

User Manual

EPD Device EPD-660, EPD-662 System Solution

Wireless ePaper Display Solution

ADVANTECH

Enabling an Intelligent Planet

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Advantech warrants the original purchaser that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products that have been repaired or altered by persons other than repair personnel authorized by Advantech, or products that have been subject to misuse, abuse, accident, or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced free of charge during the warranty period. For out-of-warranty repairs, customers will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you believe your product to be defective, follow the steps outlined below.

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages displayed when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain a return merchandise authorization (RMA) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a completed Repair and Replacement Order Card, and a proof-of-purchase date (such as a photocopy of your sales receipt) into a shippable container. Products returned without a proof-of-purchase date are not eligible for warranty service.
5. Write the RMA number clearly on the outside of the package and ship the package prepaid to your dealer.

Declaration of Conformity

FCC Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

IMPORTANT NOTE

FOR MOBILE DEVICE USAGE (>20cm/low power)

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 a minimum distance of 20cm between the radiator and a user's body.

FOR COUNTRY CODE SELECTION USAGE (WLAN DEVICES)

Note: The country code selection is for non-US models only and is not available to any US models. Per FCC regulations, all Wi-Fi products marketed in the US must be fixed to US operation channels only.

LABEL OF THE END PRODUCT

Host Model Name EPD-132R2. The final end product must be labeled in a visible area with the following "FCC ID: M82-EPD-132-092". If the labeling area is larger than the palm of the hand, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of 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.

OEM Integration Instructions

This device is intended only for OEM integrators under the following conditions. The module can be used as an installation in another host. The antenna must be installed such that 20 cm of separation is maintained between the antenna and users, and the transmitter module may not be colocated with any other transmit or antenna. The module shall be only used with the integral antenna(s) that has been originally tested and certified with this module. As long as the 3 conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end products for any additional compliance requirements with this

module installed (for example, digital device emission, PC peripheral requirements, etc.)

NCC

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Technical Support and Assistance

1. Visit the Advantech website at www.advantech.com/support to obtain the latest product information.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before calling:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Packing List

Before system installation, check that the items listed below are included and in good condition. If any item does not accord with the list, contact your dealer immediately.

■ EPD-660, EPD-662 EPD device

Model Name	Part Number	Description
EPD-660	EPD-660-002	1. 13.3" B,W WiFi w/ battery 2. Type-C connector cable 100 cm (3.2 ft)
EPD-660	EPD-660-102	1. 13.3"B,W WiFi w/o battery 2. Type-C connector cable 100 cm (3.2 ft)
EPD-662	EPD-662-002	1. 13.3"R,B,W WiFi w/Battery 2. Type-C connector cable 100 cm (3.2 ft)
EPD-662	EPD-662-102	1. 13.3"R,B,W WiFi w/o battery 2. Type-C connector cable 100 cm (3.2 ft)
EPD-662	EPD-662-003	1. 13.3"RBW WiFi w/ battery w/o button and 2. Type-C connector cable 100 cm (3.2 ft)
EPD-662	EPD-662-103	1. 13.3"RBWWiFiw/obatteryw/obuttonand 2. Type-C connector cable 100 cm (3.2 ft)
EPD-662	EPD-662-004	1. 13.3"RBW WiFi w/ battery w/ button and 2. Type-C connector cable 100 cm (3.2 ft)
EPD-662	EPD-662-104	1. 13.3"RBW WiFi w/o battery w/ button and 2. Type-C connector cable 100 cm (3.2 ft)

Ordering Information

Model Name	Part Number	Description
EPD-660	EPD-660-002	13.3" B,W WiFi w/ battery
EPD-660	EPD-660-102	13.3"B,W WiFi w/o battery
EPD-662	EPD-662-002	13.3"R,B,W WiFi w/ battery
EPD-662	EPD-662-102	13.3"R,B,W WiFi w/o battery
EPD-662	EPD-662-003	13.3"RBW WiFi w/ battery w/o button
EPD-662	EPD-662-103	13.3"RBW WiFi w/o battery w/o button
EPD-662	EPD-662-004	13.3"RBW WiFi w/ battery w/ button
EPD-662	EPD-662-104	13.3"RBW WiFi w/o battery w/ button

Safety Instructions

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Disconnect the equipment from all power outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.
5. Protect the equipment from humidity.
6. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. Do not cover the openings.
8. Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet.
9. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage from transient overvoltage.
12. Never pour liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If any of the following occurs, have the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated the equipment.
 - The equipment has been exposed to moisture.
 - The equipment is malfunctioning, or does not operate according to the user manual.
 - The equipment has been dropped and damaged.
 - The equipment shows obvious signs of breakage.
15. **CAUTION:** Batteries are at risk of exploding if incorrectly replaced. Replace only with the same or equivalent type as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
16. This product is intended to be supplied by a UL listed (Certificate) power supply, output rated 5Vdc or Power over Ethernet (PoE) complied with IEEE802.3at (af,

bt), 2A minimum, Tma 50 degree C minimum and altitude 2000m, if need further assistance, please contact manufacture or UL File owner or brand owner further information.

17. CAUTION:

– Battery:

Replacement of a **battery** with an incorrect type that can defeat a **safeguard** (for example, in the case of some lithium **battery** types).

Disposal of a **battery** into fire or a hot oven, or mechanically crushing or cutting of a **battery**, that can result in an **explosion**.

Leaving a **battery** in an extremely high temperature surrounding environment that can result in an **explosion** or the leakage of flammable liquid or gas.

A **battery** subjected to extremely low air pressure that may result in an **explosion** or the leakage of flammable liquid or gas.

– Ground Pin:

The equipment power supply cord shall be connected to a socket-outlet with earthing connection.

DISCLAIMER: These instructions are provided according to IEC 704-1 standards. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Consignes de Sécurité

1. Lisez attentivement ces instructions de sécurité.
2. Conservez ce manuel de l'utilisateur pour référence ultérieure.
3. Débranchez cet appareil de toute prise secteur avant le nettoyage Utilisez un chiffon humide. N'utilisez pas de détergents liquides ni en spray pour le nettoyage
4. Pour les équipements enfichables, la prise de courant doit être située à proximité de l'équipement et doit être facilement accessible.
5. Gardez cet équipement à l'abri de l'humidité.
6. Placez cet équipement sur une surface fiable lors de son installation
7. Les ouvertures de l'enceinte sont destinées à la convection de l'air. Protégez le matériel contre la surchauffe. NE COUVREZ PAS LES OUVERTURES.
8. Assurez-vous que la tension de la source d'alimentation est correcte avant de connecter l'équipement à la prise de courant.
9. Placez le cordon d'alimentation de sorte que personne ne puisse marcher dessus. Ne placez aucun objet sur le cordon
10. Toutes les mises en garde et avertissements sur l'équipement doivent être notés
11. Si l'équipement n'est pas utilisé pendant une longue période, débranchez-le de la source d'alimentation pour éviter tout dommage d? à une surtension transitoire
12. Ne jamais verser de liquide dans une ouverture sous peine de provoquer un incendie ou un choc électrique
13. Ne jamais ouvrir l'appareil. Pour des raisons de sécurité, cet équipement ne doit être ouvert que par du personnel qualifié
14. Si l'une des situations suivantes se produit, faites vérifier l'équipement par le personnel de service:
 - Le cordon d'alimentation ou la fiche est endommagé.
 - Un liquide a pénétré dans l'appareil.
 - L'équipement a été exposé à l'humidité.

-
- L'équipement ne fonctionne pas bien ou vous ne pouvez pas le faire fonctionner conformément au manuel d'utilisation.
 - Equipement L'équipement est tombé et a été endommagé.
 - Equipement L'équipement présente des signes évidents de rupture.
15. ATTENTION: RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACÉE DE MANIÈRE INCORRECTE. Remplacer uniquement avec un modèle recommandé par le fabricant, et éliminer les piles usagées selon les instructions du fabricant.
16. Ce produit est destiné à être alimenté par une alimentation électrique répertoriée UL (certificat), sortie nominale 5Vdc, 2A minimum (pour l'unité sans batterie) ou 3A minimum (pour l'unité avec batterie), T_{ma} 50 degrés C minimum et altitude 2000m, si besoin Pour obtenir de l'aide, veuillez contacter le fabricant ou le propriétaire du fichier UL ou le propriétaire de la marque pour plus d'informations.
17. ATTENTION:
- Batterie:
Remplacement d'une batterie par un type incorrect qui peut annuler une protection (par exemple, dans le cas de certains types de batteries au lithium). Jeter une batterie dans le feu ou dans un four chaud, ou écraser ou couper mécaniquement une batterie, ce qui peut entraîner une explosion. Laisser une batterie dans un environnement à température extrêmement élevée pouvant entraîner une explosion ou une fuite de liquide ou de gaz inflammable.
Une batterie soumise à une pression d'air extrêmement faible pouvant entraîner une explosion ou la fuite de liquide ou de gaz inflammable.
 - Broche de terre:
Le cordon d'alimentation de l'équipement doit être connecté à une prise de courant avec mise à la terre.

AVERTISSEMENT: Cet ensemble d'instructions est donné conformément à la norme CEI 704-1. Advantech décline toute responsabilité quant à l'exactitude des déclarations contenues dans le.

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Chapter 1

Introduction

1.1 Introduction

Advantech EPD-660 and EPD-662 ePaper solutions support the 2.4 GHz RF wireless protocol integrated with 13.3" display ePaper and ARM Cortex-M4 processors. EPD-660 and EPD-662 support optimized power consumption, device management, optimal battery life and a 2.4 GHz Wi-Fi solution which adapts to a diverse set of applications. This solution applies multiple buttons with indicators to fit different application controls. The solution is also integrated with our RESTful API for DeviceOn/ePaper, making it easy for devices to be configured and join the network via Wi-Fi/ BLE. Data can be quickly and accurately acquired and exchanged between servers and end devices. All device activities can be controlled by DeviceOn/ePaper. End users are able to focus on application development and system management by applying Advantech EPD-660.662 system integration.

The main features of the EPD-660 and EPD-662 are:

- Arm Cortex-M4 core processor
- Supports IEEE 802.11b/g/n
- 13.3" ePaper panel display: EPD-662 for red/black/white, EPD-660 for black/white (16 gray levels)
- Multiple Control I/O: 5 x buttons and 2 x color LEDs
- Supports operation temperatures of 0°C ~ 40°C (red/black/white), 0°C ~ 50°C (black/white without a battery)
- High-performance integrated system
- Supports over-the-air upgrades (OTA)
- Solutions with WISE-3220 Wi-Fi AP & ARK DeviceOn/ePaper server

1.2 Specifications

Table 1.1: Specifications		
ePaper Display	Screen Size	285.8 mm x 213.65 mm
	Resolution	1600 x 1200 pixels
	Color	16 gray levels or red/black/white
Wireless Network	Standard	IEEE 802.11b/g/n
	Frequency Band	2.4000-2.4840 GHz for Wi-Fi
System I/O	Function Button	SW Reset/Wake-up/HW Reset
	Page Button	P1: Next page P2: Previous page P3: 13th page for alarm P4: 14th page for system information
	LED	Red: system alarm, abnormal battery status Green: data transmit, battery starts charging, button wake up
Power	DC-in	Power package specification: 8233 mAh / 5 V Li battery capacity: 13620 mAh / 3.6 V (warranty 1 year) Charged at 10°C ~ 45°C & Discharged at -20°C ~ 60°C

Table 1.1: Specifications		
Environment	Operational Temperature	0 ~ 40°C; 32 ~ 104°F (w/ battery, w/ button) 0 ~ 40°C; 32 ~ 104°F (w/o battery, black, white, red, w/ button) 0 ~ 50°C; 32 ~ 122°F (w/o battery, 16 gray, w/ button) 0 ~ 40°C; 32 ~ 104°F (w/ battery, black, white, red, w/o button) 0 ~ 40°C; 32 ~ 104°F (w/o battery, black, white, red, w/o button)
	Non-Operational Temp.	-10 ~ 50°C; 14 ~ 122°F (w/ battery, w/ button) -10 ~ 60°C; 14 ~ 144°F (w/o battery, black, white, red, w/ button) -10 ~ 60°C; 14 ~ 144°F (w/o battery, 16 gray, w/ button) -10 ~ 50°C; 14 ~ 122°F (w/ battery, black, white, red, w/o button) -10 ~ 50°C; 14 ~ 122°F (w/o battery, black, white, red, w/o button)
	Operating Humidity	5 ~ 80% relative humidity, non-condensing
Housing Mechanical (Preliminary)	Material Type	Button version with plastic housing Non-button version with plastic housing
	Dimension	235 x 328 x 23 mm
	Weight	Approximately 1.2 kg with battery and 0.9kg without battery

Note! The channel frequency selection can be supported with an upgraded plan.



EPD Data Report and Wakeup behavior duration can be adjusted for different scenarios from RESTful APIs.

System bundles and wireless modules need RED compliance.

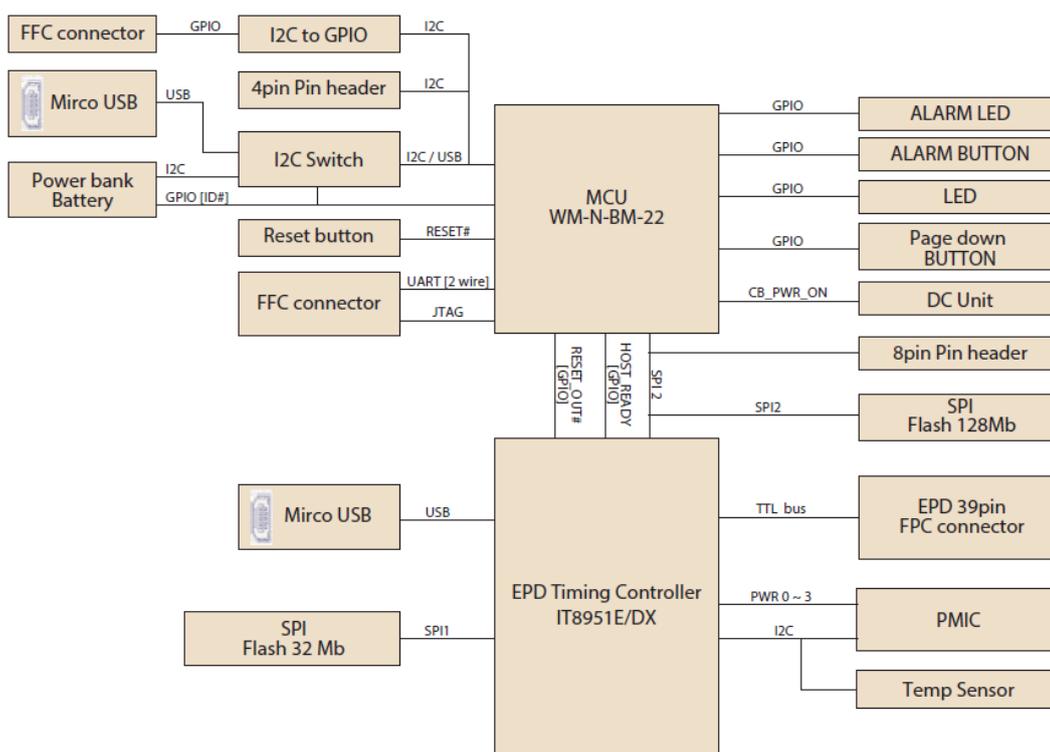


Figure 1.1 Block Diagram

1.3 System Structure

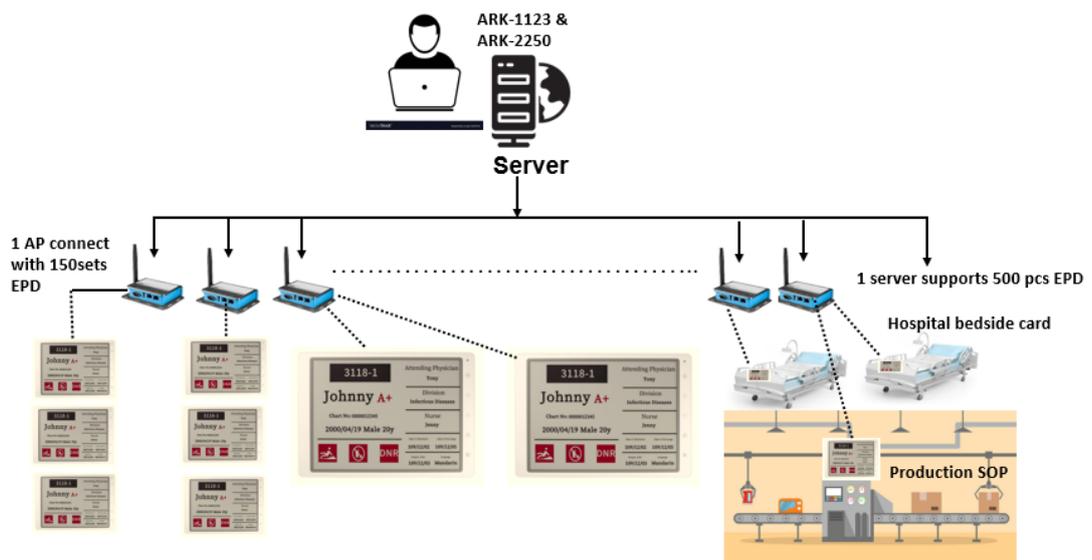


Figure 1.2 EPD-660 EPD-662 Network Topology

1.3.1 Advantech EPD-660.662 Solution Structure

The EPD-660.662 ePaper device can be adapted to different applications and the system integrator enables the RESTful API to establish the end user's required scenario. The wireless EPD System consists of an DeviceOn/ePaper, router and the EPD device.

- The DeviceOn/ePaper provides Web GUI to manage the wireless EPD device.
- The embedded computers are responsible for communication between DeviceOn/ePaper and EPD device.
- The EPD device consists of an ePaper display panel, EPD controller, and wireless connectivity.

Advantech provides a total solution for additional needs of the end user and helps them select different system architectures in accordance with their requirements.

The following system architecture is for EPD-660 and EPD-662 at the end node of the system. Developers are able to apply Advantech WISE-3220 as a Wi-Fi AP to connect to DeviceOn/ePaper installed on the Advantech embedded computer (EPD server). There are multiple-function RESTful APIs available on DeviceOn/ePaper for developers' integration in vertical market applications - for instance, smart warehouse, smart factory, hospital, transportation, retail and more.

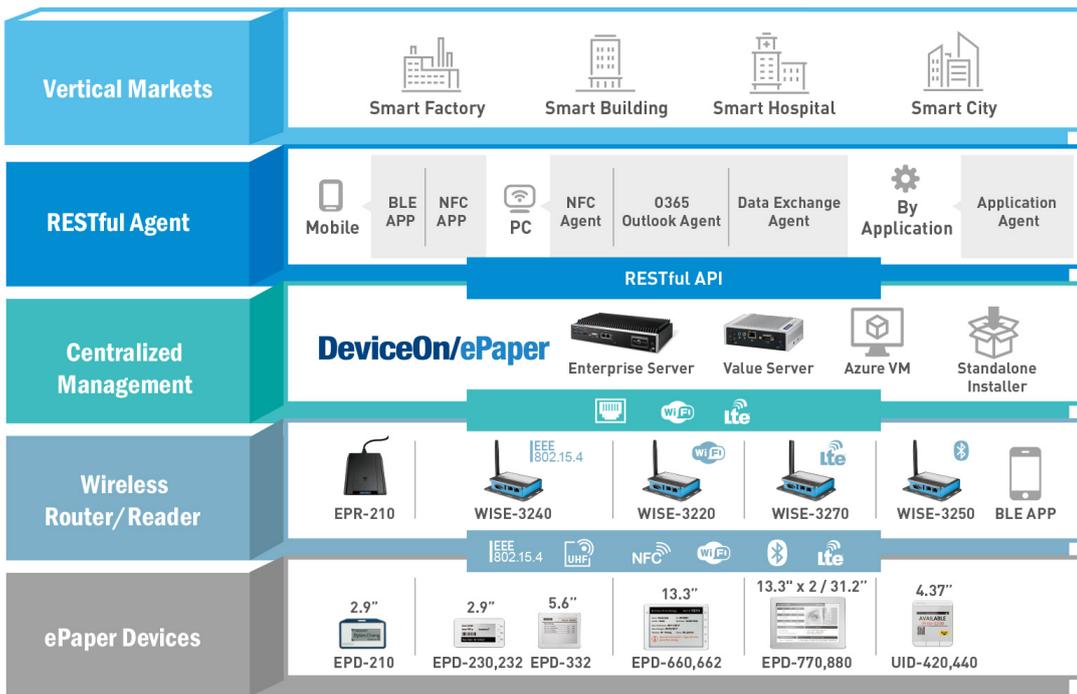


Figure 1.3 EPD-660 EPD-662 Solution Architecture

Chapter 2

EPD Hardware
Specification

2.1 Hardware Specification

EPD-660 and EPD-662 are directly designed for end users to mount on the wall. EPD-660 and EPD-662 devices include an ePaper display panel, control board, housing, battery, and an optional mounting bracket.

2.1.1 ePaper Display Panel

- Panel Size: 285.8 x 213.65 mm
- Panel PN:
 1. 968AD00388 Operation temperature range: 0°C to 50°C for Black and White.
 2. 968DD00200 Operation temperature range: 0°C to 40°C for Red, Black and White.
- Panel inspection criteria refers to E Ink CAS & Inspection standard document.

Note! *E Ink Recommend condition for storage:*



- *Temperature: 20 +/- 10°C.*
- *Humidity: 60% RH +/- 10%RH, non-condensing.*
- *The following diagram demonstrates how to mount EPD-660 on the wall, and the components required.*

2.1.2 Lithium-Ion Battery Pack

- **Optimal method of charging the battery:**
 1. We suggest to STOP charging the battery after you see the battery 90% ICON. Charging the battery after it has fully charged will damage the battery.
 2. We suggest that battery must be recharged if you see 20% or lower, low power ICON on the EPD device to avoid power-drain and damaging the battery.
- **SW mechanism to alarm low power:**
 1. When a 20% low battery ICON displays, the EPD device will not allow OTA connection.
 2. When the battery is under 3%, the EPD device is forced to shut down and won't wake up in order to avoid over power consumption.

Note! *When customers first receive a sample, the battery will be fully charged (100%). **DO NOT CHARGE** the battery at this time. We suggest customers use the sample for a while and charge the battery when it is well below 50% (See # 1 above).*

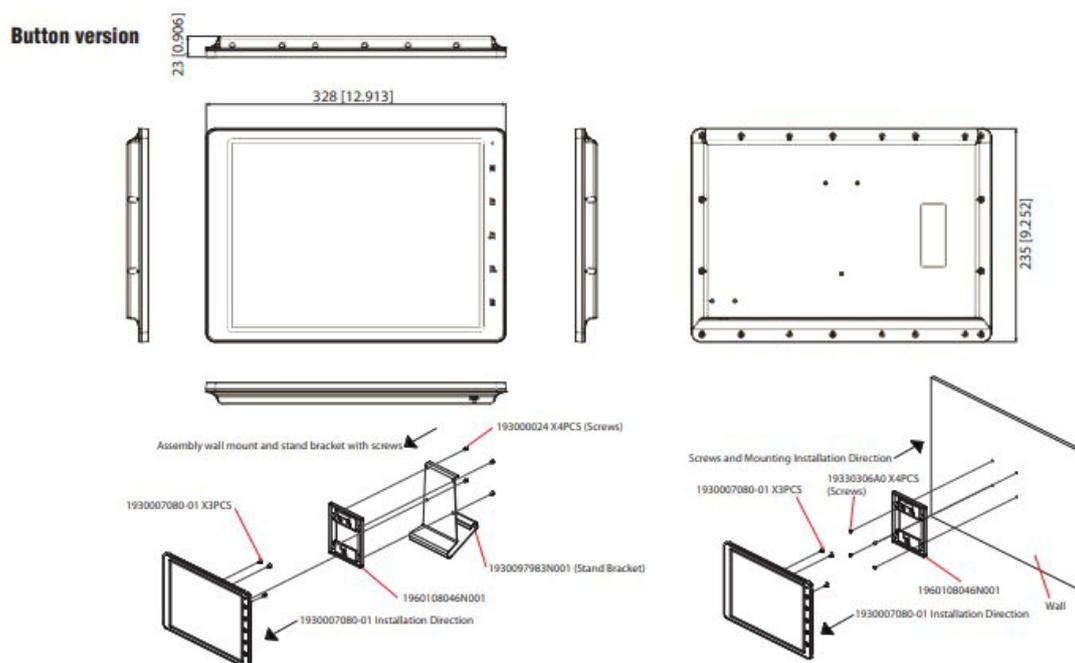


2.2 ID Dimension (with Mounting Bracket)

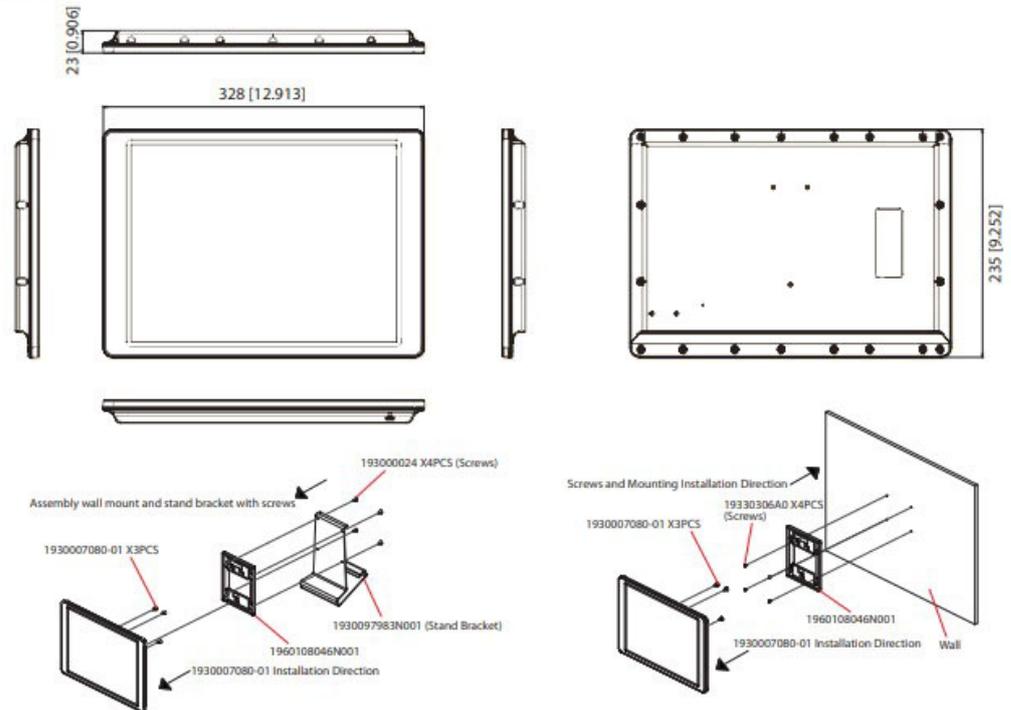
2.2.1 2.2.1 ID for with/without Button Version

Table 2.1: ID for with/without Button Version

*Part Number	*Description
1960097983N001	ID STAND white EPD-660
1960108046N001	ID Mount Bracket for DS-662 Liquid WHITE
1930001024	Screw M 4*8 L R/S D=8.9 H=2.5 + ST Ni NK
1930007080-01	Screw M 3x10 L F/S D=10 H=1 2+ ST Ni TGM3-10
19330306A0	Screw M 3*6 L 1/4R/S D=6.9 H=1.9 (2+) ST Ni NK



Non-button version



2.3 LED Indicator & Button Behavior

2.3.1 EPD-660, EPD-662 Device Button Behavior and LED

Table 2.2: General Mode (Button Version)

Button	Action 1	Function 1	Action 2	Function 2
1	Press	Wake up device Report button event		
2	Press	Next Page with image Report button event	Press for 3s	Last page with image (it doesn't include P13 and P14) Report button event
3	Press	Previous Page with image Report button event	Press for 3s	First page with image Report button event
4	Press	Show Page 13 (Alarm page) Report button event	Press for 8s	Clean sticking image
5	Press	Show Page 14 (System information) Report button event		
Multiple	Button 2 + Button 3	Reset Device Report button event		

Table 2.3: General Mode (Non-Button Version)

Button	Action 1	Device Connection	Action 2	Function 2
Reboot button at device back	Wakeup Device Report button event	Follow 5.2 step to check the device location		

Table 2.4: Carousel Mode (Button Version)

Button	Action 1	Function 1	Action 2	Function 2
1	Press	Wake up the device		
2	Press	Next page and stop carousel for 60s	Press for 3s	Last page with image (it doesn't include P13 and P14) Report button event"
3	Press	Next page and stop carousel for 60s	Press for 3s	First page with image Report button event"
4	Press	Show P13 and stop carousel for 60s	Press for 8s	Clean sticking image
5	Press	Show P14 and stop carousel for 60s		
Multiple	Button 2 + Button 3	Reset Device Report button event		

2.3.2 EPD-660, EPD-662 LED Indicator Behavior

Table 2.5: EPD-660, EPD-662 LED Indicator Behavior

EPD-660, EPD-662	Green LED	Red LED
Flash	Data transmission	Battery status is abnormal
Brighten	Brighten for 60 seconds, when press button and device wake up. Brighten for 60 seconds, when device starts charging	Always brighten, when device receive API for system alarm. LED will be turned off by pressing button 2.3.4.5.

2.3.3 Pages 13/14 Information Page

The EPD-660 and EPD-662 have a total of 14 information pages on the display panel. The last two pages (13/14) are used to convey information to end users. Page 13 is for alarms and page 14 is for system information. Page 13 shows alarm information and the corresponding buttons. (E.g. press buttons 1 ~ 5 to confirm). Page 14 is an automatic delivery page from the EPD server. DeviceOn/ePaper will show the latest system information including battery status, IP, empty pages, carousel settings, and the last time of update. A new system information update must be initiated by the end user to transmit the data to the device. Otherwise, it will only show the last update to the system information page.

Table 2.6: Pages 13/14 Information Page

Page 13	Alarm Page (customer defined)
Page 14	System Information (refer to figure 2.3.3.1)

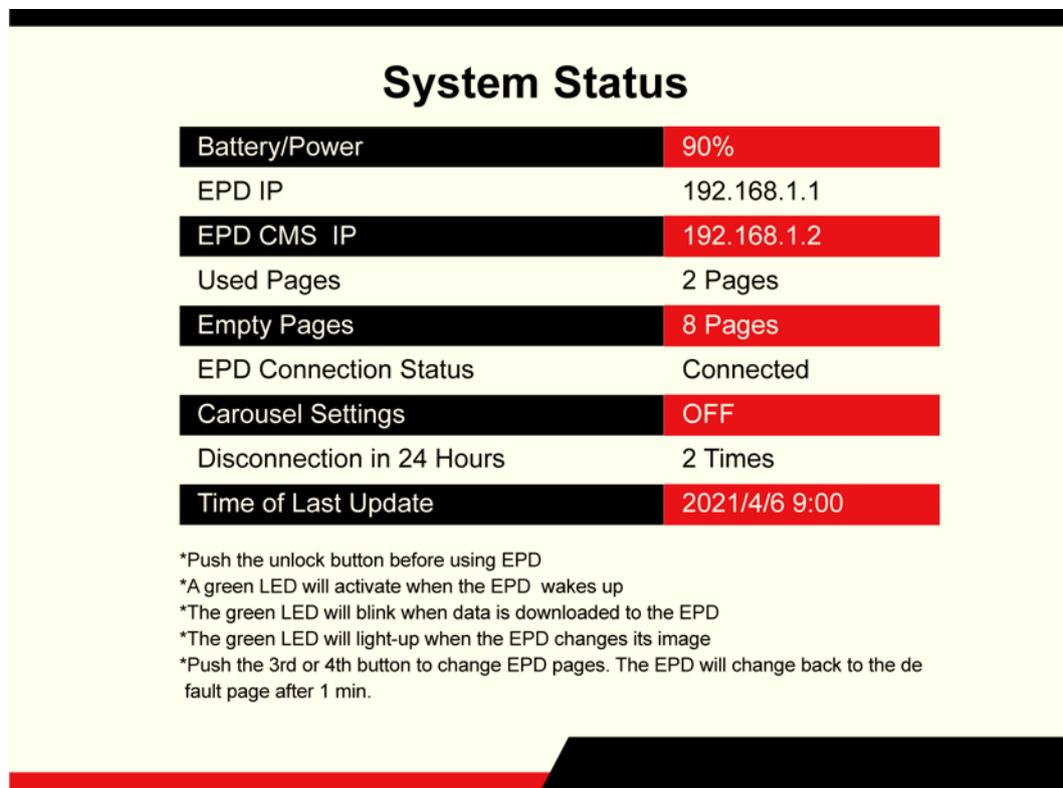
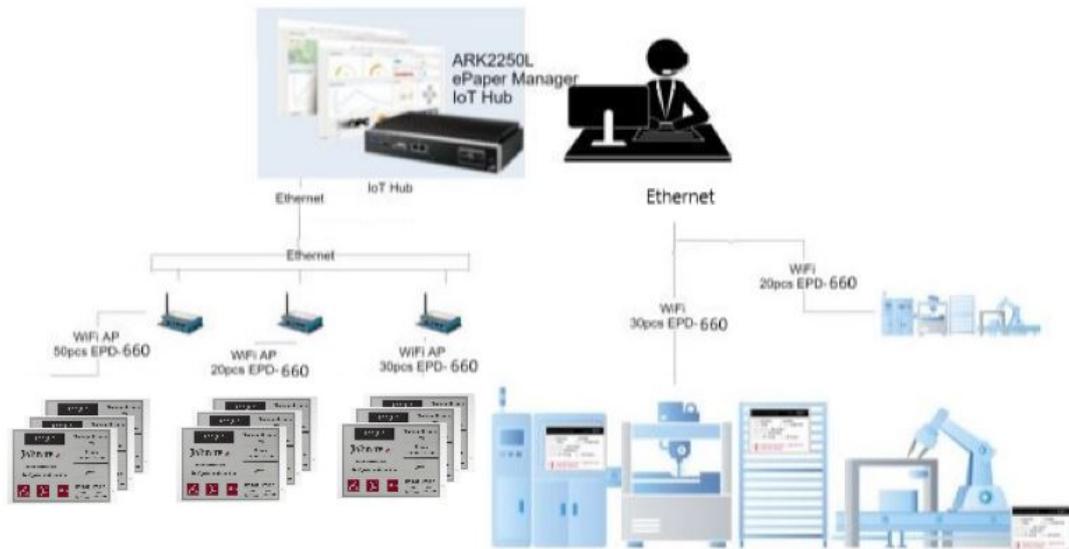


Figure 2.1 EPD-660 EPD-662 Page 14 System Information Page

Chapter 3

EPD Network
Architecture and
Software Features

3.1 System Topology Architecture



3.1.1 System Environment

Table 3.1: System Environment

No	Device1	OS	Version
1	ARK-1123H, ARK-2250L/DeviceOn/ePaper	Ubuntu	18.04
2	WISE Router: WISE-3220	OpenWRT	15.05.01
6	EPD-660, EPD-662: Cypress BM22	ThreadX	V5.6

3.2 System Specification

1. One ARK-1123 and ARK-2250 can support 500pcs ePaper.
2. Each WISE-3220 router is able to organize an isolated network as a WiFi AP.
3. One WISE-3220 can support 150 EPD devices.

3.2.1 DeviceOn/ePaper

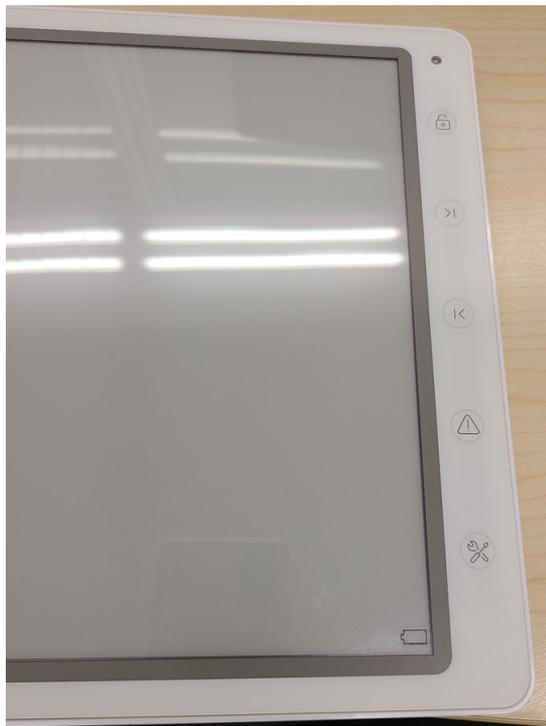
- DeviceOn/ePaper provides a friendly user interface to execute commands for control of EPD-660 and EPD-662.
- Through our RESTful API, the external system can operate the whole system as shown below:
 1. DeviceOn/ePaper can perform EPD device actions and control EPD series devices.
 2. DeviceOn/ePaper can deliver the image/firmware to an EPD device through a WISE Router.
 3. A device can periodically report its status back to DeviceOn/ePaper.

3.2.2 WISE-3220 Wi-Fi AP and Configuration Tool

- Receive commands from the ePaper manager and control the EPD-660 and EPD-662 through commands from DeviceOn/ePaper.
- EPD-660, EPD-662 wirelessly connects to WISE-3220.
- An EPD-660, EPD-662 wireless ePaper device connects to the internet through the WISE-3220 as a router.
- Modify the EPD-660, EPD-662 SSID and password to connect with the Wi-Fi AP.

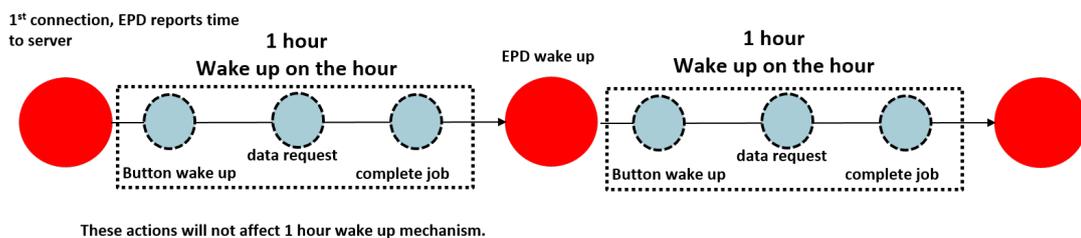
3.2.3 EPD Device

- Supports BLE re-configuration. If an EPD device keeps failing to join the network, the EPD device will enable BLE for end users to get a new SSID/password from the BLE app and reconnect to the system.
- Supports emergency status reports for low power and abnormal voltage of the battery after connecting to a router.
- Supports multi-image storage:
 - a. Full size image: 14 pages
 - b. Supports image carousels
- Execute device actions from the WISE-3220.
- Support low battery ICON shown on the ePaper device after the battery status is under “low.”



3.3 System Network Specification

- 2-way communication: Device status report and battery status report.
- Physical transmission data rate: HT20_MCS7 (65 Mbps).
- Network join performance:
 1. Server can join the network in 20 seconds.
 2. One EPD can join the network in 15 seconds from when the EPD wakes up.
 3. 100 pcs EPD can join the network in 3 minutes.
- Data transfer performance from the WISE-3220
 1. Update 50 pcs EPD-660, EPD-662 in 3 minutes.
- EPD wake-up mechanism (default setting).



Note! The performance will be adjusted according to environmental limitations.

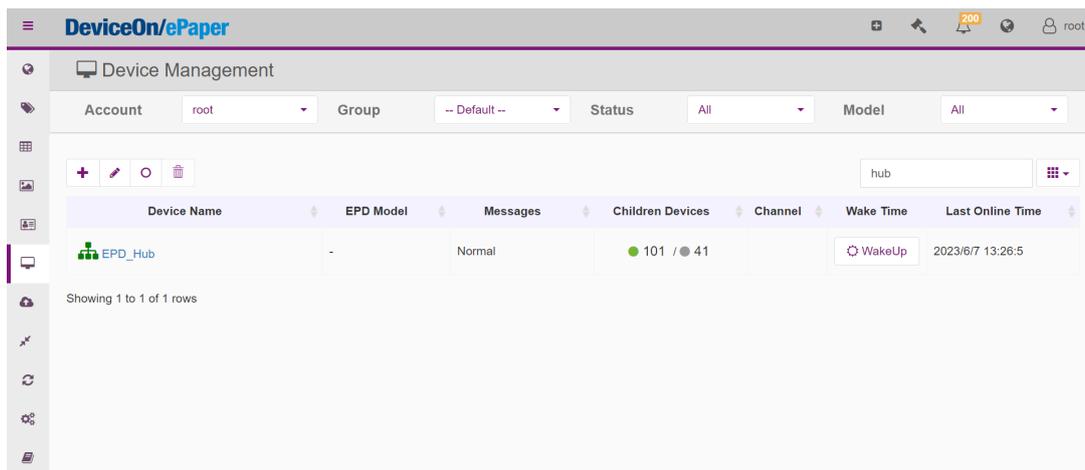


- EPD time sync and wake up mechanism:
Step 1: You can set up the time sync in the Device List

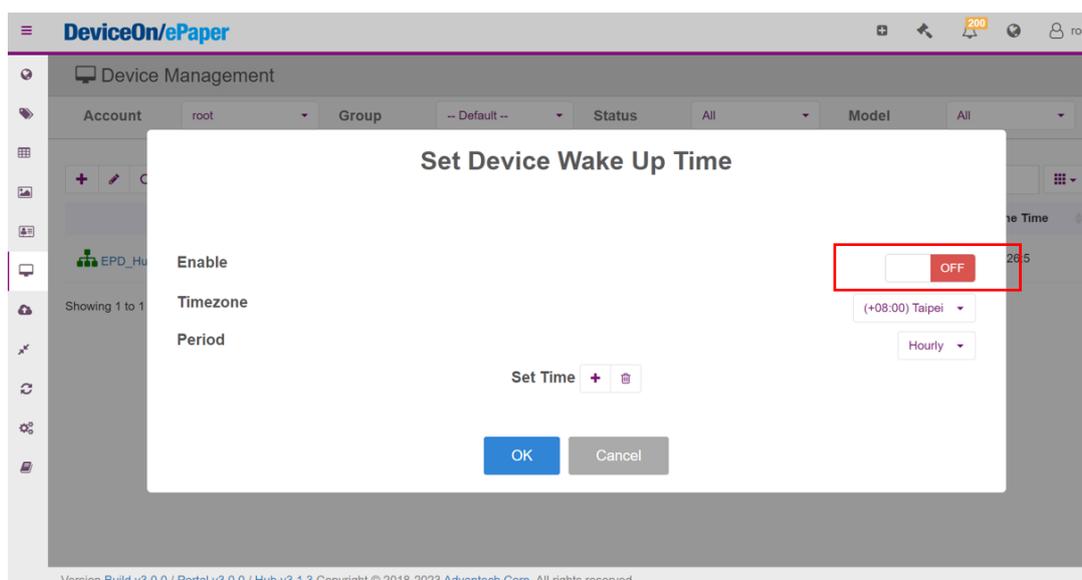
Device Name	EPD Model	Messages	Children Devices	Channel	Wake Time	Last Online Time
Device List	-	Disconnected			-	2023/9/6 14:40:3
EPD-Device-02ee38	EPD-662	Disconnected			WakeUp	2023/9/5 14:53:3
EPD-Device-68e056	EPD-770	Disconnected			-	2023/8/8 13:49:14
EPD-Device-68e057	EPD-770	Disconnected			-	2023/8/8 13:49:12
EPD-Device-68e068	EPD-770	Disconnected			-	2023/8/8 11:35:11

Showing 1 to 5 of 725 rows 5 rows per page

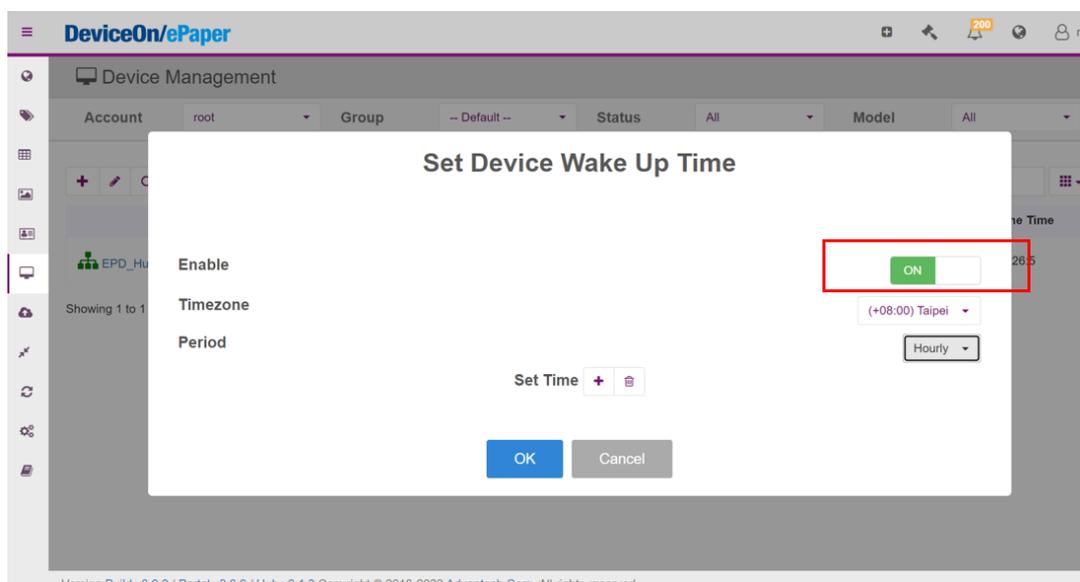
Step 2: You can choose to bind the settings for the Hub or EPD device.



Step 3: Default settings of "Set Device Wake Up Time" is disabled. The EPD device will wake up on the designated hour each day to ensure the EPD device receives the updated events from the server.



Step 4: While enabling "Set Device Wake Up Time" there are two periods which can be set up by users. One is hourly and the other is daily. The minimum setup for the hourly period is 1 configuration. Maximum setup for hourly periods are 6 configurations. Minimum setup for daily period is 1 configuration. The maximum setup for hourly periods are 12 configurations.



Note! *"Set Device Wake Up Time" is our latest release function. The compatible table is shown below. If your device FW is before V3.0.2 and you want to upgrade FW to the updated version, please check the following table:*

Table 3.2: Device Wake Up Time					
Function	Set up the specific time	Align on the hour	Support FW version	Support Server version	FW before V3.0.2 to upgrade to up to date FW version
Node sync time	No	No	V2021 node sync mechanism is default setting	All compatible	After OTA, EPD device resets to default
Time sync	Yes	EPD will align on the hour if there is no assigned time	After V3.0.2	After V3.0	No

Chapter 4

EPD-660, EPD-662 in
DeviceOn/ePaper

4.1 EPD-660, EPD-662 with DeviceOn/ePaper Solution

After completing the hardware setup of an EPD device, adjusting the system settings is the next step. DeviceOn/ePaper provides a total solution for end users to import EPD data, design EPD templates and manage EPD devices easily.

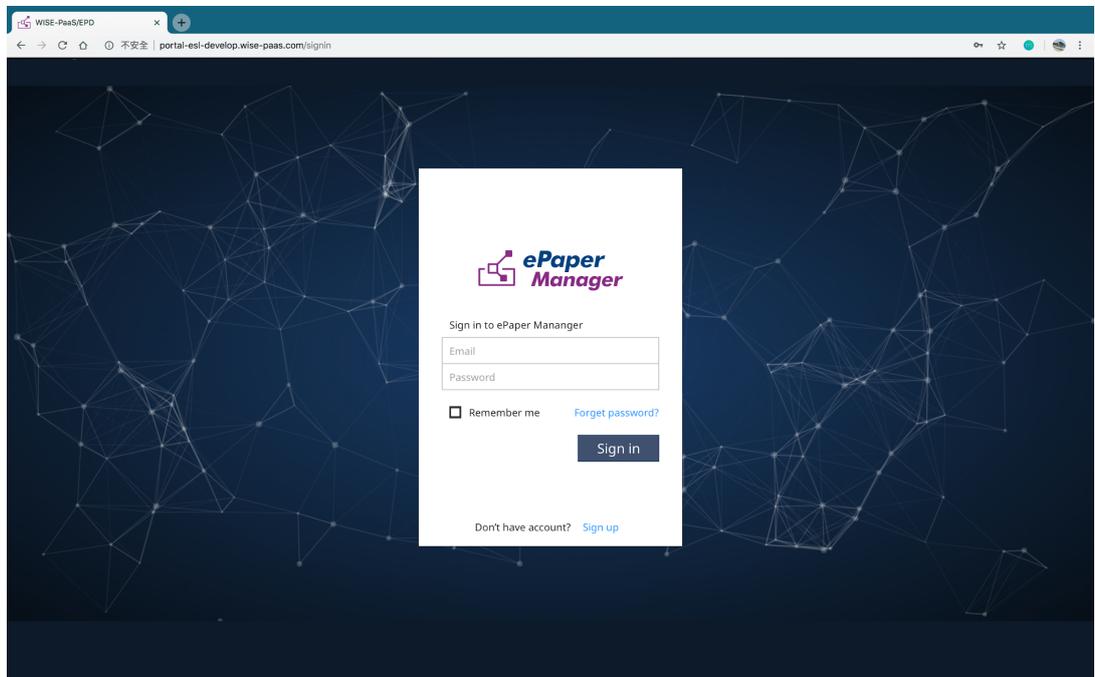


Table 4.1: DeviceOn/ePaper Main Feature List

1	Overview	System dashboard
2	EPD Controller	Control & manage EPD devices and associations with target
3	Item Data	Dynamic data management for EPD devices
4	Gallery	Dynamic image management for EPD devices
5	Device List	Router/EPD device management & importing
6	Template	EPD image design and generation
7	White List Settings	EPD white list
8	OTA	Firmware upgrade
9	Setting	System management including user account, device group, server activation, and email notification
10	Document	Online document and testing tool for the RESTful API

4.2 Preparation

4.2.1 Hardware Component List

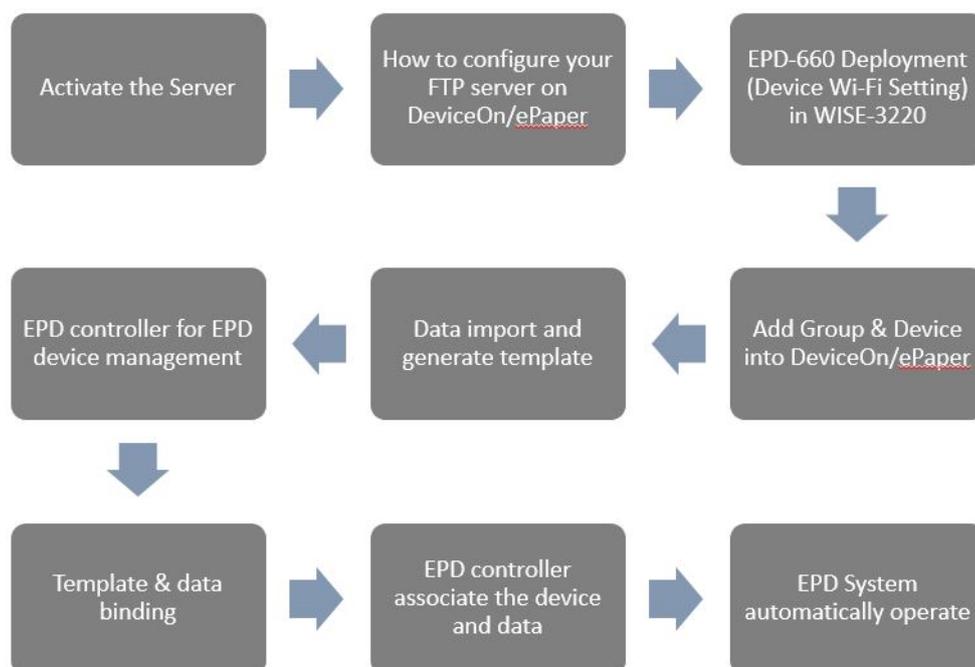
1. Advantech Embedded Computer: ARK-2250L/ARK1123H
2. Advantech Wi-Fi: WISE-3220 & WISE-3240 & Advantech EPD devices

4.2.2 Software Component List

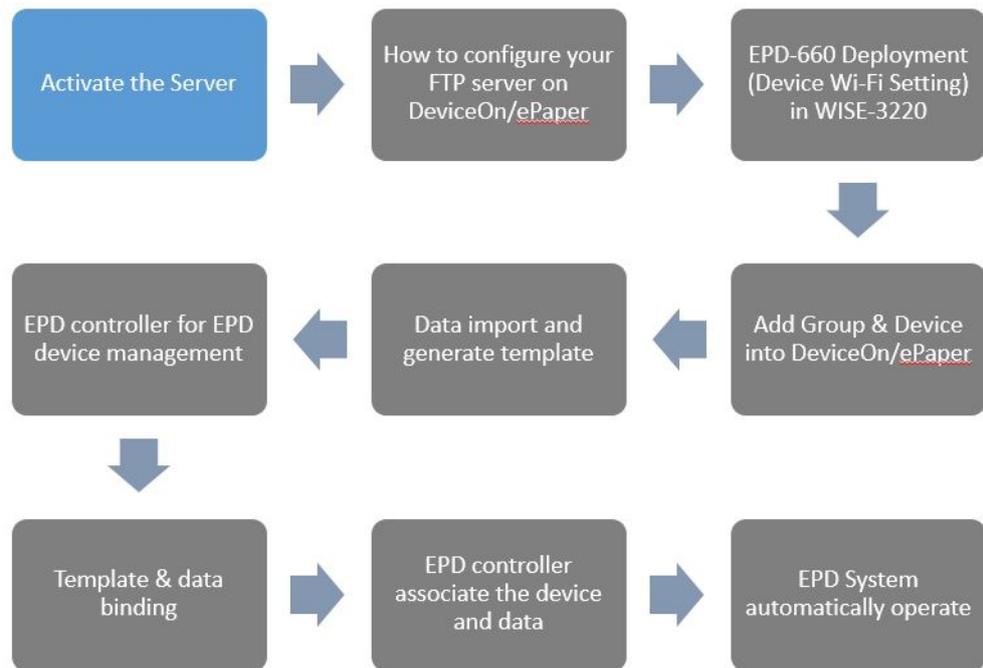
1. DeviceOn/ePaper Installation & license for ARK-2250L/ARK-1123H
2. 500 connection license on ARK-2250L/ARK1123H
3. Recommend Browser: Chrome version 75.0.3770.100 (official version) (64-bit)
4. Recommend FTP Server: FileZilla server version 0.9.60 beta

4.2.3 DeviceOn/ePaper Setup on ARK

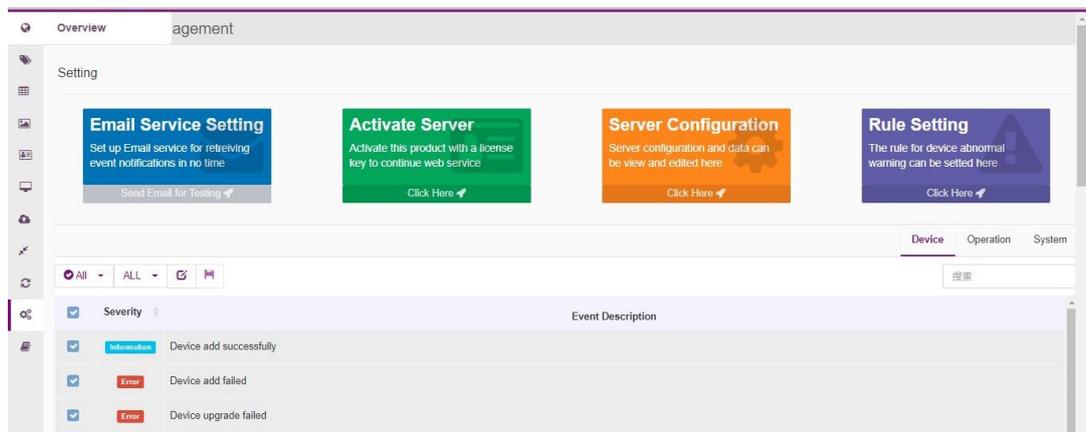
The following diagram demonstrates the process of the ePaper Manager operation.



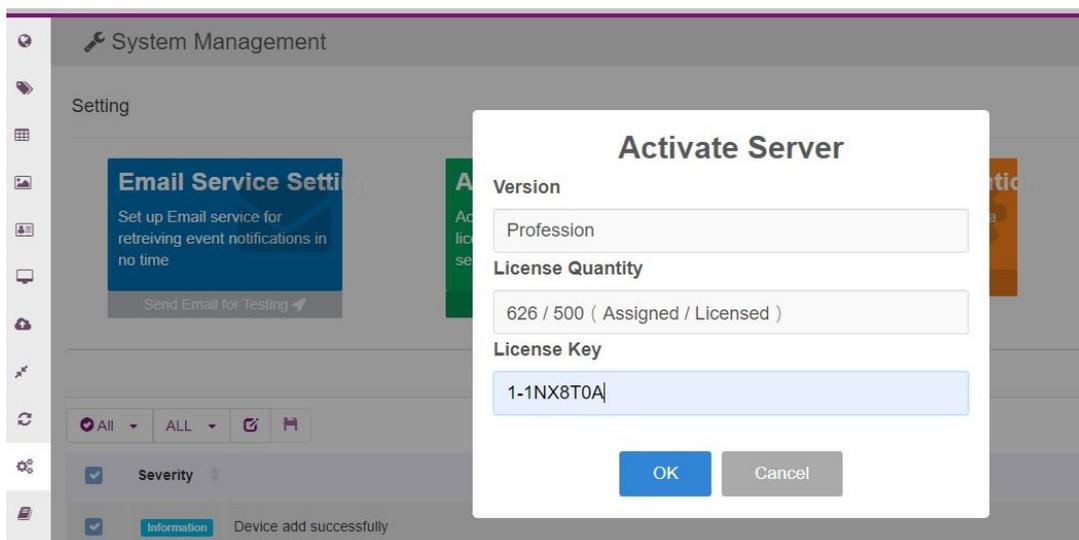
4.2.3.1 Activate the Server



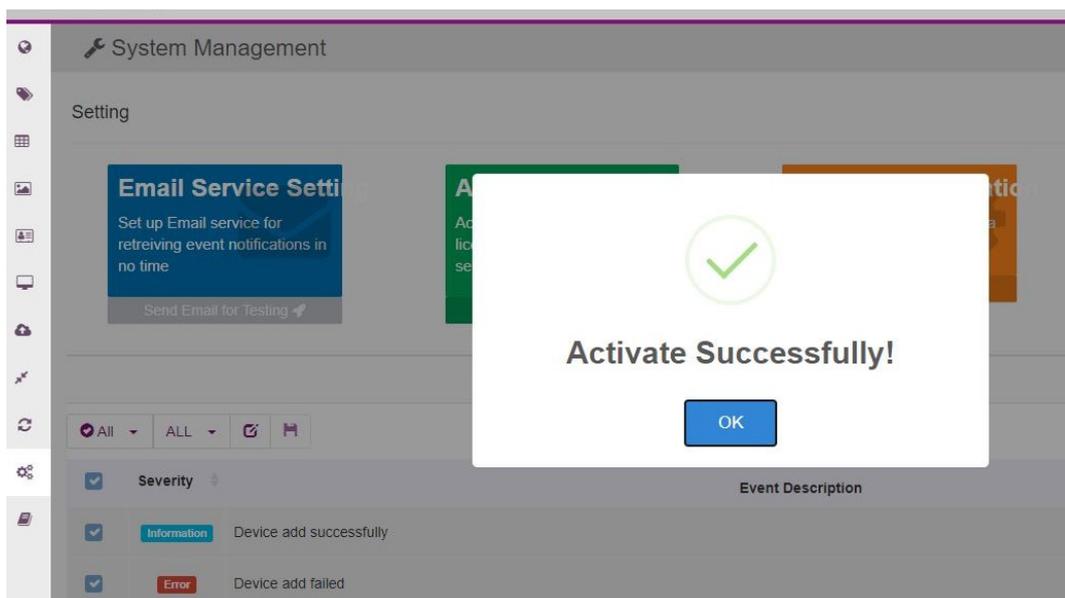
1. Please click **“System”** in **“Setting”** on DeviceOn/ePaper.



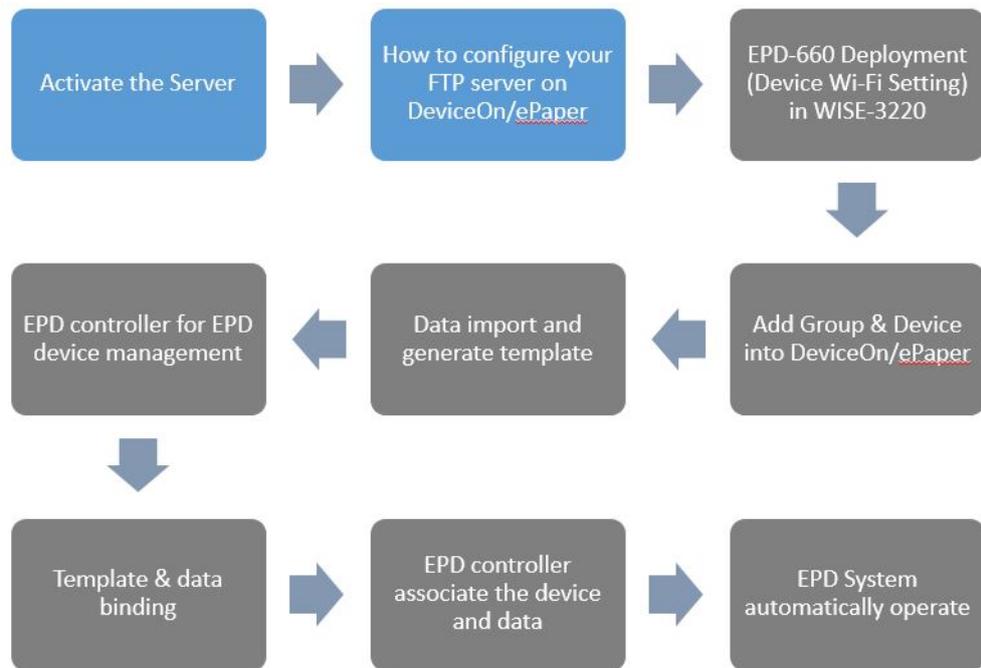
2. Click **“Activate Server”** and enter the license key provided in the sales package.



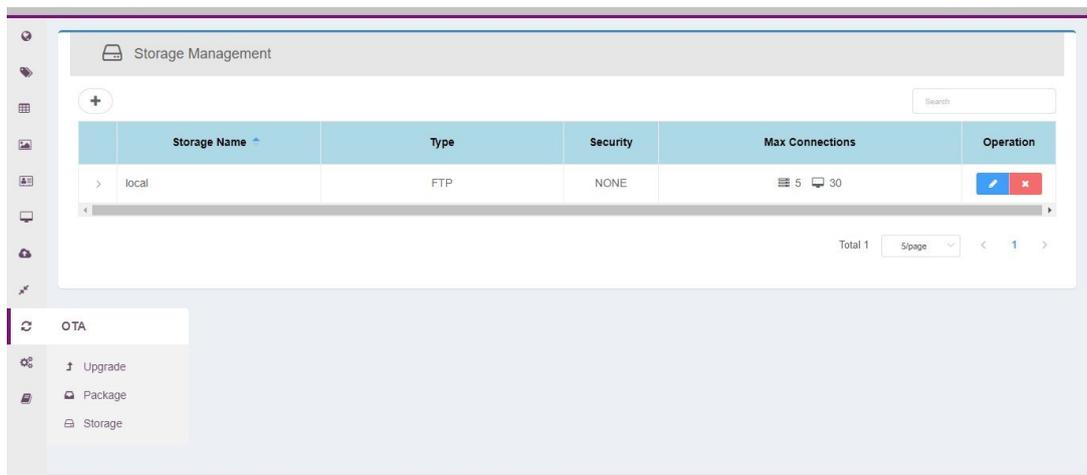
3. Then the system will show **“Activate Successfully.”**



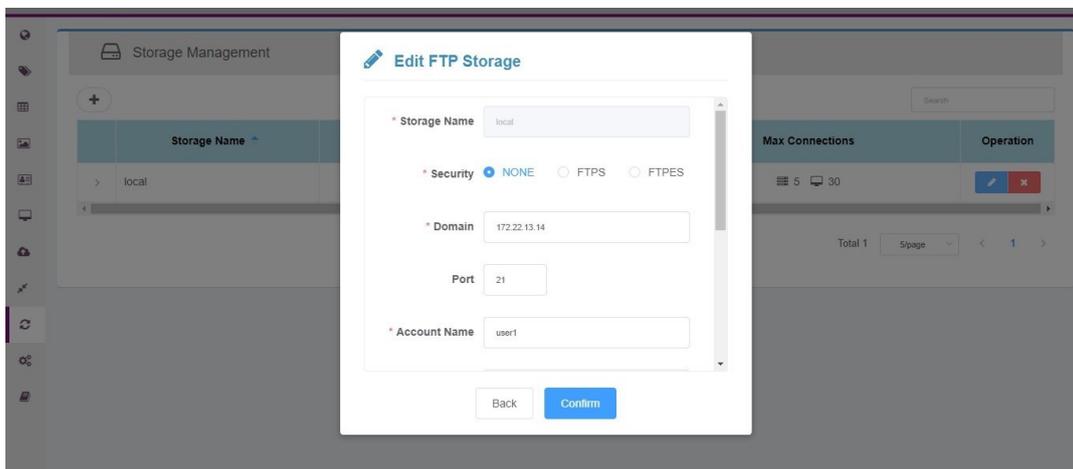
4.2.3.2 How to Configure Your FTP Server on DeviceOn/ePaper



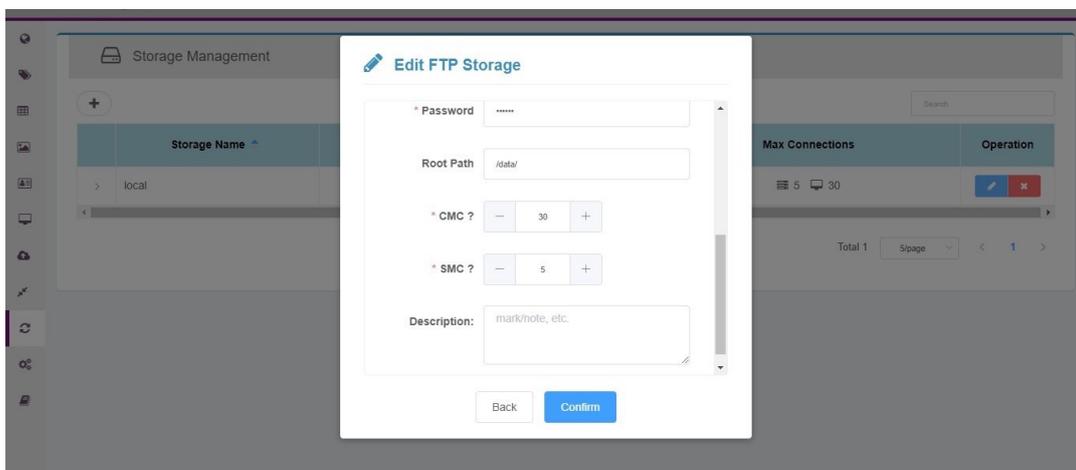
1. Click **“Storage”** in **“OTA”** and image delivery.



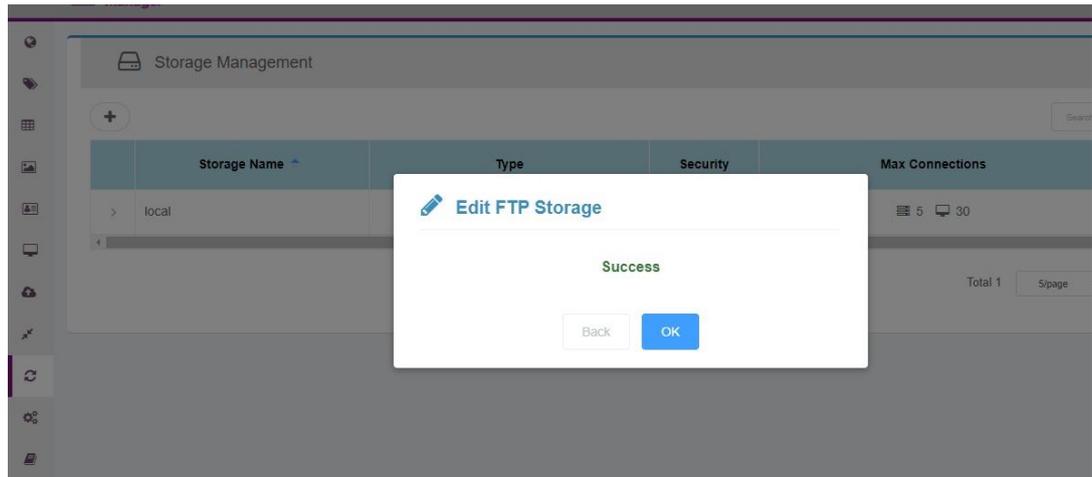
2. Click **“Edit”** to input the storage name, security, domain, port, and the account name as shown below.
Storage Name: local [default]
Security: NONE
Domain: [your server IP]
Port: 21
Account Name: user1 [default]
Password: 123456 [default]



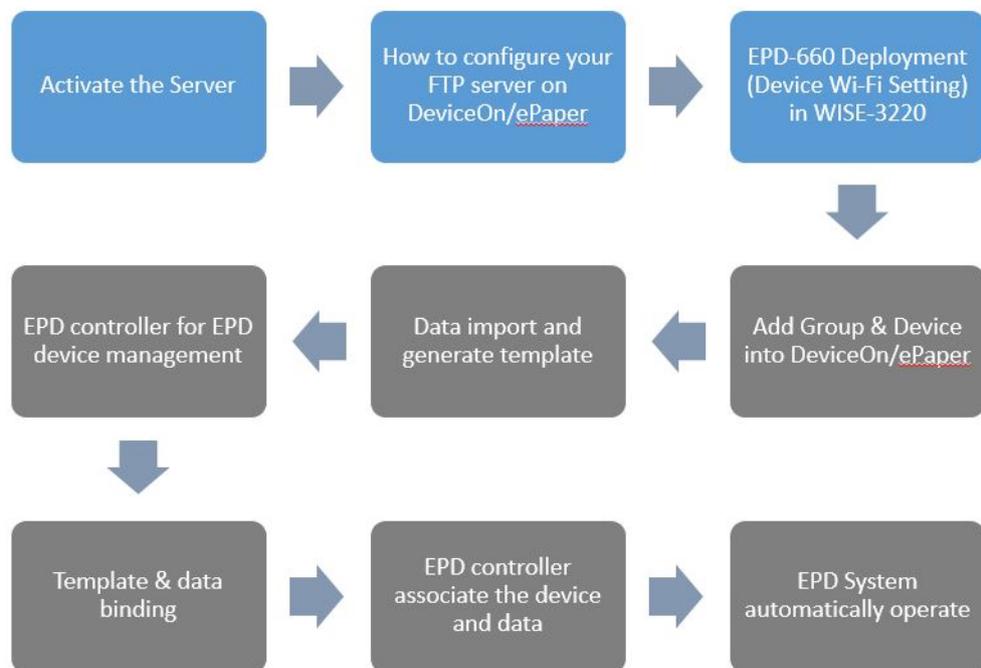
3. Scroll down to choose the numbers for **“CMC”** and **“SMC”** and click **“Confirm.”**



4. If successful, you will see a “**Success**” message. Click “**OK**” to close.



4.2.4 EPD-660 Deployment (Device Wi-Fi Settings) in WISE-3220



1. Power on the WISE-3220 and connect it to your laptop or PC via the LAN port.
2. Open the WISE-3220 management web page: Open a web browser (Chrome is suggested) and enter the IP Address: `http://192.168.1.1`.
3. Login: The default username and password are “**root**” and “**ePaper**”. Click the “**Login**” button to open the web configuration page.

ADVANTECH

Authorization Required

Please enter your username and password.

Username

Password

There are a few things to know before deploying the EPD-660 or EPD-662 with WISE-3220. EPD-660 or EPD-662 deployment is set up with a Wi-Fi device SSID and password. End users need to set up an EPD-660 or EPD-662 MAC address, AP SSID, AP password, server IP, and sever port: 1883. Follow the steps below in detail and check that the SSID is shown as ADV-ePaper (default).

ADVANTECH Status System Security Network ePaper Manager Logout **UNSAVED CHANGES: 3** **AUTO REFRESH ON**

radio0: Master "OpenWrt" radio0: Master "ADV-ePaper" **Wifi** radio0: Master "OpenWrt"

Wireless Overview

Generic MAC80211 802.11bgn (radio0) Channel: 6 (2.437 GHz) | Bitrate: ? Mbit/s

SSID: ADV-ePaper Mode: Master

0% **BSSID: 74:FE:48:55:94:CE** | Encryption: mixed WPA/WPA2 PSK (TKIP, CCMP)

Set up the server key.

ADVANTECH Status System Security Network DeviceOn/ePaper Logout

Device Onboarding Node Configuration Node Import Node Export

DeviceOn/ePaper

User should acquire server Device Onboarding information to connect to DeviceOn/ePaper server.

Configuration

Connection URL

Username

Password

Save & Apply Save Reset

ADVANTECH Status System Security Network ePaper Manager Logout

Status Mode: Master | SSID: ADV-ePaper
0% BSSID: 74:FE:48:44:BF:47 | Encryption: mixed WPA/WPA2 PSK (TKIP, CCMP)
Channel: 6 (2.437 GHz) | Tx-Power: 19 dBm
Signal: 0 dBm | Noise: -95 dBm
Bitrate: 0.0 Mbit/s | Country: US

Wireless network is enabled

Operating frequency

Mode	Channel	Width
N	6 (2437 MHz)	20 MHz

Transmit Power dBm

Interface Configuration

General Setup Wireless Security MAC-Filter

Encryption

Cipher

Key

Next, follow these steps to implement and deploy:

1. Click “ePaper Manager”.
2. Select “EPD Deployment”.
3. Click “Add EPD Node”.

ADVANTECH Status System Security Network ePaper Manager Logout

ePaper Congfigure
User should acquire server Device Onboarding information to connect to ePaper Manager.

Configuration

DeviceOn URL

DeviceOn Username

DeviceOn Password

Save & Apply Save Reset

ADVANTECH Status System Security Network DeviceOn/ePaper Logout

Node Configuration Node Import Node Export

Device Onboarding
EPD Deployment

Node deployment lead node connect to server through different WIFI AP router. It's for model of EPD-660, EPD-662.
Users have to set up EPD node's MAC address · WIFI AP's SSID, Password · ePaper Manager's server IP address and port number.

EPD Node

Show 10 entries Search:

#	EPD MAC Address	AP SSID	AP Password	Server IP	Server Port	Action
1	e04f4302dabc	ADV-ePaper	*****	172.22.12.132	1883	Edit delete
2	e04f4302da28	ADV-ePaper	*****	192.168.1.1	1883	Edit delete

Showing 1 to 2 of 2 entries Previous 1 Next

Add EPD Node

Save & Apply

- Enter the information for the EPD MAC address, AP SSID, AP password, server IP, and server port.
EPD MAC address: Please check the back of the EPD device
AP SSID: ADV-ePaper
AP Password: ePaperePaper
Server IP: Depends on your server
Server Port: 1883

ADVANTECH Status System Security Network DeviceOn/ePaper Logout

EPD660 node configuration

General Settings

EPD MAC address:

AP SSID:

AP Password: 

Server IP:

Server Port:

[Back to Overview](#) [Save & Apply](#) [Save](#) [Reset](#)

- After completing the settings, click **“Save & Apply.”**

ADVANTECH Status System Security Network DeviceOn/ePaper Logout

Device Onboarding Node Configuration Node Import Node Export

Node deployment lead node connect to server through different WIFI AP router. It's for model of EPD-660, EPD-662.
 Users have to set up EPD node's MAC address - WIFI AP's SSID, Password - ePaper Manager's server IP address and port number.

EPD Node

Show entries Search:

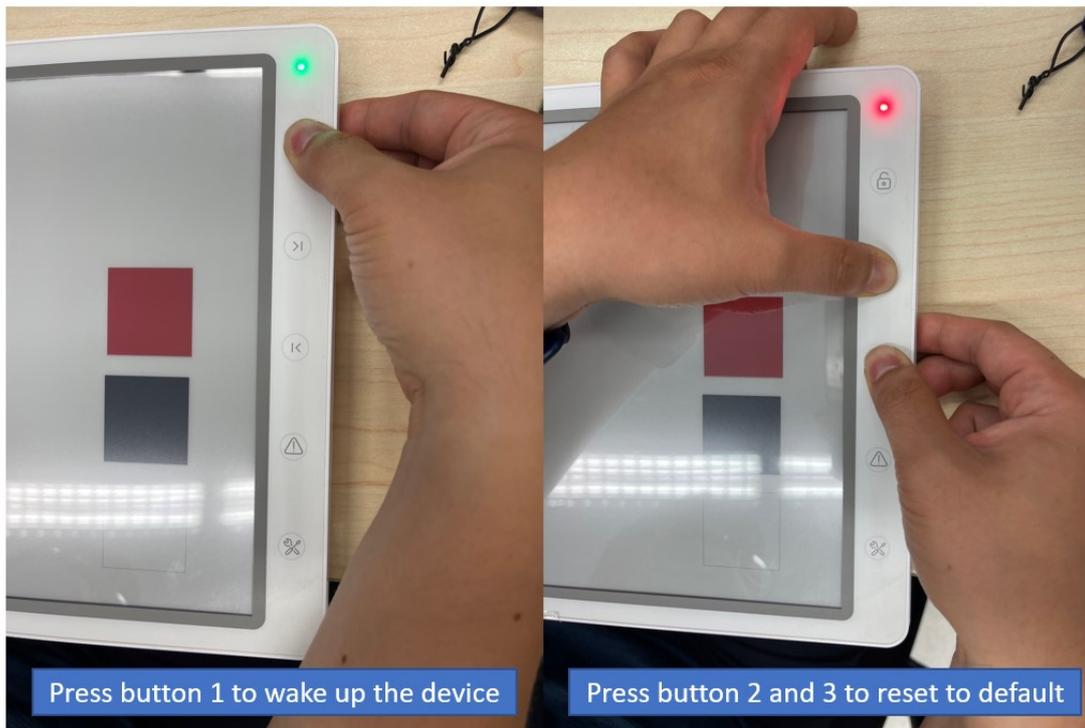
#	EPD MAC Address	AP SSID	AP Password	Server IP	Server Port	Action
1	e04f4302db4e	ADV-ePaper	*****	172.22.12.104	1883	Edit delete

Showing 1 to 1 of 1 entries Previous Next

[Add EPD Node](#)

[Save & Apply](#)

6. Reset device to default.
 - 1) Button version: press button 1 to wake the EPD. Press button 2 and button 3 together to reset back to default.



- 2) Non-button version:
 - 1st deployment: press the reset button on the back of device to wake up the device.
 - 2nd deployment: IP settings must use Wi-Fi connector APP.

Large Quantity EPD Deployment (Device Wi-Fi Setting Only) in WISE-3220

Users may apply a .json file to edit the device connecting SSIDs and passwords for large quantities of devices. Users are able to find the .json example on the settings page displayed below.

1. Click “Node Import”.
2. Select “Node.json”.

ADVANTECH Status System Security Network ePaper Manager Logout

Node Configuration Node Import

Import

Template: Node.json

File Name: -

File Size: -

File Date: -

Overwrite:

Import: 選擇檔案 未選擇任何檔案

Overwrite

3. The .json file example is displayed below. Follow the array format to write the device information. The array column is defined as follows:

Tagssid: Connecting AP SSID

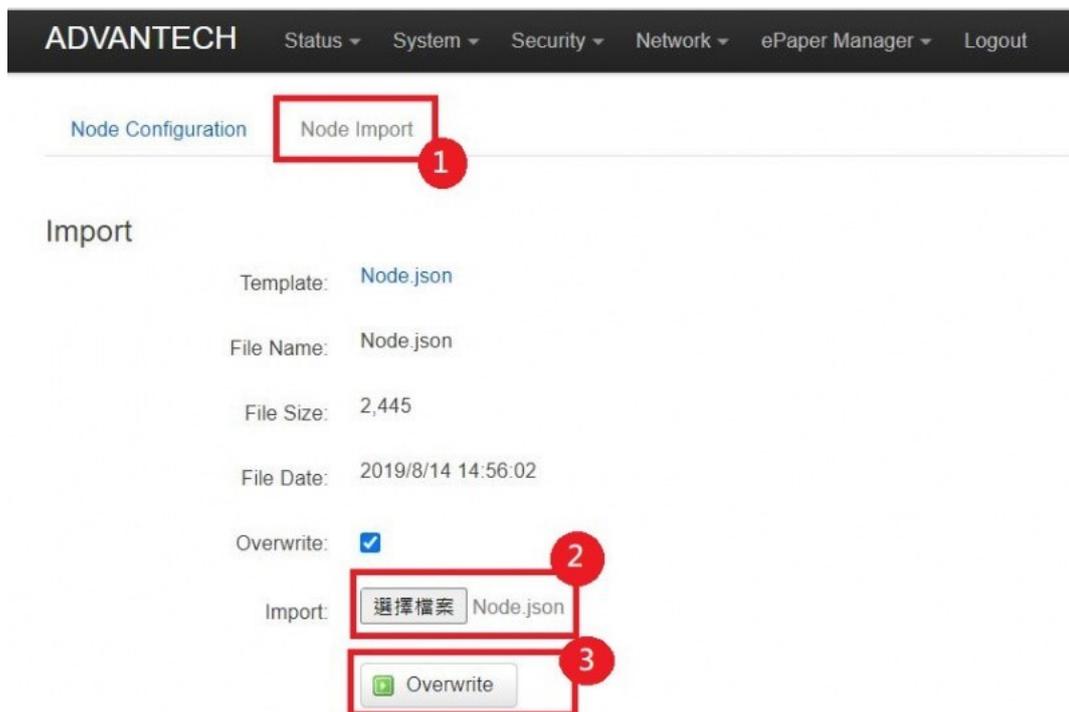
Tagpwd: Connecting Password

Tagip: Connecting DeviceOn/ePaper Sever IP

Tagport: Connecting DeviceOn/ePaper Sever IP Port

```
{
  "Metadata" : ["TagMac", "Tagssid", "Tagpwd", "Tagip", "Tagport"],
  "Tag"      : [
    ["e04f4302cb12", "advantech", "1234abcd", "192.168.1.1", "5853"],
    ["e04f4302cbaa", "abcefgeth", "abcd1324", "192.168.1.1", "5853"],
    ["e04f4302cbdd", "adv", "1qaz2wsx", "192.168.1.1", "5853"],
    ["e04f4302cbee", "ADV-ePaper", "ePaper1234", "test.mosquitto.org", "1883"]
  ]
}
```

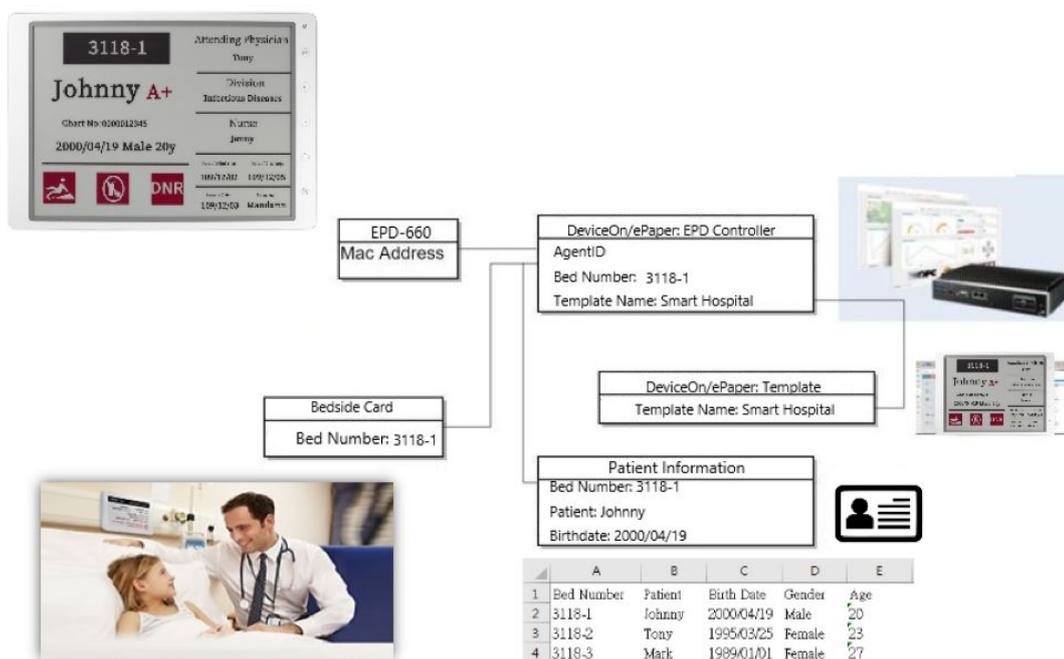
- Click “**Choose file button**” to upload Node.json and then click “**Overwrite**”.
TagMac: EPD device Mac Address



4.3 Hands-On EPD Device on DeviceOn/ePaper

The following figure demonstrates the usage scenario in a smart hospital. Users need to prepare information as shown below:

- EPD device mac address.
- Target Item description data which must contain the column of unique ID as the key, e.g., Bed Number.**
- Target Item ID as the key, e.g., Bed Number.
- EPD device screen typesetting as the EPD image template.



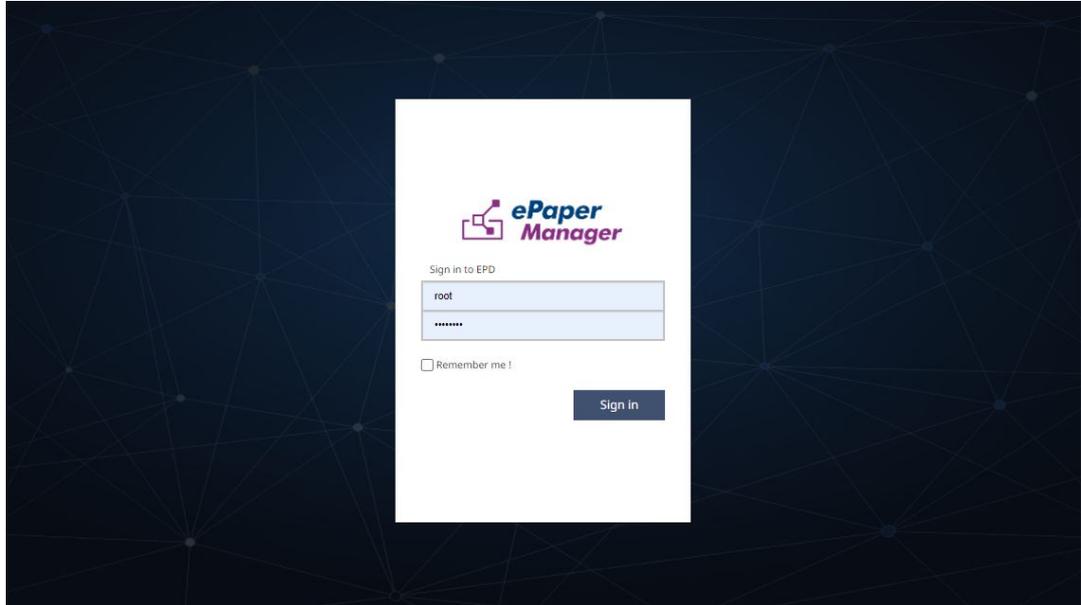
4.3.1 DeviceOn/ePaper Login

Log in to your ePaper manager by entering the IP address.

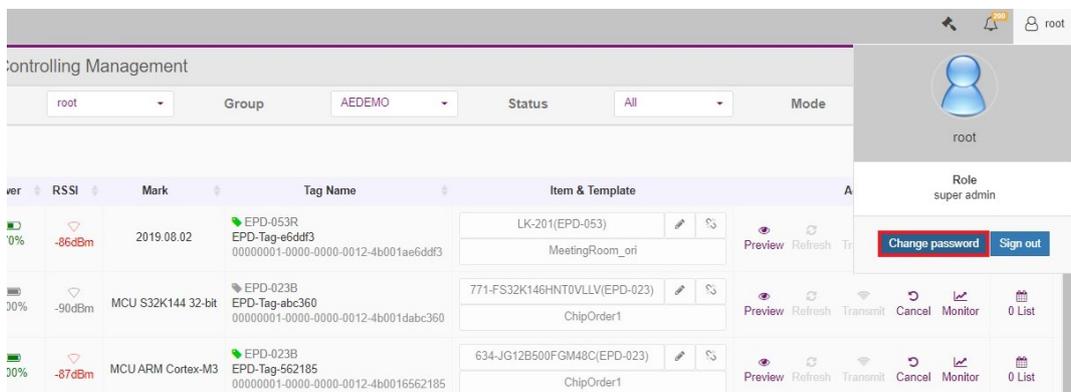
Enter the default username and password.

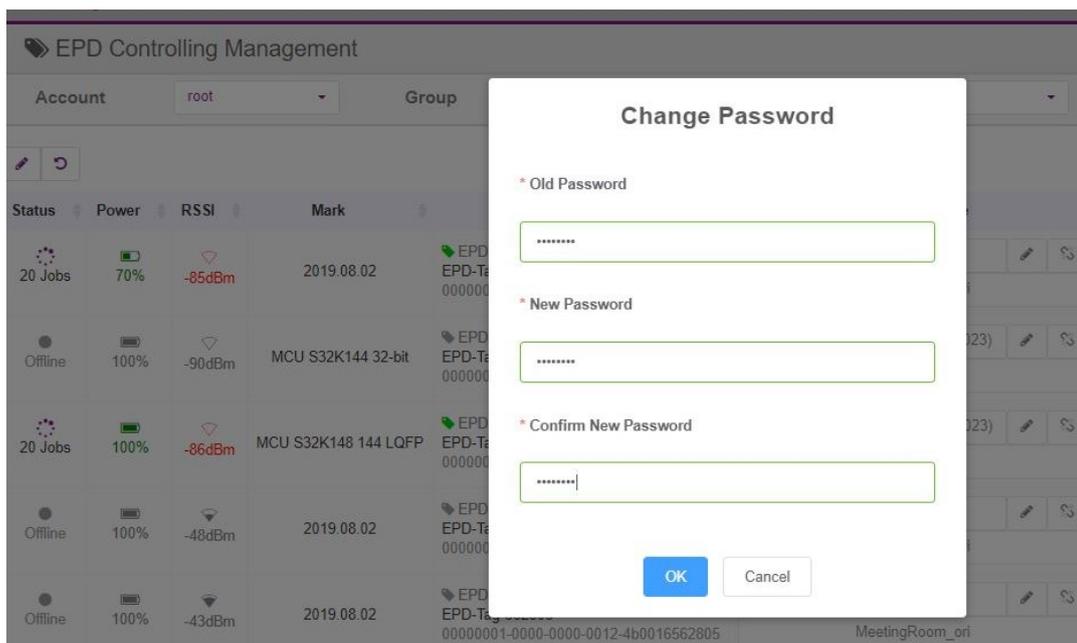
Username: root

Password: P@ssw0rd

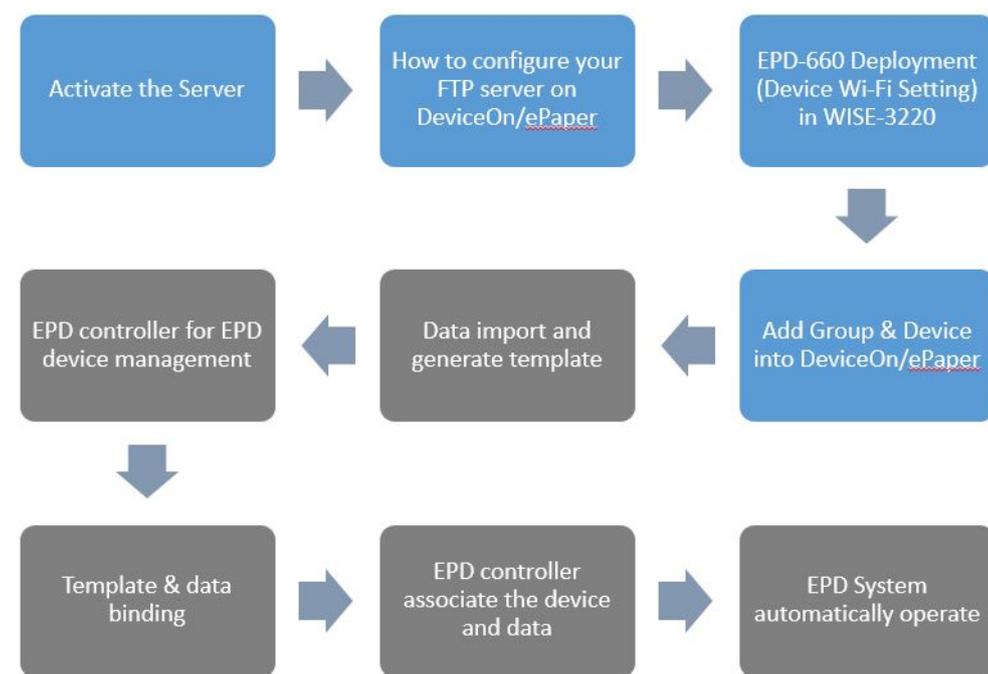


If you would like to change the password, please click **“Root”** and then click **“Change password”**. Enter your new password and click **“OK”**.

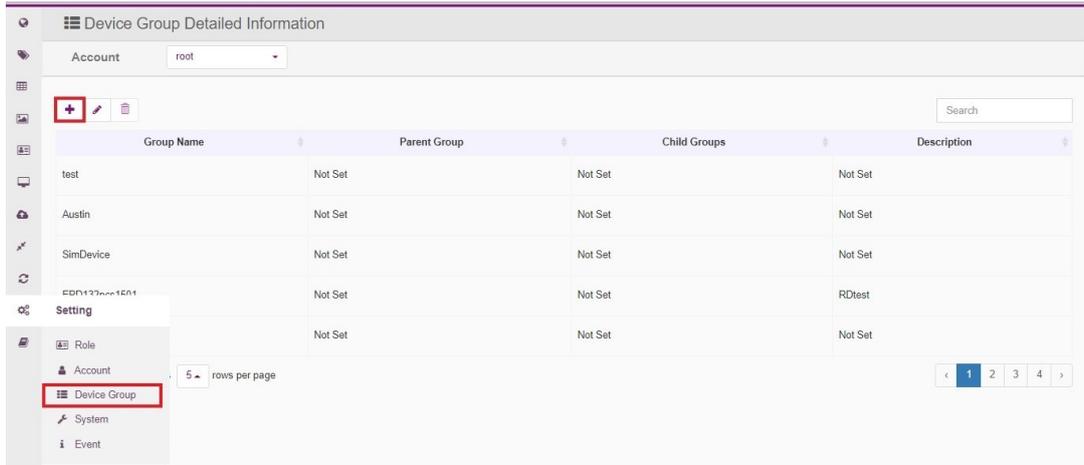




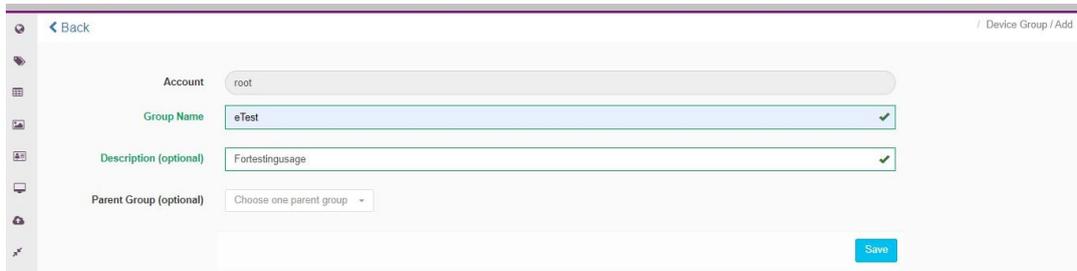
4.3.2 Add Group & Device into DeviceOn/ePaper



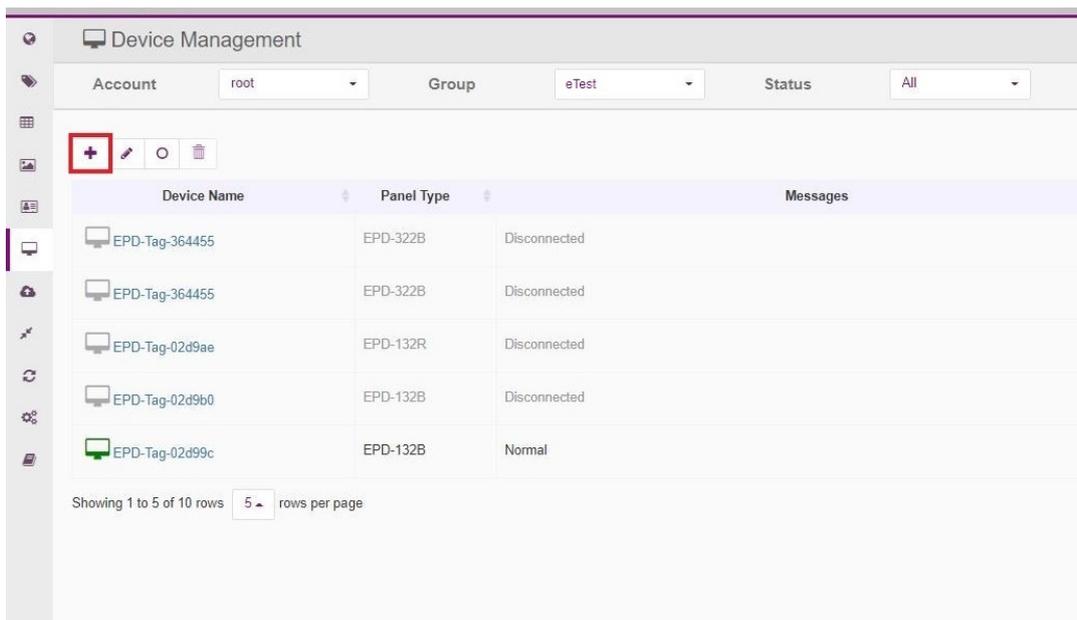
1. Add group by clicking the add icon in **Device Group** in settings.



2. Add group by entering the Group Name and Description (optional), then click **“Save”**.



3. Add the EPD device to a Group.



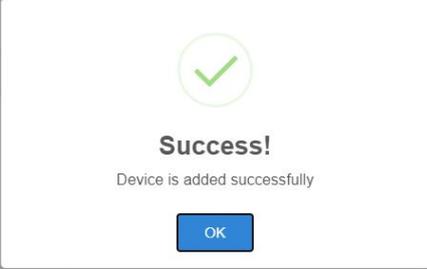
Back

Add Device - Normal View

Status	Device Name	Agent ID
<input type="checkbox"/>	EPD-Tag-0000d6	00000001-0000-0000-4444-0404000000d6
<input type="checkbox"/>	EPD-Tag-2cff26	00000001-0000-0000-0012-4b00192cff26
<input type="checkbox"/>	EPD-Tag-561581	00000001-0000-0000-0012-4b0016561581
<input type="checkbox"/>	EPD-Tag-478245	00000001-0000-0000-0000-74fe4b478245

Back

Add Device - Normal View

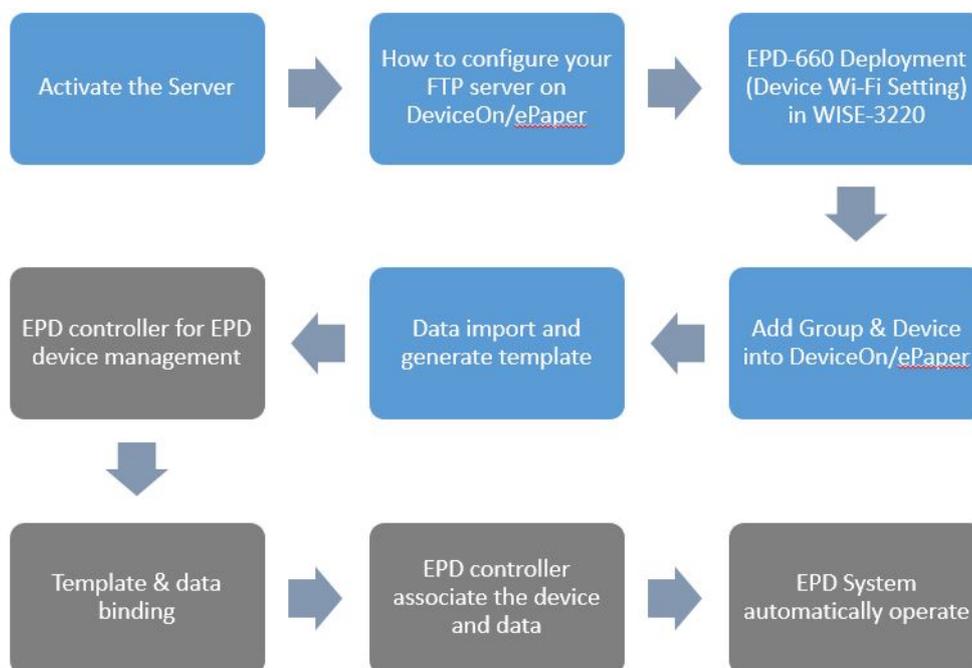


Success!
Device is added successfully

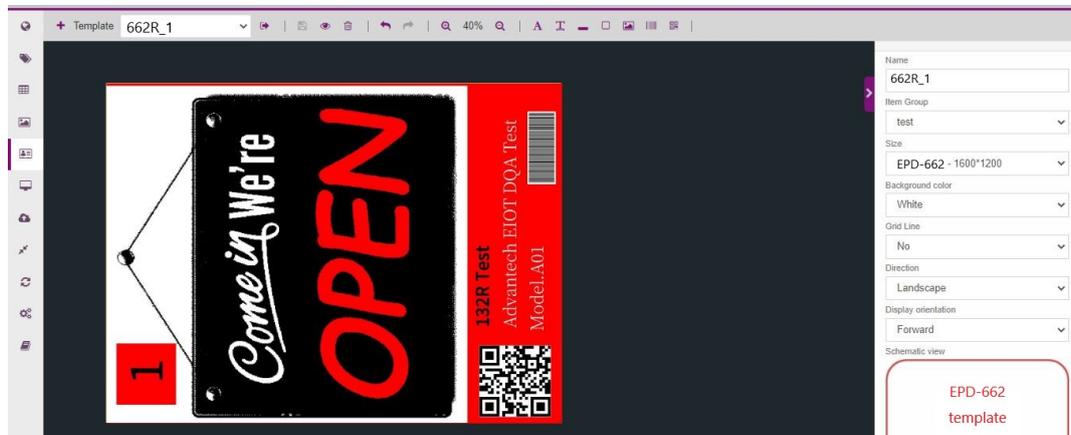
OK

Showing 1 to 5 of 539 rows | 5 rows per page

4.3.3 Design Your Own Template



Before delivering data to the EPD device, users are able to design their templates for the device to display on an ePaper panel. Advantech has provided you with a drag and drop user interface to help you design your templates more easily. Click the “**Template**” icon in the left-side navigation bar and choose various tools to design templates, such as “Label”, “Text”, “Image”, “Shape”, “Barcode” and “QR Code”. You can search for “Image Generator” for a video guide on YouTube.



- Label
 - Simply a text note.
- Text
 - Its value comes from imported data, and you can choose what column of data needs to be shown.
- Image
 - You can upload color images and they will automatically be transformed to red, black, and white.
- Shape
 - The system supports rectangle, circle, and triangle shapes.
- Barcode
 - The system supports Code 39 barcodes.
- QR Code

4.3.4 Import Item Data to DeviceOn/ePaper

There are 2 ways to import data from vertical market applications to our DeviceOn/ePaper device.

1) JSON Format: A user can send out the API to update data in real time.

In order to import data to EPD, below is the .JSON format schema. You should refer to the rule below and prepare the data to upload your file.

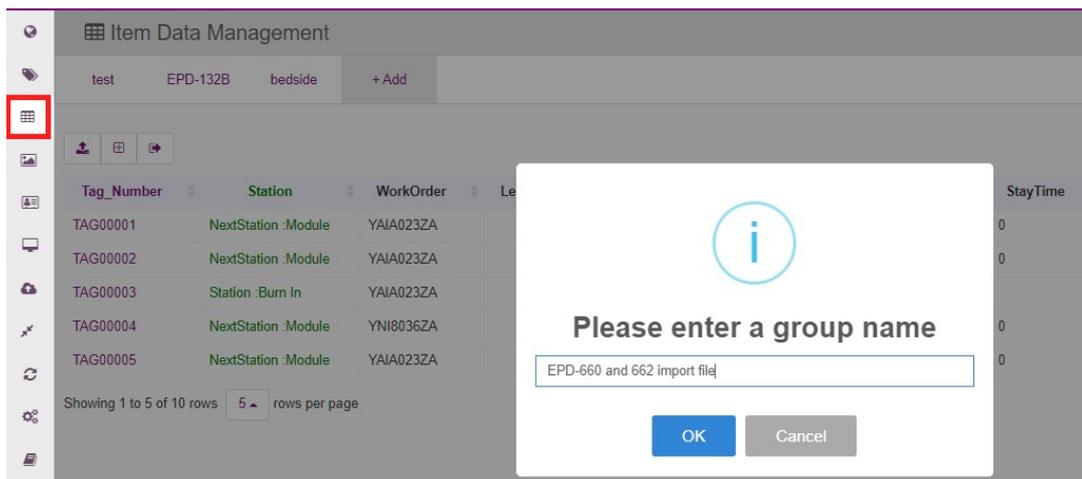
```
{ "items": [ { "code": "uniqueID_user_provide_1", "name": "item_name_user_provide_1", "content": { "Tag Content Title 01": "Tag Content01", "Tag Content Title 02": "Tag Content02" } }, { "code": "uniqueID_user_provide_2", "name": "item_name_user_provide_2", "content": { "Tag Content Title 11": "Tag Content11", "Tag Content Title 12": "Tag Content12" } }, ] }
```

2) Batch data update into the DeviceOn/ePaper database using Excel or CSV format
If you upload Excel or CSV files to the system directly, the system will auto-transfer the format to JSON.

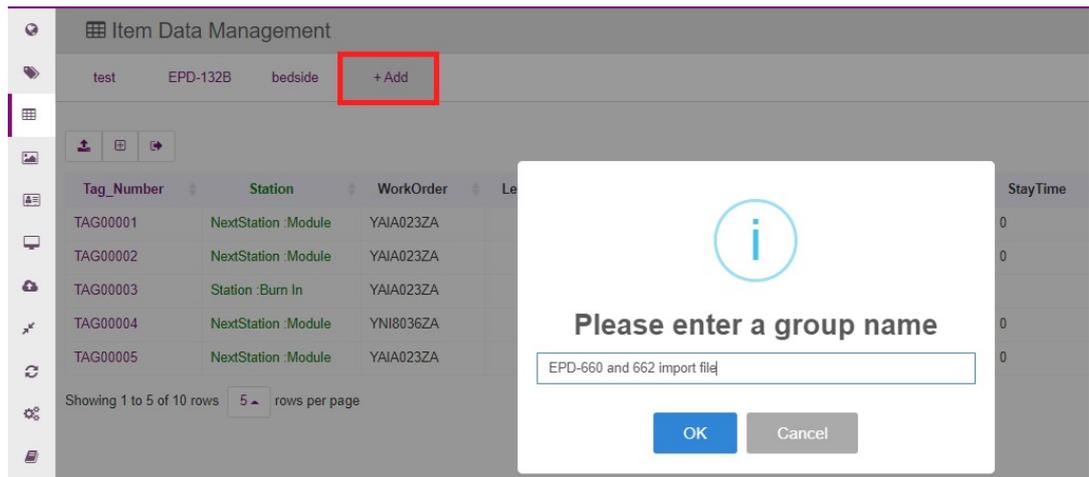
Example 1:

- i. Vertical application scheduling to send data to a DeviceOn/ePaper server.
- ii. Click “**Item Data**” in the left-side navigation bar and click the left-side button in the page as the picture shows below. The detailed steps are shown below.

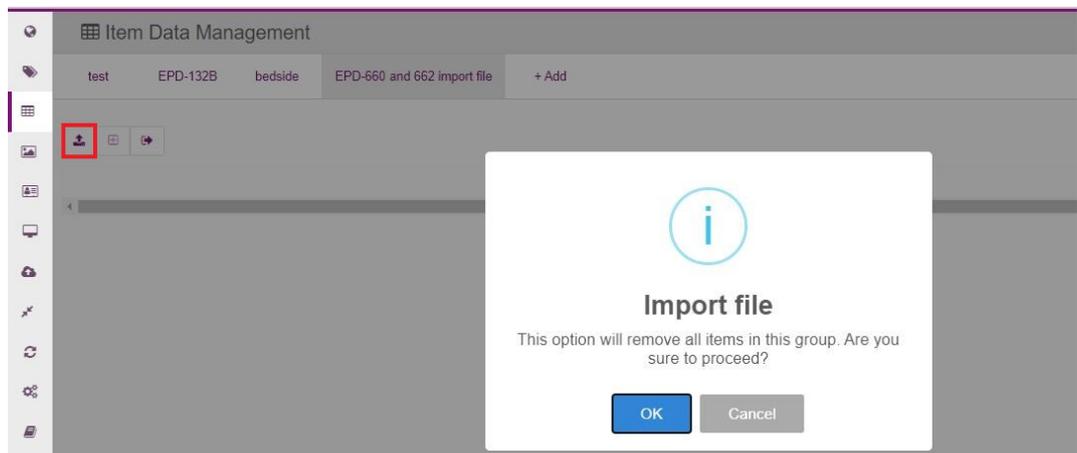
1. Click “**Item Data**”.



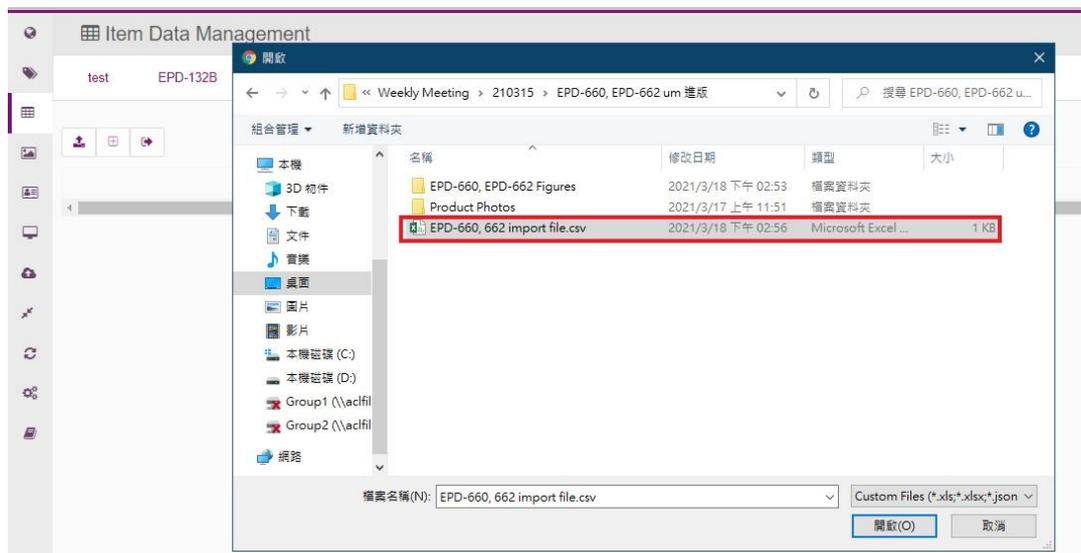
2. Click **+Add** and enter the group name.



3. Click the **Upload New Items** icon to import file.



4. Choose the Excel file to import, and it will generate the pop up **“Upload successfully!”**



Item Data Management

test EPD-132B bedside EPD-660 and 662 import file + Add

roomID date ext subject time

LK-201	2019.08.02	#8868	meeting	13:00~16:30
LK-205	2019.08.02	#9631	F/W meeting	13:00~18:00
LK-207	2019.08.02	#9438	ME weekly meeting	14:00~18:00
LK-203		#9294	Product Training	13:30~17:00
LK-206	2019.08.02	#7097	[Campus Tour]	09:00~18:30

Showing 1 to 5 of 9 rows 5 rows per page

Updating Items Status

Upload successfully!

OK

Item Data Management

test EPD-132B bedside EPD-660 and 662 import file + Add

roomID date ext subject nextTime nextExt nextAppointer time

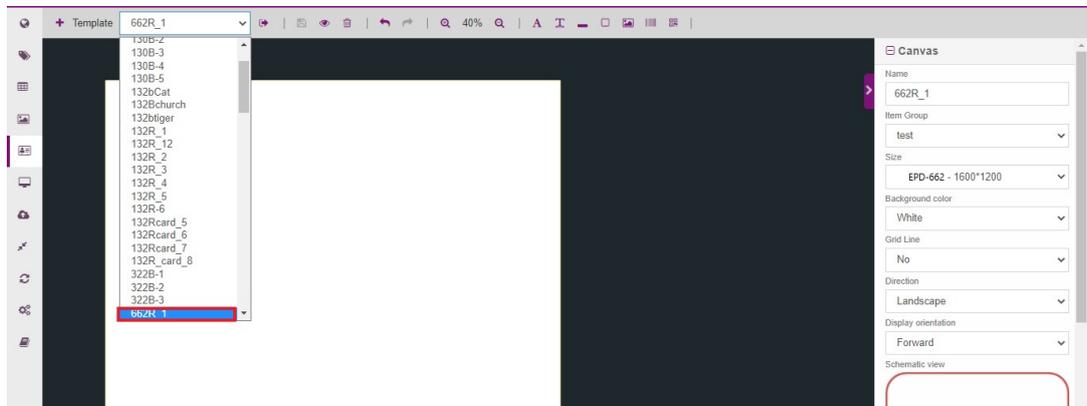
LK-201	2019.08.02	#8868	meeting	16:30~17:30	#9362	◆◆◆◆i	13:00~16:30
LK-205	2019.08.02	#9631	F/W meeting	FREE			13:00~18:00
LK-207	2019.08.02	#9438	ME weekly meeting	Yes			14:00~18:00
LK-203		#9294	Product Training	FREE			13:30~17:00
LK-206	2019.08.02	#7097	[Campus Tour]	FREE			09:00~18:30

Showing 1 to 5 of 9 rows 5 rows per page

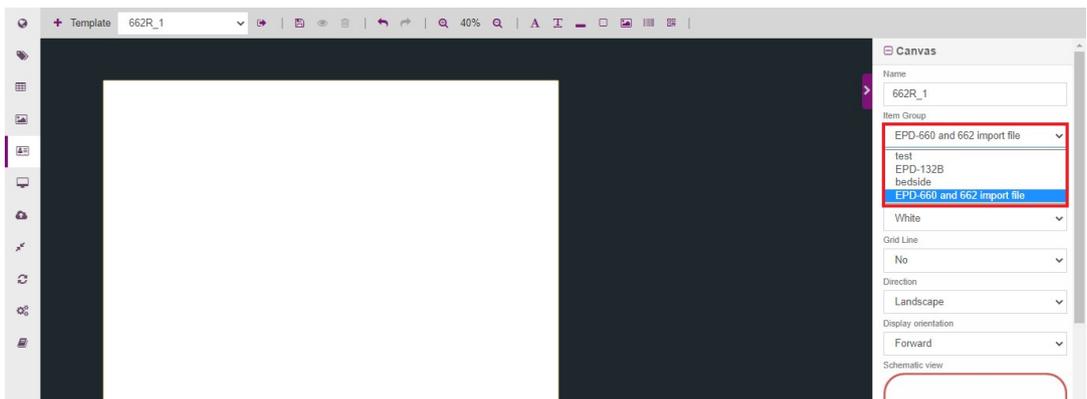
4.3.5 Combine the Template and Item Data

After importing data and making the template, we can combine them for regular data auto-updates.

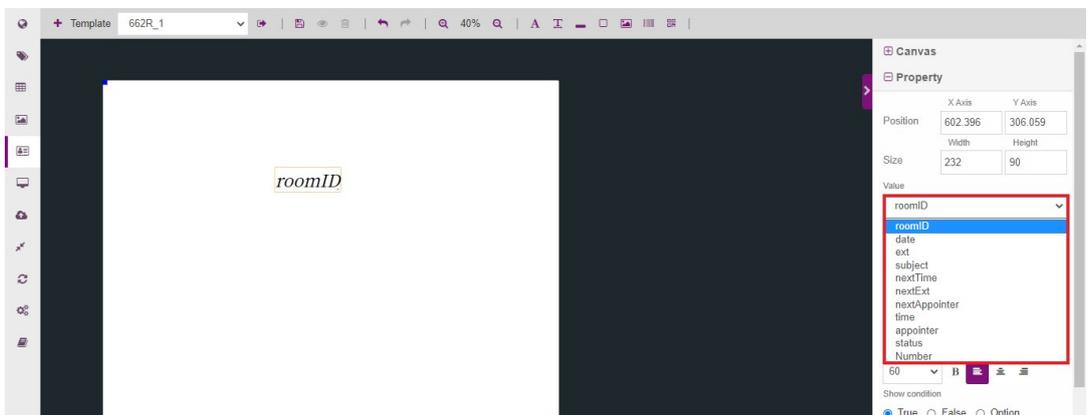
1. Select the Template.



2. Choose "Item Group."



3. Click the object to edit the content by selecting "Value."

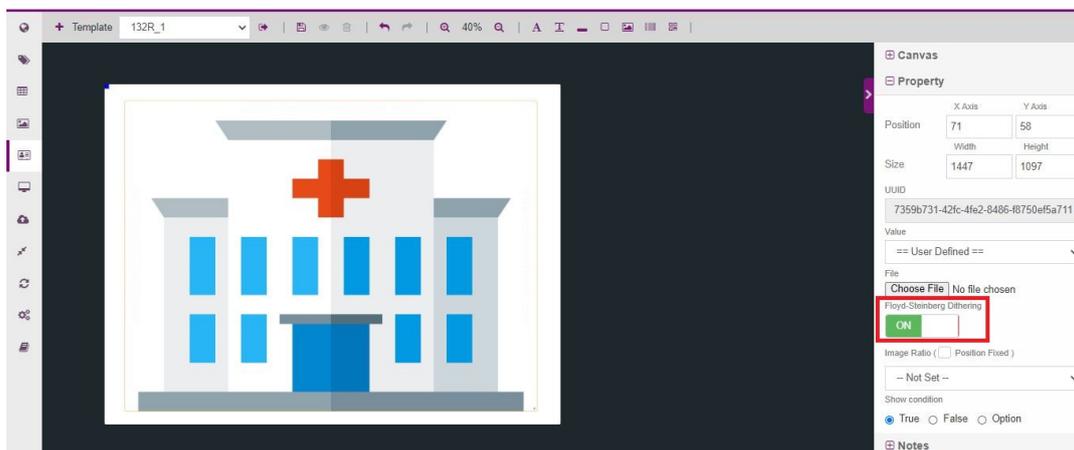


Dithering Function Introduction (Part 4.3.5 continued)

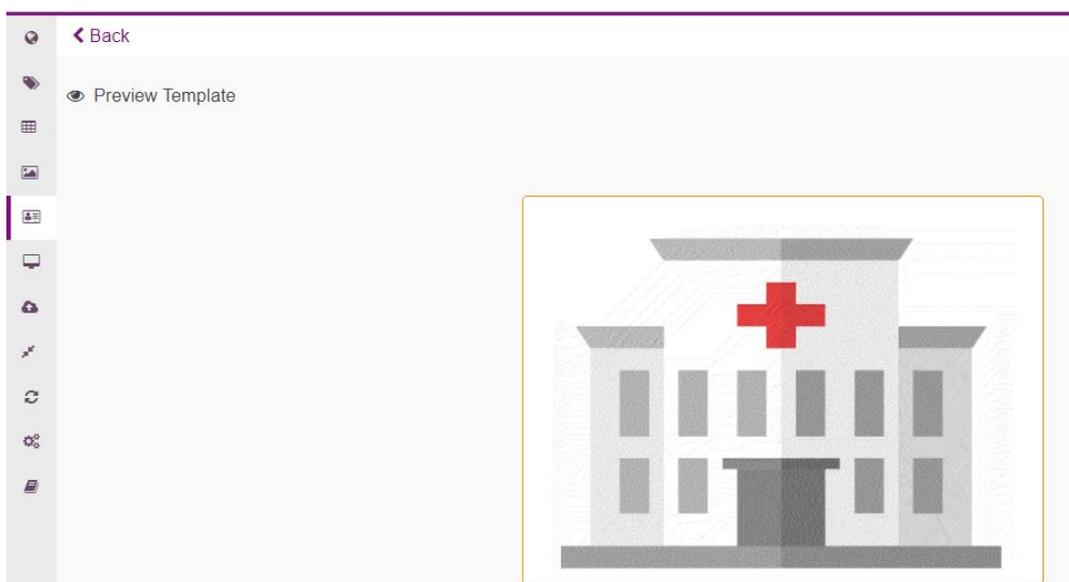
The dithering function is supported by the ePaper Manager for increased clarity of images. Image dithering consists of mapping the original gray image into a binary image. Seeing as our eyes perform spatial integration, it is possible to achieve reasonable results by using a mapping strategy where the gray-intensity values are converted to different densities of black pixels.

The following will demo how to trigger the dithering function in the ePaper Manager.

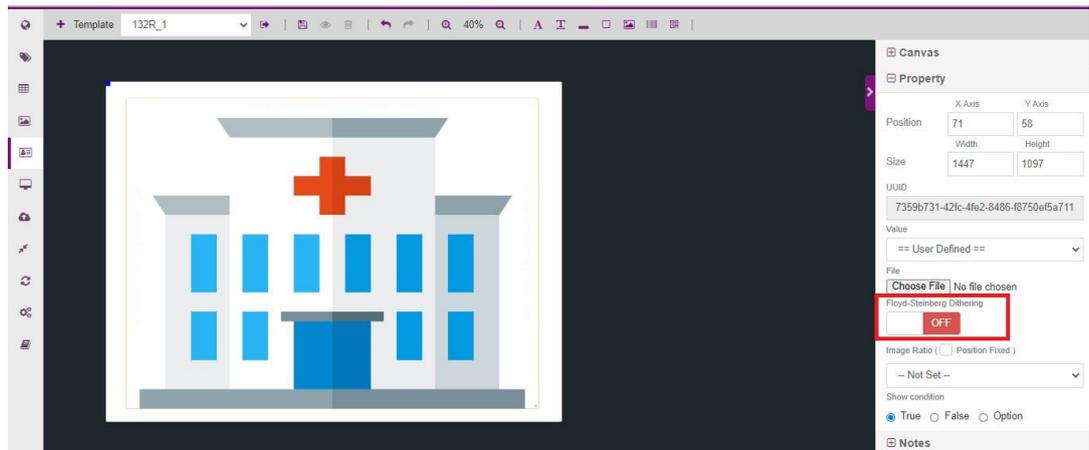
1. Choose an image template and open the dithering function.



2. Click the “**Save**” and “**Preview**” buttons to preview it.



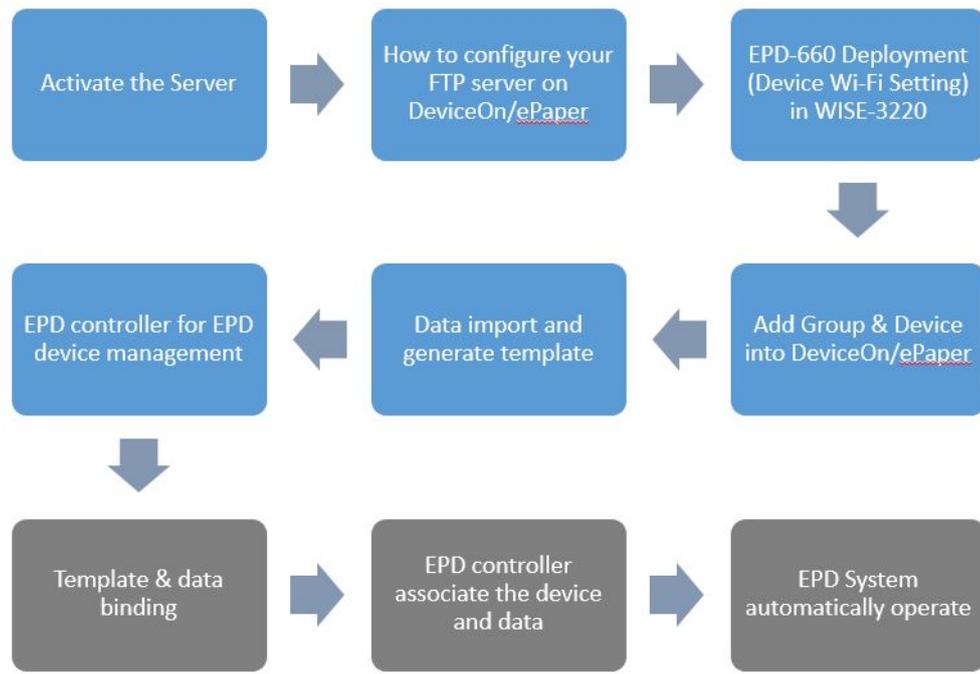
- Then, users can close the dithering function to check the differences between dithering and non-dithering.



- Click **“preview”** again to see the image without dithering applied.



4.3.6 EPD Controller for EPD Device Management



- Select correct account/group where your devices belong to
- Select Preview/Edit mode

EPD Controlling Management												
Account	root	Group	EPD132pcs1502	Status	All	Mode	Device					
Status	Power	RSSI	Mark	Tag Name	Item & Template	Action			Schedule			
Idle	External	-29dBm	NextStation :Module	EPD-132R EPD-Tag-02d814 00000001-0000-0000-0000-e04f4302d814	TAG00002(test) EPD132 new year	Preview	Refresh	Transmit	Cancel	Carousel	Monitor	0 List
Idle	External	-38dBm	NextStation :Module	EPD-132R EPD-Tag-02d9c8 00000001-0000-0000-0000-e04f4302d9c8	TAG00002(test) EPD132 new year	Preview	Refresh	Transmit	Cancel	Carousel	Monitor	0 List
Idle	External	-41dBm	NextStation :Module	EPD-132R EPD-Tag-02d848 00000001-0000-0000-0000-e04f4302d848	TAG00002(test) EPD132 new year	Preview	Refresh	Transmit	Cancel	Carousel	Monitor	0 List
Idle	External	-44dBm	NextStation :Module	EPD-132R EPD-Tag-02d9ec 00000001-0000-0000-0000-e04f4302d9ec	TAG00002(test) EPD132 new year	Preview	Refresh	Transmit	Cancel	Carousel	Monitor	0 List

There are 2 sections within management: Properties & Action.

1) Properties: The user can read EPD device statuses below

- EPD device name
- Panel type
- Data page for the device
- Electricity
- Connection status
- Time of last update

2) Action

- Action: Schedule
 - The user needs to set up a delivery schedule for EPD device data
- Device Task: Select Transmit
 - The user needs to set up an image flash schedule for the EPD device

■ Device Task: Select Refresh

EPD Controlling Management

Account: root Group: EPD132pcs1502 Status: All Mode: Device

Status	Power	RSSI	Mark	Tag Name	Item & Template	Action	Schedule
Idle	External	-29dBm	NextStation :Module	EPD-132R EPD-Tag-02d814 00000001-0000-0000-0000-e04f4302d814	TAG00002(test) EPD132 new year	Preview Refresh Transmit Cancel Carousel Monitor	0 List
Idle	External	-38dBm	NextStation :Module	EPD-132R EPD-Tag-02d9c8 00000001-0000-0000-0000-e04f4302d9c8	TAG00002(test) EPD132 new year	Preview Refresh Transmit Cancel Carousel Monitor	0 List
Idle	External	-41dBm	NextStation :Module	EPD-132R EPD-Tag-02d848 00000001-0000-0000-0000-e04f4302d848	TAG00002(test) EPD132 new year	Preview Refresh Transmit Cancel Carousel Monitor	0 List
Idle	External	-44dBm	NextStation :Module	EPD-132R EPD-Tag-02d9ec 00000001-0000-0000-0000-e04f4302d9ec	TAG00002(test) EPD132 new year	Preview Refresh Transmit Cancel Carousel Monitor	0 List

EPD Schedule Management - 00000001-0000-0000-0000-e04f4302d814

Schedule Name	Action	Mode	Next Execution Time
No matching records found			

Add EPD Schedule - 00000001-0000-0000-0000-e04f4302d814

Schedule Name:

Enable: ON

Device Task:

Working Page:

Timezone:

Period:

Set Time: :

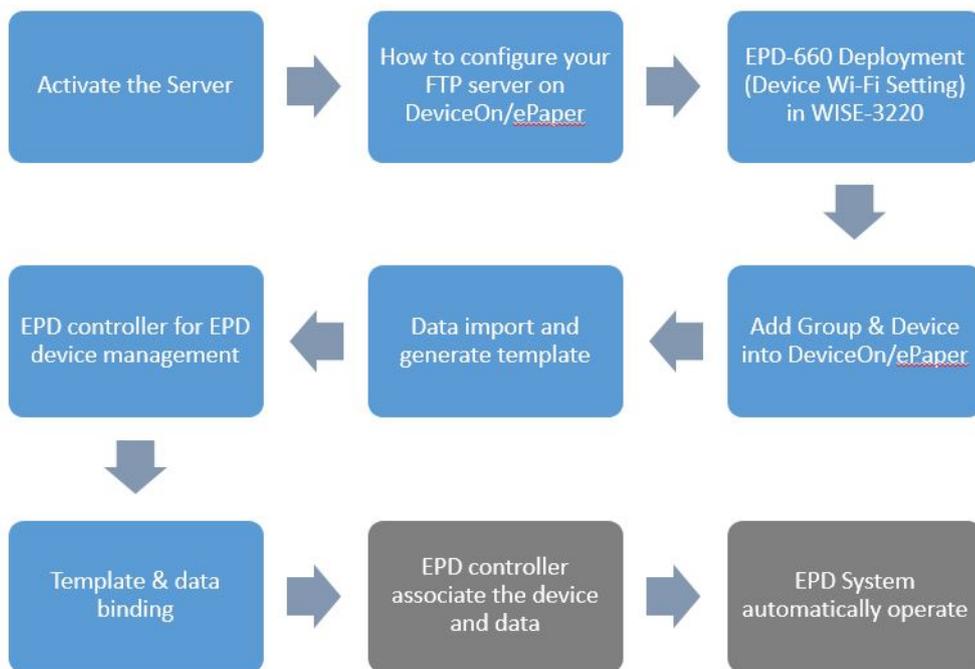
Set Tag Refresh After Tag Transmit: Yes No

Select EPD Type:

Select EPD Item:

Select EPD Template:

- Select EPD Device: select a device to receive the schedule.
- Set Tag Template: you may select an EPD template from your already customized list.
- Working Page: select a page for the EPD device.
- Set up a scheduled date and time in the system.



1. Click the “Save” and “Preview” buttons to preview it.

Status	Power	RSSI	Mark	Tag Name	Item & Template	Action	Schedule
Idle	External	-26dBm	NextStation :Module	EPD-132R EPD-Tag-02dad6 00000001-0000-0000-0000-e04f4302dad6	TAG00002(test) EPD132 new year	Preview Refresh Transmit Cancel Carousel Monitor	0 List
Idle	External	-40dBm	NextStation :Module	EPD-132R EPD-Tag-02dac8 00000001-0000-0000-0000-e04f4302dac8	TAG00002(test) EPD132 new year	Preview Refresh Transmit Cancel Carousel Monitor	0 List
Idle	External	-36dBm	NextStation :Module	EPD-132R EPD-Tag-02dab6 00000001-0000-0000-0000-e04f4302dab6	TAG00002(test) EPD132 new year	Preview Refresh Transmit Cancel Carousel Monitor	0 List
Idle	External	-35dBm	NextStation :Module	EPD-132R EPD-Tag-02daa8 00000001-0000-0000-0000-e04f4302daa8	TAG00002(test) EPD132 new year	Preview Refresh Transmit Cancel Carousel Monitor	0 List

2. Select the data to bind.

roomID	date	ext	subject	nextTime	nextExt	nextAppointer	time	appointer
LK-201	2019.08.02	#8868	meeting	16:30-17:30	#9362		13:00-16:30	
LK-205	2019.08.02	#9631	F/W meeting	FREE			13:00-18:00	
LK-207	2019.08.02	#9438	ME weekly meeting	Yes			14:00-18:00	
LK-203	2019.08.02	#9294	Product Training	FREE			13:30-17:00	
LK-206	2019.08.02	#7097	[Campus Tour]	FREE			09:00-18:30	
LK-202	2019.08.02	#9215	Meeting FST	FREE			14:00-16:30	
LK-109	2019.08.02	#3542	Unify	15:30-18:00	#9001		09:00-15:30	
LK-111	2019.08.02	#9560	meeting	15:30-18:00	#9001		13:30-15:30	
LK-102	2019.08.02			15:30-18:00	#9001			

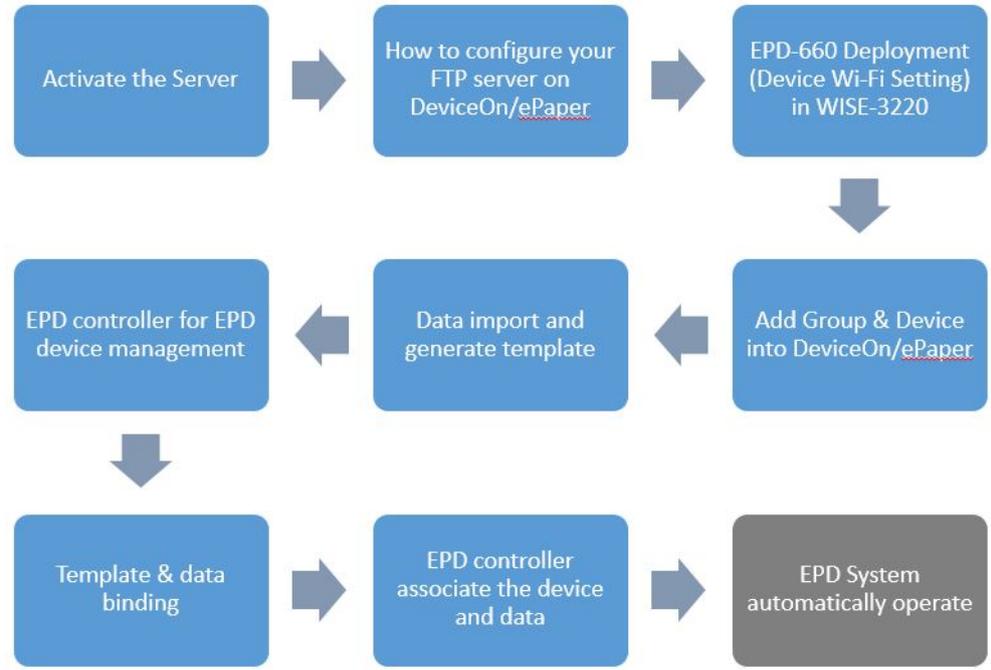
Showing 1 to 9 of 9 rows

Note! Users can import data and bind data to the EPD device on this web page.



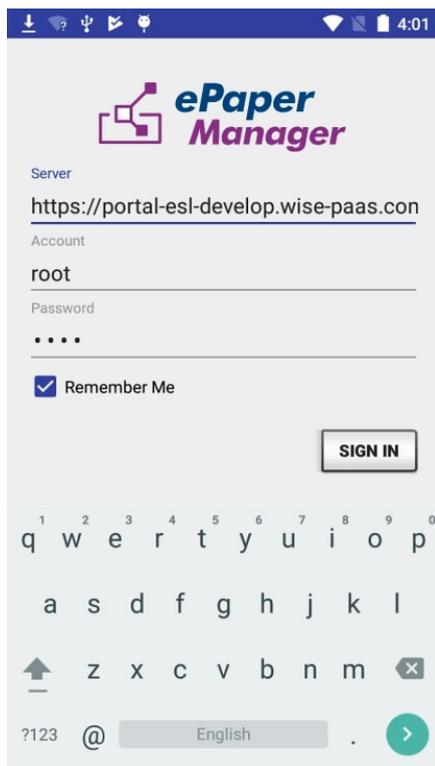
We also offer to users a handset app to bind device data and EPD as follows. Users can then complete this binding task.

3. Binding Product item data with APP.

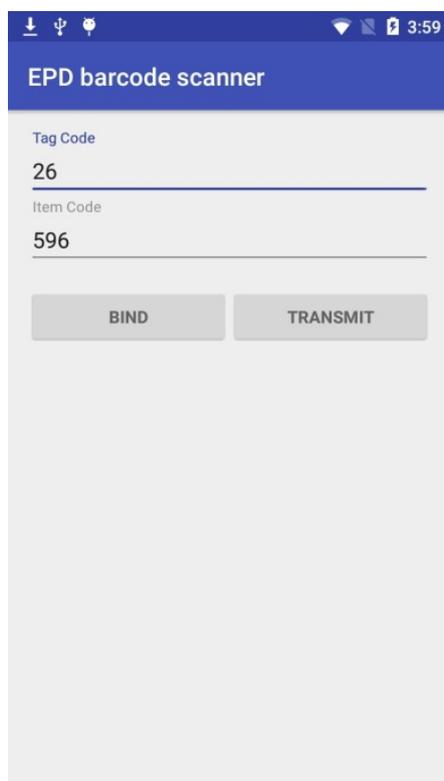


- Install on the barcode scanner handset.
- Use a PWS-472 barcode scanner to scan the EPD device MAC address barcode and target product barcode.
- DeviceOn/ePaper associated app:
Download and install the EPM Barcode Scanner app on the PWS-472 device. This device is a 5" industrial-grade hand-held terminal with a 1D barcode scanner. You will then see the icon  on your desktop.

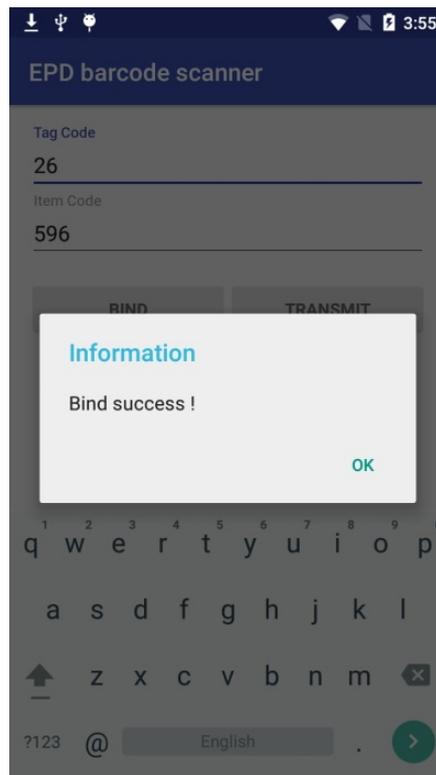
Please check that your device is linked with the Internet. Launch the app by clicking the icon.
Enter the server location, account, and password to sign in to the ePaper Manager.



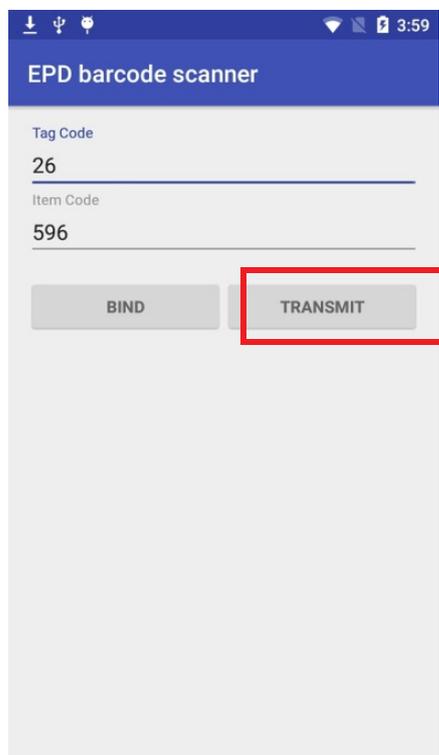
Enter your Tag Code and Item Code information to complete the binding action.



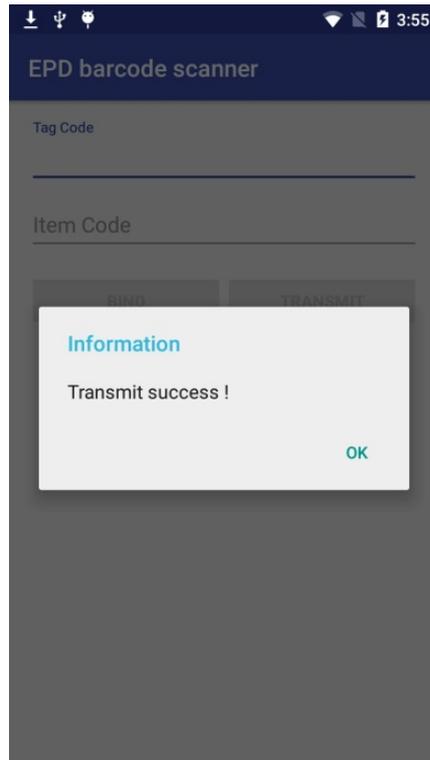
The PWS-472 device can scan a barcode quickly, which fills in the device code and item code fields. A “Bind Success!” window will pop up.



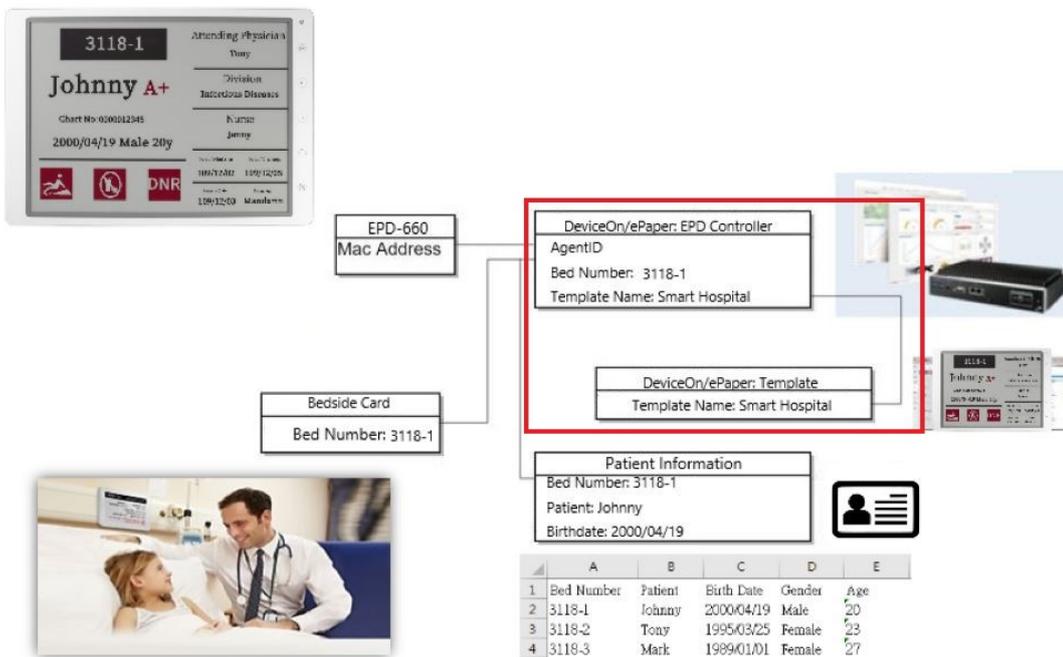
Click the “**Transmit**” button to transmit an image to tag a device.

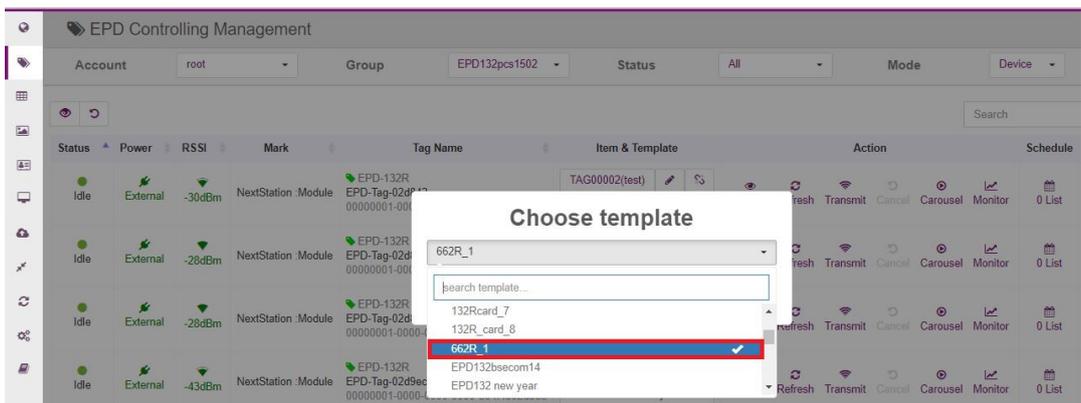
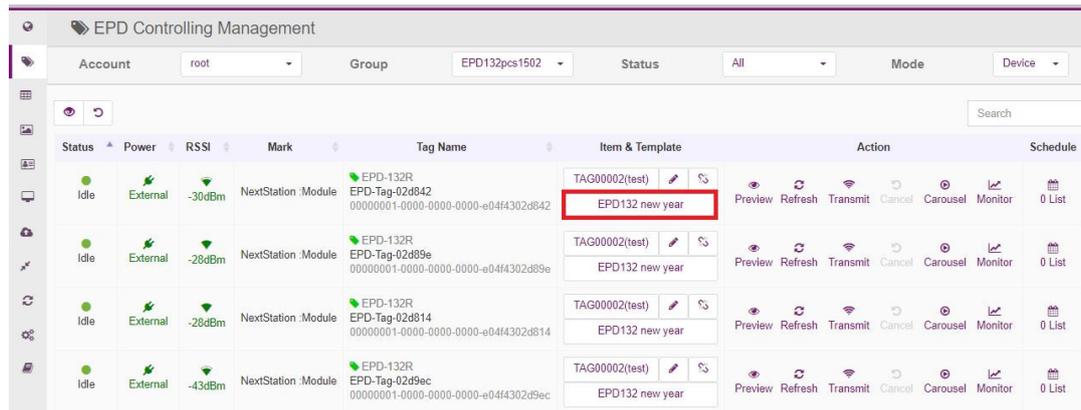


A window will pop up to show “Transmit success”.



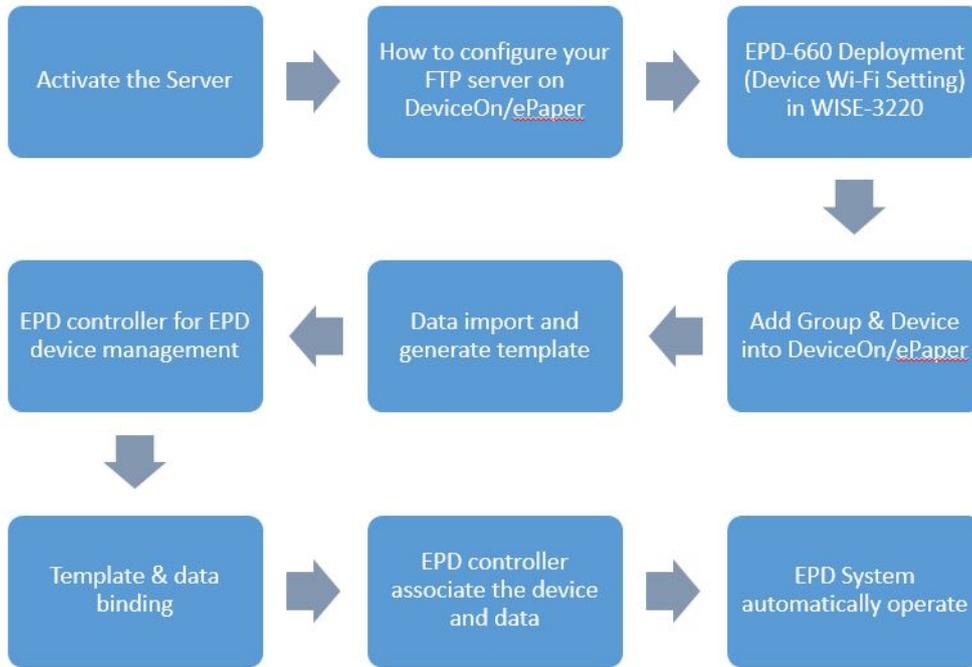
4. Binding template.





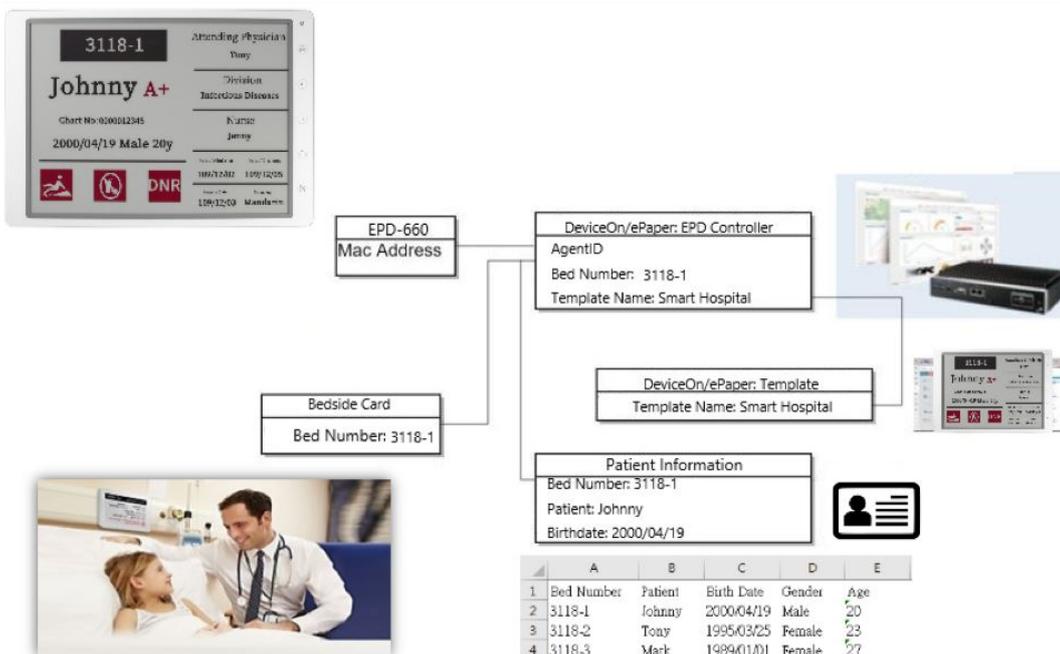
- There are 4 actions for you to select from:
 - Preview: Current EPD device image preview.
 - Refresh: Refresh an image.
 - Transmit: Transmit an image.
 - Unbind the EPD device from the item.
 - Carousel: The EPD images can be displayed in rotation with a desired time interval.
 - Monitor: Allows users to monitor the RSSI, battery, and voltage status of devices in the decided time range.
 - Schedule: Users can set up the schedule for refreshing images by group or separate device.

4.3.7 Final Association Between EPD Device, Target Product, and Product Data

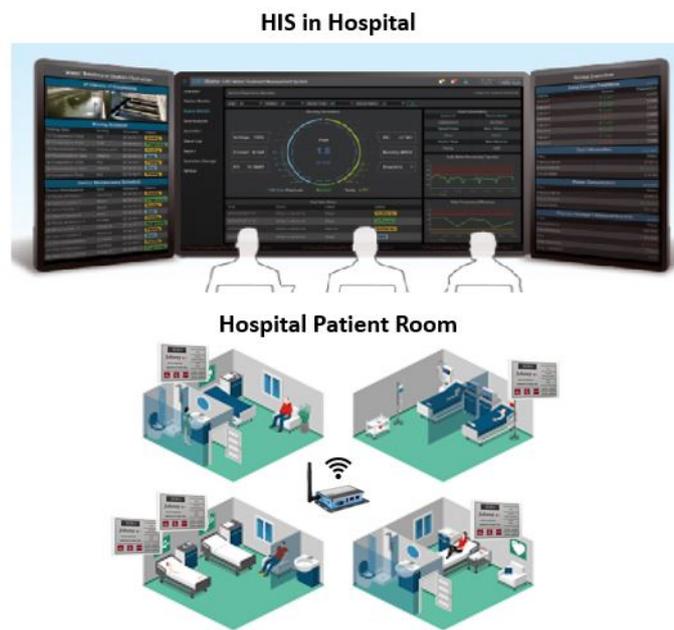


Tag Name	Item & Template
EPD-132R Product model EPD-Tag-02d842 Agent ID 00000001-0000-0000-0000-e04f4302d842 MAC Address	Target Bed Number 3118-1(EPD-660 and 662 import file) 662R_1

1. EPD device: MAC address, agent ID number and target bed number.
2. Target Item Product: Get a physical bed number as an associated attribute.
3. Patient Information that needs to be included: bed number, patient, birth date.



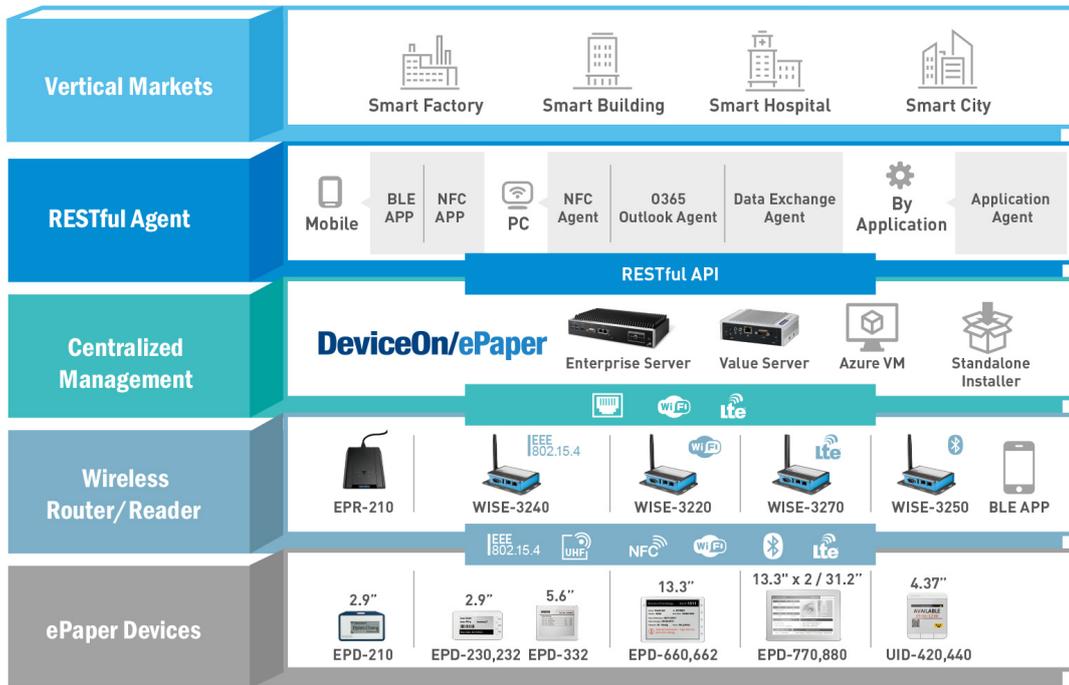
4.3.8 Smart Hospital Scenario



1. EPD device in standby mode shows patients' information and bedside card status.
2. Hospital administrators can monitor patients' situations and information such as name, gender, age, attending physician, and more.

4.4 Integrating EPD APIs into Your System

We provide easy-to-use APIs to help you integrate into your own system. Below is an example for you to understand how it can be integrated into your system with our RESTful API.



The vertical application needs to send the API to DeviceOn/ePaper. Some sample code is shown below.

1. Our API in Javascript: `setItemData` to update data into DeviceOn/ePaper and DeviceOn/ePaper will help forward the data to EPD.

```
// update Item Data
function setItemData(){
    var url = HOST + '/esl/v1/items';
    var type = 'PUT';
    var data = {
        "items": [ JSON.parse($('#log').val()) ]
    };
    console.log(data);

    api(url, type, data, function(res){
        if(res && res.result)
            alert("Item Successfully Updated!");
        else
            alert("Ajax request error!");
    });
}
```

2. Users also can use our API: `setSensorData` to control EPD LED.

```
// set LED light
function setSensorData(){
    var agentid = $('#agentid').val();
    var plugin = $('#plugin').val();
    var sensorId = $('#sensorId').val();
    var    sensorValue    =    parseInt($('#sensor-
Value').val());

    var url = HOST + '/esl/v1/devicectl/data';
    var type = 'POST';
    var data = {agentId: agentid, plugin: plugin,
sensorIds: [{n: sensorId, v: sensorValue}]};

    api(url, type, data, function(res){
        console.log(JSON.stringify(res));
        if(res && res.items && res.items.length > 0
&& (res.items[0].statusCode === 202 || res.items[0].statusCode
=== 200)){
            alert("Update Sensor Data Command Sended!")
        } else {
            alert("Ajax request error!");
        }
    });
}
```

4.4.1 EPD Data Update API

1. Upload EPD Data.

- path: /esl/v1/items
- method: POST
- header: Basic Authorization
- body parameters:
 - code: string
 - name (group name): string
 - content: JSON string
- body(example)


```
{ "items": [ { "code": "X001", "name": "John", "content": "{\"name\": \"John\", \"age\": \"18\"}" } ] }
```
- response(example)


```
{ "result": true }
```

2. Upload EPD Data for a specific item group.

- path: /esl/v1/items/name/{name}
- method: POST
- header: Basic Authorization
- body parameters:
 - code: string
 - name (group name): string
 - content: JSON string
- body(example)


```
{ "items": [ { "code": "X001", "name": "John", "content": "{\"name\": \"John\", \"age\": \"18\"}" } ] }
```
- 3. response(example)


```
{ "result": true }
```

3. Update EPD Data.

- path: /esl/v1/items
- method: PUT
- header: Basic Authorization
- body parameters:
 - code: string
 - name (group name): string
 - content: JSON string
- body(example) (Notes: you have to give all content in body even if you only need to edit partial content)


```
{ "items": [ { "code": "X001", "name": "John", "content": "{\"name\": \"John\", \"age\": \"20\"}" } ] }
```
- response(example)


```
{ "result": true }
```

4. Delete EPD Data.

- path: /esl/v1/items
- method: DELETE
- header: Basic Authorization
- body parameters:
 - code: string
- body(example)


```
{ "items": [ { "code": "X001" } ] }
```

- response(example)


```
{ "result": true }
```
- 5. **Get EPD Tag Agent ID.**
 - path: /esl/v1/tags/agentid
 - method: GET
 - header: Basic Authorization
 - url parameter: ?itemcode=[ITEM CODE]
 - response(example)


```
{ "agentid": "00000001-0000-0000-0012-4b001557aa72" }
```
- 6. **Get EPD Tag Status.**
 - path: /esl/v1/tags/status
 - method: GET
 - header: Basic Authorization
 - url parameter: ?agentid=[DEVICE AGENT ID]
 - response(example) (Notes: all possible status are "sending command", "command timeout", "setting image", "set image okay", "set image error", "refreshing image", "refresh image okay", "refresh image error")


```
{ "status": "set image okay" }
```
- 7. **Set EPD Tag Binding.**
 - path: /esl/v1/tags/setBinding
 - method: POST
 - header: Basic Authorization
 - body parameters:
 - agentid: string
 - templatename: string
 - body(example) (Notes: you must provide "agentid" or "did" in body, and for other parameters as follows, you only need to give at least one: "tid or templatename", "iid or itemcode", "mid")


```
{ "agentid": "00000001-0000-0000-0012-4b001557a500", "templatename": "Abnormal-English" }
```
 - response(example)


```
{ "result": true }
```
- 8. **Set EPD Tags Binding.**
 - path: /esl/v1/tags/setBindings
 - method: POST
 - header: Basic Authorization
 - body parameters:
 - agentid: string
 - templatename: string
 - body(example) (Notes: you must provide "agentid" or "did" in body, and for other parameters as follows, you only need to give at least one: "tid or templatename", "iid or itemcode", "mid")


```
{ "bindings": [ { "did": 32, "itemcode": "Stop0002", "templatename": "Bus Stop Demo Init" }, { "agentid": "00000001-0000-0000-0012-4b001557a682", "itemcode": "Stop0002", } ] }
```
 - response(example)


```
{ "result": true }
```
- 9. **Transmit Image.**
 - path: /esl/v1/tags/setImage
 - method: POST

- header: Basic Authorization
- body parameters:
 - agent id: string
 - refresh(optional, default: 1): number [available values: 1: Refresh after transmit, 0: Just store image to ESL tag memory]
 - page(optional, default: 0): number [available values: 0 ~ maxpagesize-1]
- body(example)


```
{ "agentid": "00000001-0000-0000-0012-4b001557aa72", "refresh": 1, "page": 0 }
```
- response(example)


```
{ "status": "setting image" }
```
- 10. **Transmit Image with Item Data.**
 - path: /esl/v1/tags/setImageWithData
 - method: POST
 - header: Basic Authorization
 - body parameters:
 - agent id: string
 - item: JSON
 - code: string
 - name (optional): string
 - content (optional): JSON string
 - refresh (optional, default: 1): number [available values: 1: Refresh after transmit, 0: Just store image to ESL tag memory]
 - page (optional, default: 0): number [available values: 0 ~ maxpagesize-1]
 - body(example)


```
{ "agentid": "00000001-0000-0000-0012-4b001557aa72", "item": { "code": "Stop0001", "name": "Taipei 101", "content": "{\\"Stop_Name\\":\\"Grand Hotel\\",\\"Route1 Name\\":\\"Test\\"}" }, "refresh": 1, "page": 0 }
```
 - response(example)


```
{ "itemStatus": "update item okay", "status": "set image okay" }
```
- 11. **Refresh Image.**
 - path: /esl/v1/tags/refreshImage
 - method: POST
 - header: Basic Authorization
 - body parameters:
 - agent id: string
 - page(optional, default: 0): number [available values: 0 ~ maxpagesize-1]
 - body(example)


```
{ "agentid": "00000001-0000-0000-0012-4b001557aa72", "page": 0 }
```
 - response(example)


```
"status": "refreshing image" }
```
- 12. **Get Item.**
 - path: /esl/v1/items/itemcode/{itemcode}
 - method: GET
 - header: Basic Authorization
 - response(example)


```
{ "code": "Tag_00001", "iid": 243, "name": "RunCard", "content": "{\\"Tag_Number\\":\\"Tag_00001\\",\\"Template_ID\\":\\"RunCard\\",\\"WorkOrder\\":\\"YSI5001ZA\\",\\"PartNumber\\":\\"DLV8315-1J30000\\",\\"Qty\\":\\"20\\",\\"Station\\":\\"Assy\\",\\"NextStation\\":\\"BurnIn\\",\\"Arrival-
```

```
Time\":"5/22/18 9:11\", \"LeaveTime\":"\", \"StayTime\":"0\", \"Cau-
tions\":"\", \"Remark\":"\" } }
```

4.5 DeviceOn/ePaper Feature List

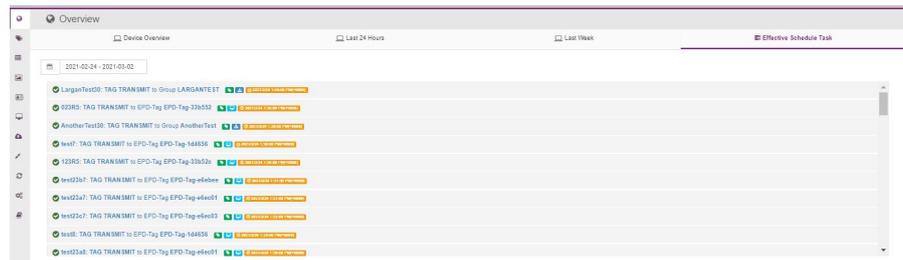
4.5.1 Component List

Table 4.2: Component List



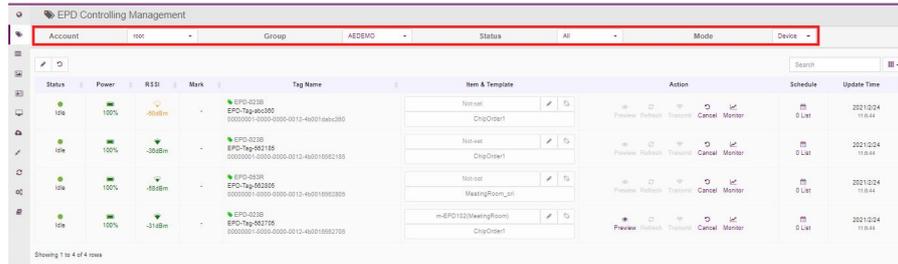
Dashboard

1. Device Status: Provide EPD device status in the system.
2. Battery Status: Show battery status on the EPD device.
3. EPD Device: Show image update status.



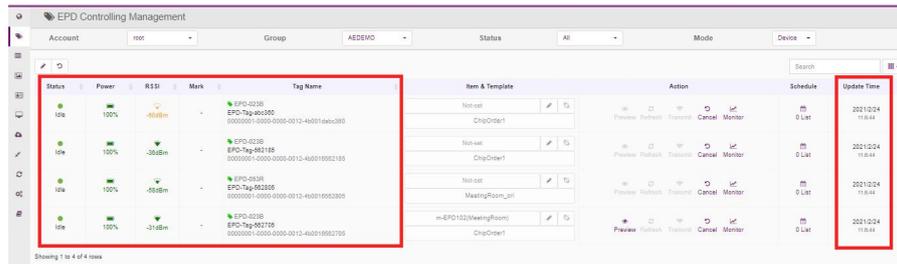
4. Schedule Task: Users can select the current schedule in the system.

EPD device search



EPD Controller

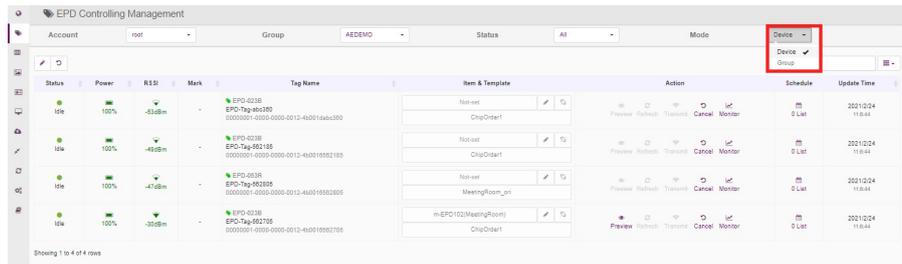
Search criteria
Account/Group/Connecting Status/EPD Device Mode
Properties



Name/Panel type/total page/Connecting status/Update Status

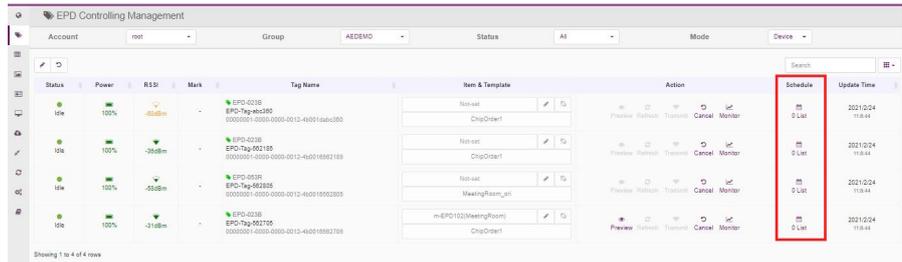
Schedule (4.5.1 Continued)

Initial Stage: Select the mode (Device/Group) for schedule setting. First, the Device Mode is shown.



Device Mode

1. Choose the desired item to make the schedule.

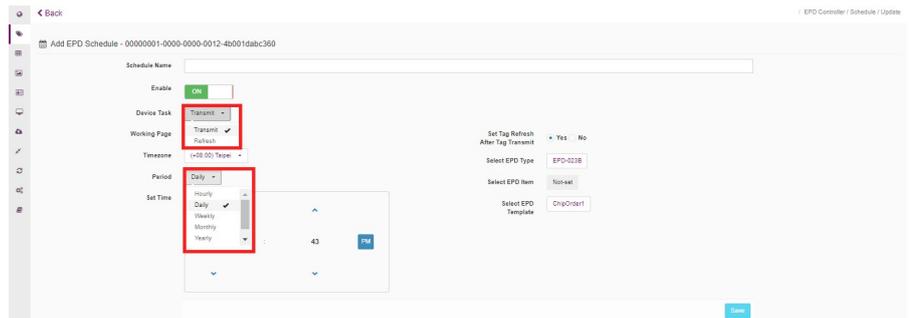


2. Click the “Add” icon to for schedule making.

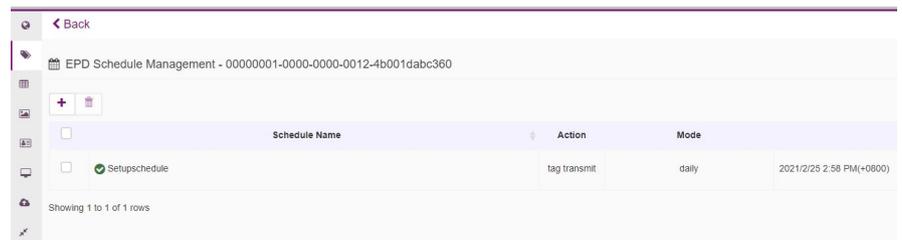
Action



3. The users can set up Transmit/Refresh as a scheduled task daily/weekly/monthly/yearly. Users can choose EPD Type, Item and Template of the schedule.

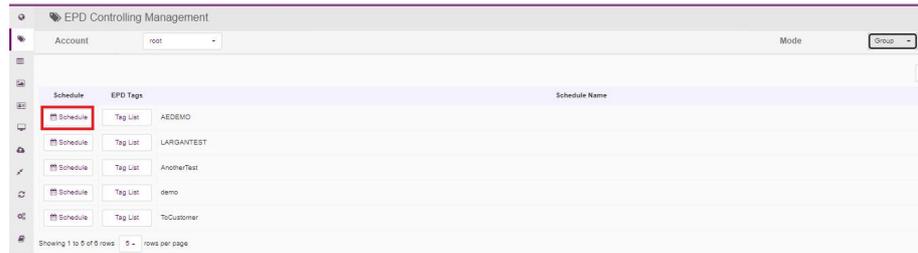


4. After “Save” is clicked, the arranged schedule will be added in the list.

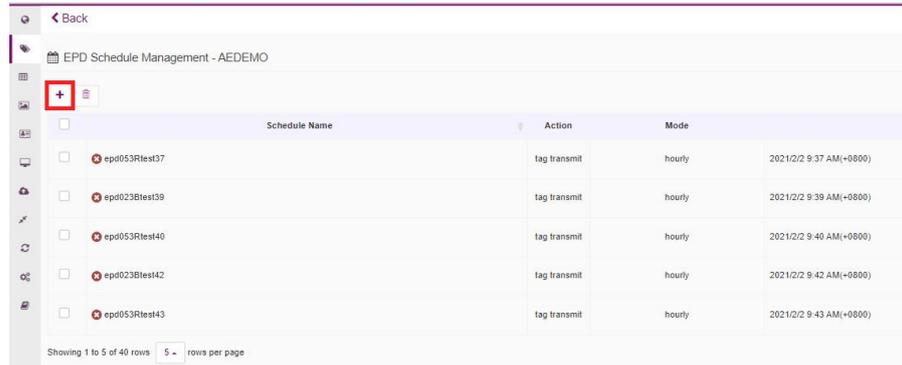


Group Mode

1. Choose the desired group to make the schedule.

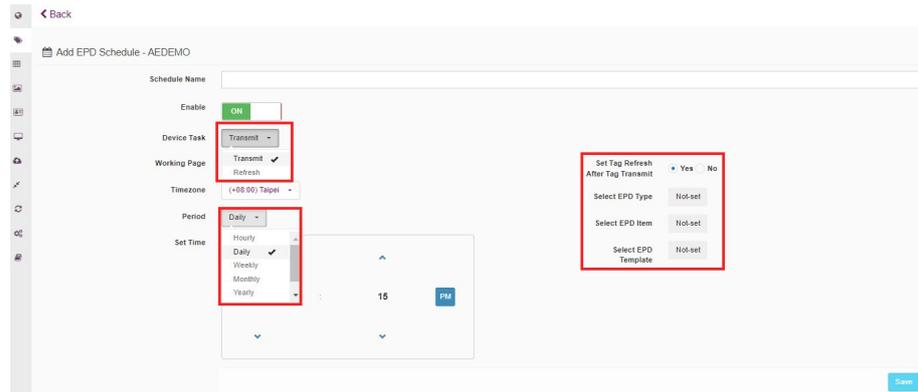


2. Click the "Add" icon for schedule creation.

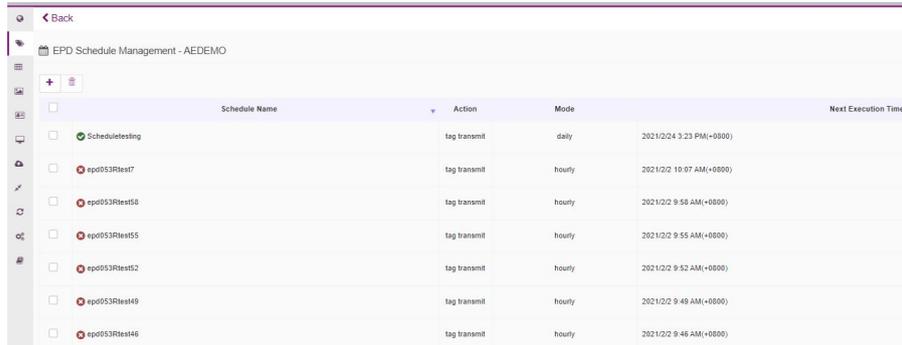


3. The users can set up Transmit/Refresh as the scheduling task daily/weekly/monthly/yearly, and choose EPD Type, Item and Template of a schedule.

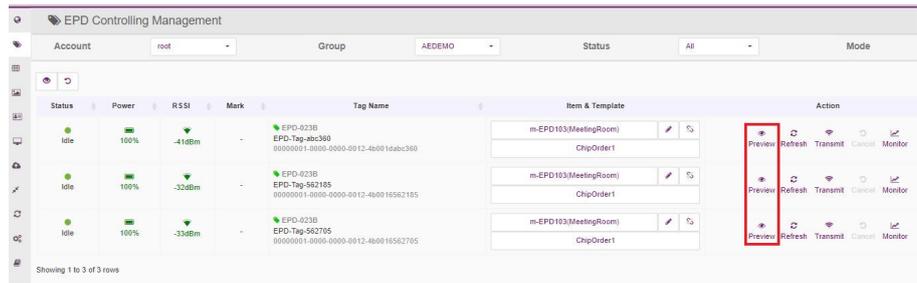
Action



4. After "Save" is clicked, the arranged schedule will be added to the list.



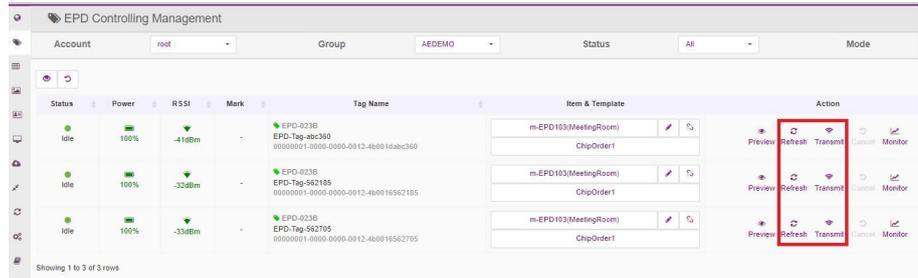
Preview



Users can preview the EPD device image.

Action

Transmit



1. Users can reflash the image on the EPD device.
2. User can transmit images to the EPD device.
3. Users can click "**Transmit**" or "**Refresh**" for the device. Users can click "**Reset**" to cancel the execution.

Import ITEM Data

Rules for Uploading Item Data

Now we support three file types: JSON, Excel, and CSV.

- JSON format (Example, JSON file must be UTF-8 encoded)


```

            {
              "items": [
                {
                  "code": "X001",
                  "name": "GroupName",
                  "location": "BA101",
                  "content": [{"id": "X001", "location": "BA101"}]
                },
                {
                  "code": "X002",
                  "name": "GroupName",
                  "location": "BA102",
                  "content": [{"id": "X002", "location": "BA102"}]
                }
              ]
            }
            
```
- Excel/CSV format (Example, CSV file must be UTF-8 encoded)

* The first column will refer to as the unique id for item data (itemcode), and the second column will refer to as a tag device location mark (itemlocation)

id	location	name	age
X001	BA101	John	18
X002	BA102	Sally	23

Supports CSV, Excel, and JSON formats

Add new data to the current item.

Item Data

The screenshot shows the 'Item Data Management' interface with the 'MeetingRoom' tab selected. A red box highlights the '+ Add' icon in the top toolbar. The table below shows item data with columns: date, ext, subject, nextTime.

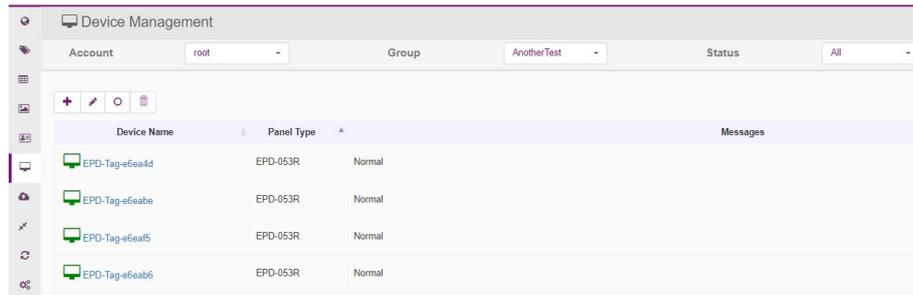
date	ext	subject	nextTime
2020-12-31			14:00~14:30
2020-12-31			FREE
2020-12-31			FREE
2021/01/11	2857	ROSA客人稽核	
2021/01/11		672005 ; 年终总结	

Working Group

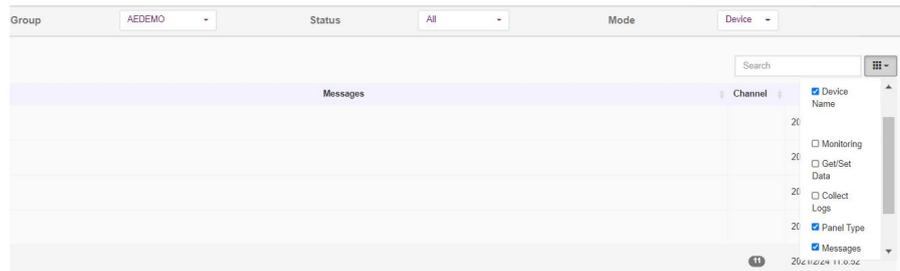
The screenshot shows the 'Item Data Management' interface with the '+ Add' button highlighted in a red box. A red arrow points from the button to a modal window titled 'Please enter a group name' which contains an input field and 'OK' and 'Cancel' buttons.

1. Users can have different working groups in the same system.
2. Users can add a new group by clicking the "Add" icon.

Device search including EPD devices, Routers and Hubs.



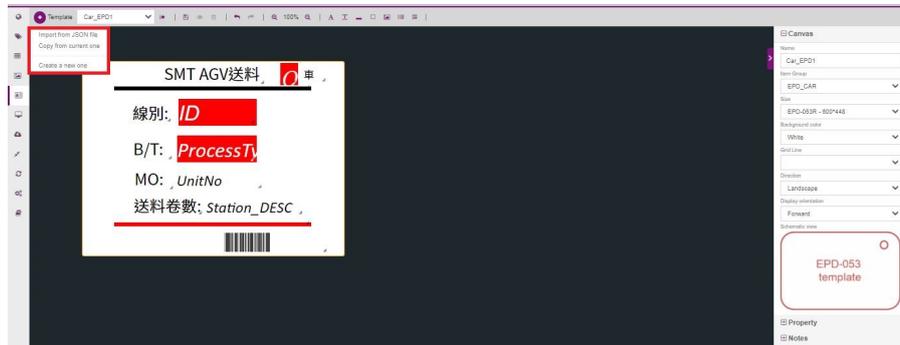
Device List
 Search criteria
 Account/Group/Connecting Status/EPD Device Mode
 Action



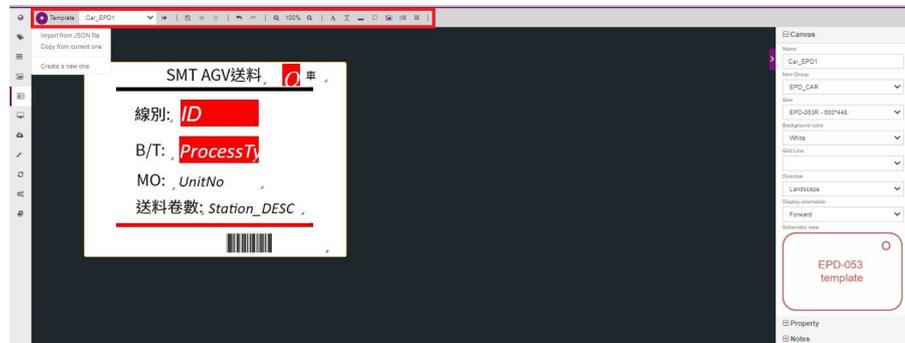
Remote Control Device:

1. The default columns are “Name” and “Messages”.
2. Users can click the icon at the right to select more fields: Monitoring, Get/ Set Data, and more.

Template



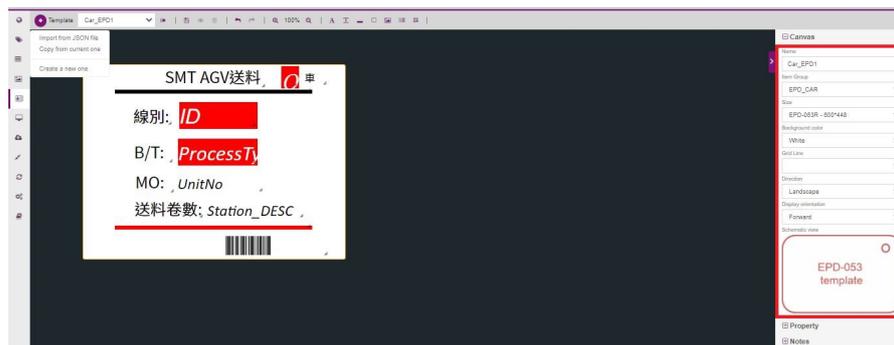
Users can create a new template, import from a JSON file, or copy from the current one.



Provide Image Tool

Save/Preview/Delete/Previous Movement or Next Movement/Zoom-in or Zoom-out/Dynamic or Static Text/Shape/Image/Barcode/QR Code.

Users may save the template and then go to the EPD controller to bind the template with the EPD device.



Template Name: Users can enter the template name here

Item Group: Users can select the created item group

EPD Size: Users can choose 2.9", 5.6", 13.2", or 32"

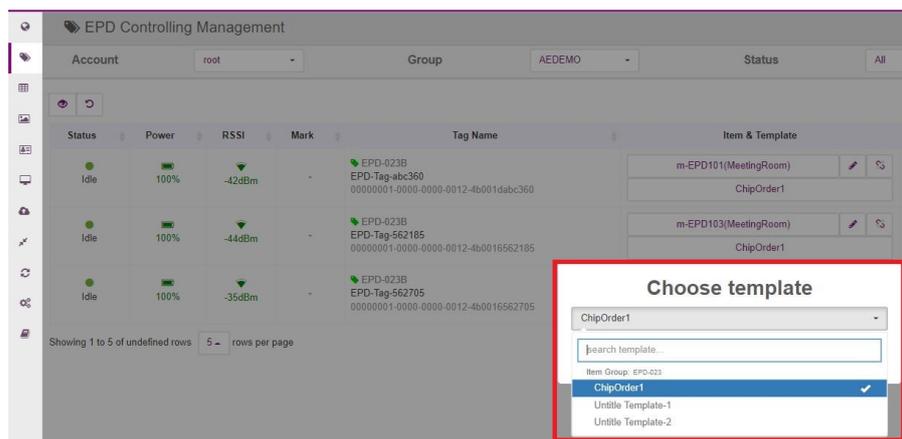
Background Color: White/black/red

Grid Line: Yes/No

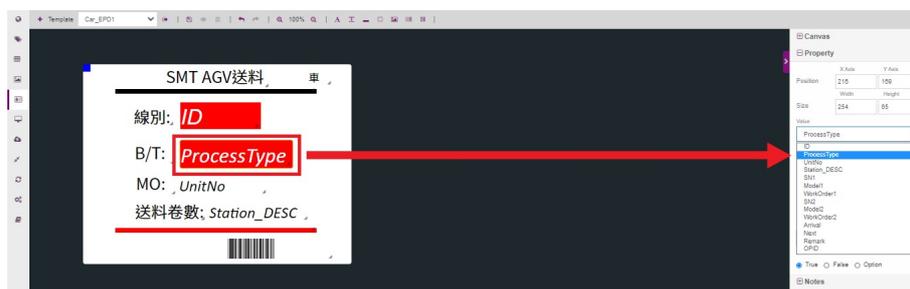
Direction: Portrait/landscape

Display orientation: Forward/reverse

Schematic View



1. The EPD controller should set up the binding template.

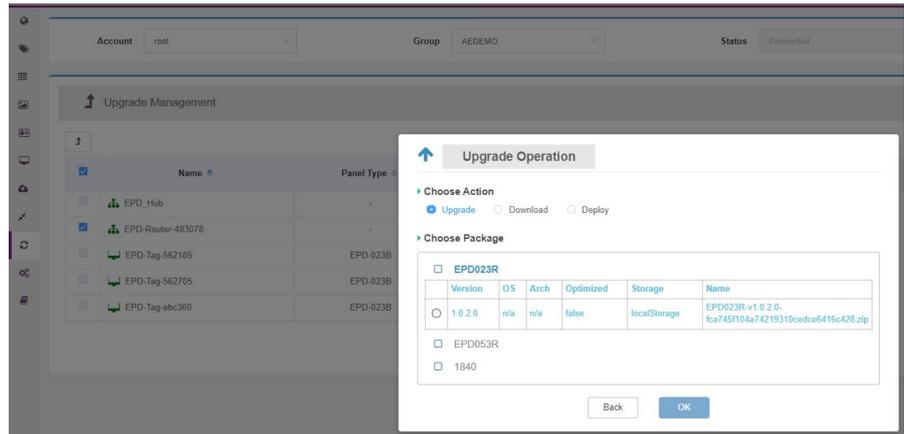


1. Select a component.

2. Right side shows component properties.

3. Select the field "Value" and the drop-down menu will show the data fields.

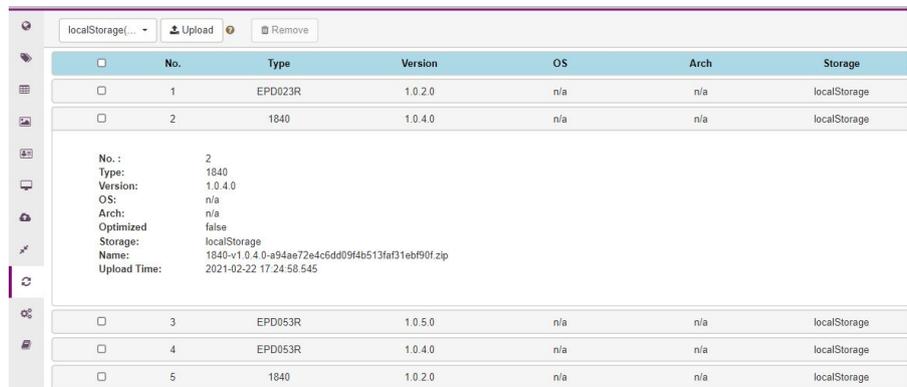
Upgrade



OTA

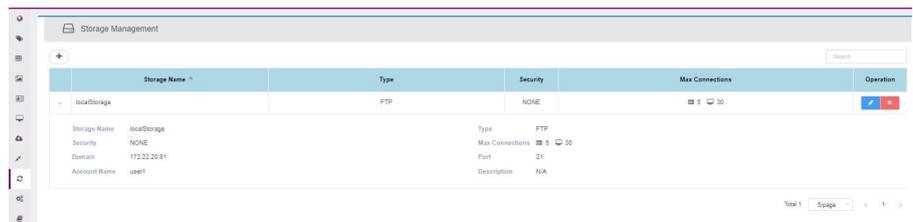
Select upgrade device

Package

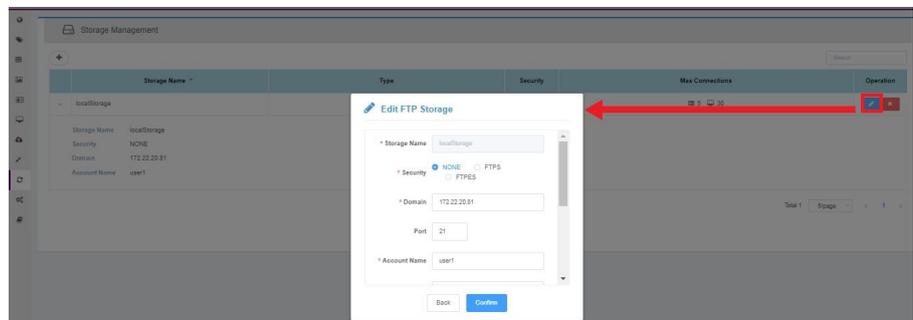


File preparing for the upgrade

Storage



OTA



FTP & file path settings

Setting

Role

Name	Description
super admin	Super Administrator
admin	System Administrator
device admin	Device Administrator

Definitions

- Super Admin: Super Administrator
- Admin: System Administrator
- Device Admin: Device Administrator

Account & Group

Name	Email	Phone
root	root@advantech.com.tw	Not set

Group Name	Parent Group	Child Groups	Description
DEMO	Not Set	Not Set	Not Set
LARGANTEST	Not Set	Not Set	Not Set
AnotherTest	Not Set	Not Set	Not Set
demo	Not Set	Not Set	Not Set
TICustomer	Not Set	Not Set	Not Set

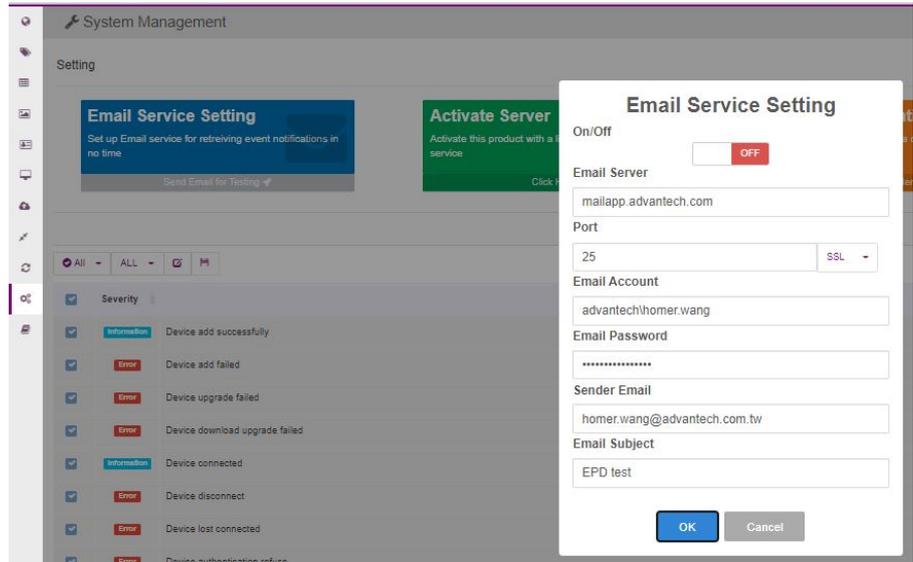
Set the device into a group.

Email Service

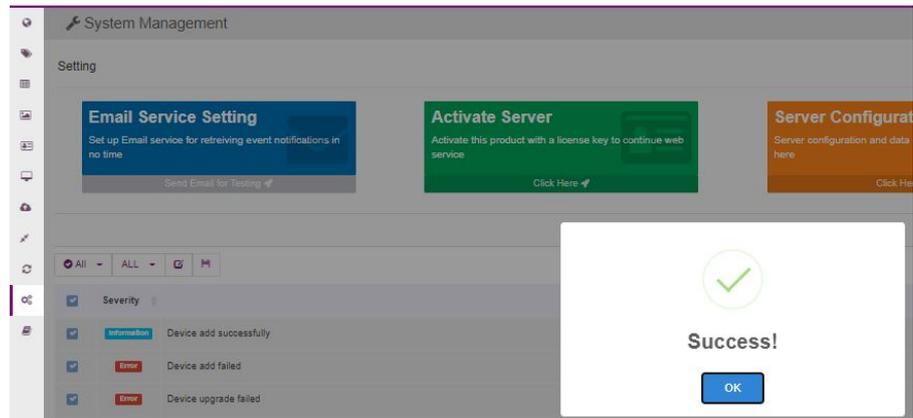
1. Click the **“System”** button under the **“Setting”** list.

The screenshot shows the 'System Management' interface. At the top, there are four main settings cards: 'Email Service Setting', 'Activate Server', 'Server Configuration', and 'Rule Setting'. Below these is a navigation bar with 'Device', 'Operation', and 'System' tabs. A dropdown menu is open under the 'Setting' tab, listing options: 'Role', 'Account', 'Device Group', 'System', and 'Event'. The 'System' option is highlighted with a red box.

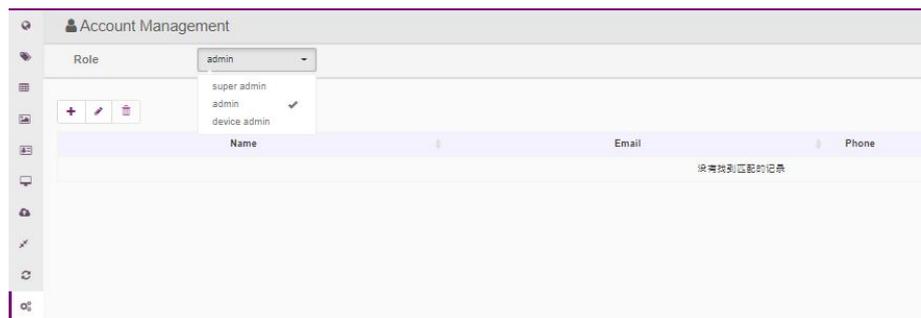
2. Click “**Email Service Setting**” and fill in the following form.



3. Setting successfully completed.



4. Add an email account list for this service. Click the “**Account Management**” button under the setting list.

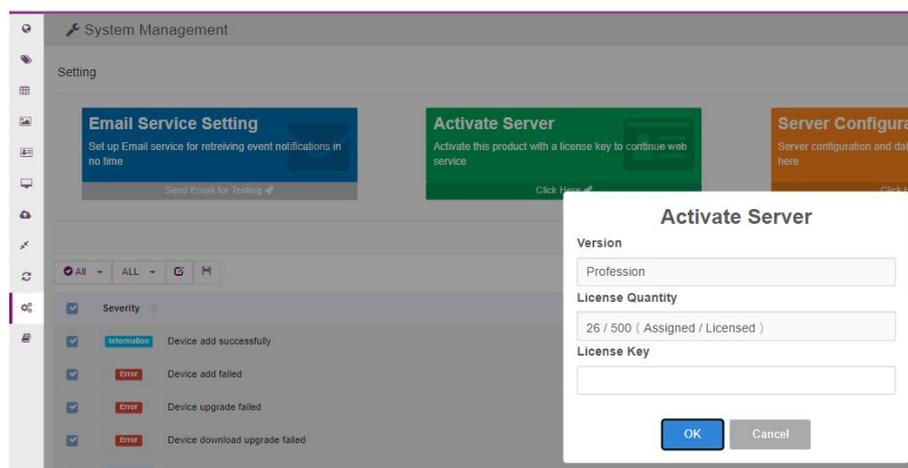


5. Add an admin account. Click the **“Save”** button. An email will be sent to this local user when an event occurs.

The screenshot shows a user creation form with the following fields:

- Role: admin
- Account Name: Enter account name
- Password: Enter password
- Email: Enter email. For example, xxx.xxx@advantech.com.tw, xxxxxxxx@gmail.com, xxxxxxxx@hotmail.com
- First Name: Enter first name
- Last Name: Enter last name
- Phone(optional): Enter phone

A **Save** button is located at the bottom right of the form.



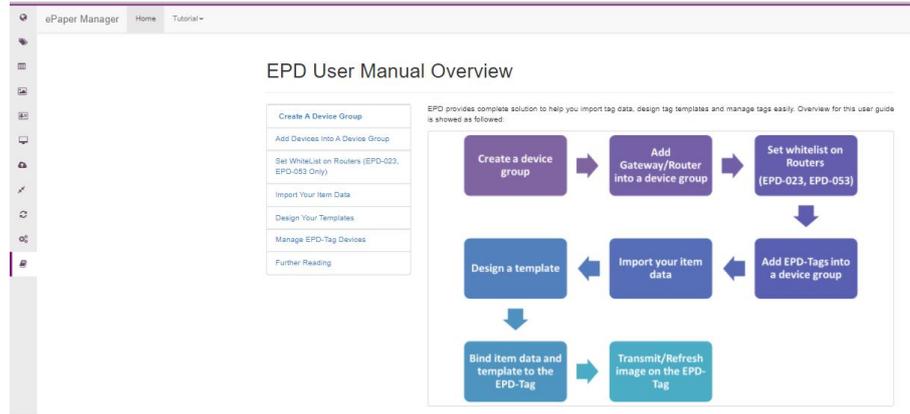
Add an EPD connection number license.

Events

The screenshot shows the 'Event Management' interface. It includes a calendar view for February and March 2021, and a table of events. The table has columns for Time, Type, and Severity.

Time	Type	Severity
2/26/2021, 3:23:00	Device	Error
2/26/2021, 3:23:00	Device	Error
2/26/2021, 3:23:00	Device	Error
2/26/2021, 2:58:59	Device	Error
2/26/2021, 1:28:54	Device	Information
2/26/2021, 1:28:53	Operation	Information
2/26/2021, 1:28:53	Device	Information
2/26/2021, 1:28:53	Operation	Information
2/25/2021, 6:05:26 PM	EPD-Router-483078	Information
2/25/2021, 6:05:25 PM	EPD-Router-483078	Information
2/25/2021, 6:05:25 PM	EPD-Router-483078	Information
2/25/2021, 6:05:24 PM	EPD-Router-483078	Information

Users can query events by clicking the calendar.



Document

EPD Restful API

User Guide - URL Path

The full format of URL Path for ePaper Manager RESTful API is "http(s)://[ePaper Manager Server IP or Domain Name]:[Port]/[Relative Path of API]"

`http://172.22.20.81:8080/API/fofomt`

item

item - Create Items for Specific Group

Create items for a specific item group. (Notice: This Api will DELETE ALL items in this item group, and create new items.)

POST

`/rest/v1/items/name/:group-name>`

Request Example(json)

```

{
  "items": [
    {
      "code": "X801",
      "name": "Groupname",
      "location": "80101",
      "content": "[{"id": "X801", "name": "John", "age": "20"}]"
    }
  ]
}
  
```

User Manual
RESTful API

Chapter 5

EPD-660.662 APP WiFi
Connector

5.1 EPD-660.662 APP Wi-Fi Connector

5.1.1 Introduction

The Advantech EPD APP Wi-Fi Connector provides a quick device IP setting to connect servers with EPD-660 and EPD-662 devices. End users are able to operate the IP setting by the APP which is provided by Advantech. Using smartphone connections, the IP of the ePaper server, and the router, the EPD-660 and EPD-662 can easily be set up.

5.1.2 Device IP Setting Flow

Note! Mobile phones need to have same domain as the server

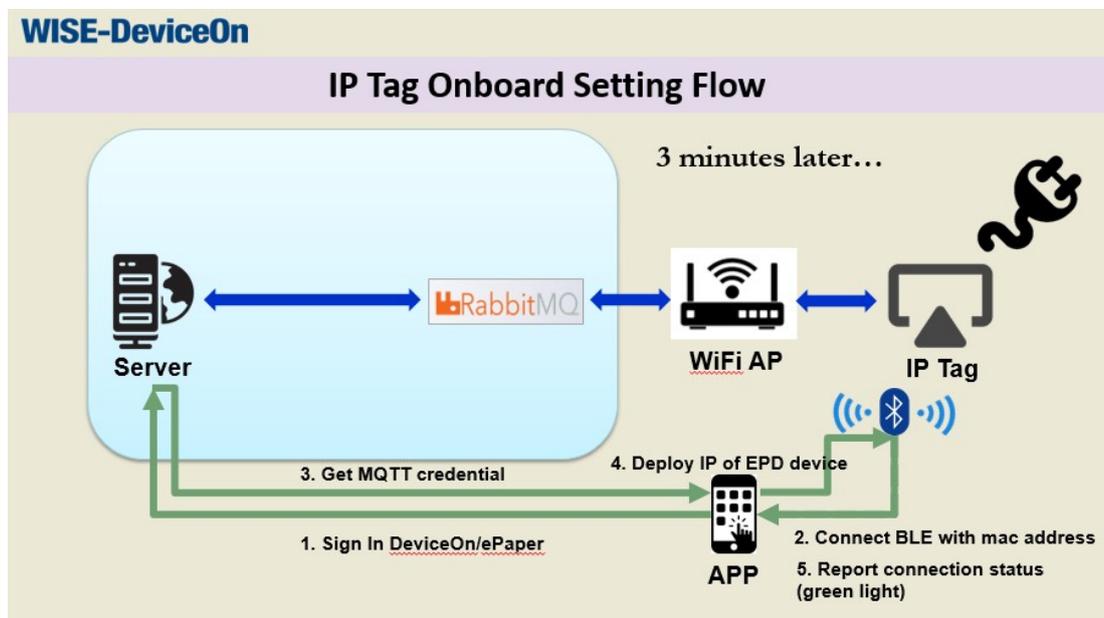


Figure 5.1 Device APP Wi-Fi connector Setting Flow

5.1.3 Installation

5.1.3.1 Download APP for Android and ISO

1. Keyword: EPD Wi-Fi connector



Google Play

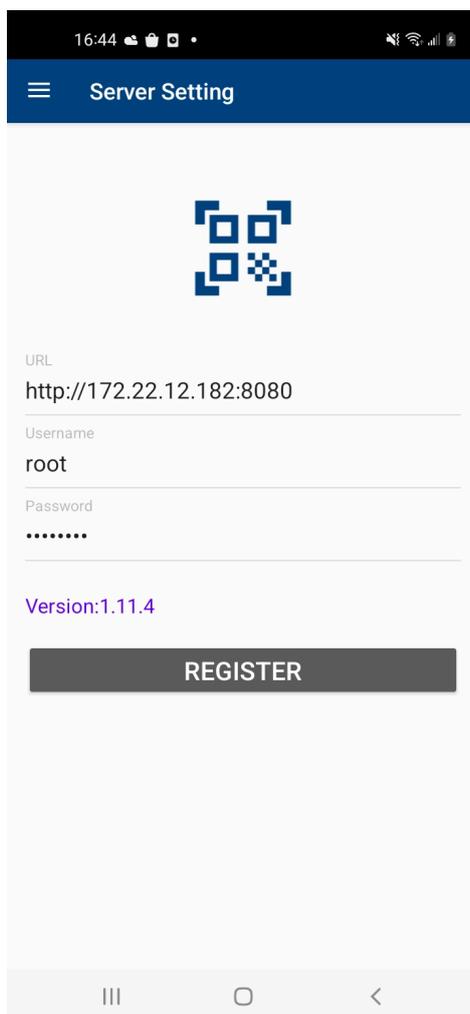


App Store

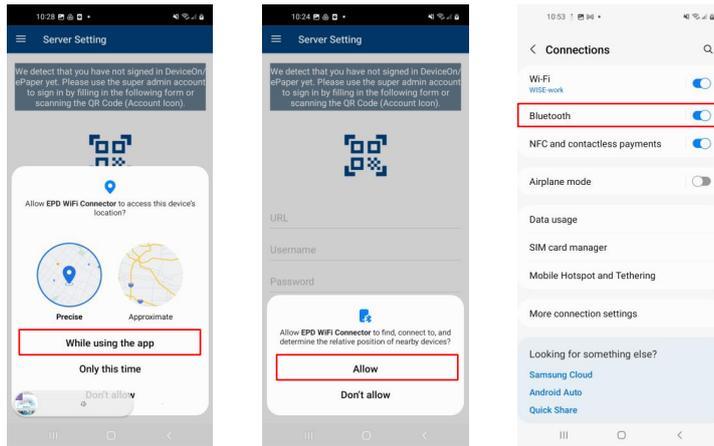


2. Permission settings

1): Click the QR code and set up by using the following images.

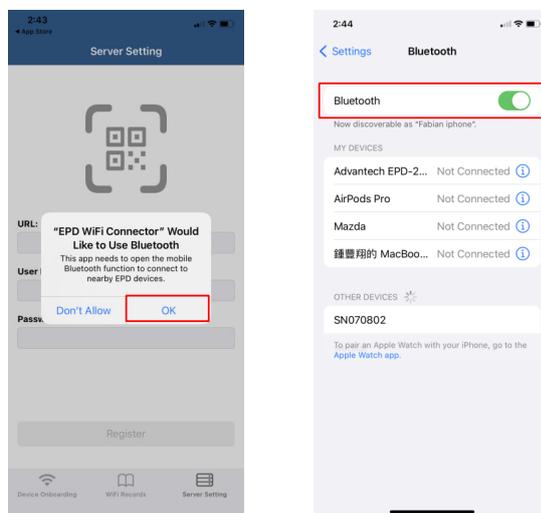


Platform: Android



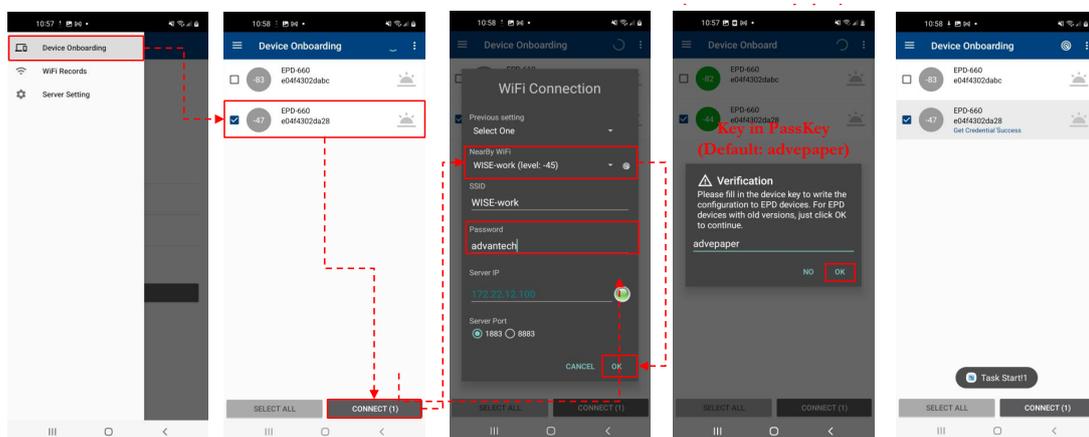
This app relies on **mobile Bluetooth** function, so users must open their Bluetooth setting.

Platform: iOS

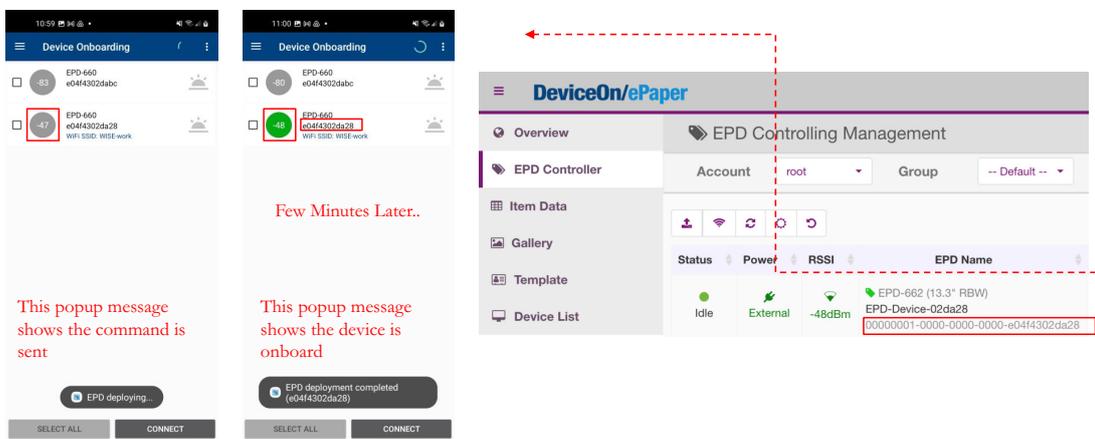


This app relies on **mobile Bluetooth** function, so users must open their Bluetooth setting.

3. EPD device onboarding. Login server (This step will only need to be done once unless the app is removed)
 - 1) Click “**Device Onboarding**”
 - 2) Click “**Connect**”
 - 3) Click “**OK**”
 - 4) Key in the password (Default: advpaper)
 - 5) Start task

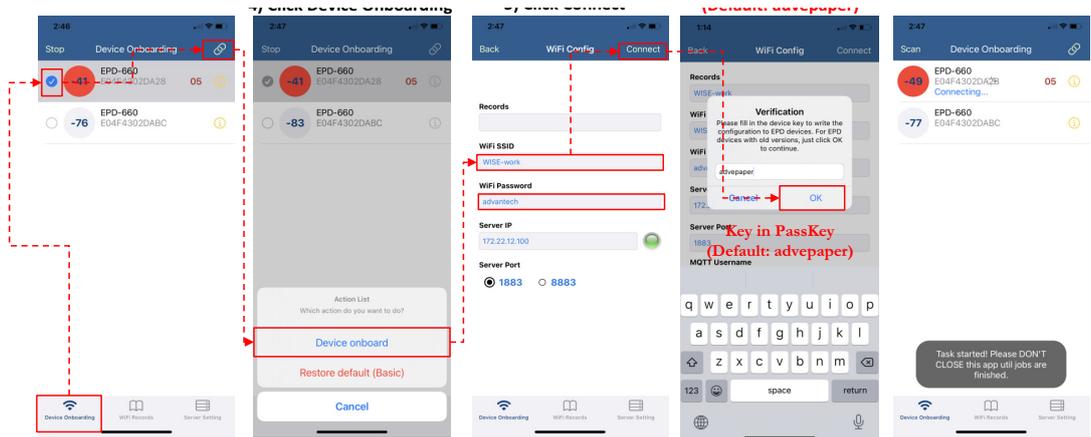


- 6) EPD deploying means command was sent.
- 7) After a few minutes, you’ll see a green icon corresponding with your device.
- 8) Check your MAC address on DeviceOn/ePaper or on an EPD device label. Find the Mac address on the app and click “**connect**”.

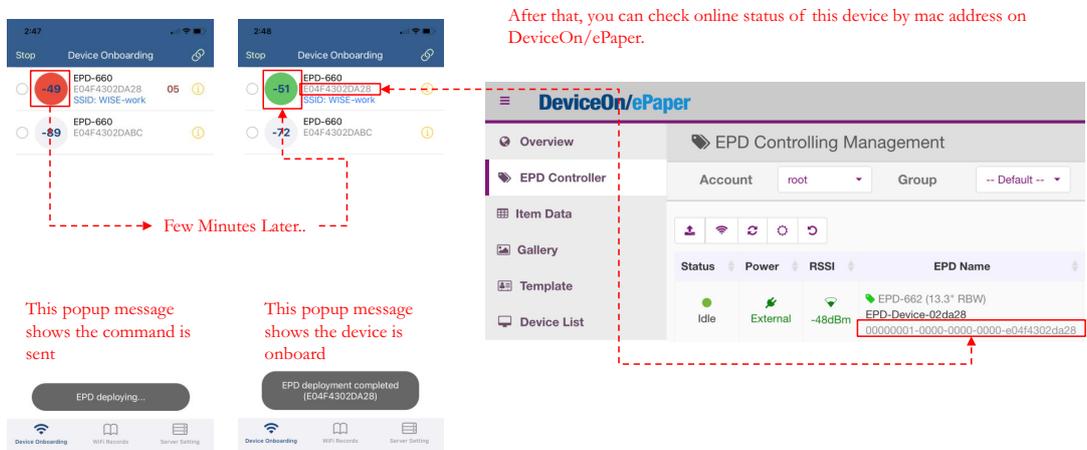


Platform: iOS

- 1) Click **“Device Onboarding”**
- 2) Check the device that you are going to connect with
- 3) Click the link icon in the upper right corner
- 4) Click **“Device Onboarding”**
- 5) Click **“Connect”**
- 6) Key in the password (Default: advpaper)
- 7) Start task

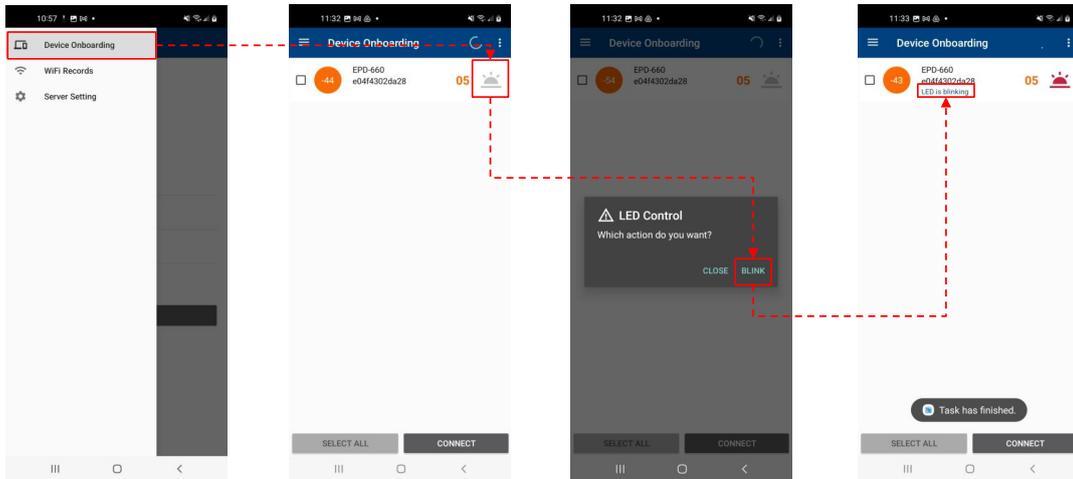


- 8) EPD deploying means command was sent.
- 9) After a few minutes, you'll see a green icon corresponding with your device.



5.2 Identification for Device Location

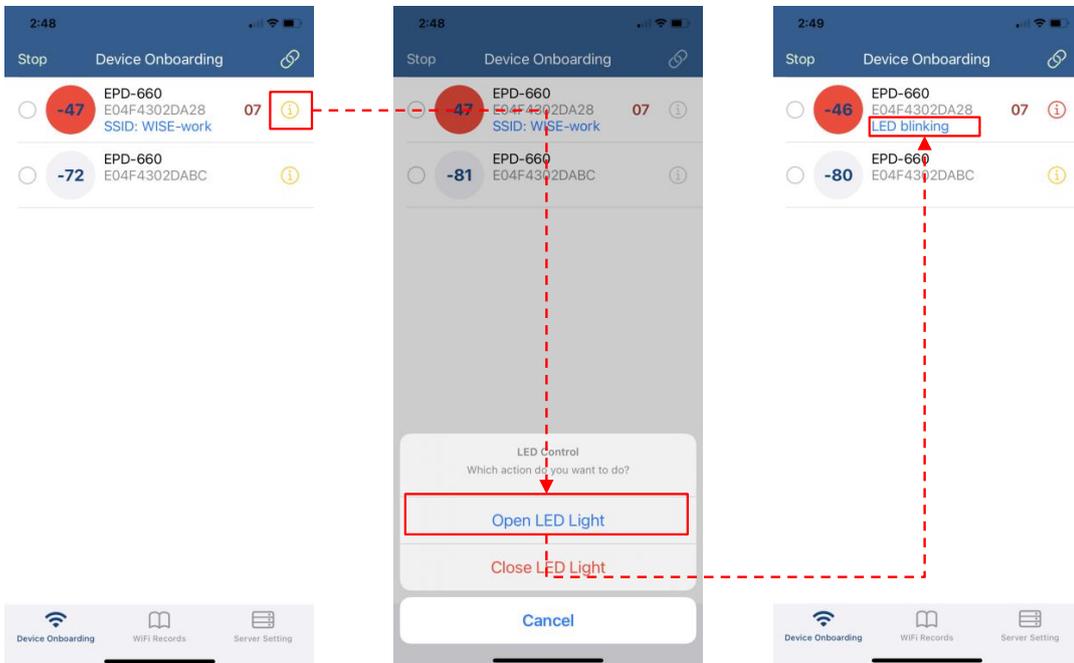
- Through triggers and stop LEDs blinking to seek the devices.
Android platform



Note! Please remember to stop LED lights from blinking when you do not need them.

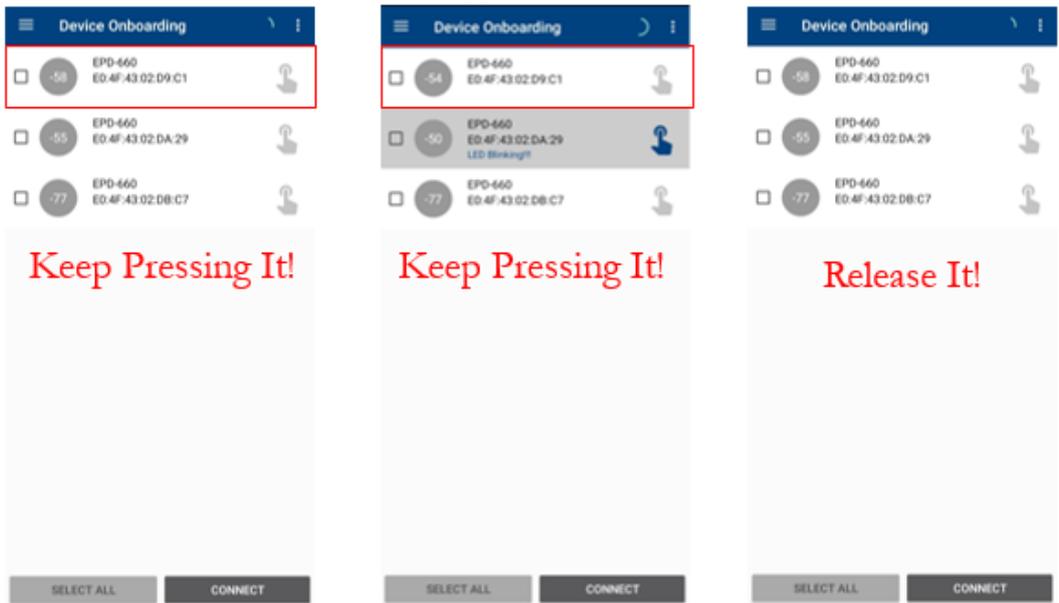


IOS platform



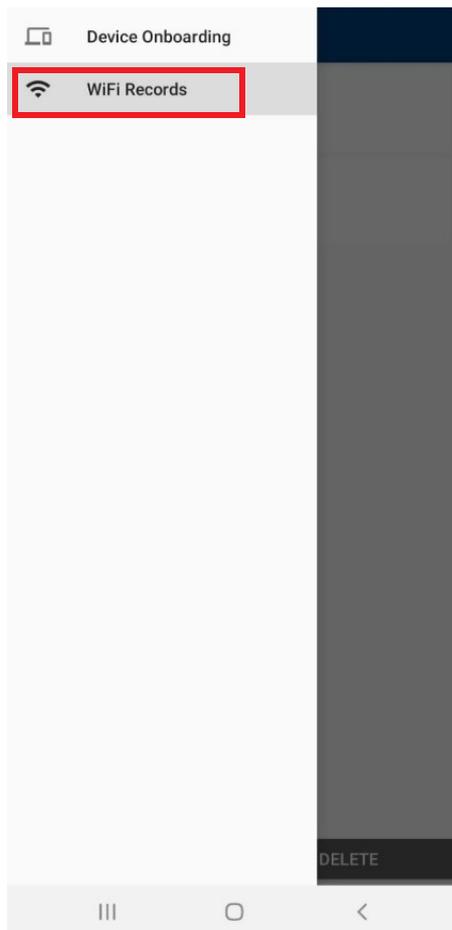
Note! Please remember to stop LED lights from blinking when you do not need them.



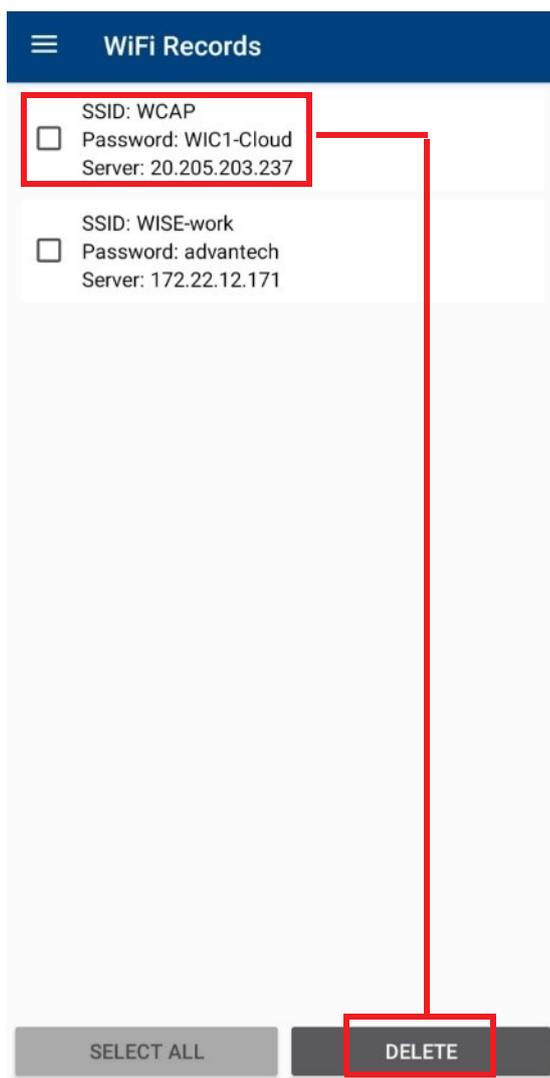


5.3 Wi-Fi Records Management

1. Click **WiFi Records**.



2. Choose the Wi-Fi you would like to cancel
3. Click **Delete**



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