



KONICA MINOLTA

# AeroDR SYSTEM

## Operation Manual

Introduction

Chapter 1 Safety Precautions  
and Warnings

Chapter 2 Product Overview

Chapter 3 Basic Operations

Chapter 4 Troubleshooting

Chapter 5 Maintenance

Appendix

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## Introduction

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Digital radiography AeroDR SYSTEM (hereafter referred to as this device) performs X-ray imaging of the human body using an X-ray planar detector that outputs a digital signal, which is then input into an image processing device, and the image acquired with a digital image acquisition device is then transmitted to a filing system, printer, image display device as diagnostic image data.

There are two types of X-ray planar detector for this device: the high-definition type AeroDR 1417HQ (AeroDR P-11) and the standard type AeroDR 1417S (AeroDR P-12), and connection is made by either wireless or wired connection. Diagnostic X-ray imaging of this device does not provide mammographic images.

The console CS-7 (hereafter referred to as CS-7), which controls the receiving, processing, and output of image data of this device, is required for operation. For the operation of the CS-7, refer to its operation manual.

This operation manual provides instructions on the basic functions for operation of this device. Those operating this device for the first time should read this manual beforehand.

Also, store this manual close to this device after reading it through, so it can be used as a guide to allow optimum operating conditions.

**※If the pages of the operation manual are smudged and illegible, replace with a new one. (There is a fee for this service)**

### Application Specification Regarding Usability

- 1) Principle of operation
  - The X-ray planar detector reads the diagnostics X-ray digital image data from the X-ray image exposed by the X-ray exposure device, and sends the image data to the CS-7.
- 2) Exposure subject patient groups
  - All patients who can be exposed
- 3) Parts of body that can touch the X-ray planar detector
  - Exposable entire skin surface
- 4) Profile of intended operators
  - Physicians, radiologists, nurses
  - Healthy technicians of sound body who have specialized knowledge and a license.

## Structure of This Manual

This manual consists of the chapters listed below.

**Chapter 1 Safety Precautions and Warnings**

This chapter describes the precautions and warnings to be followed to use this device safely.

**Chapter 2 Product Overview**

This chapter describes the overview of this device.

**Chapter 3 Basic Operations**

This chapter describes the basic operations of this device.

**Chapter 4 Troubleshooting**

This chapter describes the corrective actions for the errors and lists the error messages.

**Chapter 5 Maintenance**

This chapter describes the maintenance and inspection items required to use this device safely.

**Appendix** This appendix describes the specifications of this device.

## Explanation of Terms

The meaning of terms used in this operation manual are as follows:

Terms	Explanation
<b>AeroDR detector</b>	Collective term indicating both AeroDR 1417HQ and AeroDR 1417S in this manual.
<b>CS-7</b>	The console that controls this device. It integrates management from the registration of patient/examination data to the checking of images.
<b>UF Cable</b>	Abbreviation for Universal Fit Cable. It is used for wired connection to power/communicate with the AeroDR detector.
<b>Gain calibration</b>	Processing for correcting the sensitivity of the AeroDR detector.
<b>Bucky</b>	An exposure stage for housing the AeroDR detector at exposure.

## Structure of Pages

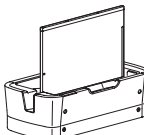
①

### 3.4 • Selection and Registration of AeroDR Detector

By registering the AeroDR detector to the CS-7, it is possible to move it between different radiology rooms.

#### 3.4.1 Registering the AeroDR Detector

- 1 Turn the power of the AeroDR detector ON.
- 2 Insert the AeroDR detector into the registration AeroDR battery charger.



- Registration process will start.

- 3 Once the registration is completed, a buzzer will sound on the AeroDR battery charger and the status LED will go from slow flashing to lit (green).

**HINT**

- Charging will also start when the AeroDR detector is inserted into the AeroDR battery charger, and the AeroDR battery charger feeding LED will light (blue).

**CAUTION**

- Once it is registered in a new radiology room, it will not be usable in the previous radiology room. Perform the registration operation again when returning to a previous radiology room.
- The AeroDR detector cannot be registered with the charging AeroDR battery charger.

- 4 Registration is completed when "Registration completed" is displayed on the CS-7.

#### 3.4.2 Selecting the AeroDR Detector

The AeroDR detector to be used is selected as follows depending on the number of registered AeroDR detectors.

Number of registered AeroDR detectors	Selection method
1	AeroDR detector is selected automatically when that AeroDR detector is ready to be selected (there is no problem with the battery, wireless connection, etc.). The AeroDR detector is not selected if it is not inserted into a bucky that matches the order information.
Multiple	The AeroDR detector that was selected immediately beforehand will be selected automatically. Also, if there is an AeroDR detector inserted in the bucky that matches the order information, that AeroDR detector will be selected. If there is no AeroDR detector that matches the order information, no AeroDR detector will be selected.




To change the selected AeroDR detector to another AeroDR detector, turning the selection switch of the AeroDR detector ON enables manual selection.

**HINT**

- A selected AeroDR detector will have its status LED lit (green).
- The AeroDR detector can also be selected manually from the CS-7. For details, refer to the "CS-7 Operation Manual".

Chapter 3

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Number	Item	Description	Icon
①	Item heading	Title of operation described in this chapter.	-
②	Operation procedure	The operating procedure is described in sequential numerical steps.	-
③	Hint	Describes important information.	 <b>HINT</b>
④	Precautions	Describes the operating precautions. Be sure to read these precautions.	 <b>CAUTION</b>
-	Reference	Indicates pages and items for reference. Refer to these as necessary.	
-	Term description	Describes the terms used in this operation manual.	-

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# Chapter 1

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## **Safety Precautions and Warnings**

This chapter describes the precautions and warnings to be followed to use this device safely.

## 1.1 • Alert Symbols



### Safety Alert Symbol

This is a "safety alert symbol". This symbol alerts the user to matters and/or operations that present a hazard to the user and other people. Read these messages and follow the instructions carefully. Be sure to read all instructions and safety standards and become thoroughly familiar with this device before installation or starting operation.

### Description of Graphic Symbols



Danger, Warning, or Caution  
Read the text next to this symbol.



AC Voltage (Power Supply).



Earth (Grounding).



Main Power Supply OFF. The main power supply is OFF.



Main Power Supply ON. The main power supply is ON.



Power Supply Standby. Turns the power supply ON or OFF.



Dangerous Voltage. This indicates the use of a high-voltage power supply.



B-type Device.

## 1.2 • Warning Notice (Signal Word)

Signal words designate a degree or level of hazard seriousness inherent in products.

Signal words include the following three types, which are used according to risk of damage caused by danger and the severity of damage:

### DANGER

Indicates an imminently hazardous situation which, if instructions are not followed, will result in death or serious injury.

### WARNING

Indicates a potentially hazardous situation which, if instructions are not followed, could result in death or serious injury.

### CAUTION

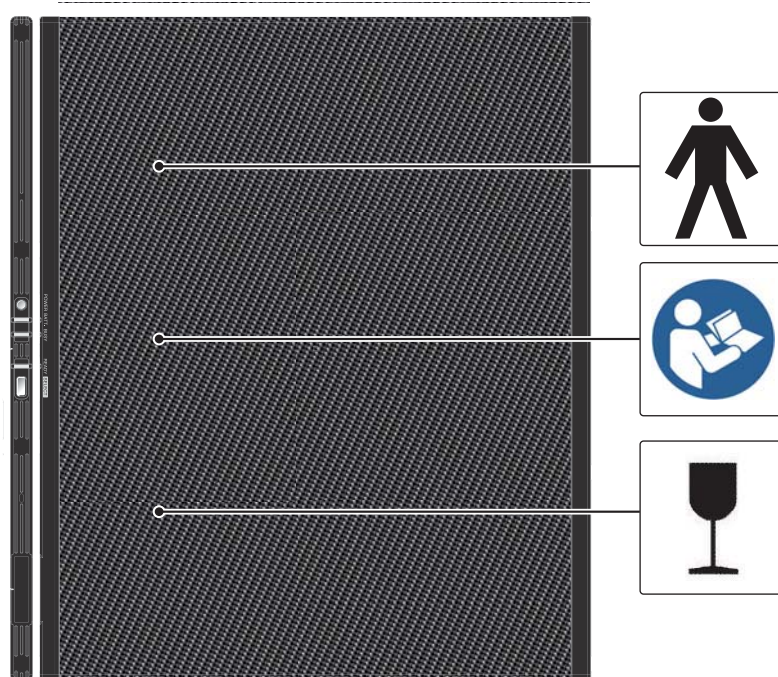
Indicates a potentially hazardous situation which, if instructions are not followed, may result in minor or moderate injury. It may also be used to indicate a hazardous situation where only property damage is likely to occur.

## 1.3 • Warning Labels

Various warning labels are attached to this device on the locations shown below. Do not remove these labels from this device. Warning labels are there to make sure that the user recognizes potential hazards when operating this device.

※ If a warning label is too dirty or damaged to read, contact Konica Minolta technical representatives to have a new warning label attached. (There is a fee for this service)

### 1.3.1 AeroDR Detector



## 1.4 • Safety Precautions

### 1.4.1 Precautions Before Usage

#### CAUTION

- The users (hospitals and clinics) hold responsibility for the usage and maintenance of this device. Do not use this device unless you are a physician or certified person under law.
- Perform the pre-operation check before using this device, and confirm that this device is operating normally.
- When a problem occurs with this device, turn the power off, attach an appropriate sign, such as "malfunction", on this device, and contact Konica Minolta technical representative.
- This device is not explosion-proof, so do not use any flammable or explosive gas near this device.
- For the basic operation of the computer, display monitor, and optional parts for this device, refer to their operation manuals.
- Please follow the rules and regulations of your relevant authorities in the disposal of this product, accessories, options, consumables, media and their packing materials.



#### For EU member states only

This symbol means: Do not dispose of this product together with your household waste!

Please refer to the information of your local community or contact our dealers regarding the proper handling of end-of-life electric and electronic equipments.

Recycling of this product will help to conserve natural resources and prevent potential negative consequences for the environment and human health caused by inappropriate waste handling.

### 1.4.2 Precautions for Usage

#### WARNING

- Take note of the following when using this device:
  - Do not apply strong shocks or excessive loads to the AeroDR detector by dropping it, etc.
  - For the load applied to the AeroDR detector, do not exceed an overall load of 150kg or a partial load of 100kg/80φ.
  - Do not disassemble or modify this device.
  - Do not connect any devices that were not purchased from Konica Minolta.
  - Do not turn the power switch OFF or pull out the power cable while the system is operating.
  - Be careful not to drop the AeroDR detector on any part of a person's body by catching the AeroDR I/F Cable or AeroDR UF Cable with your feet or similar.
- The AeroDR I/F Cable and AeroDR UF Cable are connected to the AeroDR detector using a magnet. When moving the AeroDR detector, do not hold onto the cable, and make sure to hold on the main body. Also, do not grasp and pull the AeroDR detector forcefully.
- People with an implanted pacemaker or implanted defibrillator may feel palpitation or dizziness.
- If there is any smoke, odor, or abnormal sound, it may cause a fire if use is continued, so immediately turn the power switch OFF, unplug the power plug from the wall outlet, and contact Konica Minolta technical representative.
- Take note of the following to reduce the risk of fire, electric shock, or electrical leakage:
  - Use specified cables for the power cable, etc.
  - Use wall outlet with the correct rating as a power source.
  - Connect the power plug to the wall outlet properly without any slack.
  - Use power source with a ground wire.
  - If you do not plan to use this device for an extended period of time, unplug the power plug.
  - The supplied power cable is dedicated for this device, so do not use it elsewhere.
  - Avoid exposure to liquid such as water.
  - Make sure that foreign material, such as pieces of metal or wires, does not get inside.
  - Do not allow any metal or conductive objects to come into contact with the AeroDR I/F Cable connection port.
  - Do not handle the power plug with wet hands.
  - Do not let soil or dust accumulate on the power plug, AeroDR I/F Cable, or AeroDR UF Cable.
  - Do not use extension cords.
  - Do not place many loads on one electrical outlet.
  - Do not damage the power cable, AeroDR I/F Cable, or AeroDR UF Cable. Also, do not use damaged cables.
  - Do not block the ventilating openings.

**WARNING**

- When installing the AeroDR battery charger on a table top, observe the following:
  - The contact area for the AeroDR battery charger must be larger than the area of the AeroDR battery charger.
  - Install on a horizontal and stable surface.
  - Connect power cable and wires so that no one will trip.
- Do not put your hands on, sit down, or lean on the AeroDR battery charger installed on a wall.
- If there is any abnormality in appearance such as deformation of the housing or a crack, stop using the device immediately and contact Konica Minolta technical representatives.

**CAUTION**

- When using an AeroDR I/F Cable, observe the following:
  - Remove the cable by holding the connector housing.
  - Do not let the cable get pinched by doors and do not place heavy objects on it.
  - Do not bend or pull the cable excessively.
  - Make sure that the cable is properly connected to the AeroDR detector without wobbling.
  - Do not connect the connector housing in the opposite direction.
- Use on a flat base. Use the dedicated adapter when you need to perform exposure on a stretcher or a place where load is to be applied locally.
- Pressing the power switch causes each LED (green, orange, blue) to light temporarily or flash. After this, only green begins to flash in a slow cycle. Please check the lighting or flashing of each color once.
- Do not use devices that emit electromagnetic waves such as high-frequency therapy apparatus, mobile phones, or pocket pagers, close to this device.
- Take note of the reception status for radios and TVs near this device, since interference may occur in them when this device is in use.
- Due to its design, the battery capacity will decrease approximately 60% in 7 years with an average charging of 10 times per day. It can be replaced with a new battery for a fee if necessary.
- Take note of the following when the AeroDR detector is damaged and fluorescent medium or lead is exposed:
  - Immediately stop using the device, and contact Konica Minolta technical representatives.
  - If the fluorescent medium gets in your eyes, do not rub and instead wash with running water immediately.
  - If you have swallowed any of the fluorescent medium or if the fluorescent medium has gotten into your eyes, administer first-aid treatment immediately, and consult a doctor.
  - If the medium comes into contact with your skin directly, wash the affected area thoroughly with water.
  - Use and store in a location inaccessible to children.
- Use under the specified environmental conditions. Failure to do so may result in degradation of performance or malfunction.
- Be careful not to get your hand caught when setting the AeroDR detector into the AeroDR battery charger.

### 1.4.3 Precautions Regarding Electromagnetic Waves

#### EMC Statement

The device has been tested and found to comply with the limits for medical devices to the IEC 60601-1-2:2007.

These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. The device generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation.

If this device does cause harmful interference to other devices, which can be determined by turning this device 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 device.
- Increase the separation between the devices.
- Connect this device into an outlet on a circuit different from that to which the other devices are connected.
- Contact Konica Minolta technical representatives.

#### Supplementary information regarding IEC 60601-1-2: 2007

- (1) Take precautions against this device especially regarding EMC. Install and put into service according to the electromagnetic compatibility (EMC) information provided in the manual (Table 1 - Table 4).
- (2) Do not use mobile phones or pocket pagers in the vicinity of this device. Use of mobile phones or pocket pagers near this device can cause errors in operation due to electromagnetic wave interference, so such devices should be turned off in the vicinity of this device.
- (3) Cable List
  - AC Power Cable (3 m/3-Wire/No Shielding)
  - Ethernet Cable (max 100 m/100 BASE-TX)
  - PoE Ethernet Cable (30 m/No Shielding)
  - Parallel Interface Cable (20 m/No Shielding)
  - Parallel Interface Cable for UFA (2 m/No Shielding)
  - Parallel Interface Cable for Collimator (20 m/No Shielding)
  - Parallel Interface Cable for Generator (20 m/No Shielding)
- (4) The use of accessories, transducers and cables other than those sold by KONICA MINOLTA MEDICAL & GRAPHIC, INC. as for internal components, may result in increased emissions or decreased immunity of this device.
- (5) Do not use this device adjacent to or stacked with other devices. If adjacent or stacked use is necessary, confirm normal operation in the configuration in which this device will be used.
- (6) Specifications regarding RF transmitters
  - Frequency: 5150 to 5350 MHz, 5470 to 5850 MHz
  - Modulation: OFDM
  - Maximum effective radiation power: +15 dBm
  - This device may be interfered with by other devices that conform to CISPR emission requirements.

Continued on the next page

## 1.4 Safety Precautions

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Table 1

<b>Guidance and manufacturer's declaration - electromagnetic emissions</b>		
The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.		
<b>Emissions test</b>	<b>Compliance</b>	<b>Electromagnetic environment - guidance</b>
RF emissions CISPR 11	Group 1	The device 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 electronic equipment.
RF emissions CISPR 11	Class B	The device 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 for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Table 2

<b>Guidance and manufacturer's declaration - electromagnetic immunity</b>			
The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.			
<b>Immunity test</b>	<b>IEC 60601 test level</b>	<b>Compliance level</b>	<b>Electromagnetic environment - guidance</b>
Electrostatic discharge (ESD) IEC61000-4-2	+/- 6kV contact	+/- 6kV contact	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %. Mains power quality should be that of a typical commercial or hospital environment.
	+/- 8kV air	+/- 8kV air	
Electrical fast transient/burst IEC61000-4-4	+/- 2kV for power supply lines	+/- 2kV for power supply lines	
	+/- 1kV for input/output lines	+/- 1kV for input/output lines	
Surge IEC61000-4-5	+/- 1kV differential mode	+/- 1kV differential mode	Mains power quality should be that of a typical commercial or hospital environment.
	+/- 2kV common mode	+/- 2kV common mode	
Voltage dips, short interruptions and voltage variations on power supply input lines IEC61000-4-11	<5% $U_T$ (>95% dip in $U_T$ ) for 0.5 cycle	<5% $U_T$ (>95% dip in $U_T$ ) for 0.5 cycle	Mains power quality should be that of a typical commercial or hospital environment. If the user of the device requires continued operation during power mains interruptions, it is recommended that the device be powered from an uninterrupted power supply or a battery.
	40% $U_T$ (60% dip in $U_T$ ) for 5 cycles	40% $U_T$ (60% dip in $U_T$ ) for 5 cycles	
	70% $U_T$ (30% dip in $U_T$ ) for 25 cycles	70% $U_T$ (30% dip in $U_T$ ) for 25 cycles	
	<5% $U_T$ (>95% dip in $U_T$ ) for 5 sec	<5% $U_T$ (>95% dip in $U_T$ ) for 5 sec	
Power frequency (50/60 Hz) magnetic field IEC61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

[NOTE]  $U_T$  is the a.c. mains voltage prior to application of the test level.

Continued on the next page

## 1.4 Safety Precautions

Table 3


<b>Guidance and manufacturer's declaration - electromagnetic immunity</b>			
The device is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an environment.			
<b>Immunity test</b>	<b>IEC 60601 test level</b>	<b>Compliance level</b>	<b>Electromagnetic environment - guidance</b>
Conducted RF IEC 61000-4-6	3 Vms 150 kHz to 80 MHz	[3]V	Portable and mobile RF communications equipment should be used no closer to any part of the device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.  Recommended separation distance $d-[1.2] \sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	[3]V/m	$d-[1.2] \sqrt{P}$ 80 MHz to 800 MHz $d-[2.3] \sqrt{P}$ 800 MHz to 2.5 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 <sup>a</sup> , should be less than the compliance level in each frequency range <sup>b</sup> .  Interference may occur in the vicinity of equipment marked with the following symbol: 
[NOTE] At 80 MHz and 800 MHz, the higher frequency range applies.			
[NOTE] These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects 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 device is used exceeds the applicable RF compliance level above, the device should be observed to verify normal operation. If abnormal performance is observed, additional measures may necessary, such as reorienting or relocation the device.			
b. Over the frequency range 150 kHz to 80 MHz, field strength should be less than [3] V/m.			



Table 4


<b>Recommended separation distance between portable and mobile RF communications equipment and the device.</b>			
The device is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the device as recommended below, according to the maximum output power of the communications equipment.			
<b>Rated maximum output power of the transmitter</b>	<b>Separation distance according to frequency of transmitter</b>		
	<b>m</b>		
<b>W</b>	<b>150 kHz to 80 MHz <math>d-[1.2] \sqrt{P}</math></b>	<b>80 MHz to 800 MHz <math>d-[1.2] \sqrt{P}</math></b>	<b>800 MHz to 2.5 GHz <math>d-[2.3] \sqrt{P}</math></b>
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	8
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] At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

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

### 1.4.4 Precautions Regarding Wireless


**CAUTION**

- This device is equipped with communication function that operates via wireless LAN.
- It is required to abide with the relevant regulations defined by the countries in which this device is to be used.
- Inappropriate usage may cause interference in the radio communication. Also, if this device is modified, approval and warranty according to the radio law of the applicable government will be voided.
- It may affect aeronautical systems, so do not use on-board airplanes.
- This device has been confirmed to comply with the relevant regulations of the following countries:

#### United States & Canada

##### Federal Communications Commission Statement / Canadian Department of Communications

- This device complies with Part 15 of FCC Rules and RSS-Gen of IC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device.
- This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.
- 5.15-5.25GHz band is restricted to indoor operations only.
- 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. AeroDR detector has been tested and found to comply with FCC/IC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65 and RSS-102 of the IC radio frequency (RF) Exposure rules.

#### FCC WARNING

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

#### European Union

##### European Union Directives Conformance Statement

This device is confirmed Declaration of Conformity (DoC) to Directive 1999/5/EC (to R&TTE Directive). This device is on purpose to connect to access point of 5GHz network.

This device is used for the following countries indicated in country code (ISO3166 2letter code).

AT	BE	BG	CY	CZ	DK
EE	FI	FR	DE	GR	HU
IE	IT	LV	LT	LU	MT
NL	PL	PT	RQ	SK	SI
ES	SE	GB	IS	LI	NO
CH	HR	MK	TR		

## Taiwan

**Observe the following based on the regulations stated in Article 10 of Administration Measures for Low-power Radiation Electric Machines.**

### Article 12

As for type-approval qualified low-power radio-frequency generator, no company, firm, or user may arbitrarily change the frequency, increase the power or alter the function or characteristics of the original design without prior permission.

### Article 14

The use of low-power radio-frequency electric machines shall not affect air flight safety or disturb lawful communication. If disturbance is found, the use of such electric machines shall be suspended immediately and such use shall not be resumed until the disturbance is eliminated. Lawful communication mentioned in the preceding paragraph refers to wireless communication operation in accordance with the provisions of the Telecommunication Law. Low-power radio-frequency electric machines shall tolerate disturbance from lawful communication or from radio-wave radiation electric machine for industrial, scientific or medical use.

### 低功率電波輻射性電機管理辦法 第十條

#### 第十二條

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

#### 第十四條

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。

低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Continued on the next page

### China

- Clearly indicate the technical indicators and the scope of usage in the accompanying document, and explain the usage of all controls, adjustments, and switches, etc.
  - Operating frequency range: 5725-5850 MHz
  - Transmit power:  $\leq 500$  mW and  $\leq 27$  dBm
  - Equivalent isotropic radiated power (EIRP):  $\leq 2$  W and  $\leq 33$  dBm
  - Maximum radiation power density:  $\leq 13$  dBm/MHz and  $\leq 19$  dBm/MHz (EIRP)
  - Frequency Tolerance limit: 20 ppm
  - Transmit power at the band edge (EIRP):  $\leq 80$  dBm/Hz ( $\leq 5725$  MHz or  $\geq 5850$  MHz)
  - Spurious emissions:
    - $\leq -36$  dBm/100 kHz (30-1000 MHz)
    - $\leq -40$  dBm/1 MHz (2400-2483.5 MHz)
    - $\leq -40$  dBm/1 MHz (3400-3530 MHz)
    - $\leq -33$  dBm/100 kHz (5725-5850 MHz)(Note: Other than  $\pm 2.5$ -times supported channel bandwidth)
    - $\leq -30$  dBm/1 MHz (Other 1-40 GHz)
- Do not arbitrarily change frequency or increase transmit power (including the added radio frequency amplifier). In addition, do not mount an antenna without permission, or change to another transmission antenna.
- When in use, do not cause harmful interference in other legal wireless communication services. If you find interference to be occurring, discontinue use immediately. After taking measures to eliminate interference, you may continue using the device.
- If you use low power radio equipment, you must accept interference from various wireless services or radiation interference from industrial, scientific and medical application equipment.
- Do not use near a plane or an airport.

### 微功率 (短距离) 无线电设备管理暂行规定第十三条

- 标明附件中所规定的技术指标和使用范围, 说明所有控制、调整及开关等使用方法;
  - 工作频率范围: 5725 - 5850 MHz
  - 发射功率:  $\leq 500$  mW 和  $\leq 27$  dBm
  - 等效全向辐射功率 (EIRP):  $\leq 2$  W 和  $\leq 33$  dBm
  - 最大功率谱密度:  $\leq 13$  dBm / MHz 和  $\leq 19$  dBm / MHz (EIRP)
  - 载频容限: 20 ppm
  - 带外发射功率 (EIRP):  $\leq -80$  dBm / Hz ( $\leq 5725$  MHz 或  $\geq 5850$  MHz)
  - 杂散发射 (辐射) 功率:  $\leq -36$  dBm / 100 kHz (30 ~ 1000 MHz)
    - $\leq -40$  dBm / 1 MHz (2400 ~ 2483.5 MHz)
    - $\leq -40$  dBm / 1 MHz (3400 ~ 3530 MHz)
    - $\leq -33$  dBm / 100 kHz (5725 ~ 5850 MHz) (注: 对应载波 2.5 倍信道带宽以外)
    - $\leq -30$  dBm / 1 MHz (其它 1 ~ 40 GHz)
- 不得擅自更改发射频率、加大发射功率 (包括额外加装射频功率放大器), 不得擅自外接天线或改用其它发射天线;
- 使用时不得对各种合法的无线电通信业务产生有害干扰; 一旦发现有害干扰现象时, 应立即停止使用, 并采取措施消除干扰后方可继续使用;
- 使用微功率无线电设备, 必须忍受各种无线电业务的干扰或工业、科学及医疗应用设备的辐射干扰;
- 不得在飞机和机场附近使用。

### South Korea

해당 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없습니다.

### Thailand

This telecommunication equipment conforms to NTC technical requirement.

### Brazil

Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário. Este equipamento está homologado pela ANATEL de acordo com os procedimentos regulamentados pela Resolução 242/2000 e atende aos requisitos técnicos aplicados.

Para consultas, visite:

<http://www.anatel.gov.br>

### Mexico

Este equipo opera a título secundario, consecuentemente, debe aceptar interferencias perjudiciales incluyendo equipos de la misma clase y puede no causar interferencias a sistemas operando a título primario.

## 1.5 • Precautions for Installing, Moving, and Storing

### WARNING

- Take note of the following when moving this device not including the AeroDR detector:
  - Do not apply shocks or vibration.
  - Do not start moving until the power is turned OFF, and operation has stopped completely.
  - Do not move with the power cable or any other cable connected.

### CAUTION

- Contact Konica Minolta or dealers specified by Konica Minolta to install or move this device.
- Take note of the following when installing or storing this device.
  - Do not install or store in a location where it may be adversely affected by atmospheric pressure, temperature, humidity, ventilation, sunlight, dust, salt-air, or air containing sulfur.
  - Do not install or store in a location where it is not stable, ventilation is insufficient, the difference in light-dark is big, electromagnetic waves are generated, or where vibration or shock will be applied.
  - Do not install or store in a location where chemical agents are used or stored.
  - With the exception of the AeroDR detector, do not install this device facing up or upside down.

## 1.6 • Cautions Regarding Care and Maintenance of the Device

### WARNING

- Perform the maintenance and inspection periodically. In addition to the user periodical maintenance that needs to be performed, periodical maintenance by service personnel is also required.
- If there are stains such as body fluids, clean and disinfect.

### CAUTION

- Turn OFF the power and disconnect the power plug from the wall outlet before cleaning or maintaining this device.
- Securely connect the power cable, AeroDR I/F Cable, and AeroDR UF Cable after cleaning and maintenance.
- Clean the dirt from between the protective cover and the exterior, and the terminal using a dedicated brush. Do not clean with sharp and hard objects.
- Take care of the following when sterilizing the AeroDR detector.
  - Use sterilizing ethanol, sterilizing isopropanol, or hypochlorite solution as the sterilizing solution when sterilizing.
  - Dampen a lint-free soft cloth with sterilizing solution, and use after wringing it thoroughly. Do not apply sterilizing solution onto the terminal part and operation panel when cleaning.
  - Sterilizing solution is a chemical reagent, so follow the precautions of the manufacturer.
- When cleaning the spring connector of the AeroDR battery charger, be careful not to damage it.
- Periodically clean any dirt from around the spring connector.

## 1.7 • Precautions for Parts Replacement and Regular Maintenance

Name	Service life
AeroDR detector	6 years
AeroDR interface unit	6 years
AeroDR generator interface unit	6 years
AeroDR battery charger	6 years



**HINT**.....

- The above service life is valid if the product has been properly operated while following the precautions for use.
- The above service life is a guideline for replacement.
- Based on the warranty, parts that are no longer under warranty (1 year) can be replaced for a fee.

.....  
To maintain optimal X-ray imaging, the AeroDR detector requires regular maintenance by service personnel.

# Chapter 2

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## Product Overview

This chapter describes the overview of this device.

## 2.1 • Overview of This Device

This section describes the functions and features of this device as well as a system configuration example using this device.

### 2.1.1 Functions and Features

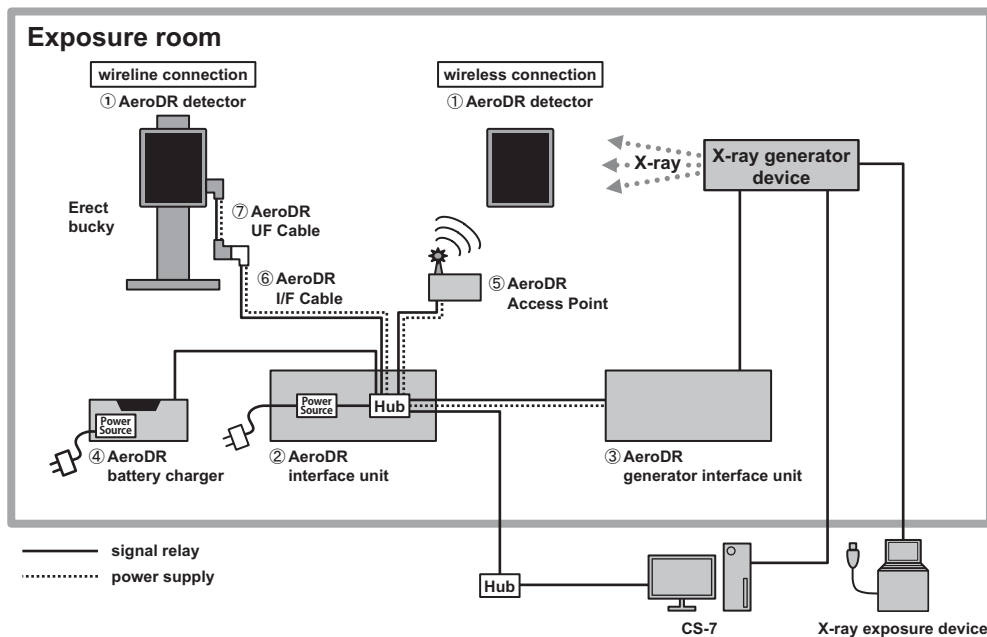
This device consists of AeroDR detector, AeroDR interface unit, AeroDR generator interface unit, AeroDR battery charger, AeroDR Access Point, etc. The AeroDR detector reads the diagnostics X-ray digital image data from the X-ray image exposed by the X-ray exposure device, and sends it to the CS-7.

### 2.1.2 System Configuration Example

The basic configuration is as follows.

Number	Name	Remarks
①	AeroDR detector	<ul style="list-style-type: none"> <li>A maximum of four AeroDR detectors can be connected, but the expansion AeroDR interface unit is required for connecting the third and fourth AeroDR detectors.</li> <li>There are two types of AeroDR detector: AeroDR 1417HQ (high-definition type) and AeroDR 1417S (popular type).</li> <li>TYPE B APPLIED PARTS.</li> </ul>
②	AeroDR interface unit	—
③	AeroDR generator interface unit	—
④	AeroDR battery charger	—
⑤	AeroDR Access Point	Used for wireless connection.
⑥	AeroDR I/F Cable	Used for wired connection.
⑦	AeroDR UF Cable	Used when the AeroDR detector is used only for the erect or supine position.

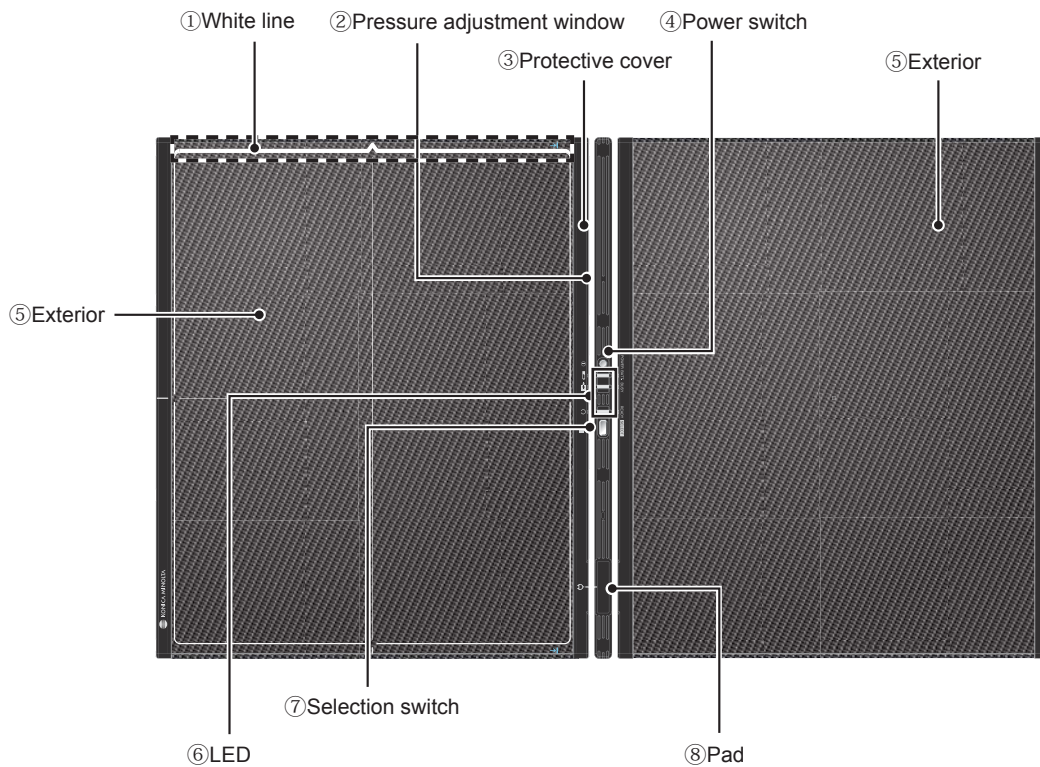
### 2.1.3 System Connection Example





## 2.2 • Component Names and Functions

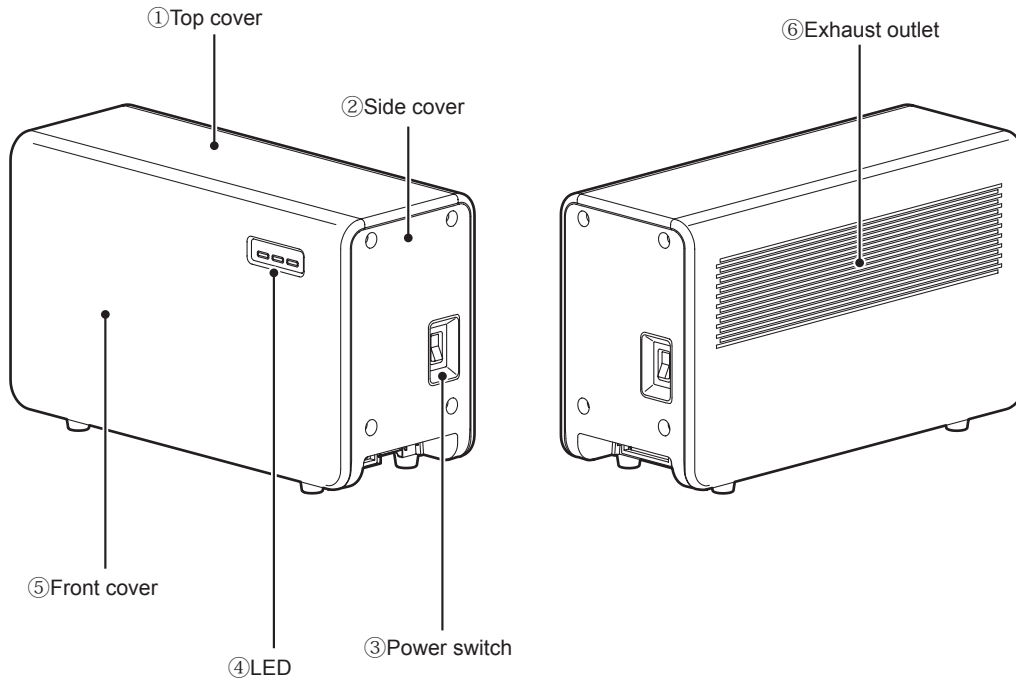
### 2.2.1 AeroDR Detector



Number	Name	Functions
①	White line	Expose the body part with the white line located at the bottom (portrait) or with the white line located to the right of the upper edge that should be positioned at the top of the image field (landscape).
②	Pressure adjustment window	A hole to equalize the ambient pressure with the internal pressure.
③	Protective cover	Absorbs the external shock.
④	Power switch	Used to turn ON/OFF the AeroDR detector.
⑤	Exterior	Protects the internal parts.
⑥	LED	Displays the status of the AeroDR detector.
⑦	Selection switch	Notifies the CS-7 that this AeroDR detector will be used for the exposure.
⑧	Pad	Connects to the AeroDR interface unit with an AeroDR I/F Cable.

### 2.2.2 AeroDR Interface Unit

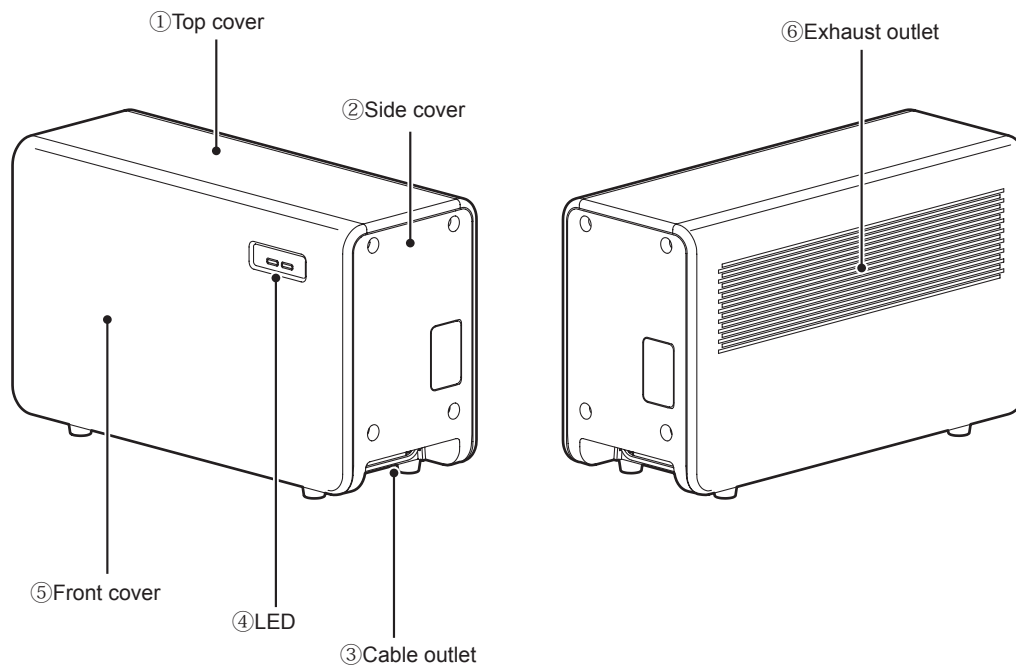
The AeroDR interface unit will supply power to the AeroDR generator interface unit, AeroDR Access Point, and supply power to and charge the battery of the AeroDR detector when an AeroDR I/F Cable or AeroDR UF Cable is used. It also has a hub function.



Number	Name	Functions
①	Top cover	Protects the internal parts.
②	Side cover	Protects the internal parts.
③	Power switch	Used to turn ON/OFF the AeroDR interface unit.
④	LED	Displays the status of the AeroDR interface unit.
⑤	Front cover	Protects the internal parts.
⑥	Exhaust outlet	Exhausts internal heat.

### 2.2.3 AeroDR Generator Interface Unit

The AeroDR generator interface unit relays signals between the X-ray generator device, the AeroDR detector, and the CS-7.

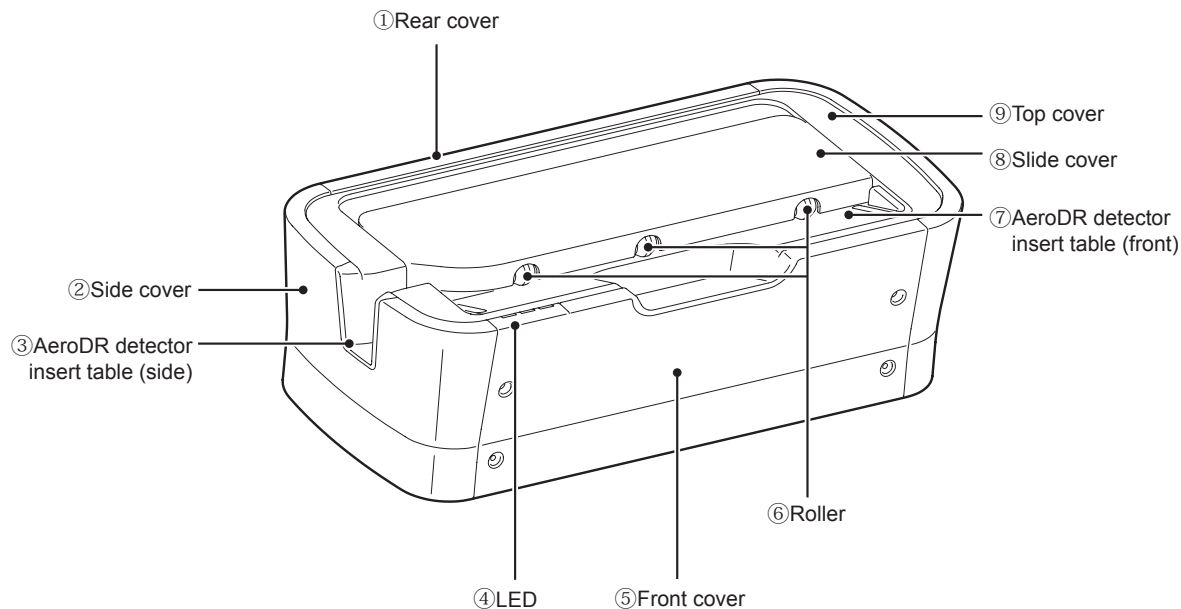


Number	Name	Functions
①	Top cover	Protects the internal parts.
②	Side cover	Protects the internal parts.
③	Cable outlet	Outlet for various cables.
④	LED	Displays the status of the AeroDR generator interface unit.
⑤	Front cover	Protects the internal parts.
⑥	Exhaust outlet	Exhausts internal heat.

### 2.2.4 AeroDR Battery Charger

The AeroDR battery charger charges the AeroDR detector. It also has the registration function for the AeroDR detector.

There are two types of AeroDR battery charger: one with the AeroDR detector registration function and the other for charging only.

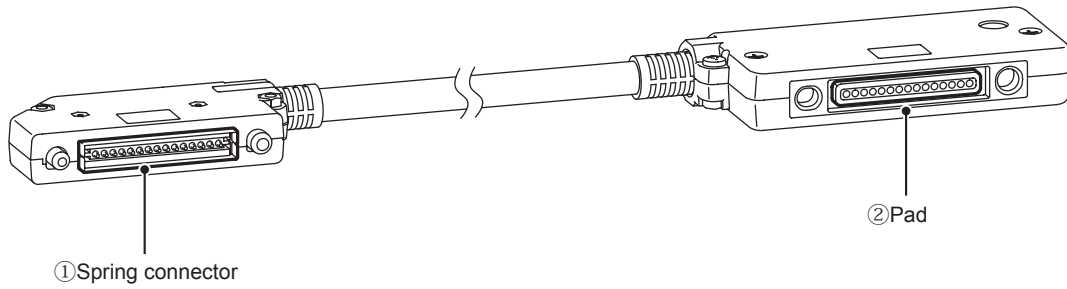


Number	Name	Functions
①	Rear cover	Protects the internal parts.
②	Slide cover	Protects the internal parts.
③	AeroDR detector insert table (side)	Guide for inserting the AeroDR detector from the side.
④	LED	Indicates the communication status between the AeroDR detector and the AeroDR battery charger.
⑤	Front cover	Protects the internal parts.
⑥	Roller	Prevents external friction when you insert the AeroDR detector.
⑦	AeroDR detector insert table (front)	Guide for inserting the AeroDR detector from the front.
⑧	Slide cover	Protects internal components, and prevents dust from getting inside the AeroDR battery charger.
⑨	Top cover	Protects the internal parts.

### 2.2.5 AeroDR Access Point

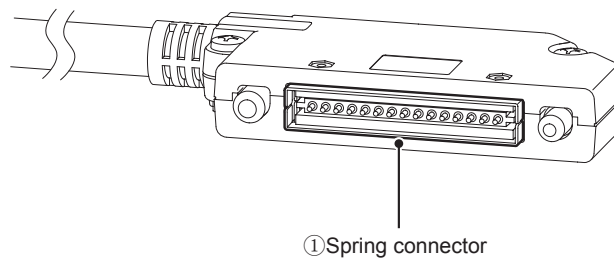
The AeroDR Access Point is used for wireless connection with the AeroDR detector. For details, refer to the "AeroDR Access Point Operation Manual".

### 2.2.6 AeroDR UF Cable



Number	Name	Functions
①	Spring connector	Connects with the pad of the AeroDR detector.
②	Pad	Connects with the spring connector of an AeroDR I/F Cable.

### 2.2.7 AeroDR I/F Cable



Number	Name	Functions
①	Spring connector	Connects with the pad of the AeroDR detector and AeroDR UF Cable.

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# Chapter 3

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## Basic Operations

This chapter describes the basic operations of this device.

## 3.1 • Startup and Shutdown

Power for this device can be left ON during normal use. However, to turn on the power after not using for a long period of time, or to turn off the power when not intending to use for a long period of time, follow the procedures described below.



### HINT.....

- There is no definite startup/shutdown sequence for this device or the CS-7. Check the power ON and startup status, or power OFF and shutdown status as follows.

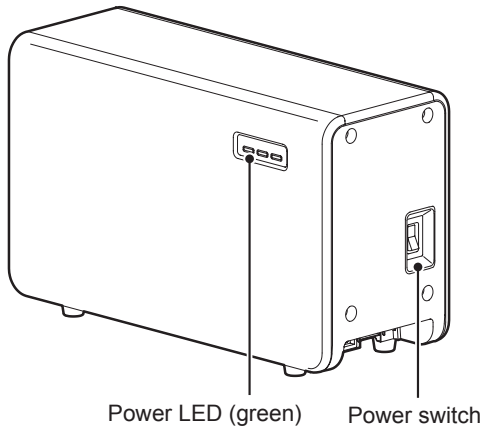
### 3.1.1 Power ON

#### Start the CS-7.

- Start the CS-7 by turning the power switch of the CS-7 ON.

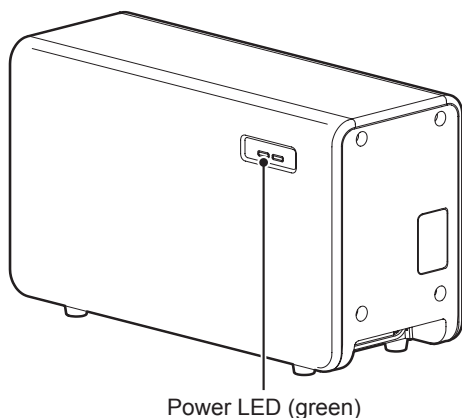
#### Start the AeroDR interface unit.

- Turn the power switch of the AeroDR interface unit ON, and confirm that the power LED lights (green).



#### The AeroDR generator interface unit is started.

- When the power switch of the AeroDR interface unit is turned ON, power is supplied to the AeroDR generator interface unit, and the power LED will light (green).

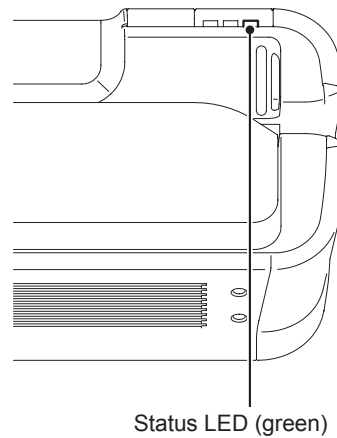


#### Start the AeroDR Access Point.

- When the power switch of the AeroDR interface unit is turned ON, power is supplied to the AeroDR Access Point, and the PoE LED on the AeroDR Access Point will light.

#### Start the AeroDR battery charger.

- When the AC cable is connected to the outlet, power of the AeroDR battery charger is turned ON and depending on the situation the status LED (green) will be as follows.
  - Slow flashing: AeroDR detector not inserted
  - ON: AeroDR detector inserted, charging



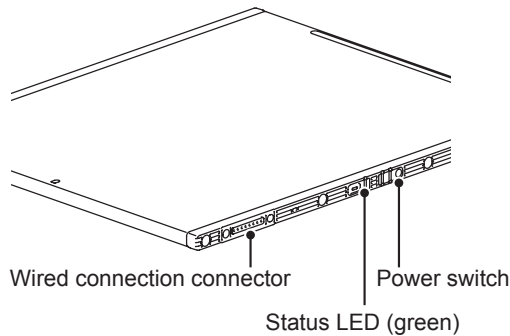


**Start the AeroDR detector.**

- If inserted into the AeroDR battery charger with the wireless connection, the AeroDR detector should be removed.

For the wired connection, confirm that the AeroDR I/F Cable is connected securely to the pad of the AeroDR detector.

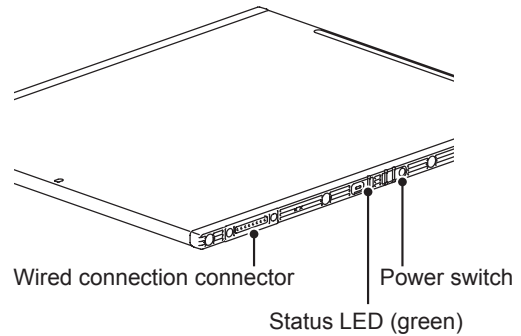
Then, turn the power switch of the AeroDR detector ON, and confirm that the status LED (both green) is short flashing or lit.

**Confirm that the AeroDR detector has started with the CS-7.**

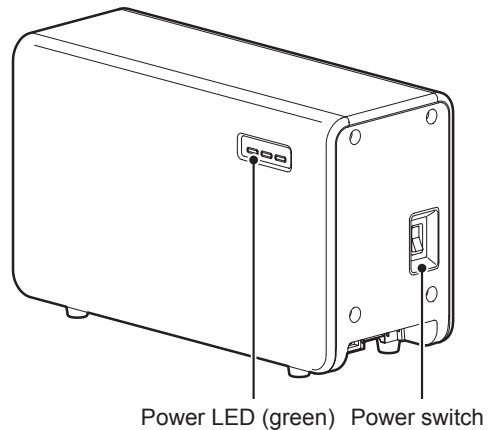
- Confirm that the status of AeroDR detector is ready for usage on the CS-7 screen.

**3.1.2 Power OFF****Shut down the AeroDR detector.**

- Turn the power switch of the AeroDR detector OFF, and confirm that the status LED is turned off.

**Shut down the AeroDR generator interface unit.**

- Turn the power switch of the AeroDR interface unit OFF, and confirm that the power LED is turned off.

**Shut down the AeroDR generator interface unit and AeroDR Access Point.**

- When the power switch of the AeroDR interface unit is turned OFF, the power supply to AeroDR generator interface unit and AeroDR Access Point is terminated. The power LED will turn off on the AeroDR generator interface unit, and the PoE LED will turn off on the AeroDR Access Point.

**Shut down the AeroDR battery charger.**

- When the AC cable is removed from the outlet, the power of the AeroDR battery charger is turned OFF and the status LED is turned off.

**Shut down the CS-7.**

- Shut down the CS-7.

## 3.2 • Operation of AeroDR Detector

### 3.2.1 Exposure

To expose X-ray images, check that this device is ready to expose images, and then perform the exposure operation using the X-ray exposure device.

When the exposure is completed, image is stored in the AeroDR detector and will then be converted to digital data and sent to the CS-7 sequentially. When the data transfer is completed, the exposed image is displayed on the CS-7.



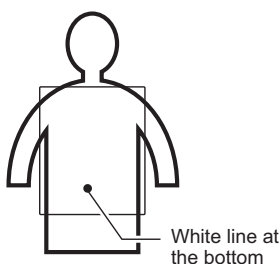
#### HINT.....

- When the AeroDR detector is used with a wireless connection, it will enter sleep mode if not used for a long time (you can adjust the time it takes).
- To recover from the sleep mode, click on the "Sleep recovery button" on the CS-7 or keep pressed the selection switch on the AeroDR detector for two seconds or more.
- The AeroDR detector will not go into sleep mode if it is used in a wired connection.

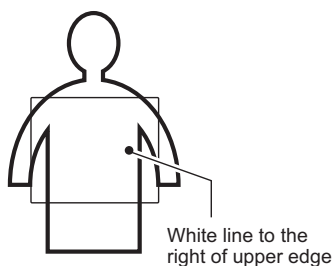
### 3.2.2 AeroDR Detector Orientation

With the AeroDR detector, expose the body part with the white line located at the bottom (portrait) or with the white line located to the right of the upper edge that should be positioned at the top of the image field (landscape).

- When exposing in portrait



- When exposing in landscape



#### CAUTION .....

- The white line side faces a patient.

### 3.2.3 Precautions for Exposure

#### High-dose exposure

- When high-dose exposures are performed continuously, afterimages of the last exposure will occasionally be visible. Since the influence of afterimages in this device will be solved by leaving longer intervals between exposures, make the intervals between exposures longer than usual when performing high-dose exposure.
- In high-dose exposure, if you continue to use a marker made of lead in the same position, the afterimage may be burned in. Therefore, avoid using it in the same position. Also, if image burn-in is visible, run gain calibration.

#### Exposure time

- The maximum exposure time for this device is set to 1 second. Even if the exposure time is set to longer than 1 second, reading starts 1 second after X-ray exposure. Therefore, be careful not to set exposure time to longer than 1 second.

## 3.3 • Charging

Charge the AeroDR detector when the battery LED on the AeroDR detector lights or flashes (both blue), or when the battery level gets low in the AeroDR detector status display on the CS-7.

There are two ways to charge the AeroDR detector.



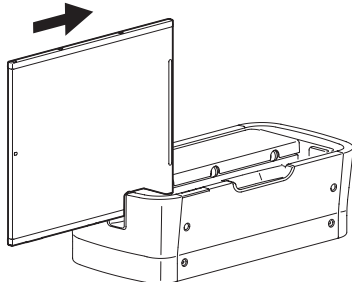
### HINT.....

- Even if you use the battery equipped in this device by repeating quick charge and use, deterioration of battery life is small compared to a lithium-ion battery.

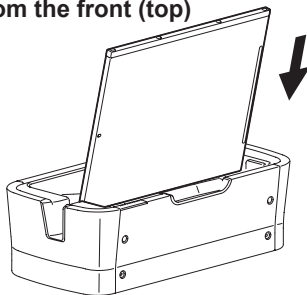
### 3.3.1 Using the AeroDR Battery Charger

- ① First, confirm that the power of the AeroDR battery charger is ON (the status LED of the AeroDR battery charger is slow flashing (green)).
- ② The AeroDR detector will start charging when you insert the AeroDR detector into the AeroDR battery charger all the way until it is fixed with the exposure side of the AeroDR detector facing toward the operator.

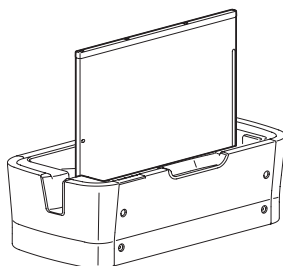
Insert from the side



Insert from the front (top)



Inserted



- ③ Once the AeroDR detector is set correctly and the charging starts, the status LED on the AeroDR battery charger will light (green).
- ④ Once the charging of the AeroDR detector is completed, the battery LED on the AeroDR battery charger will turn off.



### CAUTION .....

- The status LED of the AeroDR detector is not visible when the AeroDR detector is inserted into the AeroDR battery charger.

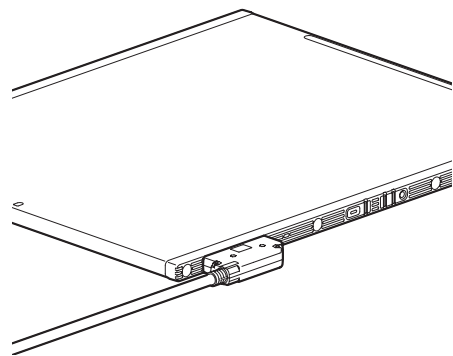


### HINT.....

- It is possible to remove the AeroDR detector before the charging starts or while charging.
- When there is any problem during charging, the error LED on the AeroDR battery charger will light (orange). Also, charging will stop when an error occurs.

### 3.3.2 Using the AeroDR I/F Cable

- ① Confirm that the power of the AeroDR interface unit is ON (the power LED of the AeroDR interface unit lights (green)).
- ② Securely connect the AeroDR I/F Cable to the wired connection connector on the AeroDR detector. Once it is connected, the wired connection is detected and the AeroDR detector will start charging.



- ③ Once the charging of the AeroDR detector is completed, the battery LED on the AeroDR detector will turn off. Once the charging is completed, the power supply will automatically be terminated.
- ④ Following this, intermittent charging is performed to maintain the full charge status of the battery.



### HINT.....

- It is possible to remove the AeroDR I/F Cable before the charging starts or while charging.
- When there is any problem during charging, the busy/error LED on the AeroDR detector will light (orange). Also, charging will stop when an error occurs.

### 3.3.3 Charging Time Guide

Charging status	Charging time of the AeroDR detector when the power is OFF
Using AeroDR battery charger	Max. 30 min
Using AeroDR I/F Cable	Max. 90 min

※When the AeroDR detector is ON, charging time will be slightly longer as it depends on the operation status.

 **CAUTION** .....

- If the AeroDR detector gets hot while charging on the AeroDR battery charger or AeroDR I/F Cable connection, immediately stop the charging. Also, if charging errors occur repeatedly, contact Konica Minolta technical representative.
- The wired connection connector of the AeroDR detector may become warm right after charging on the AeroDR battery charger.

 **HINT** .....

- If you charge the AeroDR detector with the AeroDR battery charger when you do not use it for a long time such as during the night, turn the power switch of the AeroDR interface unit OFF.

### 3.3.4 AeroDR Detector Charging Display

The AeroDR detector battery LEDs change according to the level of battery power.

Remaining battery capacity	LED display
Less than 3% (exposure not possible)	Lit (blue)
Less than 5%	Fast flashing (blue)
Less than 10%	Slow flashing (blue)
10% or more	Off

 **CAUTION** .....

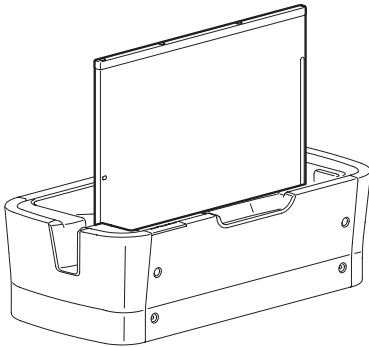
- When the battery runs down completely, all the LEDs go out. Make sure that the status LED (green) either lights or flashes.

## 3.4 • Selection and Registration of AeroDR Detector

By registering the AeroDR detector to the CS-7, it is possible to move it between different radiology rooms.

### 3.4.1 Registering the AeroDR Detector

- 1 Turn the power of the AeroDR detector ON.
- 2 Insert the AeroDR detector into the registration AeroDR battery charger.



- Registration process will start.

- 3 Once the registration is completed, a buzzer will sound on the AeroDR battery charger and the status LED will go from slow flashing to lit (green).



#### HINT.....

- Charging will also start when the AeroDR detector is inserted into the AeroDR battery charger, and the AeroDR battery charger feeding LED will light (blue).



#### CAUTION .....

- Once it is registered in a new radiology room, it will not be usable in the previous radiology room. Perform the registration operation again when returning to a previous radiology room.
- The AeroDR detector cannot be registered with the charging AeroDR battery charger.

- 4 Registration is completed when "Registration completed" is displayed on the CS-7.

### 3.4.2 Selecting the AeroDR Detector

The AeroDR detector to be used is selected as follows depending on the number of registered AeroDR detectors.

Number of registered AeroDR detectors	Selection method
1	AeroDR detector is selected automatically when that AeroDR detector is ready to be selected (there is no problem with the battery, wireless connection, etc.). The AeroDR detector is not selected if it is not inserted into a bucky that matches the order information.
Multiple	The AeroDR detector that was selected immediately beforehand will be selected automatically. Also, if there is an AeroDR detector inserted in the bucky that matches the order information, that AeroDR detector will be selected. If there is no AeroDR detector that matches the order information, no AeroDR detector will be selected.

To change the selected AeroDR detector to another AeroDR detector, turning the selection switch of the AeroDR detector ON enables manual selection.



#### HINT.....

- A selected AeroDR detector will have its status LED lit (green).
- The AeroDR detector can also be selected manually from the CS-7. For details, refer to the "CS-7 Operation Manual".

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## 3.5 • Gain Calibration

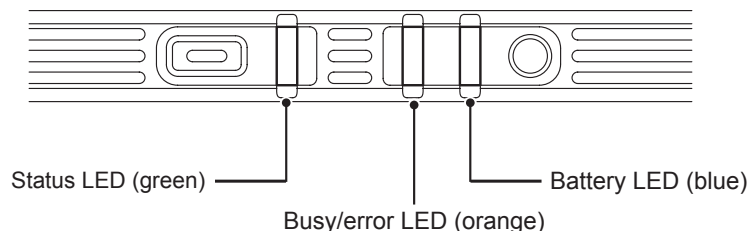
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The AeroDR detector performs the gain calibration to provide the optimum image by adjusting image quality according to the characteristics of X-ray generator device. The correction data obtained by the gain calibration is saved in the system, and is used for exposure. Also, it is necessary to perform the gain calibration periodically to compensate for chronological change or change in the exposure environment.

The gain calibration is performed with the CS-7.

## 3.6 • Status Display

### 3.6.1 AeroDR Detector



Status LED: Green  
 Busy/error LED: Orange  
 Battery LED: Blue

- Slow flashing: Lit for 1 second/off for 1 second
- Fast flashing: Lit for 0.2 seconds/off for 0.2 seconds
- Short flashing: Lit for 0.2 seconds/off for 2 seconds
- -: Changes depending on the situation

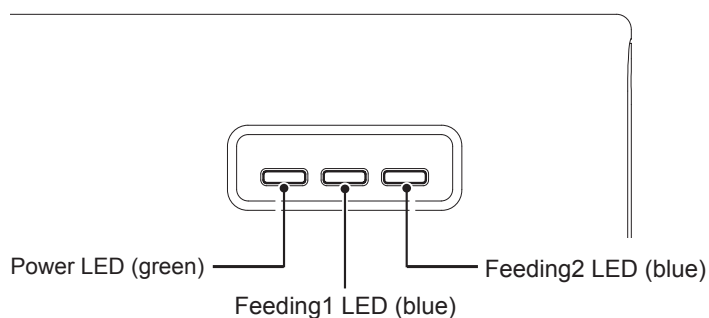
Status		LED type	Lighting (transition) method		
Stopped		Status	Off		
		Busy/error			
		Battery			
Startup processing		Status	Fast flashing ⇒ lit ⇒ lit		
		Busy/error	Off ⇒ fast flashing ⇒ lit		
		Battery	Off ⇒ off ⇒ fast flashing		
Operating	Idling	Not selected/idling			
		Status	Short flashing		
		Busy/error	Off		
	Exposing	Selection by pressing select switch operating ⇒ selected/idling		Status	Fast flashing ⇒ lit
				Busy/error	Off ⇒ off
				Battery	-
		Exposure executing (- Reset)		Status	Lit
				Busy/error	Slow flashing
				Battery	-
	Exposure executing (Charge accumulation - image transfer complete)		Status	Lit	
			Busy/error	Fast flashing	
			Battery	-	
	Communication error occurring (Position correction between access points/recover by cable connection)		Status	Lit	
			Busy/error	Short flashing	
			Battery	-	
	Other	Battery capacity remaining		10% or more	
				Status	-
				Busy/error	-
Less than 10%		Battery	Slow flashing		
		Status	-		
		Busy/error	-		
Less than 5%		Battery	Fast flashing		
		Status	-		
		Busy/error	-		
Less than 3% (exposure not possible)		Battery	Lit		
		Status	-		
		Busy/error	-		
Initialization possibility status when selection switch is pressed to ON for 5 seconds while processing startup		Battery	Lit		
		Status	-		
		Busy/error	-		

Continued on the next page

### 3.6 Status Display

Status	LED type	Lighting (transition) method
Error occurred	Status	–
	Busy/error	Lit
	Battery	–
Processing stop	Status	Lit ⇒ lit ⇒ fast flashing
	Busy/error	Lit ⇒ fast flashing ⇒ off
	Battery	Fast flashing ⇒ off ⇒ off

### 3.6.2 AeroDR Interface Unit

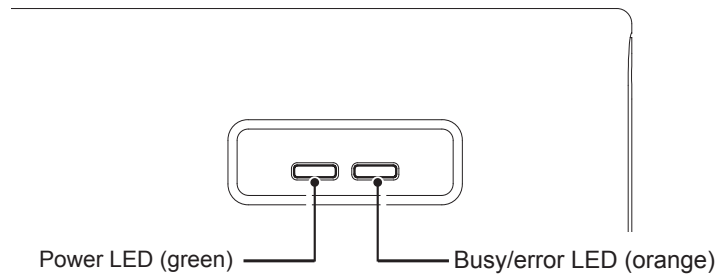


Power LED: Green  
 Feeding1 LED: Blue  
 Feeding2 LED: Blue

Status			LED type	Lighting (transition) method
Stopped			Power	Off
			Feeding1	Off
			Feeding2	Off
Operating	Idling	AeroDR detector not connected	Power	Lit
			Feeding1	Off
			Feeding2	Off
	Exposing	Example of AeroDR detector connection to feeding2	Power	Lit
			Feeding1	Off
			Feeding2	Lit



### 3.6.3 AeroDR Generator Interface Unit

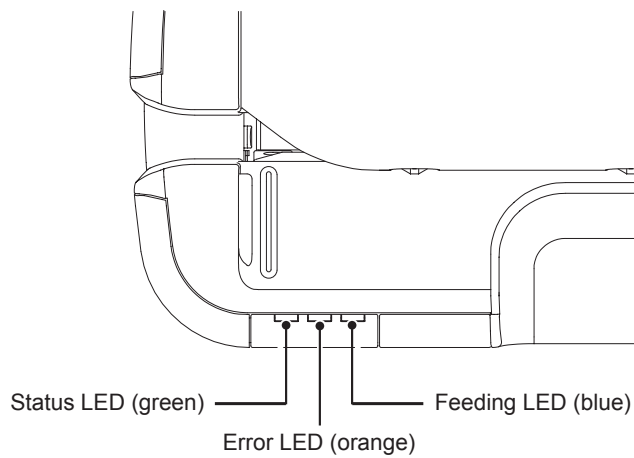


Power LED: Green  
 Busy/error LED: Orange

- Slow flashing: Lit for 1 second/off for 1 second
- Fast flashing: Lit for 0.2 seconds/off for 0.2 seconds
- Short lit: Lit for approx. 0.3 seconds

Status			LED type	Lighting (transition) method
Stopped			Power	Off
			Busy/error	Off
Operating	Idling	CS-7 not connected	Power	Slow flashing
			Busy/error	Off
	CS-7 connected	Power	Lit	
		Busy/error	Off	
	Exposing	Between X-ray operation panel switch pressed - released	Power	Lit
			Busy/error	Fast flashing
Example of X-ray pathway2 usage	Power	Lit		
	Busy/error	Fast flashing		
Error occurred			Power	Lit
			Busy/error	Lit

### 3.6.4 AeroDR Battery Charger



Status LED: Green  
 Error LED: Orange  
 Feeding LED: Blue

•Slow flashing: Lit for 1 second/off for 1 second  
 •–: Changes depending on the situation

Status			LED type	Lighting (transition) method
Stopped			Status	Off
			Error	Off
			Feeding	Off
Operating	Idling	AeroDR detector not inserted	Status	Slow flashing
			Error	Off
			Feeding	Off
		After successful registration process by insertion of AeroDR detector & charging ⇒ charged	Status	Lit ⇒ lit
			Error	Off ⇒ off
			Feeding	Lit ⇒ off
Error occurred			Status	–
			Error	Lit
			Feeding	–

# Chapter 4

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## Troubleshooting

This chapter describes the corrective actions for the errors and lists the error messages.

## 4.1 • Error Display and Solutions

If an error message or warning appears on the CS-7, take the appropriate measures as described in the following tables.

Error code	CS-7	Meaning	Corrective actions
F0007	ERROR	Abnormally high internal temperature of FPD	Turn off the device, and contact service personnel.
F0016	ERROR	Abnormally high temperature of electrical component temperature sensor 1	Turn off the device, and contact service personnel.
F00B0	ERROR	Exposure command detection error	Turn off the device, and contact service personnel.
F00B1	ERROR	Exposure command timeout error	If this error message reappears after restarting and performing exposure operations again, contact service personnel.
F00B2	ERROR	Exposure completion timeout error	Turn off the device, and contact service personnel.
F00B3	WARNING	Exposure request timeout error	Release exposure switches 1 and 2, and press again.
F00B4	WARNING	Exposure preparation cancellation timeout error	Release exposure switch 1.
F00B5	WARNING	Exposure request cancellation timeout error	Release exposure switch 2.
F00B7	ERROR	EXPOSE-REQ-I signal error	Contact service personnel.
F00B8	ERROR	XRAY-ok-EN signal error	Contact service personnel.
F00B9	ERROR	XRAY-ok signal ON error	Contact service personnel.
F00BA	ERROR	XRAY-ok signal OFF error ①	Contact service personnel.
F00BB	ERROR	XRAY-ok signal OFF error ②	Contact service personnel.
F00BC	ERROR	XRAY-ok signal OFF error ③	Contact service personnel.
F00BD	ERROR	XRAY-ok signal OFF error ④	Contact service personnel.
F00BE	ERROR	XRAY-ok signal OFF error ⑤	Contact service personnel.
F00BF	ERROR	XRAY-ready long-term ON error	Contact service personnel.
F00C0	ERROR	XRAY-start long-term ON error	Contact service personnel.
F1001	ERROR	FPD connection error	Restart the device.
F1002	WARNING	Defective data error	Contact service personnel.
F1003	WARNING	Gain calibration data error	Perform gain calibration.
F1004	ERROR	Offset calibration failure	Restart the device.
F1005	ERROR	Gain calibration failure	Restart the device.
F1006	ERROR	Exposure failure	Restart the device.
F1007	ERROR	Image acquisition failure	Restart the device.
F1099	ERROR	FPD internal processing error	Restart the device.

<b>Error code</b>	<b>CS-7</b>	<b>Meaning</b>	<b>Corrective actions</b>
F2001	ERROR	Internal communication error	Contact service personnel.
F2002	ERROR	Internal communication error	Contact service personnel.
F2003	ERROR	Internal communication error	Contact service personnel.
F2004	ERROR	Internal communication error	Contact service personnel.
F204D	WARNING	Cannot perform exposure because the exposure stage is operating.	Discontinue operation of the exposure stage.
F2056	ERROR	Internal communication error	Contact service personnel.
F2058	ERROR	Error preventing cancellation of self-test mode	Restart the device.
F3001	No display	Cannot connect to CS-7 (not including at startup), or a disconnection is detected.	If this warning message appears with CS-7 turned on, contact service personnel.
F3002	No display	A connection can be established with CS-7, but data cannot be sent or received.	Restart the device.
F4004	WARNING	Gain calibration data usage period has expired.	Perform gain calibration.
F5001	WARNING	FPD temperature sensor error	Contact service personnel.
F5011	WARNING	Exposure error (exposure completion timeout error)	Turn off the device, and contact service personnel.

## 4.2 • Action to Be Taken When AeroDR Detector Is Malfunctioning

When the exterior or protective cover is damaged extensively, or in the event of the AeroDR detector being dropped or having shock applied to it, contact Konica Minolta technical representative.

## 4.3 • Fixing Problems

### 4.3.1 Phenomena or Conditions That Could Be Malfunctions

The product may be malfunctioning if any of the following conditions are applicable. Contact the service personnel to check the corrective action.

Problem	Cause
It is not getting charged even with the AeroDR I/F Cable connected.	If this occurs repeatedly, it could be due to improper contact of the wired connection connector or connection detection function malfunction.
The color of the shock sensor attached to side of the AeroDR detector has changed to red.	Excessive shock may have been applied to the body.
The AeroDR detector is deformed, which can be checked by placing it on a flat surface and seeing if it does not lay flat.	A problem may have occurred with the installed battery.

### 4.3.2 Conditions That Are Not Malfunctions (Corrective Actions)

The following conditions are not indicative of a malfunction in the product. Take the appropriate corrective action according to the description.

Problem	Cause
The connector is warm right after it is charged on a AeroDR battery charger.	This is caused by charging and is not a malfunction.
Charging takes longer when the battery is over discharged.	The power source computer takes time to boot. Please wait.
Usage time with the battery has gotten shorter, the number of images that can be exposed has decreased, or the charging time has gotten shorter.	It could be that the charging function of the battery has deteriorated. Due to its design, the battery capacity will decrease approximately 60% in 7 years with an average charging of 10 times per day. It can be replaced with a new battery for a fee if necessary.
When using wireless communication, it does not connect, wireless communication terminates, or exposure cycle time becomes extended.	It is the effect of the wireless communication environment, and not a malfunction. However, if the performance has declined drastically from the time of installation, it is possible that the installation environment has changed. Contact Konica Minolta technical representatives.



#### HINT .....

Problems with a wireless environment can occur in the following conditions:

- Installed location of the AeroDR Access Point is not good.
- When inserted in the bucky or stretcher, the opening in the bucky is too small and there is no passage for the radio waves.
- The radio waves are not emitted due to metal parts close to the antenna, which changes the antenna characteristics.
- For exposures where the body touches the AeroDR detector directly, the radio waves are not emitted if the body completely covers the antenna.
- Other devices use the same radio band, and cause interference.

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# Chapter 5

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## Maintenance

This chapter describes the maintenance and inspection items required to use this device safely.

## 5.1 • Maintenance and Inspection Items

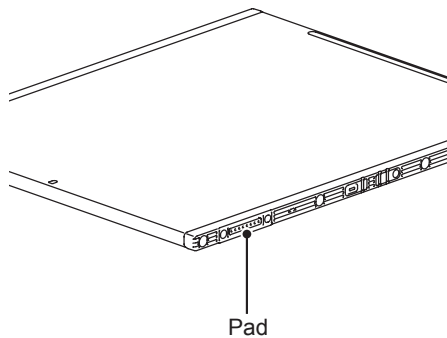
This describes the corrective actions to take in the event of a malfunction and cleaning required in order to maintain the use of this device in an optimum condition.

### 5.1.1 Maintenance Work of the Device

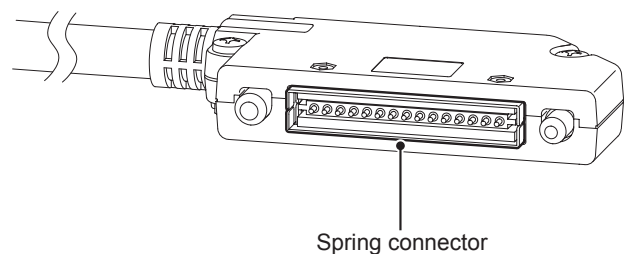
To ensure optimum use of this device, be sure to perform the weekly maintenance.

Maintenance task	Maintenance period	Corrective actions
Checking and cleaning the surface contamination of the AeroDR detector	Weekly	Clean with soft cloth damped with a small amount of absolute ethanol.
Checking for external damage of the AeroDR detector	Weekly	If the damage is extensive, stop use and ask for replacement of the damaged parts.
Checking for warping of the AeroDR detector	Weekly	If the warping is extensive, stop use and ask for replacement of the damaged parts.
Cleaning the spring connectors of the AeroDR I/F Cable and AeroDR UF Cable	Weekly	If foreign material has adhered, remove it with the dedicated brush or a commercial plastic brush (toothbrush).
Cleaning the pads of the AeroDR detector and AeroDR UF Cable	Weekly	If foreign material has adhered, remove it with the dedicated brush or a commercial plastic brush (toothbrush).
Cleaning the AeroDR battery charger	Weekly	Remove dirt with the dedicated brush.
Gain calibration	Every 6 months	Perform on the CS-7.

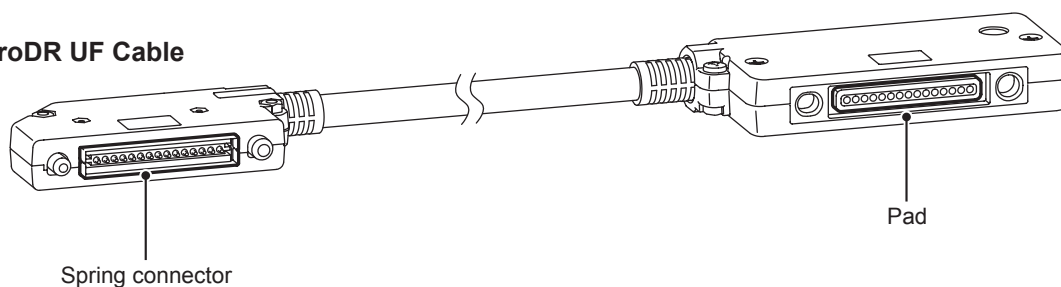
**AeroDR Detector**



**AeroDR I/F Cable**



**AeroDR UF Cable**

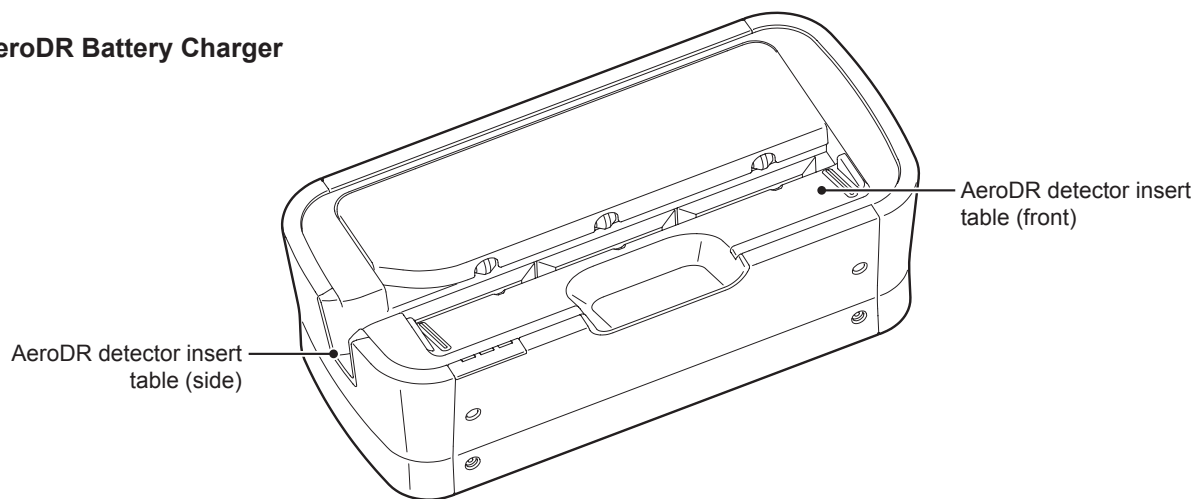




## 5.1.2 Cleaning

1. If bodily fluid or the blood of a patient has contaminated the surface of the AeroDR detector, clean it with a soft lint-free cloth dampened with a small amount of anhydrous ethanol and wrung well.
2. When cleaning the AeroDR detector to sterilize it, use ethanol for disinfection, isopropanol for disinfection, or hypochlorite solution.
3. To clean the gap between the exterior of the AeroDR detector and the protective cover, remove the dirt using a brush.
4. Remove dust on the insert table of the AeroDR battery charger periodically with a soft cloth moistened with alcohol or water.

### AeroDR Battery Charger



#### CAUTION

- Be careful not to apply any cleaning chemical or liquid onto the spring connector of the AeroDR I/F Cable, the pads of the AeroDR detector, or AeroDR UF Cable, and the LED operation panel.
- Do not clean with sharp or hard metal objects. If you cannot remove stains, contact Konica Minolta technical representatives.

## 5.1.3 Replacement Parts

The AeroDR I/F Cable and charging connector in the AeroDR battery charger are to be replaced periodically. Also, wear and deformation of the protective cover will occur to the AeroDR detector due to the way it is handled. The protective cover can be replaced when the damage becomes extensive, so contact Konica Minolta technical representative.

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# Appendix

This appendix describes the specifications of this device.







## Specifications

Item	Description
Product name (model name)	Premium: AeroDR 1417HQ (AeroDR P-11) Standard: AeroDR 1417S (AeroDR P-12)
Type	Portable flat panel detector based on amorphous silicon (a-Si)
Scintillator	CsI (Cesium Iodine) Premium or Standard efficiency
External size	384.2 (w) X 460.2 (d) X 15.9 (h) mm ※ Equivalent to standard 14" X 17" cassette
Weight	2.9 kg
Pixel pitch	175 um
Image filed size	-14" X 17"
Maximum patient weight	Withstands 100 kg circular concentrated weight , 80 mm in diameter
Power/communications tether	Possible
WLAN standard	WLAN standard IEEE 802.11a
WLAN encryption	Default AES encryption
Dynamic range	Quadruple digits
Image previews	3 seconds
Cycle time	15 seconds or less
Battery charging time empty to full	30 minutes with battery charger
Battery operating time	2 hours typ. at 60 images/hour
Battery expected lifetime	6 years (10000 charge/discharge cycles)
Power consumption	Approx. 284 KJ/H (284 KJ/H stand-by) @100V Approx. 299 KJ/H (299 KJ/H stand-by) @120V Approx. 265 KJ/H (265 KJ/H stand-by) @230V ※ When the AeroDR detector is connected to the AeroDR interface unit.
Classification	Safety Class I

Item	Description
Product name (model name)	AeroDR battery charger (AeroDR D-1)
Battery charging	Automatic charging in battery charger
Power requirements	AC 100/110/115/120/220/230/240 V Power, single phase 50/60 Hz
Power consumption	Approx. 237 KJ/H (10 KJ/H stand-by) @100V Approx. 236 KJ/H (10 KJ/H stand-by) @120V Approx. 241 KJ/H (11 KJ/H stand-by) @230V
External size	604 (w) X 322 (d) X 192 (h) mm
Weight	15 kg

Item	Description
Product name (model name)	AeroDR interface unit (AeroDR B-1)
AeroDR detector connections	Up to two (Wired) Up to four (Wireless) ※ Optional AeroDR Access Point required
Synchronization of x-ray and the AeroDR detector activation	Available
Power requirements	AC 100/110/115/120/220/230/240 V VAC Power, single phase 50/60 Hz
Power consumption	112 KJ/H (112 KJ/H stand-by) @100V 117 KJ/H (117 KJ/H stand-by) @120V 116 KJ/H (116 KJ/H stand-by) @230V ※ When no other unit is connected.
External size	460 (w) X 180 (d) X 285 (h) mm
Weight	12 kg

Item	Description
Product name (model name)	AeroDR generator interface unit (AeroDR X-1)
External size	460 (w) X 180 (d) X 285 (h) mm
Weight	10 kg

Item	Description				
Environment	<table border="1"> <thead> <tr> <th>Temperature</th> <th>Humidity</th> </tr> </thead> <tbody> <tr> <td>10 to 30 °C degrees </td> <td>35 to 80% RH </td> </tr> </tbody> </table>	Temperature	Humidity	10 to 30 °C degrees 	35 to 80% RH 
Temperature	Humidity				
10 to 30 °C degrees 	35 to 80% RH 				







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