REN-CBW & EBC-05B1

Renity CBS Gateway
5.65” E-ink Bedside Card

Quick Reference Guide

3rd Ed – 07 December 2020

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 equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide

with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

A Message to the Customer

Avalue Customer Services

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.

Technical Support

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/

Content

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

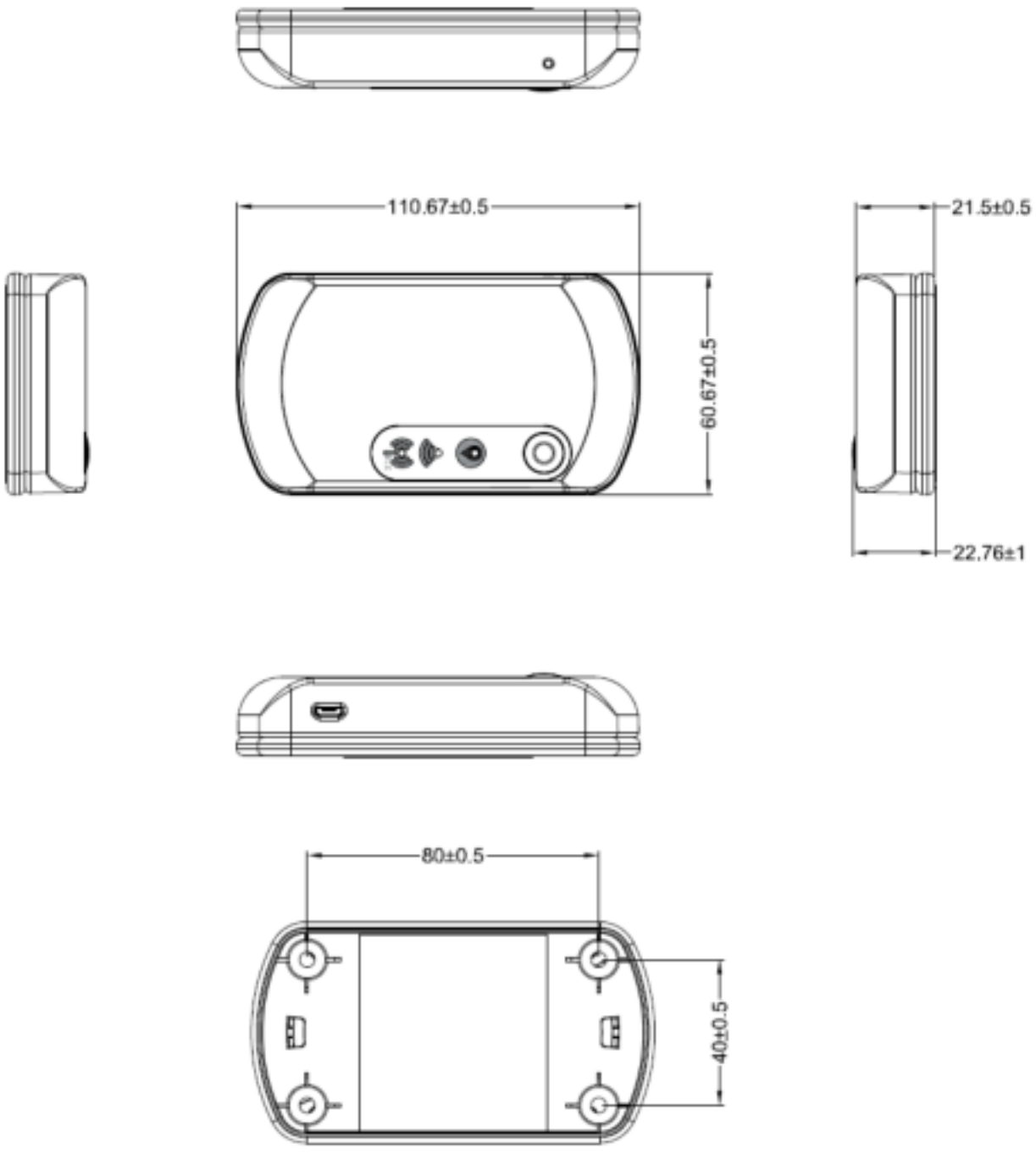
REN-CBW	
System	
Mother Board	REN-CBW Mother Board
MCU	ESP32-WROOM-32U/MDBT50Q-U1M
Frequency	32.768KHz
Wireless	802.11 b/g/n
Bluetooth	BT Bluetooth v4.2 / Bluetooth 5
Button	
Front side external I/O	1 x button
Mechanical & Environmental	
Power Requirement	DC +5V with Micro USB connector
Power Type	5V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

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

Note: Specifications are subject to change without notice.

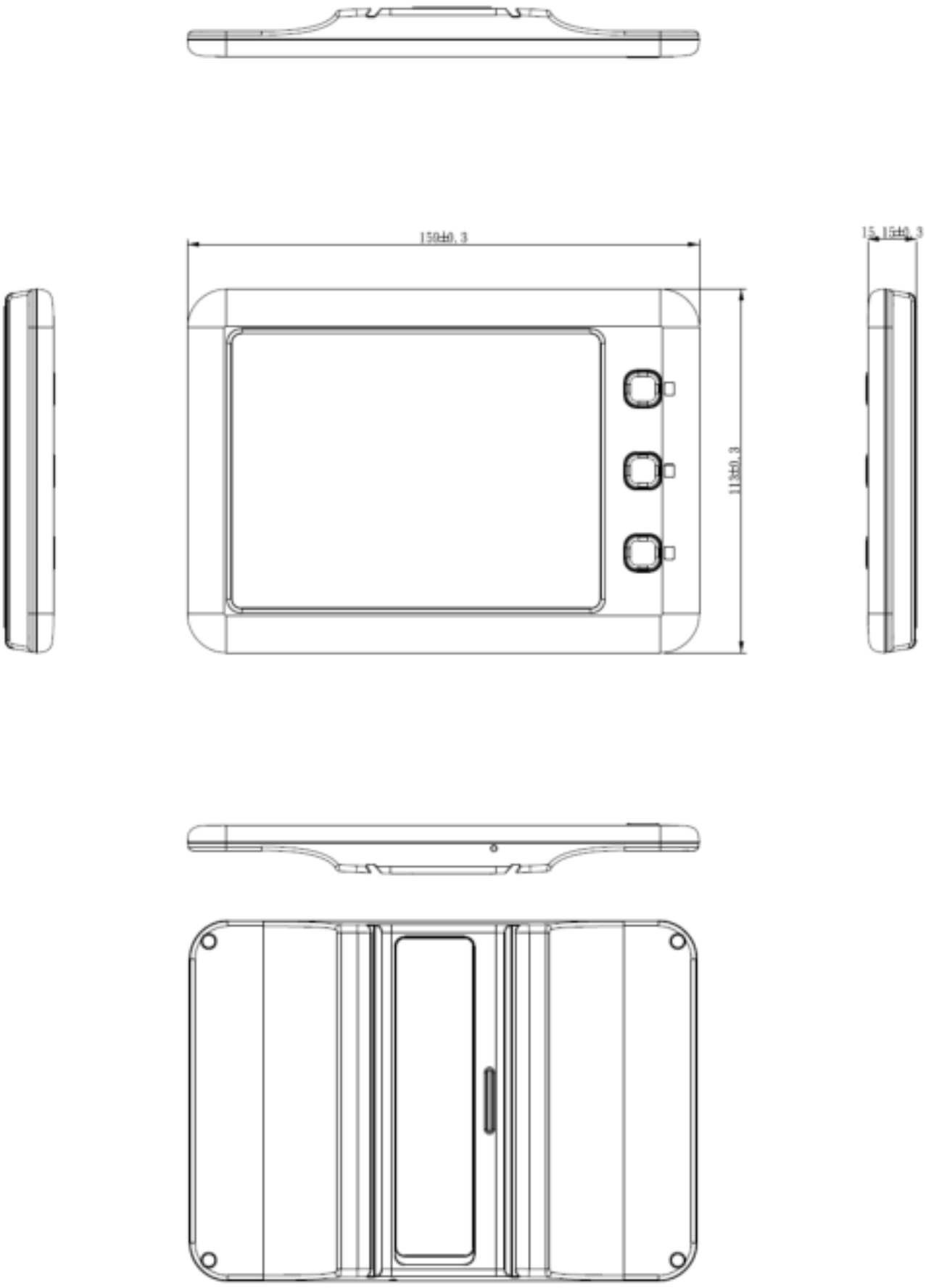
1.4 System Dimensions

1.4.1 REN-CBW



(Unit: mm)

1.4.2 EBC-05B1



(Unit: mm)

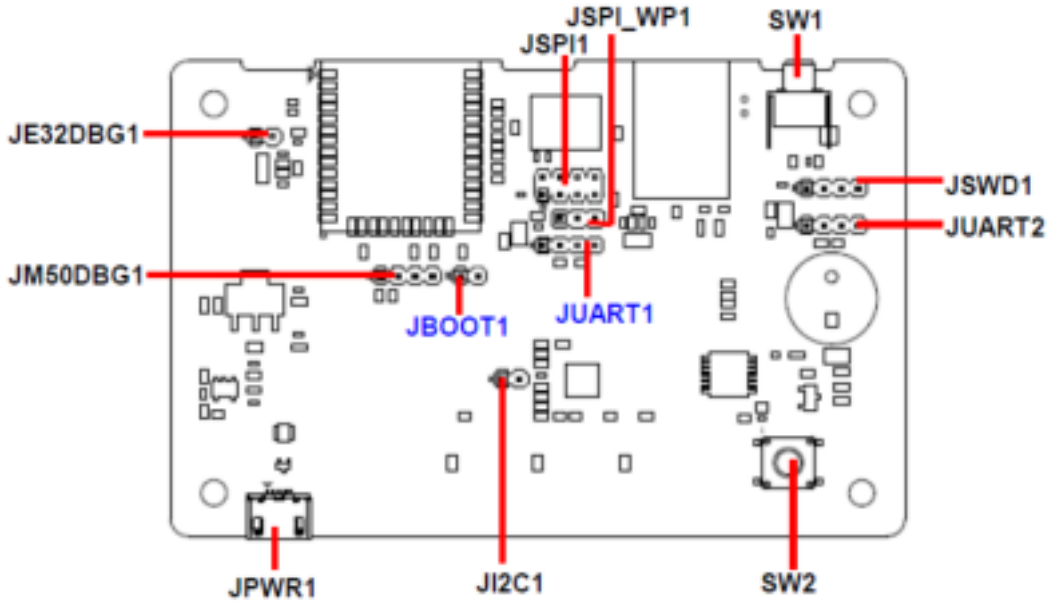
2. Hardware Configuration

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

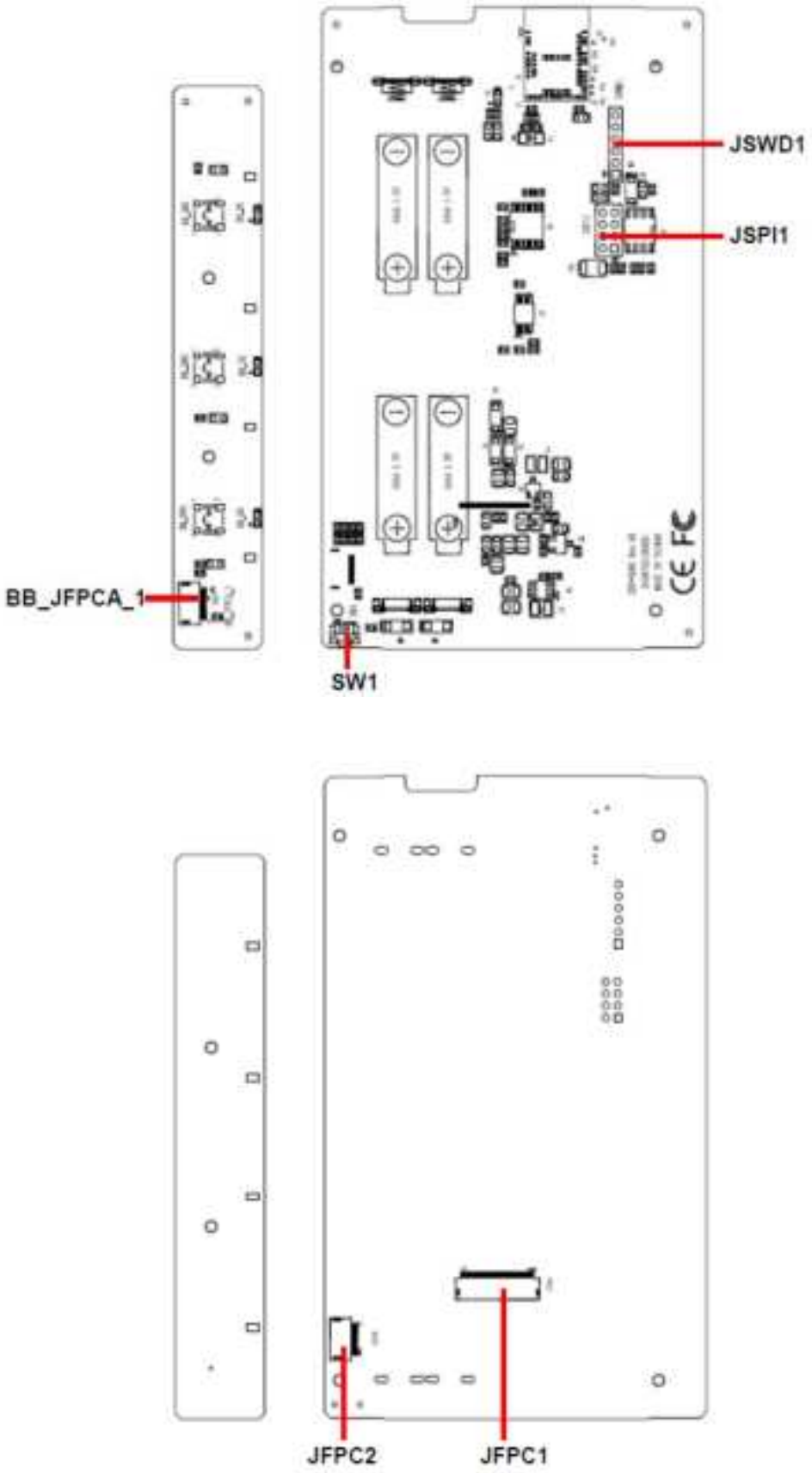
http://www.avalue.com.tw

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

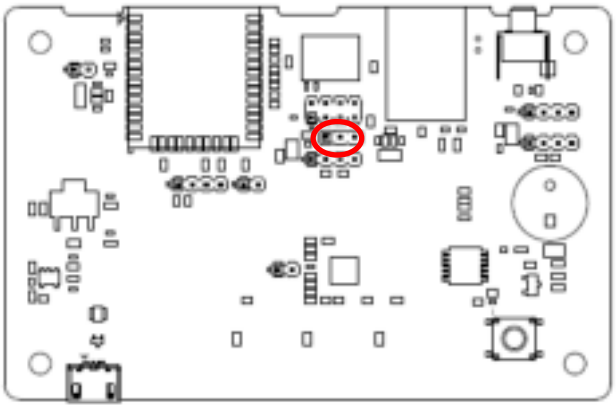
Label	Function	Note
JSPI_WP1	Write protection	3 x 1 header, pitch 2.00mm
JBOOT1	Boot selector	2 x 1 header, pitch 2.00mm

Connectors

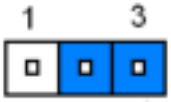
Label	Function	Note
JSPI1	SPI connector	4 x 2 header, pitch 2.00mm
SW1	Reset button	
SW2	Buzzer button	
JSWD1	SWD connector	4 x 1 header, pitch 2.00mm
JUART1	UART Debug ESP32 connector	4 x 1 header, pitch 2.00mm
JUART2	UART Debug M50Q connector	4 x 1 header, pitch 2.00mm
JE32DBG1	Debug ESP32 connector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

2.3 REN-CBW Jumpers & Connectors settings

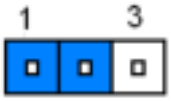
2.3.1 Write protection (JSPI_WP1)



LOW*

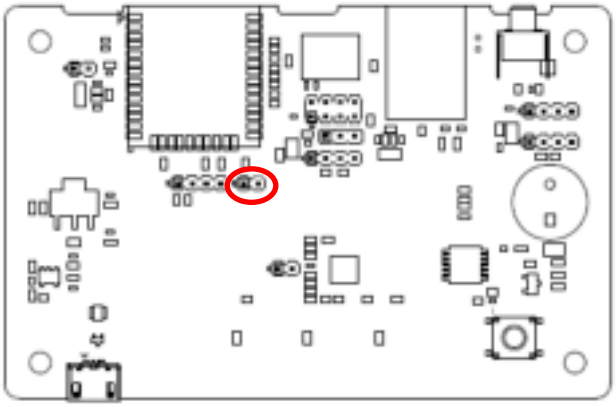


HIGH

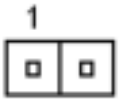


*** Default**

2.3.2 Boot selector (JBOOT1)



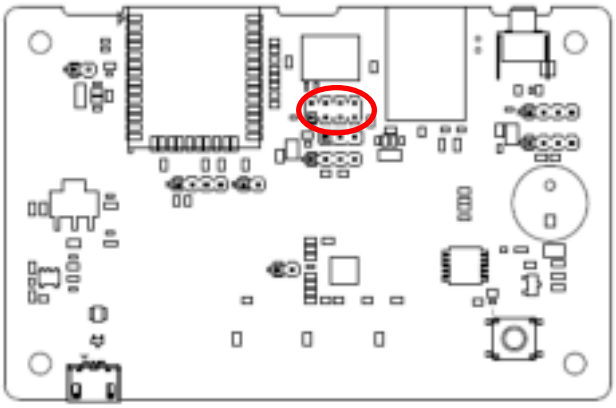
SPI BOOT*

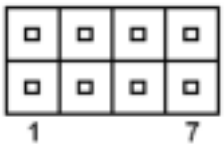


Download BOOT

*** Default**

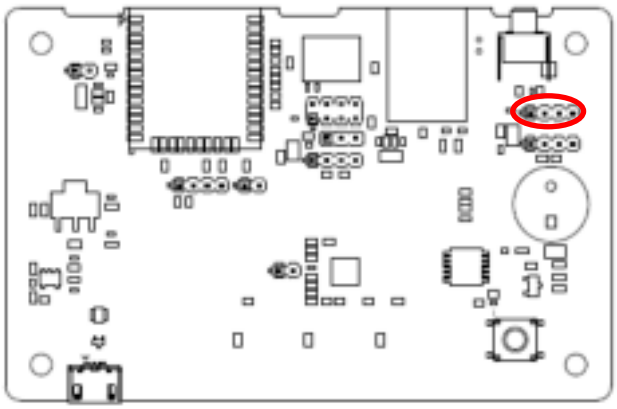
2.3.3 SPI connector (JSPI1)

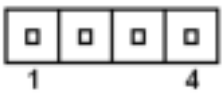




Signal	PIN	PIN	Signal
+3.3VSB	1	2	GND
SPI_CS_RST#	3	4	SPI_CLK
SPI_IO1	5	6	SPI_IO0
SPI_IO3_HOLD#	7	8	SPI_IO2_WP#

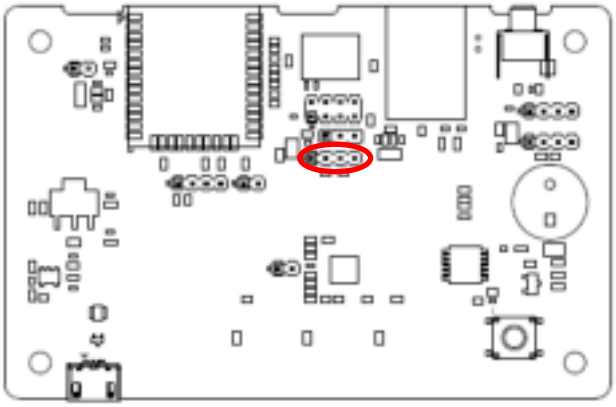
2.3.4 SWD connector (JSWD1)

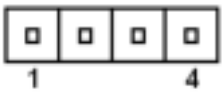




Signal	PIN
+3.3VSB	1
SWDIO	2
SWDCLK	3
GND	4

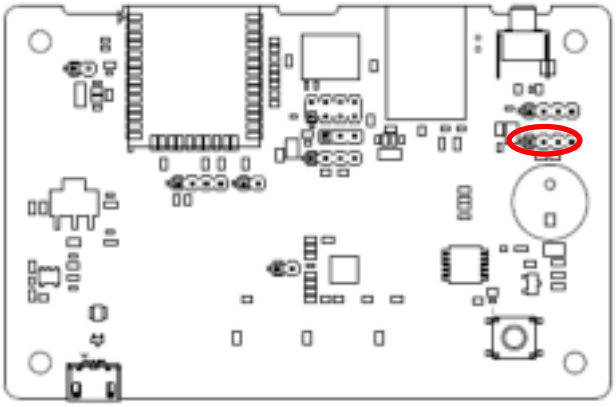
2.3.5 UART Debug ESP32 connector (JUART1)

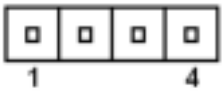




Signal	PIN
+3.3VSB	1
ESP32_UART_TX	2
+3.3VSB	3
ESP32_UART_RX	4

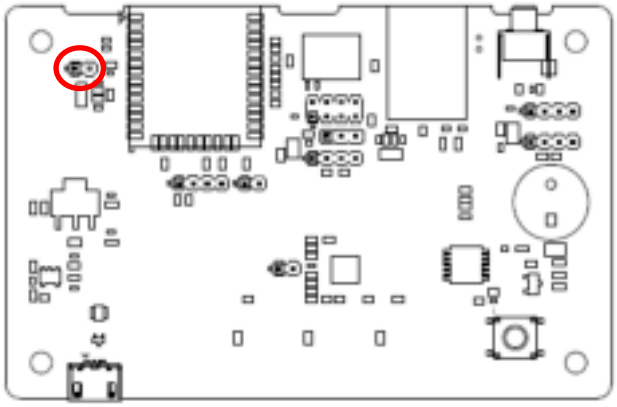
2.3.6 UART Debug M50Q connector (JUART2)

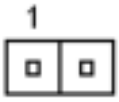




Signal	PIN
+3.3VSB	1
M50Q_UART_RX	2
+3.3VSB	3
M50Q_UART_TX	4

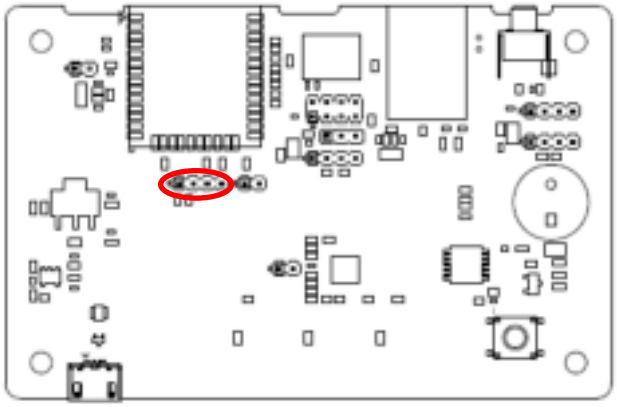
2.3.7 Debug ESP32 connector (JE32DBG1)

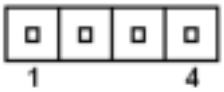




Signal	PIN
ESP32_EN	1
GND	2

2.3.8 Debug M50Q connector (JM50DGB1)





Signal	PIN
M50Q_RX	1
M50Q_TX	2
M50Q_RTS	3
M50Q_CTS	4

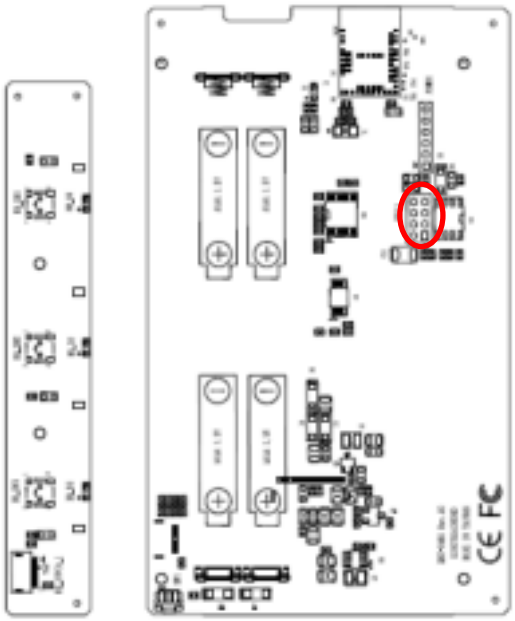
2.4 EBC-05B1 Connector List

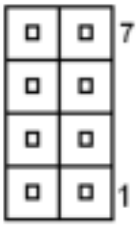
Connectors

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

2.5 EBC-05B1 Connectors settings

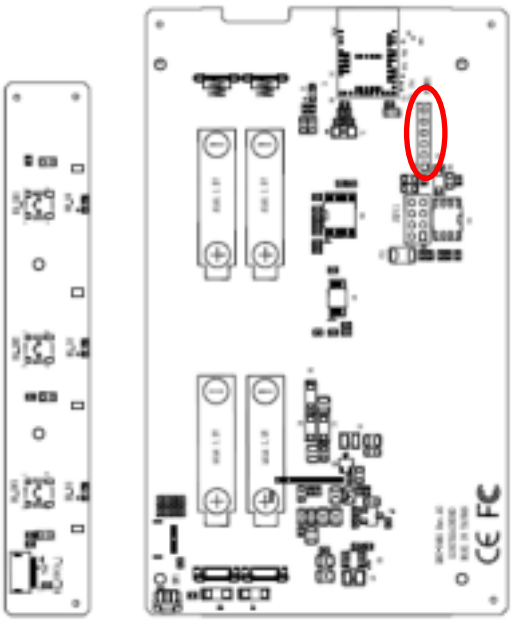
2.5.1 SPI connector (JSPI1)





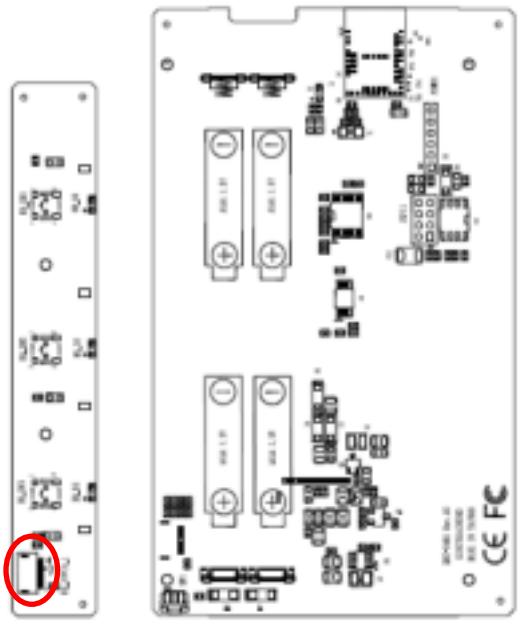
Signal	PIN	PIN	Signal
SPI0_IO2_WP#	8	7	SPI0_IO3_HOLD#
SPI0_IO0	6	5	SPI0_IO1
SPI0_CLK	4	3	SPI0_CS#
GND	2	1	+2.8VSB

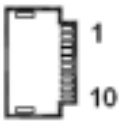
2.5.2 SWD UART Debug connector (JSWD1)



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

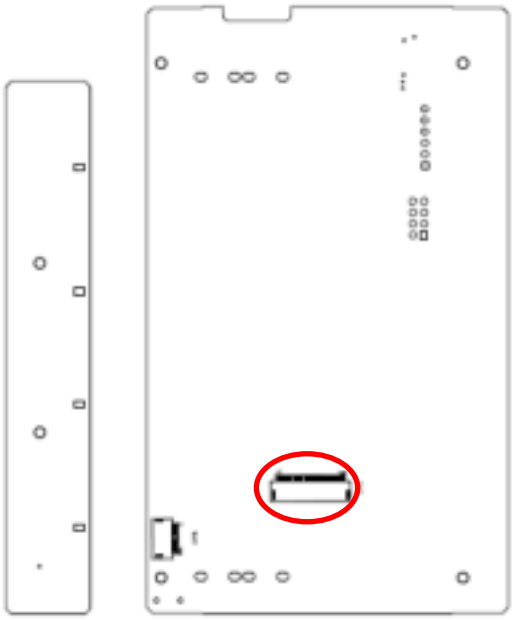
2.5.3 FPCA connector (BB_JFPCA_1)





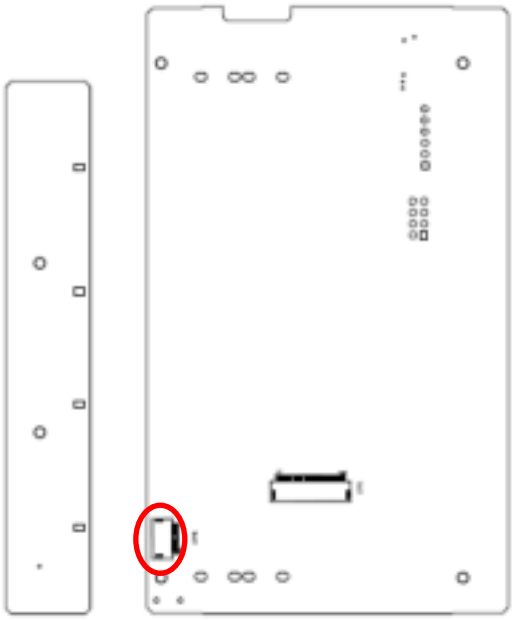
Signal	PIN
GND	1
BUTN3	2
BUTN2	3
BUTN1	4
BUTN0	5
LED3_B#	6
LED2_G#	7
LED1_R#	8
GND	9
+2.8V	10

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

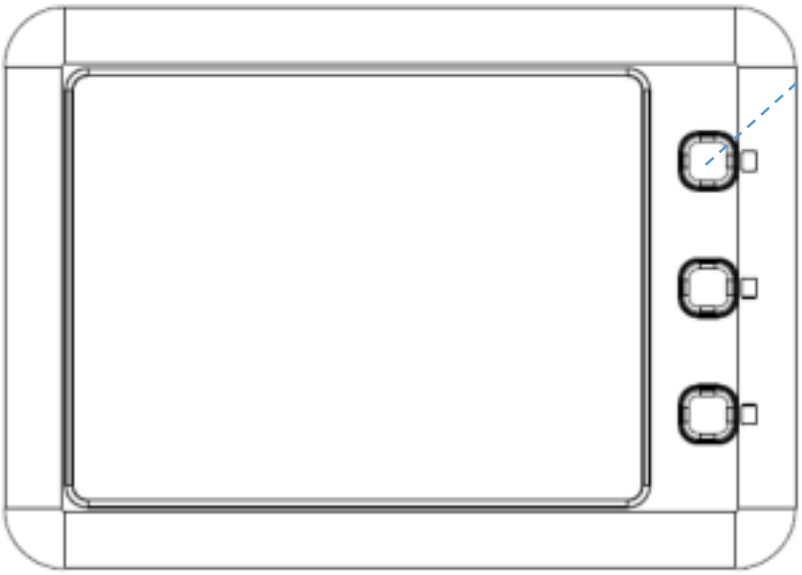
3. System Setup

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.

▲ **EBC-05B1**

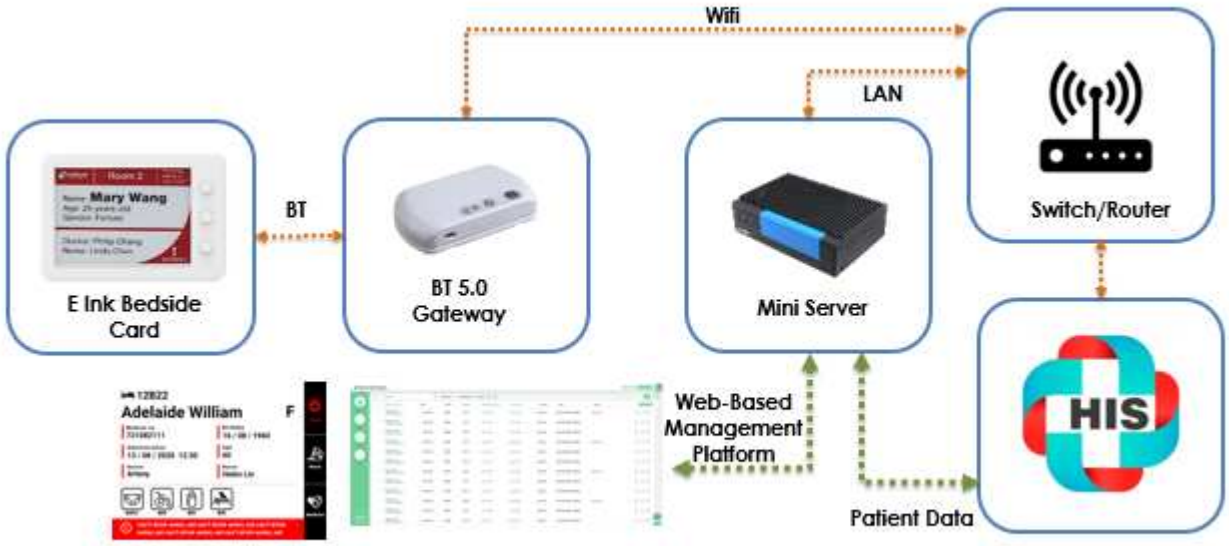
LED Behavior:

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.

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.

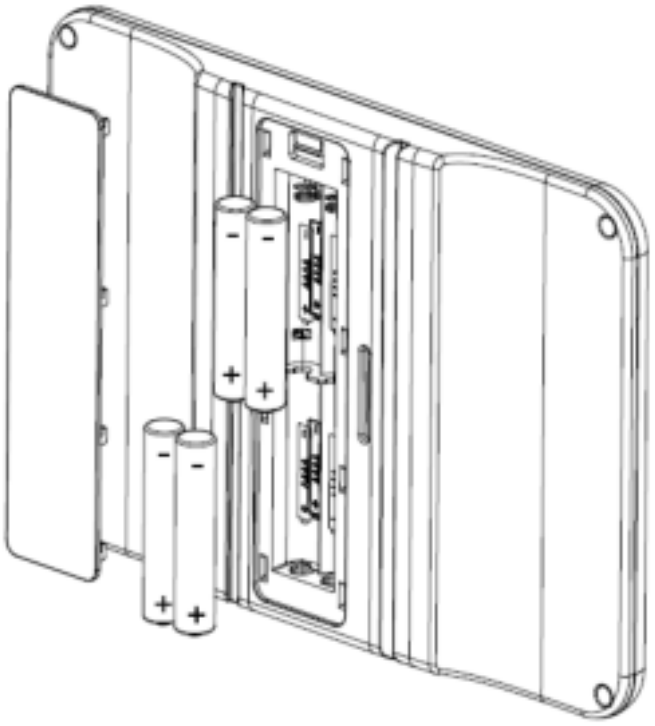
Step 4. Channels for cable ties design allow ceiling/wall/adhesive tape installation.

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.

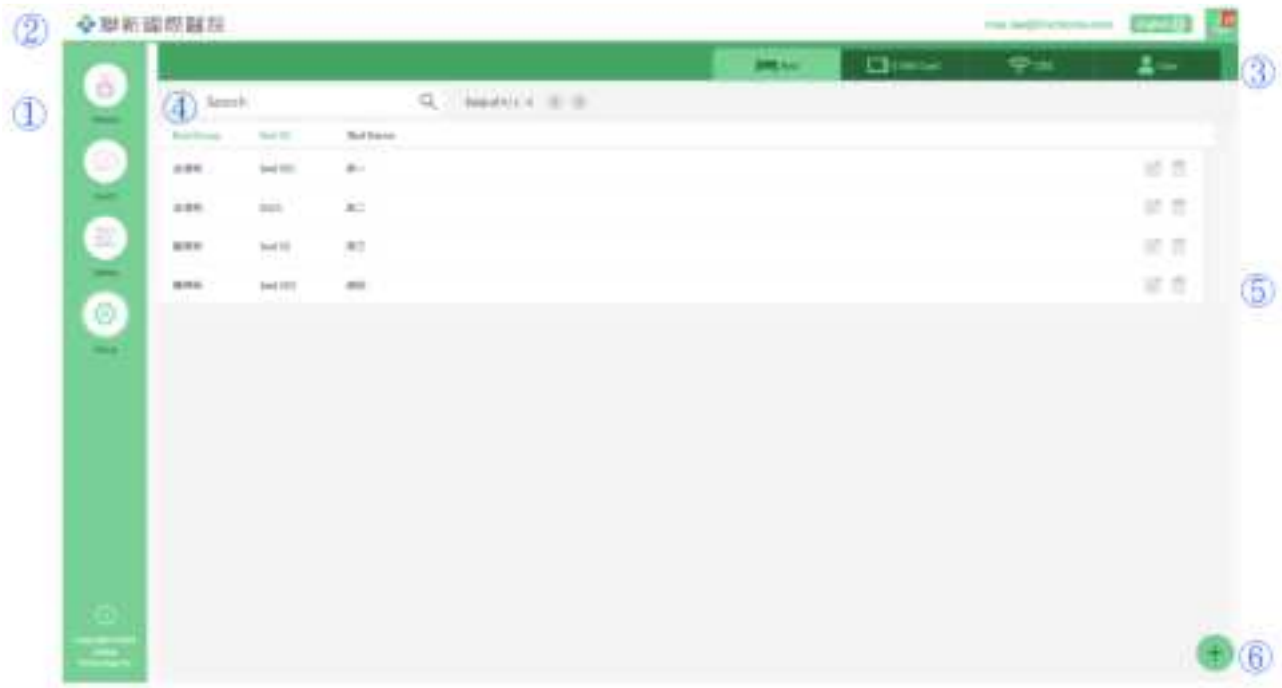
Step2. Press the battery spring, when removing batteries or replacing new one.

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

4. Smart Ward Display Solution Software Guide

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

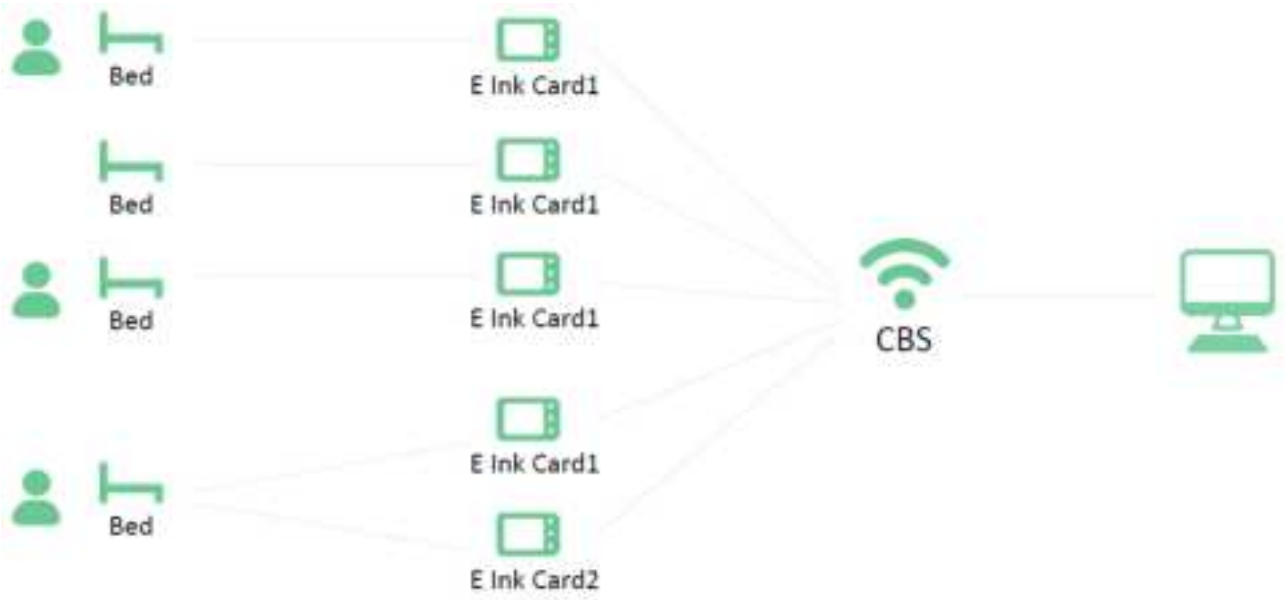
⑤ Data List

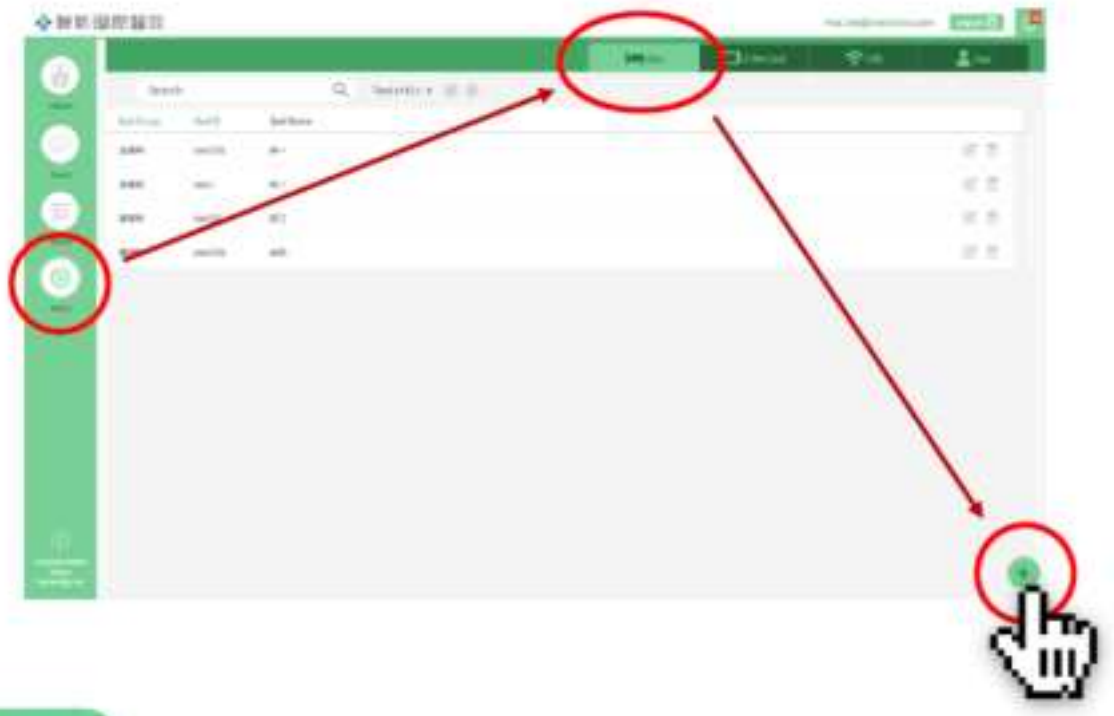
⑥ Function Buttons

4.2 Settings

4.2.1 Basic Operation Instructions- Adding Beds

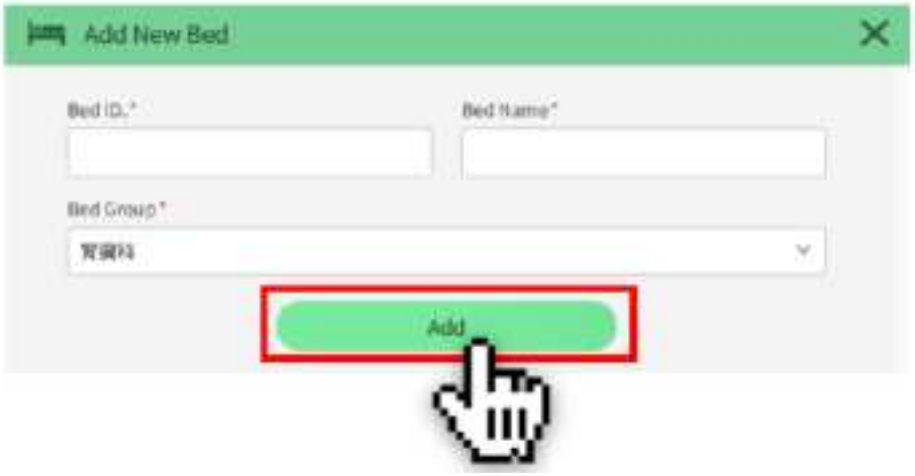
This management system takes hospital bed equipment as basic structure. The system management structure is illustrated as follows:





Step 1

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



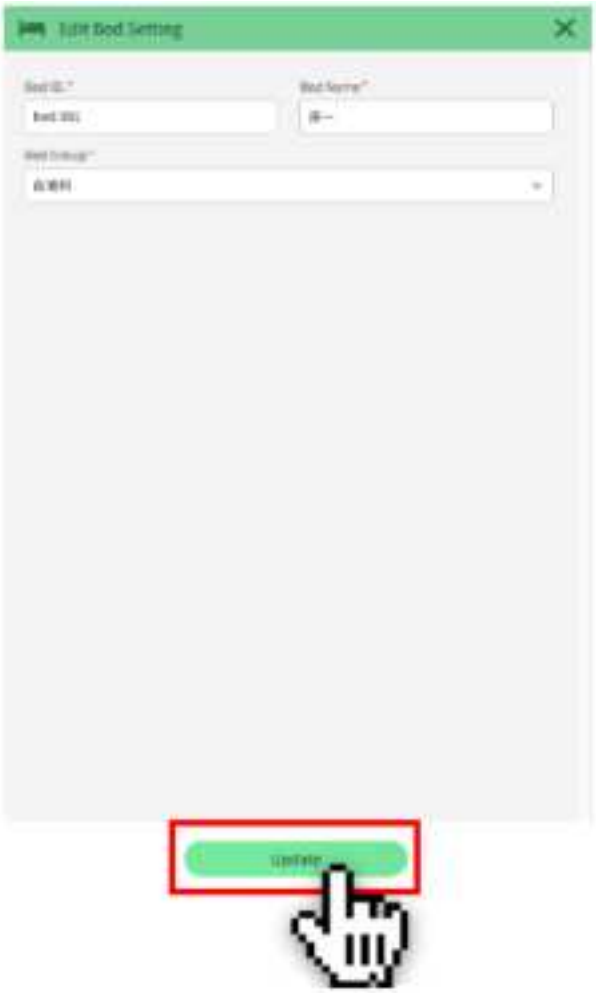
Step 2

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.

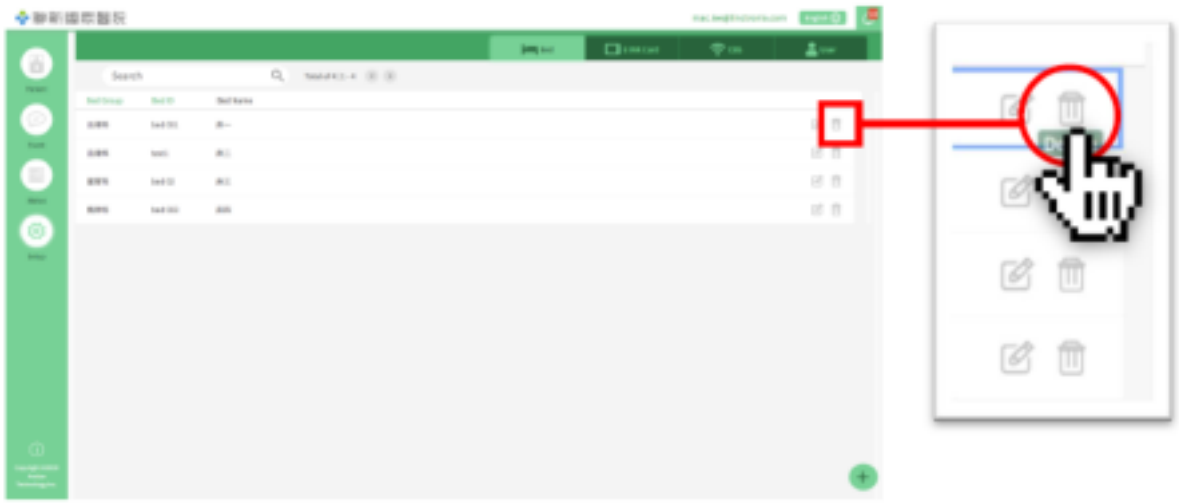


Step 2

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.

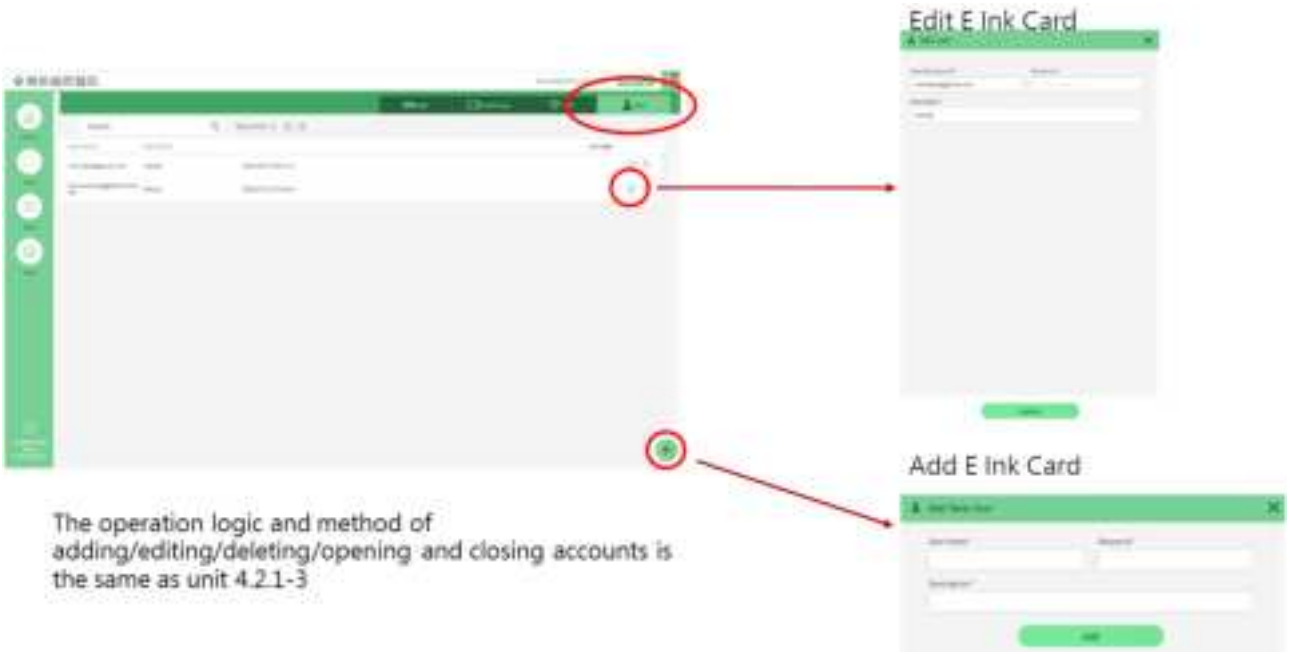
Step 2

Click "OK" to delete the bed.

4.2.4 E Ink Card Setting

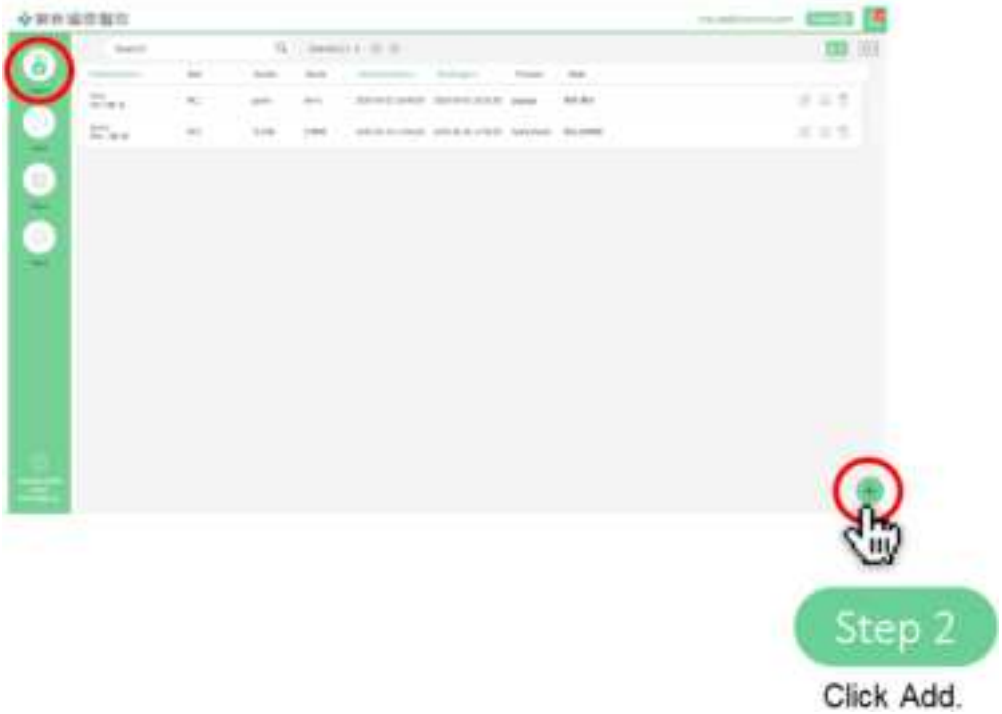
4.2.5 CBS Management

4.2.6 User Management



4.3 Patient Management

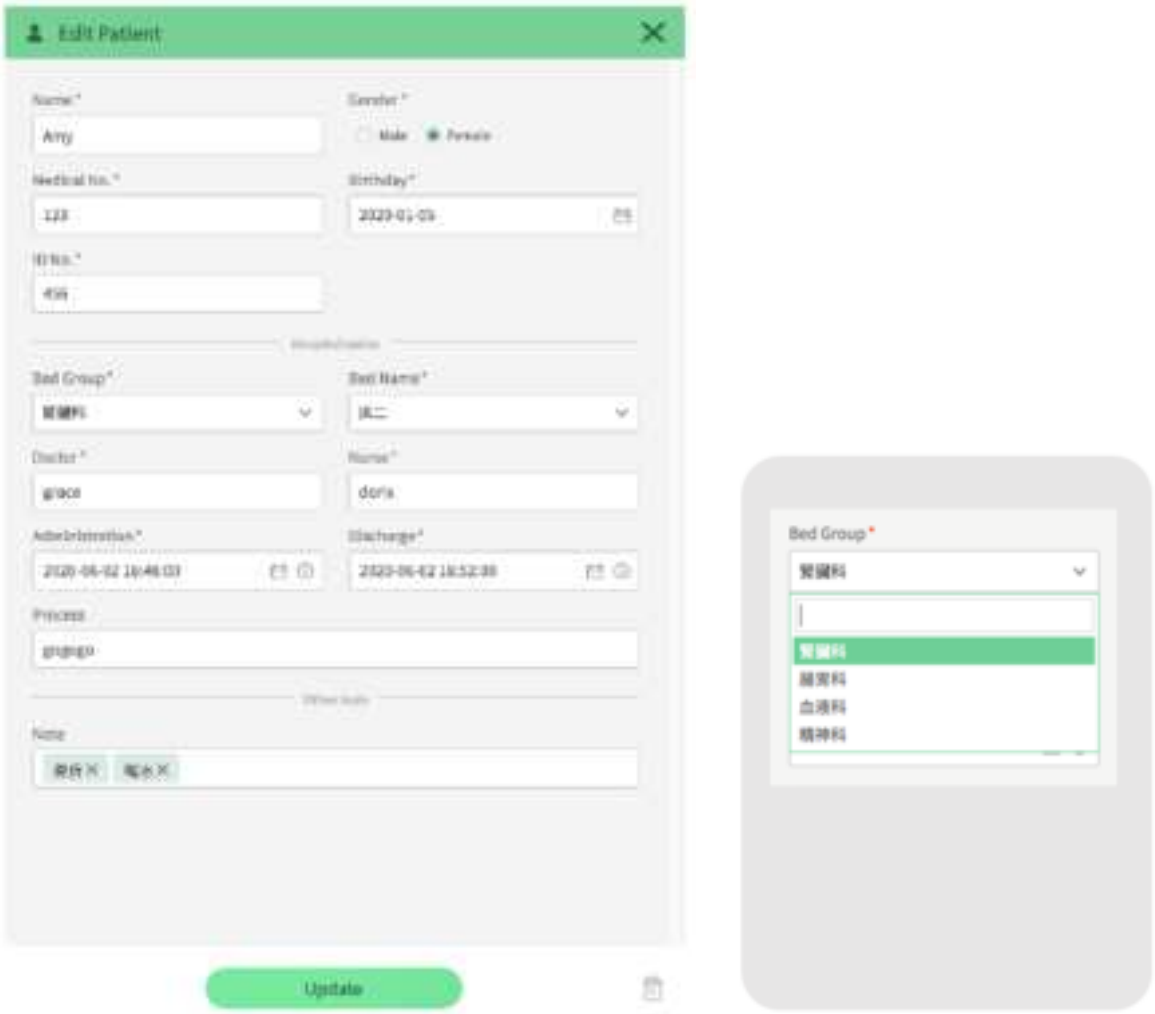
4.3.1 Patient Management- Add Patient Info



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

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

4.3.2 Patient Management- Add Patient Info



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

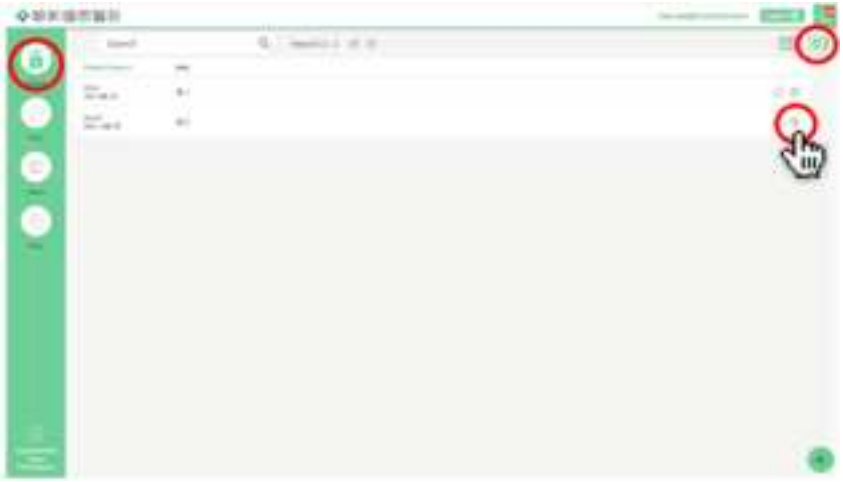
4.3.4 Patient Management- Delete Patient Info (From Edit)

Click Edit icon. 

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

4.3.5 E Ink Card Screen Setting

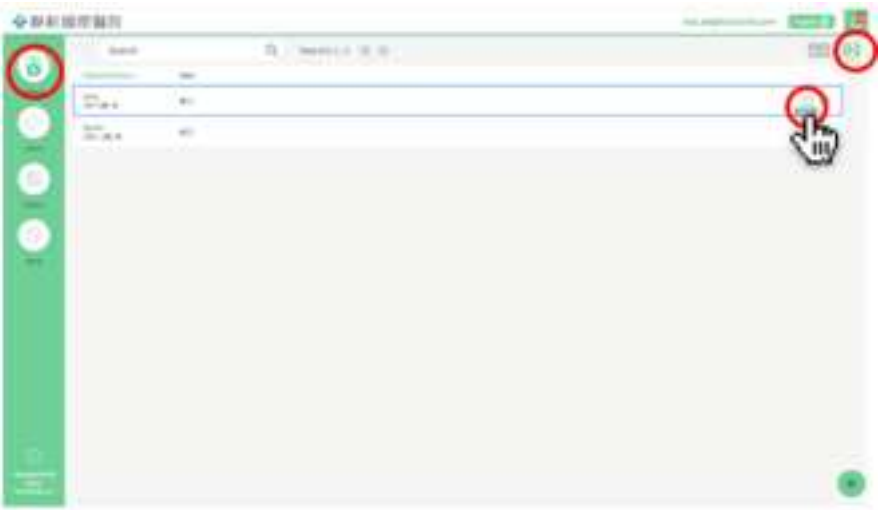
For different patient needs and scenarios, sometimes more than 2 sets of E Ink Cards are needed and different information screens are provided. This unit provides flexible configuration settings focusing on patients.
PS. This item is linked to the bed management of this system.



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

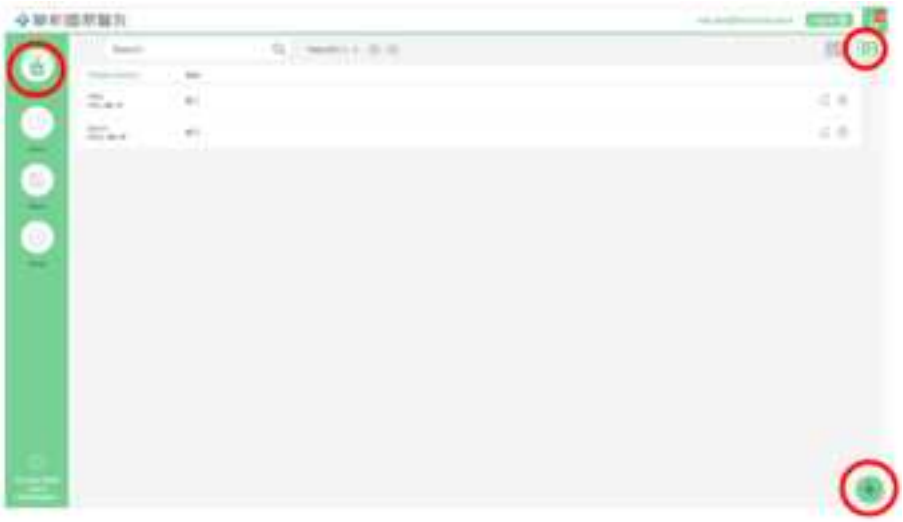
Click E Ink Card Setting icon. 

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.

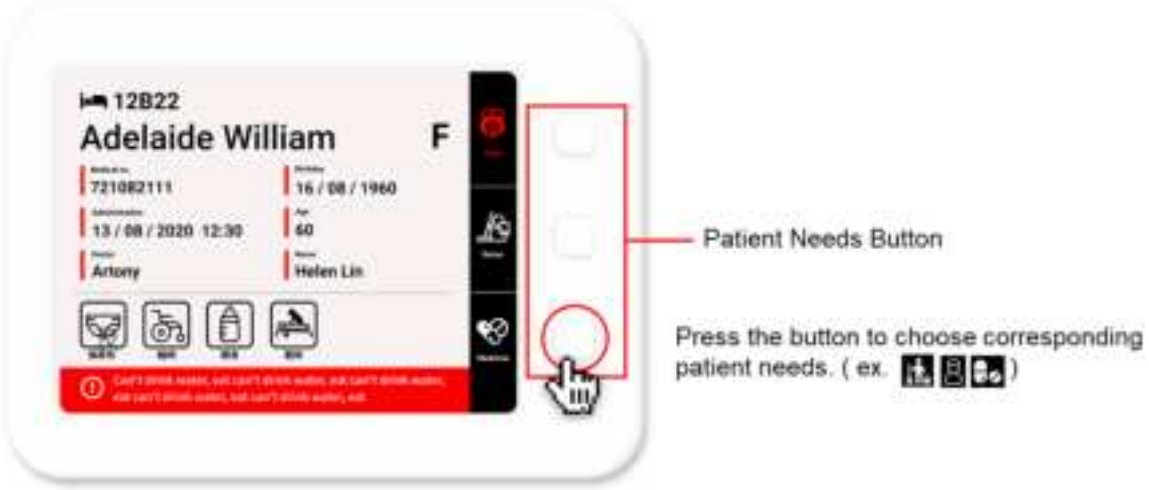


Click on the main menu on the left, and click E Ink Card Setting icon on the right.

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

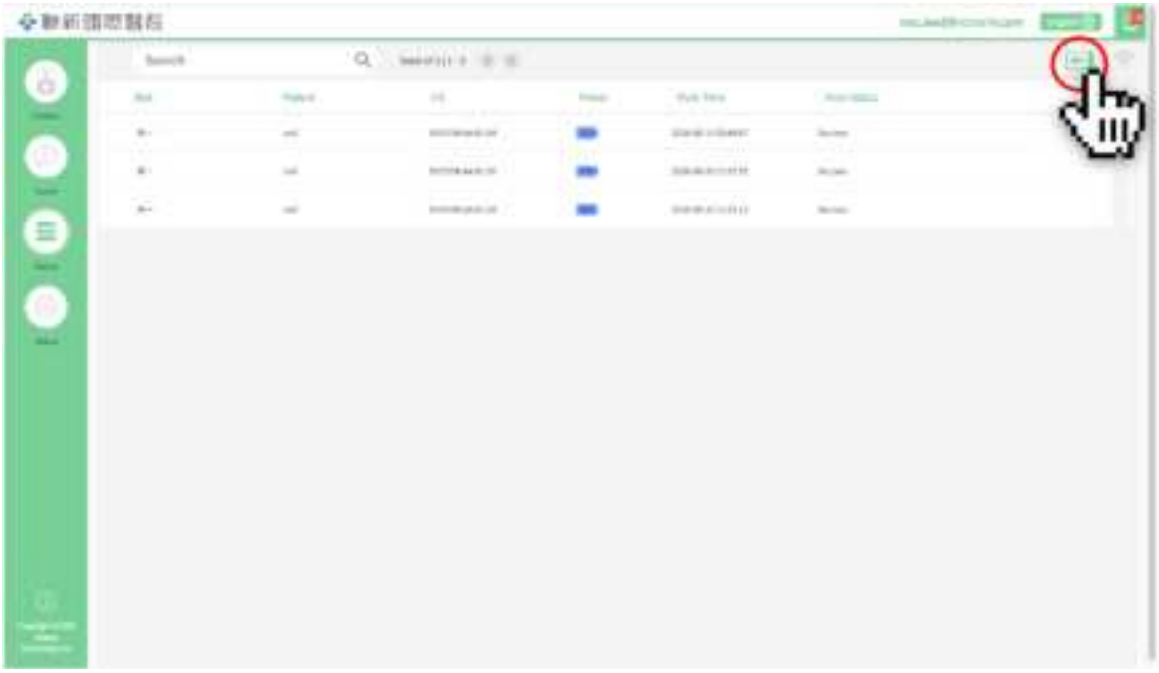
Report system requirements after pressing and record the time message was sent.

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

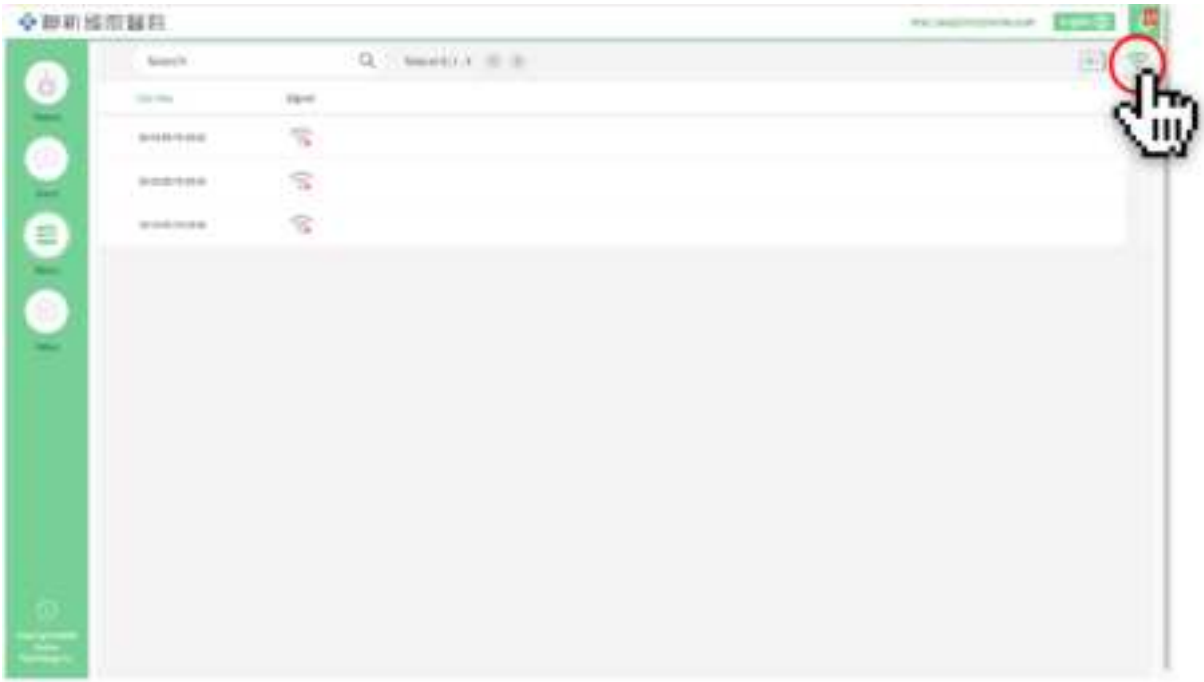
4.5.1 E Ink Card Status Management



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.