Figure 28 Sync cable

Table 10 Pins description

Color	Sync terminal	Pins definition	Description	Signal level	
				Low	High
Yellow	Exposure Signal	DET_SYNC_P	Output signal sent to the generator from the detector to trigger X-ray exposure	0V	+12V (External)
Red	Ready Signal	GEN_SYNC_P	Input signal sent from the generator to signal to the detector that the generator is ready to fire X-ray.	0V	+12V (External)
Black	Common Signal	GND	Common ground (connects to both the generator and the detector)	0V (External)	

The connection diagram between the detector and the X-ray generator is shown in the figure below.

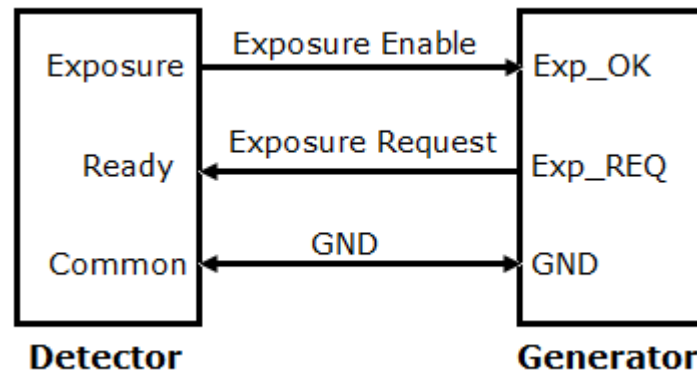


Figure 29 Connection diagram between detector and X-ray generator

4.3 Network Configuration

Set up the IP address (192.168.68.100) of image workstation prior to the use. The network setup process is shown below.

Note: The default operation system of the image workstation is Windows7. These instructions should also apply for other contemporary windows operating systems (Windows XP/ Win10).

- 1 Open the “Network and Sharing Center”.

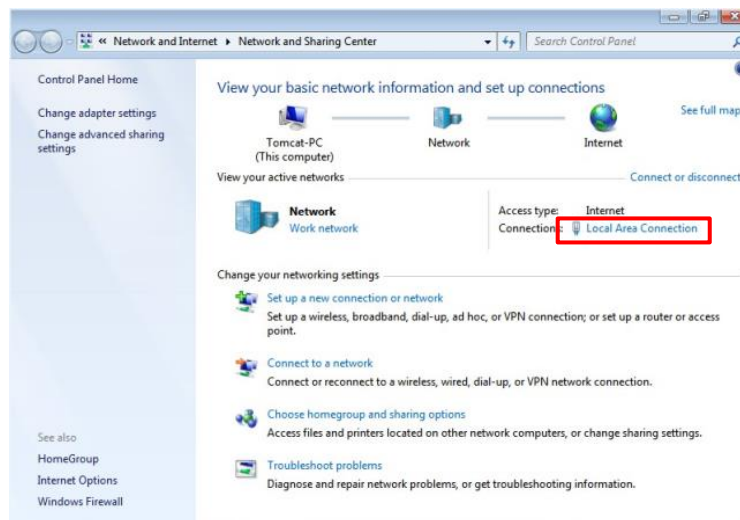


Figure 30 Select “Local Area Connection”

- 2 Open the “Local Area Connection”;

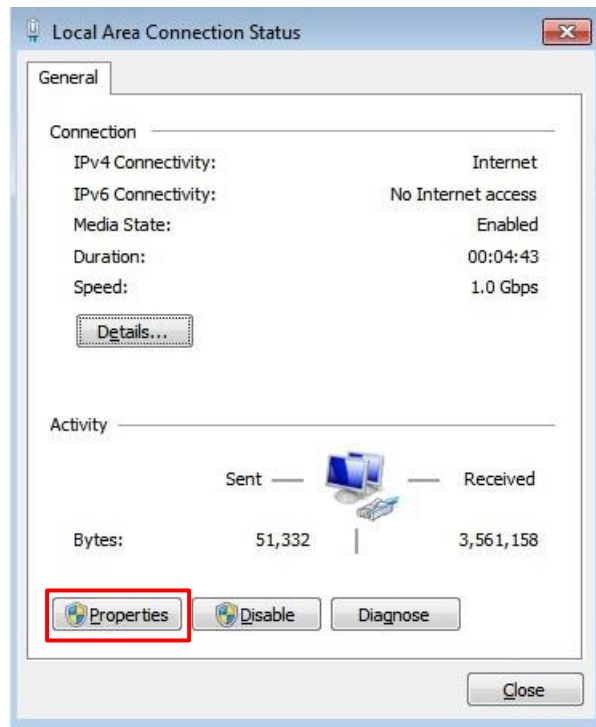


Figure 31 Select “Properties”

- 3 Check the “properties” of the Local Area Connection Status.

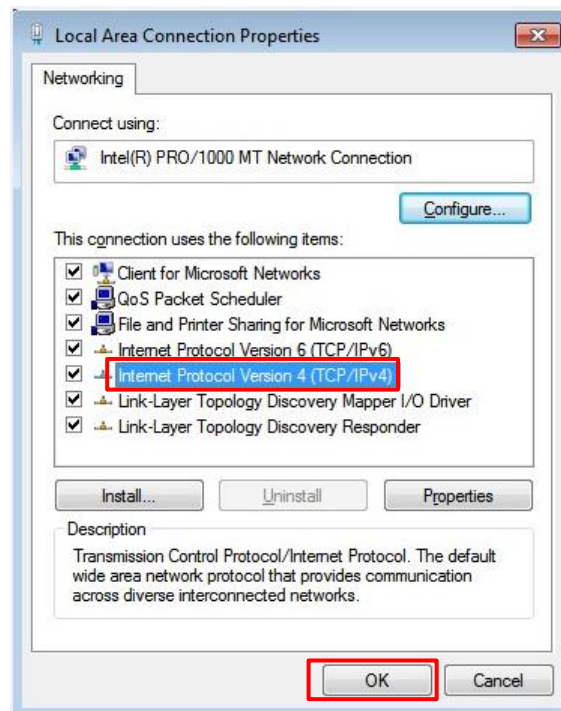


Figure 32 Select “Internet Protocol Version”

- 4 Choose “Internet Protocol Version 4 (TCP/IPv4)” and click “OK” button. Setup the IP address as shown below and click the “OK” button to close the dialog box.

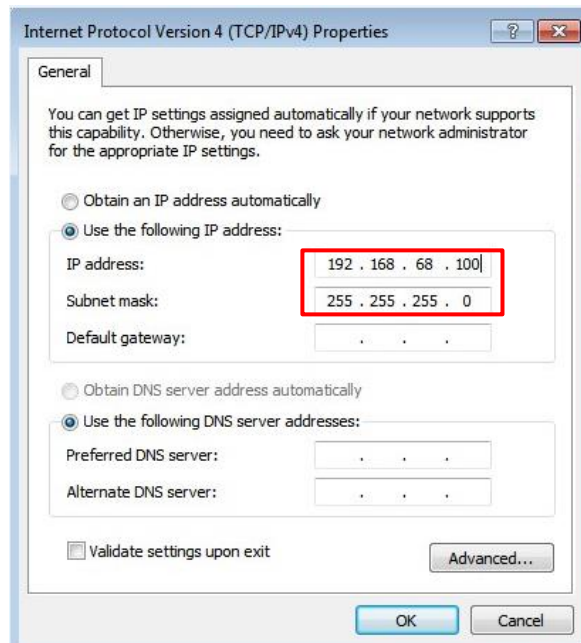


Figure 33 Set up IP address

- 5 Verify that the network connection of workstation is 1.0Gbps.

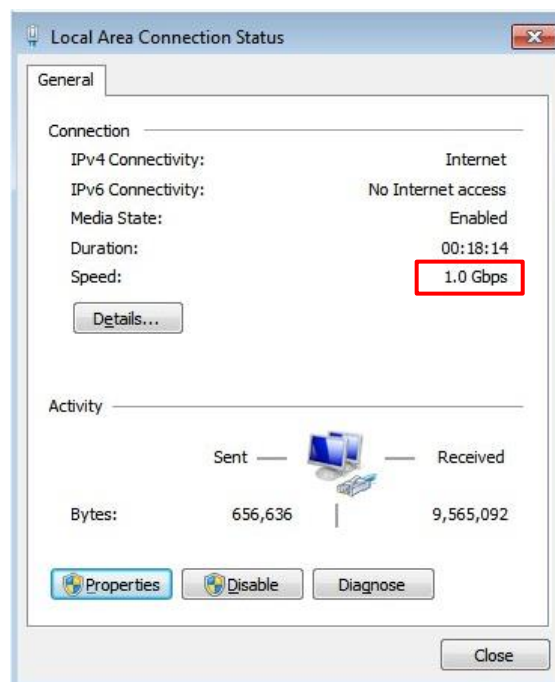
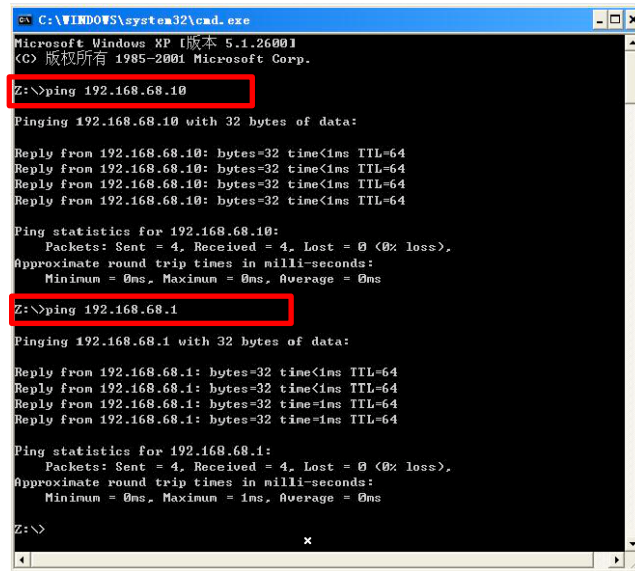


Figure 34 Verify network speed

6 Network testing

- Launch the Command Prompt. Type and execute “ping 192.168.68.10” to check the network

- connection with the wireless AP;
- Type and execute “ping 192.168.68.1” to check the network connection with the detector.



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [版本 5.1.2600]
(C) 版权所有 1985-2001 Microsoft Corp.

Z:\>ping 192.168.68.10

Pinging 192.168.68.10 with 32 bytes of data:

Reply from 192.168.68.10: bytes=32 time<1ms TTL=64
Reply from 192.168.68.10: bytes=32 time<1ms TTL=64
Reply from 192.168.68.10: bytes=32 time<1ms TTL=64
Reply from 192.168.68.10: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.68.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

Z:\>ping 192.168.68.1

Pinging 192.168.68.1 with 32 bytes of data:

Reply from 192.168.68.1: bytes=32 time<1ms TTL=64
Reply from 192.168.68.1: bytes=32 time<1ms TTL=64
Reply from 192.168.68.1: bytes=32 time<1ms TTL=64
Reply from 192.168.68.1: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.68.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

Z:\>
```

Figure 35 Network testing

5 Wireless Communication

The CareView 750Cw includes two internal wifi antennas. The system’s design should guarantee that the antenna is not electromagnetically shielded when the detector is placed inside a bucky.

5.1 Architecture

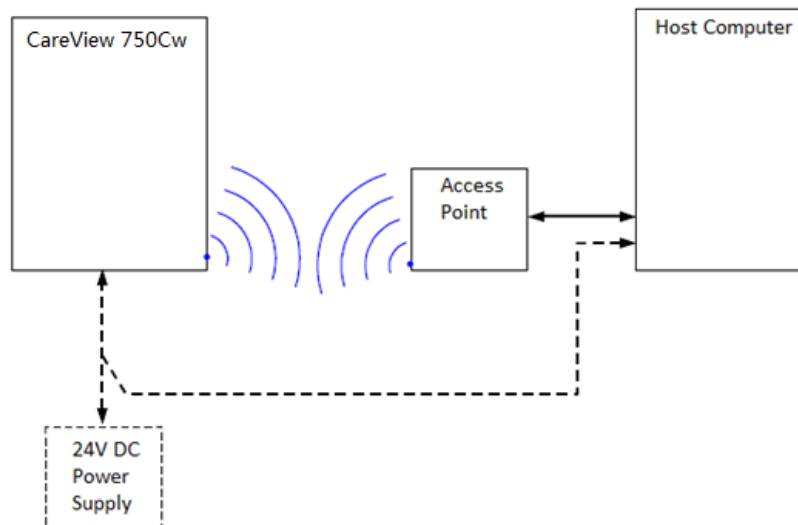


Figure 36 Architecture with wifi connection

5.2 Specification

Table 11 Wireless specification

Item	Description
Wireless standard	IEEE802.11 a/b/g/n b/g/n for 2.4 GHz band a/n for 5GHz band
Frequency range	For 2.4GHz Band 802.11b/g/n(20MHz):2412~2472MHz 802.11n(40MHz):2422~2462MHz For 5.0GHz Band 802.11a/n(20MHz):5180~5220MHz, 5260~5320MHz,5500~5700MHz; 802.11n(40MHz):5190~5310MHz, 5510~5670MHz
Channel number	2.4GHz: 13 for 802.11b/g, 802.11n (HT20) 9 for 802.11n (HT40) 5GHz: 19 for 802.11a, 802.11n (HT20) 9 for 802.11n (HT40)
Date rate	802.11b: Max. 11Mbps 802.11a/g: Max. 54Mbps 802.11n: Max. 300Mbps (MIMO 2X2)
Modulation	802.11b: DSSS 802.11a/g/n: OFDM
Output power	Max. 17dBm
Security	64/128-bits WEP, WPA, WPA2, 802.1x
Antenna	Two dual band antennas (Detector: internal)
Antenna gain	3dBi

5.3 Initial Setting

Table 12 Detector initial settings

Item	Description
IP address	192.168.68.1
Subnet mask	255.255.255.0
Country code	CN
ESSID	750Cwxxxx-5G (xxxx stands for four-bit number)
Network type	Infrastructure
Wireless mode	11(N only with 5GHz band)
Bandwidth	40MHz
Channel	149

Auth mode	WPA2PSK
Encrypt type	AES
WPAPSK(Password)	abcdefghij

Note:

- 1) The value of ESSID/ WPAPSK of the detector and the wireless AP should be the same. Avoid overlapping with other systems to prevent confusion.
- 2) The wifi band and channel should comply with the local regulations. In several cases, wifi quality is better in the 5GHz band compared to the 2.4GHz band. If possible and allowed in the country of use, CareRay recommends using the 5GHz band.
- 3) Country of use must be declared if wifi is used.

5.4 Detector Wireless Information

If wireless AP is selected and configured by the user, the ESSID value of the detector and wireless AP should be the same. Take necessary precaution to avoid ID collision.

- 1 Set the IP of the DROC station to 192.168.68.100. see chapter “4.3 Network Configuration”
- 2 Connect the detector through LAN cable.

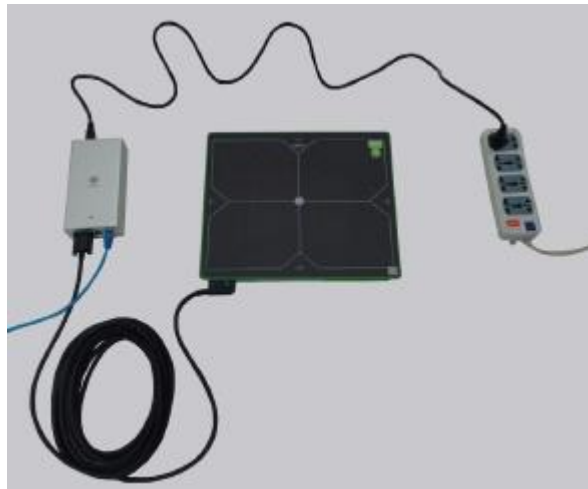


Figure 37 Wired connection

- 3 Open an IE browser and type the detector configuration page address:
<http://192.168.68.1/cgi-bin/index.cgi>. Pressing the 'Enter' button pops up the following dialog box.

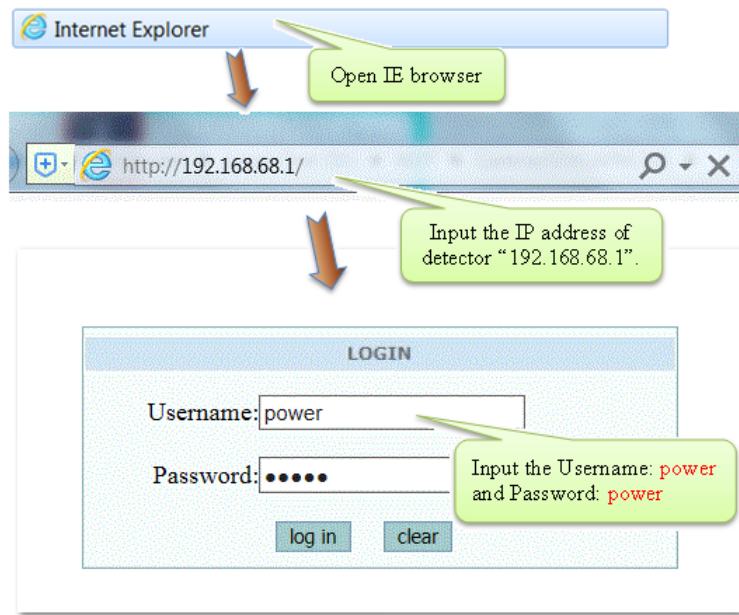


Figure 38 Enter the website

- 4 Login with Username: power and Password: power. Click the 'ADVANCED' tab, and then 'WiFi' icon.
- 5 On this page you can see various wifi related settings. Configure wifi settings to suit your application. Click <save> and then reboot the detector.
- 6 After the detector boots up, disconnect the LAN cable.

Machine ID: C08150501-004 ; Panel ID: 123456 ; AED Status: Tue Jun 28 2016 15:04:08 GMT+0800 (China Standard Time)
Last Backup Time: 2016-06-23 14:36:19; Partition Backup Status: ; Files Backup Status: SUCCESS
System Check Switch:

BASIC **ADVANCED** EXTEND SUPPORT EXIT

Network WiFi LogView Update Restore Device AEDConf Reboot

If you don't want to set step by step, just click the "default" button!

save default_5GHz default_2.4GHz

CountryCode: CN
Choose the Country you belong to

ESSID: 500Fxxxx-2.4G
Wifi name
Essid: it is name of your network! must be made up by (1~9,a~z)1~32 ascii characters.

NetworkType: ☐ Adhoc ☒ Infra
Adhoc: Ad hoc mode: An Ad-hoc network allows each device to communicate directly with each other. There is no central Access Point controlling device communication.
Infra: Infrastructure mode: An Infrastructure mode network requires the use of an Access Point. The Access Point controls Wireless communication and offers several important advantages over an Ad-hoc network.

WirelessMode: 6
"6" for 2.4G band, "11" for 5G.
0: legacy 11b/g mixed
1: legacy 11B only
2: legacy 11A only //Not support RfICType=1(id=RFIC_5225) RfICType=2(id=RFIC_5325)
3: legacy 11a/b/g mixed //Not support RfICType=1(id=RFIC_5225) RfICType=2(id=RFIC_5325)
4: legacy 11G only
5: 11ABGN mixed
6: 11N only with 2.4GHz band
7: 11GN mixed
8: 11AN mixed
9: 11BGN mixed
10: 11AGN mixed
11: N only with 5GHz band

Channel: 0
Select "0" for auto negotiation channel, or select a specified channel.

Security Options: ☐ OPEN+NONE ☐ WEPAUTO+WEP ☒ WPA2PSK+AES
OPEN+NONE: authmode=OPEN, encrypttype=NONE
WEPAUTO+WEP: authmode=WEPAUTO, encrypttype=WEP
WPA2PSK+AES: authmode=WPA2PSK, encrypttype=AES
WPA2PSK+AES is recommended.

WPAPSK: abcdefghij (max length:10)
Password
Tip: 8~63 ASCII or 64 HEX characters
If your Encrypttype is not NONE or WEP, you must input the WPAPSK value!

KEY: 0123456789 (max length:10)
Tip: 10 hexadecimal characters

Figure 39 Detector information

- Connect to the router, set the IP of Wireless AP to 192.168.68.10, and set up the wireless configuration. Make sure the "Wifi Name", "Band", "Channel", "Security Option" and "Password" are identical with those of detector.

5.5 Wireless LAN Diagnostics

Table 13 Wireless WLAN diagnostics

Item	Description
Interface	- Interface cable: Displays a wired connection status through interface cable - Wireless: Displays a wireless connection status
Quality	The signal level of a wireless connection displays four levels (minimum signal at 1 bar; maximum signal at 4 bars).

	● If a warning sign is displayed on the viewer when the signal level of the wireless connection displays 1 bar, check the user environment.
--	---

Note:

- (1) If an acquired image can't be transmitted because of wifi link failure, it may be possible to recover the image later.
- (2) In case of transmission failure, the last acquired image must be retrieved before any other action.
- (3) In case wifi communication is no longer available, a wired connection should be used to recover the last acquired image.

5.6 Intended Use Environment

Keep the detector as far as possible (at least 1-2m) from electronic devices that generate RF noise like microwaves, monitors, or electric motors.

Try to keep the antennas at least 15cm away from the wall or other objects. Wifi quality may also depend on access point position and antenna orientation.

6 Announcement

6.1 Basic Notices

Please read this operation manual carefully before using the detector in order to ensure safety and correct usage. Keep this manual for reference.

6.1.1 Use-method of Power Supply

First, connect the power box with the detector. Then, connect the AC power cable when powered on. Do not forcefully connect the AC power box when the detector is not well connected, as it may result in damage to the power interface port.

First, shut off the power switch, then disconnect the connector of the AC power cable when the device is completely powered off. Do not forcefully disconnect the interface cable between the power box and the detector, as it may short circuit, leading to damage to the battery or causing it to ignite.

6.1.2 Network

The network used between the DROC station and the detector should not be connected via public Ethernet, otherwise data transmission speed may be reduced and the network connection maybe rendered invalid or have safety issues.

Note: In case the network link is extended, the LAN cable must be file transfer protocol(FTP) or shielded twisted pair(STP) type, category 5 or above (5E or 6).

6.1.3 Electromagnetic Radiation

This product may malfunction due to electromagnetic waves caused by portable personal telephones, transceivers, radio-controlled toys, etc. Be sure to keep the detector away from electromagnetic objects or fields which may affect detector operation.

The system should be connected to a grounded electrical outlet to reduce chance of electric shock. A three conductor AC power cable is included with this system to provide proper electrical grounding.

6.1.4 Contraindication

Pregnant or lactating women should exercise caution when operating this product.

6.2 Particular Notices

6.2.1 Personnel

The device must be operated by a qualified engineer. Assembly, adjustments, examination, and maintenance should be conducted by trained staff.

6.2.2 X-ray Scope

The active matrix geometry of CareView 750Cw/CareView 750C is 244mm*307mm as shown in the figure. Make sure the X-ray exposure area is within this scope.

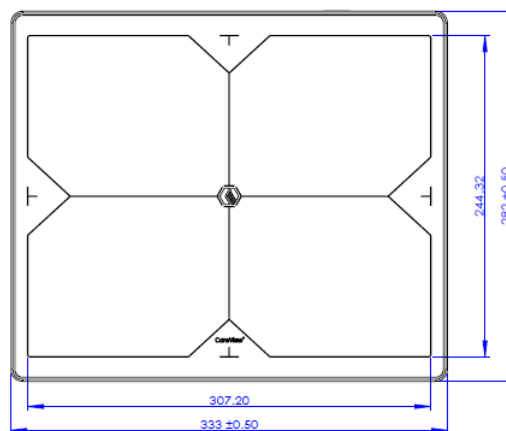


Figure 40 Active matrix geometry

6.2.3 Operation Conditions

This product is recommended for use in the required operating conditions. Any issues in storage, transportation, and operation may reduce product performance, shorten the lifespan of the product, or result in irreparable damage.

Sudden temperature changes may cause condensation, leading to poorer image quality or cause the product to short circuit. Please refrain from use until operating temperature becomes mild and stable.

Product should not be used in the vicinity of water and dust, which may cause the product to short circuit or ignite.

7 Maintenance

The product must be maintained by a qualified engineer. For safety reasons, be sure to turn off the power and unplug the power cables of each device during maintenance procedures. Failure to do so may result in electric shock.

It is recommended that a record of the inspection be kept by making copies of the checklists in this section, or making a separate checklist.

7.1 Inspections

For safety reasons, please inspect the product before use. If any problem is found during the inspection, corresponding measures should be taken. If the problem can't be resolved, contact the distributor.

Table 14 Inspection items

Item	Period	Method	Description	Remedy
Cables	Daily or Weekly	Visual inspection	Check that cables are not damaged and cover of cables is not torn.	Contact your distributor or CareRay support if there are any problems.
Connectors	Daily or Weekly	Visual inspection	Check that the plugs and locks of connectors are not loose.	Fully insert the cables and lock them.
Detector	Daily or Weekly	Visual inspection	Check that the cover and parts are not damaged and not loose.	Contact your distributor or CareRay support if there are any problems.
Test exposure	Daily or Weekly	Test exposure	Check the exposure condition of the product	Contact your distributor or CareRay support if there are any problems.
Performance	Monthly or Yearly	Expose a phantom object or a resolution chart	Check the general performance of the product	Contact your distributor or CareRay support if there are any problems.

We recommend the user uses a phantom with the following information (or equivalent):

Manufacturer: Supertech., Inc.

Item number: 07-646

Dimensions: 17" L × 14" W × 2.5" Thick (43cm × 36cm × 6 cm)

7.2 Maintenance

If any parts need to be replaced, check the product specifications to make sure it is consistent with the specifications stated in the operation manual. For system performance and safety purposes, choose the OEM accessories.

➤ Replace Fuse

Two fuses are installed inside of the power box. In order to prevent electrical accidents (such as an overcurrent occurring in the AC input), stop using the power box immediately if the fuses break.

Table 15 Fuse specifications

Item	Description
Model	023502.5
Manufacturer	Littelfuse Inc.
Amp rating	2.5A
Voltage rating	250V

Note: Turn off the power box and unplug it from the power socket before replacing fuses. Fuses should only be replaced by qualified engineers.

CareRay and, if necessary, users can replace fuses. To replace a fuse:

1. Locate the fuse holder with the symbol: F2.5AL250V. The fuse should be inside the fuse holder.
2. Remove the fuse from the fuse holder.
3. Using the fuse model and rating specified above, check the fuses and replace if necessary.
4. Place the fuse back into the fuse holder and reinstall securely in its receptacle.



Figure 41 Fuse holder

➤ Li-Polymer Battery

- 1) Do not attempt to disassemble, alter the battery.

- 2) Do not allow dirt or metal objects to contact the terminals. Otherwise, battery explosion or leakage of electrolyte may occur, resulting in fire, injury or pollution of surrounding area.
- 3) Do not use or store the battery 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, injury or fire.
- 4) To avoid the risk of injury, do not touch the internal parts of the battery if it has been cracked or otherwise damaged.
- 5) Do not clean with substances containing organic solvents such as alcohol, benzene, thinner, or other chemicals. Otherwise, fire or electrical shock may result.
- 6) During the long-term storage process, the battery should be charged once 3-month to assure the electric quantity more than 60% and the floating voltage more than 14.8V.
- 7) The battery is a consumable accessory. The battery may have expired if it discharges immediately after being fully charged. You should purchase an optional battery to replace an exhausted one.
- 8) Before discarding the battery, cover the terminals with adhesive tape or other insulators. Contact with other metal materials may cause fire or explosion.

➤ Calibration

Image quality will degrade due to X-ray exposure and component degradation. Therefore, the detector must be calibrated for initial use and every following three month interval.

7.3 Cleaning

➤ External cleaning

Use a dry cloth to clean the surface of the product. Don't use strong detergents or organic solvents to clean the product. Detergents and organic solvents may damage the product and cause structural weakening. The product must be turned off during cleaning.

➤ Internal Cleaning

The CareView 750Cw/CareView 750C has a completely enclosed design which eliminates the need for internal cleaning.

Note: Do not use an abrasive brush, scraper, or acid/alkaline cleaner when cleaning the product.

7.4 Emergency

In the event of any of the below situations, immediately turn OFF the power of each device and unplug the power cable from the AC outlet. In case of an accident, guide the patient far away from the X-ray exposure area.

- Any part of the system emits smoke or an irregular smell or sound.
- The X-ray continues to expose or not expose at all during the diagnostic process.
- The detector reaches an excessively high temperature.
- The detector is dropped and damaged.

7.5 Maintenance Note

Do not open and retrofit the detector as this will invalidate the guarantee of product quality and service. After-sales service for our product will be provided within warranty period. We will not be responsible for damage to the product due to incorrect or unsafe handling of the product.

8 Storage and Transportation

8.1 Storage

Store in a dry and well-ventilated area, and away from strong sunlight and corrosive gas. Do not invert or heap up more than three layers. Do not store more than 100kg of materials on top of the detector.

The detector should be tested every two months. Power the detector for at least two hours in a normal operation environment to ensure the detector functions correctly. Return the detector to storage once normal functionality has been verified.

8.2 Transportation

The packing instructions for the detector are as follows.

- Pack the detector with a special antistatic bag and seal.
- Place the EPE damping foam on the both ends of the detector.
- Put the detector into the packing box and make sure the X-ray exposure surface is placed in an upward position ().

Transportation and storage conditions should be established during sale and purchase. Keep the detector dry, upright, and in a secure position during transportation.

9 Specifications

9.1 Detector

Table 16 Detector specification

Item	Description	
Model	CareView 750Cw	CareView 750C
Purpose	General radiography	
Scintillator	CsI (Cesium Iodide)	
TFT/PD	10" × 12"	
Image matrix size	2048 × 2560 pixels	
Pixel pitch	120 μm	
Effective imaging area	244 mm × 307 mm	
Grayscale	16 bit, 65536 grayscale	
Fill factor	0.65	
Spatial resolution	Min. 4.2 line pair/mm	
Dynamic range	~82 dB	
Rated power supply ● Wireless ● Wired	DC 24 V, Max.1.3 A ● Powered by the battery ● Powered by the power box using interface cable	DC 24 V, Max.0.8 A ● / ● Powered by the power box using interface cable
Power consumption	31.2 W	19.2 W
Wireless communications	IEEE 802.11a/b/g/n (2.4 GHz / 5 GHz)	/
Network interface	Gigabit Ethernet	
Imaging plate	Carbon fiber plate	
Cooling	Air cooling	
Dimensions (L × W × D)	282mm × 333mm × 15mm	
Weight	2.3Kg	2.0Kg
Environmental Requirements		
Operation	Temperature: 5 ~ +35°C	
	Humidity: 30 ~ 75% (Non-Condensing)	
	Atmospheric pressure: 700 ~ 1060 hPa	
	Altitude: Max.3000 meters	
Storage and transportation	Temperature: -20 ~ +55°C	
	Humidity: 10 ~ 90% (Non-Condensing)	
	Atmospheric pressure: 700 ~ 1060 hPa	
	Altitude: Max. 3000 meters	

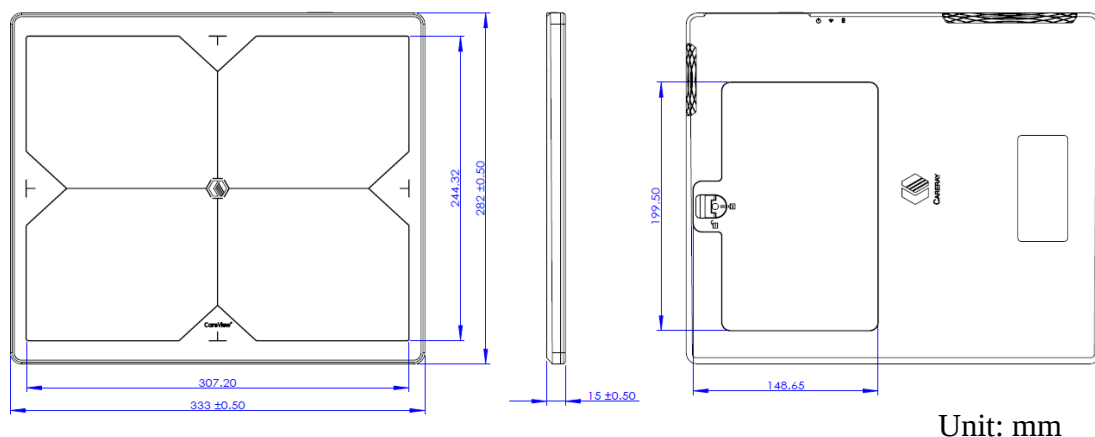


Figure 42 CareView 750Cw dimension

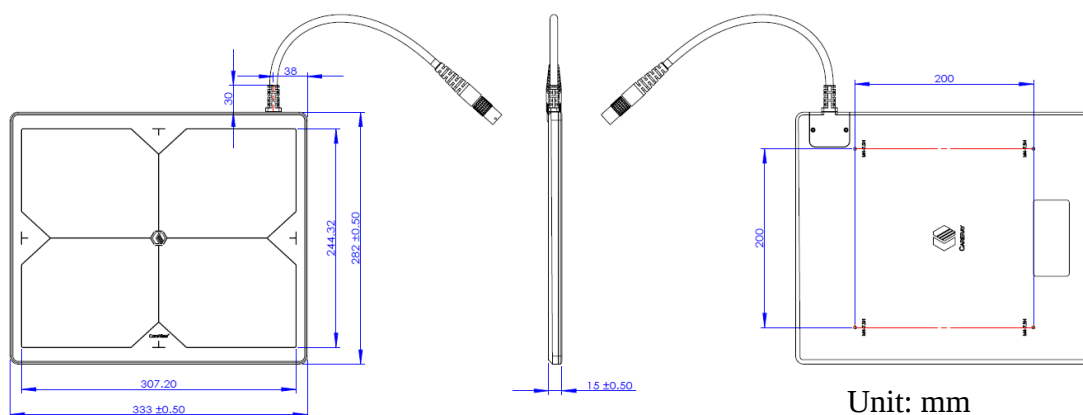


Figure 43 CareView 750C dimension

9.2 Power Box

Table 17 Power box specifications

Item	Description		
Model	CP-S303A	CP-S304A	CP-S305A
Purpose	Supplies power to the detector when connected to digital radiography via wired connection		
Input	AC 100V-240V, 50/60 Hz		
Output	DC 24 V, Max.6.67 A	DC 24 V, Max.4.16A	DC 24 V, Max.5.83 A
Output power	110W	100W	140W
Dimensions (L×W×D)	171.5 ×90.6 ×45.7 mm		
Weight	Approx. 680g		
Environmental requirements			
Operation	Temperature:	5~35 °C	
	Humidity:	30~75 %RH (Non- Condensing)	
Storage and	Temperature:	-20~+55 °C	

transportation	Humidity: 10~90 %RH (Non- Condensing)
	Atmospheric pressure: 700~1060 hPa

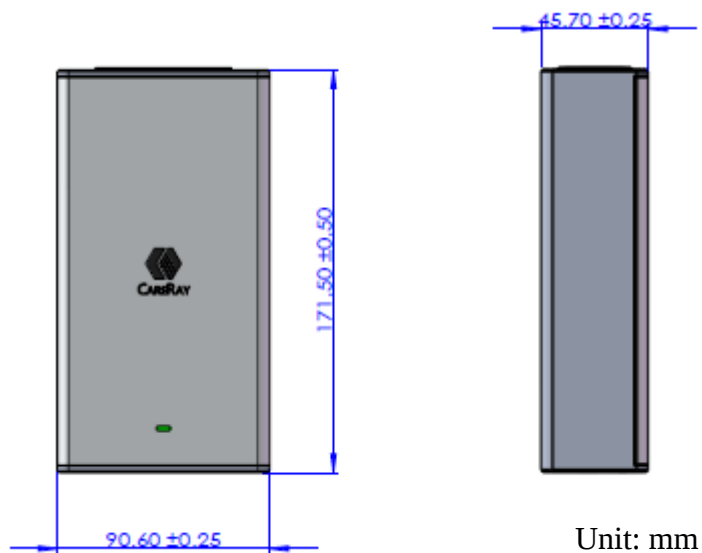


Figure 44 Power box dimensions

9.3 Charging Dock

Table 18 Charging dock specifications

Item	Description
Model	CBC-ICP3B
Simultaneous charging	Li-Polymer 3260mAh*3BAT
Charging time	3.5 hours
Input	DC 24V, Max. 2.5A
Total power for three batteries	60W
Operation	Temperature: 5~35℃
	Humidity: 30~75%RH
	Atmospheric pressure: 700~1060 hPa
	Altitude: Max. 3000 meters
Storage and transportation	Temperature: -20~55℃
	Humidity: 10~90%RH
	Atmospheric pressure: 700~1060 hPa
	Altitude: Max. 3000 meters
Dimensions (L×W×D)	150.0mm × 128.0mm × 44.5mm
Net Weight	Approx. 0.8Kg

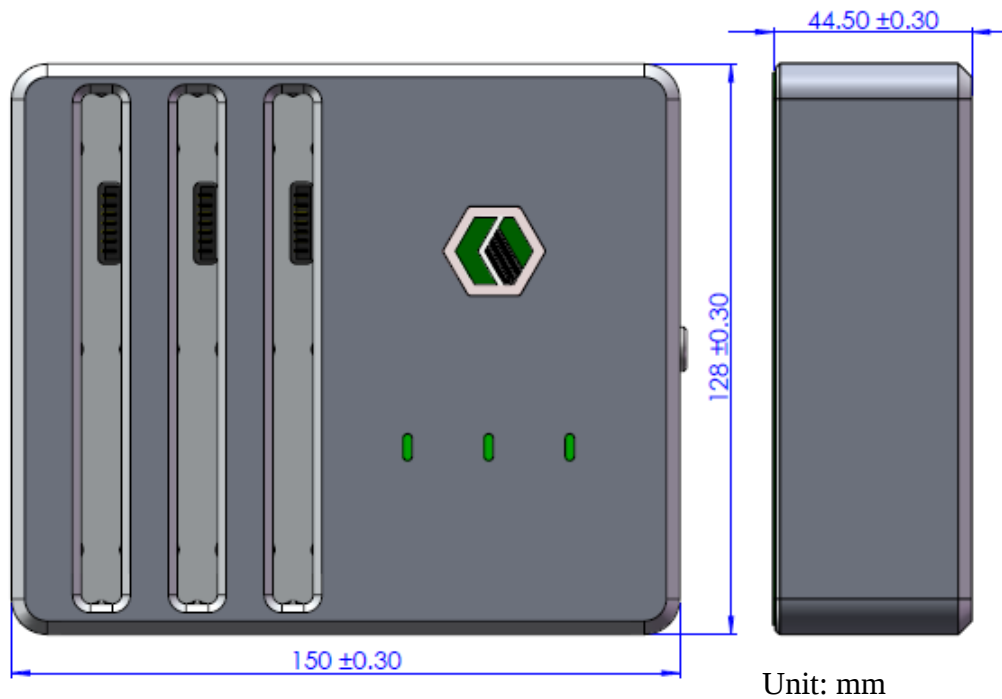


Figure 45 Charging dock dimension

9.4 Li-Polymer Battery

Table 19 Li-Polymer battery specifications

Item	Description
Model	4ICP/83/3/103
Battery capacity	3260 mAh
Standard voltage	14.8 V
Charging voltage	16.8 V
Dimensions (L×W×D)	184.0mm × 113.0mm × 8.2mm
Weight	Approx. 320g
Environmental requirements	
Operation	Temperature: 5~35 °C
	Humidity: 30~75 %RH
Storage (≤3 month)	Temperature: -20~45 °C
	Humidity: 15%~95 %RH
Storage (≥3 month)	Temperature: 22~28°C
	Humidity: 15~95 %RH

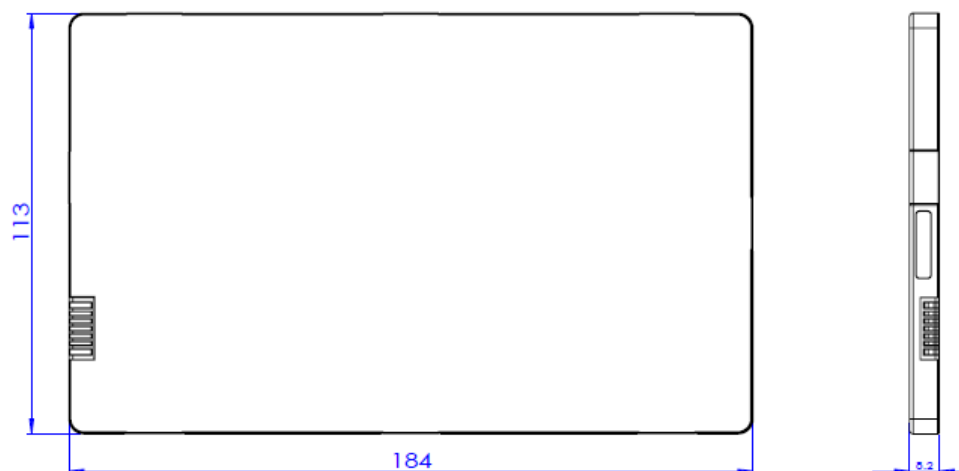


Figure 46 Battery dimension

Unit: mm

10 Disposal

The detector has required the extraction and use of natural resources for production. It may contain hazardous substances for health and the environment. In order to avoid the dissemination of those substances into the environment, and to diminish the pressure on natural resources, a take-back system should be used. Such systems will reuse or recycle most of the materials of your end-of-life equipment in an environmentally sound way.

A crossed-out wheeled bin symbol () indicates that disposal of this product should be performed by reuse and recycling systems. For additional information on the collection, reuse and recycling systems, contact your local or regional waste administrator. You may also contact CareRay support for more information on the environmental impact of our products.

11 Regulatory Requirements

11.1 Product Classification

Table 20 Product classification

Item	Classification	
Model	CareView 750Cw	CareView 750C
Type of protection against electric shock	Class I equipment Internally powered	Class I equipment /
Degree of protection against electric shock	Type B applied part	/
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.	

11.2 Standards

Table 21 Standards

Standard	Description
IEC/EN/ES 60601-1 CAN/CSA-C22.2 No. 60601-1	Medical electrical equipment- Part 1: General Requirements for Basic Safety and Essential Performance
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) compliance information

USA	FCC Part 15 Subpart B Class B and Part 15 Subpart C
European Union	EN 300328 V1.8.1 EN 301489-1 V1.9.2 EN 301489-17 V2.2.1 EN 301893 V1.7.1 EN 50566:2013 EN 62209-2:2010

11.3 Symbols

Table 22 Symbols

Symbol	Description	Symbol	Description
	Manufacturer		Manufacture date
	Serial number		Direct current
	Caution		Disposal (WEEE)
	ESD warning		Non-ionizing radiation
	Warning: dangerous voltage		Type B applied part
	Operating instructions		Refer to instruction manual/booklet

	CE mark		UL mark
	Authorized representative in the European Community		Handle gently
	This way up		Handle with care
	Keep dry		Stacking limit by number
	Keep away from sunlight		Do not roll
	CareRay logo		

11.4 FCC Rules

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

- (1) This product may not cause harmful interference.
- (2) This product must accept any interference received, including interference that may cause undesired operation.

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

Caution:

- (1) Operations within 5.15-5.25GHz frequency ranges are restricted to indoor environments only.
- (2) Any changes or modifications made to this product (including the antennas) that are not expressly approved by the manufacture may void the user's authority to operate the product.

11.5 Guidance and Manufacturer's Declaration for EMC Directive

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

Below cables information are provided for EMC reference.

CareView 750Cw

Cable	Max. cable length, Shielded/unshielded		Number	Cable classification
AC power cable	1.8m	Unshielded	1 Set	AC Power
Interface cable	7m	Unshielded	1 Set	DC Power
Gigabit LAN cable	7m	Shielded	1 Set	DC Power
24V DC power cable	3m	Unshielded	1 Set	DC Power

CareView 750C

Cable	Max. cable length, Shielded/unshielded		Number	Cable classification
AC power cable	1.8m	Unshielded	1 Set	AC Power
Interface cable	5.68m	Unshielded	1 Set	DC Power
Gigabit LAN cable	20m	Shielded	1 Set	DC Power
Synchronization cable	13m	Shielded	1 Set	DC Power

Important information regarding Electro Magnetic Compatibility (EMC)

X-ray flat panel detectors needs special precautions regarding EMC and put into service according to the EMC information provided in the operation manual; X-ray flat panel detectors conform to this IEC 60601-1-2:2014 standard for both immunity and emissions. Nevertheless, special precautions need to be observed:

- X-ray flat panel detectors following essential performance is intended used in professional healthcare facility environment.

Essential performance: Image acquisition has no negative effects and Image data transmission has no negative effects

- **WARNING:** Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the X-ray flat panel detectors, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.”
- The use of accessories and cables other than those specified by CareRay, with the exception of accessories and cables sold by CareRay of X-ray flat panel detectors as replacement parts for internal components, may result in increased EMISSIONS or decreased IMMUNITY of the X-ray flat panel detectors.

- WARNING: Use of this equipment X-ray flat panel detectors adjacent to or stacked with other equipment should be avoided because it could result in improper operation.”
- When the AC input voltage is interrupted, the X-ray flat panel detectors will power off and if the power supply restored, it should be recovered by operator manually, this degradation could be accepted because it will not lead to unacceptable risks and it will not result in the loss of basic safety or essential performance

EMI Compliance Table

Table 23 Emission

Phenomenon	Compliance	Electromagnetic environment
RF emissions	CISPR 11 Group 1, Class A	Professional healthcare facility environment
Harmonic distortion	IEC 61000-3-2 Class A	Professional healthcare facility environment
Voltage fluctuations and flicker	IEC 61000-3-3 Compliance	Professional healthcare facility environment

EMS Compliance Table

Table 24 Enclosure Port

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

Table 25 – Proximity fields from RF wireless communications equipment

Test frequency (MHz)	Band (MHz)	Immunity test levels
		Professional healthcare facility environment
385	380-390	Pulse modulation 18Hz, 27V/m

450	430-470	FM, ± 5 kHz 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		

Table 26 Input a.c. power Port

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

Table 27 Signal input/output parts Port

Phenomenon	Basic EMC standard	Immunity test levels
		Professional healthcare facility environment
Electrical fast	IEC 61000-4-4	± 1 kV

transients/burst		100kHz repetition frequency
Conducted disturbances induced by RF fields	IEC 61000-4-6	3V, 0.15MHz-80MHz 6V in ISM bands between 0.15MHz and 80MHz 80%AM at 1kHz

12 Abbreviations

Table 28 Abbreviations

Abbreviation	Description
OEM	Original equipment manufacturer
SIP/SOP	Signal input/output part
FCC	Federal communications committee
EMI	Electromagnetic interference
EMS	Electromagnetic susceptibility
EMC	Electromagnetic compatibility
IEEE	Institute of electrical and electronics engineers
API	Application program interface
DR	Digital radiography
DROC	Digital radiography operator console
F ² AED	Full-Field automatic exposure detection
TFT/PD	Thin-film transistor/ Photo-diode
DQE	Detective quantum efficiency
LED	Light emitting diode
LAN	Local area network
SID	X-ray source to detector distance
Fps	Frame per second
lp/mm	Line pair/mm
TBC	To be confirmed
FTP	File transfer protocol
STP	Shielded twisted pair
RF	Radio frequency
AP	Access point
AES	Advanced encryption standard
WPA	Wifi protected access
WEP	Wired equivalent privacy
MIMO	Multiply input multiply output
DSSS	Direct sequence spread spectrum
OFDM	Orthogonal division multiplexing



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Tel: (408) 418-3985

Contain FCC ID: RYK-WUBR508N

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Statement

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 instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

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

The exposure standard for wireless transmitter employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6W/kg.

The highest SAR value for the EUT as reported to the FCC when used next to body, as described in this user guide, is 0.88 W/kg.