Melten

M2 Nurse Call Module

User Guide

Model NO.: BM-B01

Solutions to Connect with Your Patients

Revision History

Version	Date	Revision
0.1	2018.7.1	First Draft
0.2	2018.8.16	Add the FCC warning messages in the “Important Notice” section.
0.3	2018.8.20	Modify the product name and add the product specification table.
0.4	2018.8.21	Add the product model number

Important Notice

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Precaution

All peripheral or connected devices such as network switch, server, or software must be tested and verified by Melten before installations.

BM-A01 supports BT4.0 and WiFi (802.11 b/g/n) interfaces. The configuration can only be configured by certified Melten engineers and please also contact Melten before using it. Changing the radio frequency and power is prohibited and may consequently violates the radiation law in any country.

*Maximum wireless signal rate derived from IEEE Standard 802.11ac and 802.11n specifications. Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate. Environmental conditions will adversely affect wireless signal range.

- 802.11n/g/b/a Compatible
- BT4.0 Supported
- Operating Temperature: 0°C (32°F)~+40°C (104°F)
- Storage Temperature: 0°C (32°F)~+50°C (122°F)
- Humidity Control: 20% to 80% (non-condensing)

A Statement and Advisory from Melten Inc.

This manual is designed to instruct all personnel responsible for proper installation, use and care of the Melten Smart Ward IoT System and M2 nurse call module. All users are urged to carefully read these instructions before operating the system.

The instructions described in this manual are the only officially approved operating methods by Melten Inc. (Melten) and should be followed except for any statutory obligation. All users and technicians should become familiar with the warnings, cautions, and instructions contained herein. Do not operate or service the system until you have become familiar with this information.

The system must be installed and serviced by competent personnel. Do leave this manual with the users and technicians after installation. If you are in any doubt, contact your Melten representative for details.

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.

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

Melten Inc.

Customer Service and Sales

Website: http://melten.com

Phone: +886-2-22670607

FAX: +886-2-22674427

E-Mail: info@melten.com

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1. Introduction

Melten Smart Ward IoT System is provided to the patient's family, caregivers or nurses who respond to the assistance calls from the bedside and need to react quickly. This document mainly describes the architecture and installation procedures of Smart Ward IoT System.

2. System Overview

The system is designed to be installed in the ward rooms of the hospitals, providing real-time communication between the patients and nursing staffs through the connection with telephone exchanges, wireless telephones and computers. It allows the medical and nursing personnel to receive and respond to every information coming from this system at any time. It meets the goals of medical service quality improvement and fulfill the management needs.

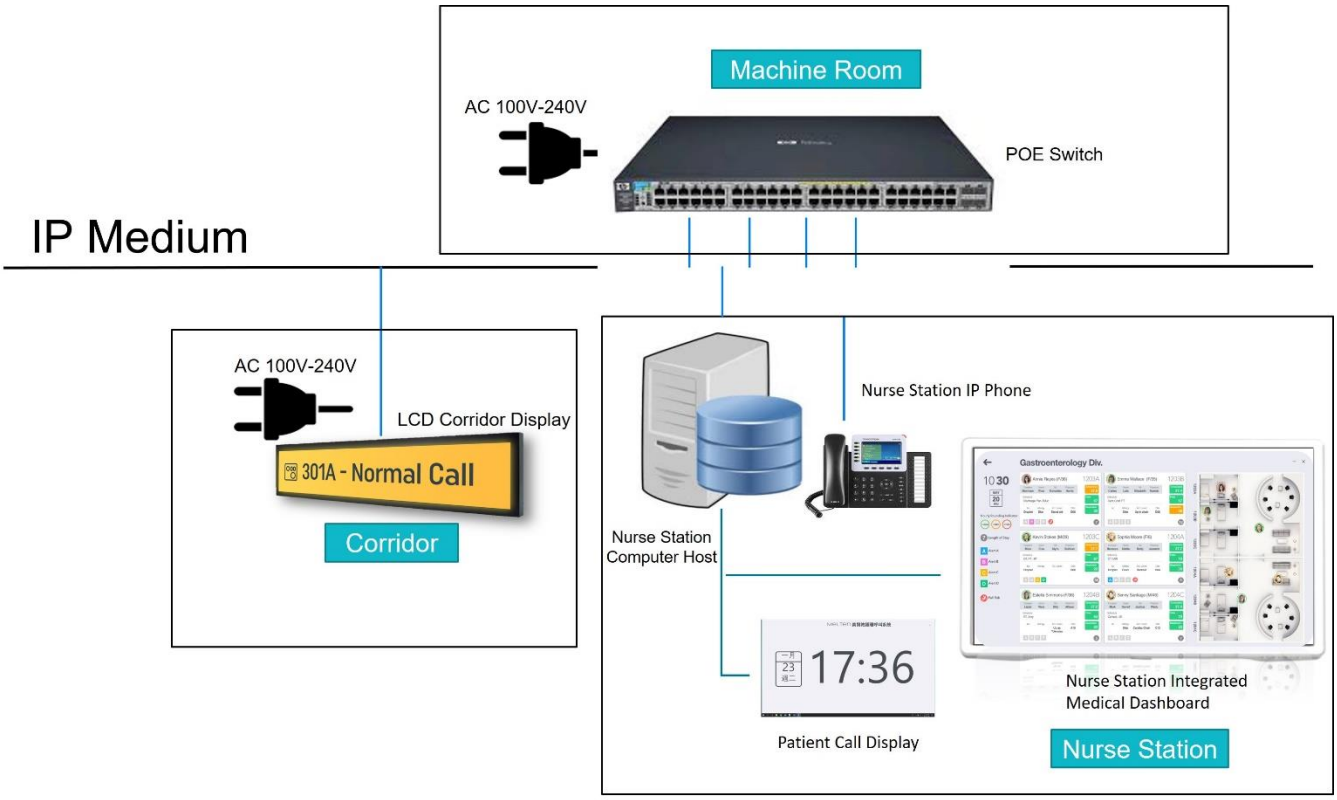
3. Before Using

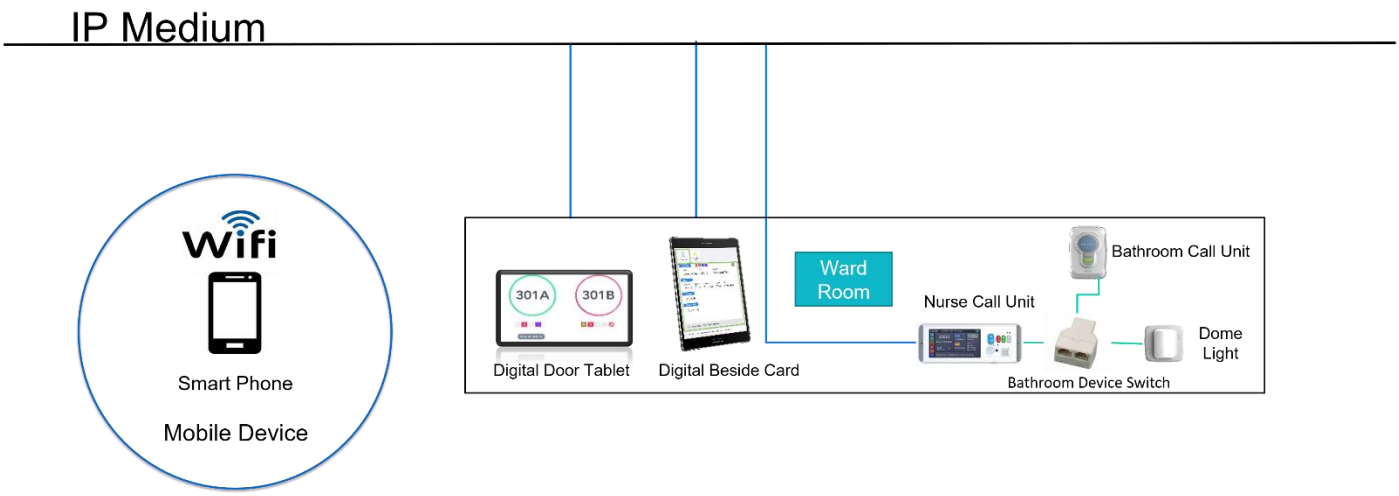
All peripheral or connected devices such as network switch, server, or software must be tested and verified by Melten before using.

4. System Device List

Device Name	Device Image	Installation Area
M2 Nurse Call Module		Bedside
Nurse Call Cords		Nurse Call Unit
Bathroom Call Unit		Ward Bathroom
IP Telephone Attendant Console		Nurse Station
Corridor Display		Hospital Corridor
Dome Light		Ward Doorway
22” Display (PCD Display & Smart Dashboard) + Computer Host x 2		Nurse Station
Smart Phone		Portable phone carried by nursing staff

5. Smart Ward IoT System Architecture

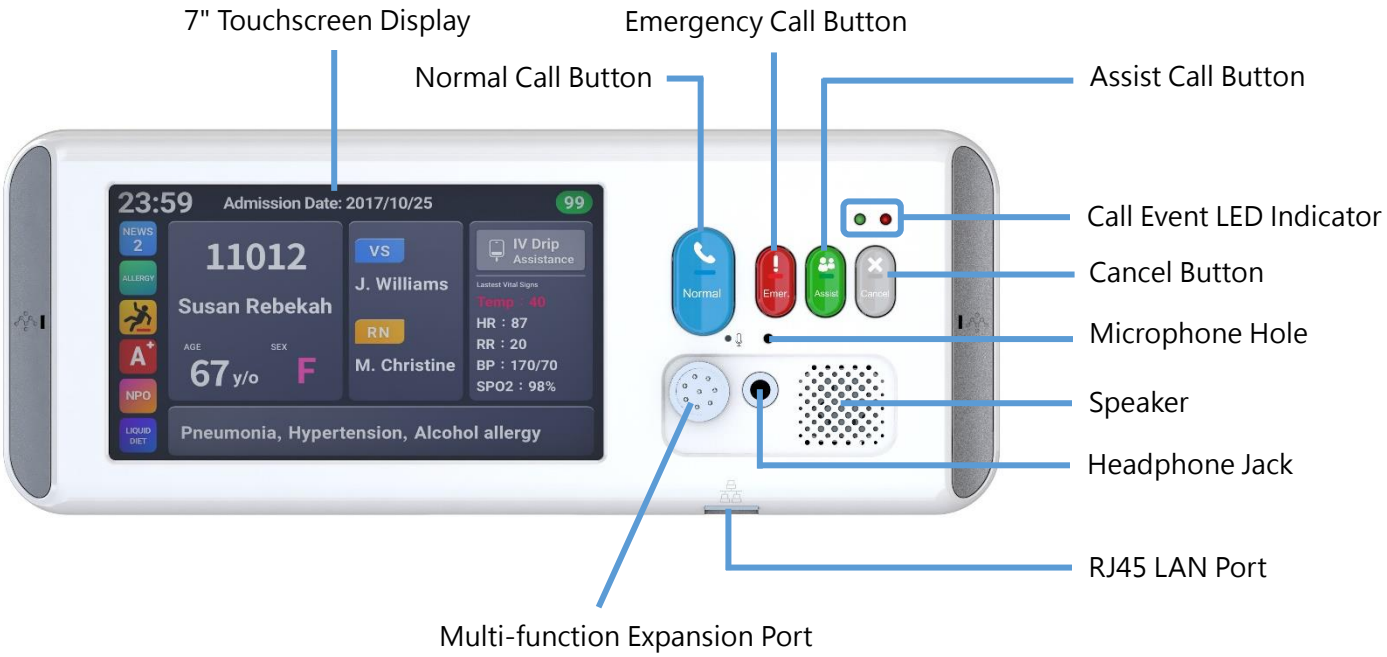




6. System Device Introduction

6.1 M2 Nurse Call Module

6.1.1 M2 Front View

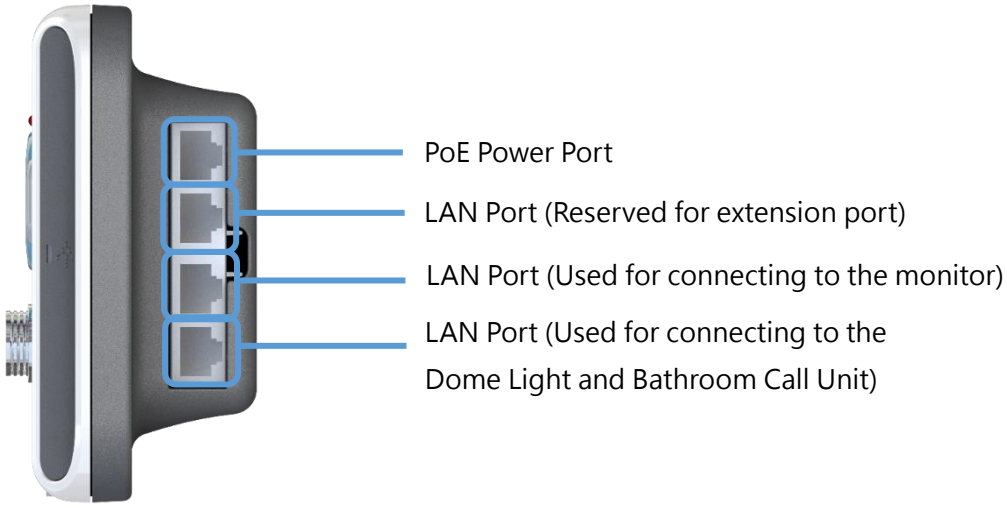


6.1.2 M2 Front Panel User Interface Functionalities

- 7" Touchscreen Display: Displays real-time patient information, medical care notes, inspection schedules and medical care team members.
- Normal Call Button: Press this button to call the nursing staff when a normal situation needs to be handled.
- Emergency Call Button: Press this button to call the nursing staff when an emergency situation needs to be taken care of. When receiving an emergency call, the message will be simultaneously displayed on the monitors of Nurse Station Host, Corridor Displays, Smart Phone and Mobile Medical Cart.
- Assist Call Button: To call other groups of nursing staff for assistance, press this button.
- Cancel Button: To cancel a call, press this button.
- Call Event LED Indicator: Distinguishes different event types by displaying different colors.
- Microphone Hole: Receives the voice signal of the patient call.
- Speaker: Transmits the voice signal sent by nursing staff.
- Headphone Jack: For functional expansion and connectivity with other equipment
- RJ 45/Ethernet Port: Connects with vital sign equipment and uploads data instantly.

- Multi-function Expansion Port: Connects with call cords or other medical equipment and synchronizes with Intelligent Nurse Call System. When connected with the attachable call cord, it supports Fall Detection function.

6.1.3 M2 Side View

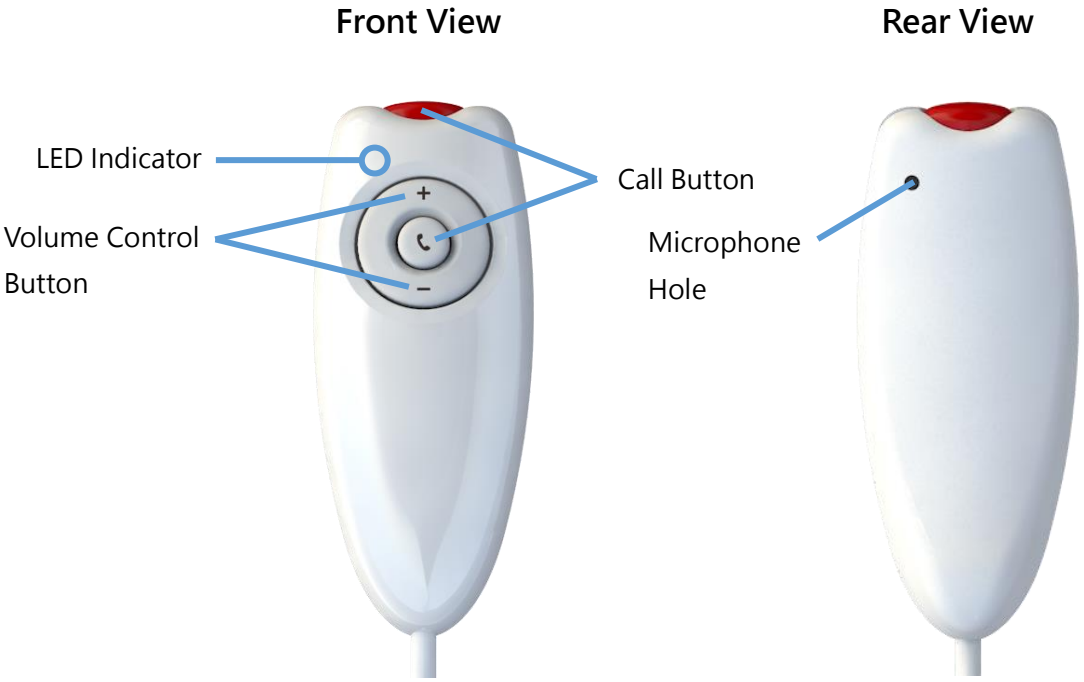


6.1.4 M2 Touch Screen User Interface

6.2 Nurse Call Cords

The nurse call cords are designed for the bedridden patients to call the nursing staff in a quick and easy way.

6.2.1 Nurse Call Cords Components

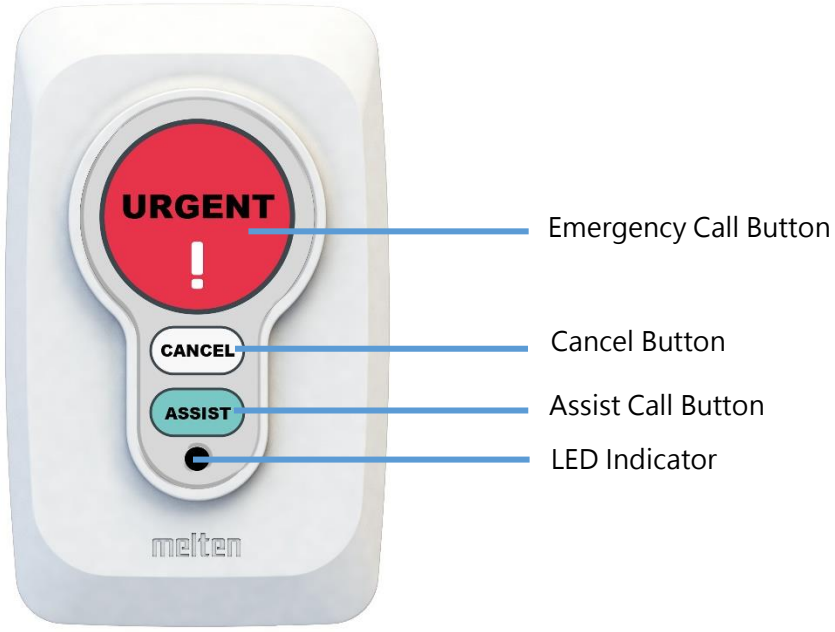


6.2.2 Nurse Call Cords Component Functionalities

- Call Button: Press this button to call the nursing staff when a normal situation needs to be handled.
- LED Indicator: When pressing the call button, this LED indicator will illuminate.
- Microphone Hole: Receives the voice signal of the patient call.
- Volume Control Button: Allows the patients to adjust the speaker volume.

6.3 Bathroom Call Unit

6.3.1 Bathroom Call Unit Components



6.3.2 Bathroom Call Unit Functionalities

- Emergency Call Button: Press this button to call the nursing staff when an emergency situation needs to be taken care of.
- Cancel Button: To cancel a call, press this button. A bathroom emergency call can only be cancelled by pressing the “Cancel Button” of bathroom call unit.
- Assist Call Button: To call other groups of nursing staff for assistance, press this button.
- Call Display LED Indicator: When pressing the Call Button, this LED indicator will illuminate.

6.4 Nurse Station IP Phone

6.4.1 Nurse Station IP Phone Exterior View

6.4.2 Nurse Station IP Phone Functionalities

- Power and Function Light Indicators
  - A. Allows a set of 4 characters (including the above) and 10 sets (including the above) of caller ID automatically displayed in turns. The caller ID and waiting calls will be displayed actively.
  - B. With volume control function
- Answering the calls from every ward bed and providing intercommunication capability (Two-way conversation between nurse station and ward bed)
  - A. The call signals are categorized into the following 3 types: Normal Call, Emergency Call and Assist Call. These calls will be automatically distinguished by the calling sequence.
  - B. It supports smart mobile phone conversation method. When the patient calls and the nurses are away from the nurse station or they are making their rounds, the portable smart phone will simultaneously ring and vibrate, allowing the nurses to answer the patient' s calls. In addition, the nurses are able to call and notify other nursing staff through the broadcasting function, or directly call and communicate with the nurse call unit of every ward room.
  - C. The call number arrangement of every nurse call unit is adjustable according to the room number and bed number of each ward room.
- It supports single nurse call unit intercommunication and ward room area broadcasting function to distribute notification, keeping all nursing staff well-informed.

6.5 Double-sided Corridor Display

6.5.1 Corridor Display Exterior View

6.5.2 Corridor Display Functionalities

- Displays the calling ward room number, bed number and bathroom number.
- Call Display Function (4-digit number display) for ward room and bathroom emergency calls
- Caller ID Memory Sequential Display Function: When the lines are busy, it will automatically memorize the caller IDs and display them in turns. Its displaying and elimination are totally synchronized with the nurse station host.
- Calling number display and music ring tone indication
- Single-row Display; each set of captions can contain 4 and above characters (4 Chinese characters, 8 English characters). It supports 10 sets (including the above) of captions automatic memory sequential display.
- Supports Chinese character entries and display
- It can be used as a caption machine. Each row can display 20 English/Number digits or 10 Chinese characters. Up to 20 lines of captions can be entered.

6.6 Dome Light (4 Colors)

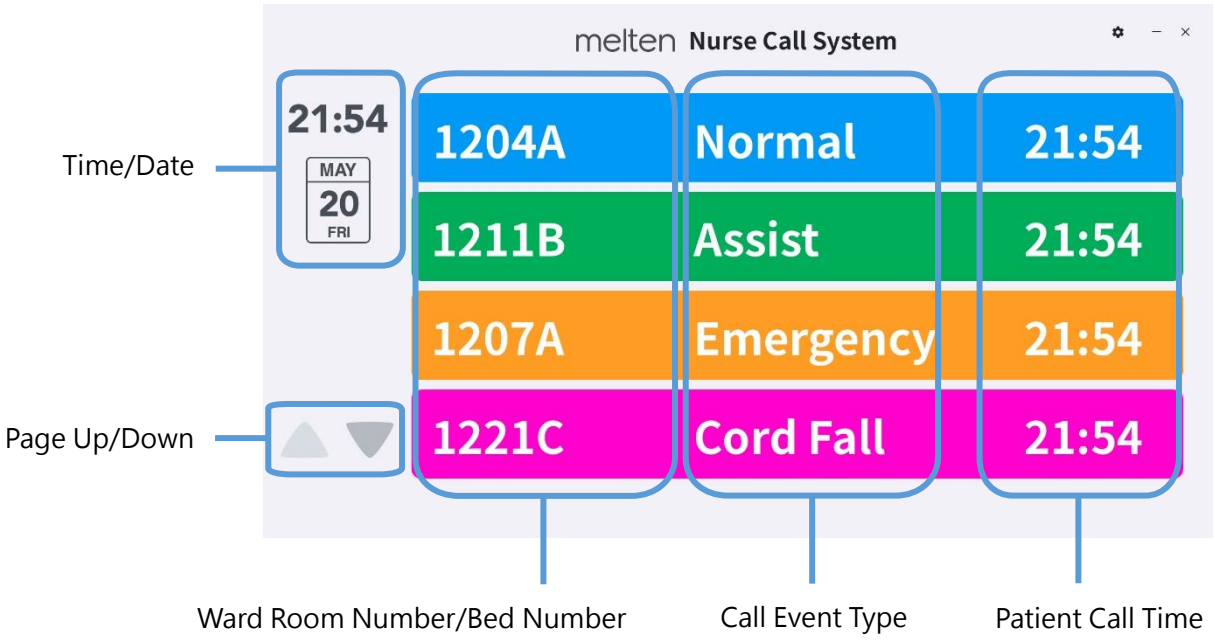
6.6.1 Dome Light Exterior View

6.6.2 Dome Light Functionalities

- White square translucent plastic compression molding
- Contains Red and Green indicators
- Bathroom emergency calls will illuminate in red.
- Bedside normal calls will illuminate in green.
- The red and green lights can be individually or simultaneously displayed by software control (yellow light).
- It will support 7-color display (red, green, blue, light blue, purple, yellow and white).

6.7 Patient Call Display (PCD)

6.7.1 PCD User Interface

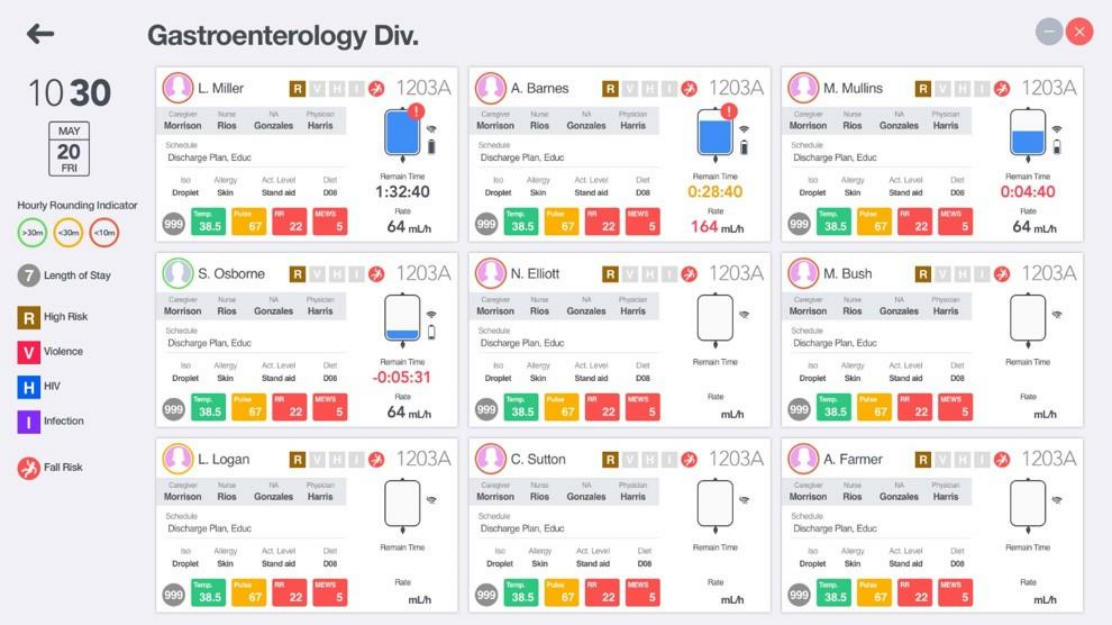


6.7.2 PCD Functionalities

- Patient bed number and Information displayed in English and Chinese while calling
- Automatic sorting by priority and call sequence
- Distinguishes the types of patient calls by different colors, which makes it easy for the nursing staff to identify the call types.
- Displays the ward room numbers, ward bed numbers and conversation
- Displays the bathroom call of every ward room
- Supports Remote Call Cancel Function

6.8 Nurse Station Dashboard

6.8.1 Nurse Station Dashboard User Interface



6.8.2 Nurse Station Dashboard Functionalities

- Integrated nurse daily workflow
- Melten IoT peripheral information integration
- Reduces medical personnel handwritten errors
- Increases the working efficiency of medical personnel

6.9 Smart Phone

6.9.1 Smart Phone Exterior View

6.9.2 Smart Phone Functionalities

- Supports ward room number digital display.
- It’s signal receiving area covers the ward room, corridor and public area of the unit.
- Answering the calls from every ward bed and providing intercommunication capability

7. M2 User Interface Introduction

7.1 M2 User Interface

By manipulating the M2 user interface, the users are able to view or switch the following information:

- Current Time/Date and Inpatient Days: Displays the current time, date and inpatient Days.
- Patient Basic Information: Displays the basic information of the patient.
- Care Team: Displays the duty doctor and nurse for the patient.
- Special Needs and Condition Display: Displays the special needs and current condition of the patient.
- Latest Vital Sign Data: Displays the latest measured vital sign data of the patient.
- Special Notes: This area displays the special notes of the medical treatments for the patient.

7.2 Switch Flow of the Special Needs and Condition Display

This area displays the real-time needs, current condition or the handling hint of the patient. The priority and flow sequence are as follows.

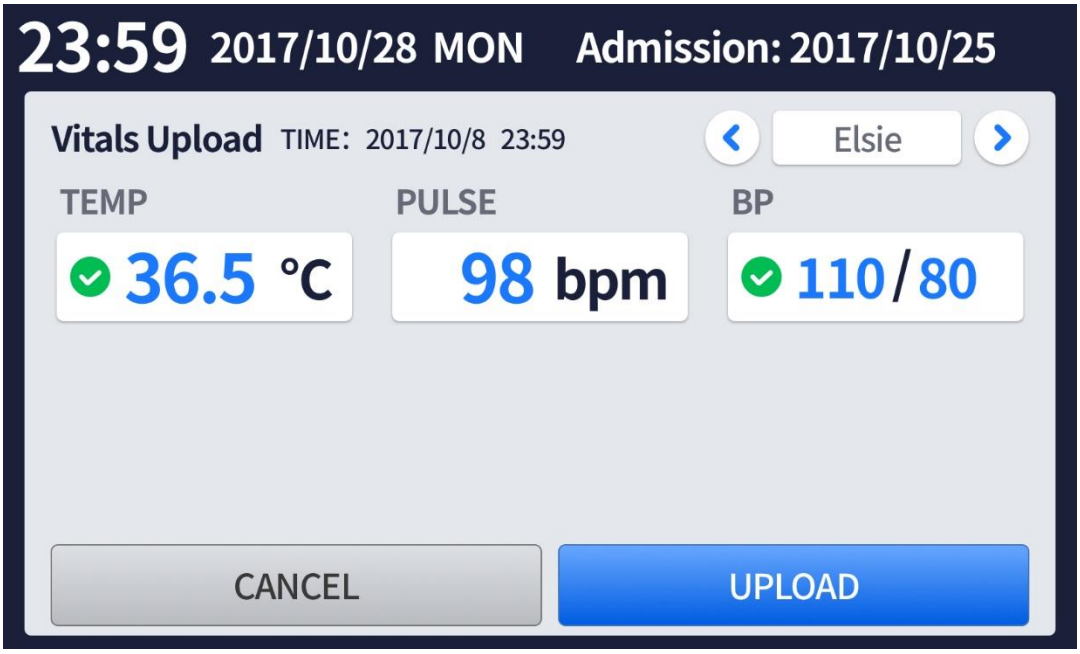
(1) News Check (Emergency)：

(2) Equipment Alarm Reset:

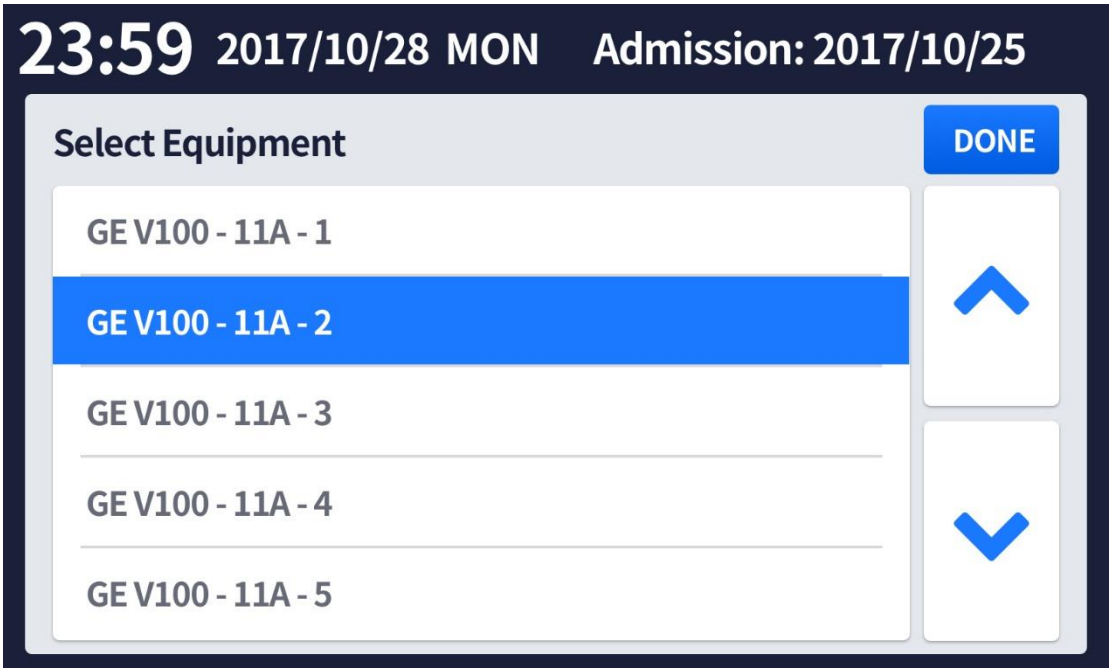
(3) Drip Assist:

(4) Ward Round:

(5) Connected with vital sign measuring equipment and ready to upload data:



(6) Connected with multiple vital sign measuring equipments:



8. M2 Nurse Call Module Specifications

Main Module	
Platform	MTK7688, W708-32-64C,32MB Flash + 64MB DDR2
Bluetooth Module	eGM-A18, BT4.0 Dual mode USB module
PoE Interface	
PoE Ports	RJ-45 x 2 for Power + Data input RJ-45 x 1 for Data output
Input/Output Ports	
Input	Touch Panel, Nurse Call Cord, Microphone, Switch x 4
Output	LCD, LED x 6, Speaker
Environment and Features	
Maximum Power Consumption	10 Watts
Power Output Interface	RJ-45 for Power + Data input
Power Requirement	802.3 at 48V~56V POE + Ethernet Source
POE Input Voltage	48V~56V
Operating Temperature	0° to 40° C
Storage Temperature	-10° to 50° C
Operating Humidity	20% to 80% (non-condensing)
Storage Humidity	20% to 80% (non-condensing)
Dimensions (W x H x D)	310 x 120 x 52 mm
Weight (g)	665g
Case Material	ABS
Accessory Waterproof Rating	Nurse Call Cord (IP67)
Safety Regulations	FCC, CE, RoHs Compatible
Contact Discharge Voltage	±2KV and ±4KV
Air Discharge Voltage	±2KV, ±4KV and ±8KV
Language Support	English, Traditional Chinese, Simplified Chinese
Operating System	Linux