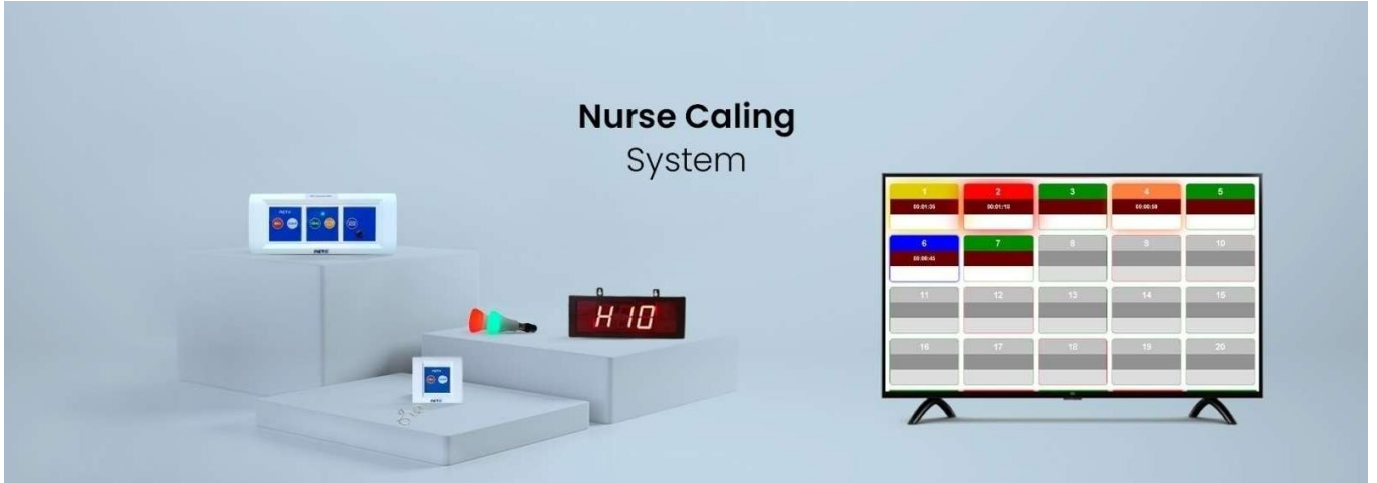




Nurse Calling System



Nurse Calling System Technical Document

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Nete Nurse Calling System increases better quality of service of the patients by ensuring a positive response from the Nurse station when called by a patient. We have designed Nurse Calling System to provide growing demands in Health Care Industry. This system provides efficient Management of the Nurse Station through the Supervisor Station. This system also provides complete information through reports for analysis to improve service further more by hospital management.

Basic features of Nurse calling system

- Working on mesh network with IOT controller
- Up to 5 calling options
- Any patient call is remembered until the patient is attended to
- Room number display
- Multicolor Door Indicators help status
- Low working voltage to ensure patient's safety
- Sound Announcement for every call
- Accurate Reporting on each type of event
- Call forwarding and call escalation features (Optional)
-

Product Modules:

- 1 Calling Unit
- 2 Indicator
- 3 Display Controller (Nurse Station)
- 4 Display Unit (Nurse Station)
- 5 Software



➤ Calling Unit:

Micro-Controller based IoT Device used for calling to nurse station and can act as a primary device to connect secondary devices with to send data at nurse station i.e. Door Indicator, Toilet Calling Unit. It reports call status to the Nurse Calling Station Server.



Bed Calling Unit

1. Dome Push buttons
 - **Call:** to be pressed by patient when he needs help
 - **Care:** to be pressed by Nurse when attends patient
 - **Extra Help:** to be pressed by Nurse if extra nurse help require for patient's call
 - **Code Blue:** to be pressed by Nurse when he/she finds patient in dire need of doctor
 - **Clear:** Pressed by Nurse when patient's need is fulfilled
2. RGB LED status indicator
 - **Default:** Yellow
 - **Call:** Red
 - **Care:** Green
 - **Extra Help:** Orange
 - **Code Blue:** Blue
3. Connector to insert Palm Call unit

❖ **Wiring Details:**

- Connected with Nurse Station Controller via CAT6 connector
- Maximum 50 bed units can be connected with one nurse station display controller unit

Technical characteristics

- Power supply: 5 V DC
- Power consumption:
 - in standby mode: mA
 - max: mA
- Operating temperature: 5 to 45°C
- Antimicrobial
- Protection index: IP 42
- Dimensions(HxWxD): 225mm X 70mm X 36mm
- Installation supplied with mounting support frame
- Sound level: dBA at 2 m
- Weight : 0.3 kg
- Material : Plastic Enclosure
- Communication: Ethernet Protocol



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Pull Cord Unit

➤ Toilet Call Unit:

This device helps to initiate a call at nurse station in emergency during toilet visit of patient. It reports call status to the Nurse Calling Station Server.

1. Dome Push buttons
 - **Call:** to be pressed by patient when he needs help
 - **Clear:** Pressed by Nurse when patient's need is fulfilled
2. Pull Cord

Technical characteristics

- Power supply: 5 V DC
- Power consumption:
 - in standby mode: mA
 - max: mA
- Operating temperature: 5 to 45°C
- Antimicrobial
- Protection index: IP 42
- Dimensions(HxWxD): 7 mm X 70mm X 36mm
- Weight : 0.1 kg
- Material : Plastic Enclosure

❖ Wiring Details:

- Connected with BCU via two pair wire
- Can be connected with the nearest Bed Calling Unit



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➤ **Indicator:**

It has a Multi Color LED lights to indicate various Call type of the Patient. LED colors will be same as calling unit configuration. Two types of Indicator

- 1 Room Indicator:** Mounted outside the room and indicates colours according to button pressed by any bed calling unit and toilet calling unit inside that room
- 2 Toilet Indicator:** Mounted outside the toilet and indicates colour when button pressed by any person through toilet calling unit



Room Indicator

Technical characteristics

- Power supply: 5 V DC
- Power consumption:
 - in standby mode: mA
 - max: mA
- Operating temperature: 5 to 45°C
- Antimicrobial
- Protection index: IP 65
- Dimensions(HxWxD): 8 mm X 58mm X 101mm
- Weight : 0.1 kg
- Material : Plastic Enclosure

❖ **Wiring Details:**

- Connected with BCU via two pair wire
- Can be connected with nearest BCU.

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Nurse Calling Station with LCD Screen

Features:

- Screen will display the bed number along with room number
- Different colour blink for different type of call
- Different sound for different type of call

➤ **Nurse Station:**

Nurse Station displays the Room number of the patient calling along with the Call Type and a Voice Module alert. Types of Display

- **Digital Display**

- ❖ Display Controller

- Android G1 is used to as display controller
- Display controller itself work as a server
- Android App installed to

show numbers

- ❖ Television or LCD/LED Screen

- To display Bed Calling Unit number

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➤ **Software:** Software controls all devices and modules as designed to run the system. This is Linux base OS to control the elements. This software provides user, an admin panel to make necessary changes what user wants. Changes can be done and controlled are:

- Status Setting (I.e. Colour , Blink, Sound)
- Nurse Code
- Room and bed number
- Display settings
- Reports
- Settings

A screenshot of a web browser displaying the "Nurse Calling Application" interface. The browser address bar shows "http://192.168.1.100:8080/nursecallingadmin/index.html". The interface has a dark blue header with the title "Nurse Calling Application" and a "Logout" button. A sidebar on the left contains navigation links: Dashboard, Manage Status, Manage Nurse, Manage Room, Manage Display, Reports, Bed Wise Reports, Pains Reports, Door Inid Reports, and Settings. The main content area is titled "Manage Status" and contains a table with columns: No., Status Code, Label, Color Code, Blink Color?, Play Sound?, and Sound File?. The table lists 10 rows of status configurations.

No.	Status Code	Label	Color Code	Blink Color?	Play Sound?	Sound File?
<input type="checkbox"/>	1	0	Idle	Yellow	NO	NO
<input type="checkbox"/>	2	1	Call Alert	Red	YES	YES
<input type="checkbox"/>	3	2	Alarm	Green	NO	YES
<input type="checkbox"/>	4	3	Extra Help	Orange	YES	YES
<input type="checkbox"/>	5	4	Calls Blue	Blue	YES	YES
<input type="checkbox"/>	6	5	connected	Green	NO	NO
<input type="checkbox"/>	7	6	disconnected	Black	NO	NO
<input type="checkbox"/>	8	7			NO	NO
<input type="checkbox"/>	9	8			NO	NO
<input type="checkbox"/>	10	9			NO	NO



Technical Details:

1. Ethernet Communication
2. Metal Dome Switch
3. RGB Led (WS2812B)
4. Buzzer
5. Switch for pull cord

1 Ethernet Communication:

Ethernet is the common standard for wired connections to computer networks. Devices using an Ethernet connection make use of a specific type of twisted electrical cable to connect with, send and receive data with other networked devices, as well as gain access to wider networks like the internet.

Using an Ethernet connection, you can connect two devices together, or create a local area network with multiple devices. These require a router or switch device to allow the connected devices to communicate with each other.

Ethernet Controller Features

- IEEE 802.3™ Compatible Ethernet Controller
- Fully Compatible with 10/100/1000Base-T Networks
- Integrated MAC and 10Base-T PHY
- Supports One 10Base-T Port with Automatic Polarity Detection and Correction
- Supports Full and Half-Duplex modes
- Programmable Automatic Retransmit on Collision
- Programmable Padding and CRC Generation
- Programmable Automatic Rejection of Erroneous Packets



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2 Metal Dome Switch:

Dome switch keypads use two circuit board traces in conjunction with a metal dome. Metal domes, which are typically made of stainless steel, are momentary switch contacts that provide tactility or “snap” when pressed. The domes become normally-open tactile switches when actuated on the circuit.

- Mode of Operation: Tactile feedback
- Trip Force: 220g
- Operating Temperature Range: -40 to +105 °C

- Electrical Rating: 12mA @ 24VDC
- Material: SS
- Finish: Nickel Plate

3 WS2812B LED:

- Control circuit and RGB chip are integrated in a package of 5050 components, form a complete control of pixel point.
- Built-in signal reshaping circuit, after wave reshaping to the next driver, ensure waveform distortion not accumulate.
- Built-in electric reset circuit and power lost reset circuit.
- The data transfer protocol use single NZR communication mode

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Power supply voltage	VDD	+3.5~+5.3	V
Input voltage	VI	-0.5 ~ VDD+0.5	V
Operation junction temperature	Topt	25 ~ +80	°C
Storage temperature range	Tstg	Tstg -40~+105	°C



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LED characteristic parameter

Emitting color Wavelength(nm)	Wavelength(nm)	Luminous intensity(mcd)	Current(mA)	Voltage(V)
Red	620-630	550-700	20	1.8-2.2
Green	515-530	1100-1400	20	3.0-3.2
Blue	465-475	200-400	20	3.2-3.4

4 Buzzer:

It is an active buzzer, it will beep at a predefined frequency (2300 ± 300 Hz) on its own even when applied steady DC power.

- Rated Voltage: 5V DC
- Rated current: <30mA
- Small and neat sealed package
- Sound Type: Continuous Beep
- Resonant Frequency: ~2300 Hz

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5 Switch for pull cord:

In Pull cord mechanism, there is a micro switch with nylon rope on lever. Only on slight pull event will occur.

Item	Data	
Rating load	5A/125VAC,3A/250VAC	
Operating speed	0.1mm-1m/s	
Operating frequency	Mechanical	400times/min
	Electrical	30times/min
Insulation resistance	100MΩ(Above)DC500V	
Contact resistance	30MΩ(initial value)	
Withstand voltage	Non-connection wire	1000VAC
	Every terminal	1500VAC
Vibration	Misoperation	10-55Hz Amplitude 1.5mm
Impact	Durable	1000m/s ²
	Misoperation	300m/s ²
Life	Electrical	100,000above
	Mechanical	1,000,000above
Protection degree	IP40	
Operating temperature	-25~+80°C	
Operating humidity	< 85%	

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