CE

EXT 1824G

Safety and Regultory Information with User Manual

DRTECH

Digital Radiography Technologies

To Customers

Thank you for purchasing the DRTECH Radiography EXT 1824G (hereinafter, this Product). This User's Manual explains how to use the detector, x-ray interface unit, and other peripheral equipments. Before using this product, be sure to read this manual thoroughly in order to utilize it more effectively. Also, please read the Operation Manual for EVS Calibration and configuration Software (hereinafter, ECali1).

Important information on usage and maintenance of equipment

1. Only a legally certified operator or a trained personnel should use this product.
2. The equipment should be maintained in a safe and operable condition by maintenace personnel.
3. Use only the dedicated cables. Do not use any cables other than those supplied with this product.

Disclaimer

1. In no event shall DRTECH be liable for any damage or loss arising from fire, earthquake, any action or accident by a third party, any intentional negligent action by users, any trial usage, or other usage under abnormal conditions.
2. Radiography testing, image processing, image reading, and image data storage must be performed in accordance with the laws of the country or region in which the product is being used. The user is resposible for maintaining the privacy of image data.
3. In no event shall DRTECH be liable for personal physical harm or property damage that is sustained when the instructions are not followed or the product is misused.
4. In no event shall DRTECH be liable for direct or indirect consequential damages arising from the use or unavailbility of this product. DRTECH shall not be liable for loss of image data for any reason.
5. In no event shall DRTECH be liable for any damage arising from moving, alteration, inspection or repair by a person other than authorized service engineers.
6. Specifications, compositions, and appearance of this product may change without prior notice.

Contents

Safety notices

The following safety notices are used to emphasize certain safety instructions. Follow the safety instructions in this user's manual along with warning and cautions symbols. Ignoring such warnings or cautions while handling the product may results in serious injury or accient. It is important for you to read and understand the contents of this user's manual before attempting to use the product.

 **WARNING**	This notice is used to idendifiy conditions under which improper use of the product may cause death or serious personal injury.
 **CAUTION**	This notice is used to idendifi\y conditions under which improper use of the product may cause minor personal injury.
CAUTION	This notice is used to idendifiy conditions under which improper use of the product may cause property damage.
 **Prohibited**	This is used to indicate a prohibited operation.
	This is used to indicate an action that must be performed.
 **IMPORTANT**	This is used to indicate important operations and restrictions. Be sure to read this notice to prevent property damage or malfunction.
	This is used to indicate operations for reference and complementary information. Users are recommended to read this notice.

1. Safety Information

1.1. Safety precautions

Follow these saftey guides and properly use the equipment to prevent injury and damage to any equipment/data.

WARNING

Installation and environment of use

Prohibited

- **Do not use or store the equipment near flammable chemical such as alcohol, thinner, benzine, etc.**
  If chemicals are spilled or evaporated, it may result in fire or electric shock through contact with electric parts inside the equipment. Also, some disinfectants are flammable. Be sure to take care when using them.
- **Do not connect the equipment to anything other than specified connectoins.**
  Doing so may result in fire or electric shock.

Power supply

Prohibited

- **Do not operate the equipment using any type of power supply other than the one indicated on the rating label.**
  Otherwise, it may result in fire or electric shock.
- **Do not handle the equipment with wet hands.**
  You may experience an electric shock that could result in death or serious injury.
- **Do not place heavy object such as huge equipments on cables and cords, or do not pull, bend, bundle, or step on them. These precautions are required to be followed to prevent sheathes of cables and cords from being peeled. Do not alter the cables and cords.**
  Doing so may damage the cords which could result in fire or electric shock.
- **Do not supply power to more than one of equipment using the same AC outlet.**
  Doing so may result in fire or electric shock.
- **Do not turn on the system power when condensation has formed on the equipment.**
  Doing so may result in fire or electric shock.
- **Do not connect multiple portable socket-outlets or extension cords to the system.**
  Doing so may result in fire or electric shock.

- **Securely plug the power cord into the AC outlet.**
  If contact failure occurs, or if dust or metal objects come into contact with the exposed metal prong of the plug, fire or electric shock may result.
- **Be sure to turn OFF the power to each of equipment before connecting or disconnecting the cords.**
  Otherwise, you may get an electric shock that could result in death or serious injury.
- **Be sure to hold the plug or connector to disconnect the cord.**
  If you pull the cord, the core wire may be damaged, resulting in fire or electric shock.

WARNING

Handling

The system, in whole or in parts, cannot be modified in any ways without any written approval from DRTECH.

Prohibited

- **No modification of this equipment is allowed**
- **Never disassemble or modify the equipment.**
  Doing so may result in fire or electric shock. Also, since the equipment incorporates parts that may cause electric shcok as well as other hazardous parts, touching them may cause death or serious injury.
- **Do not place anything on top of the equipment.**
  The object may fall and cause an injury. Also if metal objects such as needles or clips fall into he equipment or if liquid is spilled,-may result in fire or electric shock.
- **Do not hit or drop the equipment.**
  The product may be damaged if it recieves a strong jolt. Using a damaged equipment without repair may result in fire or electric shock.

When a problem occurs

- **If any of the following problems occur, immediately turn OFF the power to each piece of equipment, unplug the power cord from the AC outlet, and contact your sales representative or local DRTECH dealer:**
  When there is smoke, when an odd smell or abnormal sound occurs.
  When liquid has been spilled into equipment or metal object has entered through an opening.
  When the equipment was dropped and damaged.

Maintenance and inspection

Prohibited

- **When the equipment is going to be cleaned, be sure to turn OFF the power of each equipment, and unpulg the power cord from the AC outlet. Never use alcohol, benzine, thinner or any other flammable cleaning agents.**
  Othewise, it may result in fire or electric shock.

- **Clean the plug of the power cord periodically by unplugging it from the AC outlet and removing dust or dirt from the plug. Clean the peripherals and AC oulet with a dry cloth.**
  If the cord is kept plugged in for a long time in a dusty, humid or a sooty place, objects around the plug will attract moisture, and this could cause insulation failure that could result in a fire.
- **For safety reasons, be sure to turn OFF the power to each piece of equipment when the inspections indicated in this manual are going to be performed.**
  Otherwise, electric shock may occur.

WARNING

Battery pack and charger

- Do not use the battery pack as a power source for equipment other than EXT 1824G detectors. Be sure to use only the dedicated battery pack for the EXT 1824G detector.
- The battery charger is designed for the dedicated battery pack. Do not use the battery charger other than the dedicated one. Otherwise, a battery explosion or a battery leak may occur, resulting in fire or electrical shock.
- Do not operate the battery charger using any type of power supply other than the one indicated on the rating label.
- Do not handle the product with wet hands.
- Do not attempt to disassemble, alter, or apply heat to the product.
- Avoid dropping or subjecting the product to severe impacts. To avoid the risk of injury, do not touch the internal parts of the battery if it has been cracked.
- Stop using the battery pack immediately if it emits smoke, a strange smell, or otherwise operates abnormally.
- Do not let the battery pack and battery charger come into contact with water or other liquids and do not allow them to get wet.
- Do not clean with substances containing organic solvents such as alcohol, benzene, thinner, or other chemicals. Otherwise, fire or electrical shock may occur.
- Do not allow dirt or metal objects (such as hair pins, clips, staples or keys) to contact the terminals. Otherwise, battery explosion or leakage of electrolytes may occur, resulting in fire, injury or pollution of surrounding area. If the battery leaks and the electrolytes come into contact with your eyes, mouth, skin or clothing, immediately wash it away with running water and seek medical attention.
- Do not leave, store, or place the product in a location near heat sources, or in a place subject to direct sunlight, high temperature, high humidity, excessive dust, or mechanical shock. Otherwise, battery leakage, overheating or damage to the product may occur, resulting in electrical shock, burns, injury or fire.
- Do not attempt to use a battery pack that has deteriorated. Using a battery pack that has exceeded its life cycle may lead to overheating, fire or explosion.
- The Lithium ion/polymer battery is recyclable.
- Battery slowly discharges even if it is not in use.
- The battery lifespan can expire if it discharges immediately after being fully charged. You can purchase an optional battery pack to replace an exhausted one.
- The battery pack is a consumable item. If a fully charged battery is consumed quickly, use a new and fully charged battery pack.
- Be sure to charge the battery periodically (once a year) if it is not used for an extended period of time. The battery pack cannot be charged if it has been over discharged.
- Before discarding the battery pack, cover the terminals with adhesive tape or other insulators. Contact with other metal materials may cause fire or explosion.

WARNING

Installation and environment of use

- **Do not install the equipment in any of the locations listed below. Doing so may result in malfuction, equipment faillng, fire or injury.**
  - **Close to facilities where water is used.**
  - **Where it may be exposed to direct sunlight.**
  - **Close to the air outlet of an air-conditioner or ventilation equipment.**
  - **Close to a heat source such as a heater.**
  - **Where the power supply is unstable.**
  - **In a saline or sulfurous environment.**
  - **Where temperature or humidity is high.**
  - **Where there is freezing or condensation.**
  - **In areas prone to vibration.**
  - **On an inclined surface or in an unstable area.**
- **Because the equipment cable is long, take care that cables do not become tangled during use. Also, be careful not to get your feet caught in the cable.**
  Otherwise, it may cause a malfunction of the equipment or injury of the user due to tripping over the cable.

Power supply

- **Always connect the three-core power cord plug to a grounded AC power outlet.**
- **To avoid the risk of electric shock, this equipment must only be connected to a power supply that maintains protective earth"**.
- **To make it easy to disconnect the plug at any time, avoid putting any obstacles near the outlet. Otherwise, it may not be possible to disconnect the plug in an emergency.**
- **Be sure to ground the equipment to an indoor grounded connector. Also, be sure to connect all the earth connections for the system to a common ground.**
- **Do not use any power source other than the one provided with this equipment.**
  Otherwise, fire or electric shock may be caused due to leakage.

Handling

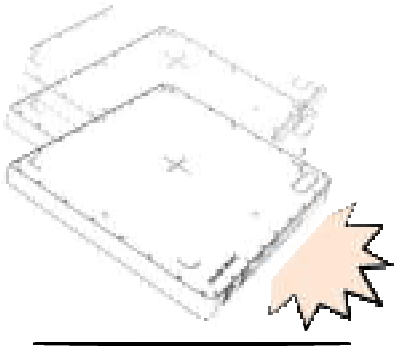
- **Do not spill liquid or chemicals onto the equipment.**
  Doing so may result in fire or electric shock.
  In such a situation, protect the equipment with a disposable covering as necessary.
- **Turn OFF the power to each piece of equipment for safety when not being used.**

CAUTION

Handling the equipment

The Equipment must be handled with care to avoid personal injury or damage to the internal image sensor.

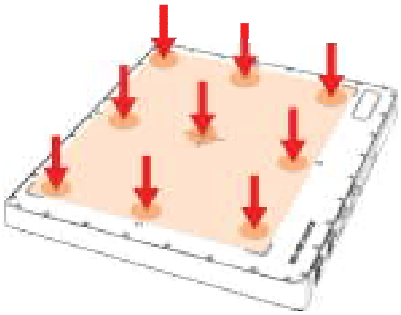
- **Handle the equipment carefully.**
- **Do not submerge the equipment in water.**
- **The internal image sensor may be damaged if something hits against it, or if it is dropped, or recieves a strong jolt.**



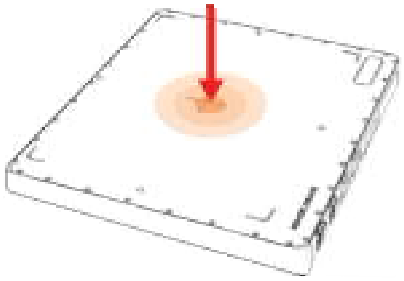
- **Do not place excessive weight on the detector.**
  Otherwise, the internal image sensor may be damaged.

<Load Limit>

Uniform load: 150 kg over the whole area of the detector



Local load: 100 kg on an area of 40 mm in diameter



- **Be sure to use the detector on a flat surface that does not bend. Otherwise, the internal image sensor can be damaged.**
- **Be sure to securely hold the detector while using it in upright positions. Otherwise, the detector may fall over, resulting in injury to the user, or may flip over, resulting in damage to the inner device.**

1.2. Notes for using the equipment

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

System Diagnostic

- The Ecali1 software runs a system diagnosis.
- Run Ecali1 software after installing the system, at least once a year. If an error occurs, report the detailed error information to DRTECH local dealer or distributor.

 **CAUTION**	The owner is responsible for ensuring that the system diagnostic is performed every year. Do not try to use the system if the system diagnosis failed.

Calibration

- To ensure optimal performance of the system, it is important to verify that the system is calibrated.
- You can process calibration with the calibration data CD (provided).

 **CAUTION**	The owner is responsible for ensuring that the system calibration is performed whenever the system installation is completed or the system is repaired. Do not try to use the system if system calibration is not performed.

Before exposure

- Be sure to check the equipment on a daily basis and confirm that it works properly.
- Suddenly heating the room in clod area will cause condensation to form on the equipment. In this case, wait until the condensation evaproates before performing an exposure. If the equipment is used while the condensation forms, problems may occur in the quality of captured images. When an air-conditioner is used, be sure to raise/lower the temperature gradually so that a significant change in temperature in the room and in the equipment does not occur, to prevent condensation.

During exposure

- Do not use the selected frequency chanel (2.4GHz and 5GHz dual band) for other wireless devices. Mutual interference may affect the image data transmission rate.

- Do not use the detector near devices generating a strong magnetic field. Doing so may produce image noise or artifacts.

Image Backup

- To avoid missing images, it is important to store the images by filming or by using external storage devices such as CD, DVD, HDD, USB, etc.. This should be done as a routine operation for every image. If the hard disk of your workstation is about to full, the operator should backup images and manually delete the images as administrator to make room on the hard disk for new images.

User Limitation

- The Ecali1 software has the technician mode which could only be operated by inputting the correct PASSWORD. The technician mode should be operated by the personnel who are qualified by DRTECH.

Electric Shock Hazards

- To reduce electric shock hazards, the system must be connected to an electrical ground.
- A three-contact conductor AC power cable is supplied with this system to provide the proper electrical grounding. The power cable must be plugged into an UL-approved three-contact electrical outlet.
- Do not disassemble or modify the product as it may result in fire or electric. There are no serviceable parts inside equipments and adjustments should not be made. Only trained and qualified personnel should be permitted access to the internal parts of the system.
- To reduce electric shock hazards, product is required to be well insulated with the use of appliance coupler, mains plug, and other seperable connections.

Disinfection and cleaning

- Wipe it with a dry cloth slightly damed with a neutral detergent.
- Do not use solvents such as alcohol, thinner or benzene. Doing so may damge the surface of the equipment.
- Do not clean the system while the power is on.

Operating/storage environment

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

	Temperature	Humidity	Atmospheric pressure
Operating environment	0 to 45 ℃ (-20 to 45 ℃ @ Operating with External Battery)	30 to 85 % RH	700 to 1060 hPa
Transportation & Storage environment	0 to 45 ℃ (12h Storage -40 to 70 ℃)	5 to 95 % RH	500 to 1060 hPa

- Do not expose this equipment to high temperatures and/or high humidity. Malfunction can occur.
- When not in use, keep the detector, handle unit, and grid in a designated location or in a location where they are safe and cannot fall down.

Notes on disposal

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

Handling the equipment

- The equipment must be handled with care to avoid personel injury or damage to the internal image sensor.
- The EXT 1824G Wireless is an advanced wireless digital radiographic equipment in the DRTECH Extream series. This equipment is designed to provide the highest resolution and sensitivity in the series. In addition, the wireless LAN (IEEE 802.11n*) communication feature improves the operability, and high-speed processing.

2. Introduction

2.1. Features

- Wireless LAN communication (IEEE 802.11n*) includes a lightweight and thin detector that is easy to handle.
- The new sensor with 76 μm of pixel pitch and CsI (Cesium Iodide), Gadox (Gadolinium Oxysulfide) used for the scintillator produces high resolution (approx. 7.1 Mega pixels) digital images within the effective imaging area (233 x 175 mm), with low doses of X-rays.
- Depending on the operating conditions at each site, the wiring unit (optional) enables the equipment to be used through expansion to a wired connection.

  ✓ At the time of installation, set a specific channel in the frequency band of 5.0 GHz before using the LAN. Note that the available frequency band for this standard varies, depending on the local radio laws, regulations and system requirements.

Intended Use

The EXT 1824G of Flat Panel Digital X-ray detector for industry was designed for industrial use.

Intended conditions of use

Considerations	Condition
Environment including hygienic requirements	● Operating conditions - Temperature: 0℃ to 45℃ (-20 to 45 ℃ @ Operating with External Battery) - Atmospheric Pressure: 700hPa to 1060hPa - Humidity: 30% R.H. to 85% R.H. ● Storage and delivery conditions - Temperature: 0℃ to 45℃ (12h Storage -40 to 70 ℃) - Barometric Pressure: 500hPa to 1060hPa - Humidity: 5% R.H. to 95% R.H. ● Non-sterile ● Less than ten minute contact ● Ambient luminance range: 100 lx to 1500 lx ● Viewing angle: normal to the display ± 20°

2.2. System Configuration

2.2.1. Basic Configuration

Generally, the EXT 1824G detector is used in system configuration as illustrated below:

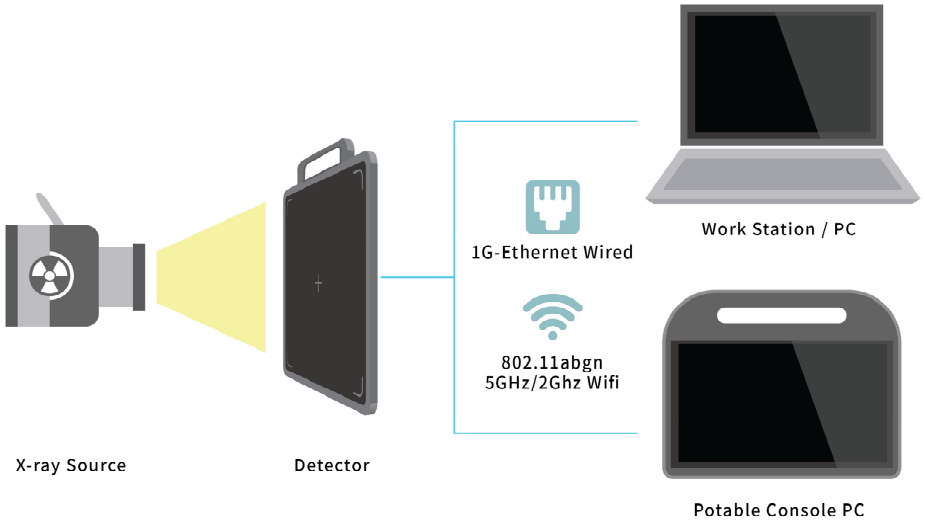


Figure 2.1 EXT 1824G System Configuration

Wireless Connection

- **EXT 1824G** wireless detector transmits images and data by wireless communication.
- A battery pack should be installed in the detector to use it under the wireless configuration.
- Up to 2 battery packs can be charged simultaneously from a battery charger.

- Use of multiple WLAN devices within the same frequency band may cause interference within each wireless communication and slow down the transmission speed
- Do not cover or block the wireless module of the detector. Otherwise, the transmission speed or operable distance may reduce.

Wired Connection

- Connect **EXT 1824G** wireless detector with the DATA(LAN) cable to make a wired configuration.
- As the power cable supplies power, a battery pack is needed to be inserted in the detector.

The wired connection is more suitable for stabilized communication

- ☐ The data communication is faster than the wireless connection.
- ☐ It enables the battery pack to be continously supplied with power while using the detector.
- ☐ The time for charging and replacing the battery pack can be reduced drastically.

EXT 1824G Wireless system consists of detector, CDs and relevant accessories. (Refer to chapter 3-1 "Product Components" for CD information)

Table 2.1. EXT 1824G Packaging: Default components

X-ray Detector (EXT 1824G)	Battery Charger (EVS-BCS)	Battery Pack (EVS-MBP-Y)
		
User's Manual	**Power adaptor (12V, 7.08A) + AC Power Cable(2m)**	**CD(Software / Calibration)**
		

Table 2.2. EXT 1824G Packaging: Optional components

NDT Tether Cable(0.45M)	DATA(LAN) Cable	EVS_Functional_Cable(5M)
	 **Option** **-. 1M** **-. 10M** **-. 25M** **-.100M**	

3. Product Description

3.1. Product Components

3.1.1. AED Mode

Table 3.1. Product componets for AED Mode

Part name	Remark
Flat panel detector	EXT 1824G(Scintillator : Gadox) 1.7 kg
Battery charger	EVS-BCS : 0.5 kg
Battery pack	EVS-MBP-Y : 0.24 kg
CD (Software / Calibration)	Document : User 's Manual (PDF) Calibration Data : MAP, PMP, GMP Software : Ecali1
User's Manual	Supported in all Modes
Tether Cable(0.45M)	Supported in all Modes
DATA(LAN) Cable	Supported in all Modes
Power Adaptor	Supported in all Modes
AC Power Cable (2M)	Supported in all Modes

WARNING

The use of accessories and cables other than those specified, with the exception of ***EXT 1824G Wireless*** accessories and cables sold by DRTECH Co., LTD. as replacement parts for internal components, may result in increased emissions or decreased immunity of the equipment. Accessory equipment connected to the analog and digital interfaces must be certified according to the respective IEC standards.

3.1.2. S/W Trigger Mode

Table 3.2. Product componets for S/W Trigger Mode

Part name	Remark
Flat panel detector	EXT 1824G(Scintillator : Gadox) 1.7 kg
Battery charger	EVS-BCS : 0.5 kg
Battery pack	EVS-MBP-Y : 0.24 kg
CD (Software / Calibration)	Document : User 's Manual (PDF) Calibration Data : MAP, PMP, GMP Software : Ecali1
User's Manual	Supported in all Modes
Tether Cable(0.45M)	Supported in all Modes
DATA(LAN) Cable	Supported in all Modes
Power Adaptor	Supported in all Modes
AC Power Cable (2M)	Supported in all Modes

3.1.3. Workstation (Recommended and minimum but NOT included)

Table 3.4. Workstation

Item	Specification
Operating system	Windows 7 64 bit SP1 (Professional Edition or higher)
CPU	Intel Core i7 or higher (or compatible CPU)
Memory	8GB or higher
Hard disk	1TB or higher
LAN card	Gigabit (Detector only) Intel® PRO 1000 Series (Gigabit LAN Card for network interface) Min. Requirements : 1Gbps Jumbo Frames : 9K Receive Descriptors : 2K (higher than 1024) This is not dedicated to DICOM
Monitor	24 inch, 1920 x 1080 or higher
Optional disc drive	CD or DVD R/W

4. Parts Name and Functions

4.1. Detector

4.1.1. Detector Specification

Table 4.1. Detector Specifications

Item	Description
Model	EXT 1824G
Purpose	EOD, Industrial NDT
Pixel Pitch	76 ㎛
Scintillator	Gadox (Gadolinium Oxysulfide)
Image Matrix Size	2304 × 3072 pixels
Effective Imaging Area (H x V)	233.472 x 175.104 mm
Image Acquisition and Transfer Time	< 4sec (with HR Mode) , < 3 sec (with HT Mode)
Rated Power Supply Wireless Wired	Powered by the battery pack (DRTECH Corporation(Powerlinx) / EVS-MBP-Y /7.4V, 4000mAh) Powered by Power adaptor using tether interface (XP Power / AHM85PS12 / DC12V 7.08A)
Power Consumption	Max. 24 W
Network Interface	Gigabit wired / WIFI(2.4G, 5G)
Dimensions (㎜) [±0.5 mm]	265(W) x 215(H) x 21.8(D)
Weight	1.7 kg
IP grade	IP67
Environmental Requirements	
Operational	Temperature: 0℃ to 45℃ (-20 to 45 ℃ @ Operating with External Battery) Humidity: 30 to 85% RH (Without Condensing) Atmospheric pressure: 700 to 1060 hPa
Storage and Transportation(unpacked)	Temperature: 0℃ to 45℃ (12h Storage -40 to 70 ℃) Humidity: 5 to 95% (Without Condensing) Atmospheric pressure: 500 to 1060 hPa

4.1.2. Detector Component

The detector is designed to capture radiographic images.

Captured images are transmitted to the EXT 1824G image-capture computer using the wireless/wired data transfer

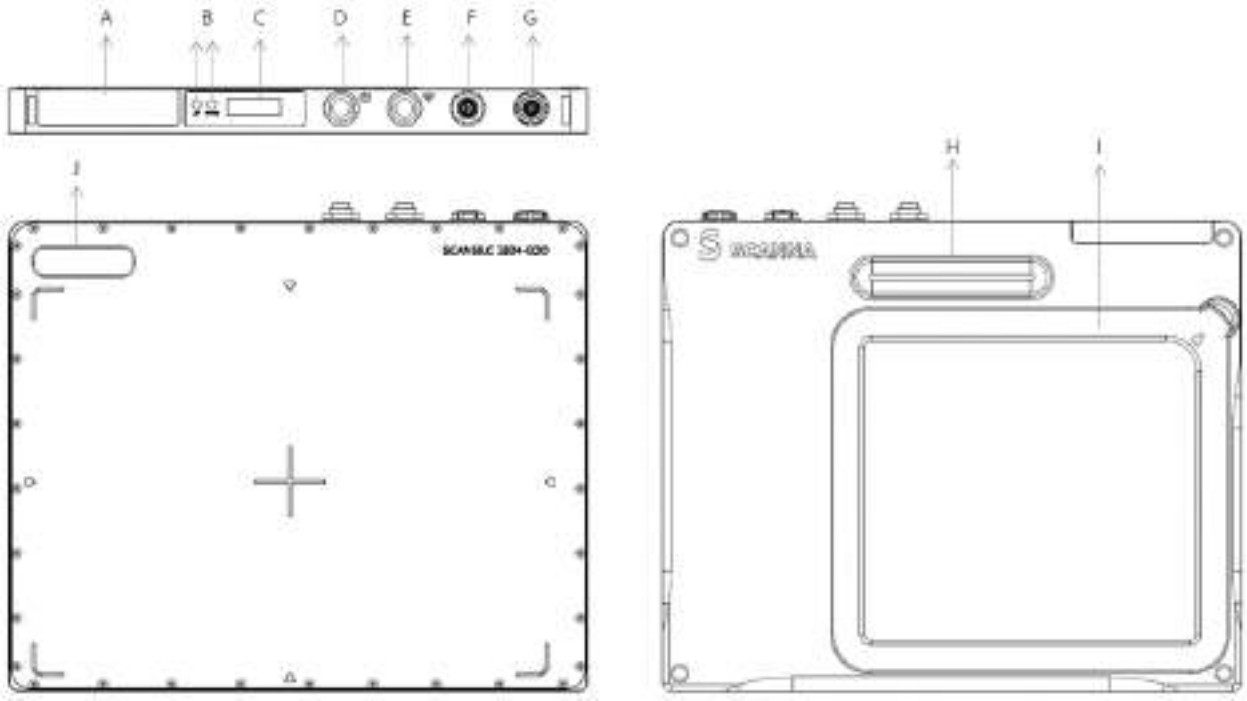


Figure 4.1. Detector Components

A. Wireless antenna: Transmits image data with wireless comunication (IEEE802.11n).

B. LED Indicators
   - Ready: Lamp showing data communication state and ready state of the detector.
     (Green: detector is ready / Orange: detector is busy)
   - AP: Lamp indicating Wired / Wireless mode.

C. OLED Display: Displays some information for the detector such as a battery level, operating modes(Wired/Wireless), HR / HT, and SSID ect.

D. Power Button: Turns the detector on / off.

E. AP Button: Can register the detector among the different wireless connection options.
   (Connection options: Wireless using an AP/ Wireless using the detector's internal AP/ Portable mode).

F. X-ray Connector: Integrates with a x-ray generator.

G. Data/Power Connector: Data communication and power supplying through LAN or Power cable with the circular connector.

H. Handle: Can grab the detector easily.

I. Battery Pack: Supplies electrical power to the detector.

J. Logo: A sticker logo.

4.2. Battery Charger and Battery Pack

4.2.1. Battery Charger

4.2.1.1. Battery Charger Specifications

Table 4.2. Battery Charger Specifications

Item	Description
Model	EVS-BCS
Simultaneous Charging	Battery Pack 2 EA
Charging Time	3 hours
Rated Power Supply	DC +12 V, 6 A Max.
Dimensions (W x H x D)	255 mm x 180 mm x 35 mm
Weight	0.5 kg

4.2.1.2. Battery Charger Components

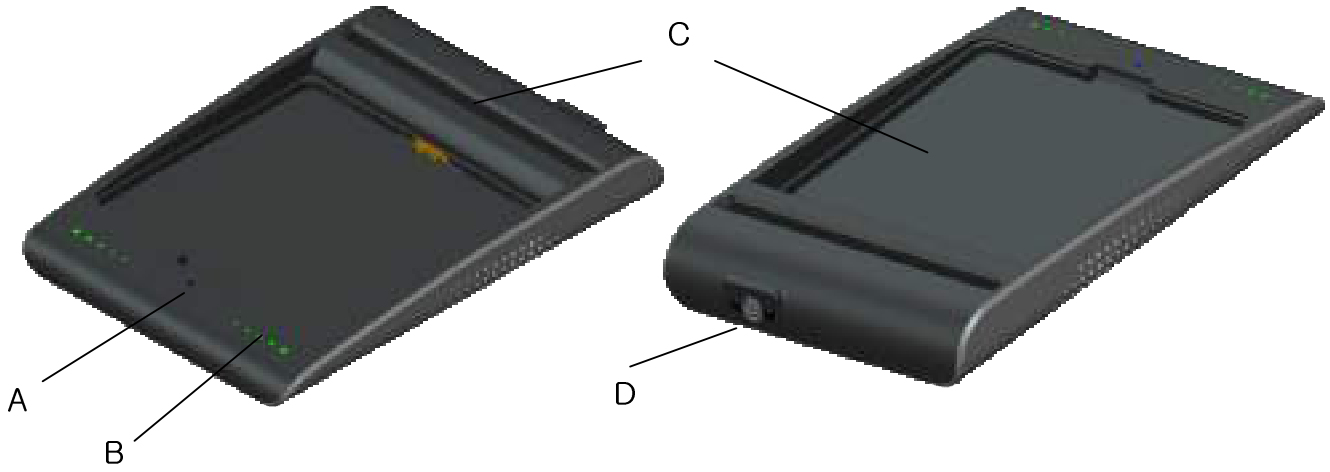


Figure 4.2. Battery Charger

A. Power indicator : Indicates the power on/off status..

B. Charging indicator : Indicates the charging status.

C. Battery compartment : Insert the battery pack to charge.

D. DC Input : Connect the DC adapter to supply electrical power to the battery charger.

4.2.2. Battery Pack

4.2.2.1. Battery Pack Specification

Table 4.3. Battery Charger Specifications

Item	Description
Model	EVS-MBP-Y
Cell Type	Lithium Polymer
Number of Cells	2S1P (2series 1 Parallel)
Rated Power Supply	Output : DC +7.4 V
Lifetime	Approx. 500 cycles of use (full charge to discharge is 1 cycle)
Dimensions (W x H x D)	163 mm x 148 mm x 7 mm
Weight	0.24 kg

4.2.2.2. Battery Pack Components

Figure 4.3. Battery Pack

A. Charging indicator : Indicates the charging status

B. Latch knob : Rotate between on/off for battery swap

4.2.2.3. Charging Battery Pack

The battery pack supplies power to the detector during wireless connection.
Be sure to use only the dedicated battery pack, and fully charge it before usage.

- Connect the power adapter to the DC Input port of the battery charger. The power LED lights in blue indicates the presence of direct current (DC) power.
- Insert the battery pack into the battery charger. Charging starts automatically. The charge LED lights appear green when the battery pack is being charged. When battery pack is completely charged, all levels of chare LEDs will illuminate.
- Gently pull the charged battery pack to remove from the battery charger.

 **WARNING**	Securely plug the power cord into the power source. If contact failure occurs, or if dust or metal objects come into contact with the exposed metal prongs of the plug, fire or electrical shock may occur.
 **CAUTION**	Be sure to stop charging the battery pack when the charge LED lights appear in green beyond the specified charging time. Not doing so may result in battery pack overheating or smoke emission, or battery explosion or fire.
 **CAUTION**	You must use the power adaptor that is certified with IEC 60950 or IEC 60601-1.
	Two batteries can be charged at the same time.
	It takes approximately two hours to fully charge a battery pack. The required charging time may vary depending on the temperature and remaining battery level.

4.2.3. Adaptor

Table 4.5. AD/DC Adaptor Specifications

Item	Description
Model	AHM85PS12
Rated input	100- 240Vac / 1.0A, 50/60Hz
Rated output	12V, 7.08A
Maker	XP POWER

4.3. Interface

4.3.1. WIFI Specification

Table 4.3. WIFI Specifications

Item	Wireless Module
Standard	IEEE 802.11abgn (2T2R)
Data Rate	802.11b: 11Mbps / 802.11a/g: 54Mbps / 802.11n: 300Mbps
Operating Frequency	IEEE 802.11abgn ISM Band, 2.400GHz ~ 2.4835GHz, 5.150MHz ~ 5.825MHz *Subject to local regulations
Interface	USB
Antenna	2 x UFL connector or printed antenna for 2T2R
Modulation	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11a/g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
Power Consumption:	Continue TX: Max 450mA@2TX / Continue RX: Max 175mA@2RX
Security	64/128-bits WEP, WPA, WPA2, 802.1x
Operation Range	Depending on the customer's design.
Sensitivity	802.11g: ≦-74dBm 802.11n/2.4GHz: ≦-72dBm(HT20), ≦-69dBm(HT40) 802.11a: ≦-71dBm 802.11n/5GHz: ≦-71dBm(HT20, HT40)

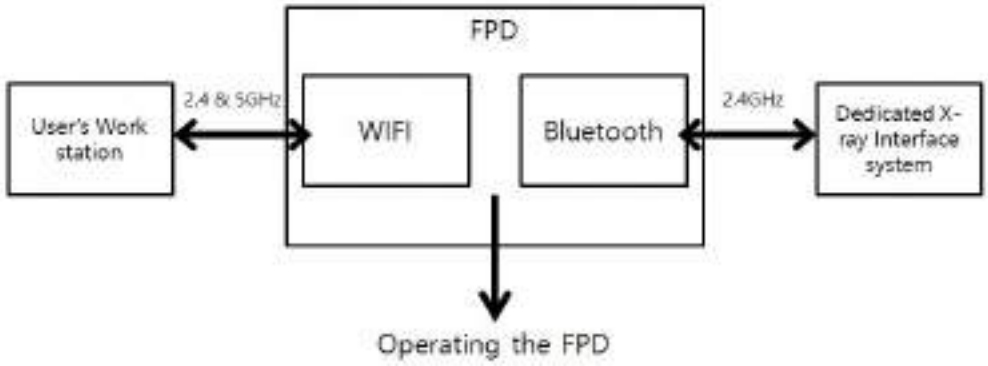
* The WUBR-508N is powered by Ralink radio chip and features 2R2R 11abgn MIMO technology for higher throughput performance, reiability and range. It is designed to meet the demading performance requirements of critical embedded applications and supports the following features:
-. Ralink RT5572
-. Antenna: U.FL * 2 for 2T2R
-. Data Rates: allows link speeds up to 300Mbps.
-. Support Windows XP, Vista, Win7, Linux driver

* Detectors only provide 5150-5250MHz range in wireless mode. It is not available to adjust other channels.

4.3.2. Bluetooth Specification

Item	Bluetooth Module
Standard	Bluetooth 4.1
Data Rate	1 Mbps
Operating Frequency	2.4 ~ 2.48 GHz
Interface	UART, PIO, AIO, SPI
Antenna	PCB
Modulation	GFSK
Power Consumption:	Depends on profiles, 12 mA typical
Security	-
Operation Range	100 meters(depending on the customer's design.)
Sensitivity	-92.5 dBm at 0.1% BER

4.3.3. WIFI & Bluetooth Workflow

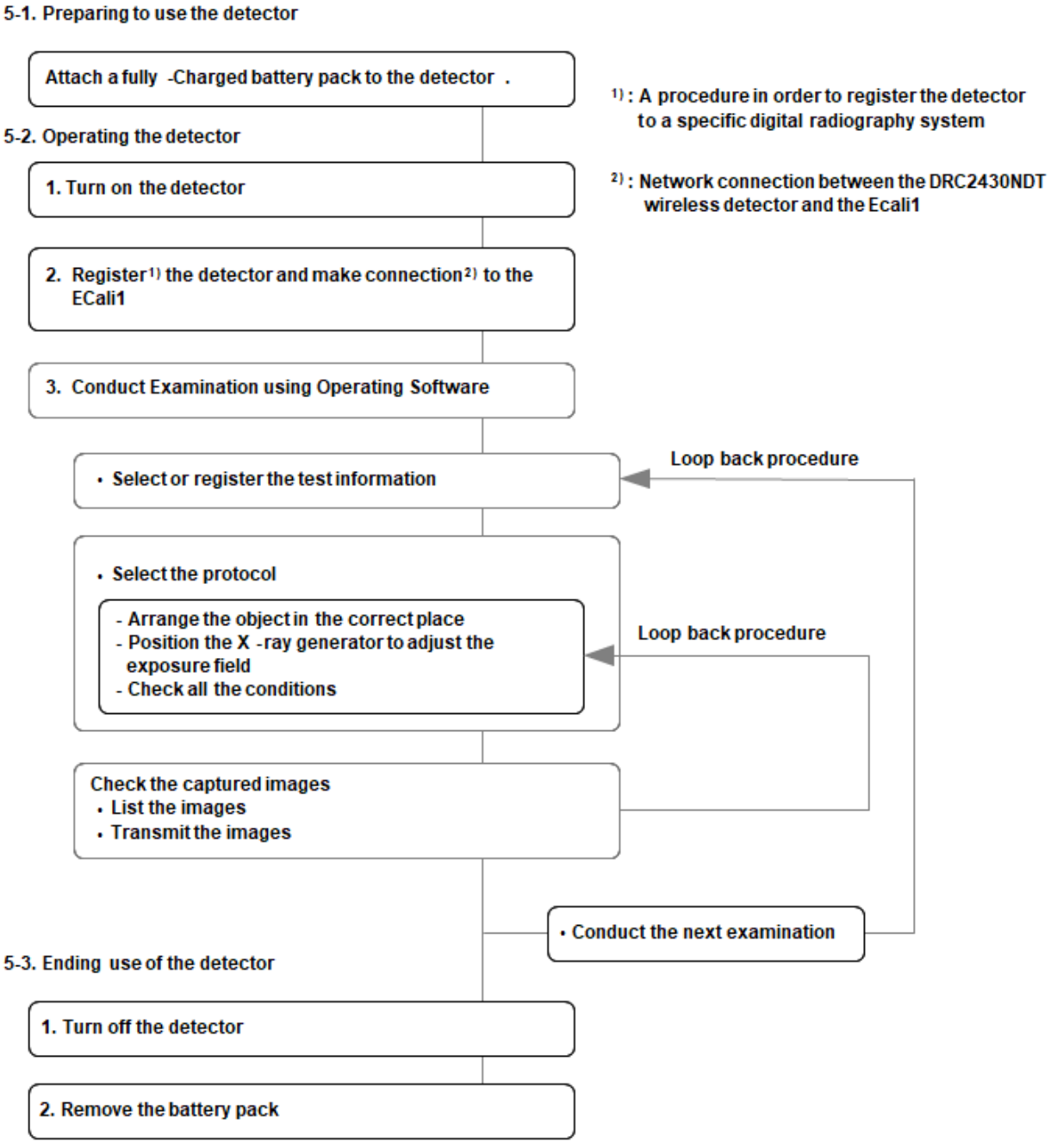


1. Give a signal from the dedicated x-ray interface to the bluetooth
2. FPD catches the signal from the bluetooth & X-ray
3. FPD operates and transmits images to the workstation
4. The workstation receives the images

5. Operating Procedure

General Workflow

The following workflow indicates the procedures after startup of Ecali1 and other system equipments



5.1. Preparing to Use the Detector

CAUTION	Be sure to use only the dedicated power supply for the EXT 1824G detector

5.1.1. Standard Configuration

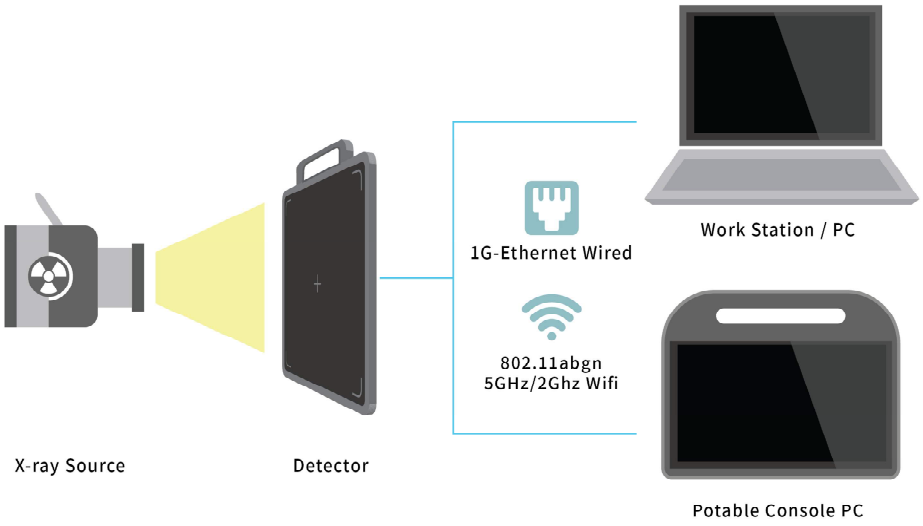


Figure 5.1 EXT 1824G System Configuration

A. Wireless Connection

- EXT 1824G transmits images and data by wireless communication.
- A battery pack should be installed in the detector to use it under the wireless configuration.
- Up to 2 battery packs can be charged simultaneously from a battery charger.

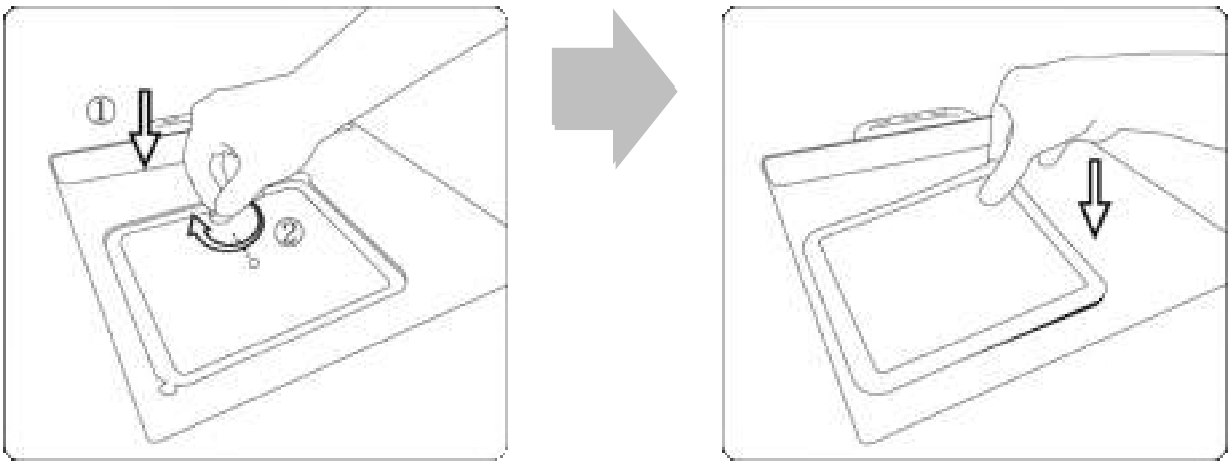
B. Wired Connection

- Connect EXT 1824G and PC with the DATA(LAN) cable to make a wired configuration.
- As the DATA(LAN) cable supplies power, a battery pack is not needed to be installed in the detector.
- Data communications are faster than wireless connection.
- It is able to keep charging a battery pack while using the detector.

5.1.2. Battery Pack

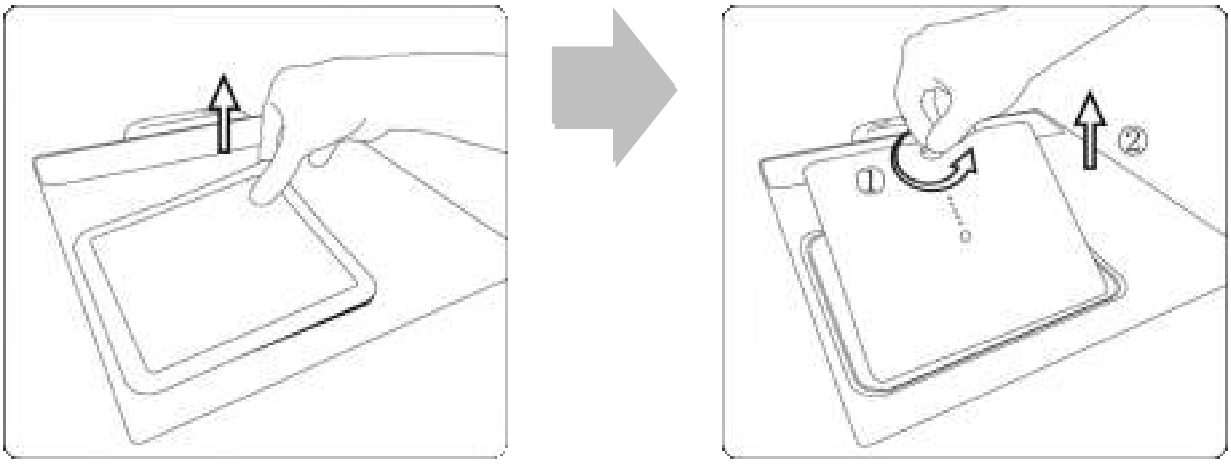
WARNING	Securely attach the battery into the detector or charger. If contact failure occurs, or if dust or metal objects come into contact with the exposed connector pins of the detector or charger, fire or electrical shock may occur

5.1.2.1. How to Attach a Battery Pack



1) Align the arrows on the detector and battery pack.
2) Push down the battery pack.
3) Turn the battery lock knob 90 degrees clockwise.

5.1.2.2. How to Detach a Battery Pack



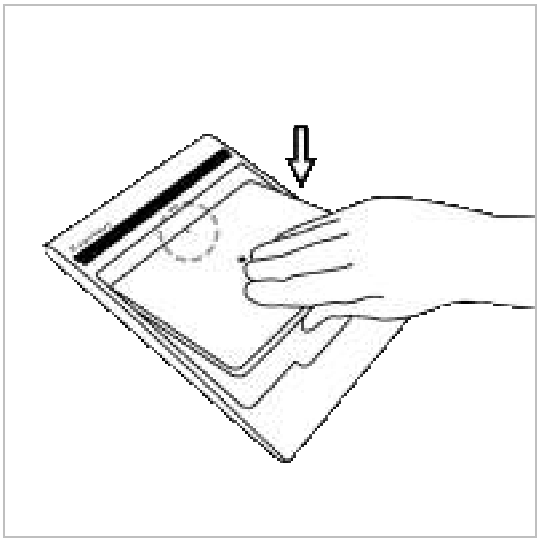
1) Turn the battery lock knob 90 degrees counter-clockwise.
2) Pull up the battery pack grabbing the knob.

WARNING	Make sure to turn off the detector before detaching a battery pack. Press and hold the **power** button for about 2 seconds. All status LED lamps will be turned off when the detector is turned off.

5.1.2.3. How to Charge Battery Packs

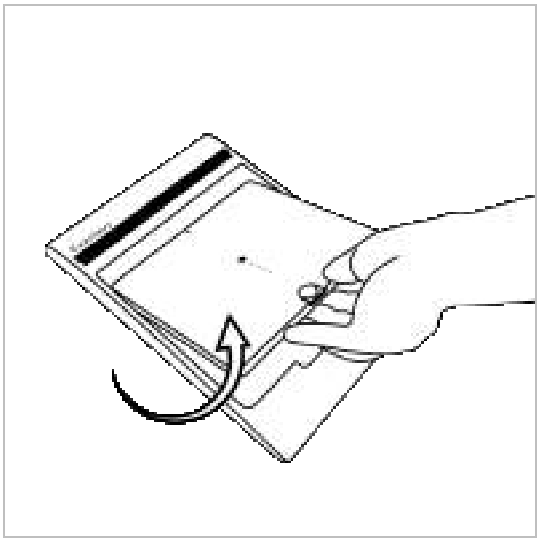
- **Horizontal Direction**

1) Attachment



1) Align the arrows on the charger and battery pack.
2) Push down the battery pack.

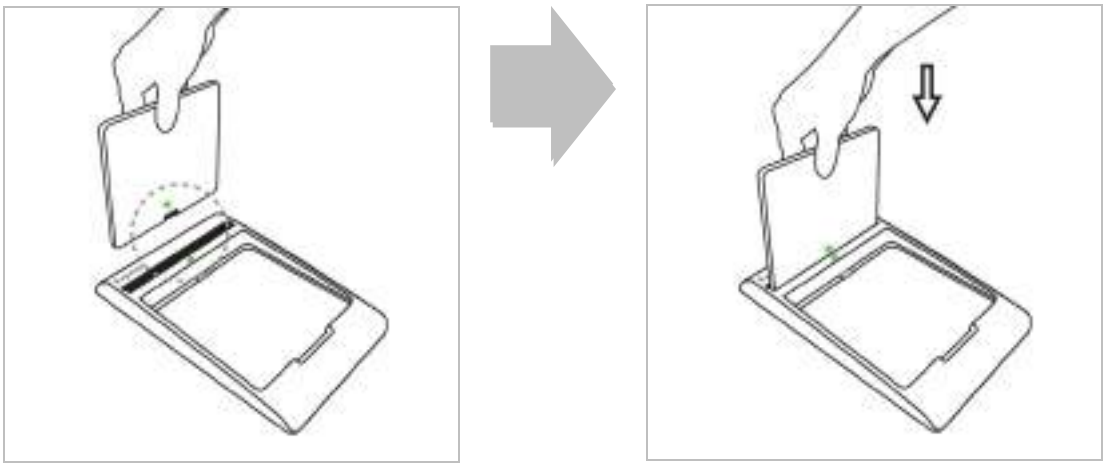
2) Detachment



1) Put the finger into the groove on the charger and grab the battery pack.
2) Pull out the battery pack.

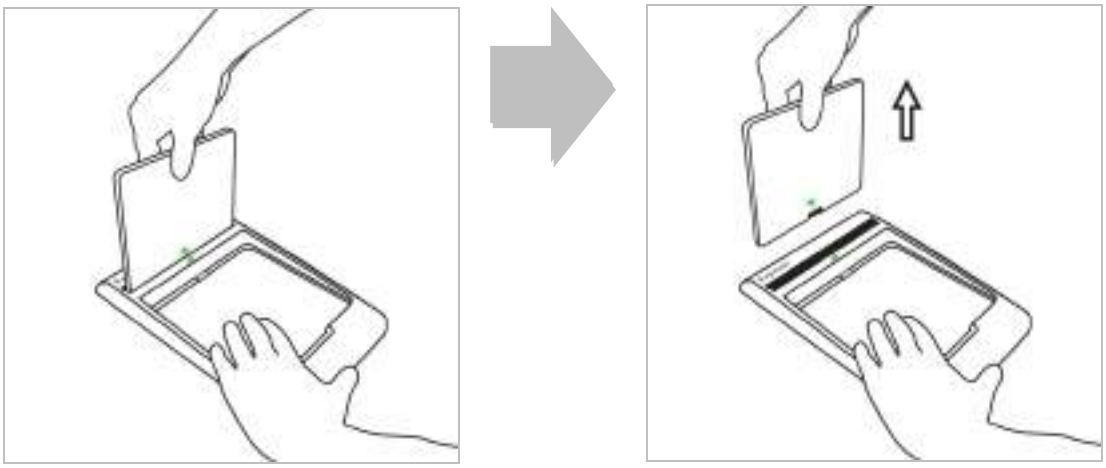
- **Vertical Direction**

1) Attaching



1) Stand the battery pack up to reveal the battery charged connector.
2) Check the yellow-green arrows on the charger and bottom of the battery pack.
3) Align the left and right side of battery pack to the charger.
4) Push down the battery pack.

2) Detaching



1) Grab the battery pack.
2) Pull out the battery pack from the charger while holding the charger by the other hand.

5.2. Hardware Installation

5.2.1. Connecting Device

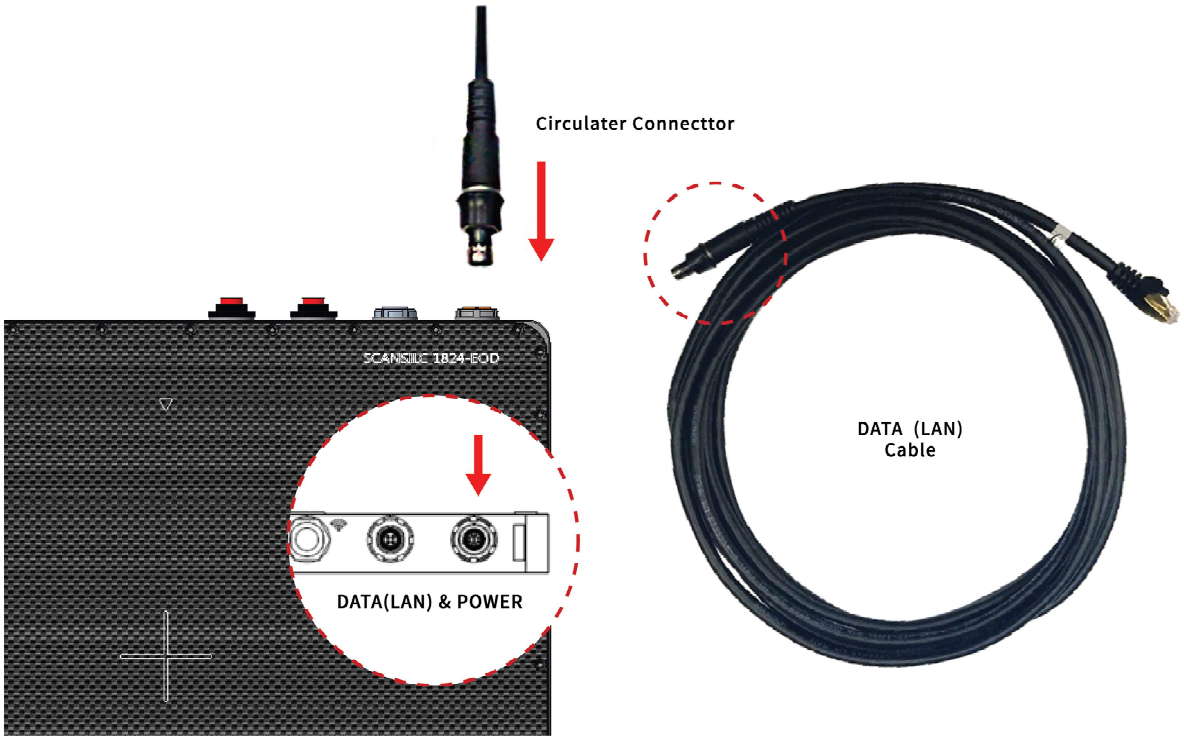
This section describes how to connect the EXT 1824G system (Detector)

5.2.1.1. DATA(LAN) & Power Cable

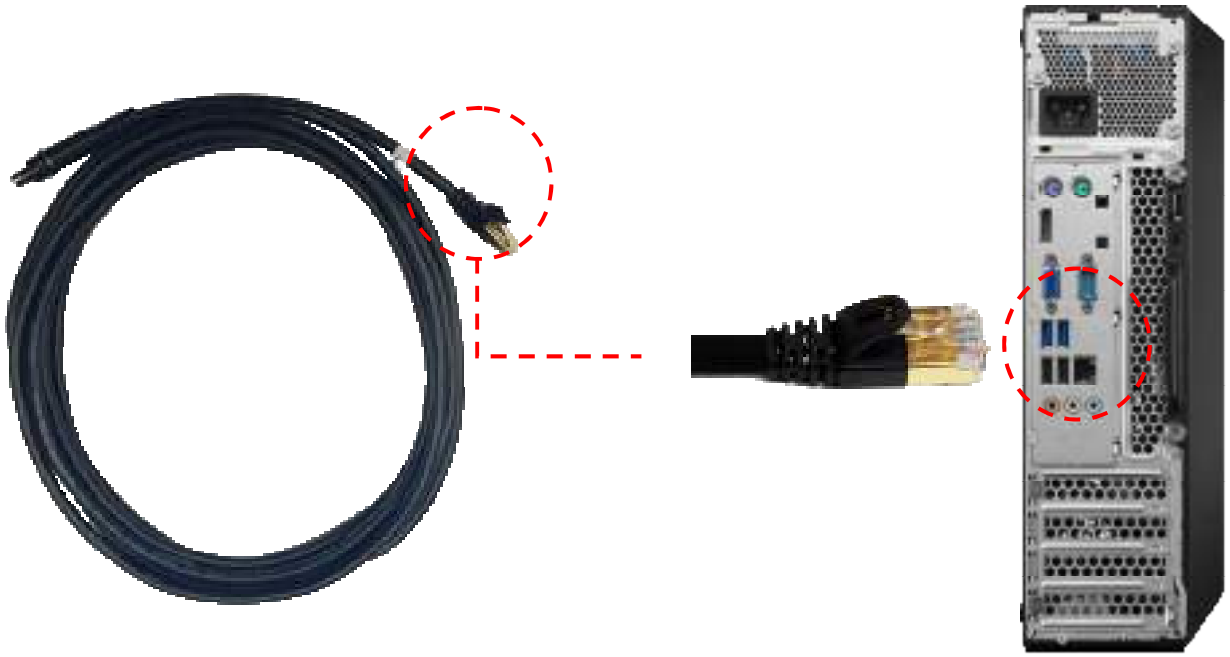
This section describes how to connect the EXT 1824G system (Detector) by using DATA(LAN) cable.

CAUTION	Installation of this equipment should be made by licensed and authorized personnel.

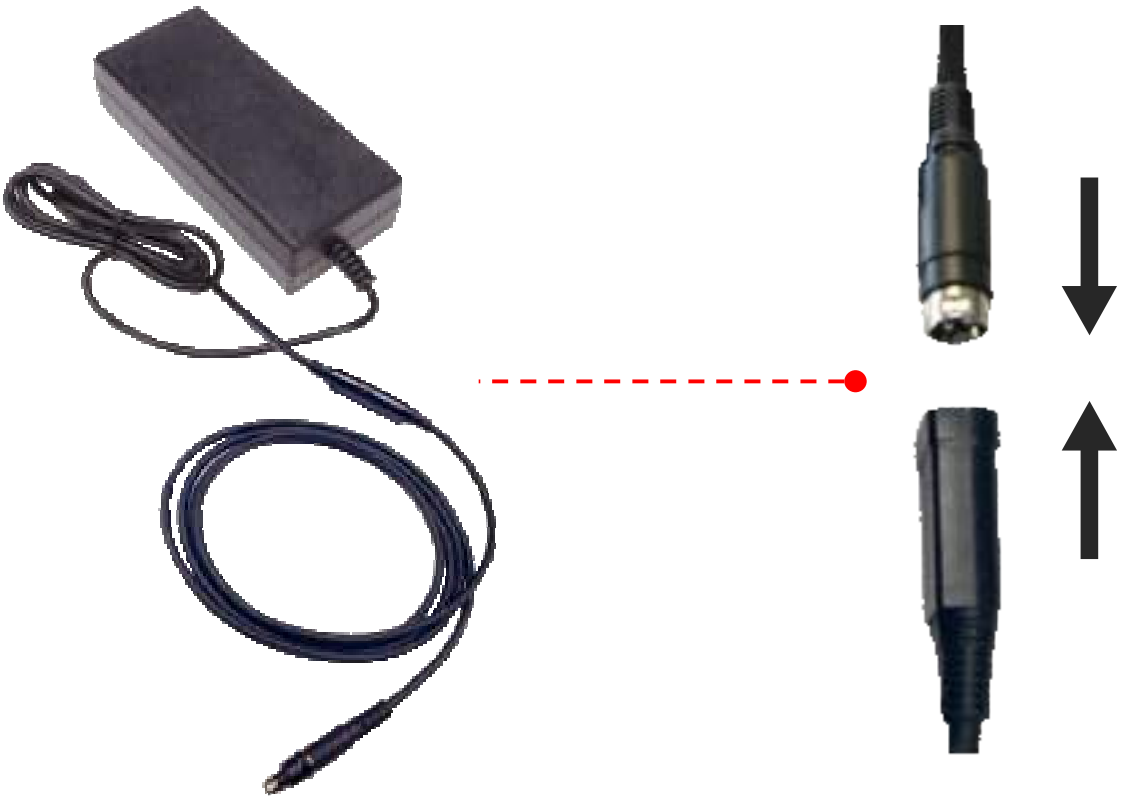
1) Connect the circular connector to the connector as blow



2) Connect the LAN cable to the LAN Card connector of workstation assigned for the data transfer



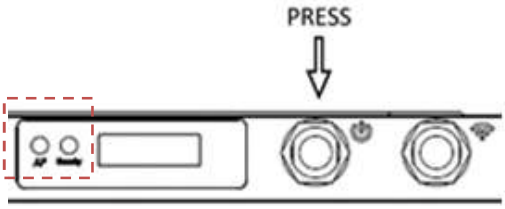
3) Connect the power adaptor to other power cable to supply power



5.2.2. Operating Detector

1) Turn on the detector

Press and hold the POWER button
(approx. 2 second)
Ready lamp (Green) lights up first time
Ready lamp(Orange) lights up,
as OLED window shows up Booting information
(In approx. 1 minute)



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

i. Registration

AP(Blue) blinks

When the AP lamp is blinking 1 time in 2seconds, system is in wired mode status.

When the AP lamp is blinking 2 times in 2seconds, system is in wireless mode (AP_1) status.

When the AP lamp is blinking 3 times in 2seconds, system is in wireless mode (AP_2) status.

When the AP lamp is blinking 4 times in 2seconds, system is in wireless mode (Inside AP) status.

When the AP lamp is blinking 5 times in 2seconds, system is in wireless mode (CR mode) status.

****User can set value of AP_1, AP_2, in Ecali Program. Please refer to Operation Manual for Ecali1 (Calibration tool).**

ii. Connection

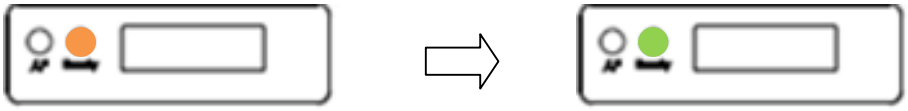
Network connection between the internal wireless module of the detector and the wireless access point / detector control system is secured automatically.

3) Conducting Examination

For details about operation, refer to the **Operation Manual for the ECali1**

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

The READY lamp color is changed from orange to green when the detector and ECail1 change to exposure ready status.



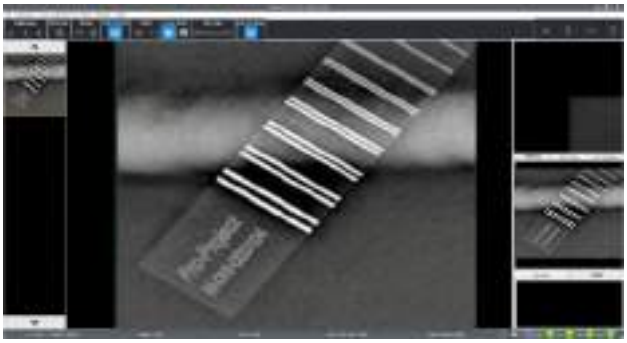
- Arrange the object in the correct posture and position the detector aligning it with the target part.
- Position the X-ray generator to adjust the exposure field.
- Check all conditions before exposure.

Make sure that Ready lamp is lit and AP lamp is blinking. This means that the system is ready to start an examination.

When the READY lamp (orange color) lights on, the detector is in detector selection status (Sleep). The detector enters the detector selection status automatically when it has not been used for a certain period of time.

ii. **Press the exposure switch of the X-ray generator.**

Images captured with the detector are transmitted to the ECali1 and appear on the monitor.



- Check the images on the monitor.
- If any uncompleted protocols remain, repeat procedure ii).

- Choose the exposure mode before the shooting.

Mode	Description
AED	AED Mode.
S/W Trigger	S/W Trigger Mode.

iii. **Click the "Save Raw Image" button to store image.**

- To conduct examination for another object, repeat step iii.

A signal strength indicator appears on the screen of the ECali1 computer. It shows the wireless communication level between the detector and ECali1.

Keep the wireless communication level stable on capturing or transmitting images.

Table 5.1. Signal Strength Indicator

Display	Signal Strength (comunication stability)	Status	Required Actions
	Wireless, high (Stable)	Normal	
	Wireless, Normal (Stable)	Normal	
	Wireless, Low (Unstable)	Unstable communication. Communication speed is lowered	Check whether there is any obstacle (e.q., your hands) between the wireless module and the wireless access point. If there is any obstacle, remove it. If the problem cannot be resolved, ask for consultation to your sales representative or local DRTECH dealer.
	No signal or No Link (Communication failed)	Disconnected communications	Confirms that detector and the access point are turned on. If the problem cannot be resolved, ask for consultation to your sales representative or local DRTECH dealer.
	Wired Link	Normal	External cable connected.

Table 5.3. Battery Remains Indicator

Display	Status	Ext. Pwr	Required Actions
	Charge complement	Ext. cable & battery	
	Ext. cable charging	Ext. cable & battery	
	100%	Only battery	
	90~99%	Only battery	
	80~89%	Only battery	
	70~79%	Only battery	
	60~69%	Only battery	
	50~59%	Only battery	
	40~49%	Only battery	
	30~39%	Only battery	
	20~29%	Only battery	
	10~19%	Only battery	Warning message is popped up at the bottom-right. Recommend to change the battery.
	0~9%	Only battery	Warning message is popped up at the bottom-right. Change the battery before the battery is discharged.
	No Battery or Error	Unkown	Change the battery. If the problem cannot be resolved, ask for consultation to your sales representative or local DRTECH dealer.

5.2.3. Image Data Retransmission

EXT 1824G can save the image data as a file when detector is disconnected from AP during image data transmission. User can download the image file or receive the lastest shotted image data by using acquisition mode of Ecali1 after reconnection.

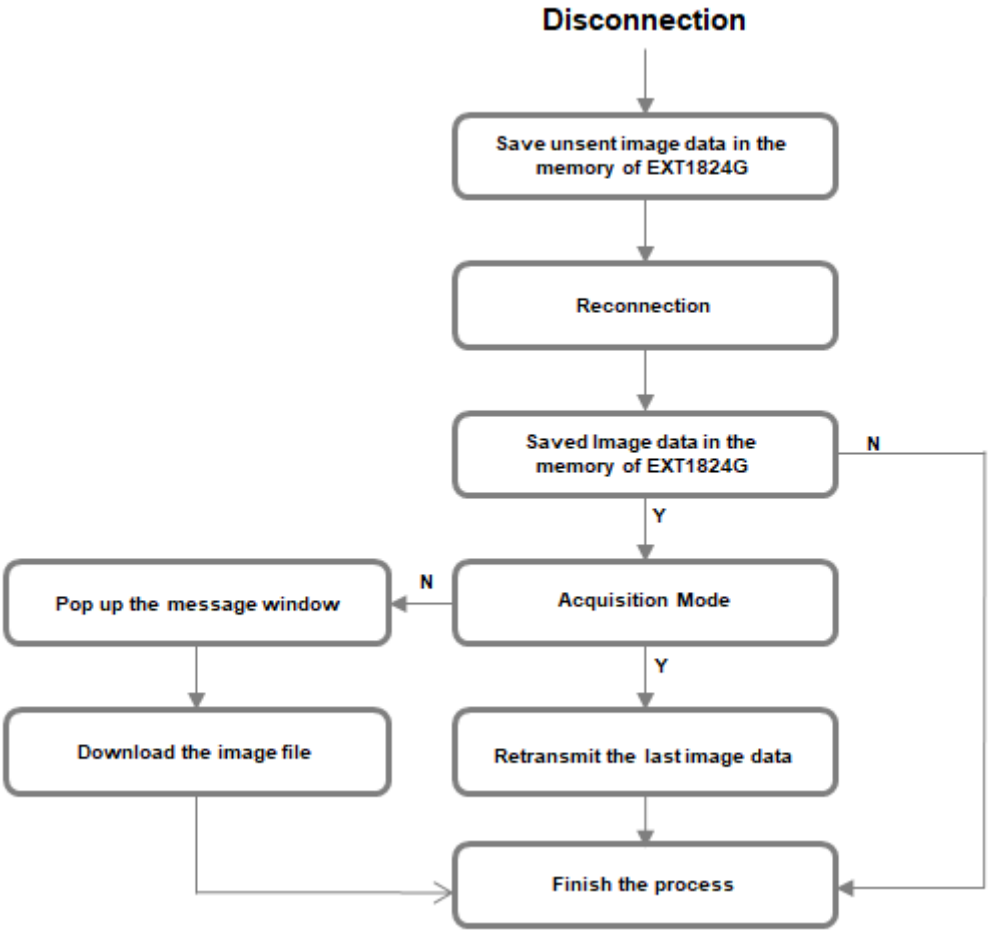


Figure 5.2. Flow Chart

If user does not use acquisition mode after reconnection, image data is saved as file. Image file cannot be retransmitted automatically even if acquisition mode is activated.

5.3. Ending Use of the Detector

- **Turn off the detector**

  Press the POWER button.

  All the LED lamps shall be off.

Table5.4. Detector Status List

Lamp Type	O Ready		O AP
	Ready	Busy	AP
Color	■ Green	■ Orange	■ Blue
Power ON	○	X	X
During detector registration	X	○	☆
Detector registration completed (1 Sec.)	X	○	☆
During exposure preparation	X	○	☆
Ready status or performing an examination (Ready)	○	X	☆
During image data transmission	X	○	☆
Sleep Mode	X	○	☆
Deep Sleep Mode	X	○	☆
Power OFF	X	X	X

O : Light on X : Lights off ☆ : Blinking

AP : Information of detectors connection
- Blinking 1 time : wired
- Blinking 2 times: wireless(5GHz)
- Blinking 3 times: wireless (2.4GHz)
- Blinking 4 times: detector AP Mode (using internal AP inside of detector)
- Blinking 5 times: CR Mode

5.4. Detector Initialization

Table5.5. Detector Initialization

Time	Action	Lamp Status
0 sec	Press AP button.	All lamps keep their own status.
2 sec	Keep pressing AP button.	AP lamp(blue) is blinking.
10 sec		AP(blue) and Busy(orange) lamp is blinking.
15 sec		AP lamp is shown its own status. Ready(green) lamp is blinking.
After 15 sec	Release AP button when Ready(green) lamp is blinking. And then press AP button 3 times again within 5 sec.	Busy(orange) lamp is turned on the light during factory reset. The letter "Factory Reset" is displayed on OLED. It takes about 10 seconds.

- **Detector will be connected again after the initialization**
- **Setting the parameters of detector such as SSID, IP, etc.**

  Refer to "7.2.1. Detector Configuration".

6. Image Acquisition

6.1. X-ray Generator Interface

6.1.1. X-ray Exposure Mode

Table 6.1. Exposure Mode

Mode	Description
AED Mode	1. The detector detects actual amount of X-rays without any connection to the X-ray generator, and then performs image acquiring to the extent of image acquisition time and transmits the image data. 2. No signal used (No need of connector interface cable)
S/W Trigger Mode	1. The detector detects actual amount of X-rays without any connection to the X-ray generator, and then performs image acquiring to the extent of image acquisition time and transmits the image data. 2. On the S/W, you should press the Acq. Start button to give the sign for image acquisition when X-ray is shooting (No need of connector interface cable)

6.1.2. AED Mode

AED Mode is available for acquiring images without any connection to X-ray generator. Generator interface cable is not required

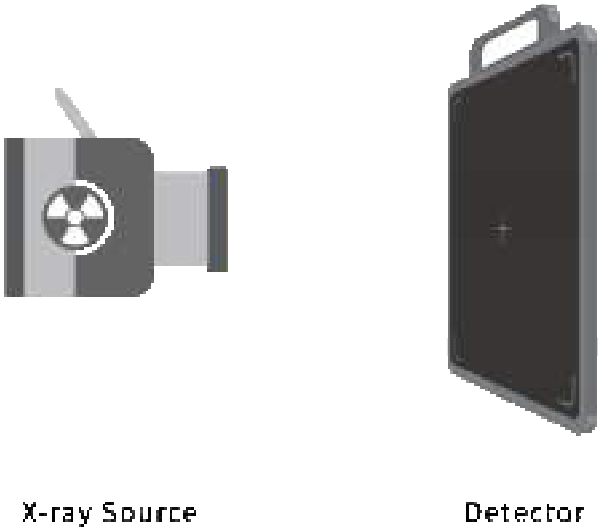


Figure 6.1. AED Mode Configuration

CAUTION

- If you use AED Mode out of operating environmental requirements, unwanted image can be acquired without x-ray image acquiring process.
- Do not hit or drop the equipment. Unwanted images can be acquired in the AED Mode if it receives a strong jolt.
- If you image a thick object in the AED Mode with low X-ray tube voltage, an image may not be acquired.
- AED performance is proportional to KV energy. Therefore, it is recommended to increase KV as much as possible and relatively decrease mA and ms.
- When you set x-ray exposure area towards the direction of the detector, the center block of the detector should be included in the X-ray exposure area. Otherwise, you may not acquire an image.
- The minimum X-ray exposure area should be wider than 4cm X 8cm on the center block of detector.

6.1.2.1. Recommendation of setting AED Sensing Area

We suggest the collimated area on detector is wider than 4cm X 8cm, and keep along the vertical direction as shown in figure 6.2 and 6.3.

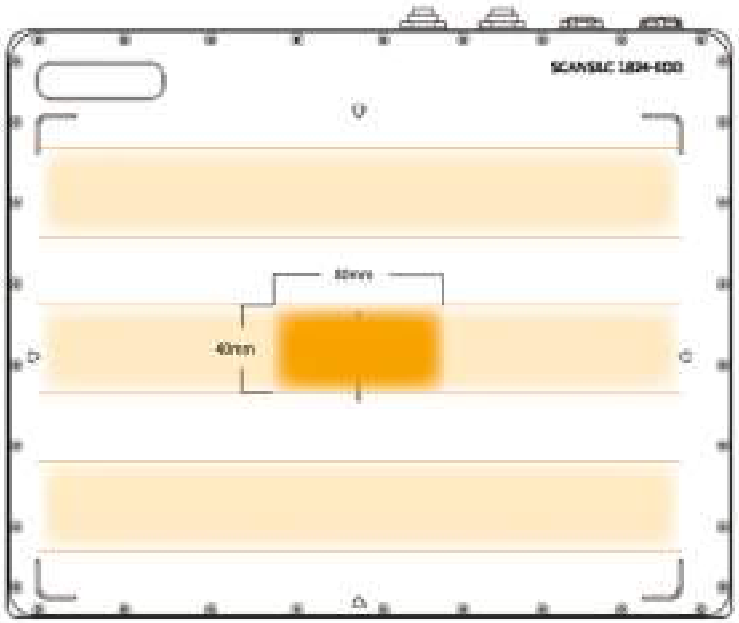


Figure 6.2 Stand Environment with AED Mode

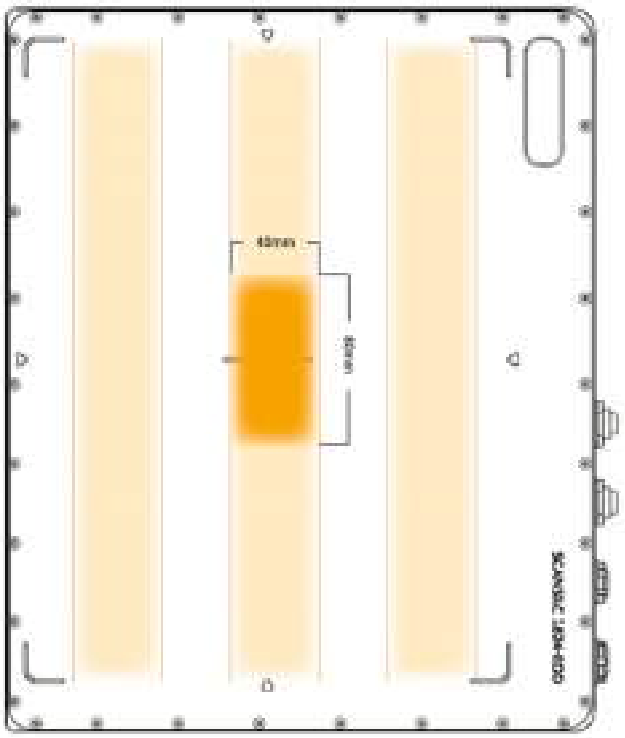


Figure 6.3. Stand Environment with AED Mode

6.1.3. S/W Trigger Mode

S/W Trigger Mode is available for acquiring images without any connection to X-ray generator. Only you should give sign from the S/W to acquire image

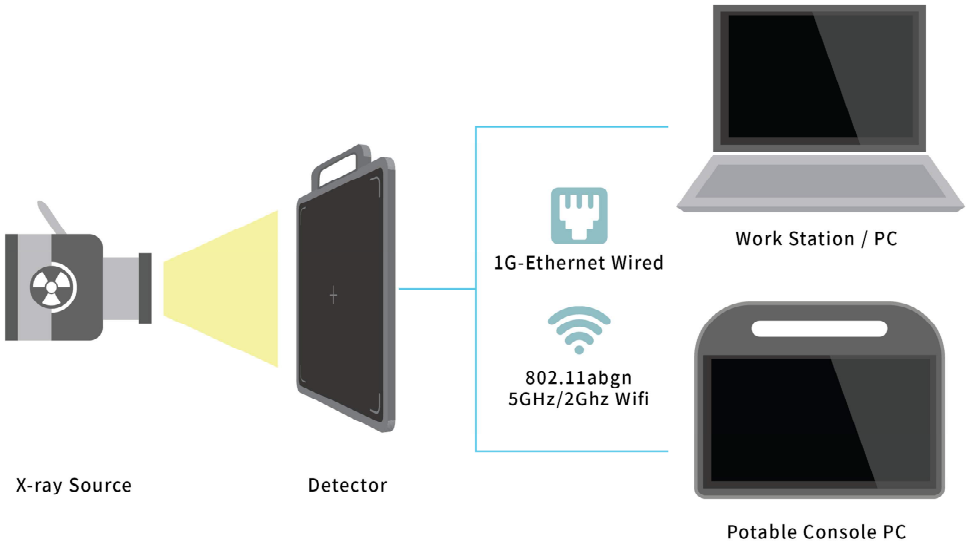


Figure 6.12. EXT 1824G S/W Trigger Mode Configuration

- The S/W Trigger mode can be used the wired or wireless network.
- PC and detector are connected by the Data(LAN) cable.
  (consistent power supplying by adaptor).
- The wired connection is used in case when faster image transmission is needed, compared to a wireless connection.
- On the S/W, you should press the Acq. Start button to give the sign for image acquisition when X-ray is shooting

6.2. Software Installation

This section gives information about how to install the software on the workstation (PC) and how to configure the environment for software operation and communication.

6.2.1. Software Classification

DRTECH provides clients who purchase our detector system with software as shown below. User can choose and use one of the software below.

Software	Description
Ecali1	A configuration and management software for the detector
SDK	Software development kit for EXT 1824G detector only, provided by DRTECH You can develop your own software dedicated to EXT 1824G by using this kit.
Document	EXT 1824G SDK Developer's Manual

6.2.2. Software Installation

- For a client who uses Ecali1, Install Ecali1 program after reading Ecali1 Operation Manual carefully.
- For a client who uses EVS SDK, Install the Setup program after reading EVS SDK Developer's Manual

CAUTION	**Be sure to install the software first with perusing the manual, before configuring Windows environment.**

6.3. Windows Environment Setting

This section gives information about configuring Windows to communicate with the detector.

The contents in this chapter are made on the basis of Windows 7.

Configuration environment can be different depending on network adaptor manufacturers or models.

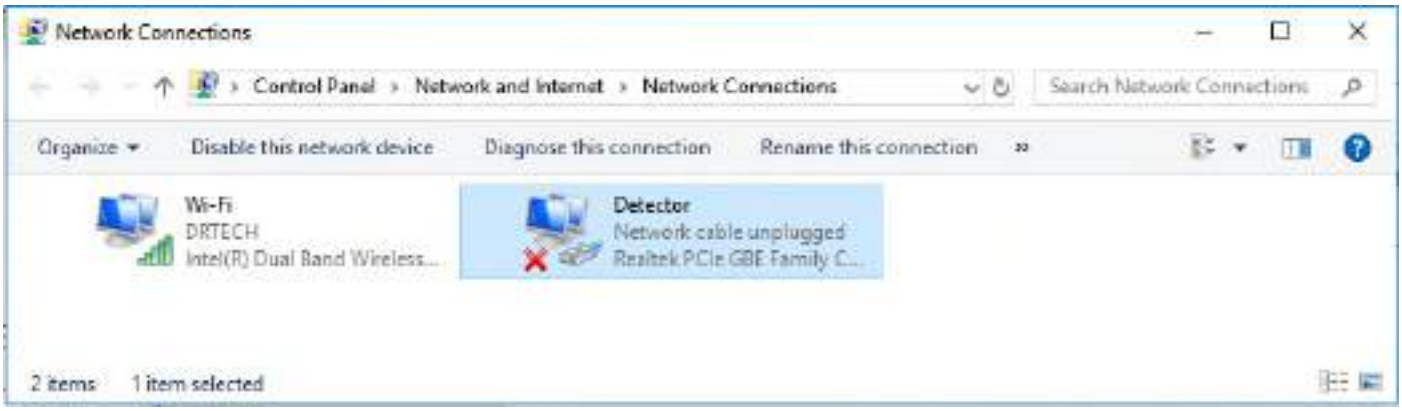
6.3.1. Network Communication

CAUTION

Communication disruption between the detector and workstation occurs unless the network adaptor is set properly. It may cause serious repercussion to the product and image quality.

➢ **Network Adaptor Selection**

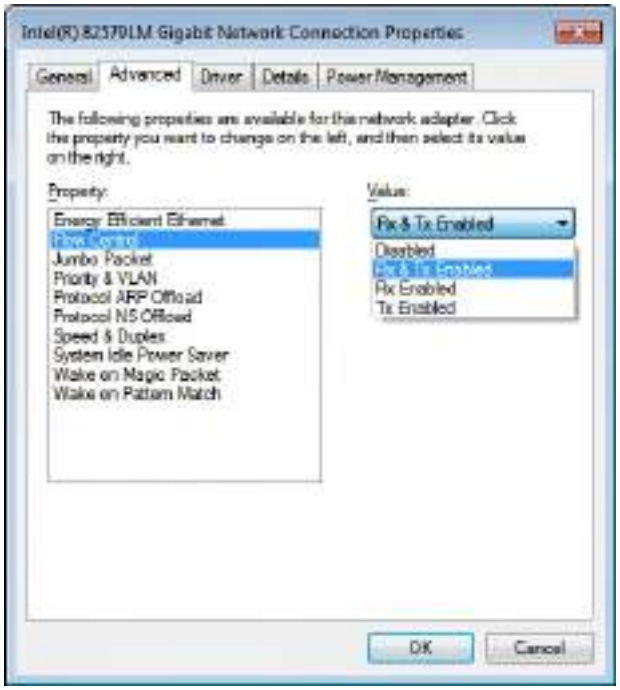
1) Click **Start → Control Panel → Network and Internet → Network and Sharing Center → Change Adapter Setting**.
2) Choose the networks adaptor for communicating with the detector and then rename it.
3) Click the chosen network adaptor with the right mouse button and click Properties to display the Properties window.



➢ **Network Adaptor Configuration**

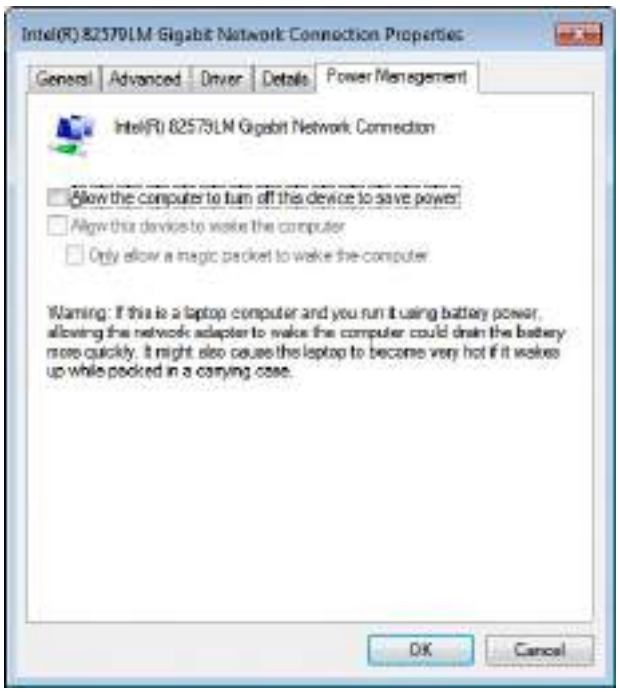
1) Click **Configure** button to open the following dialog box, and then go to the **Advanced** tab.

2) Choose **Flow Control** in the list of **Properties** and click **Value** button on the right.



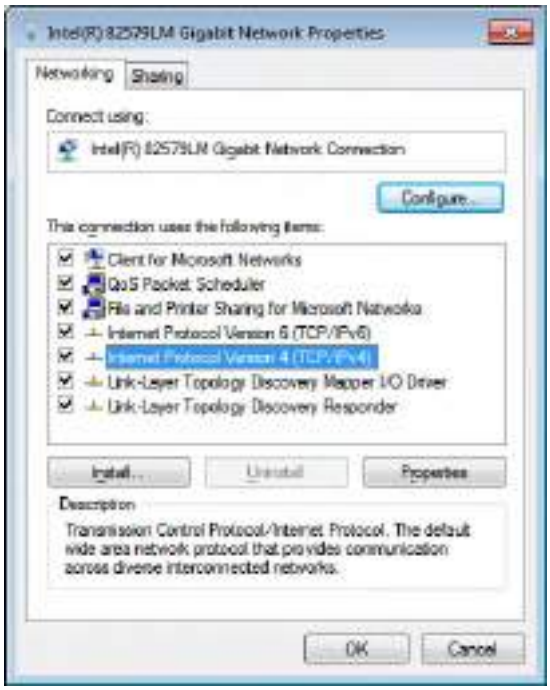
3) Power-saving Mode on Network adaptor

- Click the **Power Management** tab and check on **Allow the computer to turn off this device to save power**.
- Click **OK** button



4) Protocol selection and IP address setting

- Click Properties button after selecting **Internet Protocol Version 4 (TCP/IPv4)**.
- Input the IP address and subnet mask as shown below, and then click **OK** button.
  - **IP address: 192.168.250.100 (For wired mode)**
  - **IP address: 192.168.250.101 (For wireless mode)**

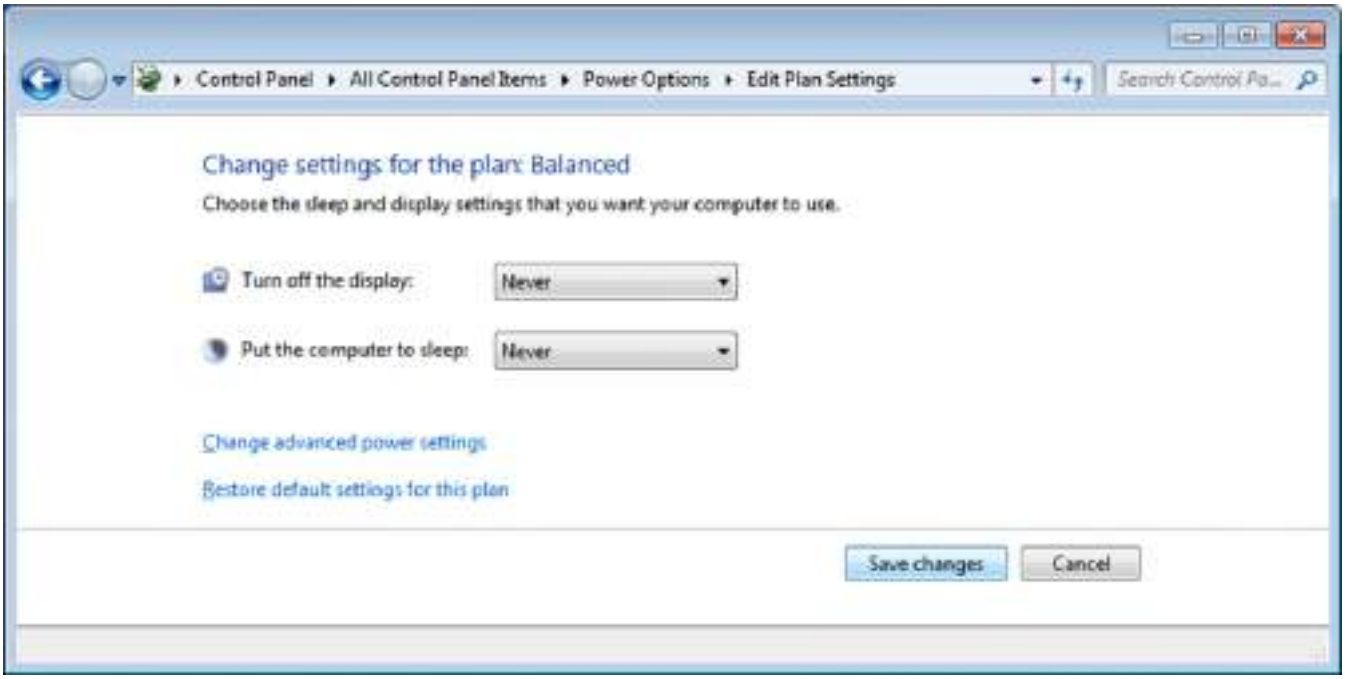


CAUTION

- It is recommended to set IP address and Subnet mask in the presented range of this document.
- If you use IP address and Subnet mask out of the presented range, it would be difficult to identify the cause or resolve in case of communication disorder.

6.3.2. Disabling Sleep Mode on Monitor

1) Click **Start** → **Control Panel** → **Power Options** and then move to the Choose **when to turn off the display** tab.
2) Set **Put the computer to sleep** to **Never** to disable the sleep mode.
3) Click **Save changes** button.



7. Device Setting

7.1. AP Setting

7.1.1. AP Configuration

Normally, AP setting does not need to be changed by user, because AP is set to match the use environment when the product is inspected for shipping.

1) Check IP address of AP

-Enter the IP address of AP, as set in ECali1 (192.168.250.98).

- Choose **Network tab** → **LAN**. IP address can be seen as stored.

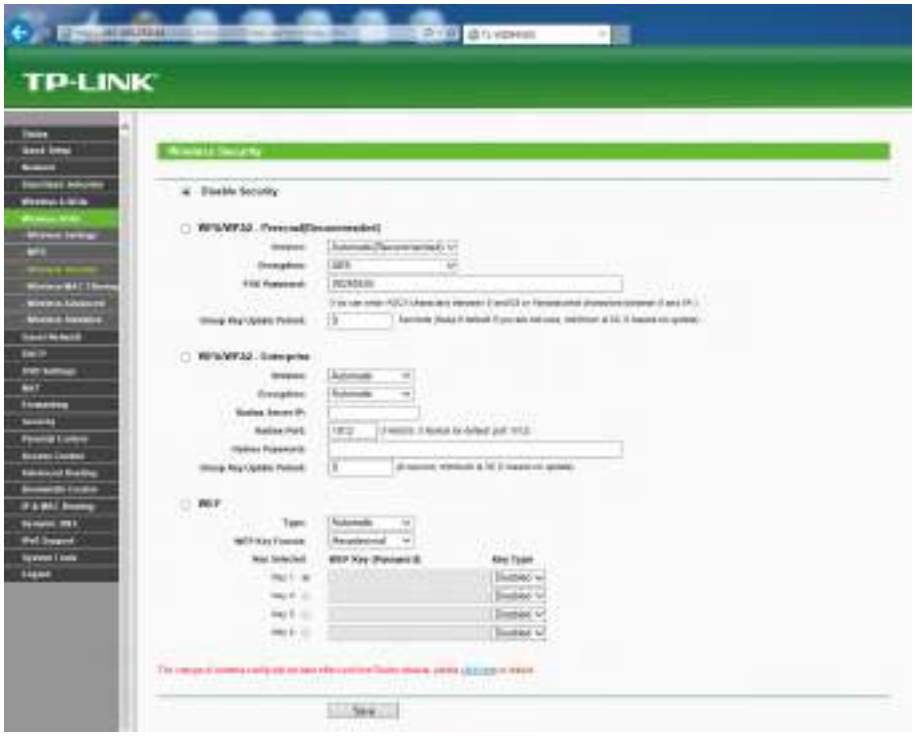
2) Setting wireless communication

-Choose **Wireless 5GHz or 2.4GHz** → **Wireless Setting**.

- Register wireless Network Name same with the detector, and select Region, Channel Width, Channel depending on the use enviroment.

3) Setting wireless communication

- Choose **Wireless 5GHz or 2.4GHz → Wireless Security**
- Choose **Disable Security** and click the **Save** button
- Detector can not be connected to AP if security is enabled.



- Default IP Address of Detector is 192.168.250.135.
- 8 numbers of channel can be used in 5GHz Frequency.
- Available channel will be limited according to country and region.
- Channel Bonding is for enhancing transmission speed. However, transmission speed may be decreased due to channel's interference, even if channel bonding has been done.
- Channel's (+/-) will be activated in case of using 40MHz Frequency bandwidth.
- The configuration whether bonding with above channel or below channel can be done.
- AP's SSID should be same as Detector's SSID, if user intends to use wireless communication.

7.2. Detecting Setting

7.2.1. Detector Configuration

For details about each parameter, refer to the **Operation Manual for ECali1**

Start up ECali1. Click **Option** → **Configuration** → **Detector** Tab.

Menu	Description
Path to save map files	Register each map file that corresponds to the product
Pre-processing	Value for pre-processing. Do not change it by yourself.
Serial number	Register the serial number of product.
Router IP	IP address of AP. The detector can not be connected to AP if router IP is changed.
Grid selection	Select type of the grid and register the path of grid filter.
Exposure mode	Choose exposure mode
Wired/Wireless	Choose communication mode
Image mode	Select image mode
Power management	Waiting time for sleep mode can be adjusted by setting parameters below. 1) Acquisition sleep time Mode is changed from acquisition mode to sleep mode, after the set waiting time. 2) Deep sleep time Mode is changed from sleep mode to deep sleep mode, after the set waiting time.
Hardware setting	AP button on detector is activated if **Enable AP Button** is checked.

➢ Image TimeOut

Set the time limit to prevent re-transmission request.

Item	Description
Time	The set waiting time for image to be transmitted.

After starting image transmission, the detector ignores received information of image transmission request, if the following conditions are all met.

- Image is being transmitted :
  No interference is allowed during transmission.
- Transmission process is not completed :
  After transmission, there is a slight waiting time for the transmission process to be finished.

➢ Deep Sleep Mode

Mode	Description
Normal	Detector can be operated and take an exposure at any time.
Sleep	Detector can be operated and take an exposure at any time within 2 seconds.
Deep Sleep	Detector can not be operated. User can take an exposure only if Deep Sleep Mode is canceled.
Power Off	Detector has been turned off. User can take an exposure after detector is rebooted.

- You can prevent unnecessary battery consumption by using the Deep Sleep function.
- When using the Deep Sleep function, be sure to check if the detector is in Deep Sleep mode before making an exposure. You cannot acquire images when the detector is in Deep Sleep mode.
- When the Deep Sleep mode is disabled, the detector needs maximum of 10seconds to wake up. It may not be available to acquire images during this time.

7.2.2. Detector Power Save Management

- **Meaning**

Mode	Description
Normal	Detector can be operated and take an exposure at any time.
Sleep	Detector can be operated and take an exposure at any time within 2 seconds.
Deep Sleep	Detector can not be operated. User can take an exposure only if Deep Sleep Mode is canceled.
Power Off	Detector has been turned off. User can take an exposure after detector is rebooted.

- **Entry Condition for Power Save Mode**

Mode	Description
Normal	-
Sleep	Activates when the detector has not been used for a certain time(Default Value is 5 min.).
Deep Sleep	Time can be set to automatically go into Deep Sleep mode, after a certain period of time passed under sleep mode(Default Value is 3 min.).
Power Off	Detector is turned off if power button on the detector is pushed

- **Escaping from Power Save Function**

Mode	Description
Normal	-
Sleep	Sleep mode is turned off within 2 sec. when user enters into the examination window or gives signal phisically such as push any button on the keyboard, shaking the mouse, etc.
Deep Sleep	Deep Sleep mode is turned off within 10 sec. when user gives signal phisically such as push any button on the keyboard, shaking the mouse, etc. Call the function for turning off Deep Sleep Mode at SDK.
Power Off	Reboot the detector with pressing power button on the detector. It takes about 60 seconds.

CAUTION

When using the Sleep function, be sure to check if the detector is in Sleep mode before making an exposure. You cannot acquire images when the detector is in Sleep mode.

When the Sleep mode is enabled, the detector needs max. 1~2 seconds to wake up. It may not be available to acquire images during this time.

8. Troubleshooting

8.1. Failed to Turn the Detector On

➢ **Symptom**

- Failed to turn on the power of the detector.

➢ **Possible Causes**

- Not installing battery pack well
- Dead battery pack
- Battery pack or Detector is broken

➢ **Solutions**

1) Install the battery pack.
2) Charge the battery pack.
3) Check the result after getting rid of the battery pack and connecting the Data(LAN) cable.
4) Replace other battery packs and check the results.
5) Replace other Detectors and check the results.
6) Replace corresponding devices.

8.2. Rapid Consumption of Battery

➢ **Symptom**

- Consumption of a fully charged battery pack is fast.

➢ **Possible Causes**

- Performance decrease caused by usage of long time.
- Usage of battery pack in low temperature environment

➢ **Solutions**

1) Replace to new battery pack if the battery pack has been used for a long time. (Battery pack is a consumable)
2) Use battery pack in normal room temperature environment. Charging capacity of battery pack in low temperature environment will decrease the capacity.

8.3. Battery Pack or Installation Part of Battery is Getting Hot

➢ Symptom

- Battery pack or compartment for installation of battery pack is getting hot.

➢ Possible Causes

- Battery pack failure
- Detector Failure

➢ Solutions

1) Do not use the battery pack
2) Consult with service engineers of DRTECH

9. Maintenance and Inspection

In order to ensure that the equipment is used safely and normally, be sure to inspect the equipment before use. If any problem is found during the inspection and cannot be corrected, please contact your sales representative or local DRTECH dealer.

➢ Daily Inspection

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

✓ Cable

1) Ensure that cables are not damaged and cable jackets are not torn.
2) Ensure that the power cord plugs are securely connected to both the equipment AC inlet and the AC outlet**.**

✓ Detector

1) Ensure that there are no loose screws or broken parts.
2) Ensure that there is no dust or foreign substance on the external connector.
3) Ensure that there are no broken parts or short-circuits in the power supply conector.

✓ After turning on the power

Be sure to start ECali1 before performing the following inspection.

1) Perform test exposure.

➢ Monthly Inspection

1) Ensure that there are no loose screws or broken parts.
2) Ensure that there is no dust or foreign substance on the external connector.

➢ Yearly Inspection

1) Perform a Performance Test or Self-diagnosis using a phantom or resolution chart, etc.

➢ Irregular Inspection

✓ Calibration

1) Perform Calibration when exposure conditions have changed significantly.
   For details, refer to the Setup Guide for ECali1.

10. Specification

10.1. Main Specifications

10.1.1. EXT 1824G Detector

[Dimensional Diagram] **(Unit mm)**

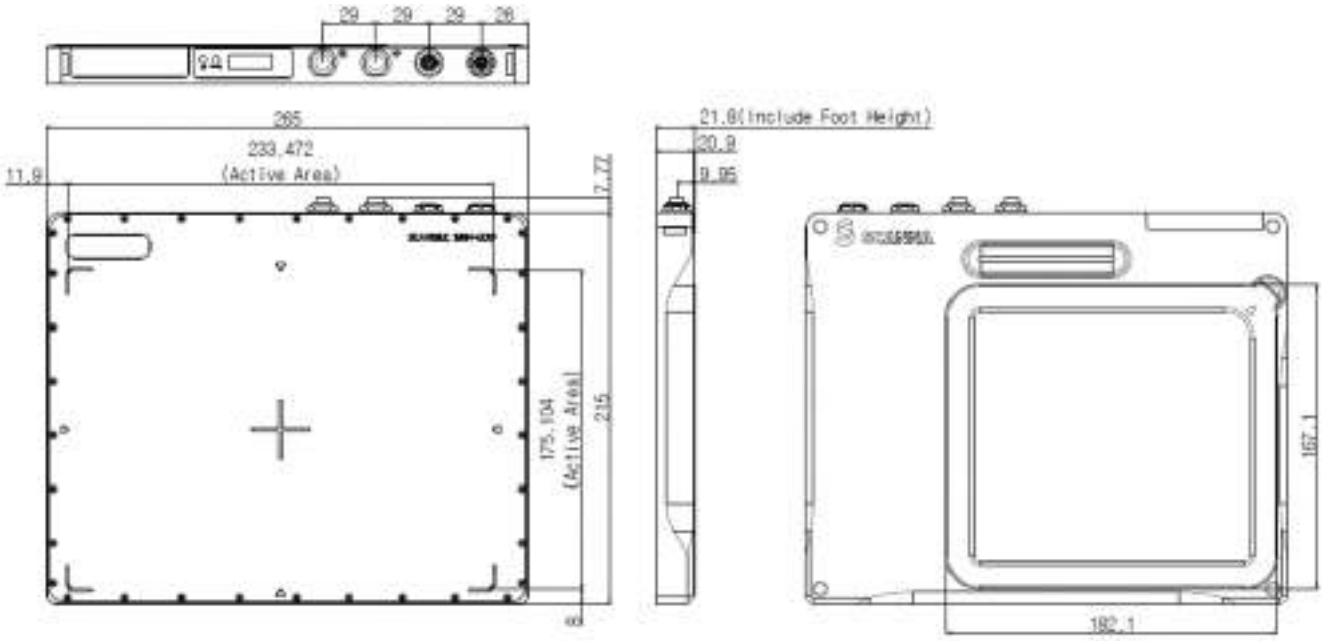


Figure 10.1 Detector Dimension

10.1.2. Battery Charger System

[Dimensional Diagram] **(Unit mm)**

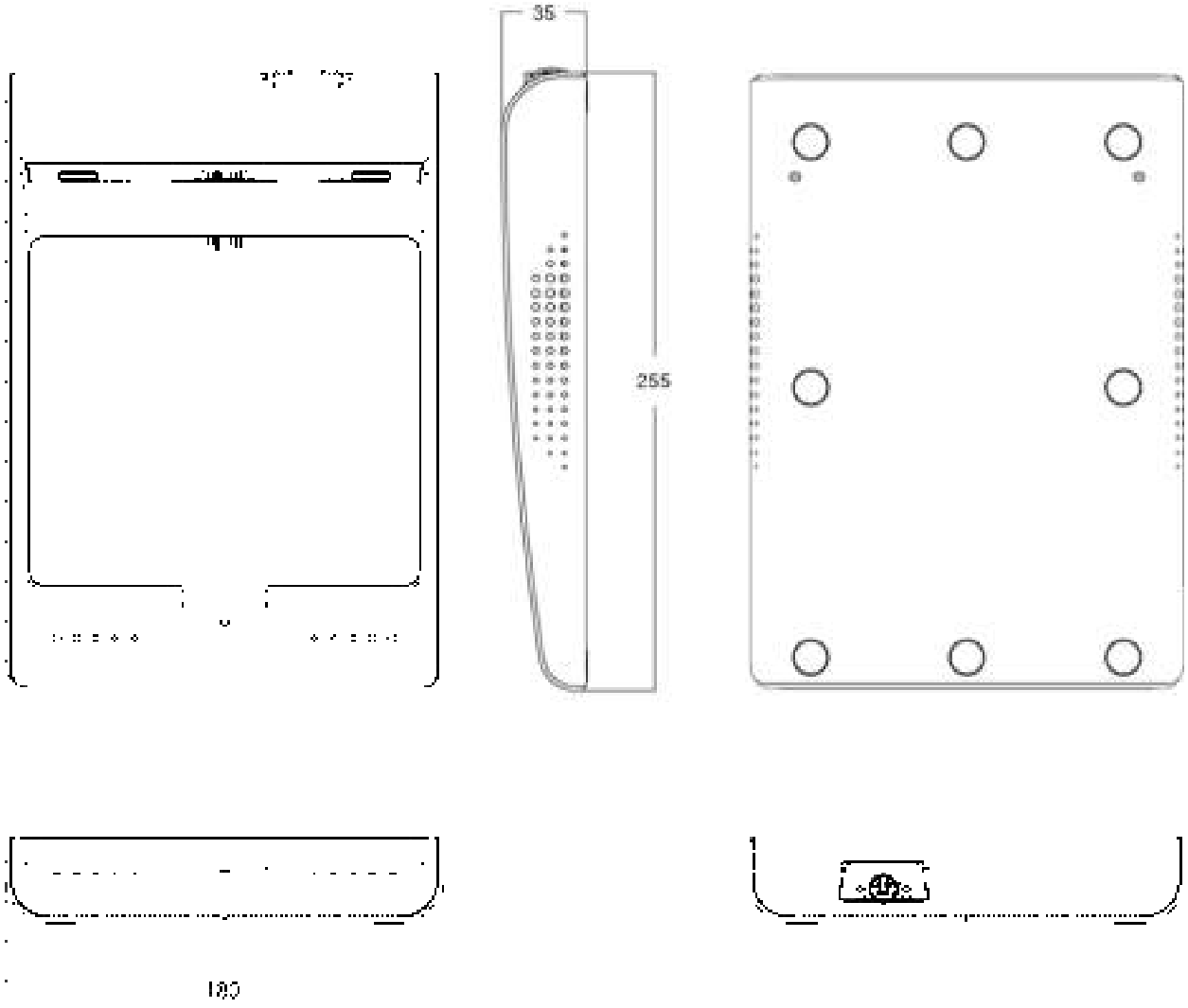


Figure 10.2 Battery Charger System Demension

10.1.3. Battery Pack

[Dimensional Diagram] **(Unit mm)**

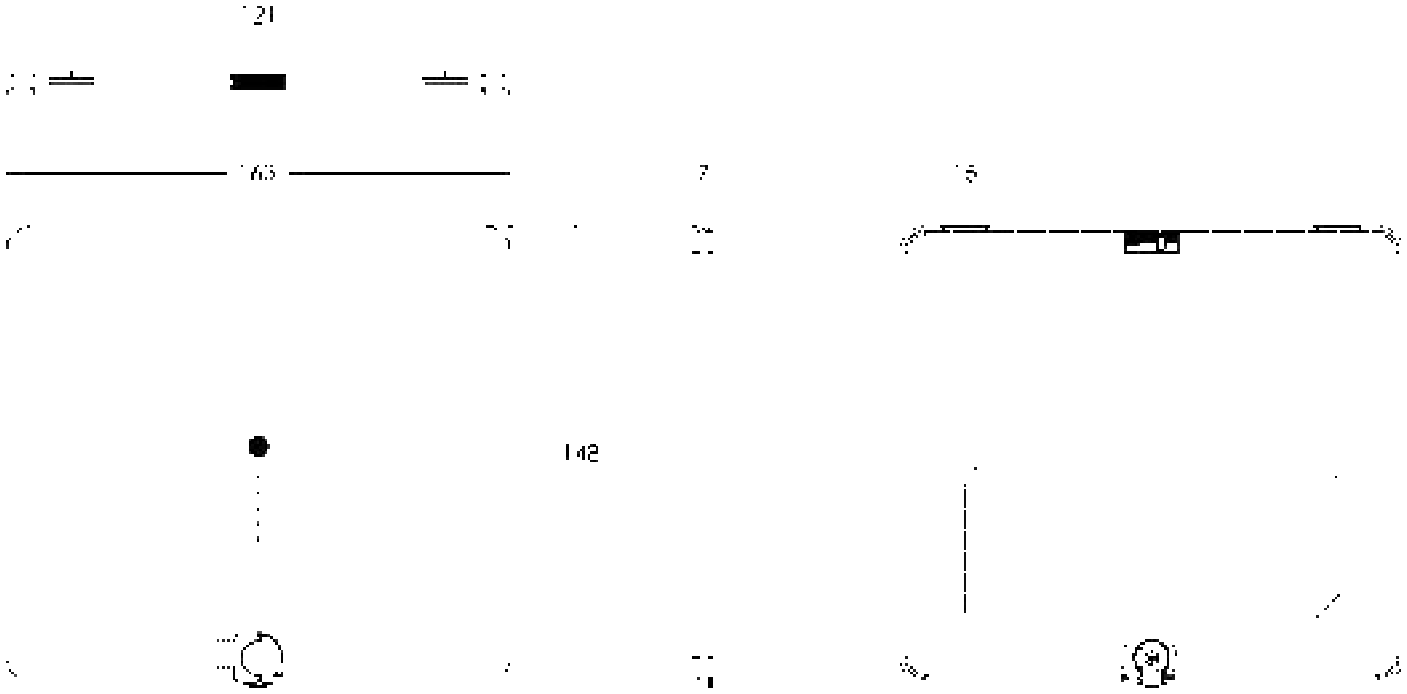


Figure 10.3 Battery Pack Demension

10.2. Packing

Note

Figures and Illustrations in this Technical Manual are provided for reference only and may differ from the actual product appearance.

10.2.1. Product Configuration List

Table 10.1. EXT 1824G (Wireless) Supply Part List (Default component)

No.	Product Name	Q'ty	Remarks
1	TFT Detector Plate	1	
2	Battery Charger	1	
3	Battery Pack	2	
4	Power Adaptor	1	
5	AC Power Cable	1	
6	Manual	1	
7	CD (Map Data and Calibration Software)	1	

Table 10.2. Optional Product List

No.	Product Name	Q'ty	Remarks
1	Tether Cable 0.45M	1	
2	EVS_Functional_Cable 5M	1	
3	DATA(LAN) Cable 1M	1	
4	DATA(LAN) Cable 10M	1	
5	DATA(LAN) Cable 25M	1	
6	DATA(LAN) Cable 100M	1	

Note

If you find any items missing from the list above upon unpacking, please contact your dealer.

10.2.2 Assemble Package

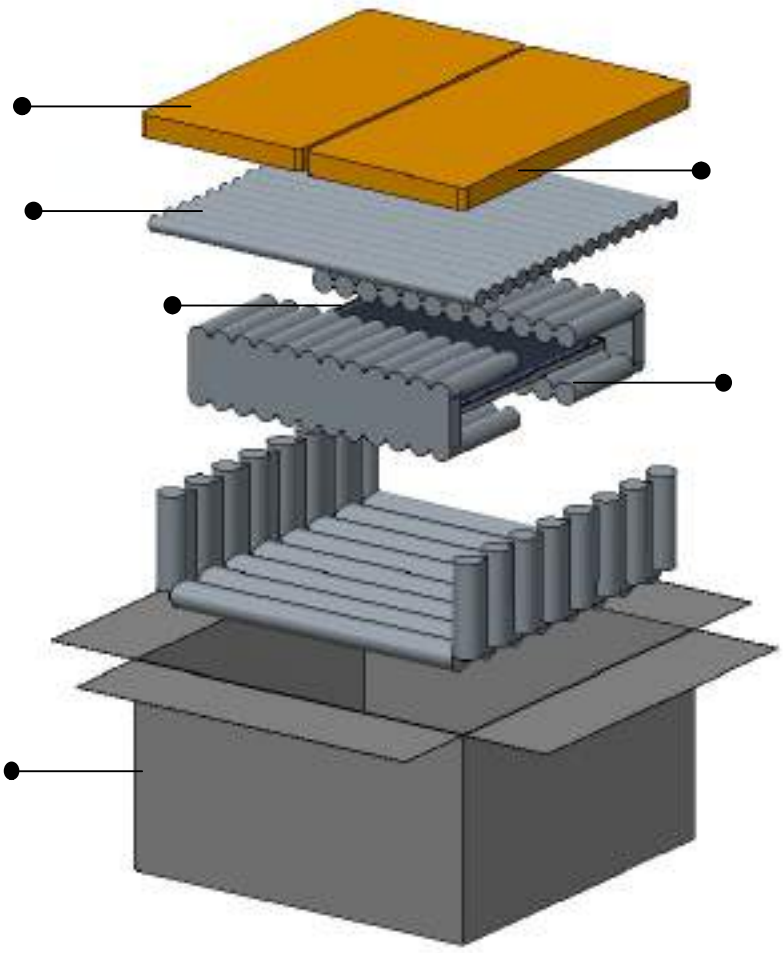


Figure 10.4. Assemble Package

WARNING	Operational issues may occur if inappropriate force is applied to the product during unboxing. Please handle the box containing the product with care.

Note

The packaging that came with the product should not be damaged or discarded as it is needed for after-sales service or for exchanging the product with a new product. If the packaging or any component is missing, the damaged product cannot be refunded or exchanged with a new product.

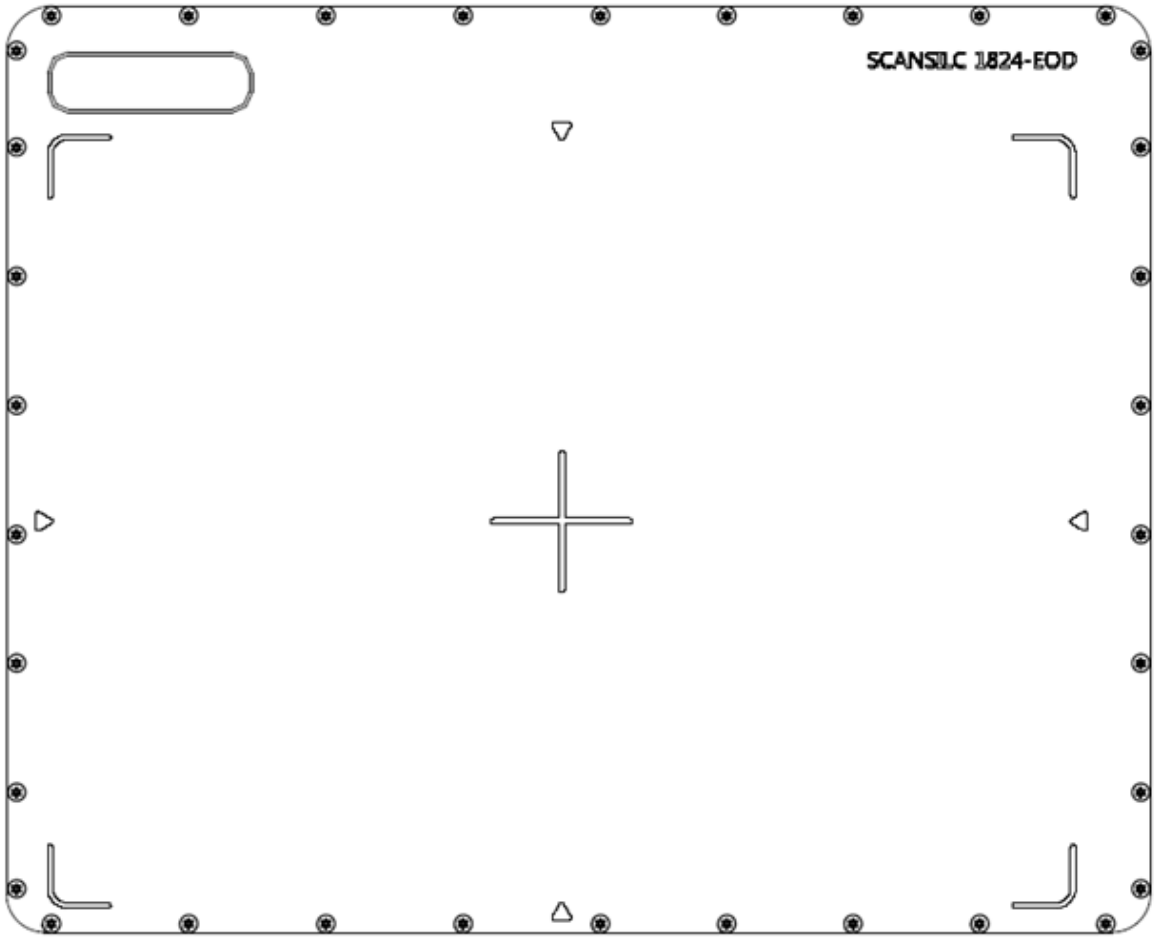
11. Regulatory Information

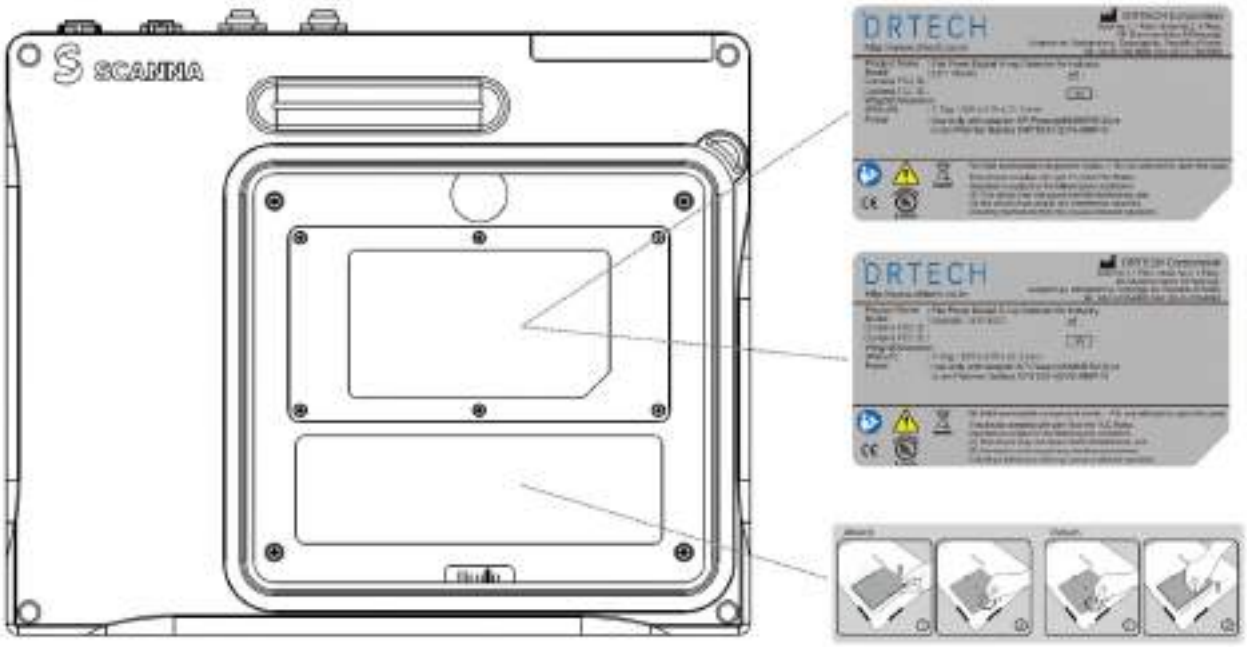
11.1. Labels and Marking on the Equipment

The EXT 1824G detector and other components have labels and markings on them.

Their contents and locations are indicated below.

11.1.1. Detector

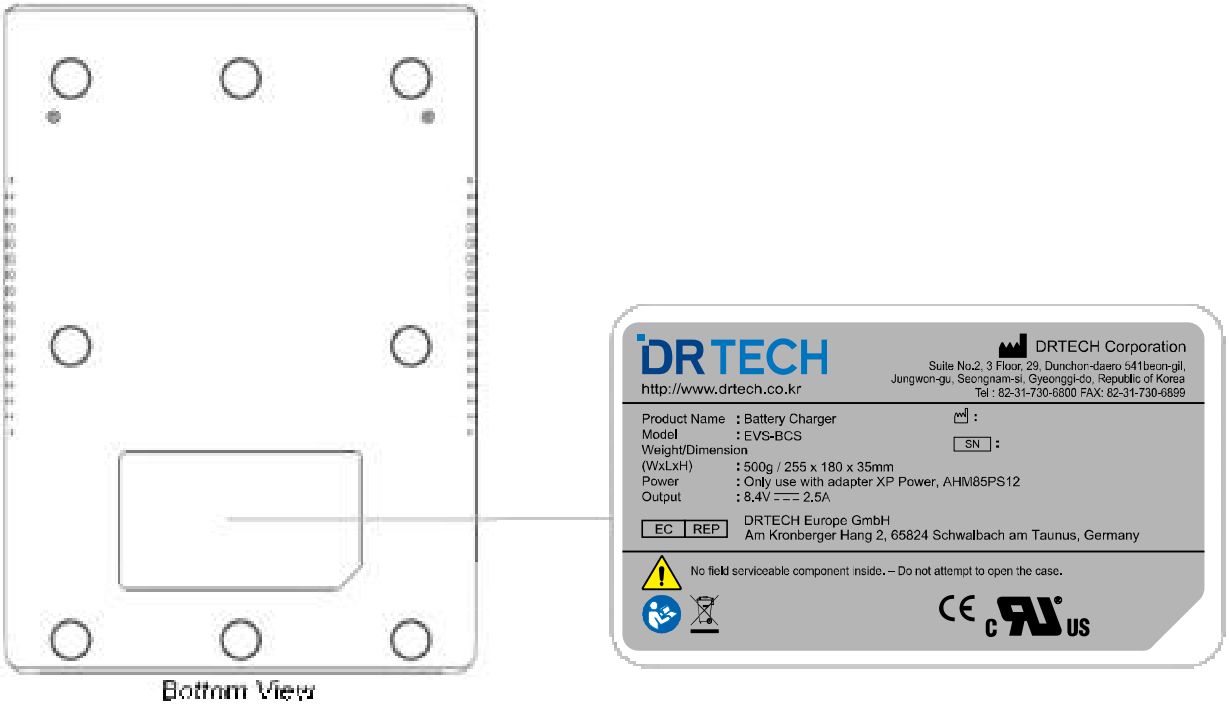




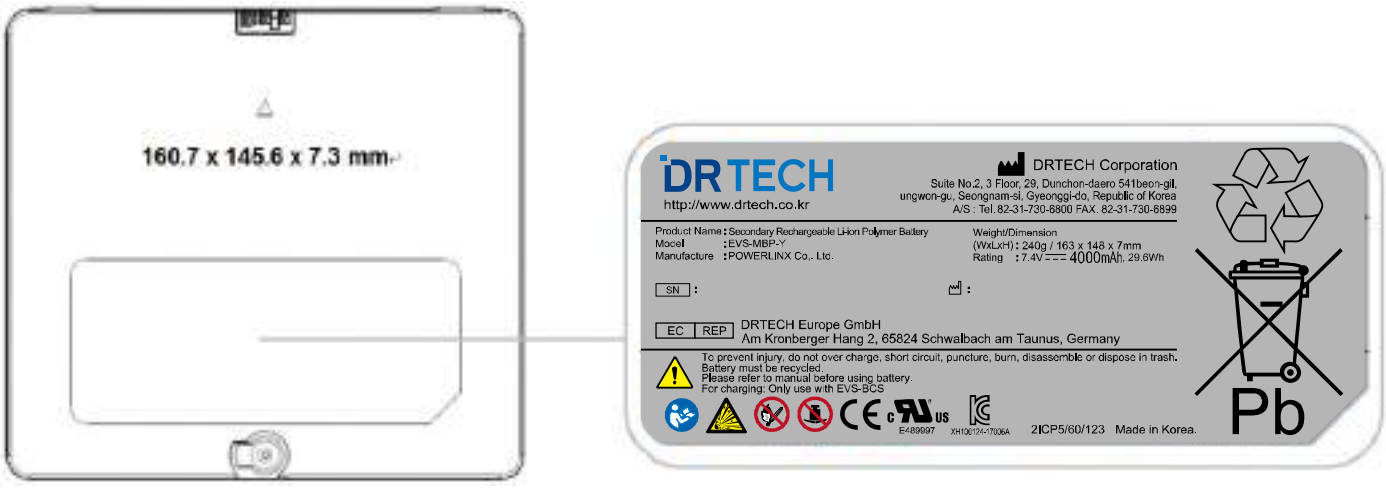
< EXT 1824G Label >

11.1.2. Battery Charger and Battery Pack

11.1.2.1. Battery Charger



11.1.2.2. Battery Pack



11.1.3. Symbol Description

	Caution : Do not jolt or apply excessive load.
	Non-ionized radiation
	The Waste Electrical and Electronic Equipment Regulations indicates separate collection for electrical and electronic equipments.
	For European Union Hereby, DRTECH Corporation, declares that this EXT 1824G Wireless is in compliance with the essential equirements and other relevant provisions of Directive 2014/30/EU, 2014/35/EU and 2014/53/EU.
MANUFACTUED	Year and Month of production
(S/N)	Serial number in six digits
	Protective Earth (Ground)
	Direct Current
	Alternating Current
	Equipotentially.
	Attention, refer to accompanying documents.
	Stand - by
	Read and understand all instructions and warning labels in the product documentation before using the equipment. Keep manual for future reference.
	Product contains specific materials that are suitable for recycling.
	Should be treated with care because if mistreated it might explode.
	Keep away from fire and flames.
	Heavy loading is prohibited.

11.2. Radio Frequency(RF) Compliance Information

For European Union (and EEA)

Hereby, DRTECH Corporation declares that the radio equipment type EXT 1824G is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:
http://DRTECH

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	

*In France, outdoor use of this equipment is prohibited.

12. Warranty

DRTECH Corporation warrants that this product will be free from defects in materials and workmanship for a period of twelve (12) months from the date of delivery. If any such product proves to be defective during this warranty period, DRTECH Corporation at its options, will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product. In order to obtain service under this warranty, customer must notify DRTECH Corporation of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by DRTECH Corporation with shipping charges prepaid. DRTECH Corporation shall pay for the return of the product to customer if the shipment is to a location within the country in which the DRTECH Corporation designated service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure, or damage caused by improper or inadequate maintenance and care. DRTECH Corporation shall not be obligated to furnish service under this warranty to repair damage resulting from attempts by personnel other than DRTECH Corporation or its representatives to install, repair, or service this product, to repair damage resulting from improper use or connection to incompatible equipment or power source; or to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

THIS WARRANTY IS GIVEN BY DRTECH Corporation WITH RESPECT TO THIS PRODUCT IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. DRTECH Corporation AND ITS VENDOR DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABLILITY OR FITNESS FOR A PARTICULAR PURPOSE. DRTECH Corporation RESPONSIBILITY TO REPAIR OR REPLACE DEFECTIVE PRODUCTS IS THE SOLE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY. DRTECH AND ITS VENDORS WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER DRTECH Corporation OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

There are no warranties which extend beyond the description mentioned in this document.

13. Statement

13.1. FCC Statement

FCC ID.	RNHEXT1824G
Model No.	EXT 1824G
Responsible Party	DRTECH NORTH AMERICA INC. 10148 International Blvd. West Chester, OH 45246-4846 +1-513-714-4900

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

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

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

WARNING

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

- **Revision History**

Revision	Date	Descriptions
00	May. 01. 2020	Initial Release
01	Aug.11.2020	Added "13. Statement"

12. Warranty

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