

# REN-CBW & EBC-05B1

Renity CBS Gateway  
5.65" E-ink Bedside Card

## Quick Reference Guide

3<sup>rd</sup> Ed – 07 December 2020

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Part No. E2017RBW0A2R

## FCC Statement



### FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT

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 instructions, 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 help.

#### CAUTION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

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

#### For EBC-05B1

The equipment complies with FCC RF exposure limits set forth for an uncontrolled environment.

The equipment must not be co-located or operating in conjunction with any other antenna or transmitter.

#### For REN-CBW

##### RF exposure warning

This device meets the government's requirements for exposure to radio waves. This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

The exposure standard employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6 W/kg. Tests for SAR are conducted using standard operating positions accepted by the FCC with the EUT transmitting at the specified power level in different channels.

The FCC has granted an Equipment Authorization for this device with all reported SAR levels evaluated as in compliance with the FCC RF exposure guidelines. SAR information on this device is on file with the FCC and can be found under the Display Grant section of [www.fcc.gov/eot/ea/fccid](http://www.fcc.gov/eot/ea/fccid) after searching on FCC ID: 2AC7Z-ESP32WROOM32U

### A Message to the Customer

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Each and every Avalue's product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Avalue device is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Avalue has come to be known.

Your satisfaction is our primary concern. Here is a guide to Avalue's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

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We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone. So please consult the user's manual first.

To receive the latest version of the user's manual; please visit our Web site at:

<http://www.avalue.com.tw/>

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# 1. Getting Started

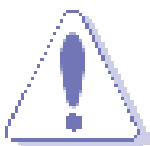
## 1.1 Safety Precautions

### Warning!



Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

### Caution!



Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

## 1.2 Packing List

- Gateway (REN-CBW)
  - 1 x REN-CBW
  - 1 x Adapter & Cord
- Patient Information Display (EBC-05B1)
  - 1 x EBC-05B1 (\*Batteries are not included)
- Optional Box PC Server (EPS-CFS2)
  - 1 x EPS-CFS2
  - 1 x Adapter & Cord



If any of the above items is damaged or missing, contact your retailer.

## 1.3 System Specifications

REN-CBW	
<b>System</b>	
<b>Mother Board</b>	REN-CBW Mother Board
<b>MCU</b>	ESP32-WROOM-32U/MDBT50Q-U1M
<b>Frequency</b>	32.768KHz
<b>Wireless</b>	802.11 b/g/n
<b>Bluetooth</b>	BT Bluetooth v4.2 / Bluetooth 5
<b>Button</b>	
<b>Front side external I/O</b>	1 x button
<b>Mechanical &amp; Environmental</b>	
<b>Power Requirement</b>	DC +5V with Micro USB connector
<b>Power Type</b>	5V DC
<b>Dimension</b>	110.67 x 60.67 x 21.5
<b>Weight</b>	TBD
<b>Color</b>	White
<b>Holder</b>	1 x Holder
<b>Adapter</b>	1 x 5V AC to DC USB Adapter
<b>USB cable</b>	1 x Micro USB to USB cable
<b>Reliability</b>	
<b>EMI Test</b>	NCC & FCC Class B
<b>Safety</b>	Avalue Standard Test Criteria
<b>Vibration Test</b>	Avalue Standard Test Criteria: Random 5~500/5G
<b>Mechanical Shock Test</b>	Avalue Standard Test Criteria : Sine wave/10G
<b>Drop Test</b>	Avalue Standard Test Criteria
<b>Operating Temperature</b>	0°C ~40°C
<b>Operating Humidity</b>	40°C @ 95% Relative Humidity, Non-condensing
<b>Storage Temperature</b>	0°C ~ 60°C
<b>Power Consumption</b>	5mA
<b>BLE transmission range</b>	80mBLE
<b>Drop Spec.</b>	120cm

<b>EBC-05B1</b>	
<b>Component</b>	
<b>Mother Board</b>	EBC-05B1
<b>MCU</b>	MDBT50Q – U1MV2 (nRF52840)
<b>Memory</b>	1MB flash / 256KB RAM
<b>Power Supply</b>	Operating with 4 x AAAA batteries
<b>Wireless/BT</b>	BT 5.0 (WiFi + uP Module)
<b>Panel</b>	
<b>LCD Panel</b>	5.65" E-ink ED057TC6
<b>LCD Control Board</b>	600 x 448
<b>B/L Inverter/Converter</b>	Black and White with Highlight Red
<b>Touch Screen</b>	Cover Lens only
<b>External I/O</b>	
<b>Wireless Antenna</b>	PCB Antenna
<b>Indicator Light</b>	Front LED Light for Front Buttons Status Indication
<b>Mechanical &amp; Environmental</b>	
<b>Power Type</b>	4 x AAAA batteries
<b>Power Connector Type</b>	Battery spring
<b>Dimension</b>	160 x 113 x 15 mm
<b>Display Area</b>	114.9 x 85.8 mm
<b>Weight</b>	70g
<b>Color</b>	White
<b>Fanless</b>	Fanless
<b>Reliability</b>	
<b>EMI Test</b>	CE & FCC Class B
<b>Safety</b>	Avalue Standard Test Criteria
<b>Dust and Rain Test</b>	Front panel IP65
<b>Vibration Test</b>	1Grms, IEC 60068-2-64, Random, 5 ~ 500Hz, 30min/axis
<b>Mechanical Shock Test</b>	10Grms, IEC 60068-2-27, Half Sine, 11ms
<b>Drop Test</b>	EC-60068-2-32 (96.5cm)
<b>Operating Temperature</b>	0°C ~40°C
<b>Operating Humidity</b>	40°C @ 95% Relative Humidity, Non-condensing
<b>Storage Temperature</b>	-20 ~ 60 °C

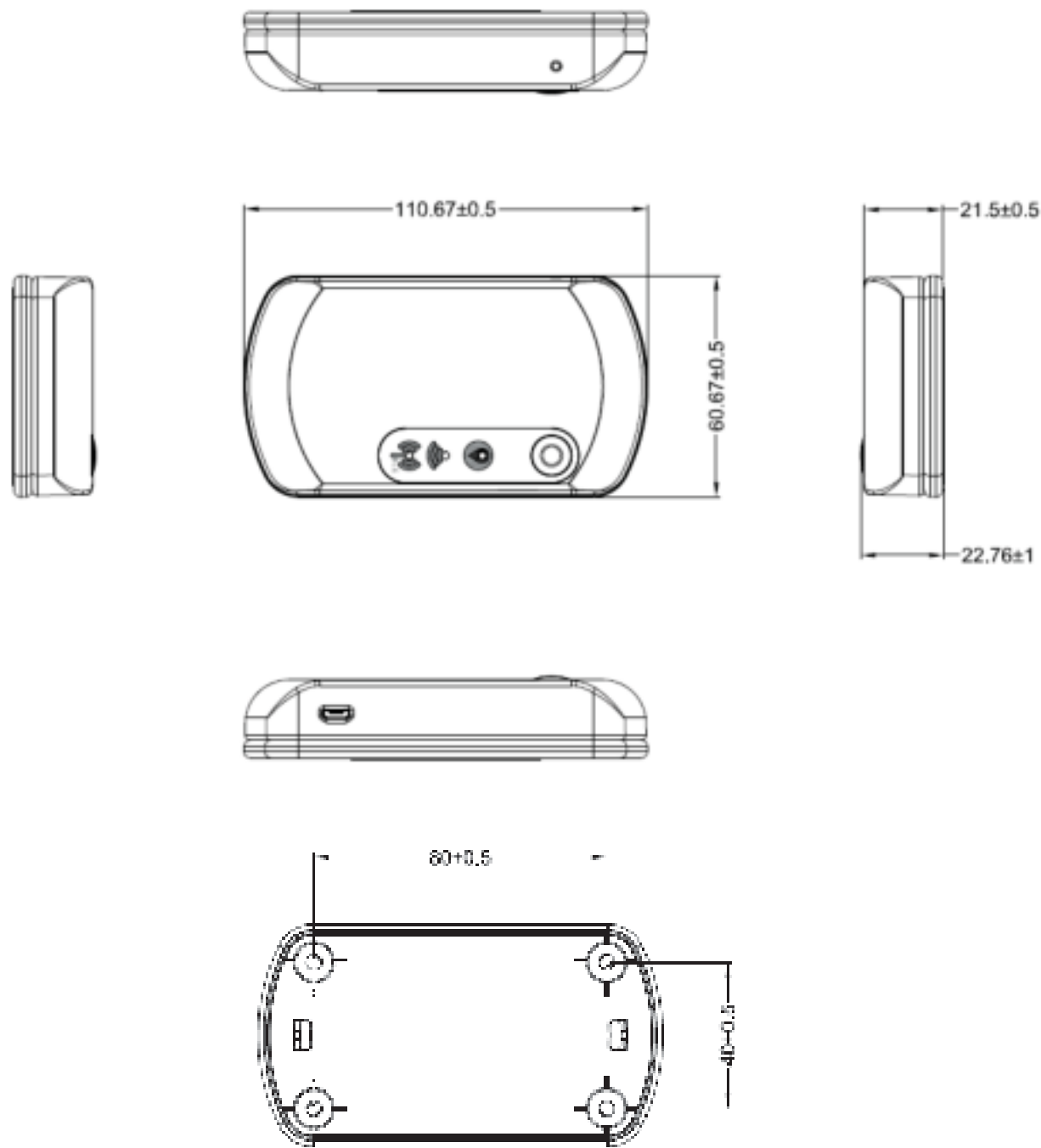




**Note:** Specifications are subject to change without notice.

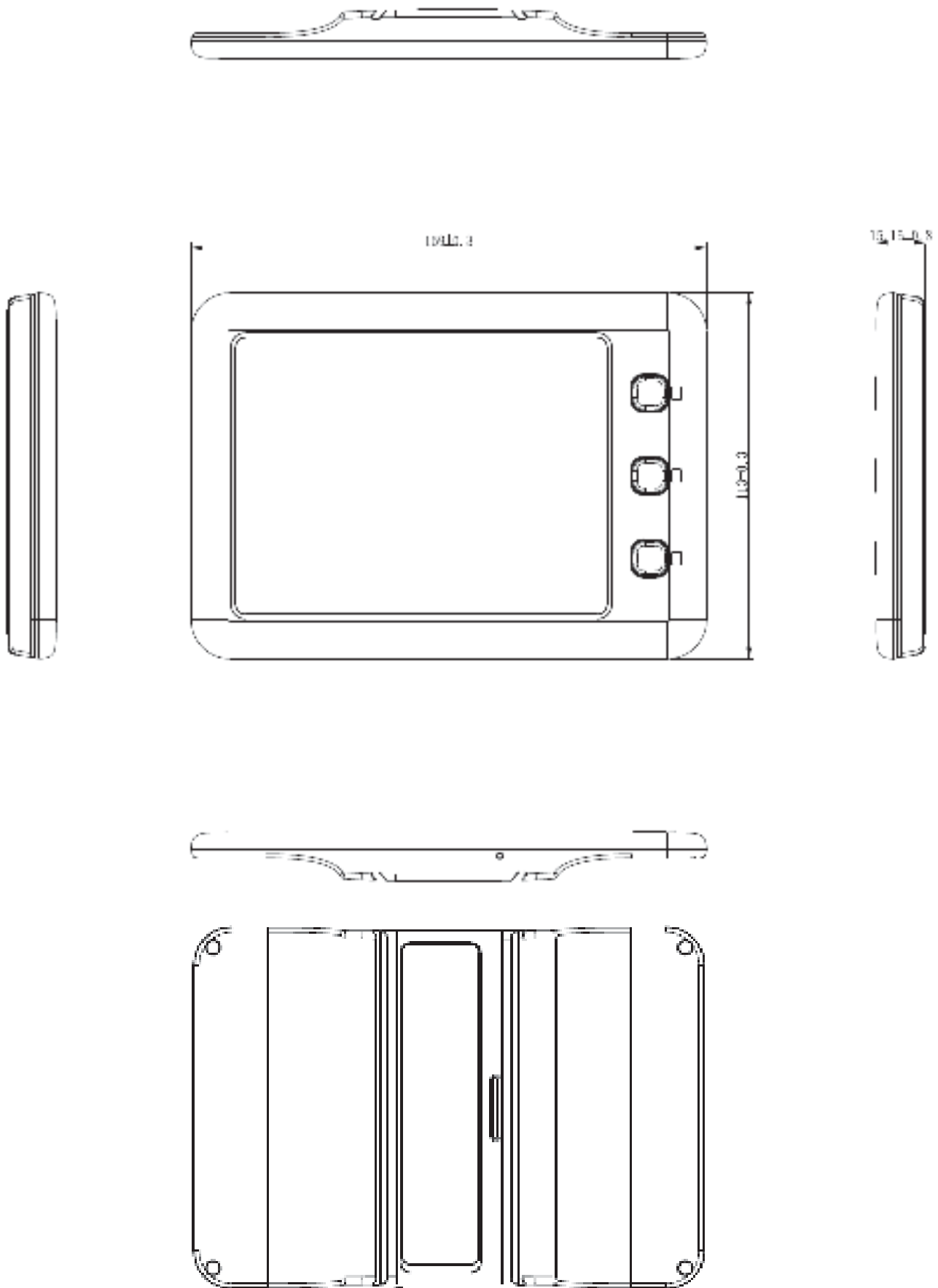
1.4 System Dimensions

1.4.1 REN-CBW



(Unit: mm)

1.4.2 EBC-05B1



(Unit: mm)

## 2. Hardware Configuration

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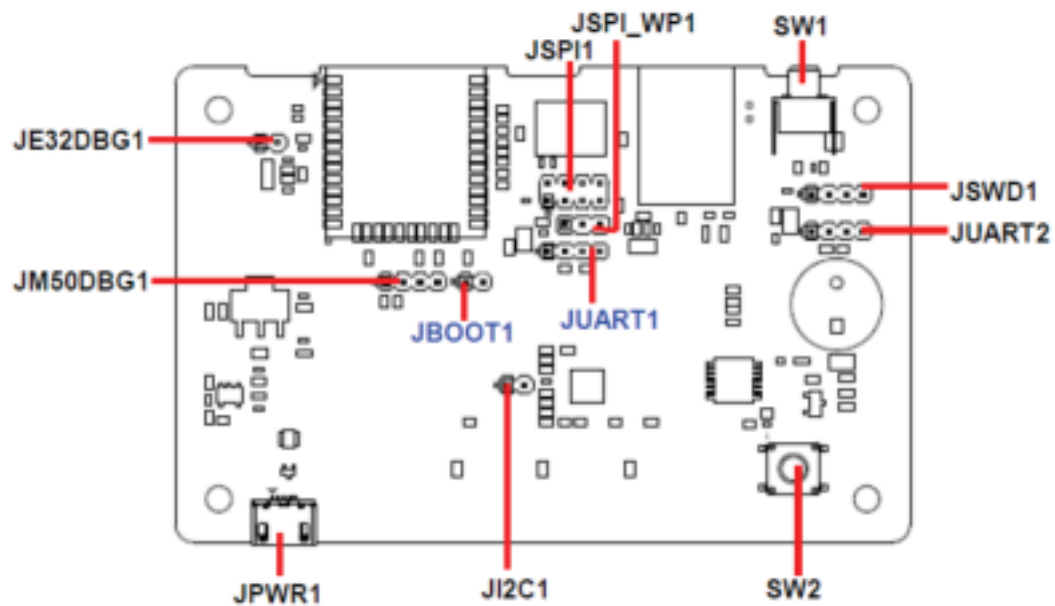


**Note:** If you need more information, please visit our website:

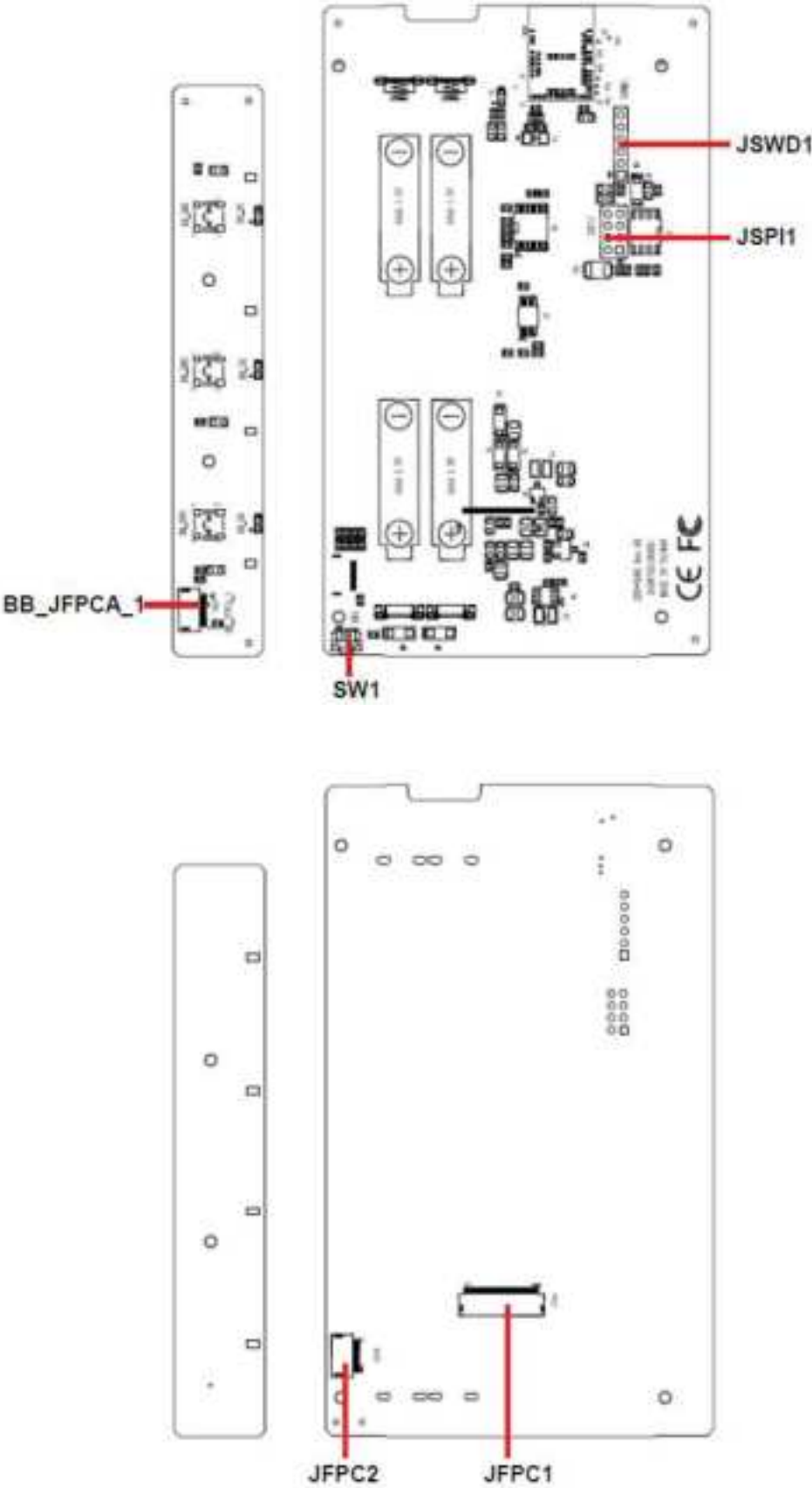
<http://www.avalue.com.tw>

## 2.1 REN-CBW & EBC-05B1 Overview

### 2.1.1 REN-CBW



2.1.2 EBC-05B1



## 2.2 REN-CBW Jumper and Connector List

### Jumpers

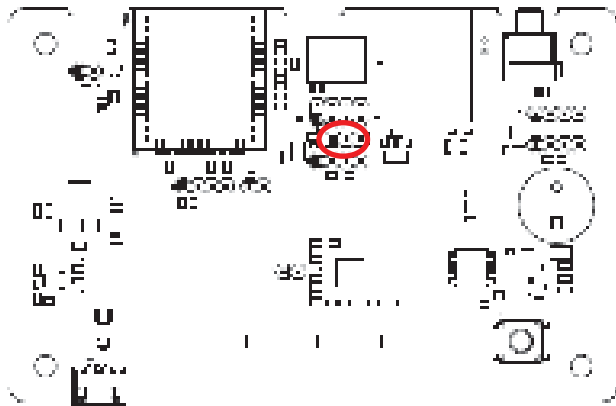
Label	Function	Note
<b>JSPI_WP1</b>	Write protection	3 x 1 header, pitch 2.00mm
<b>JBOOT1</b>	Boot selector	2 x 1 header, pitch 2.00mm

### Connectors

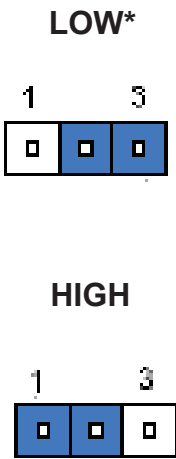
Label	Function	Note
<b>JSPI1</b>	SPI connector	4 x 2 header, pitch 2.00mm
<b>SW1</b>	Reset button	
<b>SW2</b>	Buzzer button	
<b>JSWD1</b>	SWD connector	4 x 1 header, pitch 2.00mm
<b>JUART1</b>	UART Debug ESP32 connector	4 x 1 header, pitch 2.00mm
<b>JUART2</b>	UART Debug M50Q connector	4 x 1 header, pitch 2.00mm
<b>JE32DBG1</b>	Debug ESP32 connector	2 x 1 header, pitch 2.00mm
<b>JM50DBG1</b>	Debug M50Q connector	4 x 1 header, pitch 2.00mm
<b>JI2C1</b>	I2C connector	2 x 1 header, pitch 2.00mm
<b>JPWR1</b>	DC/USB IN connector	

2.3 REN-CBW Jumpers & Connectors settings

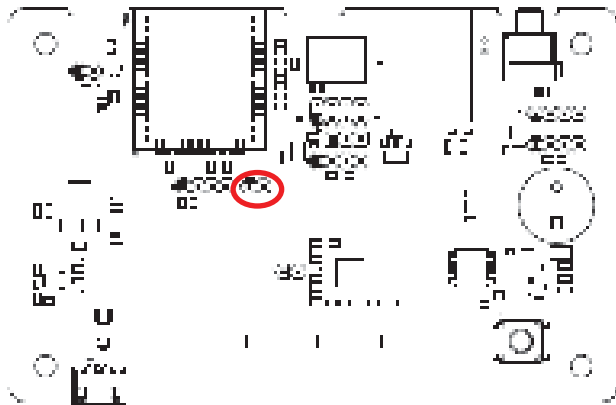
2.3.1 Write protection (JSPI\_WP1)



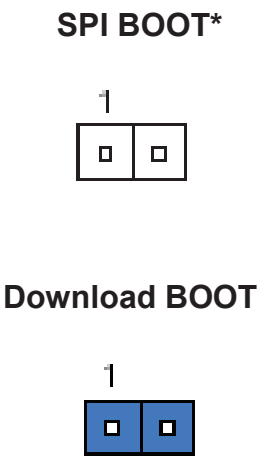
\* Default



2.3.2 Boot selector (JBOOT1)

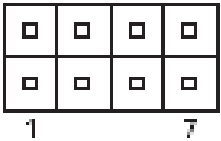
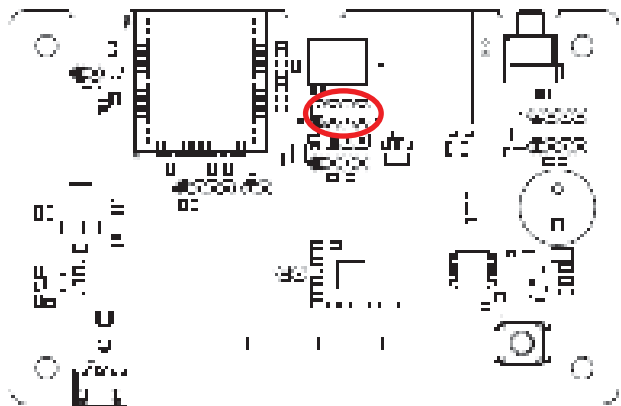


\* Default



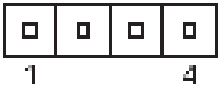
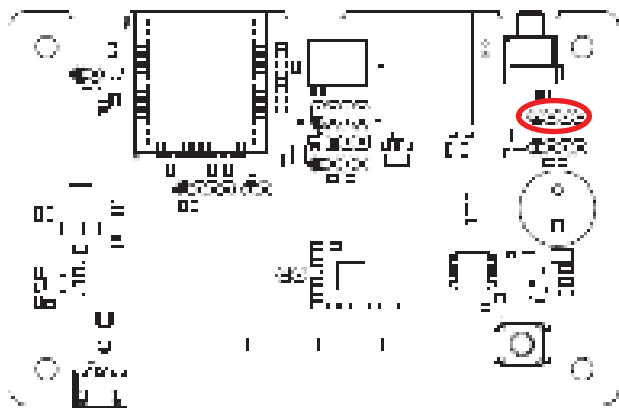


2.3.3 SPI connector (JSPI1)



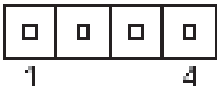
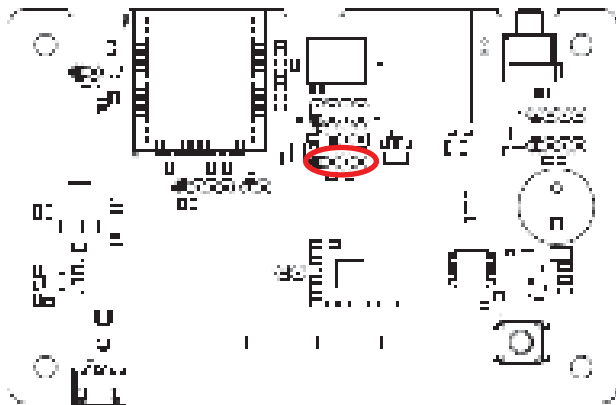
Signal	PIN	PIN	Signal
+3.3VSB	1	2	GND
SPI_CS_RST#	3	4	SPI_CLK
SPI_IO1	5	6	SPI_IO0
SPI_IO3_HOLD#	7	8	SPI_IO2_WP#

2.3.4 SWD connector (JSWD1)



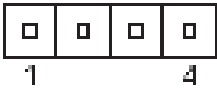
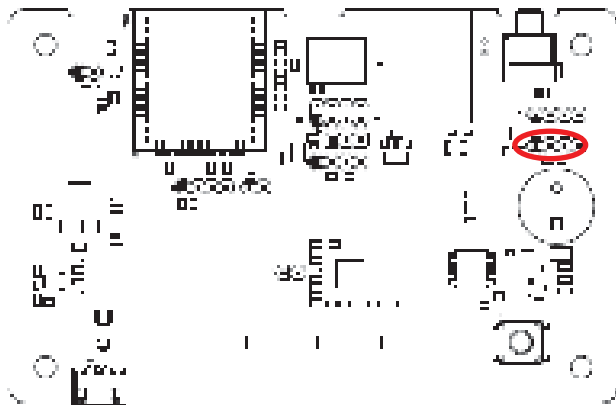
Signal	PIN
+3.3VSB	1
SWDIO	2
SWDCLK	3
GND	4

2.3.5 UART Debug ESP32 connector (JUART1)



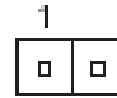
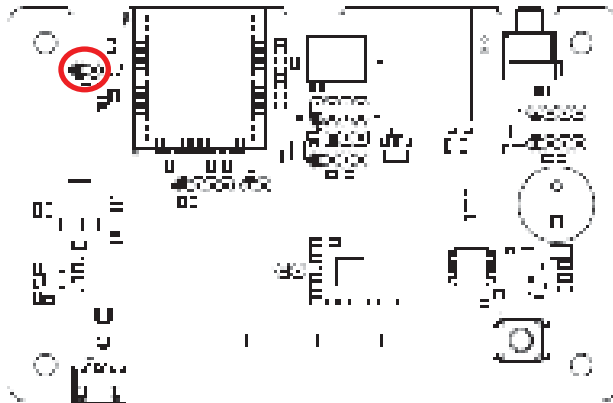
Signal	PIN
+3.3VSB	1
ESP32_UART_TX	2
+3.3VSB	3
ESP32_UART_RX	4

2.3.6 UART Debug M50Q connector (JUART2)



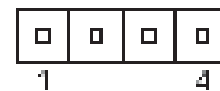
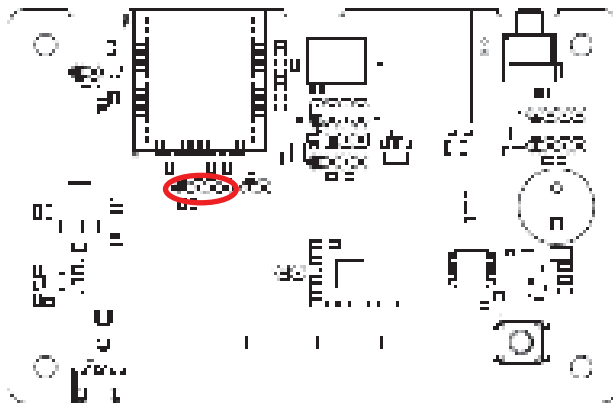
Signal	PIN
+3.3VSB	1
M50Q_UART_RX	2
+3.3VSB	3
M50Q_UART_TX	4

### 2.3.7 Debug ESP32 connector (JE32DBG1)



Signal	PIN
ESP32_EN	1
GND	2

### 2.3.8 Debug M50Q connector (JM50DGB1)



Signal	PIN
M50Q_RX	1
M50Q_TX	2
M50Q_RTS	3
M50Q_CTS	4

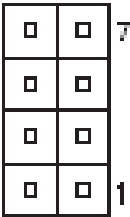
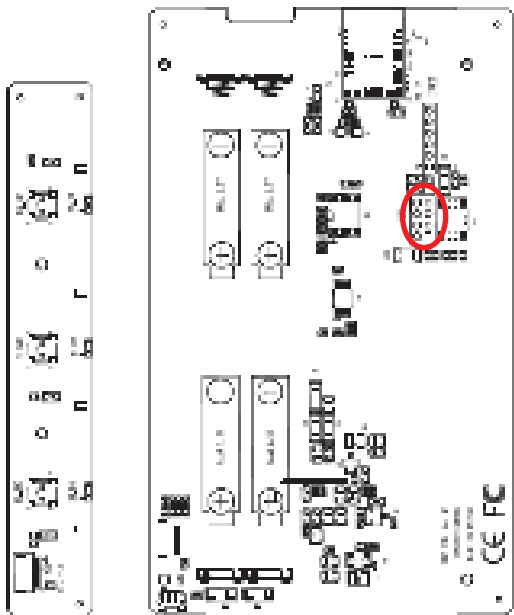
## 2.4 EBC-05B1 Connector List

### Connectors

Label	Function	Note
<b>SW1</b>	Reset button	
<b>BB_JFPCA_1</b>	FPCA connector	10 x 1 wafer, pitch 0.50mm
<b>JFPC1</b>	FPC connector 1	24 x 1 wafer, pitch 0.50mm
<b>JFPC2</b>	FPC connector 2	24 x 1 wafer, pitch 0.50mm
<b>JSWD1</b>	SWD UART Debug connector	6 x 1 header, pitch 2.00mm
<b>JSPI1</b>	SPI connector	4 x 2 header, pitch 2.00mm

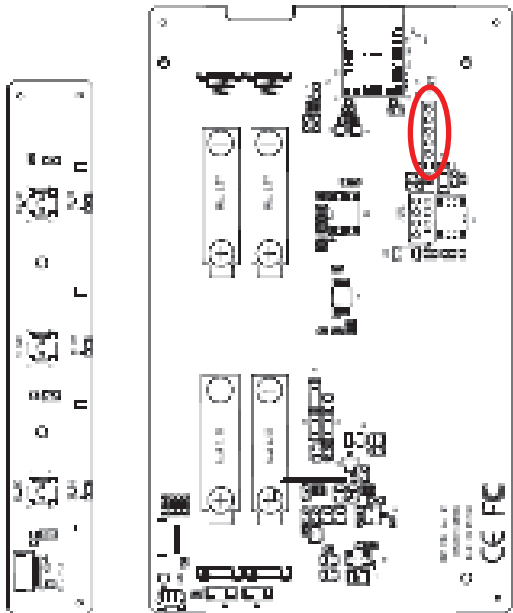
2.5 EBC-05B1 Connectors settings

2.5.1 SPI connector (JSPI1)



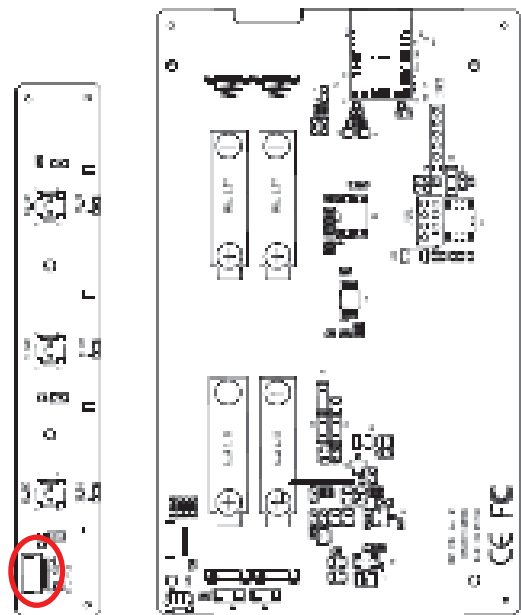
Signal	PIN	PIN	Signal
SPI0_IO2_WP#	8	7	SPI0_IO3_HOLD#
SPI0_IO0	6	5	SPI0_IO1
SPI0_CLK	4	3	SPI0_CS#
GND	2	1	+2.8VSB

2.5.2 SWD UART Debug connector (JSWD1)



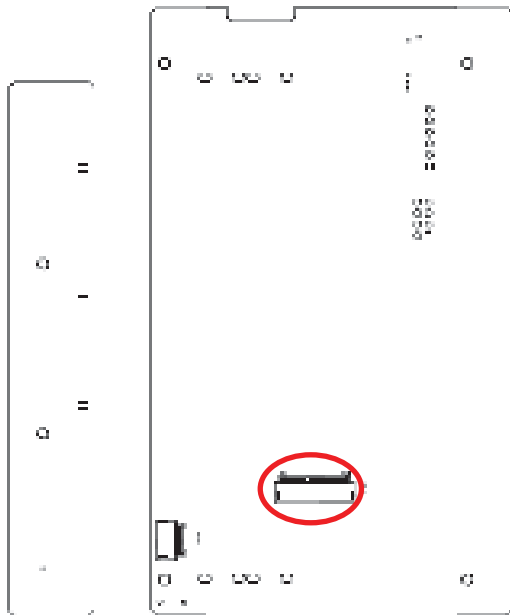
Signal	PIN
DUART_RX	6
DUART_TX	5
GND	4
SWDCLK	3
SWDIO	2
+3.0VSB	1

2.5.3 FPCA connector (BB\_JFPCA\_1)



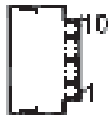
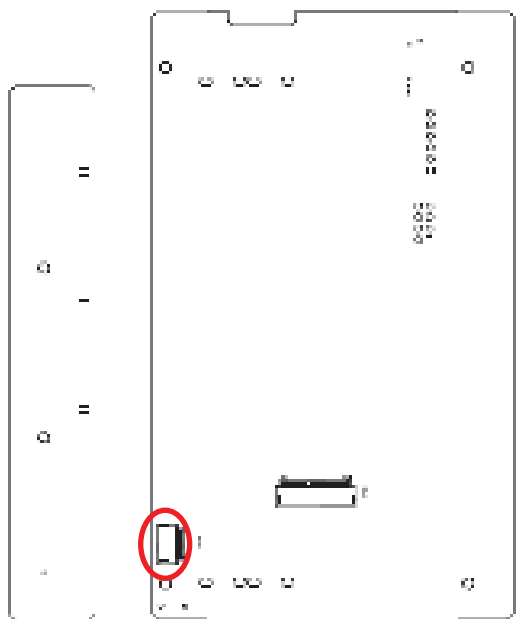
Signal	PIN
GND	1
BUTN3	2
BUTN2	3
BUTN1	4
BUTN0	5
LED3_B#	6
LED2_G#	7
LED1_R#	8
GND	9
+2.8V	10

### 2.5.4 FPC connector 1 (JFPC1)



Signal	PIN
SPI1_CS2#	1
EPD_GDR	2
EPD_RESET	3
VGL	4
VGH	5
EPD_TSCL	6
EPD_TSDA	7
I2C1_SCL	8
EPD_BUSY	9
EPD_RESET#	10
SPI1_DCX	11
SPI1_CS1#	12
SPI1_CLK	13
SPI1_MOSI	14
+2.8VSB	15
+2.8VSB	16
GND	17
EPD_VDD	18
SPI1_MISO	19
VSH	20
PREVGH	21
VSL	22
PREVGL	23
VCOM	24

2.5.5 FPC connector 2 (JFPC2)



Signal	PIN
GND	10
BTN3_R	9
LED1_B#	8
LED2_B#	7
BTN0_R	6
LED3B#	5
LED2G#	4
LED1R#	3
GND	2
+2.8VSB	1



## 3. System Setup

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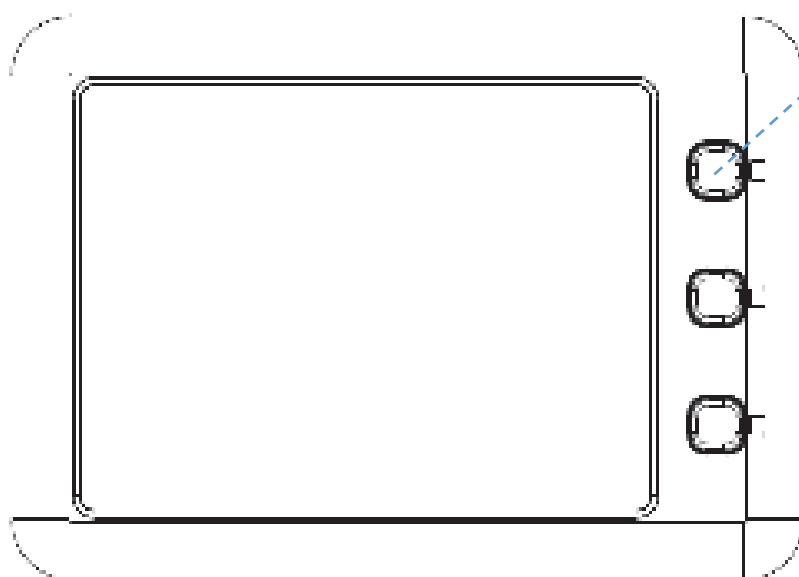
## 3.1 Become Familiar

Before you set up, take a moment to become familiar with the locations and purposes of the controls, drives, connections and ports, which are illustrated in the figures below.



1. Power Indicator
2. WiFi Indicator
3. Bluetooth Indicator

▲ REN-CBW



There are 3 buttons on the right to allow patients call for assistance which will correspond to the corresponding icons on the display.

LED Behavior:

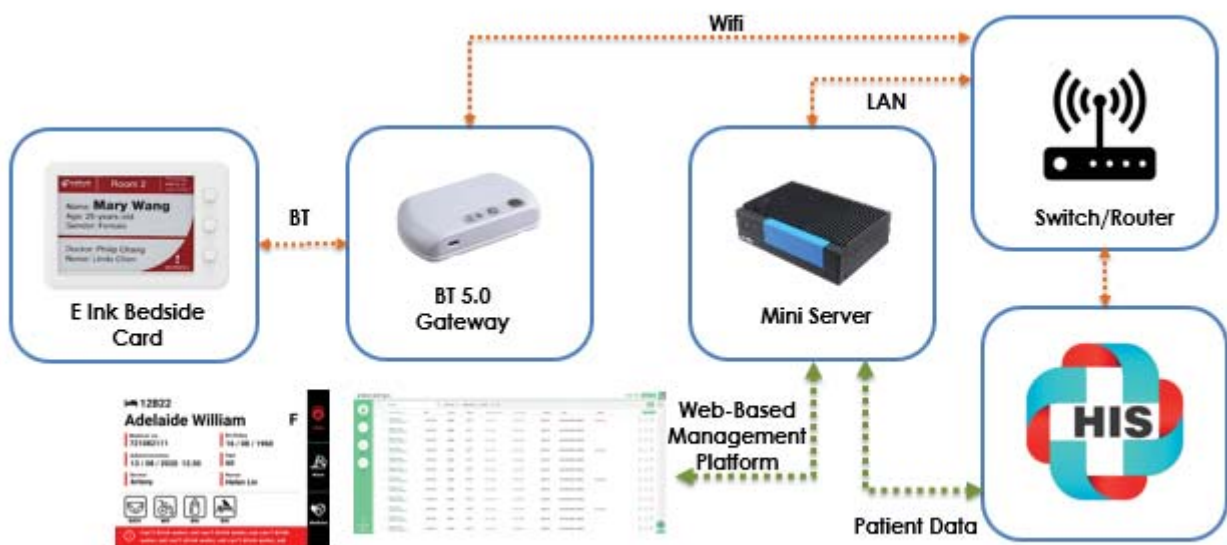
1. LED lights will flash 3 times when EBC-05B1 is powered up. LED lights off when the boot up process has been completed.

2. The first light starts to flash when pushing a picture from the backend to the device. LED light goes off when the data is received successfully.

3. LED light starts to flash when a button is pressed from the electronic paper, until it receives confirmation signal from the backend, or someone long press the same button for more than 3 seconds. Without actions, the light will automatically turns off after 180 seconds.

▲ EBC-05B1

## 3.2 Setup Arrangement



1. Setup WIFI AP.
2. Setup Mini Server (Box PC)  
Box PC LAN port 1 must be connected to WIFI AP's LAN port.



3. Login with box pc to web-based management platform using the correct account and passwords.  
Website: <http://192.168.1.227/login>



### 3.3 Installing REN-CBW Gateway



Step 1. Device included 1 x REN-CB, 1 x USB adapter and 1 x Micro USB to USB cable.

Step 2. Before installation, rotate counterclockwise the REN-CB cover to remove it.

Step 3. Each REN-CB has a code number, located in the body back shell.

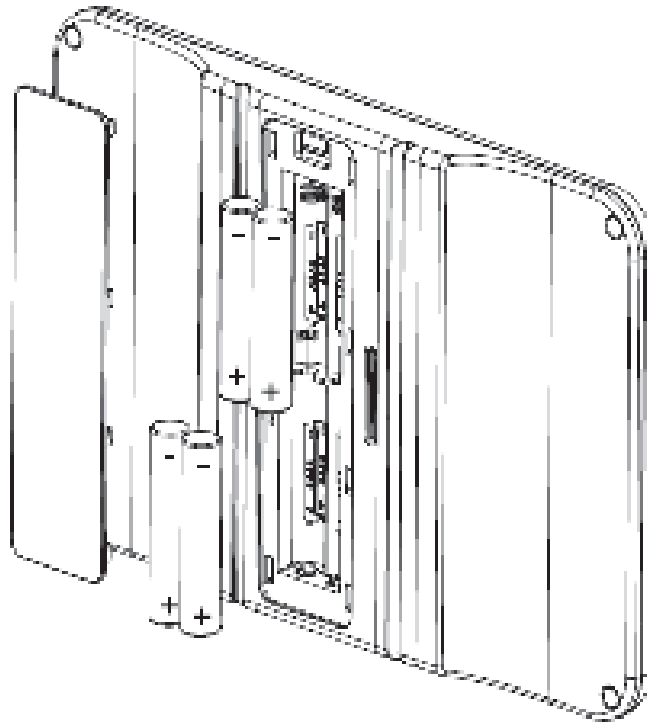
Step 4. Channels for cable ties design allow ceiling/wall/adhesive tape installation.

Step 5. Rotate clockwise to attach the unit and plug in USB power cable; the unit will startup automatically.

Adhesive Tape Note:

1. Clean the surface area before use.
2. This adhesive tape can be fixed or mount on the object.
3. This adhesive tape is reusable with wipe of water.

### 3.4 Installing Batteries to EBC-05B1 Patient Information Display



**Step1.** Remove the battery cover.

**Step2.** Press the battery spring, when removing batteries or replacing new one.

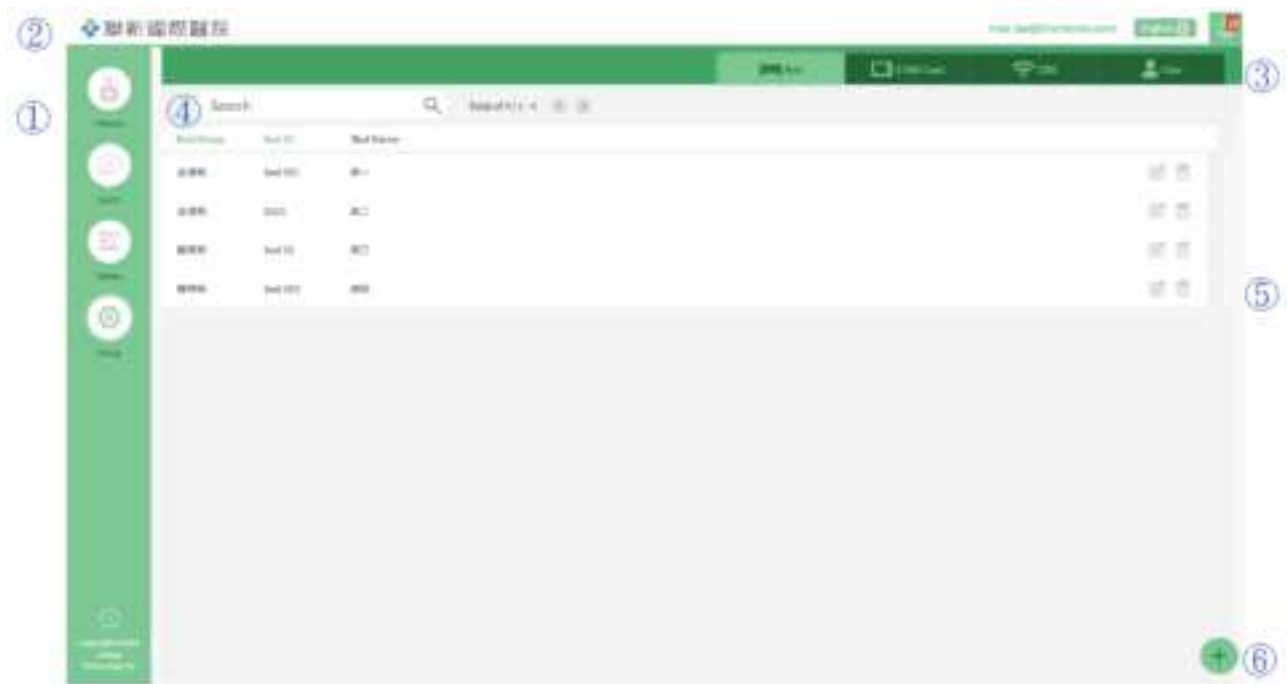
**Step3.** Re-assemble your system back through previous steps to complete the installation.

# 4. Smart Ward Display Solution Software Guide

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## 4.1 Operation interface description

### 4.1.1 Interface



- ① Main Menu : Main Settings
- ② Header : Account Login/Language/Notification
- ③ Sub-function Menu
- ④ Search and Data List
- ⑤ Data List
- ⑥ Function Buttons

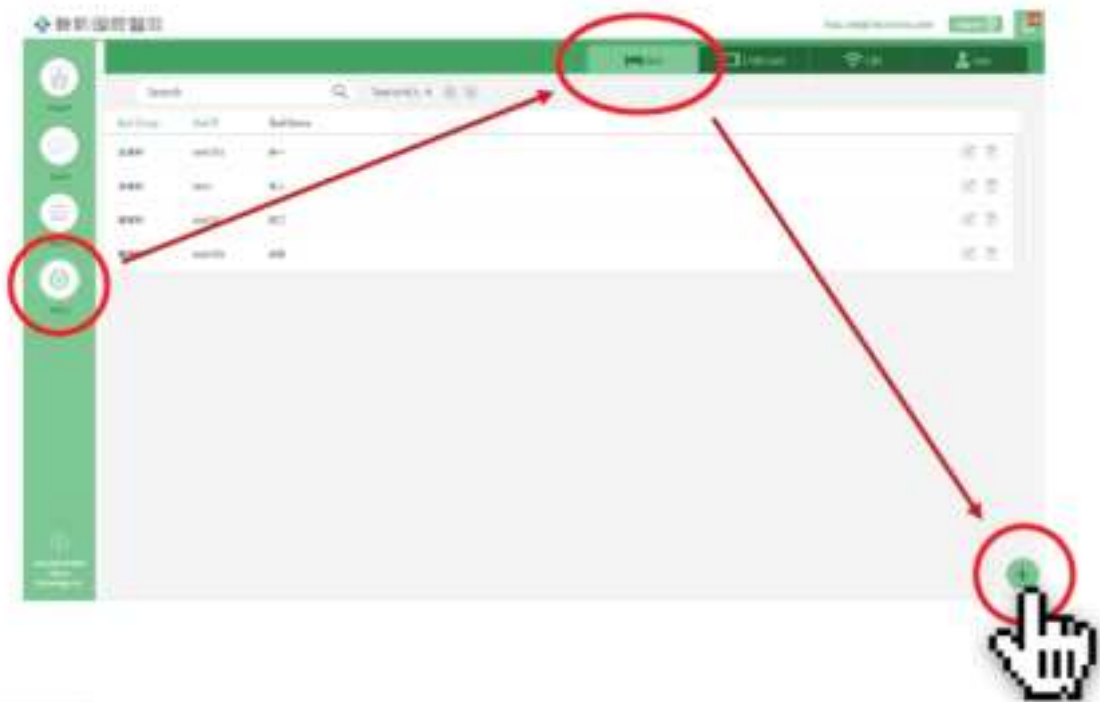
## 4.2 Settings

### 4.2.1 Basic Operation Instructions- Adding Beds

This management system takes hospital bed equipment as basic structure. The system management structure is illustrated as follows:







### Step 1

Click Setup from left main menu to enter Bed sub-menu, then click the Add icon on lower right corner.

A screenshot of a modal window titled 'Add New Bed'. It contains three input fields: 'Bed ID.\*', 'Bed Name.\*', and 'Bed Group.\*'. The 'Bed Group' dropdown menu is open, showing '腎臟科' as the selected option. At the bottom of the form is a green 'Add' button, which is highlighted with a red rectangular border. A hand cursor icon is pointing at the 'Add' button.

### Step 2

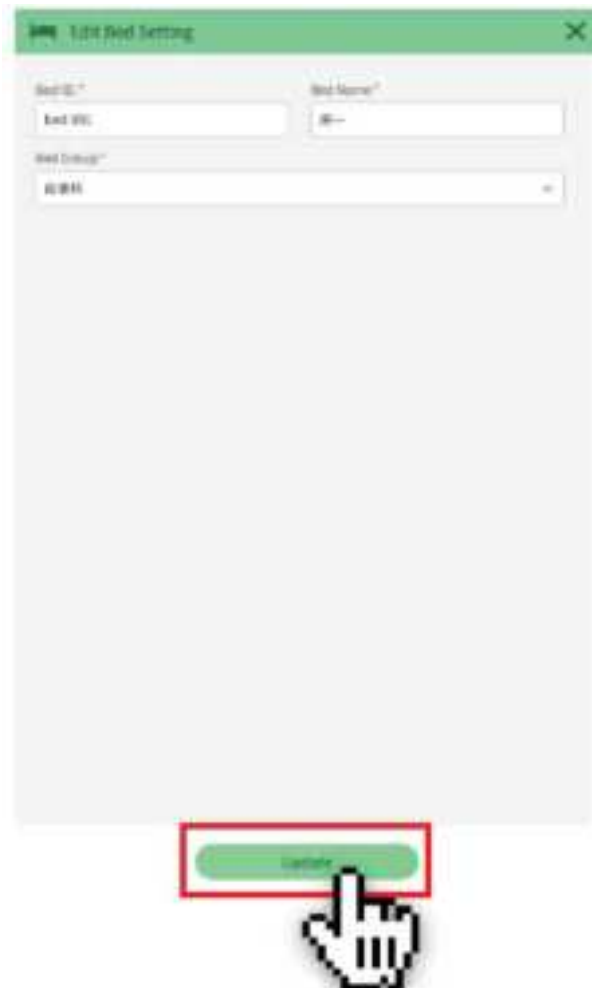
After filling in bed and patient information, click “Add” to complete the process.

## 4.2.2 Edit Bed Status



### Step 1

Click the edit icon on the right side of the profile list.



### Step 2

Modify bed and E Ink Card Setting.

Click "Update" to complete the modification of bed information.

### 4.2.3 Deleting Beds



#### Step 1

Click the delete icon on the right side of the profile list.



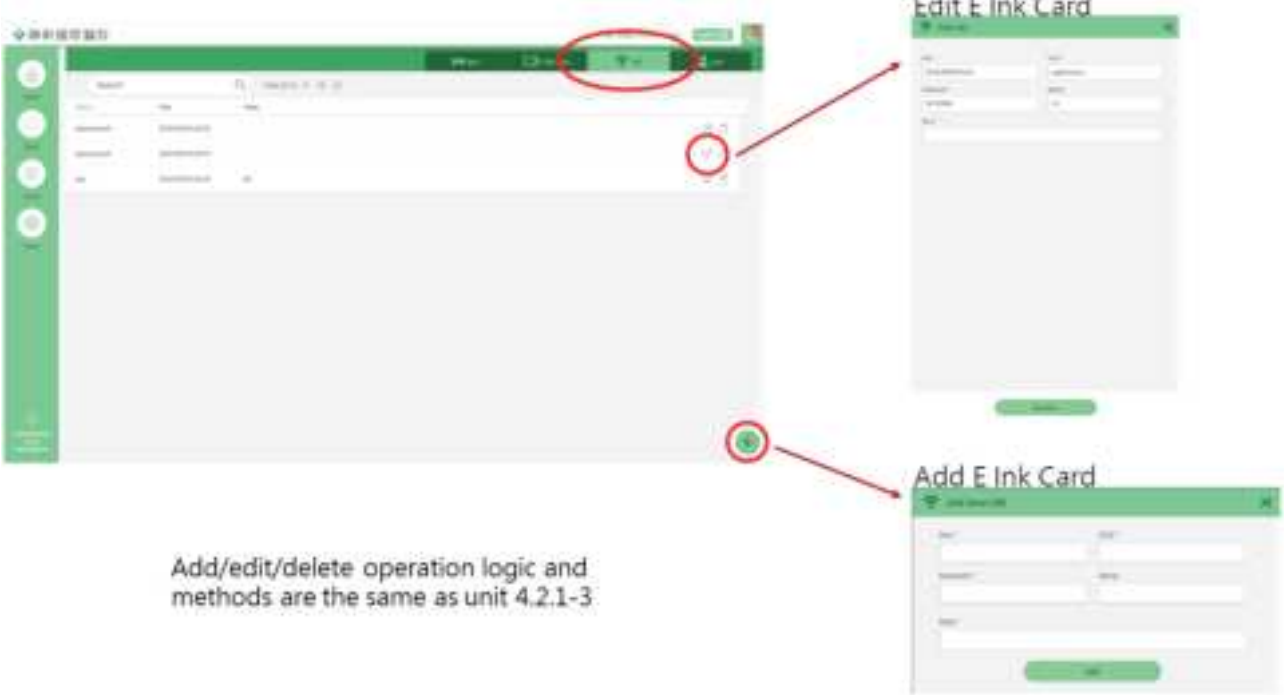
#### Step 2

Click "OK" to delete the bed.

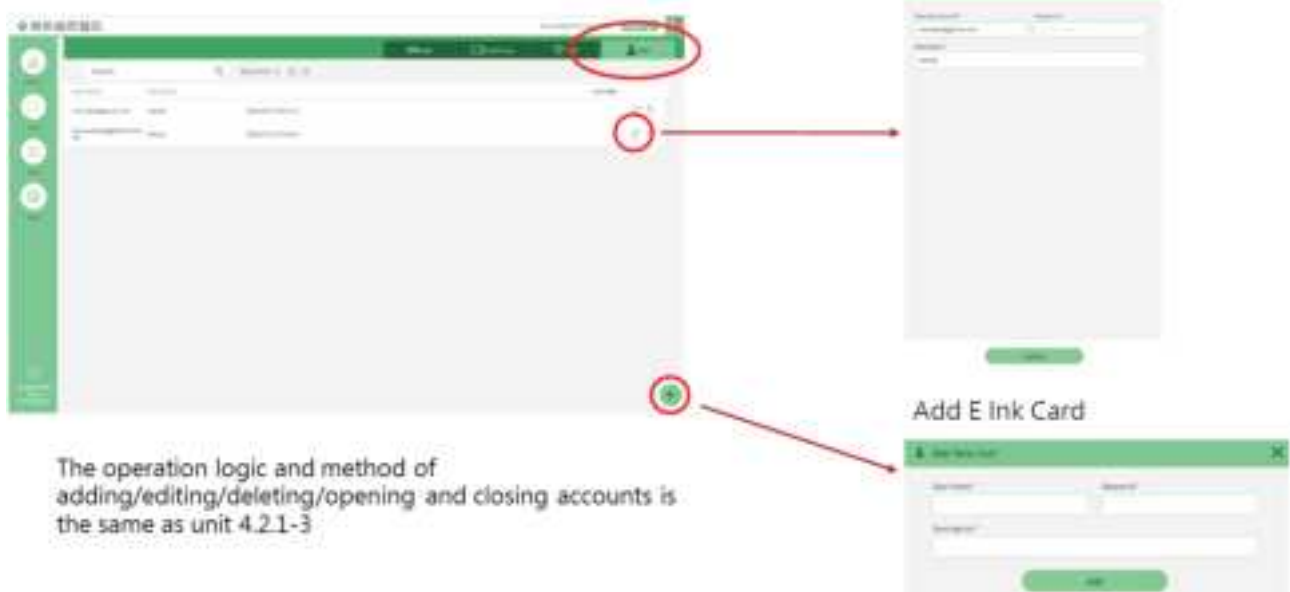
4.2.4 E Ink Card Setting



4.2.5 CBS Management

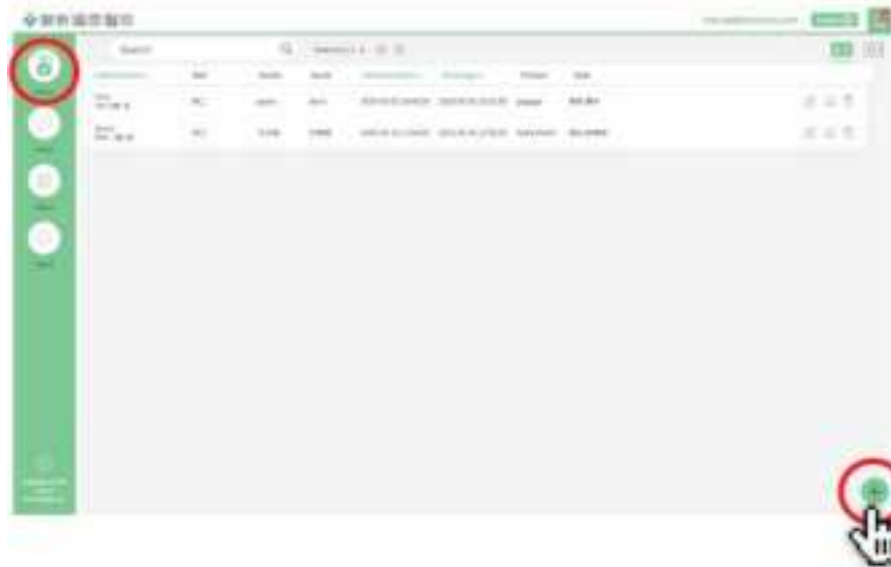


## 4.2.6 User Management



## 4.3 Patient Management

### 4.3.1 Patient Management- Add Patient Info



Step 1

Step 2

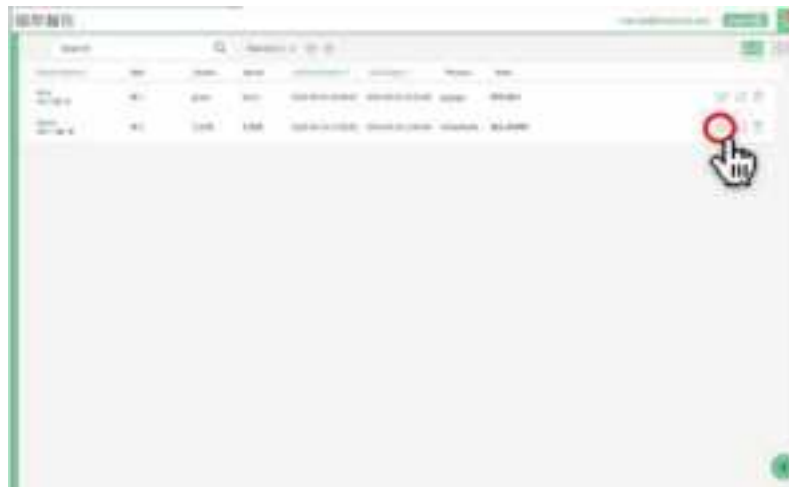
Click Add.

Click on the main menu on the left, and the patient screen will show on the patient data by default.

Step 3

After filling in the patient information completely, click "Update" to complete the process.

### 4.3.2 Patient Management- Add Patient Info



**Edit Patient**

Name\*  Gender\* ☐ Male ☒ Female

Medical No.\*  Birthday\*

ID No.\*

Group/Location

Bed Group\*  Bed Name\*

Doctor\*  Nurse\*

Admission\*    Discharge\*

Prescriber

Other notes

Note



Click to edit icon to adjust patient related information.

4.3.3 Patient Management- Delete Patient Info (Directly)



Step 1

Click Push icon.




Step 2

Click "OK " to complete the patient profile push.





### Step 1

Click Delete icon. 




### Step 2

Click "OK " to complete the patient profile push

4.3.4 Patient Management- Delete Patient Info (From Edit)



Click Edit icon. 

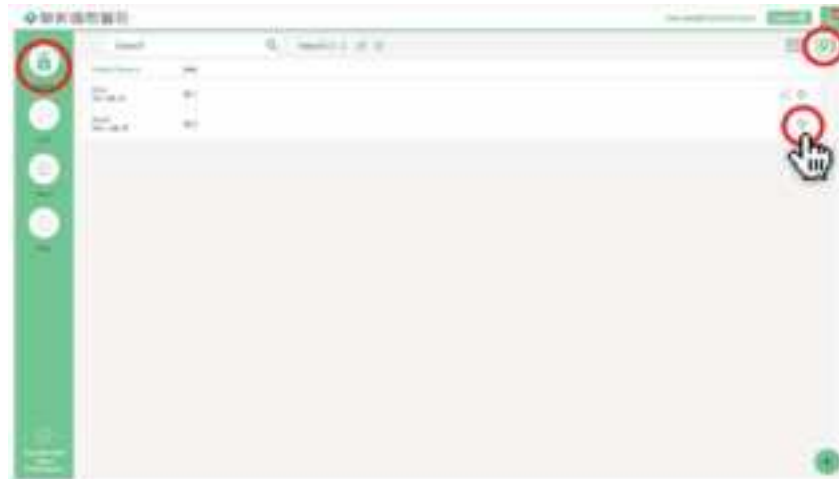
A screenshot of a web application interface for editing patient information. The form is titled 'Edit Patient' and contains various input fields for patient details. At the bottom right of the form, there is a red circle highlighting a trash can icon, which is used to delete the patient information.

Click Delete icon  at the bottom right to delete the patient info.

### 4.3.5 E Ink Card Screen Setting

For different patient needs and scenarios, sometimes more than 2 sets of E Ink Cards are needed and different information screens are provided. This unit provides flexible configuration settings focusing on patients.

PS. This item is linked to the bed management of this system.

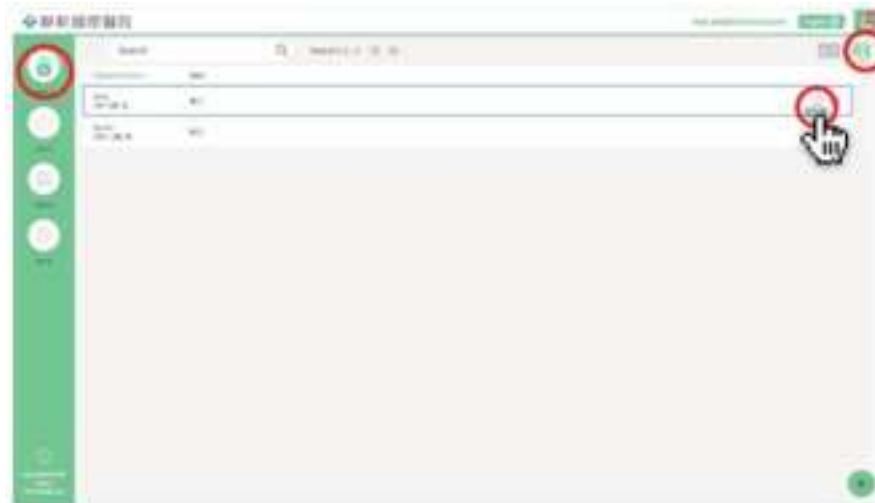


Click on the main menu on the left, and the patient screen will show on the patient data by default.

Click E Ink Card Setting icon.



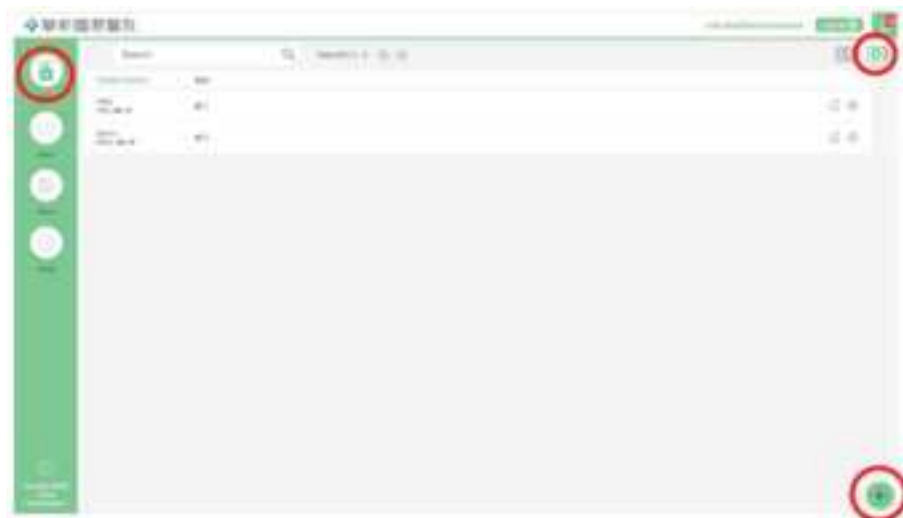
Click Setting icon  to setting patient related information.



Click on the main menu on the left, and the patient screen will show on the patient data by default.



Click Push icon  to complete the patient profile push.



Click on the main menu on the left, and click E Ink Card Setting icon on the right.

Click the new icon at the bottom right.

## 4.4 Patient Needs Management

### 4.4.1 Patient Needs Management- E Ink Card Operating Instructions



### 4.4.2 Patient Needs Management- System Data Management



Report system requirements after pressing and record the time message was sent.

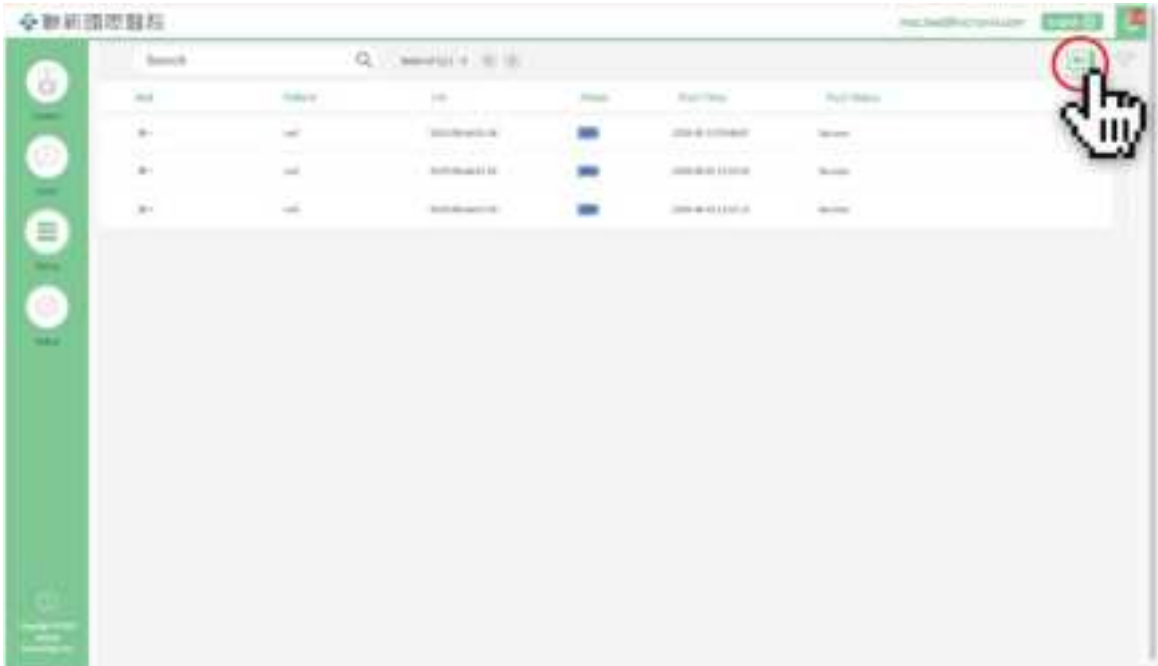
#### 4.4.3 Button Description



Click the bell icon on upper right corner to enter notification center to pay attention to patient needs in time.

4.5 Device Status Management

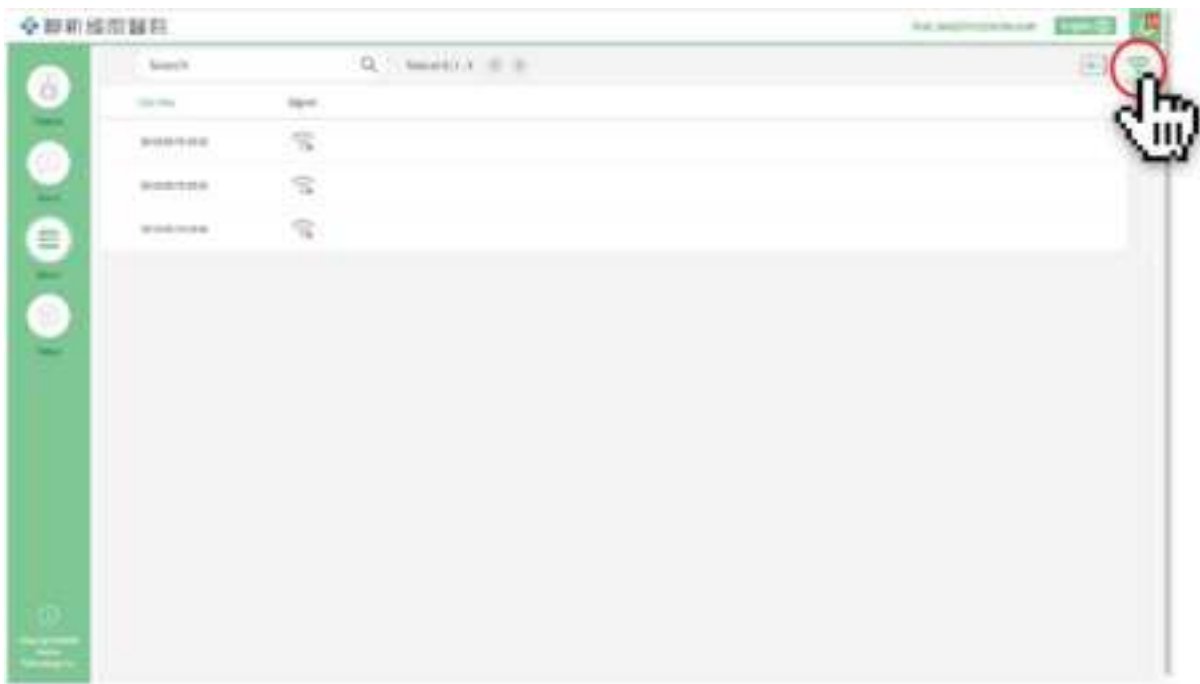
4.5.1 E Ink Card Status Management



This unit only provides browsing of E Ink Card device status.  
(Battery Capacity, signal status and whether the bed is occupied.)

4.5.2 CBS Status Management

E INK Card > Btn Set.

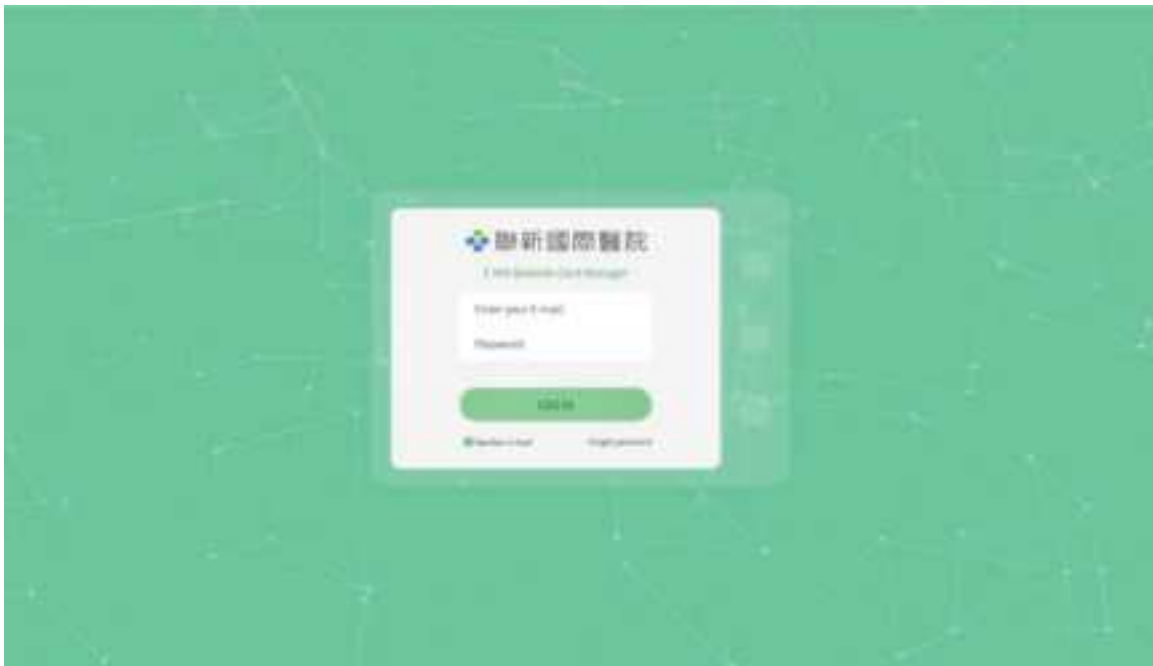


This unit provides the signal status of CBS device.



## 4.6 Log in / Log out

### 4.6.1 Login Account



Enter and fill in the administrator account and password.

(Website: <http://192.168.1.227/login>)



Move the mouse to the upper right corner of the screen, logout instruction appears on top of the account name.

