



KONICA MINOLTA

DIRECT DIGITIZER

# *AeroDR* SYSTEM *AeroDR* SYSTEM 2

Operation Manual



CE 0197 CE Ⓢ



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EN

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# Introduction

# Introduction

The digital radiography AeroDR SYSTEM and AeroDR SYSTEM 2 (hereinafter, both are referred to as this device) perform 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 acquired image is then transmitted to a filing system, printer, and image display device as diagnostic image data.

- Diagnostic X-ray image data of this device does not provide mammographic images.
- This device is also used for carrying out exposures on children.

There are 4 types of X-ray planar detectors for the AeroDR SYSTEM: AeroDR 1417HQ (AeroDR P-11), AeroDR 1417S (AeroDR P-12), AeroDR 1717HQ (AeroDR P-21) and AeroDR 1012HQ (AeroDR P-31), and connection is made by either wireless or wired connection.

There are 2 types of X-ray planar detectors for the AeroDR SYSTEM 2: AeroDR 2 1417HQ (AeroDR P-51) and AeroDR 2 1417S (AeroDR P-52), and connection is made by either wireless or wired connection.

The DIRECT DIGITIZER CS-7 or ImagePilot (hereafter referred to as the image processing controller), which controls the receiving, processing, and output of image data, is required for operation. For the operation of the image processing controller, refer to the "Operation Manual" of the image processing controller.

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 it with a new one. (There is a fee for this service.)**
- \* **The illustrations in this manual use the AeroDR 2 1417HQ (AeroDR P-51) and AeroDR Battery Charger2 as the example.**



- **This Operation Manual is common to both the digital radiography AeroDR SYSTEM and digital radiography AeroDR SYSTEM 2.**
- **The following shows the meanings of terms used in this operation manual.**
  - **This device or not specified: Indicates both the digital radiography AeroDR SYSTEM and digital radiography AeroDR SYSTEM 2.**
  - **AeroDR SYSTEM: Indicates the digital radiography AeroDR SYSTEM.**
  - **AeroDR SYSTEM 2: Indicates the digital radiography AeroDR SYSTEM 2.**

## Indications for Use

The AeroDR SYSTEM is indicated for use in generating radiographic images of human anatomy. It is intended to replace radiographic film/screen systems in general-purpose diagnostic procedures.

<Only for USA>

The AeroDR SYSTEM with P31 is not indicated for use in mammography, fluoroscopy, tomography and angiography applications.



**Federal law restricts this device to sale by or on the order of a physician.**

## Summary of usability specifications (for IEC/EN 60601-1-6, IEC/EN 62366)

- 1) Medical purposes
  - Provision and reading of disease and injury diagnostic images.
- 2) Patient groups
  - No patient population exists who uses the device.
  - Patient population for the X-ray images read is not specified.
- 3) Parts of body or organizations to which the device is mounted or that interact with the device.
  - AeroDR Detector contacts the body surface of a patient.
  - AeroDR Interface Unit, AeroDR Interface Unit2, AeroDR Battery Charger and AeroDR Battery Charger2 contact the body surface of an operator.
- 4) Operating principle
  - AeroDR Detector forms the still images according to the X-ray energy passing through the human and animal body; after digitizing the exposed image, it is transmitted to the console (the image processing controller) with wired communication or wireless communication.
  - AeroDR Interface Unit and AeroDR Interface Unit2 supply the power to AeroDR Detector, AeroDR Generator Interface Unit, AeroDR Generator Interface Unit2, and access point (radio communication device). It also relays wired communication.
  - AeroDR Interface Unit2, AeroDR Generator Interface Unit or AeroDR Generator Interface Unit2 interfaces with an X-ray device.
  - Access point (radio communication device) performs a wireless communication with AeroDR Detector.
  - The console (the image processing controller) processes the image data into the diagnostic image, and then stores and outputs the images added with the patient information.
  - The AeroDR Battery Charger and AeroDR Battery Charger2 charge the AeroDR Detector. It registers the using AeroDR Detector with the exposure room.
- 5) Significant physical characteristics
  - Refer to "7.1 Specifications".
- 6) Significant performance characteristics
  - Refer to "2.1 Overview of this device".
- 7) User of this device
  - No special training is required to use this device. The intended users of this device are as follows.  
A professional in good health with specialist knowledge/qualifications who has fully understood the content of this document. (Such as a doctor or radiological technologist)

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## Name correspondence table

Product name (Operation Manual name)		Model name (nameplate name)
AeroDR Detector	AeroDR 1417HQ	AeroDR P-11
	AeroDR 1417S	AeroDR P-12
	AeroDR 1717HQ	AeroDR P-21
	AeroDR 1012HQ	AeroDR P-31
	AeroDR 2 1417HQ	AeroDR P-51
	AeroDR 2 1417S	AeroDR P-52
AeroDR Interface Unit		AeroDR B-1
AeroDR Interface Unit2		AeroDR Interface Unit2
AeroDR Generator Interface Unit		AeroDR X-1
AeroDR Generator Interface Unit2		AeroDR Generator Interface Unit2
AeroDR Battery Charger		AeroDR D-1
AeroDR Battery Charger2		AeroDR Battery Charger2
AeroDR Access Point		AeroDR C-1

## Term description

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

Terms	Explanation
AeroDR Detector	Collective term indicating AeroDR 1417HQ, AeroDR 1417S, AeroDR 1717HQ, AeroDR 1012HQ, AeroDR 2 1417HQ and AeroDR 2 1417S.
Image processing controller	The image processing workstation (CS-7 or ImagePilot) is referred to as the image processing controller.
Calibration	Processing for calibrating the characteristics of the AeroDR Detector for each pixel.
PoE	An abbreviation for Power over Ethernet. Provides power using an Ethernet cable.
Wired cable	Collective term indicating AeroDR I/F Cable and AeroDR UF Cable.
Aero Sync	This is a mode in which exposure is performed without being synchronized with the X-ray device.
Access Point	Collective term indicating the AeroDR Access Point and general-purpose access points. The AeroDR Access Point 2 is included.
AeroDR I/F Cable	Collective term indicating the AeroDR I/F Cable (10/20m) and AeroDR I/F Cable2 (10/20m).

## Structure of pages

**Example of page structure**

**(1) 1.1 • Operation of AeroDR Detector**

**1.1.1 Exposure**

Exposure with this device is performed with the following procedure.

**(2) 1 Perform examination registration with the image processing controller.**

**2 Check that this device is ready to expose images, and then prepare for the exposure.**

**3 Push the exposure switch of the X-ray device to perform the exposure.**

- When the exposure is completed, images are stored in the AeroDR Detector and will then be converted to digital data and sent to the image processing controller sequentially.

**4 Check that the exposed image is displayed on the image processing controller.**

**(3) HINT**

- If the AeroDR Detector remains unused for a long time it transitions to the sleep mode.
- When the image processing controller is ready to expose, it recovers from the sleep mode.

**(4) Reference**

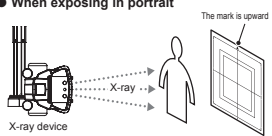
- Regarding the operation of the image processing controller, refer to the "Operation Manual" of the image processing controller.

**1.1.2 AeroDR Detector orientation**

Change the orientation of the AeroDR Detector according to the exposure body part.  
Expose with the mark upward when exposing in portrait, and with the mark to the side when exposing in landscape.

**• When exposing in portrait**

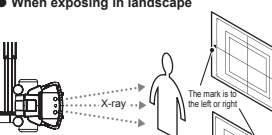
The mark is upward



X-ray device

**• When exposing in landscape**

The mark is to the left or right






X-ray device

**(5) IMPORTANT**

- The side with the mark is the exposure surface.
- When exposing in landscape, the direction of the mark is set according to exposure environment.

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Number	Item	Description	Icon
(1)	Item heading	Describes the titles of described content.	-
(2)	Operation procedure	The operating procedure is described in sequential numerical steps.	-
(3)	Hint	Describes important information.	 HINT
(4)	Reference	Describes reference items. Refer to these as necessary.	 Reference
(5)	Important items	Describes the important items for operation. Be sure to read them.	 IMPORTANT

# Chapter 1

---

## Safety Precautions & Warnings

This chapter describes precautions and warnings  
to ensure safe use of this device.

## 1.1 • Symbols relating to safety

### 1.1.1 Safety alert symbol



This is a "safety alert symbol". This symbol alerts you to matters and/or operation potentially hazardous to yourself and other people. Read these messages and follow the instructions carefully.

### 1.1.2 Warning notice (signal words)

Signal words indicate the degree of potential hazards in the use of the product.

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 not avoided, will result in death or serious injury.



**WARNING**

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



**CAUTION**

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

### 1.1.3 Description of graphic symbols



Indicates the on or standby position for the power switch of this device.



Indicates the off position for the main power switch of this device.



Indicates the on position for the main power switch of this device.



Indicates the position where the ground is attached.



Indicates a B-type Applied Parts medical device.



Indicates that full caution is required when handling this device.



Indicates that it is necessary to read the User's Manual before use or operation of this device.



Indicates devices including radio frequency transmitters.

**IPX6**

Indicates that the level of water ingress protection is equivalent to IPX6.

This CE mark on this product indicates that this product is in conformity with the applicable requirements set out in the Directive 93/42/EEC (Medical Device Directive) and in Directive 2011/65/EU (RoHS Directive).

**CE 0197**

0197 indicates the identification number of the notified body responsible only for implementation of the Directive 93/42/EEC (Medical Device Directive).

EC Directive 93/42/EEC does not cover animal use. So, the notified body whose identification number is 0197 is not responsible for animal use.

**CE**

It means conformity with the Radio Equipment and Telecommunications Terminal Equipment Directive 1999/5/EC. And the alert sign (!) means that is categorized Class 2 radio equipment.

## 1.2 • Warning labels

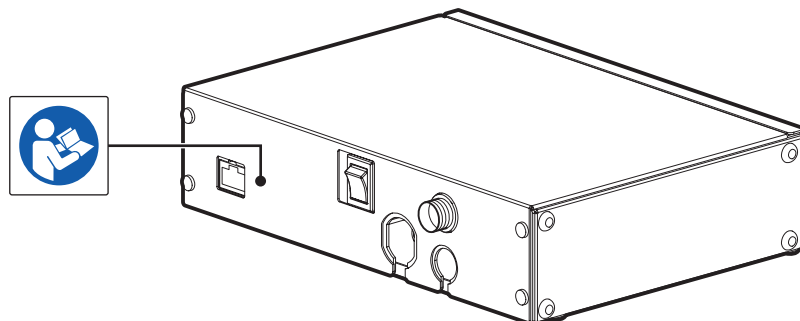
Various warning labels are attached to this device on the locations shown below. Do not remove these labels from this device. Warning labels are there to make sure that the user recognizes potential hazards when operating this device.

- \* If a warning label is too dirty or damaged to read, contact Konica Minolta technical representatives to have a new warning label attached, and redisplay by parts replacement. (There is a fee for this service.)

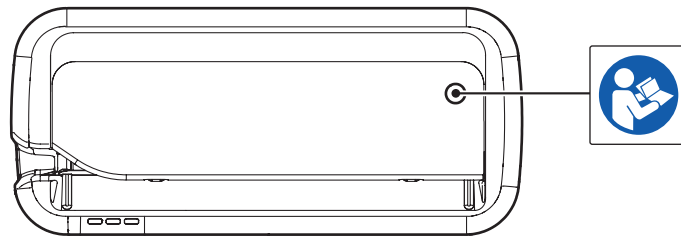
### 1.2.1 AeroDR Detector



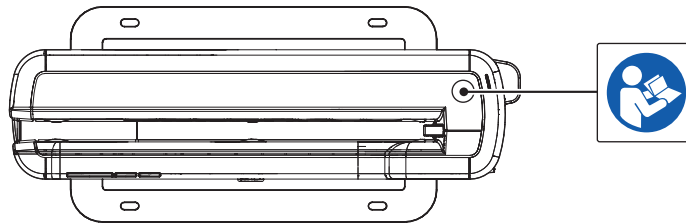
### 1.2.2 AeroDR Generator Interface Unit2



### 1.2.3 AeroDR Battery Charger



### 1.2.4 AeroDR Battery Charger2



## 1.3 • Safety precautions

Read all safety precautions thoroughly before using this device.

Be sure to observe the safety precautions described in this section.

### 1.3.1 Precautions before usage

#### CAUTION

- The operators (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.
- This device excluding the image processing controller is suitable for use in the patient environment. (PC used for the image processing controller is not suitable for use in the patient environment.)
- Confirm that this device is operating normally before using.
- 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 representatives.
- 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.



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

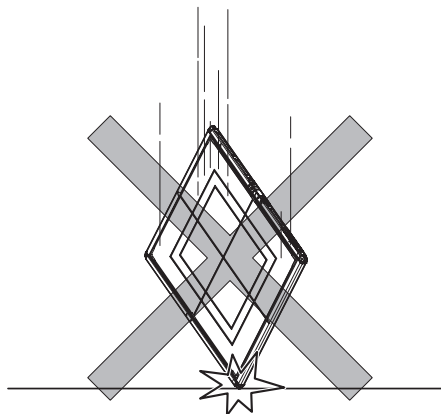
Please refer to the information of your local community or contact our dealers regarding the proper handling of end-of-life electric and electronic equipments.

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.

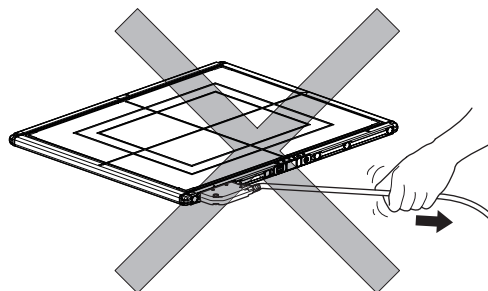
### 1.3.2 Precautions for usage

#### WARNING

- The AeroDR Detector is a precision instrument. If it is dropped or hit against any object, a failure may occur due to strong impact or excessive load.
- Take note of the following when using this device:
  - Do not subject the AeroDR Detector to strong shocks or excessive loads by dropping it, etc.



- Do not exceed the specified overall load range when applying a load to an AeroDR Detector.
- 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 on your feet.
- Do not lean on or put pressure on the AeroDR Battery Charger installed on a wall.
- The AeroDR I/F Cable and AeroDR UF Cable are connected to the AeroDR Detector using magnetic force. When moving the AeroDR Detector, do not hold onto the cable, and always hold on the AeroDR Detector. Also, do not grasp and pull the AeroDR Detector forcefully.



**! WARNING**

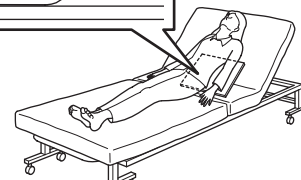
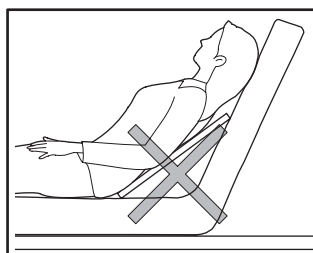
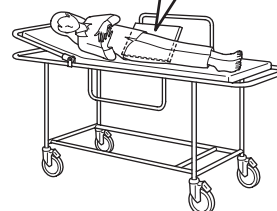
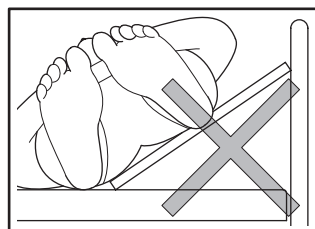
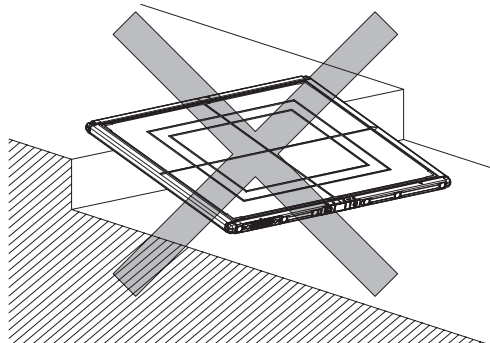
- If there is any smoke, odor, or abnormal sound, it may cause a fire if use is continued, so immediately turn the power switch off, unplug the power plug from the wall outlet, and contact Konica Minolta technical representatives.
- Take note of the following to reduce the risk of fire, electric shock, or electrical leakage:
  - Use specified cables for the power cable, etc.
  - Use a wall outlet with the correct rating as a power source.
  - Confirm that the power plug is properly connected to the wall outlet without any slack.
  - Use a grounded power source.
  - If you do not plan to use this device for an extended period of time, unplug the power plug.
  - The supplied power cable and AC adapter are 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 wire, does not get inside.
  - Do not allow any metal or conductive objects to come into contact with the spring connector of the AeroDR Battery Charger2, AeroDR I/F Cable or AeroDR UF Cable.
  - Do not handle the power plug with wet hands.
  - Do not let soil or dust accumulate on the power plug, AeroDR Battery Charger2, AeroDR I/F Cable or AeroDR UF Cable.
  - Do not use extension cords.
  - Do not connect many plugs to a single electrical outlet.
  - Do not damage the power cable, AC adapter, AeroDR I/F Cable, or AeroDR UF Cable. Also, do not use damaged cables.
  - Do not block the ventilation openings.
- 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**

- Take note of the following when using this device:
  - Do not use devices that emit electromagnetic waves such as high-frequency therapy equipment, 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.
  - Use under the specified environmental conditions. Failure to do so may result in degradation of performance or malfunction.
  - Limit the duration of continuous use of the AeroDR 1012HQ in a hot and humid environment (35 to 37°C/95% or lower) in an incubator to 25 minutes or less.
  - Do not insert the AeroDR 1012HQ into the AeroDR Battery Charger because the charger cannot be used for registration or charging the battery.
  - Note that the AeroDR Battery Charger cannot charge the AeroDR 2 1417S.

**! CAUTION**

- Take the following notes when using the AeroDR Detector:
  - Use the AeroDR Detector on a flat base. If the AeroDR Detector is placed on a sloping surface and subjected to a load, its internal sensor may be damaged.

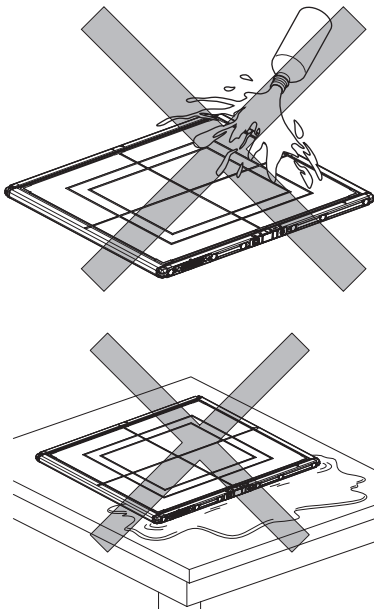


- When laying the patient onto the AeroDR Detector during positioning, do so very slowly.
- When placing the AeroDR Detector under the patient as part of the exposure process, insert and pull out the detector slowly.
- Use the recommended adapter when you need to perform exposure on a stretcher or a place where load is to be applied locally.



 **CAUTION**

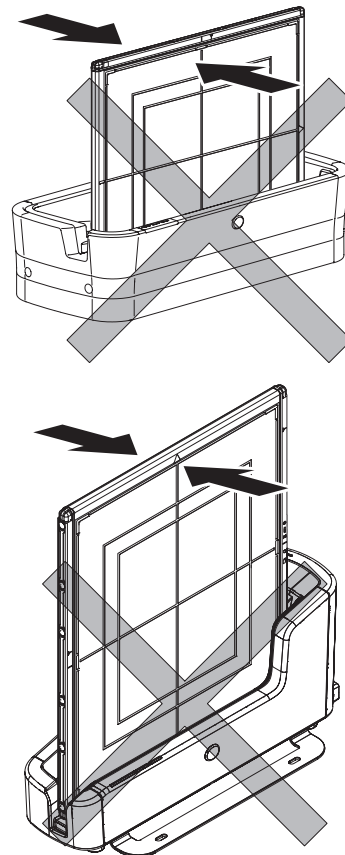
- Exposing or immersing the AeroDR Detector to patient body fluids, chemicals, water, etc. may allow such liquids to enter through exterior gaps and cause a failure. Make sure to cover the AeroDR Detector with a vinyl sheet, etc.
- Be careful of the ingress of patient body fluids, chemicals, water, etc., because the AeroDR 1417HQ, AeroDR 1417S, AeroDR 1717HQ, and AeroDR 1012HQ are not designed to be waterproof.
- The AeroDR 2 1417HQ and AeroDR 2 1417S are designed to have waterproof capabilities, but be careful when handling them because they are not guaranteed to be completely waterproof. Also, be careful because subjecting them to strong impacts or excessive loads by dropping or hitting them against other objects may diminish their waterproof capabilities.



- Never leave AeroDR Detectors in hot and humid environments for long periods of time.
- The AeroDR Detector has wireless antennae positioned at 2 places. Do not block them with the body or metal because that will interfere with, disconnect or slow down wireless communication.
- 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.
- The battery capacity is designed to allow the life period calculated based on the standard usage of the AeroDR Detector. It can be replaced with a new battery for a fee if replacement is necessary after the warranty period due to battery breakdown or decrease in capacity.

 **CAUTION**

- Check that the buzzer sounds when mounted on the AeroDR Battery Charger or AeroDR Battery Charger2.
- Check that the LED indicates recharging status when the AeroDR 1417HQ, AeroDR 2 1417S, AeroDR 1717HQ, or AeroDR 2 1417HQ is mounted on the AeroDR Battery Charger.
- Check that the LED indicates recharging status when mounted on the AeroDR Battery Charger2.
- Be careful not to get your hand caught when setting the AeroDR Detector into the AeroDR Battery Charger or AeroDR Battery Charger2.
- If the AeroDR Detector is inserted into the AeroDR Battery Charger or AeroDR Battery Charger2, make sure that the AeroDR Battery Charger or AeroDR Battery Charger2 will not tip over due to any shock applied to the AeroDR Detector.



- The AeroDR Detector is precision equipment, and therefore impact or vibration during radiography or image transfer may affect the image quality. Be careful when handling the AeroDR Detector during and just after radiography.



**CAUTION**

- Never leave AeroDR Detectors around heat generators such as electric carpet.
- Do not damage or deform the AeroDR Detector; doing so may have an effect on exposed images, or lead to injury.
- Do not use a sharp object to operate the switch; doing so may damage the AeroDR 2 1417HQ and AeroDR 2 1417S.
- When using a tool to affix the AeroDR Grip sheet or perform replacement, be careful not to get injured by a tip or edge of the tool.
- When using the AeroDR I/F Cable or AeroDR UF 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 backwards.
- Do not sit on or put your feet on the AeroDR Battery Charger or AeroDR Battery Charger2.
- Take note of the following if 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.
- When the AeroDR Detector is used for exposure, pay attention to the following items.
  - Start exposure after confirming on the display of the image processing controller that the machine is ready for exposure.
  - Perform exposure under the X-ray imaging conditions that has been confirmed by us.
  - Use the specified grid to perform exposure.
  - Apply the specified operation methods to use the grid.
  - Do not let the AeroDR Detector vibrate or receive shock until the preview image is displayed.



**CAUTION**

- Precautions when performing exposure in Aero Sync mode.
  - Confirm that the image processing controller is ready for exposure through its display before performing exposure.
  - Confirm that a confirmation is sounded from the image processing controller after the start of exposure.
  - Do not let the AeroDR Detector vibrate or receive shock until the preview image is displayed.
  - Confirm that the AeroDR Detector's battery level is full before performing exposure.
  - Use the system under the exposure condition confirmed prior to exposure.
- If there are any radioactive substances remaining in the patient's body after nuclear medicine testing or some other reason, the AeroDR 2 1417HQ and the AeroDR 2 1417S may recognize that X-rays were emitted and start image transfer. When the image is transferred, change the X-ray sensitive setting of the image processing controller to "High" before performing exposure.
 

If you change the X-ray sensitivity to "High", make sure that all of the following conditions are met before performing exposure. If you perform exposure under other conditions, you may not be able to get an image.

  - On the AeroDR Detector, set up an area (2 cm x 2 cm or larger) on which the X-rays are emitted directly.
  - Emit the X-rays onto the entire AeroDR Detector.
  - Emit the X-rays by using a tube current of 140 mA or higher or a tube voltage of 90 kV or higher.
- When setting the maximum exposure time to 4.0, 6.7, 10.3, be sure to contact Konica Minolta technical representatives.

### 1.3.3 Precautions regarding electromagnetic waves

#### ● EMC Statement

This device has been tested and found to comply with the limits for medical devices in 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 its vicinity. However, there is no guarantee that interference will not occur in a particular installation.

Whether this device does cause harmful interference to other devices can be determined by turning this device off and on. If it causes harmful interference, the user is encouraged to try to correct the interference by 1 or more of the following measures:

- Reorient or relocate the receiving device.
- Increase the separation between the devices.
- Connect this device into a wall 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
  - Power cable (3.048m/3-Wire/No Shielding)
  - Ethernet cable (max 100m/100 BASE-TX)
  - Ethernet cable (PoE) (30m/No Shielding)
  - Various AeroDR I/F Cables
  - Various AeroDR UF Cables
  - AeroDR Collimator Cable Set
  - Various AeroDR XG Cable Sets
- (4) The use of accessories, transducers and cables other than those sold by Konica Minolta, Inc. as internal components, may result in increased emissions or decreased electromagnetic 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:
  - Frequency
    - AeroDR SYSTEM: 5150 to 5350MHz, 5470 to 5850MHz
    - AeroDR SYSTEM 2: 2412 to 2472MHz, 5180 to 5320MHz, 5500 to 5825MHz
  - Modulation
    - AeroDR SYSTEM: OFDM
    - AeroDR SYSTEM 2: 2412 to 2472MHz: DSSS/CCK/OFDM, 5180 to 5320MHz, 5500 to 5825MHz: OFDM
  - Maximum effective radiation power
    - AeroDR SYSTEM: +15dBm
    - AeroDR SYSTEM 2: +10dBm
  - This device may be interfered with by other devices that conform to CISPR emission requirements.

### 1.3 Safety precautions

**Table 1**


Guidelines and manufacture's declaration - electromagnetic emissions		
This device is intended for use in the electromagnetic environment specified below. The customer or the user of this device should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidelines
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	This device is suitable for use in all establishments including the following: Domestic establishments 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**

Guidelines and manufacturer's declaration - electromagnetic immunity			
This device is intended for use in the electromagnetic environment specified below. The customer or the user of this device should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidelines
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact	± 6 kV 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.
	± 8 kV air	± 8 kV air	
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines	± 2 kV for power supply lines	
	± 1 kV for input/output lines	± 1 kV for input/output lines	
Surge IEC 61000-4-5	± 1 kV differential mode	± 1 kV differential mode	Mains power quality should be that of a typical commercial or hospital environment.
	± 2 kV common mode	± 2 kV common mode	
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<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 IEC 61000-4-8	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 AC mains voltage prior to application of the test level.

Table 3

Guidelines and manufacturer's declaration - electromagnetic immunity			
This device is intended for use in the electromagnetic environment specified below. The customer or the user of this device should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidelines
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	[3] V	Portable and mobile RF communications equipment should be used no closer to any part of this device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.  Recommended separation distance $d=[1.2] \sqrt{P}$ $d=[1.2] \sqrt{P}$ 80 MHz to 800 MHz $d=[2.3] \sqrt{P}$ 800 MHz to 2.5 GHz
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	[3] V/m	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 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.			
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 this device is used exceeds the applicable RF compliance level above, this device should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating this device.			
b Over the frequency range 150 kHz to 80 MHz, field strength should be less than [3] V/m.			

### 1.3 Safety precautions

**Table 4**

<b>Recommended separation distance between portable and mobile RF communications equipment and the device</b>			
This device is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of this device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and this device as recommended below, according to the maximum output power of the communications equipment.			
<b>Rated maximum output power of the transmitter W</b>	<b>Separation distance according to frequency of transmitter m</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.			



### 1.3.4 Precautions regarding wireless communication



#### CAUTION

- This device is equipped with a communication function that operates via wireless LAN. Conformance is required with the relevant regulations defined by the countries in which this device is to be used.
- Inappropriate usage may cause interference in 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 may be affected by other wireless devices. Make sure that the environment is free of wireless communications.
- AeroDR Detector has been confirmed to comply with the relevant regulations of the following countries:

#### United States & Canada

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

- AeroDR Detector complies with Part 15 of FCC Rules and Industry Canada license exempt RSS standard(s). Operation is subject to the following 2 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.
- The 5.15-5.35 GHz band is restricted to indoor operation 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 micro-wave 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 controlled equipment and meets the FCC radio frequency (RF) Exposure Guidelines and RSS-102 of the IC radio frequency (RF) Exposure rules.

- High-power radars are allocated as primary users (i.e. priority users) of the 5250-5350 MHz and 5650-5850 MHz bands, and these radars could cause interference and/or damage to LE-LAN devices.
- Compliance with FCC requirement 15.407(c): Data transmission is always initiated by software, which is passed down through the MAC, through the digital and analog baseband, and finally to the RF chip. Several special packets are initiated by the MAC. These are the only ways the digital baseband portion will turn on the RF transmitter, which it then turns off at the end of the packet. Therefore, the transmitter will be on only while one of the aforementioned packets is being transmitted. In other words, this device automatically discontinues transmission in case of either absence of information to transmit or operational failure.
- Compliance with FCC requirement 15.407(g): Frequency Tolerance: 20ppm

#### 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

AeroDR Detector conforms with the Declaration of Conformity (DoC) to Directive 1999/5/EC (to R&TTE Directive). This device purposely connects to an access point of a 5 GHz network. AeroDR Detector is used for the following countries indicated by country code (ISO3166 2-letter code).

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

Hereby, KONICA MINOLTA, Inc., declares that this AeroDR SYSTEM/AeroDR SYSTEM 2 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

#### 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.

### **China**

1. 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)
2. 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.
3. 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.

4. 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.
5. Do not use near a plane or an airport.

### **South Korea**

Because this wireless equipment may be affected by radio interference, it cannot provide services related with life safety.

### **Thailand**

AeroDR Detector conforms to NTC technical requirement.

### **Brazil**

This equipment operates secondarily, that is, it doesn't benefit from protection against harmful interference, even from stations of the same type, and cannot cause interference to systems that operate primarily.

AeroDR Detector has been approved by ANATEL in compliance with the procedures regulated by Resolution 242/2000 and complies with the applicable technical requirements.

AeroDR system and Stitching system fulfill the requirements set forth in INMETRO Ordinance No 350, dated 06/09/2010, and other regulations pertaining to compulsory certification of Electrical Equipment Subject to Sanitary Surveillance by ANVISA (RDC No 27, dated 21/06/2011, and Normative Instruction No 11, dated 16/12/2014).

Konica Minolta hereby declares that the Aero DR System and Stitching System products fulfill the biocompatibility aspects of ISO 10993-1:2009.

This equipment operates with a voltage of AC 127V.

For more information, please visit:

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

### **Mexico**

This equipment operates on a secondary basis; consequently, you must accept harmful interferences from equipment of the same type, and cannot cause interferences to systems operating on a primary basis.



### 1.3.5 Precautions for installing, moving, and storing

#### WARNING

- Take note of the following when moving this device not including the AeroDR Detector:
  - Do not subject to 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.
- When installing the AeroDR Battery Charger or AeroDR Battery Charger2 on a table top, observe the following:
  - Install on a base that can withstand maximum patient weight because load is inserted when setting the AeroDR Detector.
  - The contact area for the AeroDR Battery Charger or AeroDR Battery Charger2 must be larger than the area of the AeroDR Battery Charger or AeroDR Battery Charger2 so that it will not fall down when the AeroDR Detector is set or when people touch it by accident.
  - Install on a horizontal and stable surface.
  - Do not use a base that has a surface made of slippery material such as teflon.
  - Connect power cable and wires so that no one will trip.
  - Install in a place easy to set the AeroDR Detector.
  - Install so that the vent on the back side of the AeroDR Battery Charger is not blocked.

#### CAUTION

- Because connections of the X-ray device can only be made by Konica Minolta or its designated contractors, contact Konica Minolta or its designated contractors.
- For the X-ray devices enabled to connect, contact Konica Minolta technical representatives.
- Contact Konica Minolta or dealers specified by Konica Minolta to install or move this device.
- Since it is required to meet the specification provided by the X-ray device manufacturer to connect with an X-ray device, contact Konica Minolta or dealers specified by Konica Minolta.
- Take note of the following when installing or storing this device.
  - Install or store this device within the specified storage and usage conditions and environment.
  - 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 great, electromagnetic waves are generated, or where subject to vibration or shock.
  - Do not install or store in a location where chemical agents are used or stored.

#### CAUTION

- Do not install this device facing up or upside down.
- Do not install the AeroDR Interface Unit, AeroDR Interface Unit2 and AeroDR Generator Interface Unit stacked on each other.
- Connect the AeroDR Interface Unit2, AeroDR Generator Interface Unit and AeroDR Generator Interface Unit2 to an X-ray device that conforms to IEC 60601 or to an equivalent standard.
- Please see "8.4 Compatible X-ray system specification".

### 1.3.6 Precautions regarding maintenance

#### WARNING

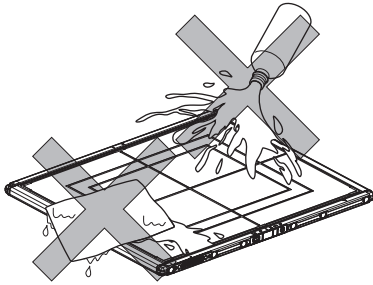
- Perform the maintenance and inspection periodically. In addition to the user periodical maintenance that needs to be performed, periodical maintenance by a service engineer is also required.
- If there are stains such as body fluids, clean and disinfect.

#### CAUTION

- Based on the warranty, parts that are no longer under warranty (1 year) can be replaced for a fee.
- 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 commercial plastic brush. Do not clean with sharp or hard objects.
- Take care regarding the following when disinfecting the AeroDR Detector.
  - Use ethanol for disinfection, isopropanol for disinfection, or commercial chlorine bleach, or 0.5% hypochlorite (10-fold dilution of household bleach) when disinfecting. However, bleach and hypochlorite are corrosive, so wash the bleach off well to avoid corrosion.

**CAUTION**

- If you directly apply or spray disinfecting solution on the AeroDR Detector, the solution will enter the instrument through exterior gaps, causing a failure. Dampen a lint-free, soft cloth with disinfecting solution, and use after wringing it thoroughly. Do not apply disinfecting solution onto the wired connection connector and LED when cleaning.



- Disinfecting solution is a chemical agent, so follow the precautions of the manufacturer.
- Fully charge battery once a month even if the AeroDR Detector has not been used for a long time.

**1.3.7 Precautions on service life**

**CAUTION**

**Service life**

Name	Service life
AeroDR Detector	6 years
AeroDR Interface Unit	6 years
AeroDR Interface Unit2	6 years
AeroDR Generator Interface Unit	6 years
AeroDR Generator Interface Unit2	6 years
AeroDR Battery Charger	6 years
AeroDR Battery Charger2	6 years
AeroDR Access Point	6 years
AeroDR I/F Cable	6 years
AeroDR I/F Cable2	6 years
AeroDR UF Cable	6 years

- The above service life is valid only if the product has been properly operated while following the precautions for use and performing the specified maintenance. (By self certification <our data>)
- The service life may differ depending on usage conditions and environment.
- Some component parts of this device are commercially available parts that have a short cycle of model changes, therefore, it might not be possible to supply service parts even within the service life. In addition, related component parts may need to be replaced to maintain compatibility at the time of model change.

# Chapter 2

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## Product Overview

This chapter describes the overview of this device.

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## 2.1 • Overview of this device

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

### 2.1.1 Functions

The AeroDR SYSTEM consists of AeroDR Detector (AeroDR 1417HQ, AeroDR 1417S, AeroDR 1717HQ and AeroDR 1012HQ), AeroDR Interface Unit, AeroDR Interface Unit2, AeroDR Generator Interface Unit, AeroDR Battery Charger, AeroDR Battery Charger2, AeroDR Access Point, etc. With the AeroDR Detector, diagnostic X-ray digital image data is generated by the irradiation signal and exposure from an X-ray device, and sent to the image processing controller.

Furthermore, the AeroDR Detector can be connected with (or inserted in) the AeroDR Interface Unit, AeroDR Interface Unit2, AeroDR Battery Charger and AeroDR Battery Charger2 or removed from them.

The AeroDR SYSTEM 2 consists of the AeroDR Detector (AeroDR 2 1417HQ and AeroDR 2 1417S), AeroDR Interface Unit, AeroDR Interface Unit2, AeroDR Generator Interface Unit, AeroDR Generator Interface Unit2, AeroDR Battery Charger, AeroDR Battery Charger2, etc. With the AeroDR Detector, diagnostic X-ray digital image data is generated by the irradiation signal or exposure from an X-ray device and sent to the image processing controller.

Furthermore, the AeroDR Detector can be connected with (or inserted in) or removed from the AeroDR Interface Unit, AeroDR Interface Unit2, AeroDR Battery Charger and AeroDR Battery Charger2.

## 2.1.2 System configuration and connection examples


The system configuration and connection examples are as follows.



### HINT

- The AeroDR SYSTEM and AeroDR SYSTEM 2 can be used together.

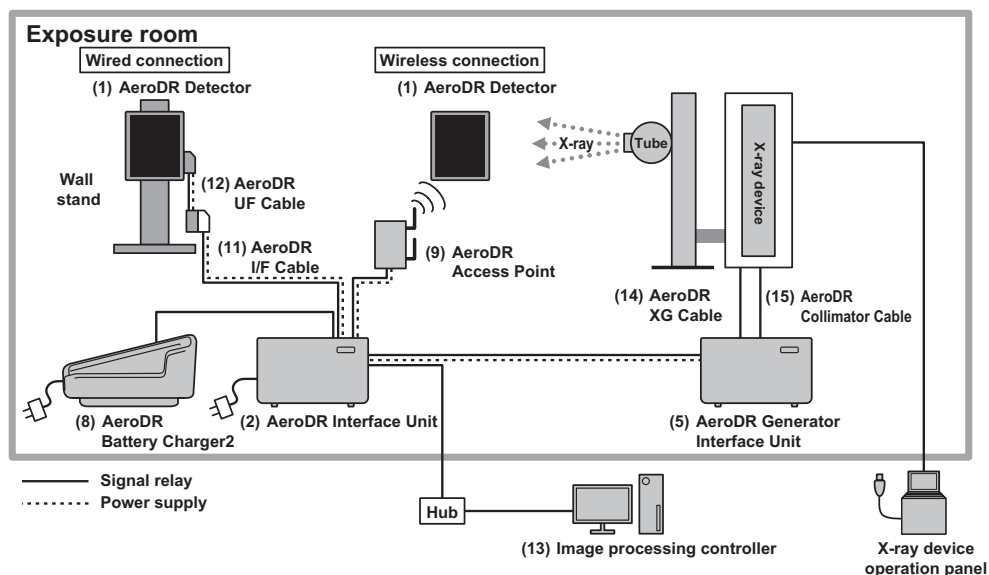
### ● Basic configuration example

Number	Name	Functions
(1)	AeroDR Detector	<ul style="list-style-type: none"> <li>• There are 6 types of AeroDR Detectors: AeroDR 1417HQ, AeroDR 1417S, AeroDR 1717HQ, AeroDR 1012HQ, AeroDR 2 1417HQ and AeroDR 2 1417S.</li> <li>• AeroDR Detector is of B-type Applied Parts.</li> </ul>
(2)	AeroDR Interface Unit	<ul style="list-style-type: none"> <li>• Supplies power to the AeroDR Generator Interface Unit, AeroDR Generator Interface Unit2, and access point.</li> <li>• Supplies power to and charges the AeroDR Detector when an AeroDR I/F Cable or AeroDR UF Cable is used.</li> <li>• It has a built-in hub function.</li> <li>• 2 AeroDR Detectors can be connected via wired connection.</li> <li>• The expansion AeroDR Interface Unit is required for connecting the third to seventh AeroDR Detectors via wired connection.</li> </ul>
(3)	AeroDR Interface Unit2	<ul style="list-style-type: none"> <li>• Supplies power to the access point.</li> <li>• Supplies power to and charges the AeroDR Detector when an AeroDR I/F Cable or AeroDR UF Cable is used.</li> <li>• It has a built-in hub function.</li> <li>• 2 AeroDR Detectors can be connected via wired connection.</li> <li>• The expansion AeroDR Interface Unit is required for connecting the third to seventh AeroDR Detectors via wired connection.</li> <li>• Relays signals between the X-ray device, the AeroDR Detector, and the image processing controller.</li> </ul>
(4)	Hub	<ul style="list-style-type: none"> <li>• Used to connect the AeroDR Generator Interface Unit2 or access point.</li> <li>• General-purpose product.</li> <li>• Product conforming to IEC 60950 (CLASS I) or equivalent standards.</li> </ul>
(5)	AeroDR Generator Interface Unit	Relays signals between the X-ray device, the AeroDR Detector, and the image processing controller.
(6)	AeroDR Generator Interface Unit2	Relays signals between the X-ray device, the AeroDR Detector, and the image processing controller.
(7)	AeroDR Battery Charger	Charges the AeroDR Detector. It also has the registration function for the AeroDR Detector.  <b>IMPORTANT</b> <ul style="list-style-type: none"> <li>• The AeroDR 1012HQ cannot be charged and registered using the AeroDR Battery Charger.</li> <li>• The AeroDR 2 1417S cannot be charged using the AeroDR Battery Charger.</li> </ul>
(8)	AeroDR Battery Charger2	Charges the AeroDR Detector. It also has the registration function for the AeroDR Detector.
(9)	AeroDR Access Point	Used for wireless connection with the AeroDR Detector.
(10)	Access Point	<ul style="list-style-type: none"> <li>• Used for wireless connection with the AeroDR Detector.</li> <li>• General-purpose product.</li> <li>• The AeroDR Access Point 2 is included.</li> </ul>
(11)	AeroDR I/F Cable	Used for wired connection with the AeroDR Detector. Also used for charging and registering the AeroDR Detector.
(12)	AeroDR UF Cable	Registers the orientation when the AeroDR Detector is used for exposure in the wall stand/ table position.
(13)	Image processing controller	<ul style="list-style-type: none"> <li>• Controls the reception, management, and output of image data.</li> <li>• Up to 7 AeroDR Detectors can be registered.</li> </ul>
(14)	AeroDR XG Cable	Performs signal relay between the X-ray device and the AeroDR Interface Unit2, AeroDR Generator Interface Unit and AeroDR Generator Interface Unit2.
(15)	AeroDR Collimator Cable	Performs exposure field signal relay between the X-ray device and the AeroDR Interface Unit2 or AeroDR Generator Interface Unit.

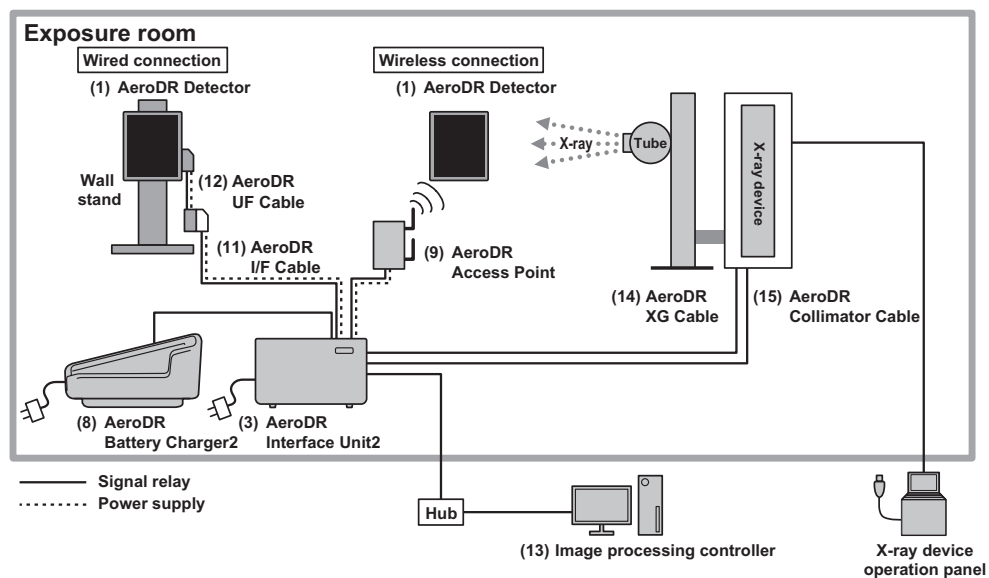
## 2.1 Overview of this device

Number	Name	Functions
(16)	AeroDR S-SRM Cable	Performs signal relay between the X-ray device operation panel and AeroDR Interface Unit2, AeroDR Generator Interface Unit, and AeroDR Generator Interface Unit2.
(17)	S-SRM	Synchronizes AeroDR Interface Unit2, AeroDR Generator Interface Unit, and AeroDR Generator Interface Unit2 and X-ray device simply. Exposure is performed using the AeroDR Generator Interface Unit.

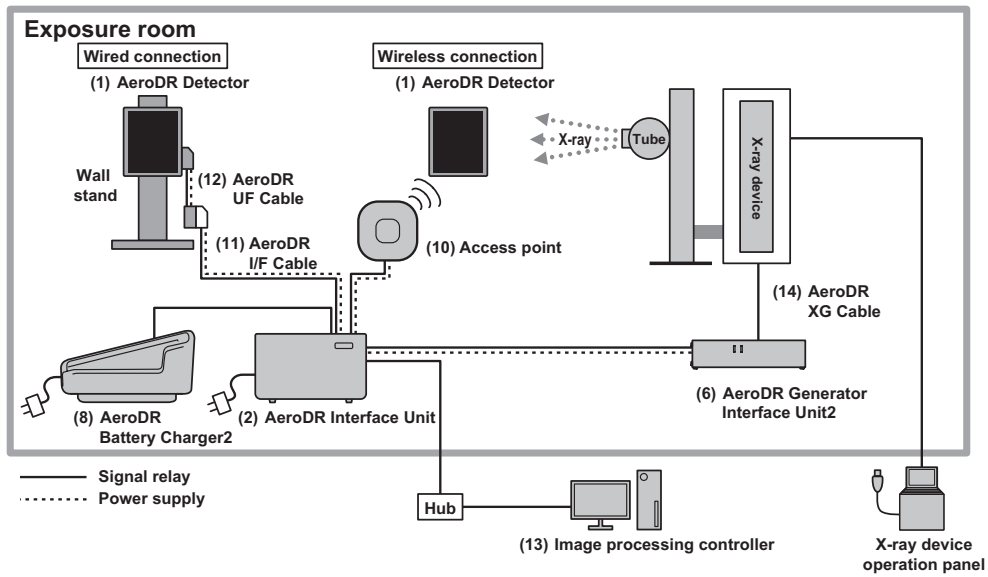
### ● Basic connection example 1



### ● Basic connection example 2



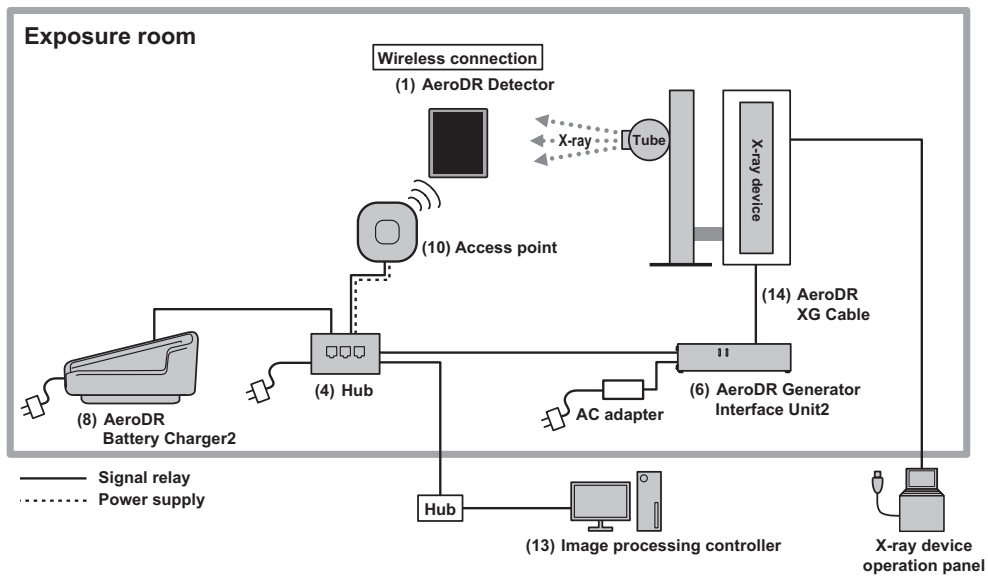
● Basic connection example 3



**HINT**

- The AeroDR Generator Interface Unit2 and access point can also supply power from the AC adapter.

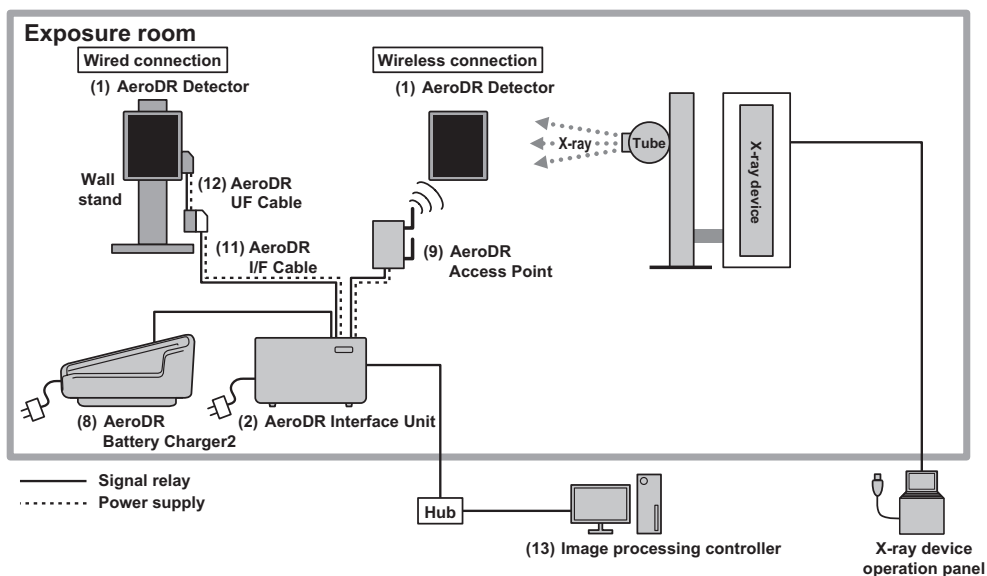
● Basic connection example 4



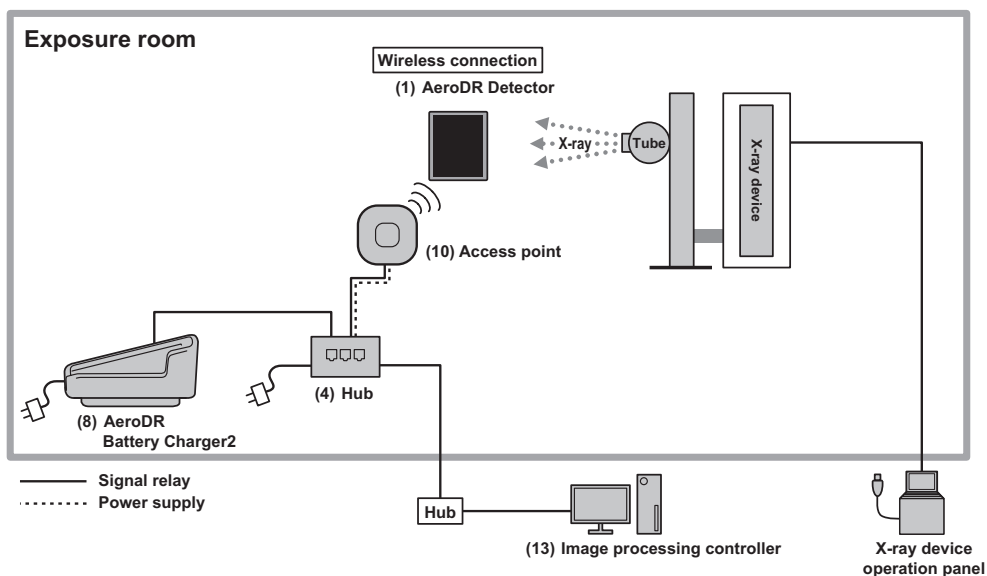
**HINT**

- The access point can also supply power from the AC adapter.

● Aero Sync connection example 1



● Aero Sync connection example 2

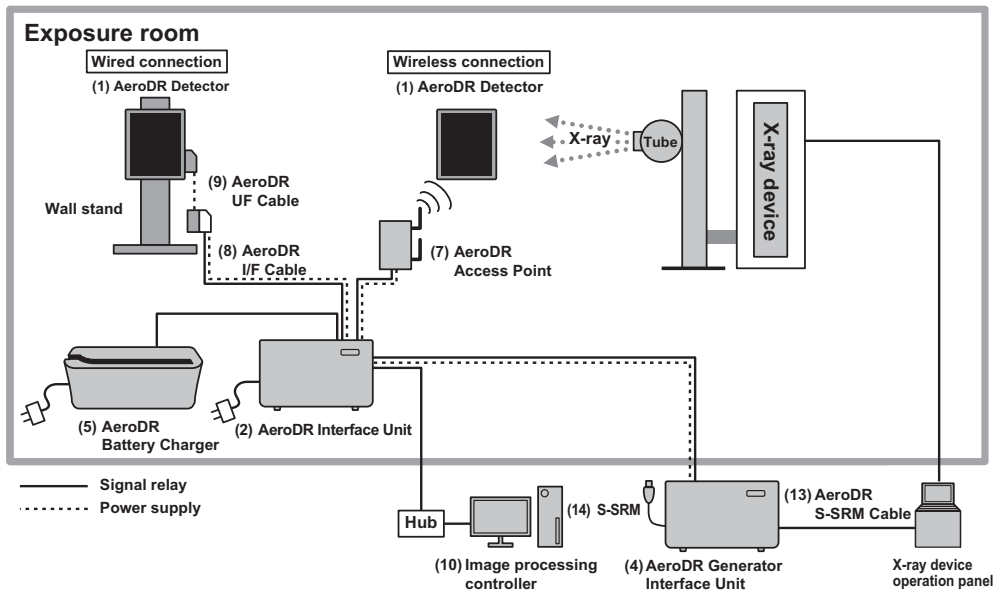


HINT

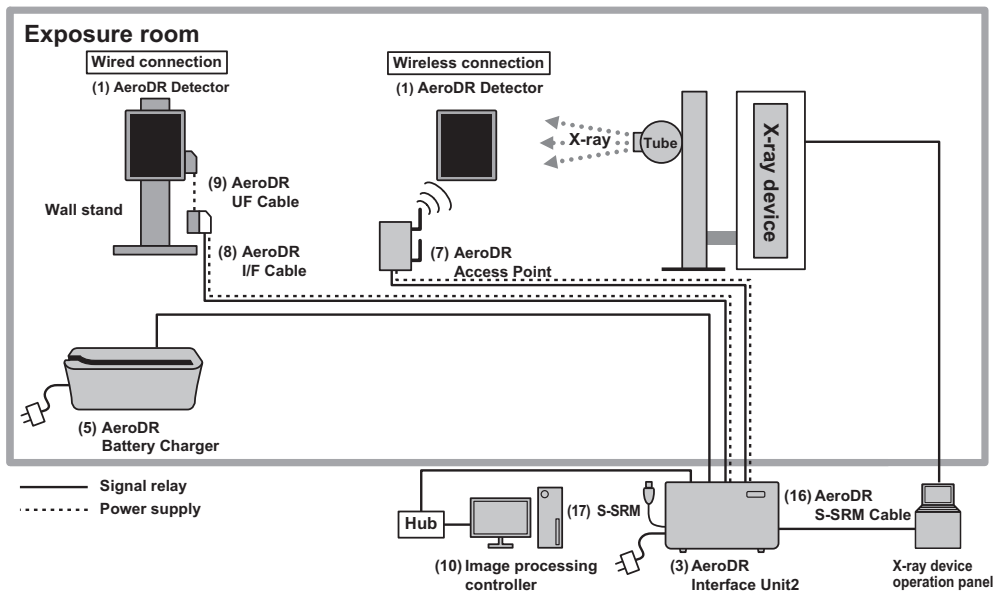
- The access point can also supply power from the AC adapter.



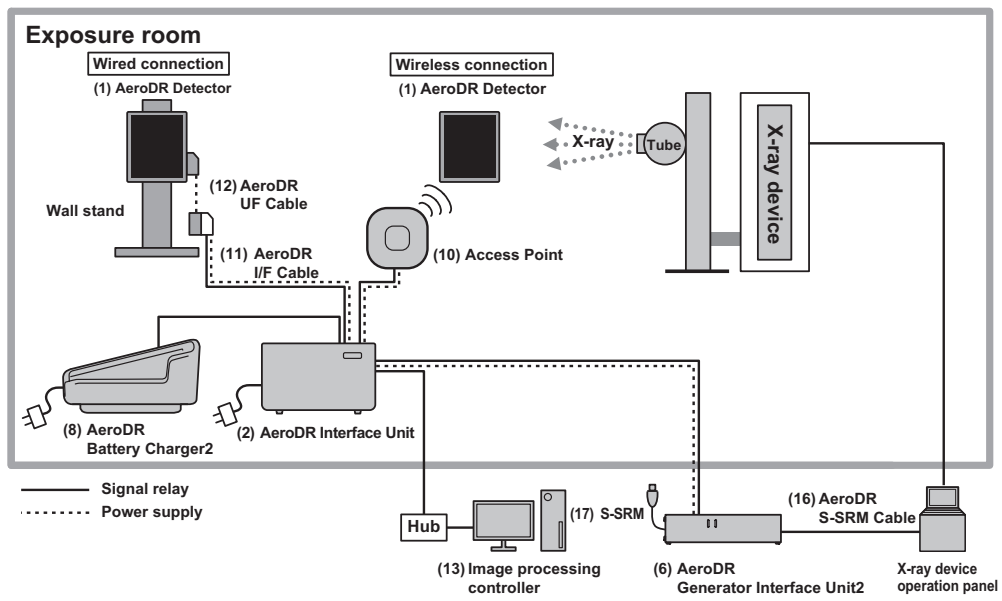
● S-SRM connection example 1



● S-SRM connection example 2



● S-SRM connection example 3



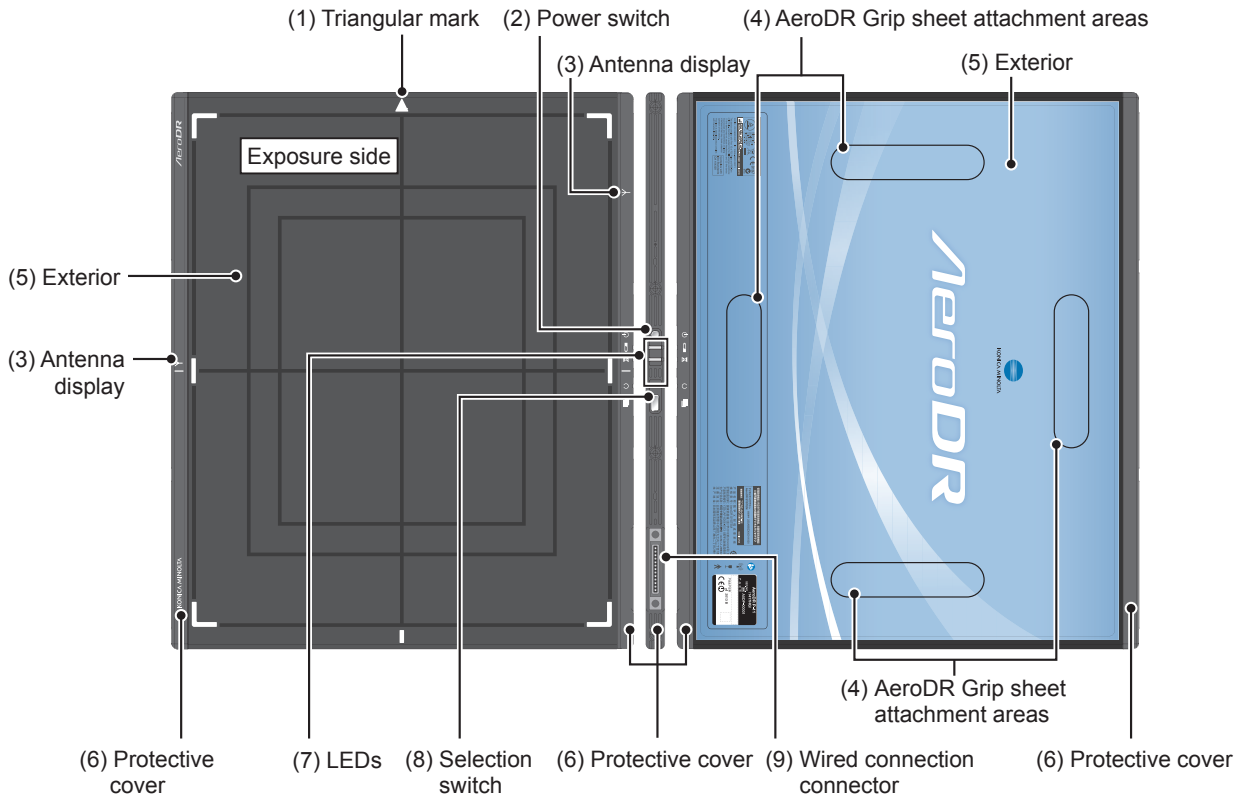
 **HINT**

- The AeroDR Generator Interface Unit2 and access point can also be supplied with power from the AC adapter.

## 2.2 • Component names and functions

### 2.2.1 AeroDR Detector (AeroDR 1417HQ/AeroDR 1417S/ AeroDR 1717HQ/AeroDR 1012HQ)

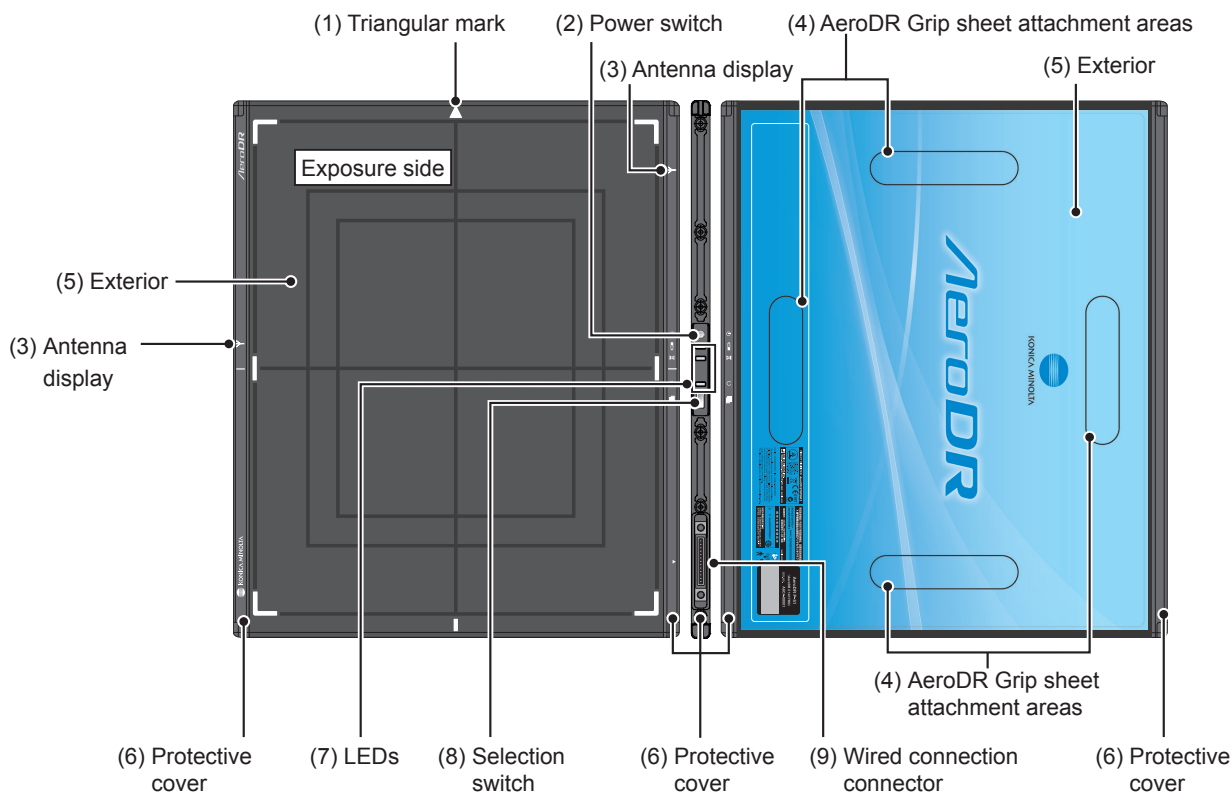
The component names and functions of the AeroDR Detector (AeroDR 1417HQ, AeroDR 1417S, AeroDR 1717HQ and AeroDR 1012HQ) are as follows.





Number	Name	Functions
(1)	Triangular mark	<ul style="list-style-type: none"> <li>Indicates the direction to place the AeroDR Detector in during exposure.                             <ul style="list-style-type: none"> <li>When exposing in portrait, place the triangular mark upward.</li> <li>When exposing in landscape, place the triangular mark to the left or right. (Left and right are set during installation according to the exposure environment.)</li> </ul> </li> </ul> <p><b>Reference</b></p> <ul style="list-style-type: none"> <li>For the placement of the AeroDR Detector during exposure, refer to "3.2.2 AeroDR Detector orientation".</li> </ul>
(2)	Power switch	Used to turn the AeroDR Detector on/off.
(3)	Antenna display	Displays the place where a wireless antenna is attached.
(4)	AeroDR Grip sheet attachment areas	<ul style="list-style-type: none"> <li>Indicates the attachment positions for AeroDR Grip sheet use.</li> <li>The AeroDR 1012HQ does not have AeroDR Grip sheet attachment areas.</li> </ul>
(5)	Exterior	Protects the internal parts.
(6)	Protective cover	Absorbs external shocks.
(7)	LEDs	<p>Displays the status of the AeroDR Detector.</p> <p><b>Reference</b></p> <ul style="list-style-type: none"> <li>For the display patterns and status of the LEDs, refer to "Chapter 4 Status (LED) Display".</li> </ul>
(8)	Selection switch	Notifies the image processing controller that this AeroDR Detector will be used for the exposure.
(9)	Wired connection connector	Connects to the AeroDR Battery Charger, AeroDR Battery Charger2, AeroDR I/F Cable, AeroDR I/F Cable2, and AeroDR UF Cable.

### 2.2.2 AeroDR Detector (AeroDR 2 1417HQ/AeroDR 2 1417S)

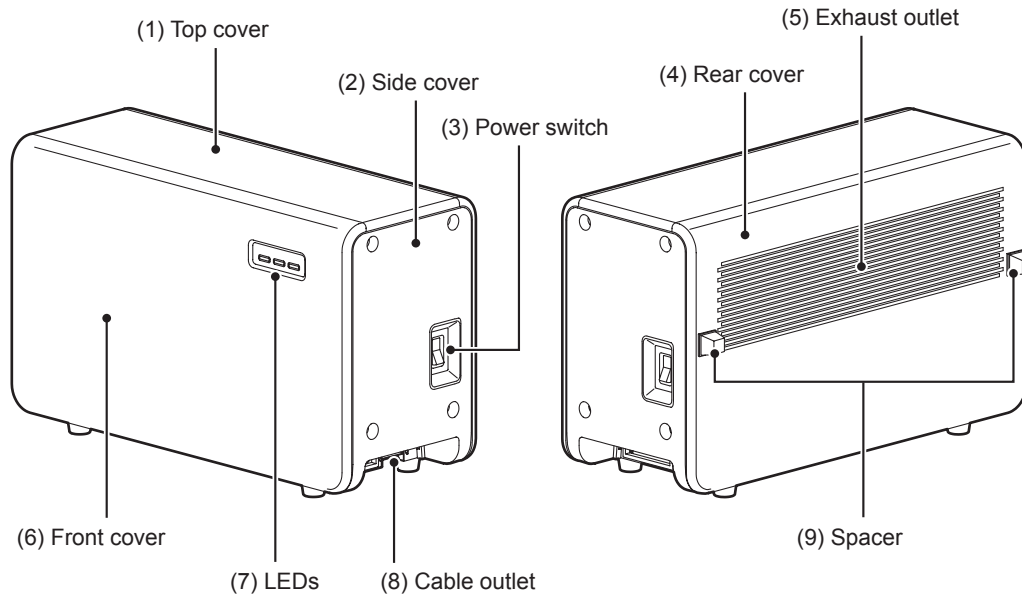
The component names and functions of the AeroDR Detector (AeroDR 2 1417HQ and AeroDR 2 1417S) are as follows.




Number	Name	Functions
(1)	Triangular mark	<ul style="list-style-type: none"> <li>Indicates the direction to place the AeroDR Detector in during exposure.                             <ul style="list-style-type: none"> <li>When exposing in portrait, place the triangular mark upward.</li> <li>When exposing in landscape, place the triangular mark to the left or right. (Left and right are set during installation according to the exposure environment.)</li> </ul> </li> </ul> <p> Reference</p> <ul style="list-style-type: none"> <li>For the placement of the AeroDR Detector during exposure, refer to "3.2.2 AeroDR Detector orientation".</li> </ul>
(2)	Power switch	Used to turn the AeroDR Detector on/off.
(3)	Antenna display	Displays the place where a wireless antenna is attached.
(4)	AeroDR Grip sheet attachment areas	Indicates the attachment positions for AeroDR Grip sheet use.
(5)	Exterior	Protects the internal parts.
(6)	Protective cover	Absorbs external shocks.
(7)	LEDs	Displays the status of the AeroDR Detector. <p> Reference</p> <ul style="list-style-type: none"> <li>For the display patterns and status of the LEDs, refer to "Chapter 4 Status (LED) Display".</li> </ul>
(8)	Selection switch	Notifies the image processing controller that this AeroDR Detector will be used for the exposure.
(9)	Wired connection connector	Connects to the AeroDR Battery Charger, AeroDR Battery Charger2, AeroDR I/F Cable, AeroDR I/F Cable2, and AeroDR UF Cable.

### 2.2.3 AeroDR Interface Unit

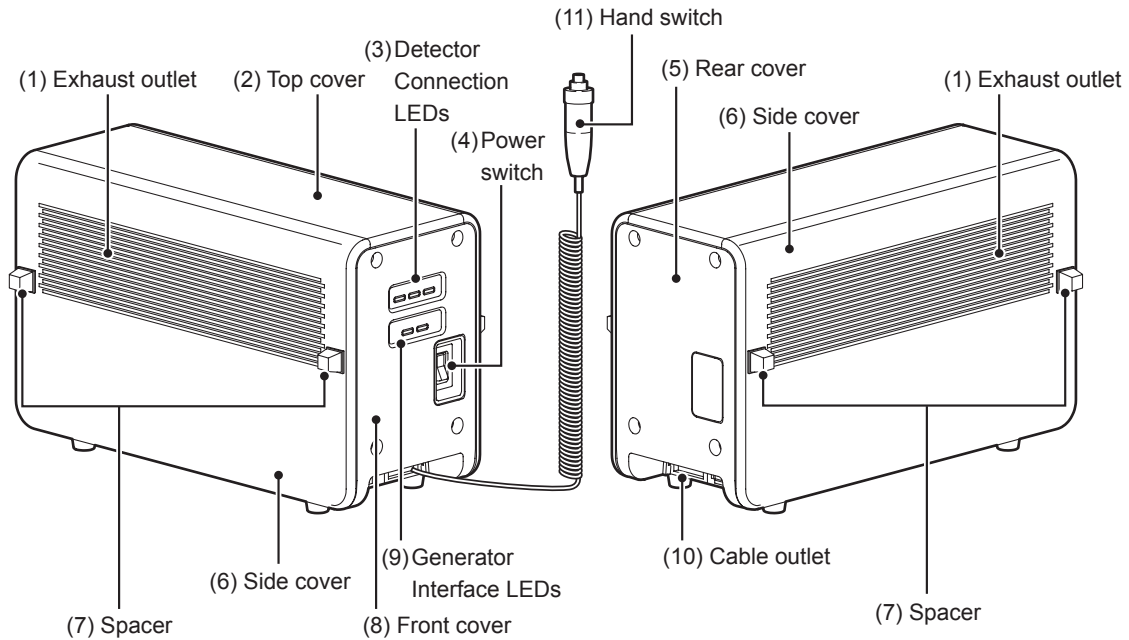
The component names and functions of the AeroDR Interface Unit are as follows.





Number	Name	Functions
(1)	Top cover	Protects the internal parts.
(2)	Side cover	Protects the internal parts.
(3)	Power switch	Turns the AeroDR Interface Unit on/off.
(4)	Rear cover	Protects the internal parts.
(5)	Exhaust outlet	Exhausts internal heat.
(6)	Front cover	Protects the internal parts.
(7)	LEDs	Displays the status of the AeroDR Interface Unit. <div style="border: 1px solid black; padding: 2px; display: inline-block;">  Reference         </div> <ul style="list-style-type: none"> <li>For the display patterns and status of the LEDs, refer to "Chapter 4 Status (LED) Display".</li> </ul>
(8)	Cable outlet	Outlet for various cables.
(9)	Spacer	Prevents exhaust outlet from being blocked after installation.

## 2.2.4 AeroDR Interface Unit2

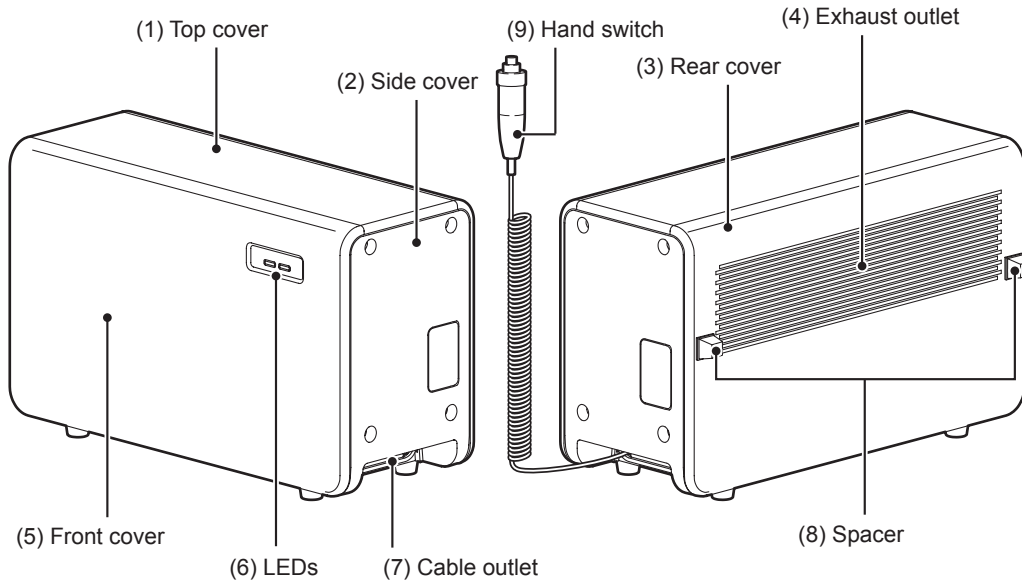
The component names and functions of the AeroDR Interface Unit2 are as follows.



Number	Name	Functions
(1)	Exhaust outlet	Exhausts internal heat.
(2)	Top cover	Protects the internal parts.
(3)	Detector Connection LEDs	Displays the status of the AeroDR Interface Unit2.  <b>Reference</b> <ul style="list-style-type: none"> <li>For the display patterns and status of the LEDs, refer to "Chapter 4 Status (LED) Display".</li> </ul>
(4)	Power switch	Turns the AeroDR Interface Unit2 on/off.
(5)	Rear cover	Protects the internal parts.
(6)	Side cover	Protects the internal parts.
(7)	Spacer	<ul style="list-style-type: none"> <li>Prevents exhaust outlet from being blocked after installation.</li> <li>No spacers may be provided on some side covers that will not come in contact with walls.</li> </ul>
(8)	Front cover	Protects the internal parts.
(9)	Generator Interface LEDs	Displays the status of the AeroDR Interface Unit2.  <b>Reference</b> <ul style="list-style-type: none"> <li>For the display patterns and status of the LEDs, refer to "Chapter 4 Status (LED) Display".</li> </ul>
(10)	Cable outlet	Outlet for various cables.
(11)	Hand switch	When S-SRM connection is adopted, a hand switch is installed in the AeroDR Interface Unit2.

### 2.2.5 AeroDR Generator Interface Unit

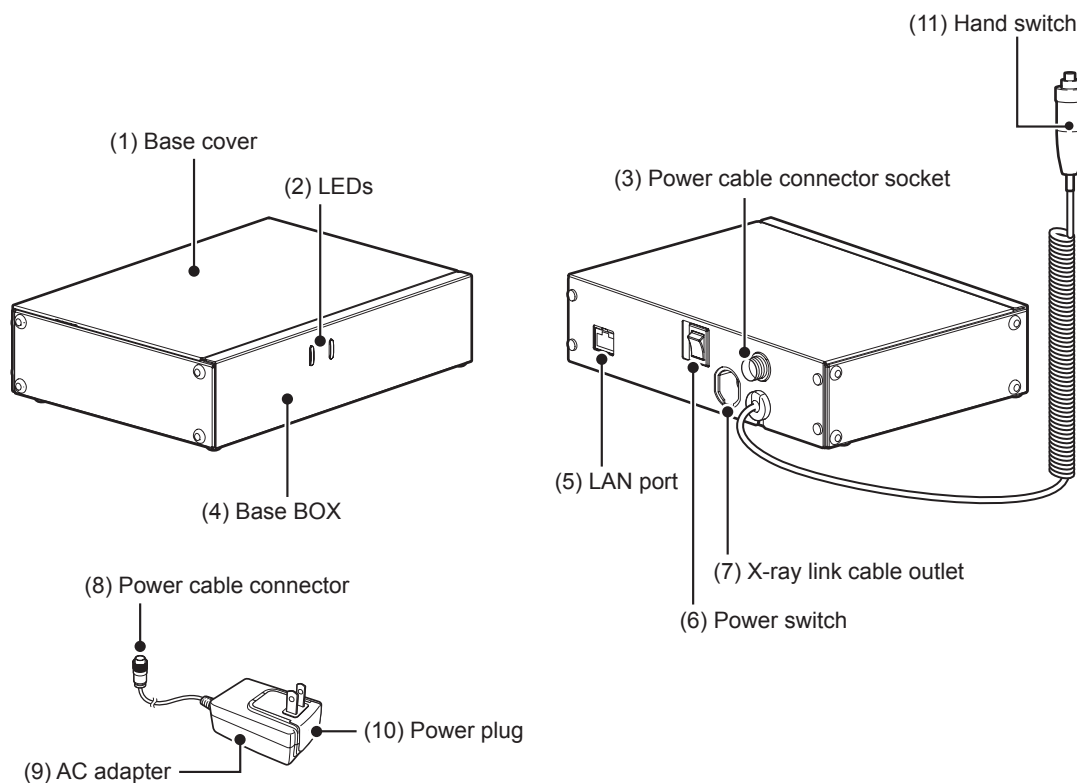
The component names and functions of the AeroDR Generator Interface Unit are as follows.



Number	Name	Functions
(1)	Top cover	Protects the internal parts.
(2)	Side cover	Protects the internal parts.
(3)	Rear cover	Protects the internal parts.
(4)	Exhaust outlet	Exhausts internal heat.
(5)	Front cover	Protects the internal parts.
(6)	LEDs	Displays the status of the AeroDR Generator Interface Unit. <div style="border: 1px solid black; padding: 2px; display: inline-block;">  Reference                 </div> <ul style="list-style-type: none"> <li>• For the display patterns and status of the LEDs, refer to "Chapter 4 Status (LED) Display".</li> </ul>
(7)	Cable outlet	Outlet for various cables.
(8)	Spacer	Prevents exhaust outlet from being blocked after installation.
(9)	Hand switch	When S-SRM connection is adopted, a hand switch is installed in the AeroDR Generator Interface Unit.

### 2.2.6 AeroDR Generator Interface Unit2

The component names and functions of the AeroDR Generator Interface Unit2 are as follows.

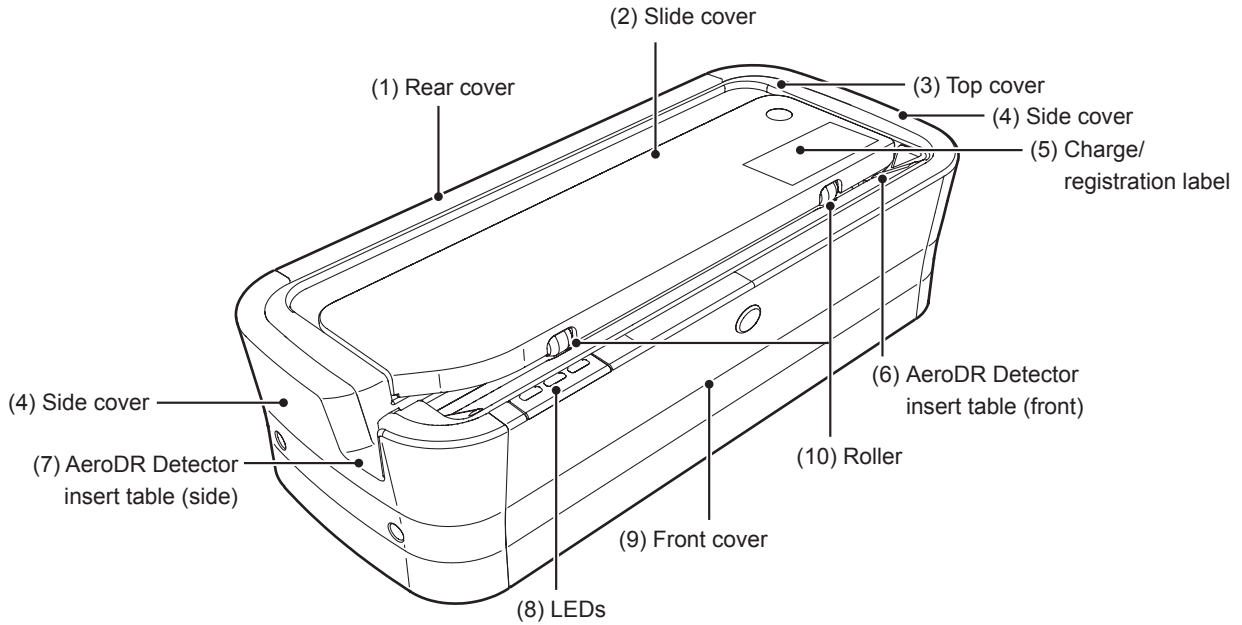


Number	Name	Functions
(1)	Base cover	Protects the internal parts.
(2)	LEDs	Displays the status of the AeroDR Generator Interface Unit2. <div style="border: 1px solid black; padding: 2px; display: inline-block;">Reference</div> <ul style="list-style-type: none"> <li>For the display patterns and status of the LEDs, refer to "Chapter 4 Status (LED) Display".</li> </ul>
(3)	Power cable connector socket	This is the socket of the Power cable connector.
(4)	Base BOX	Protects the internal parts.
(5)	LAN port	Connects to the Ethernet cable.
(6)	Power switch	<ul style="list-style-type: none"> <li>Used to turn the AeroDR Generator Interface Unit2 on/off.</li> <li>It is only installed when the AC adapter is used.</li> </ul>
(7)	X-ray link cable outlet	Outlet for various X-ray link cables.
(8)	Power cable connector	Plug into the power cable socket of AeroDR Generator Interface Unit2.
(9)	AC adapter	Used to supply power to the AeroDR Generator Interface Unit2.
(10)	Power plug	
(11)	Hand switch	When S-SRM connection is adopted, a hand switch is installed in the AeroDR Generator Interface Unit2.



### 2.2.7 AeroDR Battery Charger

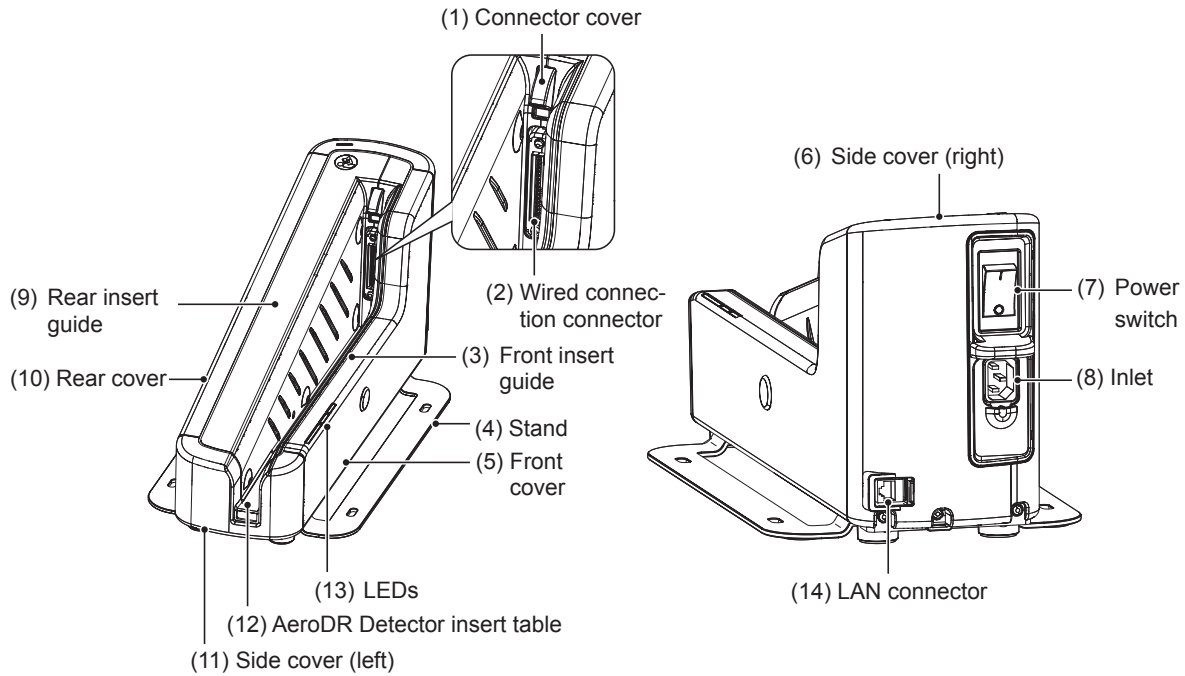
The component names and functions of the AeroDR Battery Charger are as follows.



Number	Name	Functions
(1)	Rear cover	Protects the internal parts.
(2)	Slide cover	Protects the internal parts, and prevents dust from getting inside the AeroDR Battery Charger.
(3)	Top cover	Protects the internal parts.
(4)	Side cover	Protects the internal parts.
(5)	Charge/registration label	When an AeroDR Battery Charger exclusively for charge is used, a label that distinguishes the AeroDR Battery Charger exclusively for charge from an AeroDR Battery Charger that is used for charge and registration is affixed.
(6)	AeroDR Detector insert table (front)	Guide for inserting the AeroDR Detector from the front.
(7)	AeroDR Detector insert table (side)	Guide for inserting the AeroDR Detector from the side.
(8)	LEDs	Indicates the status between the AeroDR Detector and the AeroDR Battery Charger. <div style="border: 1px solid black; padding: 2px; display: inline-block;">  Reference         </div> <ul style="list-style-type: none"> <li>• For the display patterns and status of the LEDs, refer to "Chapter 4 Status (LED) Display".</li> </ul>
(9)	Front cover	Protects the internal parts.
(10)	Roller	Prevents external friction when you insert the AeroDR Detector.

### 2.2.8 AeroDR Battery Charger2

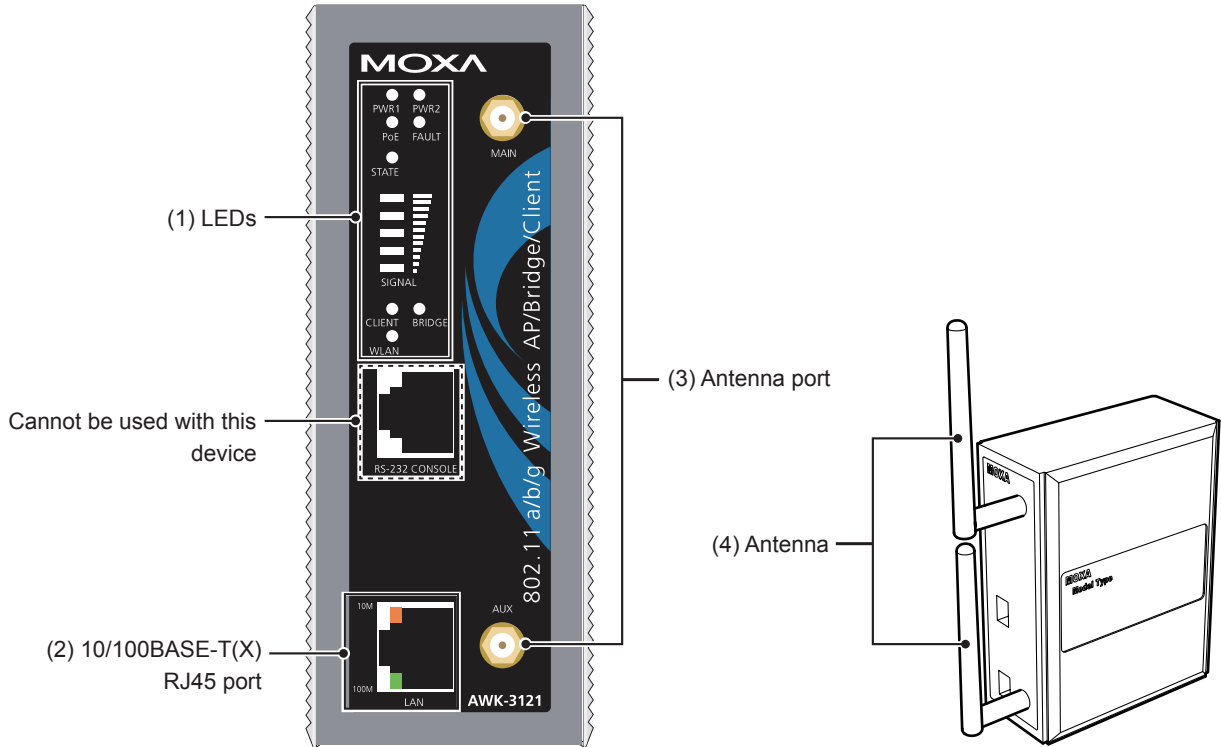
The component names and functions of the AeroDR Battery Charger2 are as follows.



Number	Name	Functions
(1)	Connector cover	Protects the wired connection connector and prevents dust from entering inside it.
(2)	Wired connection connector	Connects to the wired connection connector of the AeroDR Detector.
(3)	Front insert guide	Protects the internal parts.
(4)	Stand	Protects the AeroDR Battery Charger2 from being overturned.
(5)	Front cover	Protects the internal parts.
(6)	Side cover (right)	Protects the internal parts.
(7)	Power switch	Used to turn the AeroDR Battery Charger2 on/off.
(8)	Inlet	Connects to the power cable of AeroDR Battery Charger2.
(9)	Rear insert guide	Protects the internal parts.
(10)	Rear cover	Protects the internal parts.
(11)	Side cover (left)	Protects the internal parts.
(12)	AeroDR Detector insert table	A guide for inserting the AeroDR Detector.
(13)	LEDs	Displays the status of the AeroDR Detector and AeroDR Battery Charger2. <div style="border: 1px solid black; padding: 2px; display: inline-block;">  Reference         </div> <ul style="list-style-type: none"> <li>• For the display patterns and status of the LEDs, refer to "Chapter 4 Status (LED) Display".</li> </ul>
(14)	LAN connector	Connects to the Ethernet cable.

### 2.2.9 AeroDR Access Point

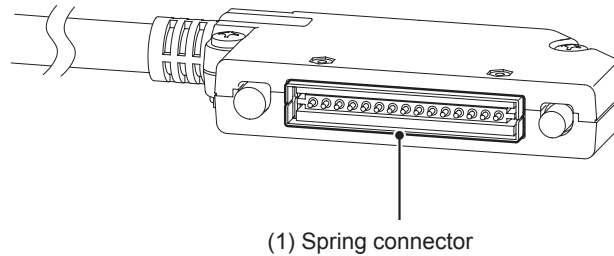
The component names and functions of the AeroDR Access Point are as follows.



Number	Name	Functions
(1)	LEDs	Displays the status of the AeroDR Access Point. <div style="border: 1px solid black; padding: 2px; display: inline-block;">Reference</div> <ul style="list-style-type: none"> <li>For the display patterns and status of the LEDs, refer to "Chapter 4 Status (LED) Display".</li> </ul>
(2)	10/100BASE-T(X) RJ45 port	Used for connection to the AeroDR Interface Unit or AeroDR Interface Unit2.
(3)	Antenna port	Port to attach antenna.
(4)	Antenna	Receives wireless signal.

### 2.2.10 AeroDR I/F Cable / AeroDR I/F Cable2

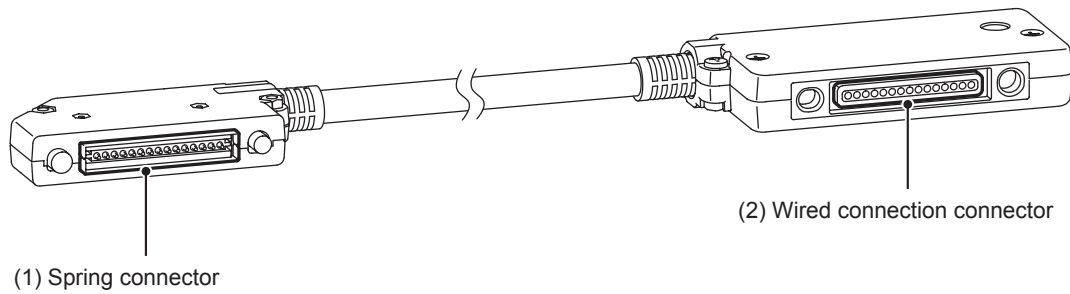
The component name and function of the AeroDR I/F Cable and AeroDR I/F Cable2 are as follows.



Number	Name	Functions
(1)	Spring connector	Connects to the wired connection connector of the AeroDR Detector or AeroDR UF Cable.

### 2.2.11 AeroDR UF Cable

The component names and functions of the AeroDR UF Cable are as follows.



Number	Name	Functions
(1)	Spring connector	Connects to the wired connection connector of the AeroDR Detector.
(2)	Wired connection connector	Connects to the spring connector of the AeroDR I/F Cable.

# Chapter 3

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## General Operations

This chapter describes general operation methods of this device.

## 3.1 • Startup and shutdown

Normally, this device is used with the power on. When not used for more than 1 day, operate the start-up/shutdown as follows.

### Reference

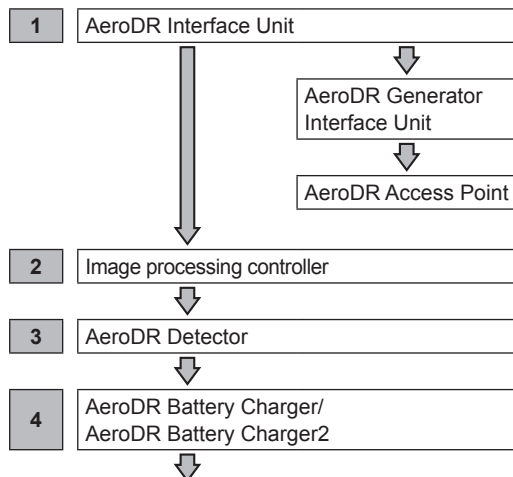
- Refer to the "Operation Manual" of the image processing controller regarding on/off for the image processing controller.

### 3.1.1 Startup sequence of this device

The startup sequence of this device is as follows.

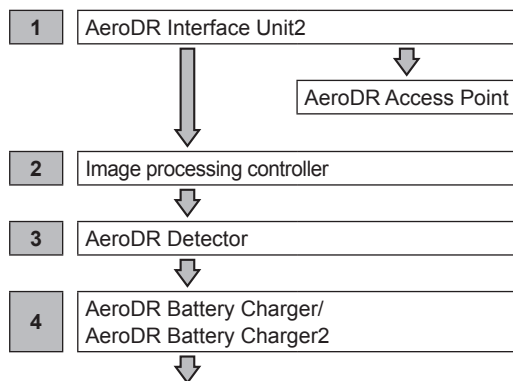
#### AeroDR SYSTEM

##### • When using AeroDR Interface Unit



Confirm that the AeroDR Detector is ready for use on the image processing controller.

##### • When using AeroDR Interface Unit2



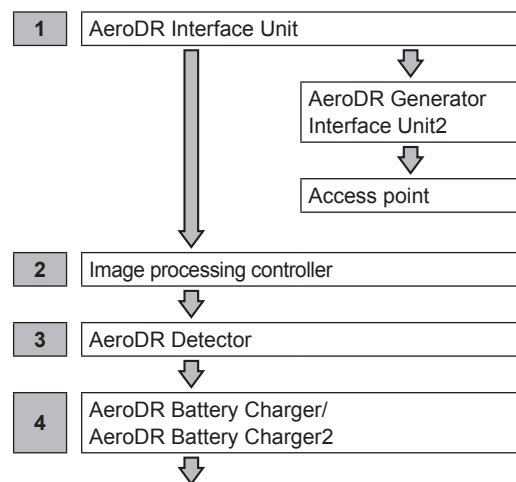
Confirm that the AeroDR Detector is ready for use on the image processing controller.

#### AeroDR SYSTEM 2

### HINT

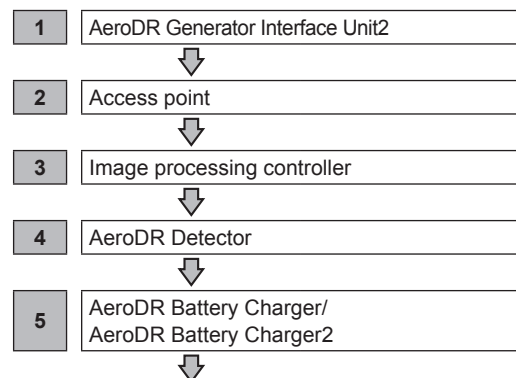
- In the AeroDR SYSTEM 2, the combination of the AeroDR Interface Unit2 and AeroDR Generator Interface Unit2 is not assumed.
- In the AeroDR SYSTEM 2, configurations that do not use the AeroDR Interface Unit are also possible.

##### • When using AeroDR Interface Unit (Power is supplied from the AeroDR Interface Unit to the AeroDR Generator Interface Unit2 and access point.)



Confirm that the AeroDR Detector is ready for use on the image processing controller.

##### • When the AeroDR Interface Unit is not used (Power is supplied from the AC adapter to the AeroDR Generator Interface Unit2 and access point.)



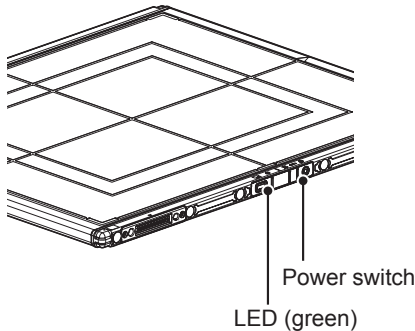
Confirm that the AeroDR Detector is ready for use on the image processing controller.

### 3.1.2 Startup of this device

The startup methods of this device are as follows.

#### ● AeroDR Detector

- If the AeroDR Detector is inserted into the AeroDR Battery Charger or AeroDR Battery Charger2 with a wireless connection, the AeroDR Detector should be removed.
- For a wired connection, confirm that the AeroDR UF Cable or the AeroDR I/F Cable is connected securely to the wired connection connector of the AeroDR Detector.
- Next, press the power switch of the AeroDR Detector for 2 seconds and turn it on, and confirm that the LED (green) is slowly flashing or lit.



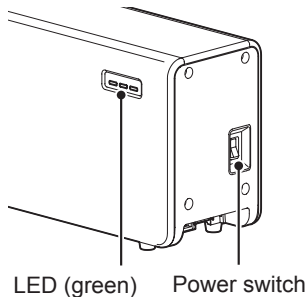
**IMPORTANT** .....

- Do not use a sharp object to operate the switch; doing so may damage the AeroDR 2 1417HQ and AeroDR 2 1417S.

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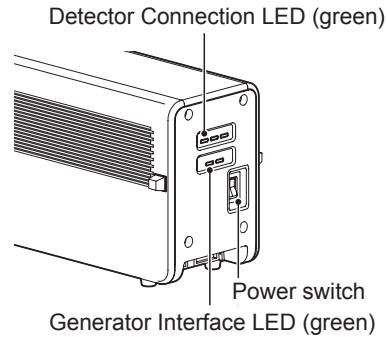
#### ● AeroDR Interface Unit

- Turn the power switch of the AeroDR Interface Unit on, and confirm that the LED (green) lights.



#### ● AeroDR Interface Unit2

- Turn the power switch of the AeroDR Interface Unit2 on, and confirm that the Detector Connection LED (green) and Generator Interface LED (green) light.



**HINT** .....

- It takes time for the Generator Interface LED (green) to light.

.....

#### ● Hub

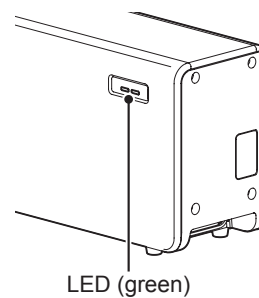
**Reference** .....

- When using a general-purpose hub, refer to its operation manual.

.....

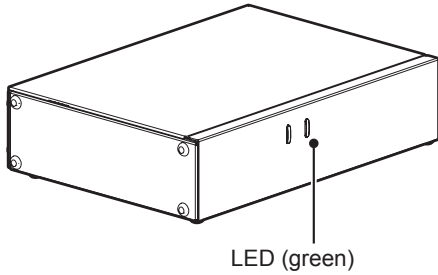
#### ● AeroDR Generator Interface Unit

- When the power switch of the AeroDR Interface Unit is turned on, power is supplied to the AeroDR Generator Interface Unit, and the LED (green) on the AeroDR Generator Interface Unit will flash.

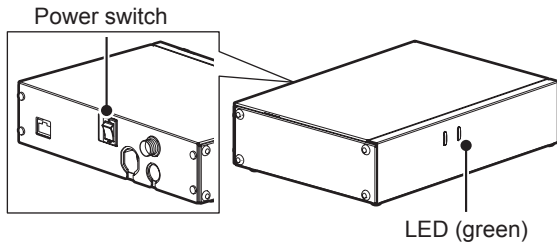


● **AeroDR Generator Interface Unit2**

- When the power switch of the AeroDR Interface Unit is turned on, power is supplied to the AeroDR Generator Interface Unit2, and the LED (green) on the AeroDR Generator Interface Unit2 will flash.

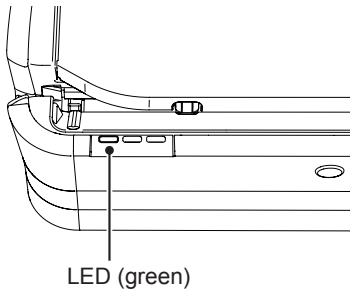


- When using the AC adapter, turn the power switch of the AeroDR Generator Interface Unit2 on, and confirm that the LED (green) on the AeroDR Generator Interface Unit2 is flashing.



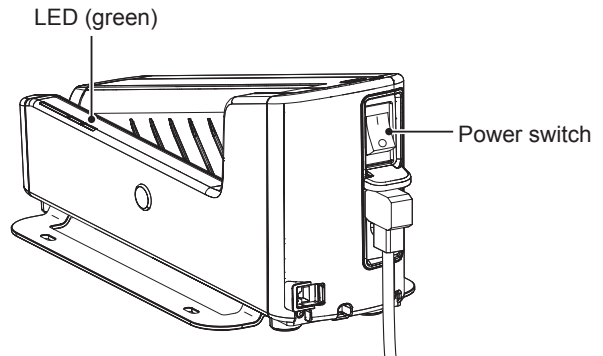
● **AeroDR Battery Charger**

- When the power cable is connected to the wall outlet, power of the AeroDR Battery Charger is turned on. Confirm that the LED (green) is slowly flashing.



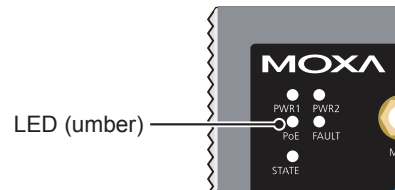
● **AeroDR Battery Charger2**

- Turn the power switch of the AeroDR Battery Charger2 on, and confirm that the LED (green) is slowly flashing.



● **AeroDR Access Point**

- When the power switch of the AeroDR Interface Unit or AeroDR Interface Unit2 is turned on, power is supplied to the AeroDR Access Point, and the LED (umber) on the AeroDR Access Point will light.



● **Access Point**

- Reference** .....
- When using a general-purpose access point, refer to its operation manual.
- .....

● **Image processing controller**

- Start the image processing controller by turning the power switch of the image processing controller on.

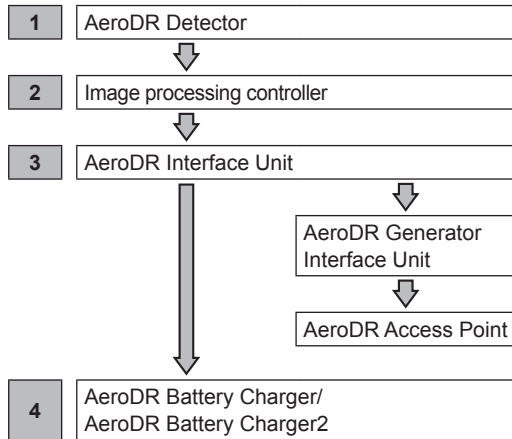


### 3.1.3 Shutdown sequence of this device

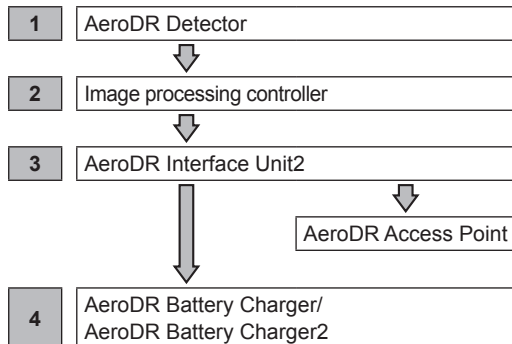
The shutdown sequence of this device is as follows.

#### AeroDR SYSTEM

- When using AeroDR Interface Unit

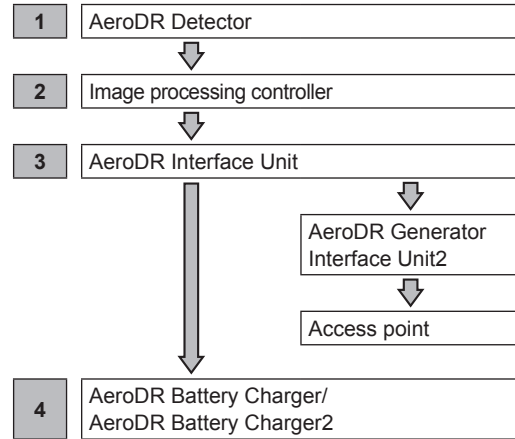


- When using AeroDR Interface Unit2

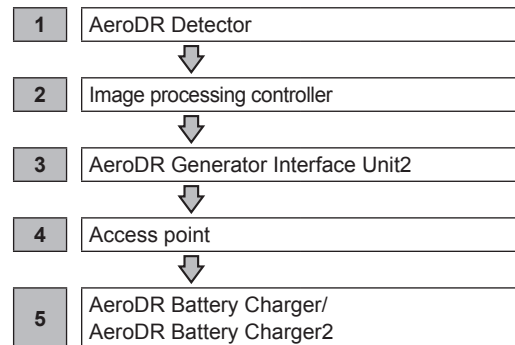


#### AeroDR SYSTEM 2

- When using AeroDR Interface Unit (Power is supplied from the AeroDR Interface Unit to the AeroDR Generator Interface Unit2 and access point.)



- When the AeroDR Interface Unit is not used (Power is supplied from the AC adapter to the AeroDR Generator Interface Unit2 and access point.)

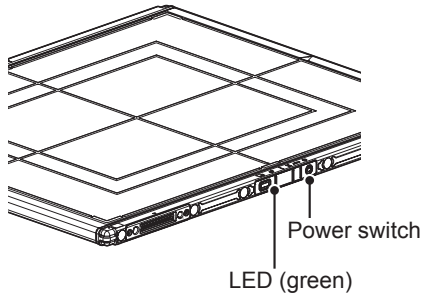


### 3.1.4 Shutdown of this device

The shutdown methods of this device are as follows.

● **AeroDR Detector**

- Press the power switch of the AeroDR Detector for 5 seconds to turn it off, and confirm that the LED (green) is turned off.

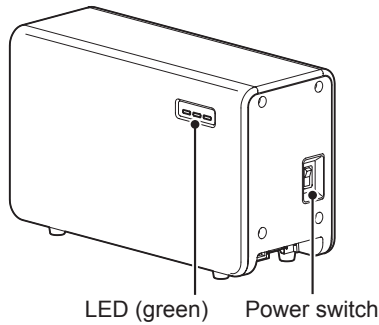


**IMPORTANT**

- Do not use a sharp object to operate the switch; doing so may damage the AeroDR 2 1417HQ and AeroDR 2 1417S.

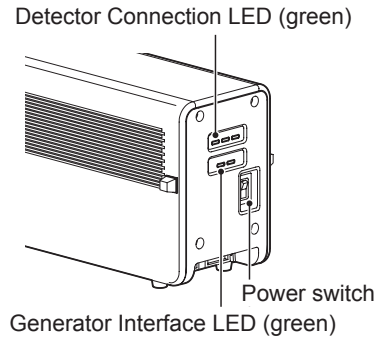
● **AeroDR Interface Unit**

- Turn the power switch of the AeroDR Interface Unit off, and confirm that the LED (green) is turned off.



● **AeroDR Interface Unit2**

- Turn the power switch of the AeroDR Interface Unit2 off, and confirm that the Detector Connection LED (green) and Generator Interface LED (green) are turned off.



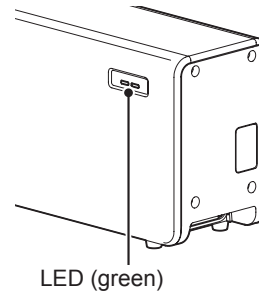
● **Hub**

**Reference**

- When using a general-purpose hub, refer to its operation manual.

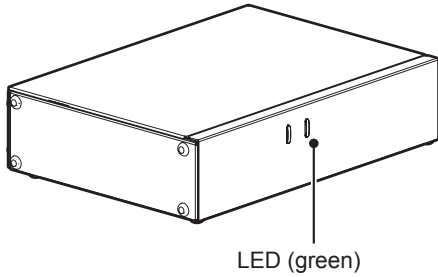
● **AeroDR Generator Interface Unit**

- When the power switch of the AeroDR Interface Unit is turned off, power supply to the AeroDR Generator Interface Unit is terminated. The LED (green) will turn off on the AeroDR Generator Interface Unit.

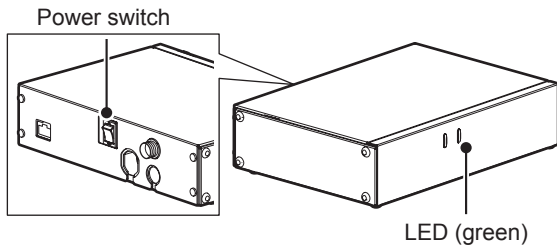


● **AeroDR Generator Interface Unit2**

- When the power switch of the AeroDR Interface Unit is turned off, the power to the AeroDR Generator Interface Unit2 is shut down, and the LED (green) on the AeroDR Generator Interface Unit2 will go off.

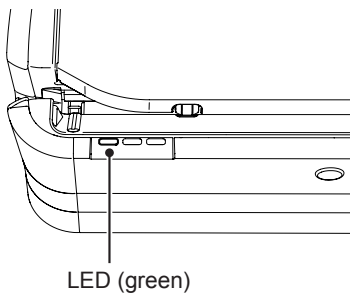


- When using the AC adapter, turn the power switch of the AeroDR Generator Interface Unit2 off, and confirm that the LED (green) on the AeroDR Generator Interface Unit2 goes off.



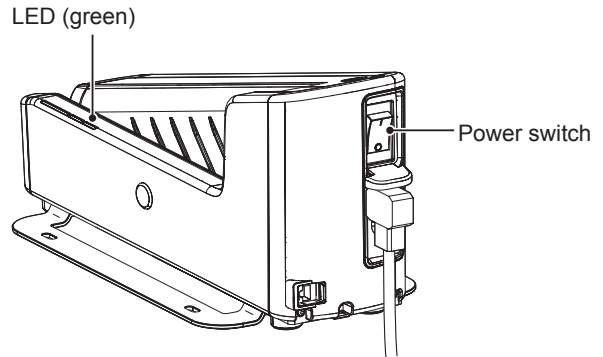
● **AeroDR Battery Charger**

- When the power cable is removed from the wall outlet, the power of the AeroDR Battery Charger is turned off and the LED (green) is turned off.



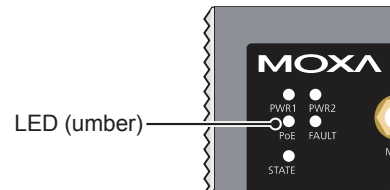
● **AeroDR Battery Charger2**

- Turn the power switch of the AeroDR Battery Charger2 off, and confirm that the LED (green) is turned off.



● **AeroDR Access Point**

- When the power switch of the AeroDR Interface Unit or AeroDR Interface Unit2 is turned off, power supply to AeroDR Access Point is terminated. The LED (umber) on the AeroDR Access Point will turn off.



● **Access Point**

- Reference** .....
- When using a general-purpose access point, refer to its operation manual.
- .....

● **Image processing controller**

- Turn the power switch of the image processing controller off, and shutdown the image processing controller.

## 3.2 • Operation of AeroDR Detector

### 3.2.1 Exposure

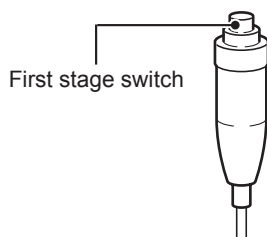
Exposure with this device is performed with the following procedure.

● **Exposure under the basic connection example**

- 1 Perform examination registration with the image processing controller.
- 2 Check that this device is ready to expose images, and then prepare for the exposure.
- 3 Push the exposure switch of the X-ray device to perform the exposure.
  - When the exposure is completed, images are stored in the AeroDR Detector and will then be converted to digital data and sent to the image processing controller sequentially.
- 4 Check that the exposed image is displayed on the image processing controller.

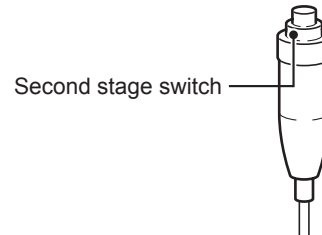
● **Exposure under the S-SRM connection example**

- 1 Perform examination registration with the image processing controller.
- 2 Check that this device is ready to expose images, and then prepare for the exposure.
- 3 Push the S-SRM's hand switch to the first stage.
  - The exposure preparation signal is sent to the X-ray device.



4 Push the S-SRM's hand switch up to the second level to perform exposure.

- Exposure is performed from the X-ray device to produce X-ray images.
- When the exposure is completed, images are stored in the AeroDR Detector and will then be converted to digital data and sent to the image processing controller sequentially.



5 Check that the exposed image is displayed on the image processing controller.

**IMPORTANT** .....

- The AeroDR Detector is precision equipment, and therefore impact or vibration during radiography or image transfer may affect the image quality. Be careful when handling the AeroDR Detector during and just after radiography.
- .....

**HINT** .....

- If the AeroDR Detector remains unused for a long time (time can be set) it transitions to the sleep mode.
  - When the image processing controller is ready to expose, it recovers from the sleep mode.
- .....

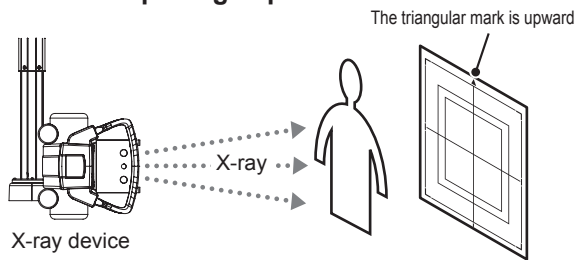
**Reference** .....

- Regarding the operation of the image processing controller, refer to the "Operation Manual" of the image processing controller.
- .....

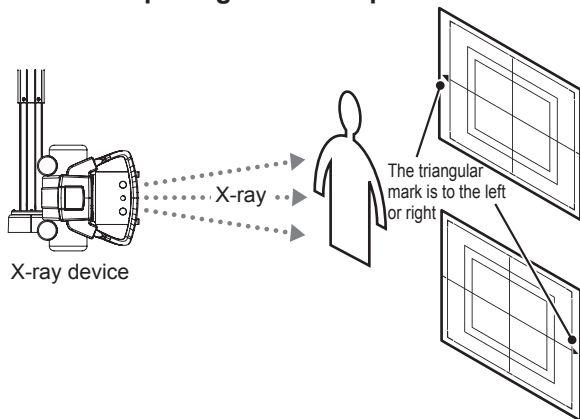
### 3.2.2 AeroDR Detector orientation

Change the orientation of the AeroDR Detector according to the exposure body part. Expose with the triangular mark upward when exposing in portrait, and with the triangular mark to the side when exposing in landscape.

● **When exposing in portrait**



● **When exposing in landscape**

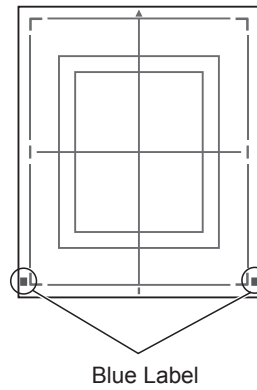


**IMPORTANT**

- The side with the triangular mark is the exposure surface.
- When exposing in landscape, the direction of the triangular mark is set according to exposure environment.
- Radiography is not allowed on a subject in a horizontal position when an AeroDR 1717HQ is used.

**HINT**

- The blue label also helps you identify the top-bottom orientation of the AeroDR Detector.
- To carry out exposures in portrait orientation, turn the AeroDR Detector so that its blue label comes to the bottom position.

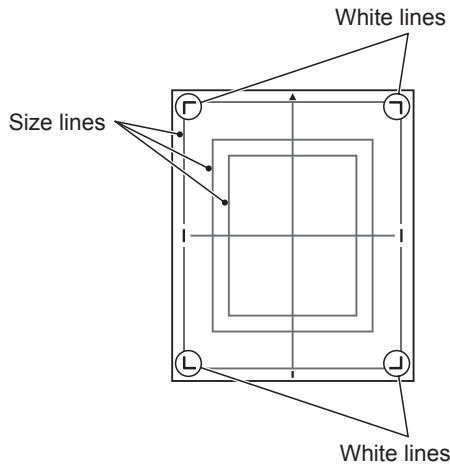


### 3.2.3 Precautions for exposure

During exposure give adequate attention to the following items.

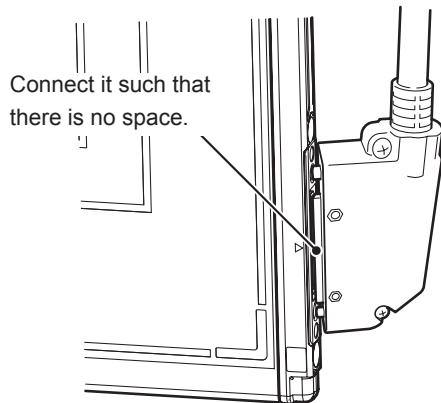
● **Exposure area**

- The size lines of AeroDR Detector indicate the exposure size.
- During exposure, place the exposure body part within the white lines on the four corners.



● **Wired connection**

- When performing exposure with a wired connection, fasten the wired cable horizontally to the wired connection connector of the AeroDR Detector. If connected at an angle, transverse (noise) sometimes gets into acquired images after exposure.



● **Wireless communications environment**

- With a wireless environment, it is possible that errors such as no wireless connection, wireless communication terminates, and lengthened exposure cycle time might occur.

**HINT** .....

- Problems with a wireless communications environment can occur in the following conditions:
    - Installed location of the access point is not good.
    - When inserted in the wall stand, table, or stretcher, the opening in the wall stand or table 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 antennas positioned in 2 places.
    - Other devices use the same radio band, and cause interference.
    - When the 2.4 GHz band is used, using high frequency therapy equipment will cause interference.
    - When the DFS band is used, the access point changes channels if weather radar or air control radar is detected. This may cause communication to be temporarily disconnected.
- .....

● **Exposure switch**

- If the exposure switch remains held down, it may result in an afterimage becoming visible. Once exposure is finished, release the exposure switch immediately.

● **Grid**

- Use the following grid when exposing.

Grid density	40 lp/cm or 34 lp/cm
Grid ratio	Variety
Convergence distance	Variety
Angle error	5.0° or less

**IMPORTANT** .....

- For an AeroDR 1417S without the "1417S" identification, use a grid with a grid density of 34 lp/cm and an angle error of 0.5° or less.



**AeroDR P-12  
(1417S)**

Identification

- When the "Aero Sync mode" is used, use a grid with a grid ratio of 8 or less.
- A capped grid is recommended when laying the grid over the AeroDR Detector on the table top or for exposure with the X-ray device.
- Do not use a grid of which the antenna is covered with metal, as the quality of wireless communication may be significantly reduced.

• **High-dose exposure**

- When high-dose exposures are performed continuously, afterimages of the last exposure will occasionally be visible. The affect of afterimages in this device can be resolved by leaving longer intervals between exposures, so make the intervals between exposures longer than usual when performing high-dose exposure.
- During high-dose exposure, continual use of a lead or other marker at the same position can cause burning in of the afterimage. Therefore, avoid using it in the same position. Also, if image burn-in is visible, run calibration.

• **Exposure time for basic connection/S-SRM connection**

- Select the maximum exposure time from 0.7, 1.7, and 3.2.
- AeroDR Detectors whose maximum exposure time can be set to 4.0, 6.7, 10.3 are as follows.

AeroDR Detector	Serial Number	
	First four digits	Number
AeroDR 1417HQ	A5DP	50198 or more
AeroDR 1417S	A50D	51001 or more
AeroDR 1717HQ	A6C3	51001 or more
AeroDR 1012HQ	A5TE	51001 or more

- The exposure time for actual exposures should not exceed the maximum exposure time you have set. Otherwise, exposure may fail or correct images may not be able to be obtained.

**IMPORTANT** .....

- You can select a maximum exposure time of 4.0, 6.7, and 10.3 for the AeroDR 2 1417HQ and AeroDR 2 1417S.
- If you increase the maximum exposure time, the AeroDR Detector may take longer to exit sleep mode.

**HINT** .....

- Use the image processing controller to set the maximum exposure time. In some cases, the maximum exposure time is fixed according to the X-ray device. For details, contact Konica Minolta technical representatives.
- When using ImagePilot as the image processing controller, it is not possible to change the maximum exposure time.

• **Exposure time for Aero Sync mode**

- When using Aero Sync mode, set the maximum exposure time to 0.8 seconds or less.
- When using Aero Sync mode, set the minimum exposure time as follows:

AeroDR Detector	Minimum exposure time
AeroDR 1417HQ/ AeroDR 1717HQ/ AeroDR 1012HQ	2.1 milliseconds
AeroDR 2 1417HQ/ AeroDR 2 1417S	1 millisecond

**IMPORTANT**

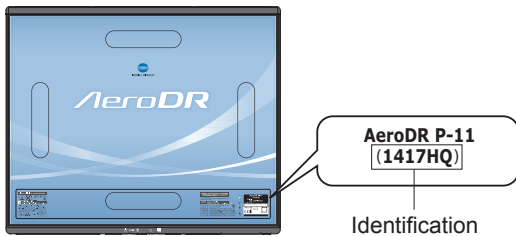
- If the conditions are not met, X-rays may not be detected or streaks may occur in the image.
- Because the minimum exposure time for AeroDR 1417HQ, AeroDR 1717HQ, and AeroDR 1012HQ varies depending on the X-ray device to be used, follow the survey results at the time of installation.
- The minimum exposure time applies to the time when X-ray is exposed onto the center of the AeroDR Detector. If X-ray cannot be exposed onto the center, contact Konica Minolta technical representatives.

**HINT**

- When using ImagePilot as the image processing controller, it is not possible to change the maximum exposure time.

**Identify the AeroDR Detector that users can use in Aero Sync mode**

- Confirm that if the following identification is in the AeroDR Detector that users can use in Aero Sync mode.



AeroDR Detector	Identification
AeroDR 1417HQ	1417HQ
AeroDR 1717HQ	1717HQ

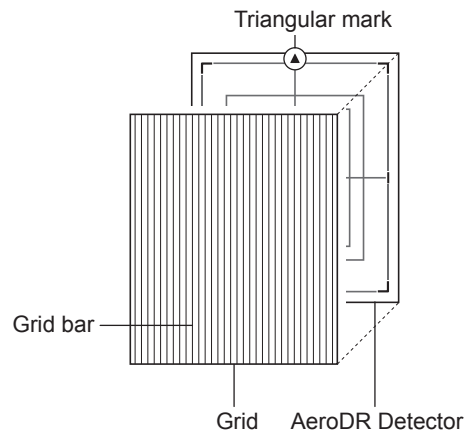
**IMPORTANT**

- The AeroDR 1012HQ, AeroDR 2 1417HQ and AeroDR 2 1417S can use the Aero Sync mode.
- Users can not use Aero Sync Mode in the AeroDR Detector if it is AeroDR 1417S.
- Users cannot use Aero Sync mode in the AeroDR Detector if the first four digits of its SerialNumber are shown in the following table in the AeroDR 1417HQ or AeroDR 1717HQ.

AeroDR Detector	SerialNumber that cannot be used
AeroDR 1417HQ	A45Y
AeroDR 1717HQ	A54T

**Exposure with the Aero Sync mode**

- To confirm X-ray detection, make sure the following conditions are met.
  - For the AeroDR 1417HQ, AeroDR 1717HQ and AeroDR 1012HQ:
    - Perform exposure by following the survey results of the installation. For details, contact Konica Minolta technical representatives.
  - For the AeroDR 2 1417HQ and AeroDR 2 1417S:
    - Perform X-ray exposure at a range of 10 cm square or more at the center of the AeroDR Detector. For the exposure conditions, set the S value to 2000 or less and the exposure time to 0.8 seconds or less.
- To use a grid in Aero Sync mode, align the orientation of the triangular mark of the AeroDR Detector with the grid bar as shown in the following figure.



- If the AeroDR Detector is used in an orientation where the grid bars are turned 90 degrees with respect to the triangle mark on the AeroDR Detector, observe the following conditions:
  - 40 lp/cm: Angular error must be 1.0° or less.
  - 34 lp/cm: Angular error must be 1.7° or less.
- Do not use additional filters for exposure dose reduction.
- If there are any radioactive substances remaining in the patient's body after nuclear medicine testing or some other reason, the AeroDR 2 1417HQ and the AeroDR 2 1417S may recognize that X-rays were emitted and start image transfer. When the image is transferred, change the X-ray sensitive setting of the image processing controller to "High" before performing exposure.
  - If you change the X-ray sensitivity to "High", make sure that all of the following conditions are met before performing exposure. If you perform exposure under other conditions, you may not be able to get an image.
    - On the AeroDR Detector, set up an area (2 cm x 2 cm or larger) on which the X-rays are emitted directly.



- Emit the X-rays onto the entire AeroDR Detector.
- Emit the X-rays by using a tube current of 140 mA or higher or a tube voltage of 90 kV or higher.

**IMPORTANT**

- If the conditions are not met, X-rays may not be detected or streaks may occur in the image.

**S-SRM connection**

- When S-SRM connection is adopted, make sure to perform exposure using the hand switch connected to the AeroDR Interface Unit2, AeroDR Generator Interface Unit and AeroDR Generator Interface Unit2.
- If exposure is performed using the hand switch on the operation panel of the X-ray device, exposure synchronized to the AeroDR SYSTEM is not possible.

**IMPORTANT**

- If you restart the image processing controller, also restart the AeroDR Interface Unit or AeroDR Interface Unit2.

**AED (Automated External Defibrillator)**

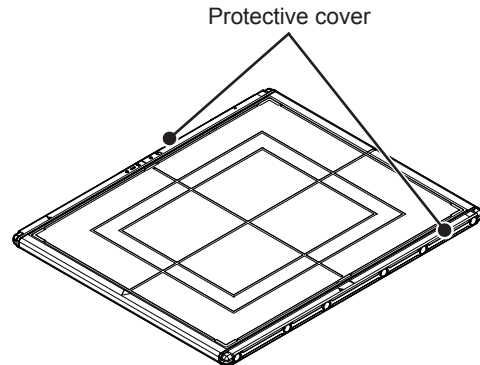
- When an AED (Automated External Defibrillator) is used, move the AeroDR Detector away from the patient. High voltage and high current may result in a breakdown of the AeroDR Detector.

**The operating temperature environment of AeroDR Detectors**

- If an AeroDR Detector is left close to or in contact with a heat generator such as electric carpet, its safety device may be activated and the AeroDR Detector may fail to work properly.

**Waterproof performance of the AeroDR 2 1417HQ/AeroDR 2 1417S**

- If there is a risk of the ingress of patient body fluids, chemicals, water, etc., make sure to cover the AeroDR 2 1417HQ and AeroDR 2 1417S with a vinyl sheet, etc. The ingress of patient body fluids, chemicals, water, etc. into the protective cover cannot be prevented. In particular, if patient body fluids enter into the protective cover, for hygienic purposes, make sure to replace or clean the parts.



- Subjecting the AeroDR 2 1417HQ and AeroDR 2 1417S to strong impacts or excessive loads by dropping or hitting them against other objects may diminish their waterproof capabilities.
- The AeroDR 2 1417HQ and AeroDR 2 1417S are designed to have IPX6 waterproof capabilities, but they are not guaranteed to be completely waterproof.

**IMPORTANT**

- The AeroDR 1417HQ, AeroDR 1417S, AeroDR 1717HQ, and AeroDR 1012HQ are not waterproof.

**HINT**

- An IPX6 (level of jet stream protection) rating indicates that the AeroDR 2 1417HQ and AeroDR 2 1417S are designed to operate even after being exposed to normal temperature water projected from all angles through a 12.5mm nozzle for 3 minutes or more (at a flow rate of about 100L/min) from a distance of 3 meters.

### ● Exposure with the remote table

- The AeroDR Detector is precision equipment, therefore impact or vibration during exposure and image transfer may affect the image quality. Impact or vibration when performing exposure using the remote table in particular may significantly increase the effect, therefore observe the following.
  - Prevent the AeroDR Detector from moving until the preview image is displayed immediately after exposure.
  - Do not operate the remote table to eject the AeroDR Detector or load the AeroDR Detector to the standby position.
  - Do not move the remote table position horizontally or vertically.
- Check that the AeroDR Detector does not automatically move immediately after exposure. If it does, please contact a technical representative of the X-ray device manufacturer and request to change the settings so that the AeroDR Detector does not move immediately after exposure.
- If the settings of the X-ray device cannot be changed, check the image quality in advance. Please contact Konica Minolta technical representative for more information about how to check the image quality.

## 3.3 • Charging of AeroDR Detector

Charge the AeroDR Detector when the LED (blue) on the AeroDR Detector lights or flashes, or when the battery level gets low in the status display of the AeroDR Detector on the image processing controller.

### IMPORTANT

- During charging, if the AeroDR Detector should become hot, stop charging immediately.
- If charging errors occur repeatedly, contact Konica Minolta technical representatives.

### HINT

- The AeroDR Detector can be charged when the power is either on or off.
- The AeroDR Detector can be used while stopping charging in progress.
- To charge the AeroDR Detector with the AeroDR Battery Charger or AeroDR Battery Charger2 when you do not use it for a long time such as during the night, charge the AeroDR Detector with its power turned off.
- Even if you use the battery equipped with this device for repeated quick charging and use, deterioration of battery life is small compared to a lithium-ion battery.

### 3.3.1 Charging with AeroDR Battery Charger

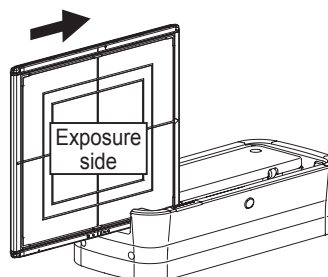
Inserting the AeroDR Detector into the AeroDR Battery Charger performs charging of the AeroDR Detector.

### IMPORTANT

- The AeroDR 1012HQ and AeroDR 2 1417S cannot be charged in the AeroDR Battery Charger.

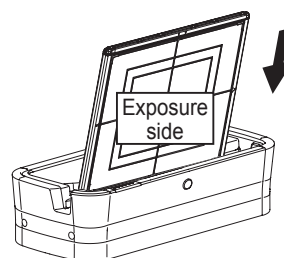
- 1 Confirm that the LED (green) of the AeroDR Battery Charger is slowly flashing.
- 2 Slowly insert the AeroDR Detector with its exposure side pointed toward the operator until the buzzer sounds. When inserted, charging of the AeroDR Detector begins.

Insert from the side

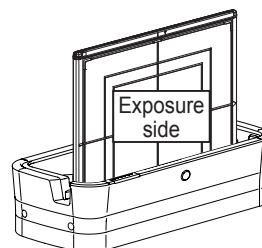


Slide slowly

Insert from the front (top)



Load slowly



Inserted

- 3 Once the AeroDR Detector is inserted correctly and charging starts, the LED (blue) on the AeroDR Battery Charger will light.
- 4 Once charging of the AeroDR Detector is completed, the LED (blue) on the AeroDR Battery Charger will turn off.

**IMPORTANT**

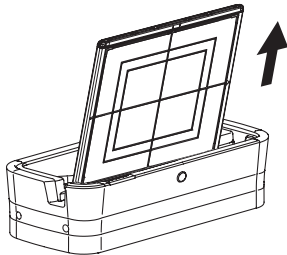
- Handle the AeroDR Detector with extreme care when inserting it into the AeroDR Battery Charger.
- The LED of the AeroDR Detector is not visible when the AeroDR Detector is inserted into the AeroDR Battery Charger.
- The wired connection connector of the AeroDR Detector may become warm right after charging on the AeroDR Battery Charger. This often occurs during charging and is not a malfunction.

**HINT**

- If there is any problem during charging, the LED (orange) on the AeroDR Battery Charger will light. Also, charging will stop when an error occurs.

**5 Remove the AeroDR Detector from the AeroDR Battery Charger.**

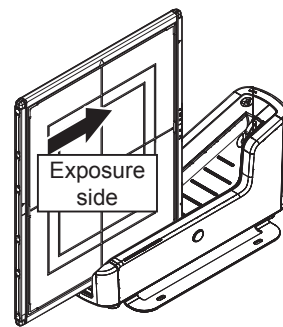
- Pull the AeroDR Detector to remove it.



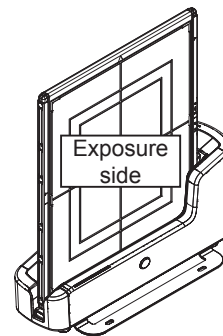
**3.3.2 Charging with AeroDR Battery Charger2**

Inserting the AeroDR Detector into the AeroDR Battery Charger2 performs charging of the AeroDR Detector.

- 1 Confirm that the LED (green) of the AeroDR Battery Charger2 is slowly flashing.**
- 2 Slowly insert the AeroDR Detector with its exposure side pointed toward the operator until the buzzer sounds. When inserted, charging of the AeroDR Detector begins.**



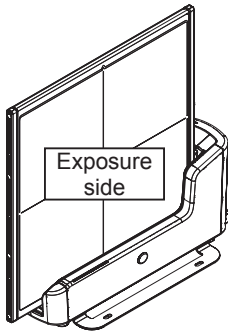
Load slowly



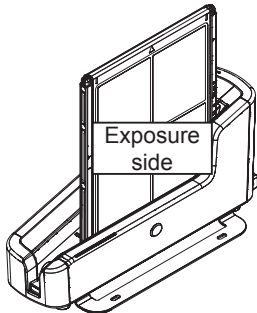
Inserted

**HINT** .....

- AeroDR 1717HQ is inserted







- AeroDR 1012HQ is inserted



**3** Once the AeroDR Detector is inserted correctly and charging starts, the LED (blue) on the AeroDR Battery Charger2 will flash or light.

- The LED (blue) on the AeroDR Battery Charger2 changes according to the level of battery power of the AeroDR Detector.

Battery level	LED display
2% or less	 Slow flashing (blue)
3 to 49%	 Lit and Slow flashing (blue)
50 to 79%	 Lit and Slow flashing (blue)
80% or more	 Lit (blue)

**4** Once charging of the AeroDR Detector is completed, all the LEDs (blue) on the AeroDR Battery Charger2 will turn on.

**IMPORTANT** .....

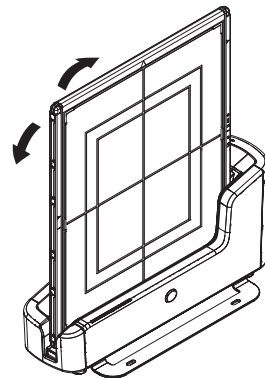
- Handle the AeroDR Detector with extreme care when inserting it into the AeroDR Battery Charger2.
- The wired connection connector of the AeroDR Detector may become warm right after charging on the AeroDR Battery Charger2. This often occurs during charging and is not a malfunction.

**HINT** .....

- If there is any problem during charging, the LED (orange) on the AeroDR Battery Charger2 will light. Also, charging will stop when an error occurs.

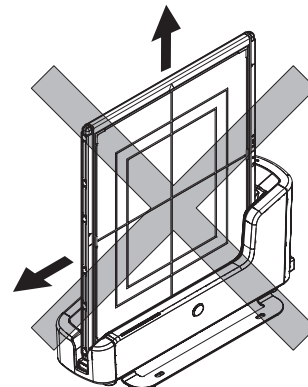
**5** Remove the AeroDR Detector from the AeroDR Battery Charger2.

- Tilt the AeroDR Detector in the direction shown in the following figure and remove it.



**IMPORTANT** .....

- As the AeroDR Detector is locked by a magnet, do not pull it out horizontally or vertically.

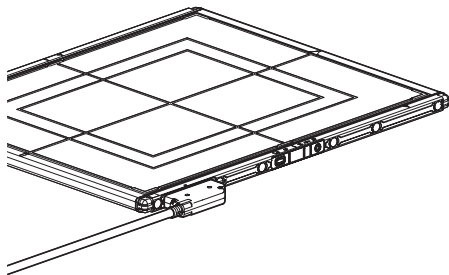


### 3.3.3 Charging with the wired cable

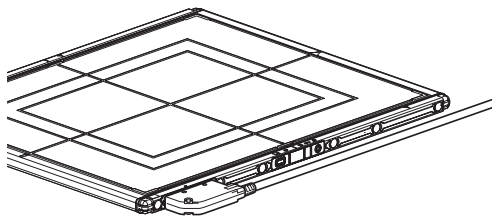
Connecting the AeroDR UF Cable or AeroDR I/F Cable to the AeroDR Detector performs charging of the AeroDR Detector.

- 1 Confirm that the LED (green) of the AeroDR Interface Unit or the Detector Connection LED (green) and Generator Interface LED (green) of the AeroDR Interface Unit2 light.
- 2 Securely connect the AeroDR I/F Cable or AeroDR UF Cable to the wired connection connector on the AeroDR Detector. Once it is connected, the AeroDR Detector will start charging.

When the AeroDR I/F Cable is connected



When the AeroDR UF Cable is connected



- 3 Once the charging of the AeroDR Detector is higher than 10%, the LED (blue) on the AeroDR Detector will go out.

**HINT** .....

- Confirm completion of full charge and the level of battery power with the image processing controller.
- If there is any problem during charging, the LED (orange) on the AeroDR Detector will light. Also, charging will stop when an error occurs.

.....

### 3.3.4 Charging time guide

To fully charge the AeroDR Detector requires the following charging time.

● **AeroDR 1417HQ/AeroDR 1417S/ AeroDR 1717HQ**

Charging status	Charging time of the AeroDR Detector when the power is off
Via the AeroDR Battery Charger	30 minutes or less
Via AeroDR Battery Charger2	60 minutes or less
Via wired cable	60 minutes or less

● **AeroDR 1012HQ**

Charging status	Charging time of the AeroDR Detector when the power is off
Via the AeroDR Battery Charger	Cannot be recharged.
Via AeroDR Battery Charger2	30 minutes or less
Via wired cable	30 minutes or less

● **AeroDR 2 1417HQ**

Charging status	Charging time of the AeroDR Detector when the power is off
Via the AeroDR Battery Charger	30 minutes or less
Via AeroDR Battery Charger2	30 minutes or less
Via wired cable	30 minutes or less

● **AeroDR 2 1417S**

Charging status	Charging time of the AeroDR Detector when the power is off
Via the AeroDR Battery Charger	Cannot be recharged.
Via AeroDR Battery Charger2	13 minutes or less
Via wired cable	13 minutes or less

**IMPORTANT** .....

- When the AeroDR Detector is on, the charging time will be slightly longer as it depends on the operation status.

.....

### 3.3.5 AeroDR Detector battery level display

The AeroDR Detector LED (blue) changes according to the battery level.

Battery level	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

#### IMPORTANT

- When the battery runs down completely, all the LEDs go out. Confirm that the LED (green) either lights or flashes when you perform exposure.

## 3.4 • Registration and selection of the AeroDR Detector

By registering the AeroDR Detector in the image processing controller using one of the following methods, the AeroDR Detector can be moved between exposure rooms.

- Insert it into the AeroDR Battery Charger or AeroDR Battery Charger2
- Connect the AeroDR I/F Cable or AeroDR UF Cable to the wired connection connector

### IMPORTANT

- When using ImagePilot as the image processing controller, it is not possible to move the AeroDR Detector between different exposure rooms.
- Once it is registered in a new exposure room, it will not be usable in the previous exposure room. When returning to a previous exposure room, perform the registration operation again.

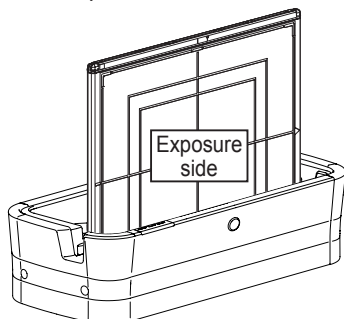
### 3.4.1 Registration with AeroDR Battery Charger

To register the AeroDR Detector in the AeroDR Battery Charger, follow the procedure below.

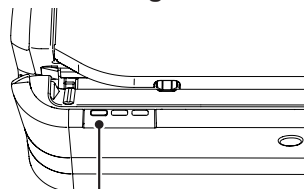
### IMPORTANT

- AeroDR 1012HQ cannot be registered with the AeroDR Battery Charger.

- 1 Make sure that all the devices in the destination exposure room are usable.
- 2 Insert the AeroDR Detector into AeroDR Battery Charger in the destination exposure room.
  - Registration process will start.



- 3 Once the registration is completed, a buzzer will sound on the AeroDR Battery Charger, and the LED (green) will change from slow flashing to lit.



LED (green)

- 4 Confirm that the AeroDR Detector icon is displayed on the image processing controller.

### IMPORTANT

- When an AeroDR Battery Charger exclusively for charge is used, confirm that the battery charger in the destination has a "Charge and registration" label.



### HINT

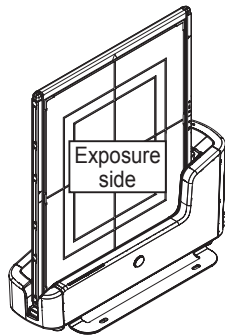
- Charging will also start when the AeroDR Detector (AeroDR 1417HQ, AeroDR 1417S, AeroDR 1717HQ, AeroDR 2 1417HQ) is inserted into the AeroDR Battery Charger, and the AeroDR Battery Charger LED (blue) will light.



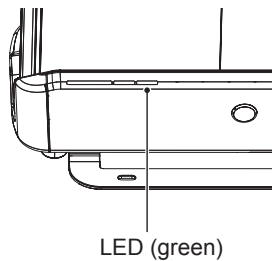
### 3.4.2 Registration with AeroDR Battery Charger2

To register the AeroDR Detector in the AeroDR Battery Charger2, follow the procedure below.

- 1 Make sure that all the devices in the destination exposure room are usable.
- 2 Insert the AeroDR Detector into AeroDR Battery Charger2 in the destination exposure room.
  - Registration process will start.



- 3 Once the registration is completed, a buzzer will sound on the AeroDR Battery Charger2, and the LED (green) will change from slow flashing to lit.



- 4 Confirm that the AeroDR Detector icon is displayed on the image processing controller.

**HINT** .....

- Charging will also start when the AeroDR Detector is inserted into the AeroDR Battery Charger2, and the AeroDR Battery Charger2 LED (blue) will light or flash.

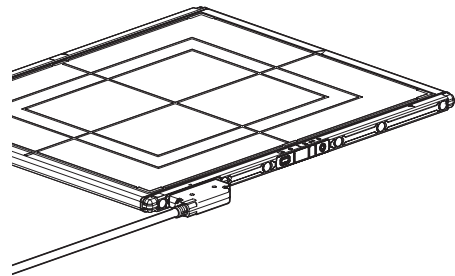
.....

### 3.4.3 Registration with the wired cable

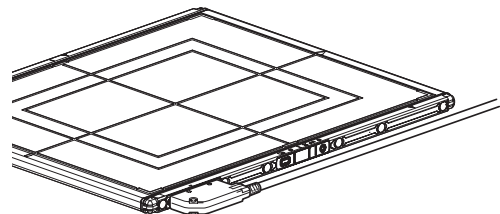
To register the AeroDR Detector by connecting the AeroDR I/F Cable or AeroDR UF Cable to the wired connection connector, follow the procedures below.

- 1 Make sure that all the devices in the destination exposure room are usable.
- 2 Securely connect the AeroDR I/F Cable or AeroDR UF Cable to the wired connection connector on the AeroDR Detector.
  - Registration process will start.

When the AeroDR I/F Cable is connected



When the AeroDR UF Cable is connected



- 3 Confirm that the AeroDR Detector icon is displayed on the image processing controller.

### 3.4.4 Selection of the AeroDR Detector

An AeroDR Detector is selected as follows depending on the number registered on each image processing controller.

Number of registered AeroDR Detectors	Selection method
1	<ul style="list-style-type: none"> <li>AeroDR Detector is selected automatically when that AeroDR Detector is ready to be selected.</li> <li>The AeroDR Detector is not selected if it is not set in a wall stand or table that matches the order information.</li> </ul>
Multiple	<ul style="list-style-type: none"> <li>The AeroDR Detector that was selected immediately beforehand will be selected automatically if it is ready to be selected.</li> <li>If there is no AeroDR Detector in the wall stand or table that matches the order information, no AeroDR Detector will be selected.</li> </ul>

**HINT** .....

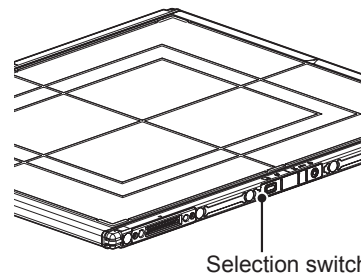
- The LED (green) of the selected AeroDR Detector is lit.

.....

### 3.4.5 Manual selection of the AeroDR Detector

Selecting the AeroDR Detector manually is performed with the following procedure.

- 1 Press the selection switch of the AeroDR Detector that will be used for 2 seconds or longer.



- 2 After selection is completed, the LED (green) of the AeroDR Detector is lit.

**Reference** .....

- The AeroDR Detector can also be selected manually from the image processing controller. For details, refer to the "Operation Manual" of the image processing controller.

.....

## 3.5 • Calibration

Perform calibration so that the AeroDR Detector can provide optimal images.

Perform calibration every 3 months or when a message prompting you to do so is displayed in the image processing controller.

### IMPORTANT

- It is necessary to perform the gain calibration periodically to compensate for changes over time or changes in the exposure environment.
- Fully charge the AeroDR Detector before the calibration.
- Perform by waiting at least 10 minutes after the previous exposure.

### Reference

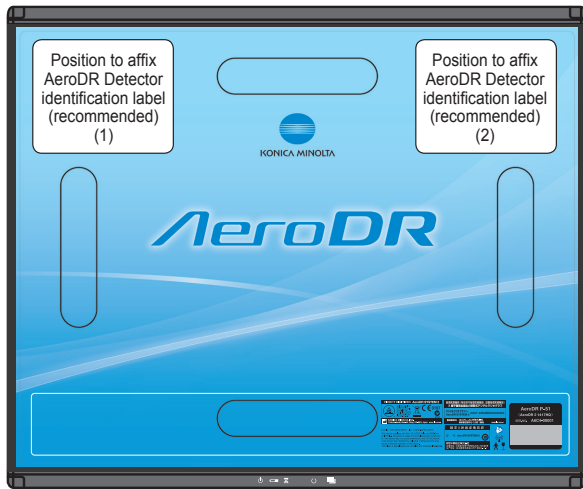
- For the calibration, refer to the "Operation Manual" or the "User Tool Operation Manual" of the image processing controller.

## 3.6 • Position to affix AeroDR Detector identification label and AeroDR Grip sheet

### 3.6.1 Position to affix AeroDR Detector identification label

When using more than 1 AeroDR Detector and affixing identification labels (stickers) to the outside of the AeroDR Detectors, it is recommended to affix the labels to the 2 places ((1), (2)) shown as follows.

Position to affix AeroDR Detector identification label



#### IMPORTANT

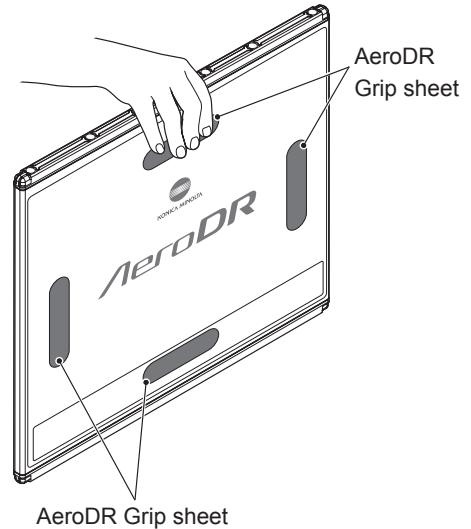
- Affix the labels only in the recommended places. Failure to do so may cause the labels to come off or image unevenness to occur.

#### HINT

- Use of commercially available vinyl (Tepa, etc.) labels are recommended for the identification labels (stickers). When possible, use labels that do not easily peel off.
- It is recommended to write the name and identification number registered in the image processing controller on the label.

### 3.6.2 AeroDR Grip sheet

When using the AeroDR Grip sheet, hold the AeroDR Detector as shown in the following figure.



#### IMPORTANT

- The AeroDR Grip sheet may peel off or deteriorate depending on usage. When AeroDR Grip sheet peel off or deteriorate, replace them.
- For replacement AeroDR Grip sheet, contact Konica Minolta technical representatives.
- For how to affix the AeroDR Grip sheet, refer to "6.1.5 AeroDR Grip sheet affixing and replacement".

# Chapter 4

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## Status (LED) Display

This chapter describes the LED display patterns and the status of the respective devices.

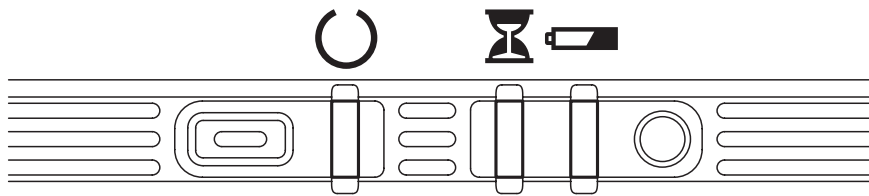
## 4.1 • LED display of respective devices

Status of the respective devices can be confirmed with LEDs.  
Check the status of the respective devices, referring to the "LED display pattern".





### LED display pattern

Notation	Display pattern
	Off
	Slow flashing
	Fast flashing
	On




### 4.1.1 AeroDR Detector (AeroDR 1417HQ/AeroDR 1417S/ AeroDR 1717HQ/AeroDR 1012HQ)







#### : Status LED (green)

Display pattern	Status
	Shutdown condition
	Standing by
	AeroDR Detector being selected
	Exposing

#### : Busy/error LED (orange)

Display pattern	Status
	Shutdown condition or standing by
	Exposing or performing maintenance
	Error occurred

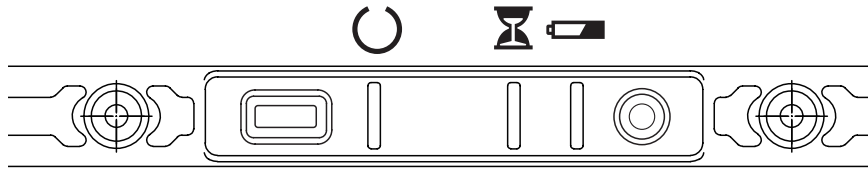
#### : Battery LED (blue)

Display pattern	Status
	Shutdown condition or battery level is 10% or above
	Battery level is less than 10%
	Battery level is less than 5%
	Battery level is less than 3%





#### HINT

- During startup/shutdown processing, it also flashes fast and is lit.




### 4.1.2 AeroDR Detector (AeroDR 2 1417HQ/AeroDR 2 1417S)







 : Status LED (green)

Display pattern	Status
	Shutdown condition
	Standing by
	AeroDR Detector being selected
	Exposing

 : Busy/error LED (orange)

Display pattern	Status
	Shutdown condition or standing by
	Exposing or performing maintenance
	Error occurred

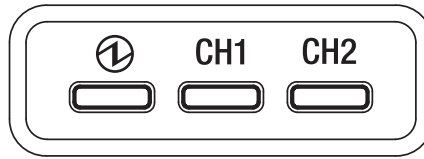
 : Battery LED (blue)

Display pattern	Status
	Shutdown condition or battery level is 10% or above
	Battery level is less than 10%
	Battery level is less than 5%
	Battery level is less than 3%

 **HINT** .....

- During startup/shutdown processing, it also flashes fast and is lit.
- .....

### 4.1.3 AeroDR Interface Unit



**⚡ : Power LED (green)**

Display pattern	Status
	Shutdown condition
	Operating

**CH1 : Feeding1 LED (blue)**

Display pattern	Status
	Shutdown condition or feeding1 is not connected to the AeroDR Detector
	The AeroDR Detector is connected to feeding1

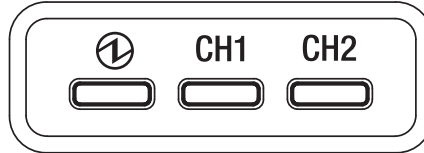
**CH2 : Feeding2 LED (blue)**

Display pattern	Status
	Shutdown condition or feeding2 is not connected to the AeroDR Detector
	The AeroDR Detector is connected to feeding2



### 4.1.4 AeroDR Interface Unit2

#### Detector Connection LED



#### Ⓛ : Power LED (green)

Display pattern	Status
	Shutdown condition
	Operating

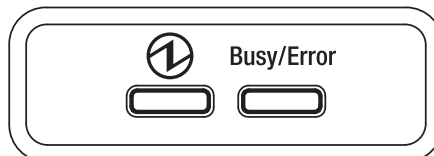
#### CH1 : Feeding1 LED (blue)

Display pattern	Status
	Shutdown condition or feeding1 is not connected to the AeroDR Detector
	The AeroDR Detector is connected to feeding1

#### CH2 : Feeding2 LED (blue)

Display pattern	Status
	Shutdown condition or feeding2 is not connected to the AeroDR Detector
	The AeroDR Detector is connected to feeding2

#### Generator Interface LED



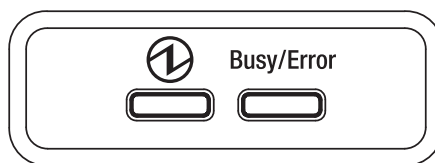
#### Ⓛ : Power LED (green)

Display pattern	Status
	Shutdown condition
	Operating and not connected to the image processing controller
	Operating and connected to the image processing controller

#### Busy/Error : Busy/error LED (orange)

Display pattern	Status
	Shutdown condition or standing by
	Exposing or performing maintenance
	Error occurred

### 4.1.5 AeroDR Generator Interface Unit



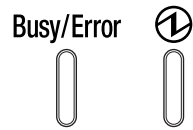
**⚡ : Power LED (green)**

Display pattern	Status
	Shutdown condition
	Operating and not connected to the image processing controller
	Operating and connected to the image processing controller

**Busy/Error : Busy/error LED (orange)**

Display pattern	Status
	Shutdown condition or standing by
	Exposing or performing maintenance
	Error occurred

### 4.1.6 AeroDR Generator Interface Unit2



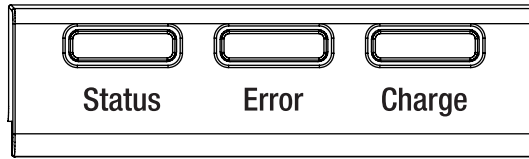
#### Busy/Error : Busy/error LED (orange)

Display pattern	Status
	Shutdown condition or standing by
	Exposing or performing maintenance
	Error occurred

#### ⌚ : Power LED (green)

Display pattern	Status
	Shutdown condition
	Operating and not connected to the image processing controller
	Operating and connected to the image processing controller

### 4.1.7 AeroDR Battery Charger



**Status : Status LED (green)**

Display pattern	Status
	Shutdown condition
	Operating
	Registration processing of the inserted AeroDR Detector is complete



- HINT** .....
- Because the charger dedicated for charging does not perform registration processing of the AeroDR Detector, the status LED always flashes slowly.
- .....

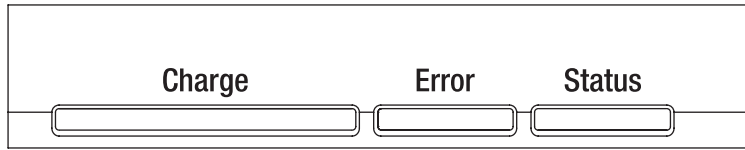
**Error : Error LED (orange)**

Display pattern	Status
	Shutdown condition or operating normally
	Error occurred

**Charge : Feeding LED (blue)**

Display pattern	Status
	Shutdown condition or standing by for insertion of the AeroDR Detector Battery charged during AeroDR Detector insertion
	AeroDR Detector battery charging

### 4.1.8 AeroDR Battery Charger2



**Charge: Feeding LED (blue)**

Display pattern	Status
	Shutdown condition or standing by for insertion of the AeroDR Detector
	AeroDR Detector battery charging (battery level is less than 2%)
	AeroDR Detector battery charging (battery level is 3 to 49%)
	AeroDR Detector battery charging (battery level is 50 to 79%)
	AeroDR Detector battery charging (battery level is higher than 80%)

**Error : Error LED (orange)**

Display pattern	Status
	Shutdown condition or operating normally
	Error occurred

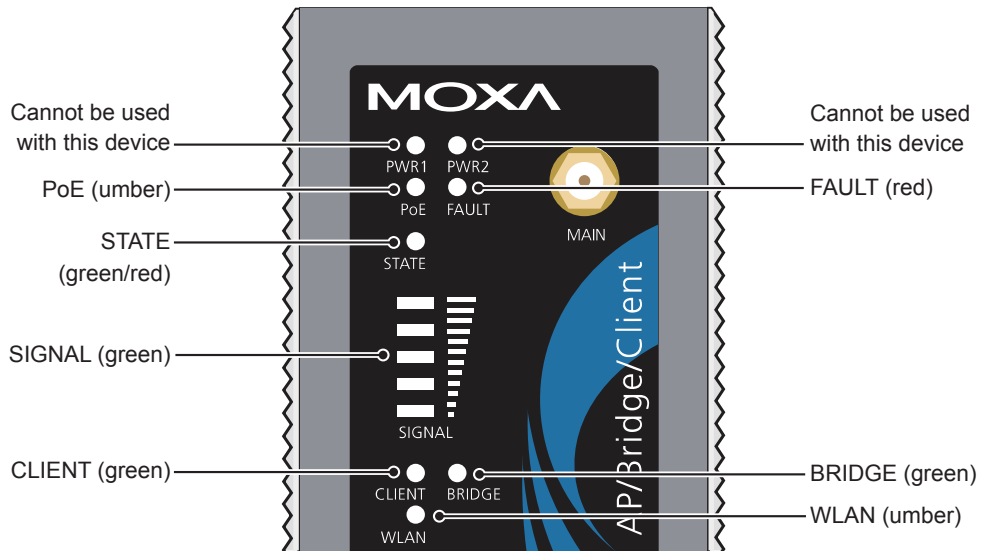
**Status : Status LED (green)**

Display pattern	Status
	Shutdown condition
	Operating
	Registration processing of the inserted AeroDR Detector is complete

**HINT** .....

- Because the charger dedicated for charging does not perform registration processing of the AeroDR Detector, the status LED always flashes slowly.
- .....

### 4.1.9 AeroDR Access Point



LED	Lighting color	Lighting pattern	Status
PoE	Umber	On	Power is being supplied.
FAULT	Red	Flashing	Error is occurring.
STATE	Green/ Red	Green/on	Lights when operation preparation is completed.
		Red/on	Error is occurring.
SIGNAL	Green	On	Signal strength of wireless. (Only in client mode)
BRIDGE	Green	On	Operating in bridge mode.
CLIENT	Green	On	Operating in client mode.
WLAN	Umber	On	Operating in wireless LAN mode. (Normal)

# Chapter 5

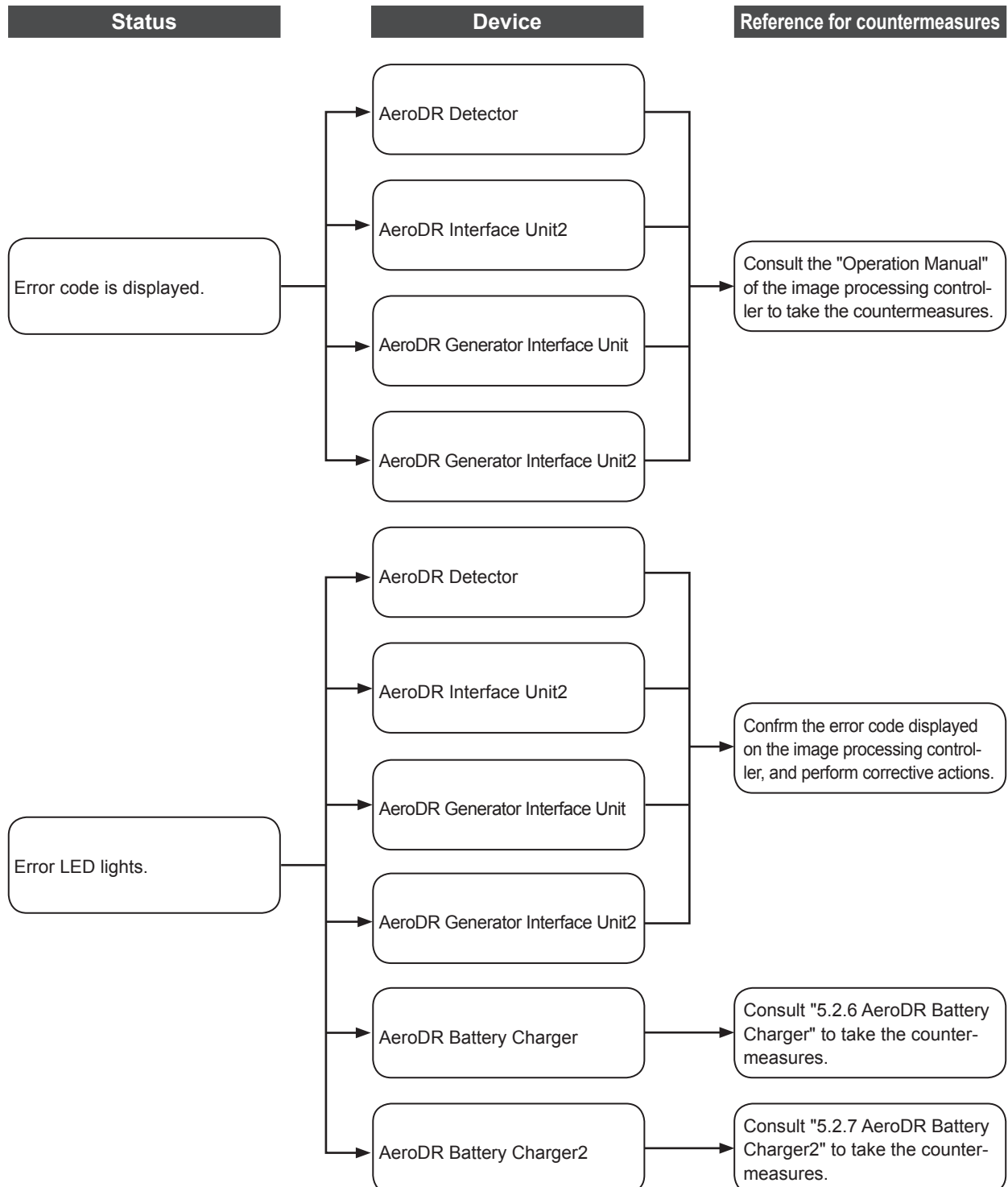
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## Troubleshooting

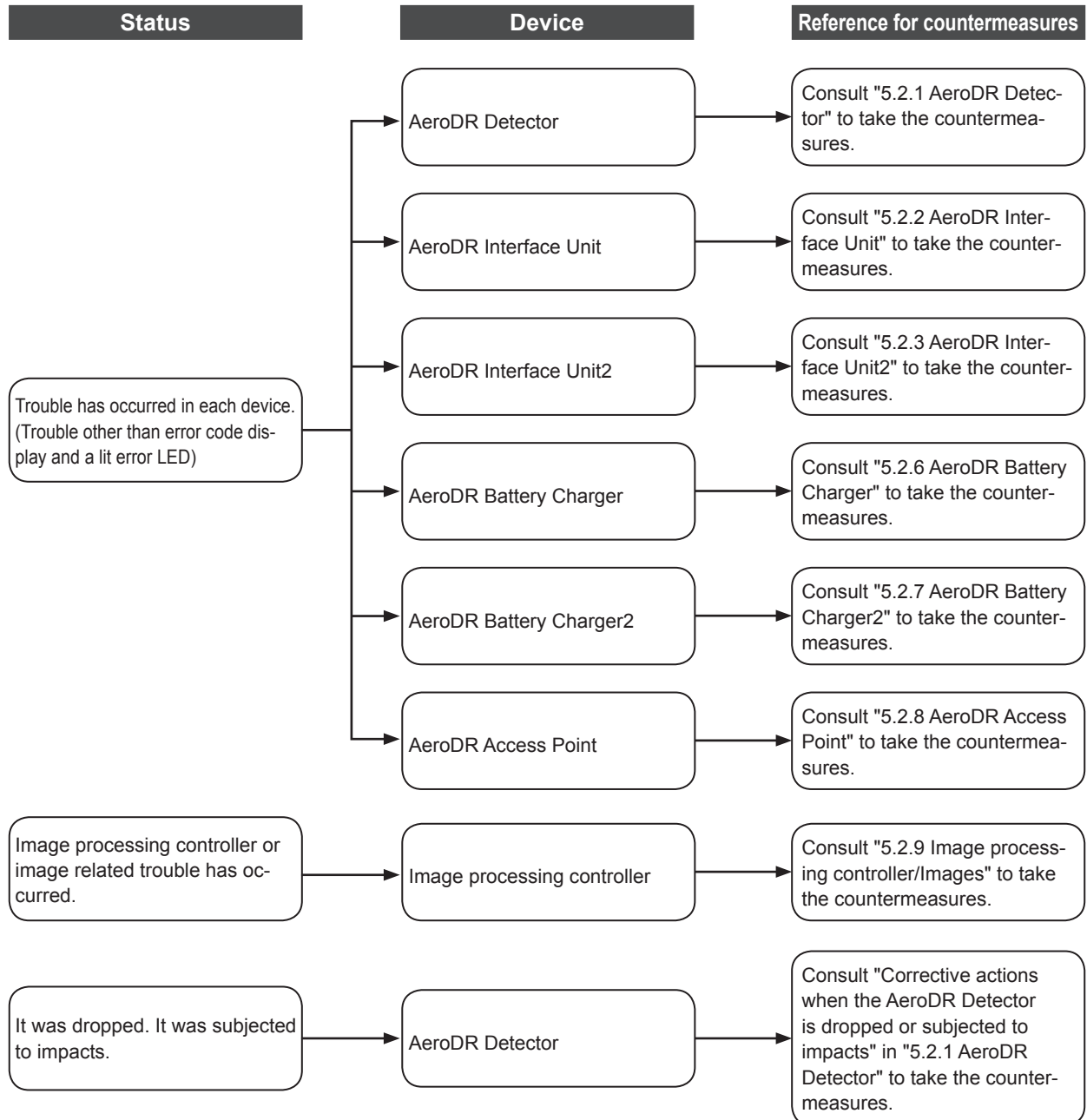
This chapter describes problems that may occur and error codes that may be displayed, and how to resolve each of them.

## 5.1 • Support flow during trouble

If the following problems occur with any of these devices, consult the respective references for countermeasures.







## 5.2 • Various problems and countermeasures

If the following problems occur with any of these devices, consult the respective references for countermeasures.

### IMPORTANT

- After performing countermeasures, if the problem does not go away, contact Konica Minolta technical representatives.

### HINT

- When an error message has been displayed in the image processing controller, check the error description and countermeasures listed in the "Operation Manual" of the image processing controller.
- When using a general-purpose hub or access point, refer to its operation manual.

### 5.2.1 AeroDR Detector

Status	Error description	Corrective actions
The AeroDR Detector does not start up.	Power does not go on even when the power switch is pressed for 2 seconds or longer.	The battery might be out. Charge it as follows. Then, start it. <ul style="list-style-type: none"> <li>• Inserting it into the AeroDR Battery Charger<sup>1</sup> for more than 2 minutes</li> <li>• Inserting it into the AeroDR Battery Charger<sup>2</sup> for more than 6 minutes</li> <li>• Connecting a wired cable for more than 6 minutes</li> </ul>
The AeroDR Detector does not shut down.	Power does not go off even when the power switch is pressed for 5 seconds or longer.	It is not possible to shut down while exposing. Shut down after exposure is ended.
The status LED (green) is lit, and the busy/error LED (orange) flashes rapidly. ("Ready" is not displayed on the image processing controller)	System error is occurring.	If a busy/error LED (orange) continues to flash after 10 minutes has elapsed, shut down the AeroDR Detector. Or, when "Ready" is not displayed on the image processing controller, restart it.
When the AeroDR Detector is placed on a smooth surface, the AeroDR Detector is not stably attached to the smooth surface.	AeroDR Detector is warped.	If the AeroDR Detector is still warped even after the detector is placed on a smooth surface, contact Konica Minolta technical representatives.
	The protective cover is deformed.	Contact Konica Minolta technical representatives.
The AeroDR Detector will not go into the wall stand or table.	AeroDR Detector is warped.	If the AeroDR Detector is still warped even after the detector is placed on a smooth surface, contact Konica Minolta technical representatives.
	The protective cover is deformed.	Contact Konica Minolta technical representatives.
The AeroDR Detector cannot be inserted in the AeroDR Battery Charger <sup>1</sup> or AeroDR Battery Charger <sup>2</sup> .	Foreign material is in the wired connection connector of the AeroDR Detector.	Refer to "6.1.2 Cleaning" and remove the foreign material.
	Foreign material is in the bottom of the AeroDR Battery Charger or AeroDR Battery Charger <sup>2</sup> .	Contact Konica Minolta technical representatives.

Status	Error description	Corrective actions
The AeroDR I/F Cable cannot be connected to the AeroDR Detector.	Part of the wired connection connector of the AeroDR Detector is deformed.	Contact Konica Minolta technical representatives.
	The spring connector of the AeroDR I/F Cable is deformed.	
	Foreign material is in the wired connection connector of the AeroDR Detector.	Refer to "6.1.2 Cleaning" and remove the foreign material.
	Foreign material is in the spring connector on the AeroDR I/F Cable.	
Only wired connection with the AeroDR Detector cannot be used.	The wired cable is not connected properly.	Check that the wired cable is properly connected to the AeroDR Detector.
Only wireless connection with the AeroDR Detector cannot be used.	There is an error in the access point.	Check that the Ethernet cable is properly connected to the access point.
	The AeroDR Detector and access point are being used under poor conditions. • Wireless does not connect • Wireless communication terminates • Cycle time is extended	Check the installation location of AeroDR Detector and access point. When performance is noticeably lower than at the initial installation of this device, it is possible that the installation environment or usage environment have changed.
AeroDR Detector wired connection connector is heated up.	AeroDR Detector wired connection connector is heated up immediately after charging with AeroDR Battery Charger <sup>1</sup> or AeroDR Battery Charger <sup>2</sup> .	This is caused by charging and is not a malfunction.
Charging sometimes takes longer.	Charging may take some time if the battery is completely discharged.	It takes time for internal components to start. Because it is not abnormal, wait a bit.
Battery LED (blue) flashes fast.	Usage time with the battery has gotten shorter.	It could be that the charging function of the battery has deteriorated. It can be replaced with a new battery for a fee if necessary.
	The number of images that can be exposed has decreased.	
	The charging time has gotten shorter.	
No image is acquired. <sup>2</sup>	No image appears after X-ray exposure.	(1) Check the following items. • Did you perform exposure in "Ready" status? • Are the exposure conditions correct? • Was X-ray output lowered? • Was X-ray voltage set to a lower value? (2) Perform the following procedures. • For AeroDR 1417HQ, AeroDR 1417S, AeroDR 1717HQ and AeroDR 1012HQ – Set the sensitivity setting of the image processing controller to "High" before exposure. If the setting is already set to "High", increase the voltage of the X-ray and perform exposure. • For AeroDR 2 1417HQ and AeroDR 2 1417S – Increase the voltage of the X-ray before exposure.
Reading has automatically started. <sup>2</sup>	The machine starts reading the image without X-ray exposure.	(1) Check the following items. • For AeroDR 1417HQ, AeroDR 1417S, AeroDR 1717HQ and AeroDR 1012HQ – Was the AeroDR Detector subjected to strong shocks or vibrations while "Ready" was displayed? – Is the sensitivity setting of the image processing controller correct? (Is the sensitivity setting of the image processing controller set to [High]?) • For AeroDR 2 1417HQ and AeroDR 2 1417S – Was the AeroDR Detector subjected to strong shocks or vibrations while "Ready" was displayed? (2) Use caution to prevent strong shocks or vibrations and restart exposure.

## 5.2 Various problems and countermeasures

Status	Error description	Corrective actions
Exposure was performed in a condition other than when the exposure with the image processing controller was possible. <sup>*2</sup>	Exposure was performed when "Ready" was not displayed on the image processing controller. Consequently, a correct image was not acquired.	Wait for one minute or more before starting the next exposure.
	Exposure was performed when "Ready" was not displayed.	Wait for 30 seconds or more before starting the next exposure.

\*1 The AeroDR 1012HQ cannot be inserted into the AeroDR Battery Charger.

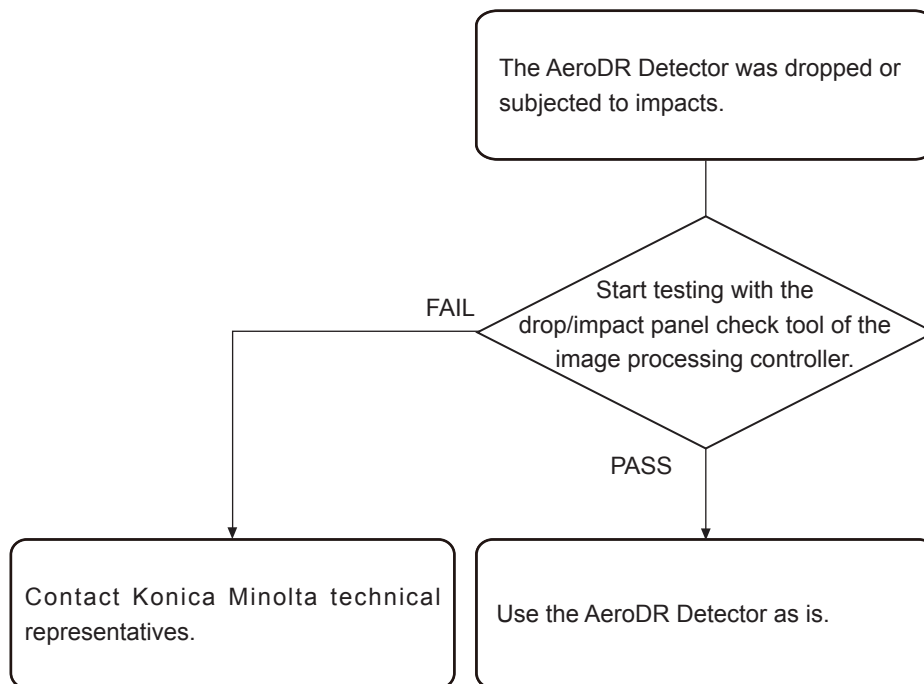
\*2 Troubleshooting in the Aero Sync mode.

### IMPORTANT

- If the exterior or protective cover is damaged extensively, contact Konica Minolta technical representatives.

### ● Corrective actions when the AeroDR Detector is dropped or subjected to impacts

- Run a test using the drop/impact panel check tool of the image processing controller.



### IMPORTANT

- The drop/impact panel check tool cannot detect all errors.  
If you use the AeroDR Detector after the test and find any error in the image, contact Konica Minolta technical representatives.

### HINT

- If a message is displayed in the image processing controller using the AeroDR 2 1417HQ or AeroDR 2 1417S, follow the message and run a test using the drop/impact panel check tool.

● **AeroDR Detector test**

**IMPORTANT**

- If untransferred images remain in the AeroDR Detector, acquire those images before starting the test. The untransferred images in the AeroDR Detector will be deleted when the test starts.

**1 Confirm that this device and the image processing controller are powered on.**

**2 Prepare for exposure with AeroDR Detector.**

- Place the AeroDR Detector on a stable worktable such as a desk.
- Make sure that the image processing controller is properly connected to the AeroDR Detector.

**IMPORTANT**

- Never attempt to test the AeroDR Detector while the AeroDR Detector is connected to the following device.
  - AeroDR I/F Cable2 of AeroDR Portable RF Unit
  - AeroDR I/F Cable2 of AeroDR Battery Charging Unit
  - AeroDR Portable UF Detector Charger Kit

**3 Perform the AeroDR Detector test using the image processing controller.**

**HINT**

- For the AeroDR Detector test, refer to the "Operation Manual" or the "User Tool Operation Manual" of the image processing controller.

**4 When the AeroDR Detector test is completed, follow the flow above and carry out the corrective action.**

**5.2.2 AeroDR Interface Unit**

Status	Error description	Corrective actions
Power LED (green) does not light.	AC power not supplied.	Make sure the power cable is connected correctly.
Feeding1/2 LED (blue) does not light.	Feeding1/2 LED (blue) does not light even when connecting the AeroDR Detector.	Make sure that the AeroDR I/F Cable is connected correctly.
Communications are down between devices, and power LED (green) is off.	The power switch is not on. Or, the power cable is not connected.	Make sure the power switch of the AeroDR Interface Unit is on. Or, make sure the power cable is connected correctly.
The AeroDR Detector is being used with wired connection, but it is not recognized on the image processing controller, and feeding1/2 LEDs (blue) are off.	The AeroDR I/F Cable is not connected.	Make sure that the AeroDR I/F Cable is connected to the AeroDR Detector properly.
Battery is not charging while the AeroDR Detector is used with wired connection (the battery level on the battery level display of the image processing controller does not increase), and feeding1/2 LEDs (blue) are off.		

### 5.2.3 AeroDR Interface Unit2

Status	Error description	Corrective actions
Power LED (green) does not light.	AC power not supplied.	Make sure the power cable is connected correctly.
Feeding1/2 LED (blue) does not light.	Feeding1/2 LED (blue) does not light even when connecting the AeroDR Detector.	Make sure that the AeroDR I/F Cable is connected correctly.
Communications are down between devices, and power LED (green) is off.	The power switch is not on. Or, the power cable is not connected.	Make sure the power switch of the AeroDR Interface Unit2 is on. Or, make sure the power cable is connected correctly.
The AeroDR Detector is being used with wired connection, but it is not recognized on the image processing controller, and feeding1/2 LEDs (blue) are off.	The AeroDR I/F Cable is not connected.	Make sure that the AeroDR I/F Cable is connected to the AeroDR Detector properly.
Battery is not charging while the AeroDR Detector is used with wired connection (the battery level on the battery level display of the image processing controller does not increase), and feeding1/2 LEDs (blue) are off.		

### 5.2.4 AeroDR Generator Interface Unit

Status	Error description	Corrective actions
LED (green) does not light.	AC power not supplied.	Make sure that the Ethernet cable is connected correctly. Or, make sure the power switch of the AeroDR Interface Unit is on.
LED (green) does not change from flashing to a solid light.	There is a communications error.	Contact Konica Minolta technical representatives.

### 5.2.5 AeroDR Generator Interface Unit2

Status	Error description	Corrective actions
LED (green) does not light.	AC power not supplied.	Make sure that the Ethernet cable is connected correctly. Make sure the power switch of the AeroDR Interface Unit or AeroDR Interface Unit2 is on. If the AeroDR Generator Interface Unit2 has a power switch, make sure the power switch is on.
LED (green) does not change from flashing to a solid light.	There is a communications error.	Contact Konica Minolta technical representatives.

### 5.2.6 AeroDR Battery Charger

Status	Error description	Corrective actions
Status LED (green) does not light.	AC power not supplied.	Make sure that the power cable is connected correctly.
Error LED (orange) is on.	-	Contact Konica Minolta technical representatives.
When the AeroDR Detector <sup>*1</sup> is set, the error LED (orange) lights.	AeroDR Detector was inserted the wrong way.	Check the insertion orientation of the AeroDR Detector.
	The AeroDR Detector is not set correctly.	Make sure that the AeroDR Detector is set correctly.
Although the AeroDR Detector <sup>*1</sup> is inserted, charging does not start, and the status LED (green) is out.	AC power not supplied.	Make sure that the power cable is connected correctly.
Although the AeroDR Detector <sup>*1</sup> is inserted, it cannot be registered, and the status LED (green) is flashing.	The Ethernet cable is disconnected.	Make sure that the Ethernet cable is connected correctly.

\*1 The AeroDR 1012HQ cannot be inserted into the AeroDR Battery Charger.

### 5.2.7 AeroDR Battery Charger2

Status	Error description	Corrective actions
Status LED (green) does not light.	AC power not supplied.	Make sure that the power cable is connected correctly.
	The power switch is turned off.	Turn on the power switch.
Error LED (orange) is on.	-	Contact Konica Minolta technical representatives.
When the AeroDR Detector is set, the error LED (orange) lights.	AeroDR Detector was inserted the wrong way.	Check the insertion orientation of the AeroDR Detector.
	The AeroDR Detector is not set correctly.	Make sure that the AeroDR Detector is set correctly.
Although the AeroDR Detector is inserted, charging does not start, and the status LED (green) is out.	AC power not supplied.	Make sure that the power cable is connected correctly.
	The power switch is turned off.	Turn on the power switch.
Although the AeroDR Detector is inserted, it cannot be registered, and the status LED (green) is flashing.	The Ethernet cable is disconnected.	Make sure that the Ethernet cable is connected correctly.

### 5.2.8 AeroDR Access Point

If a problem occurs in the AeroDR Access Point, contact Konica Minolta technical representatives.

### 5.2.9 Image processing controller/Images

Status	Error description	Corrective actions
Transverse (noise) has gotten into all images acquired from the AeroDR Detector.	The wired cable is not connected properly.	Connect the wired cable spring connector unit horizontally to the wired connector of the AeroDR Detector.
Operation is normal, but problems can be seen with exposure images.	It has been occurring frequently since a certain time.	Perform calibration.
	There is trouble in only 1 image.	Check the exposure method and image processing.
Exposure cannot be confirmed in image processing controller.	The image processing controller does not become Ready.	Check the image processing controller start up.
	The icons of devices used on the image processing controller are not displayed.	Confirm that the icon of the device to be used is displayed on the system monitor screen. When the icon of the device is not displayed, check that the device to be used is started. Or, check that the Ethernet cable is properly connected.



# Chapter 6

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## Maintenance

This chapter describes the items that require periodic maintenance.

## 6.1 • Maintenance and inspection items

This chapter describes the inspections and cleaning required in order to maintain the use of this device in an optimum condition.

### ● Quality Tool

#### HINT .....

- "Simple Check QC for CS-7" is available for checking of imaging quality. Please contact our customer service for the detail.
- For details, contact Konica Minolta technical representatives.

### 6.1.1 Maintenance schedule

The maintenance and inspection items that the user should perform are as follows.

Maintenance task	Maintenance interval
Checking and cleaning the surface of the AeroDR Detector	Weekly
Checking for external damage to the AeroDR Detector	Weekly
Cleaning the spring connectors of the AeroDR Battery Charger2, AeroDR I/F Cable and AeroDR UF Cable	Weekly
Cleaning the wired connection connectors of the AeroDR Detector and AeroDR UF Cable	Weekly
Cleaning the AeroDR Battery Charger and AeroDR Battery Charger2	Weekly
Full charge of the AeroDR Detector	Monthly
Calibration	Every 3 months or when a message is displayed

#### IMPORTANT .....

- To ensure optimum use of this device, be sure to perform periodic maintenance.
- The above task intervals are estimates and vary according to usage.

#### HINT .....

- Perform calibration when a message that prompts for calibration of the image processing controller is displayed.

#### Reference .....

- For the calibration, refer to the "Operation Manual" or the "User Tool Operation Manual" of the image processing controller.

### 6.1.2 Cleaning

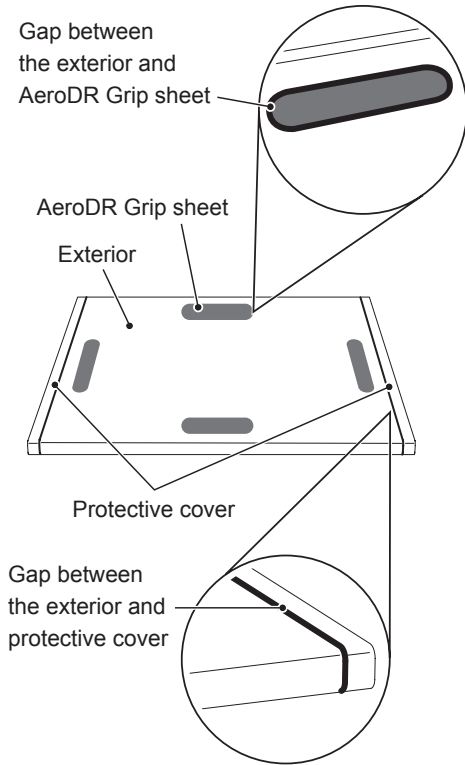
The cleaning methods of the respective devices are as follows.

#### IMPORTANT .....

- Be careful not to apply any cleaning chemical or liquid onto the spring connectors, the wired connection connectors, and the LEDs.
- Do not clean with sharp or hard metal objects. If you cannot remove stains, contact Konica Minolta technical representatives.
- Wear and deformation of the protective cover will occur with the AeroDR Detector due to the way it is handled. The protective cover can be replaced for a fee when the damage becomes extensive, so contact Konica Minolta technical representatives.

● **AeroDR Detector**

- Clean the exterior and AeroDR Grip sheet with a soft lint-free cloth dampened with a small amount of anhydrous ethanol and wrung well.
- To clean the gaps between the exterior of the AeroDR Detector and the protective cover, and the gaps between the exterior of the AeroDR Detector and the AeroDR Grip sheet, remove dirt using a commercial plastic brush.



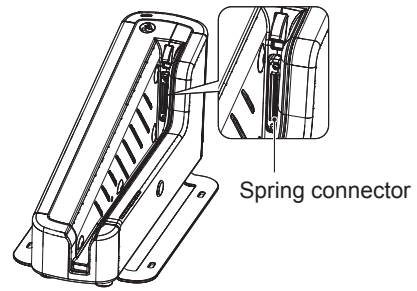
**IMPORTANT**

- If you directly apply or spray anhydrous ethanol on the AeroDR Detector, the liquid will enter the AeroDR Detector through exterior gaps, causing a failure.

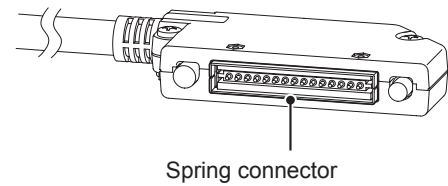
● **Spring connector**

- If foreign material has adhered to the spring connectors of the AeroDR Battery Charger2, AeroDR I/F Cable and AeroDR UF Cable, remove it with a commercial plastic brush.

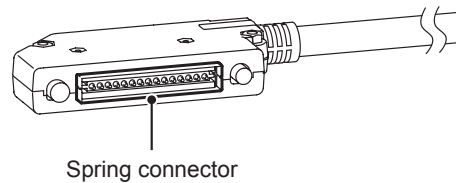
**AeroDR Battery Charger2**



**AeroDR I/F Cable**



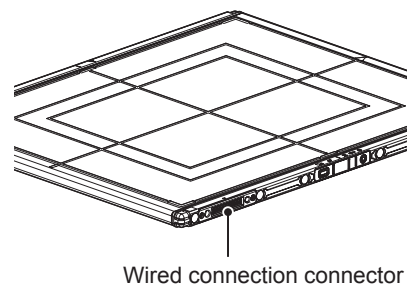
**AeroDR UF Cable**



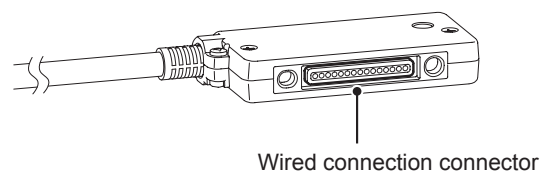
● **Wired connection connector**

- If foreign material has adhered to the wired connection connectors of the AeroDR Detector and AeroDR UF Cable, remove it with a commercial plastic brush.

**AeroDR Detector**



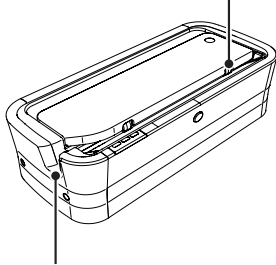
**AeroDR UF Cable**



● **AeroDR Battery Charger**

- Clean dust on the insert table of the AeroDR Battery Charger with a soft lint-free cloth dampened with anhydrous ethanol or water and wrung well.

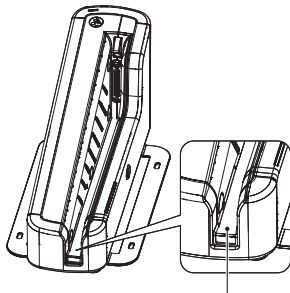
AeroDR Detector insert table (front)



AeroDR Detector insert table (side)

● **AeroDR Battery Charger2**

- Clean dust on the insert table of the AeroDR Battery Charger2 with a soft lint-free cloth dampened with anhydrous ethanol or water and wrung well.



AeroDR Detector insert table

**6.1.3 Disinfection of the AeroDR Detector**

If bodily fluid or blood from a patient has contaminated the surface of the AeroDR Detector, disinfect with a soft lint-free cloth dampened with a small quantity of the following disinfectant and wrung well.

- Ethanol for disinfection
- Isopropanol for disinfection
- Commercial chlorine bleach, or 0.5% hypochlorite (10-fold dilution of household bleach)

**IMPORTANT**

- Bleach and hypochlorite are corrosive, so wash the bleach off well to avoid corrosion.
- Be careful not to apply any chemical for disinfection onto the wired connection connectors and the LEDs.
- If you directly apply or spray chemical for disinfection on the AeroDR Detector, the solution will enter the instrument through exterior gaps, causing a failure.

**6.1.4 Consumables**

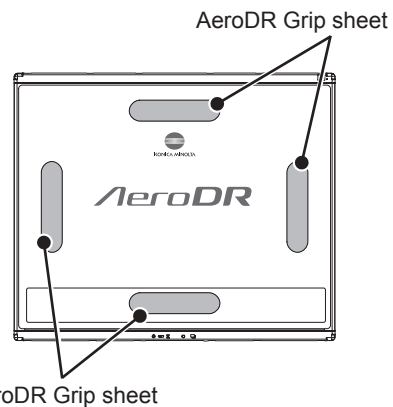
**IMPORTANT**

- Refer to each device's manual for information about periodic replacement parts and consumables for the image processing controller, etc.
- In particular, continued use of the battery may result in degradation and wear, and it may no longer exhibit proper functioning capabilities. For extended, safe use, it is necessary to replace parts which have become worn or degraded.

**6.1.5 AeroDR Grip sheet affixing and replacement**

When affixing the AeroDR Grip sheet to the AeroDR Detector, follow the procedure below.

**Application locations**

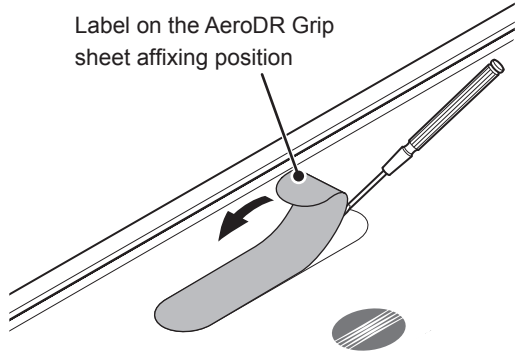


**IMPORTANT**

- When using a tool to affix the AeroDR Grip sheet or perform replacement, be careful not to get injured by a tip or edge of the tool.
- For AeroDR Grip sheet affixing or replacement, it is recommended to ask Konica Minolta technical representative.
- The AeroDR 1012HQ does not use the AeroDR Grip sheet.

**1 Remove the label from the AeroDR Grip sheet affixing position.**

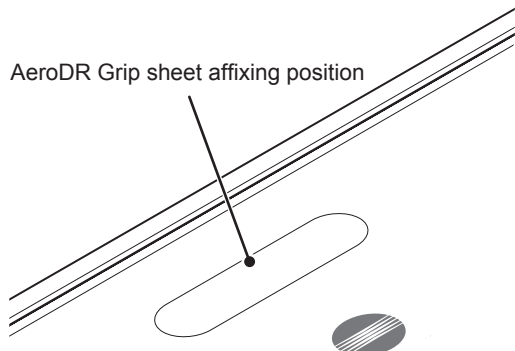
- Insert a precision flat-blade screwdriver, etc. into the step at the AeroDR Grip sheet affixing position to slightly turn the label over, and then remove it completely.



**IMPORTANT**

- Be careful not to scratch the AeroDR Detector.
- Be sure to peel off the label or used AeroDR Grip sheet because it may come off.

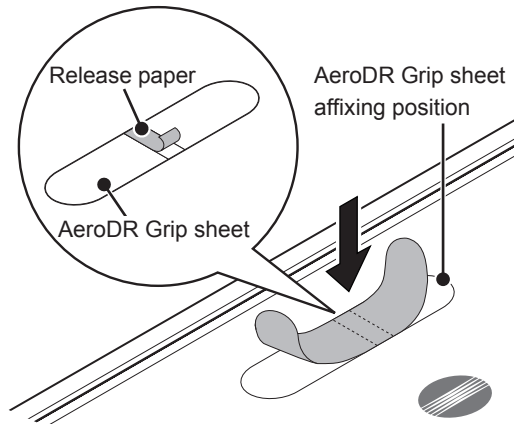
**2 Remove dust and contamination from the AeroDR Grip sheet affixing position.**



**HINT**

- After removing the label or used AeroDR Grip sheet, clean off any adhesive residue on the surface using a soft cloth moistened with anhydrous ethanol.

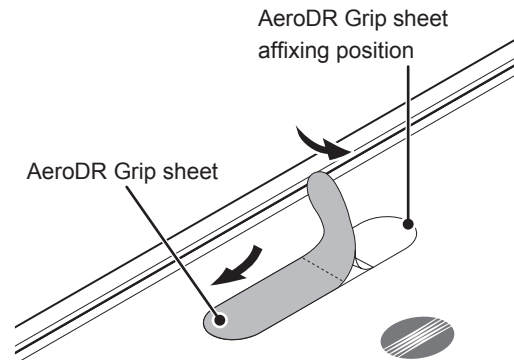
**3 Peel off the center piece of the release paper from the AeroDR Grip sheet, and temporarily affix the sheet to the required position on the AeroDR Detector.**



**IMPORTANT**

- Place the AeroDR Grip sheet in the correct position so that it does not overlap the AeroDR Detector label.

**4 Peel off the left and right pieces of the release paper from the AeroDR Grip sheet and affix the sheet to the required position on the AeroDR Detector.**



**IMPORTANT**

- Affix the sheet slowly from the center to the right and left sides to attach it tightly to the AeroDR Detector.
- Confirm that the AeroDR Grip sheet has been securely placed.

**5 Repeat the same steps to affix the other three sheets.**

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# Chapter 7

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## Specifications

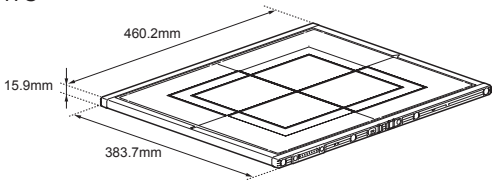
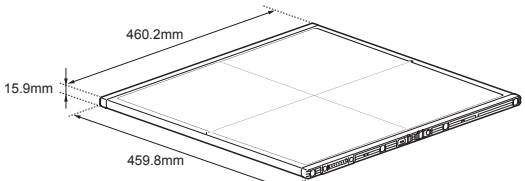
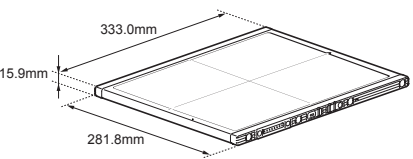
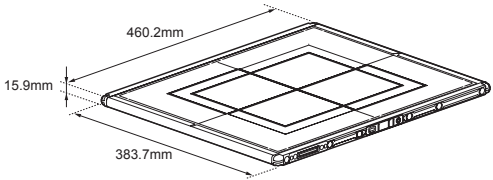
This chapter describes the specifications of this device.

## 7.1 • Specifications


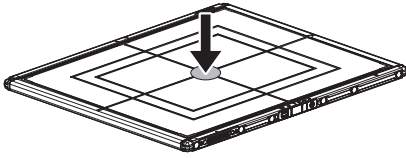
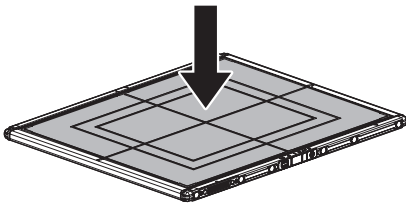


### IMPORTANT

- The following specifications and graphs described below are nominal values which may be different from actual values and may vary depending on environment and frequency of use. (These are not to provide any guarantees.)
- All specification regarding battery is for a fully-charged battery.

### 7.1.1 AeroDR Detector

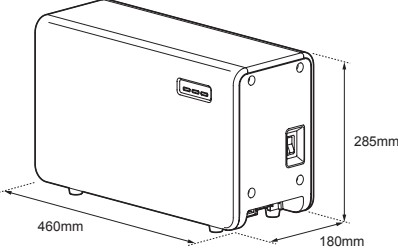
Item	Description
Product name (model name)	AeroDR 1417HQ (AeroDR P-11) AeroDR 1417S (AeroDR P-12) AeroDR 1717HQ (AeroDR P-21) AeroDR 1012HQ (AeroDR P-31) AeroDR 2 1417HQ (AeroDR P-51) AeroDR 2 1417S (AeroDR P-52)
Detection method	Indirect conversion method
Scintillator	CsI (Cesium Iodide)
External dimensions	<p>AeroDR 1417HQ and AeroDR 1417S 383.7(W)×460.2(D)×15.9(H)mm</p>  <p>AeroDR 1717HQ 459.8(W)×460.2(D)×15.9(H)mm</p>  <p>AeroDR 1012HQ 281.8(W)×333.0(D)×15.9(H)mm</p>  <p>AeroDR 2 1417HQ and AeroDR 2 1417S 383.7(W)×460.2(D)×15.9(H)mm</p> 
Weight	AeroDR 1417HQ: 2.9kg AeroDR 1417S : 2.8kg AeroDR 1717HQ: 3.6kg AeroDR 1012HQ: 1.7kg AeroDR 2 1417HQ: 2.6kg AeroDR 2 1417S: 2.5kg
Pixel size	175 um
Image area size	AeroDR 1417HQ and AeroDR 1417S: 348.95×425.25mm (1,994×2,430 pixels) AeroDR 1717HQ: 424.9×424.9mm (2,428×2,428 pixels) AeroDR 1012HQ: 245.7×296.8mm (1,404×1,696 pixels) AeroDR 2 1417HQ and AeroDR 2 1417S: 348.95×425.25mm (1,994×2,430 pixels)
AD conversion	16 bit (65,536 gradients)



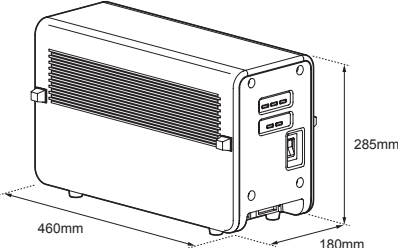
Item	Description
Usable grid frequency	40lp/cm, 34lp/cm  <ul style="list-style-type: none"> <li>For details, refer to "3.2.3 Precautions for exposure".</li> </ul>
Maximum patient weight	Point load: 150kg@Φ40mm  Face load: 300kg@effective image area overall   <b>HINT</b> <ul style="list-style-type: none"> <li>Deadweight, even when loaded on the AeroDR Detector, has no effect on images and the AeroDR Detector. The measurement method is based on KM standards.</li> </ul>
Communication	AeroDR 1417HQ, AeroDR 1417S, AeroDR 1717HQ and AeroDR 1012HQ: Dedicated wired Ethernet connection / wireless LAN (IEEE802.11a compliant) AeroDR 2 1417HQ and AeroDR 2 1417S: Dedicated wired Ethernet connection / wireless LAN (IEEE802.11a/n compliant)
Drive power	Dedicated power cable drive / battery drive
WLAN encryption	Wireless encryption method : AES Authentication method : WPA2-PSK
Patient doses	Patient doses are equivalent to 500-1000 speed film/screen systems.
Required time for wired/wireless switching	Less than 2 seconds
Battery type	Lithium ion capacitor
Battery charging time empty to full	AeroDR 1417HQ, AeroDR 1417S and AeroDR 1717HQ: 30 minutes or less (When using the AeroDR Battery Charger) 60 minutes or less (When using the AeroDR Battery Charger2) 60 minutes or less (When using the dedicated wired cable) AeroDR 1012HQ: 30 minutes or less (When using the AeroDR Battery Charger2) 30 minutes or less (When using the dedicated wired cable) AeroDR 2 1417HQ: 30 minutes or less (When using the AeroDR Battery Charger) 30 minutes or less (When using the AeroDR Battery Charger2) 30 minutes or less (When using the dedicated wired cable) AeroDR 2 1417S: 13 minutes or less (When using the AeroDR Battery Charger2) 13 minutes or less (When using the dedicated wired cable)
Number of exposable images	AeroDR 1417HQ and AeroDR 1417S: 211 images/5.8 hours AeroDR 1717HQ: 189 images/5.2 hours AeroDR 1012HQ: 146 images/4.0 hours AeroDR 2 1417HQ: 300 images/8.2 hours AeroDR 2 1417S: 150 images/4.1 hours  <b>HINT</b> <ul style="list-style-type: none"> <li>Under conditions that the interval between studies is five minutes and three images are captured in each study, assuming 20 seconds for each exposure to position a patient (when connected to the CS-7 image processing workstation).</li> </ul>
Battery duration in standby status	AeroDR 1417HQ and AeroDR 1417S: Approx. 16 hours AeroDR 1717HQ: Approx. 15 hours AeroDR 1012HQ: Approx. 7.6 hours AeroDR 2 1417HQ: Approx. 20 hours AeroDR 2 1417S: Approx. 10 hours
Battery expected lifetime	Above the AeroDR Detector Service life

## 7.1 Specifications

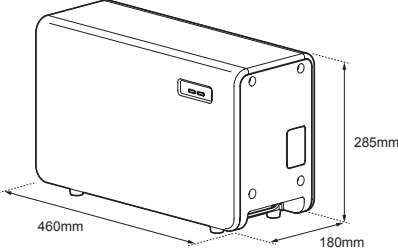
### 7.1.2 AeroDR Interface Unit

Item	Description
Product name (model name)	AeroDR Interface Unit (AeroDR B-1)
Amount of connectable AeroDR Detectors	2
Power requirements	AC 100/110/115/120/200/220/230/240 V $\pm$ 10%, single phase 50/60 Hz
Power consumption	With the AeroDR Detector connected : Approx. 160 VA (100-240 V) Without the AeroDR Detector connected: Approx. 33 VA (100-240 V)
External dimensions	460(W) $\times$ 180(D) $\times$ 285(H)mm 
Weight	11.5kg

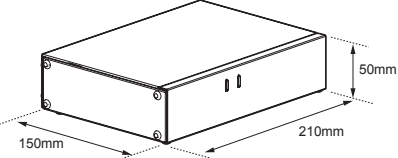
### 7.1.3 AeroDR Interface Unit2

Item	Description
Product name	AeroDR Interface Unit2
Amount of connectable AeroDR Detectors	2
Power requirements	AC 100/110/115/120/200/220/230/240 V $\pm$ 10%, single phase 50/60 Hz
Power consumption	With the AeroDR Detector connected : Approx. 160 VA (100-240 V) Without the AeroDR Detector connected: Approx. 33 VA (100-240 V)
External dimensions	460(W) $\times$ 180(D) $\times$ 285(H)mm 
Weight	12.5kg

### 7.1.4 AeroDR Generator Interface Unit

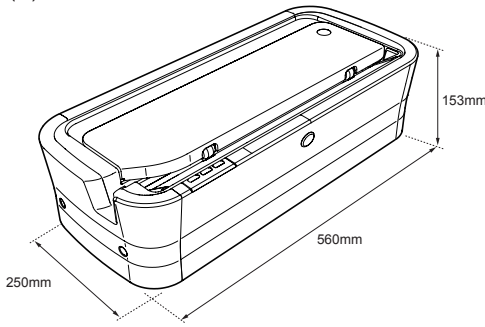
Item	Description
Product name (model name)	AeroDR Generator Interface Unit (AeroDR X-1)
Power supply	Supplied from the AeroDR Interface Unit via the Ethernet cable.
External dimensions	460(W)×180(D)×285(H)mm 
Weight	7.3kg

### 7.1.5 AeroDR Generator Interface Unit2

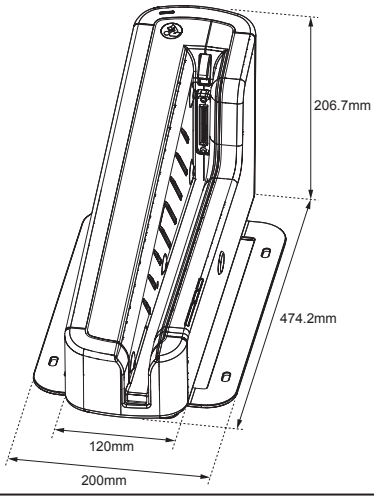
Item	Description
Product name (model name)	AeroDR Generator Interface Unit2 (AeroDR Generator Interface Unit2)
Power requirements	When the AC adapter is used: Supplied from the dedicated AC adapter. When the AeroDR Interface Unit is used: Supplied from the AeroDR Interface Unit via the Ethernet cable.
Power supply when using the dedicated AC adapter	AC 100/110/115/120/200/220/230/240 V ± 10%, single phase 50/60Hz
Power consumption when using the dedicated AC adapter	72VA (100-240V)
External dimensions	210(W)×150(D)×50(H)mm 
Weight	0.9kg
The dedicated AC adapter specifications	Product Name: AC Power Adapter (Model Number. Power-Win Technology Corp. PW-M015A-1Y050KZ) Dimensions: 78×50×35 mm (excluding wall mount & cable) Weight: 130g INPUT: AC100-240V 0.6-0.3A 50-60Hz OUTPUT: DC5V 3A

## 7.1 Specifications

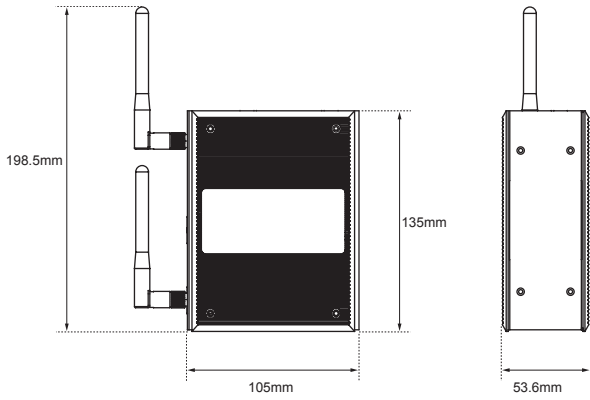
### 7.1.6 AeroDR Battery Charger

Item	Description
Product name (model name)	AeroDR Battery Charger (AeroDR D-1)
Battery charging system	Automatic charging
Power requirements	AC 100/110/115/120/200/220/230/240 V $\pm$ 10%, single phase 50/60 Hz
Power consumption	Charging: Approx. 180 VA (100-240 V) Standby : Approx. 25 VA (100-240 V)
External dimensions	560(W) $\times$ 250(D) $\times$ 153(H)mm 
Weight	7.2kg

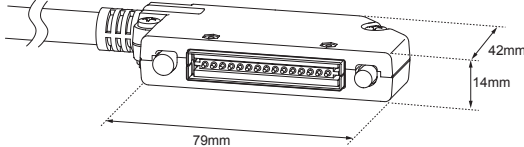
### 7.1.7 AeroDR Battery Charger2

Item	Description
Product name	AeroDR Battery Charger2
Battery charging system	Automatic charging
Power requirements	AC 100/110/115/120/200/220/230/240 V $\pm$ 10%, single phase 50/60Hz
Power consumption	Charging: 180VA(100-240V) Standby : 30VA(100-240V)
External dimensions	474.2(W) $\times$ 200(D) $\times$ 206.7(H)mm 
Weight	6kg

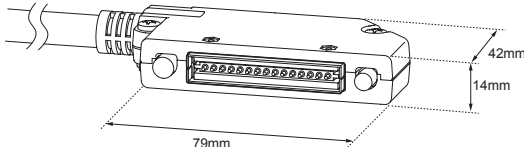
### 7.1.8 AeroDR Access Point

Item	Description
Product name (model name)	AeroDR Access Point (AeroDR C-1)
External dimensions	53.6(W)×135(H)×105(D)mm (without antenna) 
Weight	850g

### 7.1.9 AeroDR I/F Cable

Item	Description
Product name	AeroDR I/F Cable
Cable length	10m/20m
External dimensions	

### 7.1.10 AeroDR I/F Cable2

Item	Description
Product name	AeroDR I/F Cable2
Cable length	10m/20m
External dimensions	

7.1 Specifications




























**7.1.11 AeroDR UF Cable**

Item	Description
Product name	AeroDR UF Cable
Cable length	2m/5m
External dimensions	

**7.1.12 General AeroDR SYSTEM**

Item	Description						
Recommended storage and usage environment conditions	<table border="1"> <tr> <th>Temperature</th> <th>Humidity</th> <th>Atmospheric pressure</th> </tr> <tr> <td>10 to 30°C </td> <td>35 to 80% RH (ensure no water condensation) </td> <td>700 to 1060 hPa </td> </tr> </table> <p>* Limit continuous use in a hot and humid environment (35 to 37°C/95% or lower) of an incubator to within 25 minutes.</p>	Temperature	Humidity	Atmospheric pressure	10 to 30°C	35 to 80% RH (ensure no water condensation)	700 to 1060 hPa
	Temperature	Humidity	Atmospheric pressure				
	10 to 30°C	35 to 80% RH (ensure no water condensation)	700 to 1060 hPa				
<table border="1"> <tr> <th>Temperature</th> <th>Humidity</th> <th>Atmospheric pressure</th> </tr> <tr> <td>-10 to 40°C </td> <td>20 to 90% RH (ensure no water condensation) </td> <td>700 to 1060 hPa </td> </tr> </table>	Temperature	Humidity	Atmospheric pressure	-10 to 40°C	20 to 90% RH (ensure no water condensation)	700 to 1060 hPa	
Temperature	Humidity	Atmospheric pressure					
-10 to 40°C	20 to 90% RH (ensure no water condensation)	700 to 1060 hPa					
<table border="1"> <tr> <th>Temperature</th> <th>Humidity</th> <th>Atmospheric pressure</th> </tr> <tr> <td>-20 to 50°C *1 </td> <td>20 to 90% RH (ensure no water condensation) </td> <td>700 to 1060 hPa </td> </tr> </table> <p>*1 However, performance warranty period when storing at 50°C is 6 months after packing.</p>	Temperature	Humidity	Atmospheric pressure	-20 to 50°C *1	20 to 90% RH (ensure no water condensation)	700 to 1060 hPa	
Temperature	Humidity	Atmospheric pressure					
-20 to 50°C *1	20 to 90% RH (ensure no water condensation)	700 to 1060 hPa					
Classification	Safety IEC60601-1 Class I						
Operation mode	Continuous operation						

## 7.1.13 General AeroDR SYSTEM 2

Item	Description							
Recommended storage and usage environment conditions	When operating	<table border="1"> <thead> <tr> <th data-bbox="633 374 885 407">Temperature</th> <th data-bbox="885 374 1171 407">Humidity</th> <th data-bbox="1171 374 1407 407">Atmospheric pressure</th> </tr> </thead> <tbody> <tr> <td data-bbox="633 407 885 510">10 to 30°C </td> <td data-bbox="885 407 1171 510">35 to 80% RH (ensure no water condensation) </td> <td data-bbox="1171 407 1407 510">700 to 1060 hPa </td> </tr> </tbody> </table>	Temperature	Humidity	Atmospheric pressure	10 to 30°C 	35 to 80% RH (ensure no water condensation) 	700 to 1060 hPa 
	Temperature	Humidity	Atmospheric pressure					
	10 to 30°C 	35 to 80% RH (ensure no water condensation) 	700 to 1060 hPa 					
When not operating	<table border="1"> <thead> <tr> <th data-bbox="633 524 885 557">Temperature</th> <th data-bbox="885 524 1171 557">Humidity</th> <th data-bbox="1171 524 1407 557">Atmospheric pressure</th> </tr> </thead> <tbody> <tr> <td data-bbox="633 557 885 660">-10 to 40°C </td> <td data-bbox="885 557 1171 660">20 to 90% RH (ensure no water condensation) </td> <td data-bbox="1171 557 1407 660">700 to 1060 hPa </td> </tr> </tbody> </table>	Temperature	Humidity	Atmospheric pressure	-10 to 40°C 	20 to 90% RH (ensure no water condensation) 	700 to 1060 hPa 	
Temperature	Humidity	Atmospheric pressure						
-10 to 40°C 	20 to 90% RH (ensure no water condensation) 	700 to 1060 hPa 						
In storage/transport	<table border="1"> <thead> <tr> <th data-bbox="633 674 885 707">Temperature</th> <th data-bbox="885 674 1171 707">Humidity</th> <th data-bbox="1171 674 1407 707">Atmospheric pressure</th> </tr> </thead> <tbody> <tr> <td data-bbox="633 707 885 810">-20 to 50°C*1 </td> <td data-bbox="885 707 1171 810">20 to 90% RH (ensure no water condensation) </td> <td data-bbox="1171 707 1407 810">700 to 1060 hPa </td> </tr> </tbody> </table> <p data-bbox="651 810 1401 869">*1 However, performance warranty period when storing at 50°C is 6 months after packing.</p>	Temperature	Humidity	Atmospheric pressure	-20 to 50°C*1 	20 to 90% RH (ensure no water condensation) 	700 to 1060 hPa 	
Temperature	Humidity	Atmospheric pressure						
-20 to 50°C*1 	20 to 90% RH (ensure no water condensation) 	700 to 1060 hPa 						
Classification	Safety IEC60601-1 Class I							
Operation mode	Continuous operation							

## 7.1.14 Product configuration

This device must be configured as shown below.



**HINT**

- The AeroDR SYSTEM and AeroDR SYSTEM 2 can be used together.

● **USA**

System name	Device name
AeroDR SYSTEM	AeroDR 1417HQ
	AeroDR 1417S
	AeroDR 1717HQ
	AeroDR 1012HQ
	AeroDR Interface Unit
	AeroDR Interface Unit2
	AeroDR Generator Interface Unit
	AeroDR Battery Charger
	AeroDR Battery Charger2
	AeroDR Access Point
	AeroDR I/F Cable (10/20m)
	AeroDR I/F Cable2 (10/20m)
	AeroDR UF Cable
	Image processing controller
AeroDR SYSTEM 2	AeroDR 2 1417HQ
	AeroDR Generator Interface Unit2
	Image processing controller

● **EU and EFTA countries and Turkey**

Specific components described in operation manual of the specific components are not described in the following table.

Product Name	Component name in this manual	Component name in Label
AeroDR SYSTEM	AeroDR 1417HQ	AeroDR P-11
	AeroDR 1417S	AeroDR P-12
	AeroDR 1717HQ	AeroDR P-21
	AeroDR 1012HQ	AeroDR P-31
	AeroDR Interface Unit	AeroDR B-1
	AeroDR Interface Unit2	AeroDR Interface Unit2
	AeroDR Generator Interface Unit	AeroDR X-1
	AeroDR Battery Charger	AeroDR D-1
	AeroDR Battery Charger2	AeroDR Battery Charger2
	AeroDR Access Point	AeroDR C-1
	S-SRM	AeroDR S-SRM KIT
	AeroDR SYSTEM 2	AeroDR 2 1417HQ
AeroDR Generator Interface Unit2		AeroDR Generator Interface Unit 2
AC adopter		AeroDR AC Adapter KIT
S-SRM		AeroDR S-SRM KIT 2



● Cables and minor components

Product Name	Component name in this manual	Component name in Label
AeroDR SYSTEM	AeroDR I/F Cable	AeroDR I/F Cable 10m
		AeroDR I/F Cable 20m
		AeroDR I/F Cable2 10m
		AeroDR I/F Cable2 20m
	AeroDR UF Cable	AeroDR UF Cable 2m
		AeroDR UF Cable 5m
	AeroDR XG Cable	AeroDR XG Cable Set 100V
		AeroDR XG Cable Set 120V
		AeroDR XG Cable Set 220V
		AeroDR XG Cable Set 230V
		AeroDR XG Cable Set 240V
		AeroDR XG Cable Set DC24V
	AeroDR Collimator Cable	AeroDR Collimator Cable Set
	AeroDR S-SRM Cable	AeroDR S-SRM Hand S/W 5m Cable
		AeroDR S-SRM Cable ARX1
		AeroDR S-SRM Cable GEX1
		AeroDR S-SRM Cable GEX2
		AeroDR S-SRM Cable GEX3
		AeroDR S-SRM Cable GEX4
		AeroDR S-SRM Cable GEX5
		AeroDR S-SRM Cable GEX6
		AeroDR S-SRM Cable PHX1
		AeroDR S-SRM Cable NC
		AeroDR S-SRM Cable DEX1
		AeroDR S-SRM Cable SIX1
		AeroDR S-SRM Cable SIX2
		AeroDR S-SRM Cable MCX1
		AeroDR S-SRM Cable KSX1
		AeroDR S-SRM Cable KSX2
		AeroDR S-SRM Cable SMX1
		AeroDR S-SRM Cable ECX1
		AeroDR S-SRM Cable ARX2
		AeroDR S-SRM Cable SUX1
AeroDR S-SRM Cable POX1		
AeroDR S-SRM Cable CPX1		
AeroDR S-SRM Cable GEX9		
AeroDR S-SRM Cable GEX10		
AeroDR SYSTEM	AeroDR S-SRM Cable	AeroDR S-SRM Cable SMX3
		AeroDR S-SRM Cable PHX2
		AeroDR S-SRM Cable GEX7
		AeroDR S-SRM Cable ISX1
		AeroDR S-SRM Cable CTX1
		AeroDR S-SRM Cable PHX3
		AeroDR S-SRM Cable ECX2
		AeroDR S-SRM Cable EMX1
		AeroDR S-SRM Cable SIX4
		AeroDR S-SRM Cable SIX5
AeroDR S-SRM Cable HIX2		

## 7.1 Specifications

Product Name	Component name in this manual	Component name in Label
AeroDR SYSTEM 2	AeroDR XG Cable	AeroDR XG Cable Set 2
	AeroDR I/F Cable	AeroDR I/F Cable2 1m

- AeroDR S-SRM Cables is subject to change without notice.
- Other AeroDR S-SRM Cables may be added without notice.
- Some AeroDR S-SRM Cables may not be confirmed to comply with EC Directive 93/42/EEC.

### 7.1.15 Label

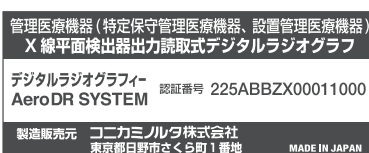
#### AeroDR Detector

#### ● AeroDR 1417HQ/AeroDR 1417S



FCC ID : YR7AERO DRP1 IC : 1048H-AERO DRP1  
 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 Class A digital apparatus complies with Canadian ICES-003.

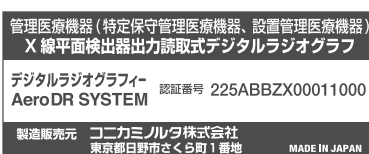
Complies with  
 IDA Standards  
 DA 104328



#### ● AeroDR 1717HQ



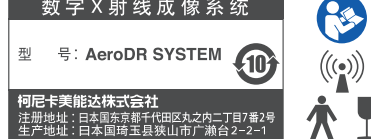
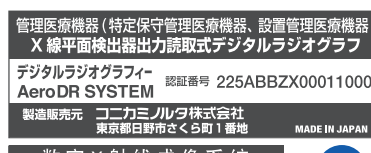
FCC ID : YR7AERO DRP2 IC : 1048H-AERO DRP2  
 This device complies with Part 15 of FCC Rules and RSS-Gen of IC Rules. Operation is subject to the following two conditions:  
 (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device.  
 This Class A digital apparatus complies with Canadian ICES-003.



#### ● AeroDR 1012HQ



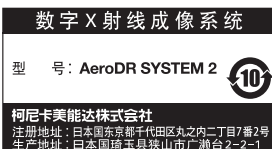
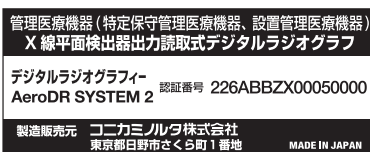
FCC ID : YR7AERO DRP3 IC : 1048H-AERO DRP3  
 This device complies with Part 15 of FCC Rules and RSS-Gen of IC Rules. Operation is subject to the following two conditions:  
 (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device.  
 This Class A digital apparatus complies with Canadian ICES-003.



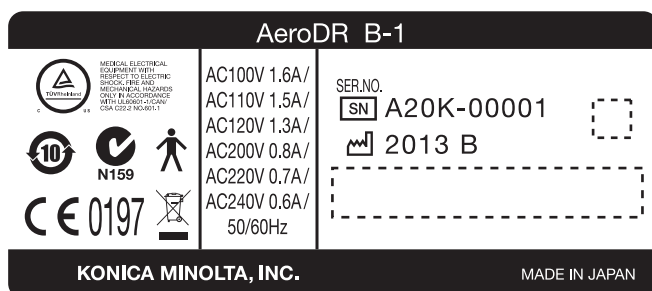
## ● AeroDR 2 1417HQ/AeroDR 2 1417S



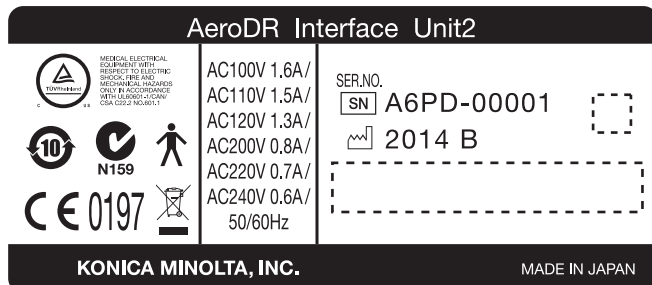
FCC ID : YR7AERO DRP5 IC : IO48H-AERO DRP5  
 This device complies with Part 15 of FCC Rules and RSS-Gen of IC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device.  
 This Class A digital apparatus complies with Canadian ICES-003.



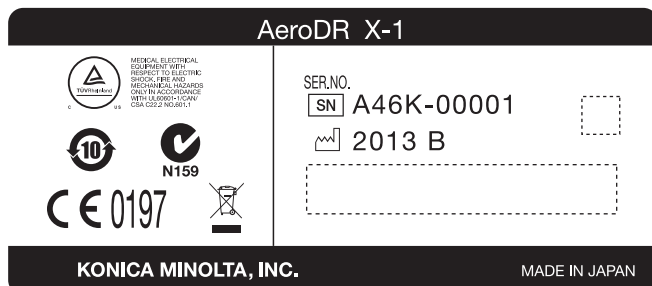
## AeroDR Interface Unit



## AeroDR Interface Unit2




## AeroDR Generator Interface Unit



7.1 Specifications

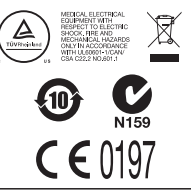
**AeroDR Generator Interface Unit2**

**AeroDR Generator Interface Unit 2**

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	KONICA MINOLTA, INC. <span style="float: right;">MADE IN JAPAN</span>

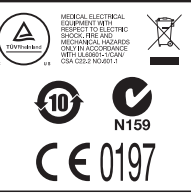
**AeroDR Battery Charger**

**AeroDR D-1**

	AC100V- AC240V  1.5A-0.7A 50/60Hz
	SER.NO. SN A3M4-00001 <input type="checkbox"/> 2013 B <input type="checkbox"/> <input type="checkbox"/>
KONICA MINOLTA, INC. <span style="float: right;">MADE IN JAPAN</span>	

**AeroDR Battery Charger2**

**AeroDR Battery Charger2**

	AC100V- AC240V  180VA 50/60Hz
	SER.NO. SN A5TJ-00001 <input type="checkbox"/> 2013 B <input type="checkbox"/> <input type="checkbox"/>
KONICA MINOLTA, INC. <span style="float: right;">MADE IN JAPAN</span>	

**AeroDR Access Point**

**AeroDR C-1**

	SER.NO. SN A46J-00001 <input type="checkbox"/> 2013 B <input type="checkbox"/> <input type="checkbox"/>
	KONICA MINOLTA, INC. <span style="float: right;">MADE IN JAPAN</span>

# Chapter 8

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## Appendix

## 8.1 • Wireless performance of AeroDR Detector

Functionality item		Requirement Specifications	
Mode Setting	Communication mode	The following settings should be enabled. Infrastructure / Adhoc	
	Communication method	Enable/Disable setting in each communication method of IEEE802.11a/b/g/n should be controlled.	
	Inter-ST communication (Adhoc)	Should be provided with standard-compliant Enable/Disable controllable functions	
	Roaming	Should be provided with standard-compliant Enable/Disable controllable functions	
	QoS	Should be provided with standard-compliant Enable/Disable controllable functions	
Authentication	SSID	1 to 32 characters should be settable.	
	Authentication method	The following settings should be enabled. open / shared	
Encryption	Encryption mode	The following settings should be enabled. none / WPA2-PSK	
	WPA-PSK	Encryption mode	AES
		Passphrase	8 to 63 characters should be settable.
Scanning function	Scanning execution	Should be provided with scanning function based on the following settings active / passive	
	Scanning targeted channel setting	Scanning targeted channel should be settable.	
	Scanning channel dwelling time	Dwelling time for each scanning-executed channel should be settable.	
	Scanning result acquisition	General information defined in 802.11 including RSSI value should be acquirable.	
Operating parameters	Number of retry operation (Hardware)	The number of 2 to 13 operations should be settable.	
	Transmitting power control	Output-enable range in hardware should be settable.	
Rate control	Support rate	Should support all rates defined in IEEE802.11a/b/g/n and be able to execute Enable/Disable setting for each rate.	
Power saving function	Operation mode	Power saving-related parameters should be controllable.	

## 8.2 • Pediatric patients' use;

AeroDR SYSTEM / AeroDR SYSTEM 2 does not have an X-ray generating function, and does not control X-ray generator unit.

AeroDR SYSTEM / AeroDR SYSTEM 2 is used connecting with X-ray generator unit currently used legally in the United States of America.

In case of using AeroDR SYSTEM / AeroDR SYSTEM 2 for pediatric patients, please manage appropriately as pediatric patients receive the minimum necessary amount of X-ray radiation for producing diagnostic quality images.

When using AeroDR SYSTEM / AeroDR SYSTEM 2 for the pediatric patients, please connect only with an X-ray generator unit which has the radiation management function for the pediatric patients, and follow the instruction of X-ray generator unit for the pediatric patients.

For further assistance (such as Educational Materials, Quality Improvement tool and Updated information) for the pediatric population includes neonates, please refer to the following Home Pages.

The Image Gently Back to Basics campaign materials; (<http://www.pedrad.org/associations/5364/ig/?page=824>)

FDA of USA's Pediatric X-ray Imaging webpage; (<http://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/MedicalImaging/ucm298899.htm>)

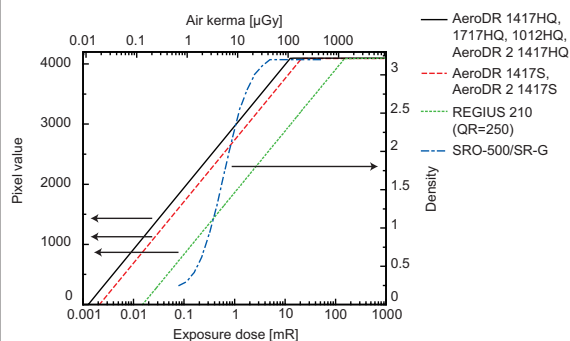
### ● IMPORTANT

Konica Minolta, Inc. strongly recommend for every X-ray device user who use our AeroDR SYSTEM / AeroDR SYSTEM 2 identifying detector exposure indices by IEC 62494-1: Exposure Index standard with protocols (such as patient sub portions of body thickness, technical factors and Technologist' imaging preference) for avoiding unnecessary exposure as low as reasonably achieved (ALARA).

For pursuing better exposure, exposure based on IEC 62494-1 is recommended conducting not only at start of use of our devices, but also continually conducting and recording.

For your understanding of our devices, please refer to a following data;

### Dynamic range



AeroDR (with dynamic range of about digits) has sensitivity in low X-ray dose side rather than Screen/Film System (or CR), so that it also has wider sensitivity even in low X-ray dose area like childhood.

The followings are further recommendation for X-ray device which uses with AeroDR SYSTEM / AeroDR SYSTEM 2.

<Individual patient Protection>

- Specific pre-set pediatric control settings that are appropriate for the intended patient
- Exposure based on thickness, not age or weight-based  
(Exceptions such as portable neonatal chest)
- Configurable based on local preferences

<Grid Use>

- Grid double or triple exposure factors / patient dose
- Grid remove scatter & improve image quality in thicker patient
- Grid are not needed in thinner patients <10-12 cm of water thickness
- Easy to override default programming & not remove grid

<Added filtration>

- Removes low energy x-rays that don't contribute to image formation but contribute to patient dose
- Little use of added filtration

<Electronic Cropping>

Image should be clearly marked and used for QA review

<Hardware requirement>

- Improved Automatic Exposure Control (AEC) design  
(ex. Chamber designed for pediatric use)
- Dose Area Product (DAP) meters  
Keeping DAP results report as part of a QA process

<Software requirement>

- Strongly recommended to use Exposure Index & Deviation Index comply with IEC 62494-1(As stated in the beginning of this section).

<Exportable QA tool>

Image review and record to measure and compare exposure and other parameters for each exam performed.

These feature can be used as part of a facilities quality program for education and continuous improvement to aim at AS LOW AS Possible exposure.

<Education>

Please reflect updated terminology standard and dose reporting profiles under medical imaging physics or radiologist or radiologic technologist representative.

● **CAUTION**

Use of equipment and exposure settings designed for adults of average size can result in excessive radiation exposure for a smaller patient.

Studies have shown that pediatric patients may be more radiosensitive than adults

(i.e., the cancer risk per unit dose of ionizing radiation is higher), and so unnecessary radiation exposure is of particular concern for pediatric patients.

● **Hint**

To keep following IEC 62494-1 correctly for using our detectors, it is important to follow QC control and compatible X-ray specification with our detectors.

- Quality tool of AeroDR SYSTEM / AeroDR SYTEM2 is prepared phantom and software to assure detector within specification to be assured before finding Exposure Index in accordance with the standard of Image Gently and government guideline as needed. Please refer to "Chapter 6" of AeroDR SYSTEM / AeroDR SYSTEM 2 Operation manual.
- For further X-ray system specification to use with AeroDR SYSTEM / AeroDR SYSTEM 2, please refer to "8.4 Compatible X-ray system specification".



Table.1 and Fig.1 show the typical radiographic technique factors, exposure geometry (SID), dose indices for two pediatric patient ages, a 1 year and 5 year, the radiographic system used, the particular configuration/settings/mode of operation used for our device.

**Table 1: Exposure index and Entrance surface air kerma for Pediatric population**

		Weight (kg)	Height (cm)	Body thickness (cm)	Target Exposure Index	(*) E entrance surface air kerma (mGy)	X-ray condition (kV/mA/Sec)	SID (cm)
AeroDR 1417HQ	1 year old	~11	100	12	350	0.05	75kV, 320mA, 5.0ms	150
AeroDR 1717HQ	5 years old	~21	113	15	350	0.05	85kV, 320mA, 4.0ms	150
AeroDR 1012HQ								
AeroDR 2 1417HQ								
AeroDR 1417S	1 year old	~11	100	12	525	0.08	75kV, 320mA, 8.0ms	150
AeroDR 2 1417S	5 years old	~21	113	15	525	0.08	85kV, 320mA, 6.3ms	150

(\*) Chest (AP/PA)/Abdomen

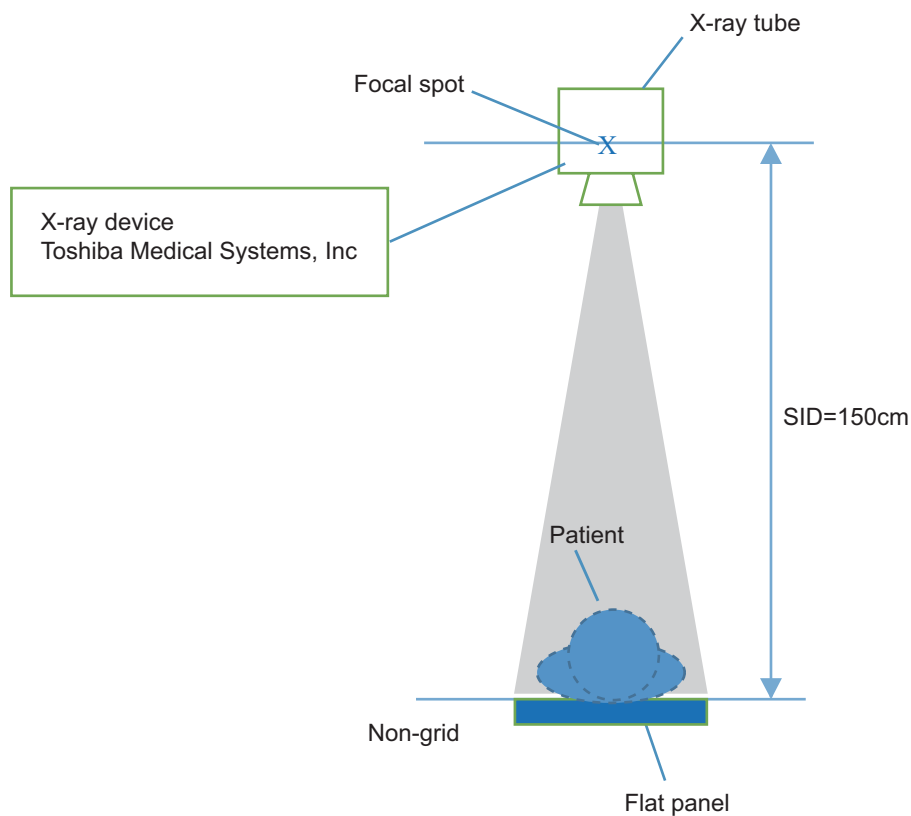


Fig.1 Measurement Set Up

We will also provide following information as supplemental information of Table1.

The Exposure Index is an index specified in IEC62494-1 issued in 2008 as Index to indicate the exposure dose to detector (Radiation quality: EI=100 at the time of 1uGy incident X-ray dose to the detector under the condition of RQA5).

## 8.2 Pediatric patients' use;

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This device (CS-7) is designed to perform the calculation, display and DICOM tag output of Exposure Index (EI), Target Exposure Index (TI) and Deviation Index (DI) for each exposed image. In the IEC62494-1, the image quality shall be managed while viewing the DI from the TI, rather than using the EI value itself. The DI is calculated from the preset TI for each body part and EI acquired from an image actually exposed (as shown in the formula below).

$$DI = 10 \cdot \log \left( \frac{EI}{TI} \right)$$

And, as shown in the table 2 below, the DI against the difference from TI of EI becomes 0 when EI is equal to TI, it becomes a negative value when EI is lower than TI, and it becomes a positive value when EI is higher than TI.

**Table 2: DI Control Limits**

DI	The difference from TI of EI	Dose Ratio
-3	-50%	0.50
-2	-37%	0.63
-1	-21%	0.79
0	0%	1.00
+1	+26%	1.26
+2	+58%	1.58
+3	+100%	2.00

More specifically, managing the DI enables the deviation from the target dose for each patient to be managed. Perform the exposure under the exposure condition suitable for each patient and body part so that the DI comes near to 0. As children have a greater cancer risk due to their high radiation sensitivity, be very careful so as to avoid the excessive irradiation and/or re-exposure due to low dose (Low image quality deterioration of graininess). This Index is used to manage the image quality through the exposure dose to detector, not used for the management of patients' exposed dose.

Please follow the x-ray source manufacture's guidelines or consult a medical physicist or other qualified personnel to determine appropriate settings in addition to information that we have provided.

## 8.3 • Characteristics and performance of the AeroDR Detector

Item	Description
Dynamic range	<p>4 digits</p> <p> <span style="color: black;">—</span> AeroDR 1417HQ, 1717HQ, 1012HQ, AeroDR 2 1417HQ  <span style="color: red;">- - -</span> AeroDR 1417S, AeroDR 2 1417S  <span style="color: green;">⋯</span> REGIUS 210 (QR=250)  <span style="color: blue;">- · - ·</span> SRO-500/SR-G         </p>
MTF	<p> <span style="color: black;">—</span> AeroDR 1417HQ, 1717HQ, 1012HQ, AeroDR 2 1417HQ  <span style="color: red;">- - -</span> AeroDR 1417S, AeroDR 2 1417S         </p>
DQE	<p> <span style="color: black;">—</span> AeroDR 1417HQ, 1717HQ, 1012HQ, AeroDR 2 1417HQ 1mR (8.7μGy)  <span style="color: red;">- - -</span> AeroDR 1417S, AeroDR 2 1417S 1mR (8.7μGy)         </p>

## 8.4 • Compatible X-ray system specification

### IMPORTANT

- AeroDR Detector is allowed to be connected to an X-ray apparatus of 10.3 sec. in its maximum irradiation time.

### 1. Electrical specifications (Hardware requirement)

#### ● XIF Board

Electro-mechanical relays are used for the interface.

The power for the relays needs to be supplied by the generator through the signal lines.

##### (1) Input Interface

Followings are the coil ratings of the relays for the "Prepare", "Exposure" and "MainGate" inputs (six different voltages are available).

Coil rated voltage		Power consumption	Minimum operation voltage	Maximum return voltage	Maximum allowable voltage	Opening/closing frequency
AC 50/60[Hz]	100[V]	1.5[VA]	80[%] (min)	10[%] (max)	115[%] (max)	3[sec/cycle] (min)
	120[V]					
	220[V]					
	230[V]					
	240[V]					
DC	24[V]	0.8[W]				

##### (2) Output Interface

Followings are the contact ratings of the "KM\_Ready" output.

Load type	Rated load	Rate current	Contact voltage	Contact current	Opening/closing capacity	Minimum load current	Resistance when closed
Resistance load	AC 250[V]/2[A] DC 30 [V]/2[A]	2[A]	AC 300[V] (max) DC 100[V] (max)	2[A] (max)	AC 500[VA] DC 60[W]	DC 5[V]/20[mA]	100[mΩ] (max)
Inductive load	AC 250[V]/0.8[A] DC 30 [V]/1.2[A]				AC 200[VA] DC 36[W]		

#### ● XGIF Board

##### (1) "XRAY-READY", "XRAY-START", and "XRAY-ON" input units

Photocoupler ratings for "XRAY-READY", "XRAY-START", and "XRAY-ON" input units are as follows.

Only use 12 V ISO for sending or receiving signals from the X-ray generator.

Item	MIN	TYP	MAX	Unit
Signal-ON current*1	15			mA
Signal-OFF dark current*1			10	uA
Response cycle		10		msec
12 V ISO output voltage	11		13	V
12 V ISO output current*2			60	mA
12 V ISO overload protection	Fuse (To recover, the board needs to be replaced.)			

\*1: Value per circuit

\*2: Total value for all input circuits

The specifications for the "KM READY" output part are as follows.

The "KM READY" output part is a relay or photocoupler depending on the connected X-ray device.

When the "KM READY" output part is a relay

Load type	Rated load	Maximum load	Contact current	Minimum load current	Resistance when closed
Resistance load	AC 250[V]/4[A] DC 30 [V]/4[A]	AC 250[V]/4[A] DC 110 [V]/0.2[A]	AC 100[VA] DC 120[W]	DC 1[V]/1[mA]	50[mohm] /(max)

In addition, regardless of the above specifications, the rated current is limited to 1 [A] when the interface cables provided by Konica Minolta, Inc. are used.

When the "KM READY" output part is a photocoupler

Item	MIN	TYP	MAX	Unit
Collector-emitter voltage			50	DCV
Emitter-collector voltage			0.2	DCV
Collector current			100	mA
Collector-emitter saturation voltage			1.2	DCV
Dark current			200	nA
Response cycle		10		msec

### ● UEC Borad

(1) "XRAY-READY", "XRAY-START", and "XRAY-ON" input units

Photocoupler ratings for "XRAY-READY", "XRAY-START", and "XRAY-ON" input units are as follows.

(2) "XRAY-OK" output unit

The PhotoMOS relay is used as output terminal of "XRAY-OK".

The specifications of "XRAY-OK" output unit are as follows.

Only use 12 V ISO for sending or receiving signals from the X-ray generator.

Item	MIN	TYP	MAX	Unit
Signal-ON current*1	15			mA
Signal-OFF dark current*1			10	uA
Response cycle		10		msec
12 V ISO output voltage	11		13	V
12 V ISO output current*2			60	mA

\*1: Value per circuit

\*2: Total value for all input circuits

The PhotoMOS relay is used in the "KM READY" output part.

The specifications for the "KM READY" output part are as follows.

Item	MIN	TYP	MAX	Unit
Load voltage (peak)			48	DCV
Continuous load voltage (peak)			80	mA
Maximum output-on resistance			50	Ω
Open-circuit time leak current			1	uA
Response cycle		10		msec

## 2. Signal Line List (Hardware/Software requirement)

The interface with X-ray device is provided with Input/Output signals shown in the following table.

Signal name	Input/Output*1	Type*2	Function
XRAY-READY	IN	M	This is a signal intended to indicate the state that 1st stage switch is pressed and then the X-ray generator begins to prepare the exposure. If there is no corresponding signal in the X-ray generator, "XRAY-START" signal is available instead.
XRAY-START	IN	M	This is a signal intended to indicate the state that 2nd stage switch is pressed and then the X-ray generator is ready to perform the exposure.
XRAY-OK	OUT	M	This is a signal intended to indicate the state that AeroDR is in exposure-enabled status (image storage status).
XRAY-ON	IN	O	This is a signal intended to indicate the state that X-ray generator is under exposure operation.

\*1: Set "X-ray generator -> AeroDR" to "IN" and "AeroDR -> X-ray generator" to "OUT" respectively.

\*2: Set signals required for interface with X-ray device to "M" and arbitrary signals to "O".

- Compatibility with our components and accessories when needed.
- X-ray system must be legally marketed in United States of America.
- X-ray system must have dose adjustment system for pediatric when use for pediatric. (Please refer to "8.2 Pediatric patients' use;".)
- Installation of our device will be done by our service and checked the compatibility with our system by our service.
- Please contact our service team when you have questions.

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