Digital X-ray Imager

AX-B3543W

2.4 GHz/5 GHz

Technical Document

To customers

Important information on usage and management of the product

1. This product complies with local radio frequency regulations in the country or region where you purchased the product. Note that it cannot be used in any other areas. When using the product, follow the notes on radio frequency in this document.
2. The product shall be maintained in a safe and operable condition by maintenance personnel.
3. Use the product by connecting a computer and monitor complying with the standard of your system, such as IEC 60950-1. For further details, consult your sales representatives.
4. In the case of a network connection, the appropriate network address must be acquired from the network administrator in the installation location, and it must be set correctly.
5. Use only the dedicated cables. Do not use the cables with other equipment. Do not use any cables other than those supplied with the product.

Disclaimer

1. In no event shall Canon be liable for any damage or loss arising from fire, earthquake, any action by a third party or other accidents, any intentional or negligent action by users, any trial usage, or other usage under abnormal conditions.
2. Roentgenography, image processing, image reading, and image data storage must be performed in accordance with the laws of the country or region in which the product is being used. The user is responsible for maintaining the privacy of image data.
3. In no event shall Canon be liable for personal physical harm or property damage that is sustained when the instructions are not followed or the product is misused.

Notes on disposal of the product

- Disposal of this product in an unlawful manner may have a negative impact on human health and on the environment. Therefore, when disposing of this product, be absolutely certain to follow the procedure which conforms with the laws and regulations applicable to your area.

USA and Canada only:
The Lithium ion/polymer battery is recyclable. Please call 1-800-8-BATTERY for information on how to recycle this battery.

Le Canada et les Etats-Unis seulement :
La batterie aux ions de lithium est recyclable. Pour obtenir des renseignements sur les façons de recycler cette batterie, veuillez appeler au 1-800-8-BATTERY.

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Conventions

Safety symbols

The following safety messages are used to emphasize certain safety instructions. This document uses the safety alert symbol along with a safety message.

WARNING	This is used to identify conditions under which improper use of the product may cause death or serious personal injury. Pay attention to the warning message.
CAUTION	This is used to identify conditions under which improper use of the product may cause minor personal injury. Pay attention to the caution message.
CAUTION	This notice is used to identify conditions under which improper use of the product may cause property damage. Pay attention to the caution message.
 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 instructions that must be followed and restrictions. Be sure to read the notices to avoid property damage or malfunction of the product and other equipment, and to avoid incorrect operations.
Information	This is used to indicate operations for reference and complementary information. Users are recommended to read this notice.

1 Safety information

The precautions described in this chapter prevent users and others from suffering damage or loss.

1.1 Safety precautions

Follow these safeguards and properly use the device to prevent injury and damage to any device/data.

⚠ WARNING

Operating/storage environment


Prohibited

- **Do not use or store the device near flammable chemicals such as alcohol, thinner, benzine, etc.**

  If chemicals are spilled or evaporate, it could 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 specified.**

  Doing so could result in fire or electric shock.

Handling


Prohibited

- **Never disassemble or modify the device.**

  Doing so could result in fire or electric shock.

- **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 into the device, or if liquid is spilled, it could result in fire or electric shock.

- **Do not hit or drop the device.**

  The device may be damaged if it receives a strong jolt, which could result in fire or electric shock if the device is used without being repaired.

- **Always confirm that there is no problem with the system during use. If a problem occurs, take appropriate measures, such as shutting down the system.**

⚠ WARNING

When a problem occurs

- **Should any of the following occur, immediately turn OFF the power to each piece of device:**
  - When there is smoke, an odd smell or abnormal sound
  - When liquid has been spilled into the device or a metal object has entered through an opening
  - When the device has been dropped and is damaged

Inspection, disinfection, and cleaning

Prohibited

- **Do not use flammable solvents to clean the surface of the device.**

  When the device is going to be cleaned, be sure to turn OFF the power to each piece of equipment, remove the battery pack. Never use alcohol, benzine, thinner or any other flammable solvents. Otherwise, it could result in fire.

- **For safety reasons, be sure to turn OFF the power to each piece of equipment when the inspections of the device and cables are going to be performed.**

  Otherwise, electric shocks may occur.

- **The device must be repaired by a qualified engineer only.**

  If it is not repaired properly, it could result in fire, electric shock, or accident.

⚠ CAUTION

Operating/storage environment


Prohibited

- **Do not install or store the device in any of the locations listed below.**

  Doing so may result in failure or malfunction, device falling, or fire or injury.
  - Close to facilities where water is used
  - Where it will be exposed to direct sunlight
  - Close to the air outlet of an air-conditioner or ventilation equipment
  - Close to a heat source such as a heater
  - Where the power supply is unstable
  - On the floor
  - In a dusty environment
  - In a saline or sulfurous environment
  - Where temperature or humidity is high
  - Where there is freezing or condensation
  - In areas prone to vibration
  - On an incline or in an unstable area
- **Use this product in an environment within a temperature range of 5°C to 35°C.**
- **When using the detector, if you observe an abnormal rise in temperature above the temperatures listed below, stop using it immediately.**
  The maximum temperature of the detector: 45°C*.

  * This is measured during maximum load test when the ambient temperature is set to 35°C.
- **Avoid doing the following actions to the detector during exposure ready status. Otherwise, the detector may acquire an image without exposure.**
  - Giving a strong shock and vibration.
  - Using the detector in a location where static electricity is easily generated.
  - Using the detector in a location where electromagnetic wave noise might be generated.
- **Images may not be acquired because the exposure conditions, such as X-ray exposure conditions or target body positioning, are not effective. For details, see “Troubleshooting” (→ page 39).**

⚠ CAUTION

Handling

- **The device is resistant to water. However, note the following precautions before using the device.**

  The ingress of water may damage the device and cause a fire or electric shock.

  – Do not submerge the device in water.
  – If the device gets wet, use a dry soft cloth to wipe it completely dry.
  – Securely close and lock the battery cover.
  – Do not open or close the battery cover when the device gets wet.
  – If necessary, wrap the device in a disposable cover.
  – The battery cover is a consumable item. If the battery cover is deformed or the packing is damaged or cracked, replace the battery cover with a new one. If a deteriorated battery cover continues to be used, water leakage may occur.

- **Turn OFF the power to each piece of equipment for safety when not being used.**

CAUTION

Handling

Prohibited

- **Do not submerge the device in water for an extended period.**

  If the device is submerged in water for an extended period, immediately stop using it.

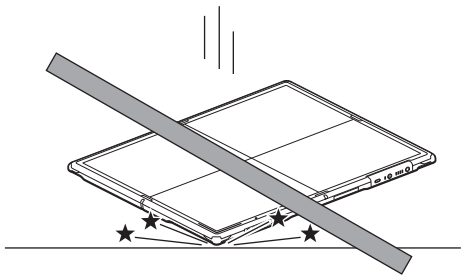
- **Do not place excessive weight on the device.**
  Do not use the device in a manner that will subject it to local loads of 100 kg or more.

  If the load exceeds the limit, the inner device may be damaged.

- **Do not touch the electrode terminals of the device and the battery pack.**

- **Handle the device carefully as it is precision device.**

  The inner device may be damaged if something hits against it, or if it is dropped, or receives a strong jolt.



- **Be sure to use the device on a flat surface while using it in horizontal position.**

  If the detector is set on a diagonal and pressure is applied to it, the inner device may be damaged.

- **Be sure to securely hold the device while using it in upright positions.**

  Otherwise, the device may fall over, resulting in injury to the user or an object, or may flip over, resulting in damage to the inner device.

CAUTION

Inspection and cleaning

Prohibited

- **Do not spray the detector directly with disinfectants or detergents.**

- **Perform regular inspections.**

  For safe use of this device and each piece of equipment, perform daily inspections. In addition, carry out regular inspections and clean the device at least once a year.

- **Always keep this device and other equipment clean and remove all dust and dirt.**

  Dust and dirt may cause malfunctions of the equipment included in the radiography system, such as this device and computers.

- **When cleaning the battery pack, turn off the device and remove the battery pack from the device.**
- **When cleaning the battery pack, wipe it with a cloth slightly damped with water or diluted neutral detergent.**

  The battery pack is not protected against liquids. When cleaning the battery pack, wipe it carefully so as not to spill the detergents onto the electrodes.

- **Dry the battery pack completely after cleaning, and attach it to the device.**
- **When cleaning any other parts than the sensor side of the detector, wipe them carefully so as not to spill the detergents onto the battery pack attachment portion (electrodes).**
- **Use a neutral detergent to clean the surface of the device. Do not use solvents such as absolute alcohol, thinner or benzine. Doing so may damage the surface of the device.**
- **Dry the detector completely after disinfecting or cleaning it.**

CAUTION

Operating/storage environment

Prohibited

- **Do not expose this product to high temperatures or high humidity.**

  Malfunctions may occur.

- **Be sure to use and store this product under the conditions described below:**

	Temperature	Humidity	Atmospheric pressure
Operating environment	5ºC to 35ºC	30% to 80% RH	613 to 1060 hPa
Storage environment	5ºC to 40ºC	30% to 85% RH	

- **When not in use, keep the detector in a designated location or in a location where they are safe and cannot fall down.**

1.2 Notes on radio frequency

This product complies with local radio frequency regulations in the country or region where you purchased the product. Note that it cannot be used in any areas other than the country or region of its purchase.
The radio frequency channel (5 GHz) configured for indoor use may not be usable in outdoor areas, depending on local radio frequency regulations.

RF compliance information

FCC compliance (For U.S.A.)

AX-B3543W (Contains FCC ID:AZDBM72065)
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 CAUTION:
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

RF exposure compliance
The available scientific evidence does not show that any health problems are associated with using low power wireless devices. There is no proof, however, that these low power wireless devices are absolutely safe. Low power Wireless devices emit low levels of radio frequency energy (RF) in the microwave range while being used. Whereas high levels of RF can produce health effects (by heating tissue), exposure of low-level RF that does not produce heating effects causes no known adverse health effects. Many studies of low-level RF exposures have not found any biological effects. Some studies have suggested that some biological effects might occur, but such findings have not been confirmed by additional research. AX-B3543W has been tested and found to comply with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines.

Only a physician or a legally certified operation should use the product. Please do not adhere to your hands and body to an antenna part to restrain exposure of the RF energy when conducting an X-ray examination.

IC compliance (For Canada)

AX-B3543W (Contains IC:498J-BM72065)

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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

La bande 5150-5350 MHz est restreints à une utilisation à l'intérieur.

High-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Les radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5250-5350 MHz et 5650-5850 MHz, et ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

RF exposure compliance

The available scientific evidence does not show that any health problems are associated with using low power wireless devices. There is no proof, however, that these low power wireless devices are absolutely safe. Low power Wireless devices emit low levels of radio frequency energy (RF) in the microwave range while being used. Whereas high levels of RF can produce health effects (by heating tissue), exposure of low-level RF that does not produce heating effects causes no known adverse health effects. Many studies of low-level RF exposures have not found any biological effects. Some studies have suggested that some biological effects might occur, but such findings have not been confirmed by additional research. AX-B3543W has been tested and found to comply with IC radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the IC radio frequency (RF) Exposure rules.

Les connaissances scientifiques dont nous disposons n'ont mis en évidence aucun problème de santé associé à l'usage des appareils sans fil à faible puissance. Nous ne sommes cependant pas en mesure de prouver que ces appareils sans fil à faible puissance sont entièrement sans danger. Les appareils sans fil à faible puissance émettent une énergie radioélectrique (RF) très faible dans le spectre des micro-ondes lorsqu'ils sont utilisés. Alors qu'une dose élevée de RF peut avoir des effets sur la santé (en chauffant les tissus), l'exposition à de faibles RF qui ne produisent pas de chaleur n'a pas de mauvais effets connus sur la santé. De nombreuses études ont été menées sur les expositions aux RF faibles et n'ont découvert aucun effet biologique. Certaines études ont suggéré qu'il pouvait y avoir certains effets biologiques, mais ces résultats n'ont pas été confirmés par des recherches supplémentaires. AX-B3543W a été testé et jugé conforme aux limites d'exposition aux rayonnements IC énoncées pour un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'IC.

Only a physician or a legally certified operation should use the product. Please do not adhere to your hands and body to an antenna part to restrain exposure of the RF energy when conducting an X-ray examination.

RE compliance (For European Union and EFTA)

English	Hereby, Canon Inc. declares that this equipment is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: https://global.canon/en/deoco/medcom/index.html
Czech	Tímto společnost Canon Inc. prohlašuje, že toto zařízení je v souladu se směrnicí 2014/53/EU. Úplné znění EU prohlášení o shodě je k dispozici na této internetové adrese: https://global.canon/en/deoco/medcom/index.html
Danish	Hermed erklærer Canon Inc., at dette udstyr er i overensstemmelse med direktiv 2014/53/EU. EU-overensstemmelseserklæringens fulde tekst kan findes på følgende internetadresse: https://global.canon/en/deoco/medcom/index.html
German	Hiermit erklärt Canon Inc, dass diese Anlage der Richtlinie 2014/53/EU entspricht. Der vollständige Text der EU-Konformitätserklärung ist unter der folgenden Internetadresse verfügbar: https://global.canon/en/deoco/medcom/index.html
Estonian	Käesolevaga deklareerib Canon Inc., et käesolev seade vastab direktiivi 2014/53/EL nõuetele. ELi vastavusdeklaratsiooni täielik tekst on kättesaadav järgmisel internetiaadressil: https://global.canon/en/deoco/medcom/index.html
Spanish	Por la presente, Canon Inc. declara que este equipo es conforme con la Directiva 2014/53/UE. El texto completo de la declaración UE de conformidad está disponible en la dirección de Internet siguiente: https://global.canon/en/deoco/medcom/index.html
Greek	Με την παρούσα, η Canon Inc. δηλώνει ότι ο παρών εξοπλισμός συμμορφώνεται με την Οδηγία 2014/53/ΕΕ. Το πλήρες κείμενο της δήλωσης συμμόρφωσης της ΕΕ διατίθεται στην ακόλουθη διεύθυνση στο διαδίκτυο: https://global.canon/en/deoco/medcom/index.html
French	Le soussigné, Canon Inc., déclare que le présent équipement est conforme à la Directive 2014/53/UE. Le texte complet de la déclaration UE de conformité est disponible à l'adresse internet suivante : https://global.canon/en/deoco/medcom/index.html
Italian	Con la presente, Canon Inc. dichiara che questa apparecchiatura è conforme alla direttiva 2014/53/UE. Il testo completo della dichiarazione di conformità UE è disponibile al seguente indirizzo Internet: https://global.canon/en/deoco/medcom/index.html
Latvian	Canon Inc. ar šo deklarē, ka šī iekārta atbilst Direktīvai 2014/53/ES. Pilns ES atbilstības deklarācijas teksts ir pieejams šādā interneta vietnē: https://global.canon/en/deoco/medcom/index.html
Lithuanian	Šiuo dokumentu „Canon Inc.“ patvirtina, kad ši įranga atitinka direktyvą 2014/53/ES. Visas ES atitikties deklaracijos tekstas prieinamas šiuo interneto adresu: https://global.canon/en/deoco/medcom/index.html
Dutch	Hierbij verklaar ik, Canon Inc., dat deze apparatuur conform is met Richtlijn 2014/53/EU. De volledige tekst van de EU-conformiteitsverklaring kan worden geraadpleegd op het volgende internetadres: https://global.canon/en/deoco/medcom/index.html
Maltese	B'dan, Canon, qed tiddikjara li dan it-tip ta' tagħmir huwa konformi mad-Direttiva 2014/53/UE. It-test kollu tad-dikjarazzjoni ta' konformità tal-UE huwa disponibbli f'dan is-sit fuq l-internet: https://global.canon/en/deoco/medcom/index.html

Hungarian	A Canon Inc. igazolja, hogy ez a berendezés megfelel a 2014/53/EU irányelvnek. Az EU-megfelelőségi nyilatkozat teljes szövege elérhető a következő internetes címen: https://global.canon/en/deoco/medcom/index.html
Polish	Canon Inc. niniejszym oświadcza, że niniejsze urządzenie jest zgodne z dyrektywą 2014/53/UE. Pełny tekst deklaracji zgodności UE jest dostępny pod następującym adresem internetowym: https://global.canon/en/deoco/medcom/index.html
Portuguese	Por este meio, a Canon Inc. declara que o presente equipamento está em conformidade com a Diretiva 2014/53/UE. O texto integral da declaração de conformidade da UE está disponível no seguinte endereço de Internet: https://global.canon/en/deoco/medcom/index.html
Slovene	CanonInc.potrjuje,dajetaopremavskladuzDirektivo2014/53/EU. Celotno besedilo izjave EU o skladnosti je na voljo na naslednjem spletnem naslovu: https://global.canon/en/deoco/medcom/index.html
Slovak	Spoločnosť Canon Inc. týmto vyhlasuje, že toto zariadenie je v súlade so smernicou 2014/53/EÚ. Úplné znenie EÚ vyhlásenia o zhode je k dispozícii na tejto internetovej adrese: https://global.canon/en/deoco/medcom/index.html
Finnish	Canon Inc. vakuuttaatäten, että tämä laite on direktiivin 2014/53/EU mukainen. EU-vaatimustenmukaisuusvakuutuksen täysimittainen teksti on saatavilla seuraavassa internetosoitteessa: https://global.canon/en/deoco/medcom/index.html
Swedish	Härmed försäkrar Canon Inc. att denna utrustning överensstämmer med direktiv 2014/53/EU. Den fullständiga texten till EU-försäkran om överensstämmelse finns tillgänglig på följande webbadress: https://global.canon/en/deoco/medcom/index.html
Romanian	Prin prezenta, Canon Inc. declară că acest echipament este în conformitate cu Directiva 2014/53/UE. Textul integral al declarației UE de conformitate este disponibil la următoarea adresă internet: https://global.canon/en/deoco/medcom/index.html
Bulgarian	С настоящото Canon Inc. декларира, че това съоръжение е в съответствие с Директива 2014/53/ЕС. Цялостният текст на ЕС декларацията за съответствие може да се намери на следния интернет адрес: https://global.canon/en/deoco/medcom/index.html
Croatian	Canon Inc. ovime izjavljuje da je oprema u skladu s Direktivom 2014/53/EU. Cjeloviti tekst EU izjave o sukladnosti dostupan je na sljedećoj internetskoj adresi: https://global.canon/en/deoco/medcom/index.html
Irish	Dearbhaíonn Canon Inc., leis seo, go bhfuil an trealamh seo i gcomhlíonadh leis an Treoir 2014/53/AE. Tá an téacs iomlán de Dhearbhú Comhréireachta AE ar fáil ag seoladh an láithreáin ghréasáin mar seo a leanas: https://global.canon/en/deoco/medcom/index.html
Norwegian	Herved erklærer Canon Inc. at dette utstyret er i overensstemmelse med direktiv 2014/53/EU. Den fulle teksten til EUs samsvarserklæring er tilgjengelig på følgende Internett-adresse: https://global.canon/en/deoco/medcom/index.html
Icelandic	Hér með lýsir Canon Inc því yfir að þessi búnaður er í samræmi við tilskipun 2014/53/ESB. Allur texti ESB-samræmisyfirlýsingar er í boði á eftirfarandi veffangi: https://global.canon/en/deoco/medcom/index.html

- For information on obtaining the original of the declaration, consult your sales representatives.

For European Union and EFTA

The AX-B3543W includes an RF transmitter whose specifications are as follows.

Frequency band	Wireless LAN standard IEEE 802.		Frequency band (MHz)	Modulation	Data rate (Mbps)	Effective radiation power (dBm)
2.4 GHz	11b		2412-2472	DSSS	11	Max.+12.48
	11g			OFDM	54	
	11n	HT20			75	
		HT40	2422-2462		150	Max.+11.99
5 GHz	11a		5180-5320 5500-5700	OFDM	54	Max.+17.35
	11n	HT20			75	
		HT40	5190-5310 5510-5670		150	

For Brazil

05807-18-07857

ANATEL

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
Este produto contém a placa (RF Module BM72065), código de homologação ANATEL 05807-18-07857.

Para consultas, visite: www.anatel.gov.br

1.3 Notes for using the device

When using the device, take the following precautions. Otherwise, problems may occur and the device may not function correctly.

Before use

- Be sure to check the device daily and confirm that it works properly.
- Sudden heating of the room in cold areas will cause condensation to form on the device. In this case, wait until the condensation evaporates before performing an exposure. If the device is used while condensation is formed on it, problems may occur. When an air-conditioner is used, be sure to raise/lower the temperature gradually so that a difference in temperature in the room and in the device does not occur, to prevent condensation.

During use

- To reduce exposure to RF energy, keep hands and other body parts out of close contact with the wireless module on the detector.
- Do not cover the wireless module on the detector with your hands. The properties of wireless communication, such as the throughput and operable distance may decrease.
- Do not use the selected frequency channel (2.4 GHz/5 GHz band) for other wireless devices. Mutual interference may affect the image data transmission rate.
- Do not use the detector near devices generating a strong magnetic field. Doing so may produce image noise or artifacts.
- Keep the detector safe from strong impacts. The detector has the waterproof protection equivalent to IPX7, but there is no guarantee it will stay free of damage if it is dropped or otherwise subjected to a strong impact.

Disinfection and cleaning

- Do not use highly invasive or corrosive disinfectants or solvents.
- When disinfecting the sensor side of the detector, wipe it with a disinfecting cloth appropriately damped with disinfectants such as disinfecting ethanol.
- When cleaning the detector, wipe it with a cloth slightly damped with diluted neutral detergents or disinfecting ethanol.

Others

- Do not use this product in combination with other equipment such as defibrillators or large electric motors as these may cause power-supply noise or power supply voltage variations. Doing so may prevent normal operation of this product and other equipment.
- This product may malfunction due to electromagnetic waves caused by portable personal telephones, transceivers, radio-controlled toys, etc. Be sure to avoid having objects such as these, which affect this product, brought near the product.
- After cleaning the cords and accessories, organize and store them together.
- Keep portable units in a predetermined storage location.
- If the device has been idled for an extended period, make sure it is working normally and safely before use.

2 Introduction

2.1 Features

- Together with the wireless LAN communication* (IEEE 802.11a/b/g/n) feature, a lightweight, thin detector simplifies operation.
- The shape of the detector, which is identical to that of a conventional film cassette complying with ISO 4090, enables digital radiography in the existing analog radiography configuration.
- The sensor with 125 µm of pixel pitch and CsI (Cesium Iodide) used for the scintillator produces high-resolution (approx. 9.5 Mega pixels) digital images within the effective imaging area (350 x 426 mm).
- Lightweight, using new CFRP construction. Only approx. 2.3 kg including battery pack.
- As durable as previous models, but now with water resistance equivalent to IPX7.
- The LED lamps on the ready indicator light up or flash, and the indicator beeps to indicates the beginning and end of exposure ready status of the detector, countdown alarms, as well as X-ray detection.

* At the time of installation, set a specific channel in the frequency band of 2.4 GHz/5 GHz before using the LAN.

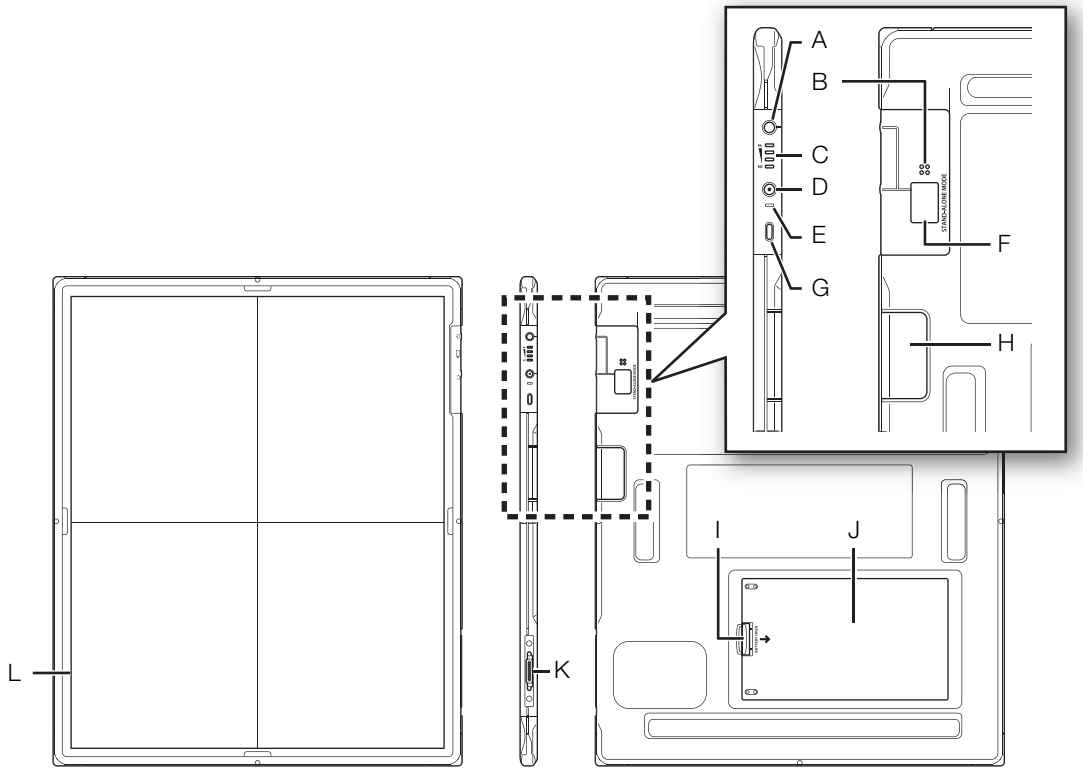
2.2 Indications for use

X-Ray Digital Imager AX-B3543W is a digital X-ray imaging device for radiographic use but not for human diagnostic use.
It may be integrated into the X-ray imaging systems equipped with an image processing unit to generate the radiographic images.
It provides the digital images by detecting X-rays passing through an object and incident on its surface.

3 Parts names and functions

3.1 Detector

The detector is designed to capture radiographic images.



A	**POWER switch**	When the detector is off, press the POWER switch (for at least 0.5 seconds) to turn on the detector. When the detector is on, press and hold the POWER switch (for at least 3 seconds) to turn off the detector, or press and hold the POWER switch (for 1 second or less) to establish the communication link.
B	**Speaker**	
C	**Power LED**	Lights up when the detector turns on. Shows the remaining battery pack charge.
D	**READY switch**	
E	**READY LED**	This LED lamp flashes while the detector is transitioning to exposure ready status, and lights up when the detector enters exposure ready status. Also flashes (approx. 3 seconds) when detector linkage is initiated. Flashes in the case of errors.
F	**Error code display**	If errors occur, an error code is displayed.
G	**IR data port**	Communication port for the detector link (registration/connection)

H	**Wireless module**	Transmits image data with wireless communication (IEEE 802.11a/b/g/n).
I	**Battery cover lock**	Locks or unlocks the battery cover.
J	**Battery cover**	Holds the battery pack. Removing the battery cover enables to attach or remove the battery pack (detector's battery for wireless configuration).
K	**Cable connector**	Accepts the wiring cable.
L	**Effective imaging area border**	Indicates the effective imaging area and center position.

Wireless communication

Wireless connection is established between the internal wireless module of this product and a laptop computer or a wireless access point.
This product supports IEEE 802.11a/b/g/n (Frequency band: 2.4 GHz/5 GHz). The available frequency band and channel vary depending on the system requirements and the radio frequency regulations in the country or region where you purchased the device.

Important

Note that the radio frequency channel configured for indoor use may not be usable in outdoor areas, depending on local radio frequency regulations.

Important

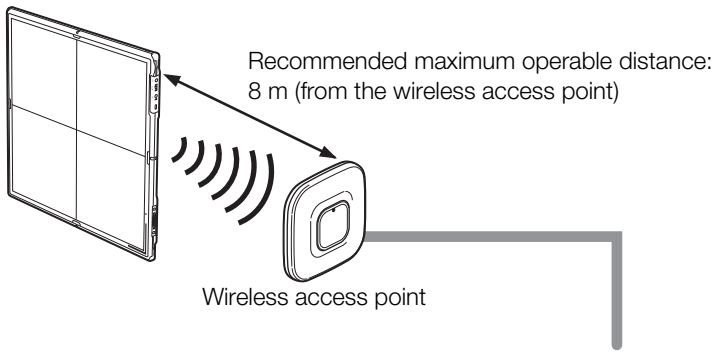
When configuring other wireless LAN equipment, do not use the same radio frequency (channel) that is selected for this product. Otherwise, an interference between the two pieces of equipment may occur and may result in a decline in transmission speed and other troubles.

Important

Before introducing other wireless equipment to the same environment where this product is set up, consult with the equipment system engineer.

Important

Do not cover the wireless module on the detector with your hands or place obstacles in the way of the wireless access point. Otherwise, the properties of wireless communication, such as the throughput and operable distance, may decrease.



3.2 Battery pack / Battery charger

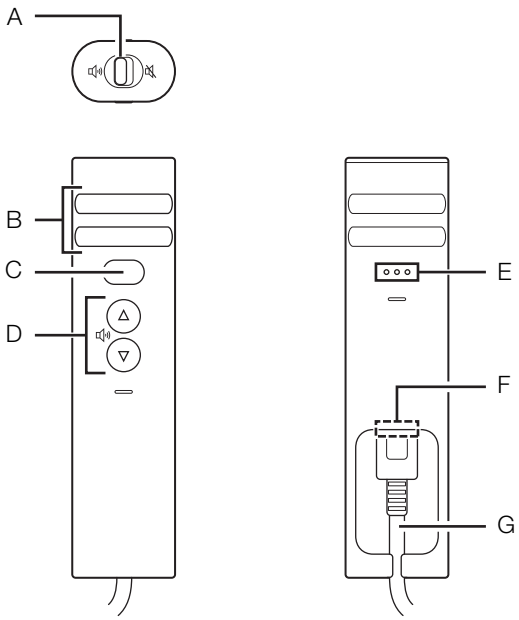
The battery pack supplies power to the detector during wireless connection. Be sure to fully charge the battery before use.
The battery charger is designed for the dedicated battery pack.
For details, refer to the technical documents for the battery pack and the battery charger.

3.3 Ready indicator

The ready indicator is connected to the image-capture computer via USB and is attached using the hook-and-loop fastener in a place where it can be easily seen.
The LED lamps on the detector light up when the detector is in exposure ready status.
As the available image-capturing time (maximum 10 minutes) after the detector is changed to exposure ready status, is reduced to 5 minutes remaining, 1 minute remaining and 10 seconds remaining, or when the X-rays are received by the detector, the detector beeps, or the LED lamps on the detector light up or flash. The volume can be controlled or set to mute.
This unit is used as an interface of the image-capture computer for infrared communication with the detector, which registers the detector to the laptop computer.

Important

Do not install the ready indicator such a position that its IR data port faces the monitor, reflector, or other IR data communication equipment, except for the detector.



A	**Mute switch**	Slide to 🔇 to enable the mute function, and to 🔊 to disable the mute function.
B	**LED status indicator**	Lights up or flashes to indicate detector status, detector registration, and connection status.
C	**IR data port**	Communication port for the detector link (registration/ connection)
D	**Volume button**	Click ▲ to turn up the volume, and ▼ to turn down the volume.
E	**Speaker**	A beeping sound is emitted from the speaker openings.
F	**Micro USB connector**	Connector for the micro USB cable (Micro B type)
G	**Micro USB cable**	Connect to the image-capture computer.

4 Operating procedures

4.1 Preparing to use the detector

1 Charge the battery pack.

Charge the battery on the day of examination or on the previous day. Charge the battery pack by inserting in the battery charger.

Information

Battery slowly discharges even if not in use. The battery pack may have expired if it discharges immediately after being fully charged. You can purchase an optional battery pack to replace an exhausted one.

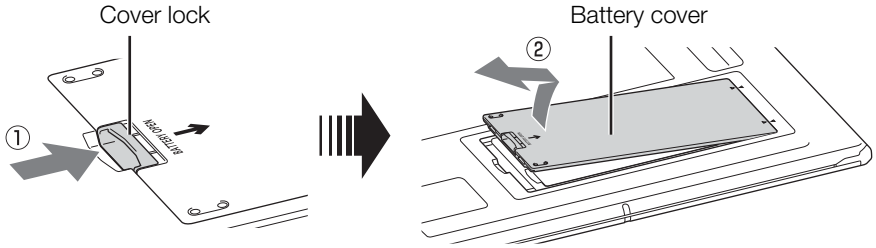
2 Attach the battery pack.

Information

Place the detector on a flat surface before commencing the steps below. Otherwise the battery pack may fall out while it is being attached.

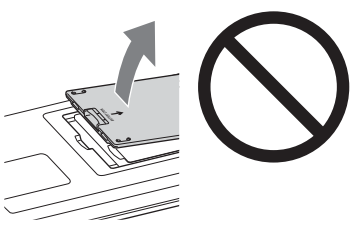
i) Remove the battery cover.

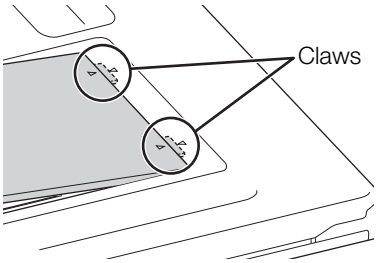
- Press and hold the battery cover lock (①) to release the lock, then lift up and pull out the battery cover (②).



Information

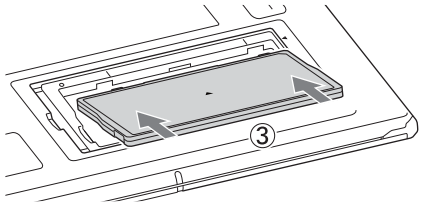
Do not lift the cover more than approximately 60° while the claws are inserted in the grooves.





ii) Attach the battery pack.

- Insert the battery pack fully (③).



Important

Check the orientation of the battery pack before inserting it.

Important

Attach the battery pack carefully.

Important

Make sure that the battery pack is correctly attached.

Information

Make sure that the battery pack is inserted fully.

iii) Attach the battery cover.

- Check that there are no foreign objects on the rubber inside the battery cover.
- Check that the rubber is free of kinks, cracks, and other damage.

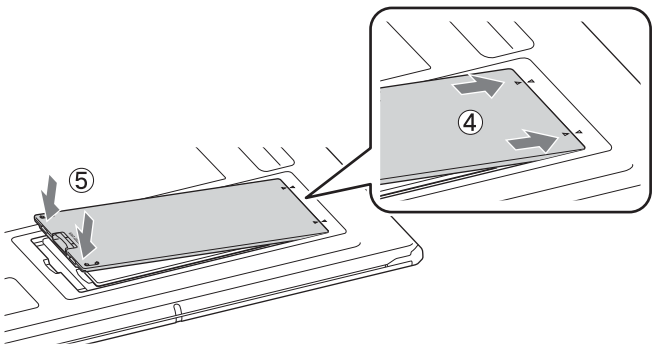
Information

If foreign objects are found on the rubber, wipe them off.

Information

If there are kinks in the rubber, fix them by hand.

- Insert the battery cover fully (④) and press down on the front of the battery cover to lock it (⑤).



Important

When inserting the battery cover, make sure it does not have a bulge in the middle. If there is a bulge, water resistance will deteriorate. Check the shape of the battery cover, and if the inside of the cover has warped into a curved shape, replace it with a new battery cover.

Information

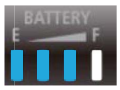
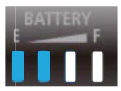
Make sure that the battery cover is inserted fully.

Information

Make sure that the battery cover is locked securely.

Information

The remaining battery pack charge is indicated by the Power LED lamps of the detector when the detector is turned on.

Power LED					
Remaining battery charge	76% to 100%	51% to 75%	26% to 50%	5% to 25%	0% to 4%*

(: Lighted up, : Flashing (1 sec. cycles), : Off)

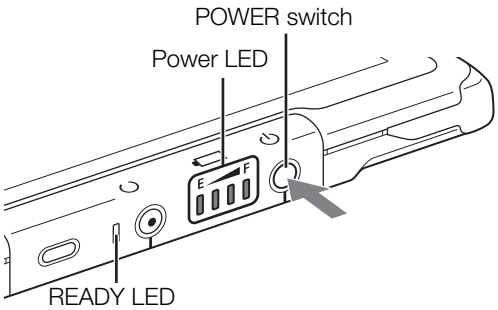
* Exposure is not possible when the remaining battery level is 0% to 4%, as indicated by flashing.

4.2 Operating the detector

1 Turn on the detector.

Press and hold the POWER switch (for at least 0.5 seconds).

Power LED lights up.

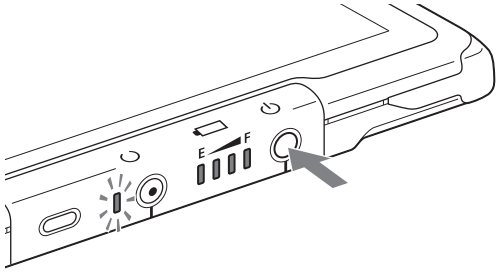


2 Register the detector and make connection to the control system.

Registration

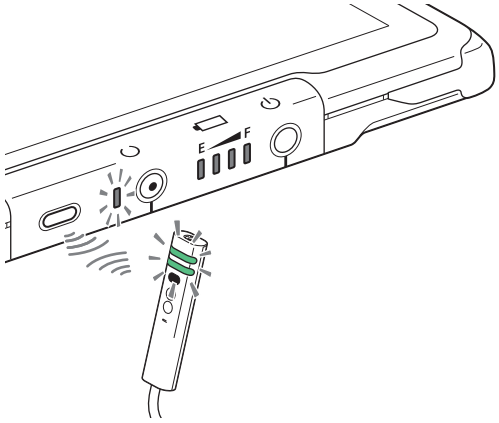
Press and release the POWER switch again.

READY LED flashes (approx. 3 seconds).



While READY LED flashes (approx. 3 seconds), locate the IR data port of the detector near the ready indicator or the IR data communication unit (within 30 cm).

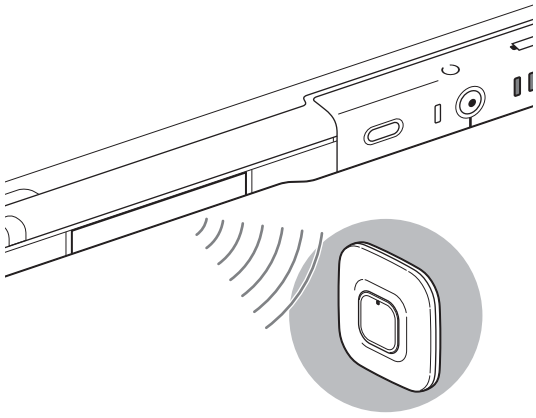
When the registration is completed, the two LED lamps on the ready indicator flash three times for 0.5 seconds at 0.5 second intervals, and a three-tone beep is emitted.



Proceed to the next **Connection**.

Connection

Communication link is automatically established between the internal wireless module of the detector and the wireless access point/control system.

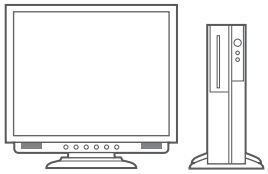


3 Conduct examination.

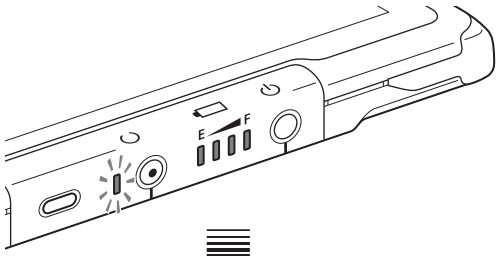
Important

To reduce exposure to RF energy during examination, keep hands and other body parts out of close contact with the antenna.

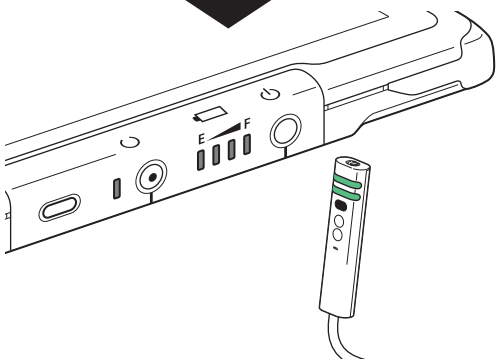
i) Select the information or protocols on the screen and start the examination.



The READY LED on the detector flashes during preparation for examinations.



When the detector and control system are in exposure ready status, the READY LED on the detector and two LED lamps on the ready indicator light up, and a single beep is emitted.



- Arrange an object in the correct posture and position the detector aligning it with the target body part.
- Position the X-ray generator to adjust the irradiation field.
- Before exposure, check the detector's ready status.
  Make sure that READY LED is lit. This means that the system is ready to start an examination.

  The LED lamps on the ready indicator light up or flash, and the ready indicator beeps to indicate the detector status.

4.3 Ending use of the detector

Information

When the detector will not be used for some time, remove the battery pack. Otherwise, overdischarge may occur, leading to a shorter battery life.

1 Turn off the detector.

Press and hold the POWER switch (approx. 3 seconds).

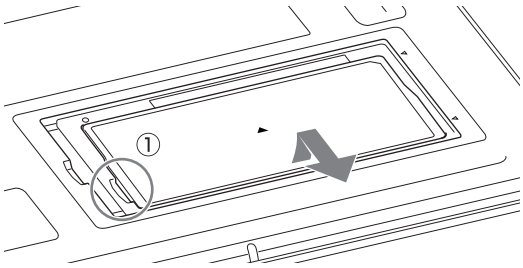
The Power LED is off.

2 Remove the battery pack.

i) Remove the battery cover.

ii) Remove the battery pack.

- Insert your fingers into the slot of the battery pack bay to grip the battery pack edge, and then pull the edge to remove the battery pack (①).



iii) Attach the battery cover.

4.4 Attaching the ready indicator / exchanging a hook-and-loop fastener

The ready indicator can be attached using a hook-and-loop fastener (fastener hooks and fastener loops) in a place where it can be easily checked during examination. Attachment of fastener loops on the ready indicator and fastener hooks where you want to attach the ready indicator allows users to easily remove and replace the ready indicator.

ⓘ Information

The fastener hooks and fastener loops can be applied to either the ready indicator or to the location where you want to attach the ready indicator. Note that the fastener hooks and fastener loops must be used in pairs.

4.4.1 Removing the hook-and-loop fastener from the ready indicator and attachment position

At installation, a pair of hook-and-loop fasteners are attached. If the fastener loops or fastener hooks are torn off or they become less adhesive, or when the attachment position needs to be changed, exchange the fastener loops or fastener hooks for new ones.

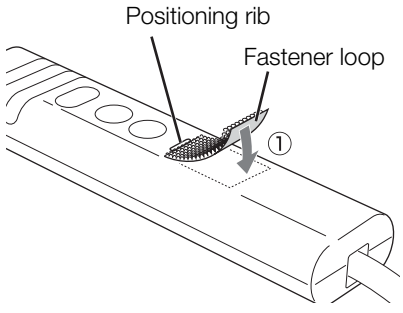
4.4.2 Attaching the ready indicator behind the monitor of a control software-installed laptop computer

This is suitable for cases in which the ready indicator and the image-capture computer can be moved, including such environments as mobile X-ray environment.

1 Attach hook-and-loop fasteners.

i) Apply fastener loops to the ready indicator (on the side of the volume buttons) on the positioning rib (①).

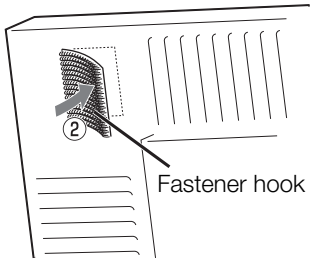
The fastener loops are attached using the adhesive on the back.



ⓘ Information

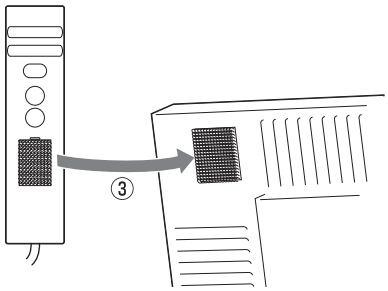
Remove any oil, water, or dust on the attachment side of the hook-and-loop fastener using a cloth slightly damped with a neutral detergent.

ii) Apply the fastener hook where you want to attach the ready indicator (behind the monitor) (②).



2 Attach the ready indicator.

Join the hook-and-loop fasteners to attach the ready indicator (③). Check that the volume adjustment buttons and the mute switch can be operated and that the LED lamps and IR data port can be seen.



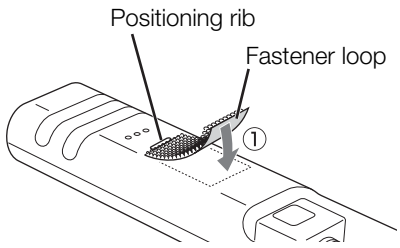
4.4.3 Attaching a ready indicator to a wall or post

This is suitable in cases in which the ready indicator and the image-capture computer are not usually moved, including such environments as an X-ray exposure room.

1 Attach hook-and-loop fasteners.

i) Apply the fastener loops to the ready indicator (on the side of the speaker holes) on the positioning rib (①).

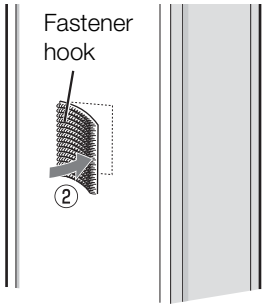
The fastener loops are attached using the adhesive on the back.



i Information

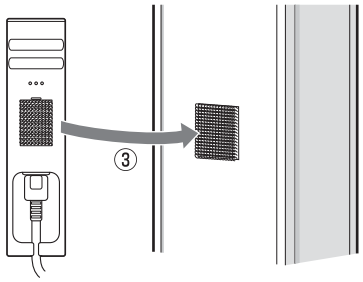
Remove any oil, water, or dust on the attachment side of the hook-and-loop fastener using a cloth slightly damped with a neutral detergent.

ii) Apply the fastener hook where you want to attach the ready indicator (on a wall or post) (②).



2 Attach the ready indicator.

Attach the hook-and-loop fastener to the attachment position of the ready indicator (③). Check that the volume adjustment buttons and the mute switch can be operated and that the LED lamps and IR data port can be seen.



5 Troubleshooting

Error codes on the error code display

Error code	Cause	Required actions
02	Internal error	Restart the detector.
03		
04		
12		
15		
16		
24		
25		
33		
47	It is time to replace the detector's internal memory. Exposure is not possible.	The internal memory must be replaced. Contact your sales representative.
48	A problem has occurred with the detector's internal memory.	Contact your sales representative.
99	Insufficient space in the detector's internal memory is preventing exposure.	Transfer images to the control computer.

6 Maintenance

Maintenance and inspection

In order to ensure that the device is used safely and normally, be sure to inspect the device before use.

Daily inspection

⚠ WARNING	**For safety reasons, be sure to turn OFF the power to each piece of equipment before the following. Otherwise, an electric shock could result.**

Detector

(1) Ensure that there are no loose or missing screws.
(2) Ensure that there are no break or no deformation on the exterior of the detector.
(3) Ensure that there is no dust or foreign matter on the battery bay connector.
(4) Ensure that there are no breaks or short-circuits in the battery bay connector.
(5) Ensure that there is no dust, dirt, or oil on the terminals of the cable connector.
(6) Ensure that the battery cover is not damaged or bent.
(7) Ensure that there is nothing wrong with the rubber in the battery cover (foreign objects, tears, cracks, etc.).

After turning on the power

(1) Perform test exposure.
Ensure that captured images are displayed normally on the monitor.

7 Specifications

Main specifications

AX-B3543W Detector

Pixel pitch:	125 µm
Scintillator:	CsI (Cesium iodide)
Effective imaging area:	350 x 426 mm
Gray scale:	65536 gradations (A/D: 16 bit)
Attenuation equivalent of the detector front panel:	Max. 0.21 mmAl
Load capacity	
Uniform load (Over the whole area of the detector surface)	310 kg or less
Uniform load (Effective imaging area)	150 kg or less
Local load (On an area 40 mm in diameter)	100 kg or less
Environmental requirements:	
Operation	
Temperature:	5°C to 35°C
Humidity:	30% to 80% RH (without condensation)
Atmospheric pressure:	613 to 1060 hPa
Storage (unpacked)	
Temperature:	5°C to 40°C
Humidity:	30% to 85% RH (without condensation)
Atmospheric pressure:	613 to 1060 hPa
Transportation (in packages at point of purchase)	
Temperature:	–30°C to 50°C
Humidity:	10% to 95% RH (without condensation)
Atmospheric pressure:	613 to 1060 hPa
Applicable grid:	34, 40*, 52*, 60* lp/cm (* recommended) (34 and 40 lp/cm have restrictions.
Wireless LAN:	Compliant with IEEE 802.11a/b/g/n
Rated power supply:	9 to 12 V DC, 2.00 A
Wireless:	Powered by the battery pack
Dimensions and mass:	Approx. 384 x 460 x 15.7 mm Approx. 2.3 kg (incl. battery pack)

Battery Pack LB-4A

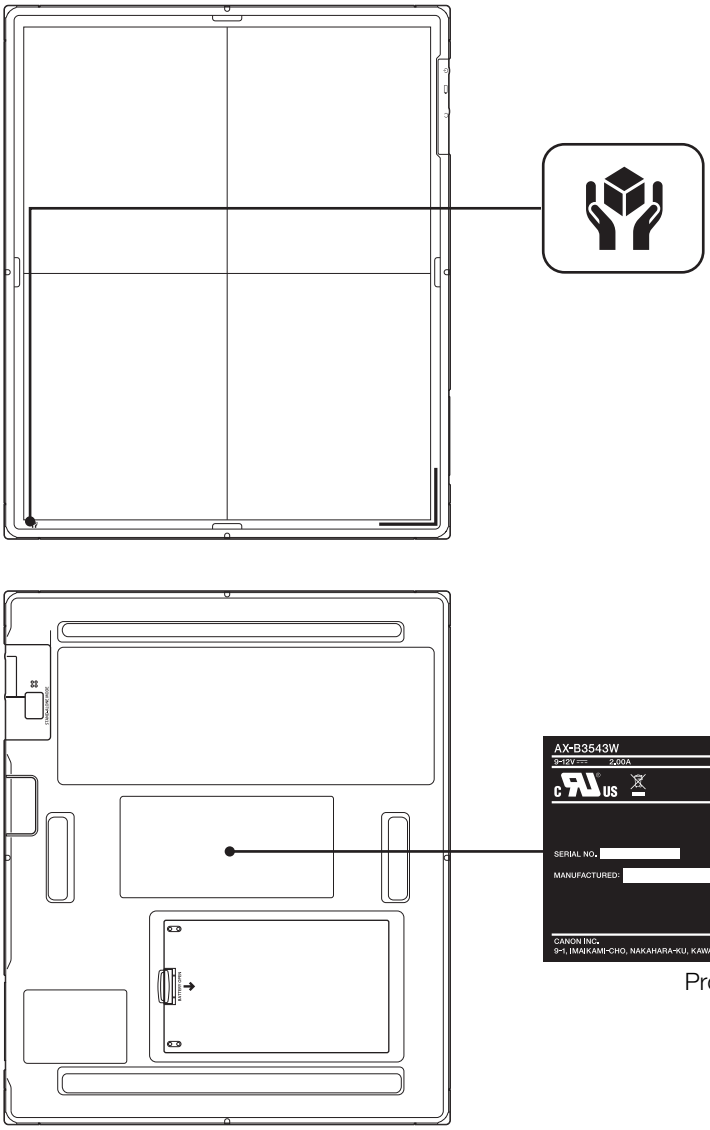
This dedicated battery pack is necessary for the AX-B3543W.
For details, refer to the technical document for the Battery Pack LB-4A.

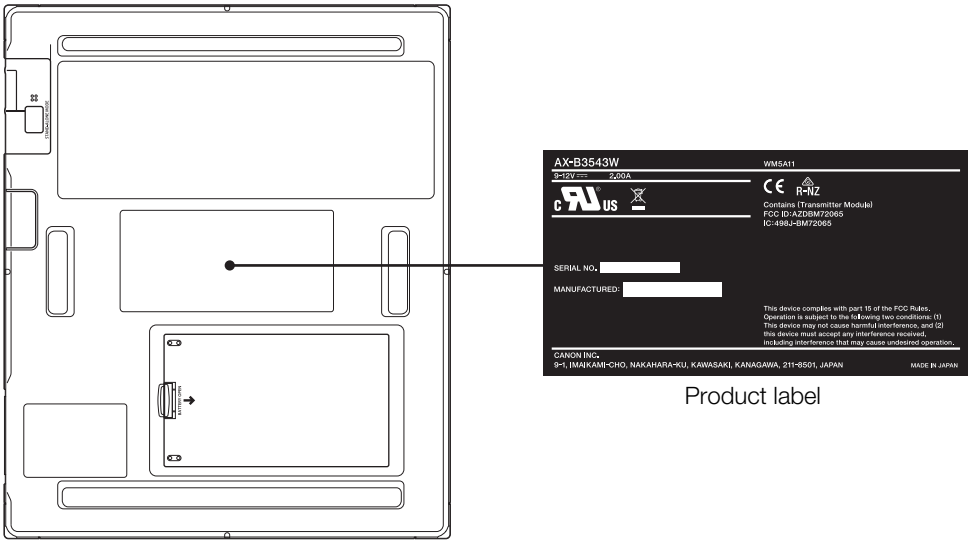
8 Regulatory information

Labels and markings on the detector

The detector has the label and the marking on it. Their contents and locations are indicated below.

Detector





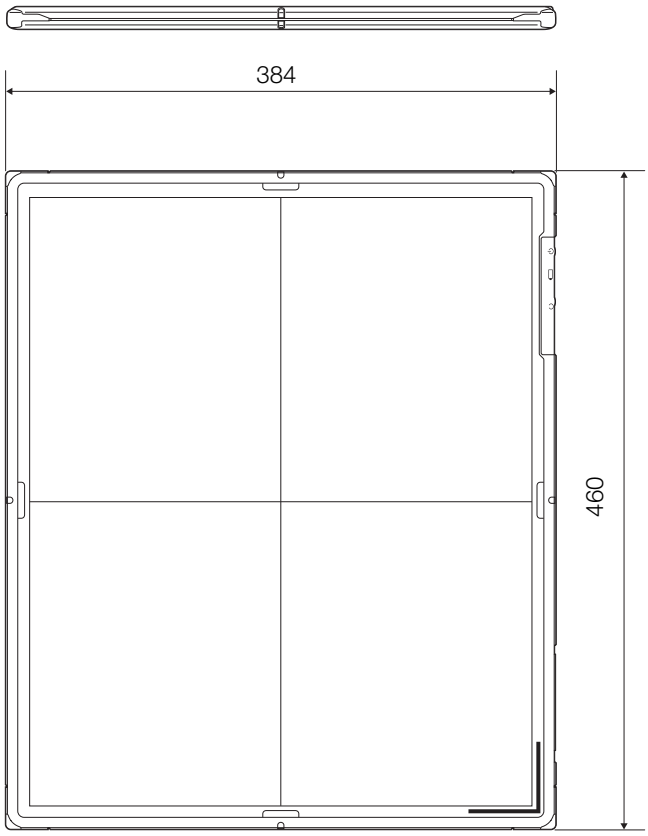
Product label

Details of markings

⎓	Direct current
	This mark indicates that this equipment must be handled with care.
c US	Certification mark that indicates the product complies with the safety standards. (For U.S.A. and Canada)

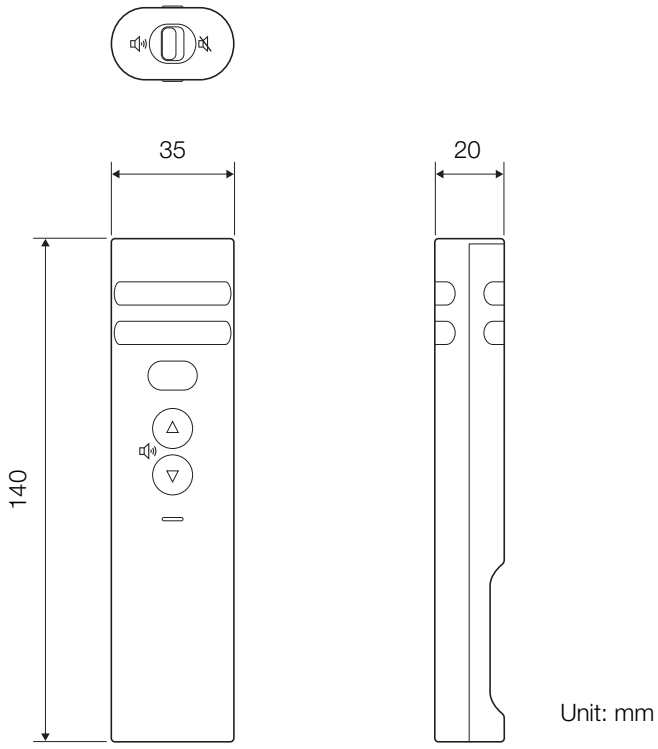
9 Dimensional diagram

AX-B3543W Detector



Unit: mm

Ready indicator



Unit: mm

10 Product components

Basic components

Detector: AX-B3543W

(Unit: pieces)

Detector 1
Battery pack: LB-4A 2

Optional parts

Battery Pack: LB-4A

Ready indicator: RI-3A

Hook-and-loop fastener (fastener hooks, fastener loops)
(One pair is already applied to the product) ..... 3 pairs

Battery Charger: BC-1A

Battery charger 1
Power cord 1

11 Guidance and manufacturer's declaration for EMD

EMD (Electromagnetic Disturbances)

The AX-B3543W is designed and tested to comply with IEC 60601-1-2 (EN 60601-1-2) which is applicable regulations regarding EMD for devices and need to be installed and put into service according to the following information.

1. Electrical equipment needs special precautions regarding EMD and needs to be installed and put into service according to the information provided in the document. (Table 1 to Table 4)
2. WARNING:
   Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.
3. To maintain the optimum EMD performance, use only the designated cables.
4. WARNING:
   Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.
5. 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 AX-B3543W, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

Electromagnetic emissions

The AX-B3543W is intended for use in the electromagnetic environment specified below. The customer or the user of the AX-B3543W should assure that it is used in such an environment.

Table 1

Emission Test	Compliance	Electromagnetic Environment – Guidance
RF emissions CISPR11	GROUP 1	The AX-B3543W uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electromagnetic equipment.
RF emissions CISPR11	Class A	The AX-B3543W is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	*1	

*1: Applies to regions where the rated voltage is 220 V or higher. Not applicable to regions where the rated voltage is less than 220 V.

Electromagnetic immunity

The AX-B3543W is intended for use in the electromagnetic environment specified below. The customer or the user of the AX-B3543W should assure that it is used in such an environment.

Table 2

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±(2, 4, 8, 15) kV air	±8 kV contact ±(2, 4, 8, 15) kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/ output lines	±2 kV for power supply lines ±1 kV for input/ output lines	Mains power quality should be that of a typical commercial environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	0% U_T; 0.5 cycle 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° 0% U_T; 250/300 cycles	0% U_T; 0.5 cycle 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° 0% U_T; 250/300 cycles	Mains power quality should be that of a typical commercial environment. If the user of the AX-B3543W requires continued operation during power mains interruptions, it is recommended that the AX-B3543W be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial environment.

NOTE: U_T is the a.c. mains voltage prior to application of the test level.

Table 3

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance
Conducted RF IEC 61000-4-6	3 V 150 kHz to 80 MHz	3 V	Portable and mobile RF communications equipment should be used no closer to any part of the AX-B3543W, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separations distance $d=1.2\sqrt{P}$ $d=1.2\sqrt{P}$ 80 MHz to 800 MHz $d=2.3\sqrt{P}$ 800 MHz to 2.7 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[a], should be less than the compliance level in each frequency range[b]. Interference may occur in the vicinity of equipment marked with the following symbol: 
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.7 GHz	3 V/m	

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflections from structures, object and people.

a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the AX-B3543W is used exceeds the applicable RF compliance level above, the AX-B3543W should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the AX-B3543W.

b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distances

The AX-B3543W is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the AX-B3543W can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the AX-B3543W as recommended below, according to the maximum output power of the communications equipment.

Table 4

Rated maximum output power of transmitter (W)	Separation distance according to frequency of transmitter (m)		
	150 kHz to 80 MHz $d=1.2\sqrt{P}$	80 MHz to 800 MHz $d=1.2\sqrt{P}$	800 MHz to 2.7 GHz $d=2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Appendix — Technical description —

EMD (Electromagnetic Disturbances)

Please perform the following to prevent adverse events to the OPERATOR due to ELECTROMAGNETIC DISTURBANCES:

- Reorient or relocate the receiving device.
- Increase the separation between the equipment.
- Connect this device into an outlet on a circuit different from that to which the other devices are connected.

If the problem cannot be solved with the above measures, stop using this equipment and consult your sales representative.

For details about this product's emission class, group, and immunity test level, see "11 Guidance and manufacturer's declaration for EMD" (→ page 51).

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