ZKR
Nurse Call Systems

ZKR IP Nurse Call Systems

Technical Manual

www.zkr.systems

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A. Preface

The purpose of this guide is twofold:

• To provide clarity on the purposes and functionality of the components and software of the ZKR IP Nurse Call Systems
• To assist in the installation and configuration of the ZKR IP Nurse Call Systems

B. Overview

B1. RCU – Room Control Unit

a. Comfort 10” Room Control Unit (VoIP)

The Comfort Room Control Unit ensures communication between the Nurse Control Panel and the call buttons in patient rooms. This unit is suitable for both flush and shallow montage.

This unit has a 10‘‘ Touchscreen and a built-in Mifare card reader. It supports up to 8 call units (bedside call units + pull-cord call units) by standard. On the Comfort VoIP Room Control Unit, you can make voice calls and contact the hospital staff. Code Blue and other custom emergency codes can be initiated through an onscreen menu. Consultation calls can be made to any branch specified by the institution. Patient information from HIS (Hospital Information System) can be monitored on the server system through the corresponding bed icons on screen. Information about the patient can also be edited through the touchscreen if desired.

• PoE (Power Over Ethernet)
• Full Duplex
• SIP Protocol
• Conference Call
• Internal and External Call (with tracking system for billing)
• Built-in RFID card Reader
• Timer/Stopwatch
• Menu option for personalized task lists based on personnel ID cards
• Can display hospital advertisements or other videos
• Can display educational videos for specific healthcare procedures

Comfort 10” Room Control Unit Technical Specification

Screen size (inches)	10”
Operating system	Linux
Weight (g)	500 gr.
Width (mm)	265 mm
Depth (mm)	40 mm.
Height (mm)	210 mm.
Display features	IPS Color Touch Screen
Screen resolution (px)	1024x768
System	Linux 4
Processor speed	Intel CPU
Memory	2GB Ram - 8GB Rom
Language	English, Spanish, Russian, Turkish Custom
Power supply	110-220 VAC 47-63 Hz
Operating temperature / Humidity	-10°C +60°C / % 30 %80 RH
Material	PC-ABS-FR
Card reader	MIFARE Card Reader
Speaker	3Watt x 2
Input connection	1-Ethernet,1-RS 485, 2.Light Control
Color	White
Communication	TCP / IP - UDP - HTTP - RS485 - SIP
Power	POE
SD Card	Yes
USB	Mini USB

b. Versatile Plus 5” Room Control Unit (VoIP)

This unit ensures communication between the Nurse Control Panel and the call buttons in patient rooms. The Room Control Unit is suitable for both flush and shallow montage. It features a 5’’ touchscreen and a built-in Mifare card reader.

Optionally a basic task list can be accessible from the onscreen menu. With appropriate hardware, this unit can define up to 8 call units. Its durable structure and modern software ensure the best operating time and performance.

- 5 “ Touch Screen
- Mifare Card Reader
- Simple, Easy to Use Interface
- High quality flame retardant raw material

Versatile Plus 5” Room Control Unit Technical Specification

Screen size (inches)	120 mm 73 mm 5” touchscreen
Operating system	Linux 4
Weight (g)	500 gr.
Width (mm)	212mm.
Depth (mm)	39 mm.
Height (mm)	165 mm.
Display features	Color Touch Screen, TFT
Screen resolution (px)	800x480
Processor speed	16-24 Bit Flash Microcontrollers 100-Pin
Memory	64MB Ram 128MB Rom
Language	English, Spanish, Russian, Turkish Custom
Power supply	110-220 AC - POE
Operating temperature / Humidity	-10°C +60°C / % 30 %80 RH
Material	PC-ABS-FR
Card reader	MIFARE Classic
Buzzer speaker	2400Hz 65 dB
Input connection	1-Ethernet,1-RS 485, 2.Light Control
Color	White
Communication	TCP / IP - UDP - HTTP - RS485
Current W	18W

c. Versatile 4.3” Room Control Unit

This unit ensures communication between the Nurse Control Panel and the call buttons in patient rooms. The Room Control Unit is suitable for both flush and shallow montage. It has a 4.3’’ touchscreen and supports up to 8 call units.

Versatile 4.3” Room Control Unit Technical Specification

Screen size (inches)	105 mm 6 6mm 4.3 ınc Touch Screen
Operating system	Linux Based
Weight (g)	500 gr.
Width (mm)	188 mm.
Depth (mm)	39 mm.
Height (mm)	132 mm.
Display features	Color Touch Screen, TFT
Screen resolution (px)	640x420
Processor speed	16-24 Bit Flash Microcontrollers 100-Pin
Memory	4-Mbit (256K x 16) Static RAM
Language	English, Spanish, Russian, Turkish, Custom
Power supply	110-220 VAC 47-63 Hz
Operating temperature / Humidity	-10°C +60°C / % 30 %80 RH
Material	PC-ABS-FR
Card reader	MIFARE Classic
Buzzer speaker	2400Hz 65 dB
Input connection	1-Ethernet,1-RS 485, 2.Light Control
Color	White
Communication	TCP / IP - UDP - HTTP - RS485
Current W	15W

B2. NCP – Nurse Control Panel

a. VoIP 10” Nurse Control Panel

The statuses of all working Room Control Units connected to the panel can be monitored actively. All errors and notifications shall be displayed on the information panel. Emergency codes, WC calls, and normal calls may be monitored.

All processes passing through the system are logged. All logs can be reported in detail. There are a configurable number of room monitoring icons on the interface. The status of calls are tracked in real time via these icons.

b. VoIP 7” Nurse Control Panel

The statuses of all working Room Control Units connected to the panel can be monitored actively. All errors and notifications shall be displayed on the information panel. Emergency codes, WC calls, and normal calls may be monitored.

All processes passing through the system are logged. All logs can be reported in detail. There are a configurable number of room monitoring icons on the interface. The status of calls are tracked in real time via these icons.

c. Versatile 18.5” Nurse Control Panel

In the case of an emergency, signal icon will appear on the monitor indicating the location and type of call. The system builds a priority depending on the call type and displays them on the monitor. All calls, emergency calls, toilet-bathroom and visiting nurses, can be tracked on the panel and remote access. IP - system is no limit on the number of beds connection. LAN based technology for the connection between units of the system. All kinds of transactions passing through the system are recorded. All records obtained can be reported in detail.

- Call queue system
- Priority system for emergency calls
- Texting between panels
- Call orientation –Night service mode to redirect calls to another panel
- Custom interface language
- View local reports

Versatile 18.5” Nurse Panel Technical Specification

Screen size (inches)	18.5 inch LCD Display All in One PC
Display features	1600 x 900
Processor information	Intel Bay Trail J1750 2.41 Ghz Dual Core
Operating system	LINUX OS
Capacity:	500 GB 7200 RPM SATA 3.5” HDD
Memory	2 GB DDR3 1333 MHz
Weight (g)	3.2 kg.
Width (mm)	485 mm.
Depth (mm)	39 mm.
Height (mm)	336 mm.
Connectivity features	Ethernet
Language	English, Spanish, Russian, Turkish, Custom
Power supply	110-220 VAC 47-63 Hz
Operating temperature / Humidity	10°C +50°C / % 30 %80 RH
Storage temperature / Humidity	20°C +60°C / %20 %90 RH
Input connection	1x Power on/off , 2xUSB 3.0, 1x Volume Button, 1xMic in, 1xSpeaker Out, 1x3in1 Card Reader (SD-MMC-MS)
Color	Black, White
Communication	RJ 45 jack Cat 6-7
Network	10/100 Mbit Gigabit Lan / 802.11b / g / n Wireless Bluetooth 4.0

B3. Call Units

a. Bedside Call Unit

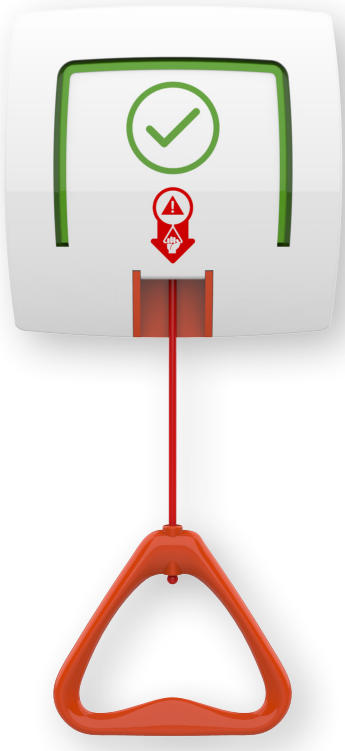
The Bedside Call Unit is used patient rooms. There are backlit call and cancel buttons on the unit. In an emergency, a patient uses the call button to make an emergency call which appears as an alert on the Nurse Control Panel. Typical locations for this unit are on the walls of patient rooms and living areas as needed.

Bedside Call Unit Technical Specification

Weight (g)	56 gr.
Width (mm)	80 mm.
Depth (mm)	35 mm.
Height (mm)	80 mm.
Mounting dimensions	W-55mm D-20mm H-55mm
Processor	Microchip
Power supply	+ 5v dc
Operating temperature / Humidity	-10°C +60°C / % 30 %80 RH
Material	PC-ABS-FR
Buzzer speaker	2400Hz 65 dB
Output connection	1-RJ45
Input connection	1-RJ45
Color	White
Communication	RS 485
Back Light	Yes

b. Pull-cord Call Unit

The Pull-cord Call Unit is used in patient bathrooms or similar areas. There is a backlit cancel button and an emergency call pull-cord on the unit. In an emergency, a patient pulls the cord making an emergency call. This appears as a WC Emergency Call on the Nurse Control Panel. The system gives priority to WC Emergency calls and they appear before other calls.



Pull-cord Call Unit Technical Specification

Weight (g)	56 gr.
Width (mm)	80 mm.
Depth (mm)	35 mm.
Height (mm)	80 mm.
Rope Durability	Max 30kg
Operating temperature / Humidity	-10°C +60°C / % 30 %80 RH
Material	PC-ABS-FR
Color	White
Communication	RS 485
Input Connection	1 RJ 45

c. VoIP Pull-cord Call Unit

The VoIP Pull-cord Call Unit is used in patient bathrooms or similar areas. There is an emergency call button and an emergency call cord on the unit. In an emergency, the patient pulls the cord to immediately start an emergency voice call with the assigned Nurse Control Panel. When the emergency call button is pressed, a regular priority WC Emergency Call is made.

VoIP Pull-cord Call Unit Technical Specification

Weight (g)	90 gr.
Width (mm)	185 mm.
Depth (mm)	30 mm.
Height (mm)	80 mm.
Rope Durability	Max 30kg
Operating temperature / Humidity	-10°C +60°C / % 30 %80 RH
Material	ABS/FR
Speaker	3 watt
Color	White
Communication	SIP, TCP/IP
Speech	SIP full Dublex
Protection class	IP55
Input	1xRJ45

d. Code Blue Unit

The Code Blue Unit is mounted on the wall as needed in the hospital. There are backlit call and code blue buttons on the unit. The call button may be pressed to initiate a nurse call which appears as an alert on the Nurse Control Panel. The code blue button may be pressed to start a Code Blue call. The same button can be configured as an assist call button.

VoIP Pull-cord Call Unit Technical Specification

Weight (g)	56 gr.
Witdh (mm)	80 mm.
Depth (mm)	35 mm.
Height (mm)	80 mm.
Mounting Dimensions	W-55mm D-20mm H-55mm
Processor	Microchip
Power	5v dc
Operating temperature / Humidity	-10°C +60°C / % 30 %80 RH
Material	ABS/FR
Output	1-RJ45
Input	1-RJ45
Color	White
Communication	RS 485
Backlit	Yes

e. Custodial Cell Call Unit

The Custodial Cell Call Unit is flush mounted on the walls of prisoner cells, psychiatric units or similar areas. There are nurse call and call termination buttons on it. It has an aesthetic and durable structure.

- Suitable for flush montage to prevent disassembly
- RJ45 socket allows easy installation
- Stainless steel raw material
- Vandal-proof, IK-10 certified in structure for use in psychiatric clinics and prisons

Custodial Cell Call Unit Technical Specification

Weight (g)	76 gr.
Witdh (mm)	165 mm.
Depth (mm)	3 mm.
Height (mm)	90 mm.
Processor	Microchip
Power	+ 5v dc
Operating temperature / Humidity	-10°C +60°C / % 30 %80 RH
Material	ABS/FR
Buzzer Speaker	2400Hz 65 dB
Input	1-RJ45
Color	Metalic Gray
Communication	RS 485
Backlit	Yes

B4. Patient Handsets

a. Comfort VoIP Handset

With voice communication, patients can speak directly to the nurses assigned to them. This system allows hospital staff to save time on service, prioritize critical cases, and comfort patients through voice communication. Thanks to the ZKR Comfort Nurse Call System, all conversations between hospital personnel and patients can be recorded, giving opportunities for quality control. Evaluation of nurse performance can be displayed as a graph on the server interface.

The Comfort VoIP Handset is easy to use. Patients can press the button labelled “Nurse Call” when they wish to send a regular nurse call signal, or they can press the large call button when they want to speak with the nurse assigned to them.

The product has a user-friendly, ergonomic, and hygienic structure. Using intelligent controls, patients can make internal and external phone calls with automatic billing. ZKR Comfort Nurse Call Systems can integrate as PBX analog, digital, and VoIP with any SIP-based brands.

- PoE (Power Over Ethernet)
- PBX
- Full duplex
- SIP protocol
- Conference call
- Function control within the room through Building Management System integration (such as lighting or window blinds)
- TV channel and volume control
- Internal and external call (with tracking system for billing)

Comfort VoIP Handset Technical Specification

Weight (g)	182 gr.
Width (mm)	65 mm
Depth (mm)	20 mm
Height (mm)	205 mm
Keypad	Anti-bacterial Membrane
Phone Book	Yes
Do Not Disturb Mode	Yes
Configuration	Embedded Micro Web Server
Custom Functional Button	2 Keys
Speaker	HD Voice
Material	PC-ABS-FR
Remote TV Controller	Yes
Communication	SIP
Back Light	Yes
VoIP	SIP Full Duplex

b. Pro Handset

The Pro Handset is designed to inform the staff of the patient's condition immediately.

- Easy to use
- Works though connection to Bedside Call Unit
- TV control option (Channel and Volume)
- EL lights allow visibility in the dark
- Function buttons help to control room lighting, reading lamp, window blinds, etc.

Pro Handset Unit Technical Specification

Weight (g)	115 gr.
Width (mm)	58 mm.
Depth (mm)	15 mm.
Height (mm)	140 mm.
Operating temperature / Humidity	-10°C +60°C / % 30 %80 RH
Cable Lengh	3 Meter Spiral Cable
Material	PC-ABS-FR
Back Light	Yes
Check number of connections	1-RS 485

c. Basic Handset

The Basic Handset allows the patient's condition to be reported quickly to the hospital staff in an emergency situation. It is easy to use and reinforced with auxiliary visuals. The device works through connection to the Bedside Call Unit. Easy-to-understand images indicate the functions of the buttons. Thanks to LEDs on the unit, the product is easily noticeable in the dark. These LEDs vary according to the last call made.

Basic Handset Technical Specification

Weight (g)	115 gr.
Width (mm)	20 mm.
Depth (mm)	50 mm.
Height (mm)	140 mm.
Operating temperature / Humidity	-10°C +60°C / % 30 %80 RH
Cable Lengh	1.5 Meter Spiral Cable
Material	PC-ABS-FR
Back Light	Yes
Check number of connections	1-RS 485
Color	White

B5. Lamps

a. Over Door Light

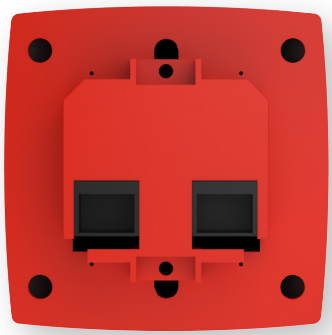
The Over Door Light is located above the patient room door in the corridor. Its half-sphere shape makes it easily noticeable from any angle of view. If there is an emergency in the room, it can be seen clearly from the corridor. It can warn with three main colors, red, green, and blue, and combinations of these, depending on the call status of the room. It has very low energy consumption and uses environment-friendly LEDs. It is flush mounted above patient doors by standard, but a surface montage box can be provided if necessary.

Over Door Light Technical Specification

Weight (g)	56 gr.
Width (mm)	80 mm.
Depth (mm)	33 mm.
Height (mm)	80 mm.
Lighting Type	LED
Operating temperature / Humidity	-10°C +60°C / % 30 %80 RH
Current W	0.8
Material	PC-ABS-FR
Power Supply	+5V
LED Colors	Blue, Red, Green
Communication	RJ 45 (Input)
Color	White

b. I/O Auxiliary Alert Lamp

In multi-bed areas, designed to be used for situations where a single lamp must be used for the bed. According to call types different colors can be lit (red, green, blue, and combinations of these).



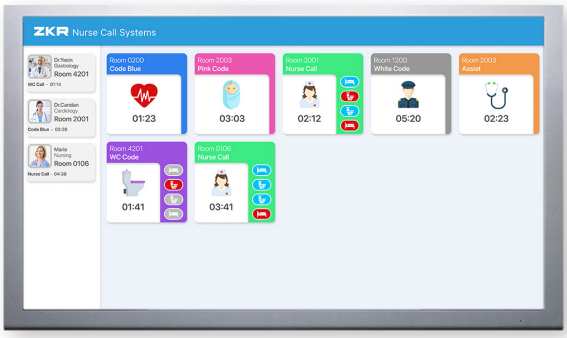
I/O Auxiliary Alert Lamp Technical Specification

Weight (g)	56 gr.
Width (mm)	80 mm.
Depth (mm)	33 mm.
Height (mm)	80 mm.
Lighting Type	LED
Operating temperature / Humidity	-10°C +60°C / % 30 %80 RH
Current W	0.8
Material	PC-ABS-FR
Power Supply	+5V
LED Colors	Blue, Red, Green
Communication	2x RJ 45 (Input/Outbut)
Color	White

B6. Optional Units

a. Central Monitoring Unit

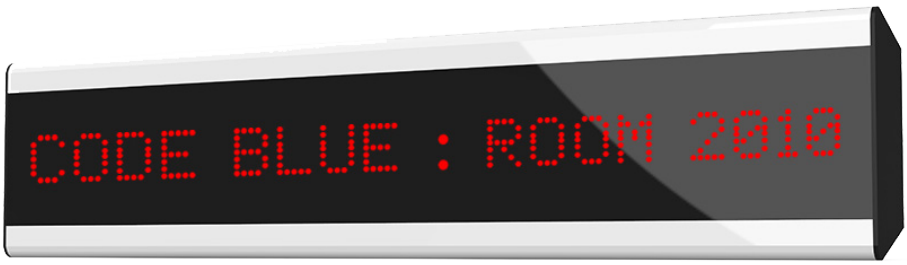
The ZKR Central Monitoring Unit is a web-based monitor that observes all activities such as nurse calls, code blue (and any custom emergency codes), assist calls, and nurse presences throughout the hospital. It can show picture IDs of personnel that are present in patient rooms.



Different parameters (call type, department, and floor info) can be filtered based on needs. In this way, the focus of health personnel can be directed and reaction and intervention times can be minimized.

b. Text Panel

The Text Panel is a scrolling 15-character dot matrix screen. It works as TCP-IP on the network, displays the calls as text, and gives audio alerts. Based on preference it can be set to display only specific types of calls or all calls. It works with 220V.

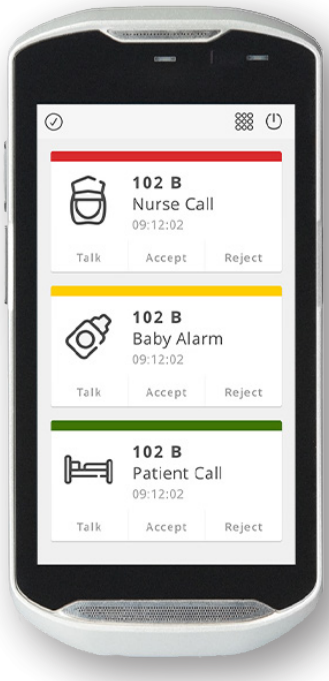


Text Panel Technical Specification

Weight (g)	1.2 kg.
Width (mm)	670 mm.
Depth (mm)	100 mm.
Height (mm)	300 mm.
Operating Temperature / Humidity	0°C +40°C / % 30 %80 RH
Operating Voltage	220v
Display	12 Segment
Sound	60db Buzzer
Input	Rj45 Ethernet 10/100
Color	Gray
Protection Class	IP50
PoE	No

c. MCW One

Research shows that healthcare professionals spend nearly 35% of their time trying to reach information. MCW One offers you next generation communication options so as to use time most efficiently. MCW One enables you to get the right information at the right time. With the help of Hospital Information System (HIS) integration, you can monitor critical and expected information in real-time.



MCW One offers you an Android-based platform which enables you to use different kinds of hospital applications comfortably. With a built-in NFC Reader, MCW One can read smart cards and can open private sessions for you or your colleague to use different services. Can reply to patient calls with a single touch. An integrated 2D Barcode Reader allows you to use HIS more quickly and reliably. You can monitor laboratory results and patient monitoring devices—allfrom your pocket.

Whenever a call is made within the Nurse Call System, an alert is sent to the defined MCW One applications. The user then has the option to accept the call, which will mark the call as accepted on other MCW One enabled smartphones and on the server, reject it which will be logged on the server, or talk directly to the origin room of the call. When a nurse responds to a call within a room, her nurse presence will be indicated on the MCW One applications that show that call.

With proper integrations, any data received from medical device readings such as EKG alarms for irregular heartbeat or any other similar alarm can be sent directly to defined MCW One users. Similarly, notifications for reminders such as when laboratory test results are ready can be sent to defined MCW One users. An address book with all of the rooms, panels, and MCW One users within the hospital allows easy messages and voice calls between personnel.

With the integrated task manager system, delegation of simple tasks such as fulfilling patient request for water, blankets, or similar has never been easier, simply assign the task to relevant teams from the onscreen menu and you will receive updates on the acceptance and completion of the task.

All of the relevant data is logged to review staff performance for administrative purposes. MCW One doesn't collect or use any hospital data. MCW one does not store any data from user's phones. The app will stop working upon leaving protected hospital WiFi, so all of your data stays onsite.

B7. Control Devices

a. ZKR NCS Server

The server controls the operation of the Comfort, Versatile Plus, Versatile, and Air Plus (optional) systems used in hospitals. The server provides log reporting through a web interface and enables integration with other systems used throughout the building. Our servers have a Linux-based robust and reliable infrastructure.

- Linux Operating System
- Fully redundant structure
- Troubleshooting and error notification of all modules connected to the system
- Voice Record Module (for Comfort and Versatile Plus systems)
- Integration with WiFi mobile phones
- Integration with DECT telephones
- Integration with pagers
- Integration with PBX and ability to start emergency codes
(such as 1111, 2222, 3333)
- IP, PRI, BRI, Analog Connection
- Integration with Fire Alarm Systems
(Modbus, Bacnet, Special TCP connection types)
- Integration with CCTV Systems (Serial Port, Special TCP connection types)
- Integration with RFID Systems (Web service, Special TCP connection types)
- Integration with Hospital Information System
- Integration with Lighting Automation

ZKR NSC Server Technical Specification

Form factor	1U rack server
Dimensions and weight	H: 42.8 mm (1.67 in), W: 434.0 mm (17.09 in), D: 495 mm (19.5 in) w/o ear, w/o bezel Max weight: 10.6 kg (20.96 lb)
Processor	1 processor from the following product families: • Intel® Xeon® processor E3-1200 v6 product family • Intel Pentium® • Intel CoreTM i3 • Intel Celeron®
Chipset	Intel C236
Operating system	Microsoft® Windows Server® 2016, Microsoft® Windows Server® 2012 Microsoft Windows Server 2012 R2, x64 Red Hat® Enterprise Linux® VMware® Vsphere® ESXi® SUSE® Linux Enterprise Server®
Memory	Architecture: Up to 2400MT/s DDR4 DIMMs Memory type: UDIMMs Memory module sockets: 4 Maximum RAM: Up to 64GB
Storage	• 2.5” SATA 7.2k • 2.5” nearline SAS 7.2k • 2.5” 10k SAS HDDs • 2.5” 15K SAS HDDs • 2.5” SATA SSDs • 3.5” Enterprise SATA 7.2k HDDs • 3.5” nearline SAS 7.2k HDDs • 3.5” 7.2k SATA entry drives
Hypervisor support	Microsoft Windows Server with Hyper-V® VMware® vSphere® ESXi®
Drive bays	2 x 3.5” cabled HDD 4 x 3.5” cabled HDD 4 x 3.5” hot-swap or 2.5” hot-swap in hybrid drive carrier
Slots	2 x PCIe 3.0 slots: x16 slot, full-height (1x8 3.0)+ x8 slot, low-profile (1x4 3.0).
RAID controllers	PERC S130, PERC H330, PERC H730, PERC H830
Network controller	Broadcom® 5720

Communications	2 x 1GbE LOM Click here for R230 supported network interface cards (NICs) and host bus adapters (HBAs) and scroll to “Additional Network Cards” section.	
Power	250W cab PSU	
Management	· IPMI 2.0 compliant · Dell OpenManage Essentials · Dell OpenManage Mobile · Dell OpenManage Power Center · Plug-in for Oracle® Enterprise Manager · Dell OpenManage Integration Suite for Microsoft System Center, Dell OpenManage Integration for VMware vCenter®	· HP Operations Manager · Dell OpenManage Integration Suite for Microsoft System Center, Dell OpenManage Integration for VMware vCenter®
Input connection	1 x USB 3.01 1x Headphone Out 1 x PS/2 Keyboard1 x PS/2 Mouse1 x RJ-45 Ethernet1 x VGA (Display Out)1 x Serial Port (RS232)1 x Mic In 4 x USB 2.0	
Device access	5 total USB: Rear: 2 x USB 3.0 ports Front: 2 x USB 2.0 ports Internal: 1 x USB 3.0 port	
Rack support	ReadyRails™ static rails for tool-less mounting in 4-post racks with square or unthreaded round holes or tooled mounting in 4-post threaded and 2-post racks.	

b. Function Control Module

Provides control of On/Off for two different functions within the room (such as reading lamp or window blinds) from the patient handset. One Function Control Module must be installed per one Patient Handset, connected between the Room Control Unit and the Bedside Call Unit via its two RJ45 ports (in/out).

• Two dry-contact relay ports

ZKR NSC Server Technical Specification

Weight (g)	75 gr.
Width (mm)	80 mm.
Depth (mm)	50 mm.
Height (mm)	40 mm.
Operating temperature / Humidity	-20°C +60°C / % 30 %80 RH
Connection Type	Vavien
Output	No-com-NC
Input	1-RJ45
Color	Gray
Communication	RS 485

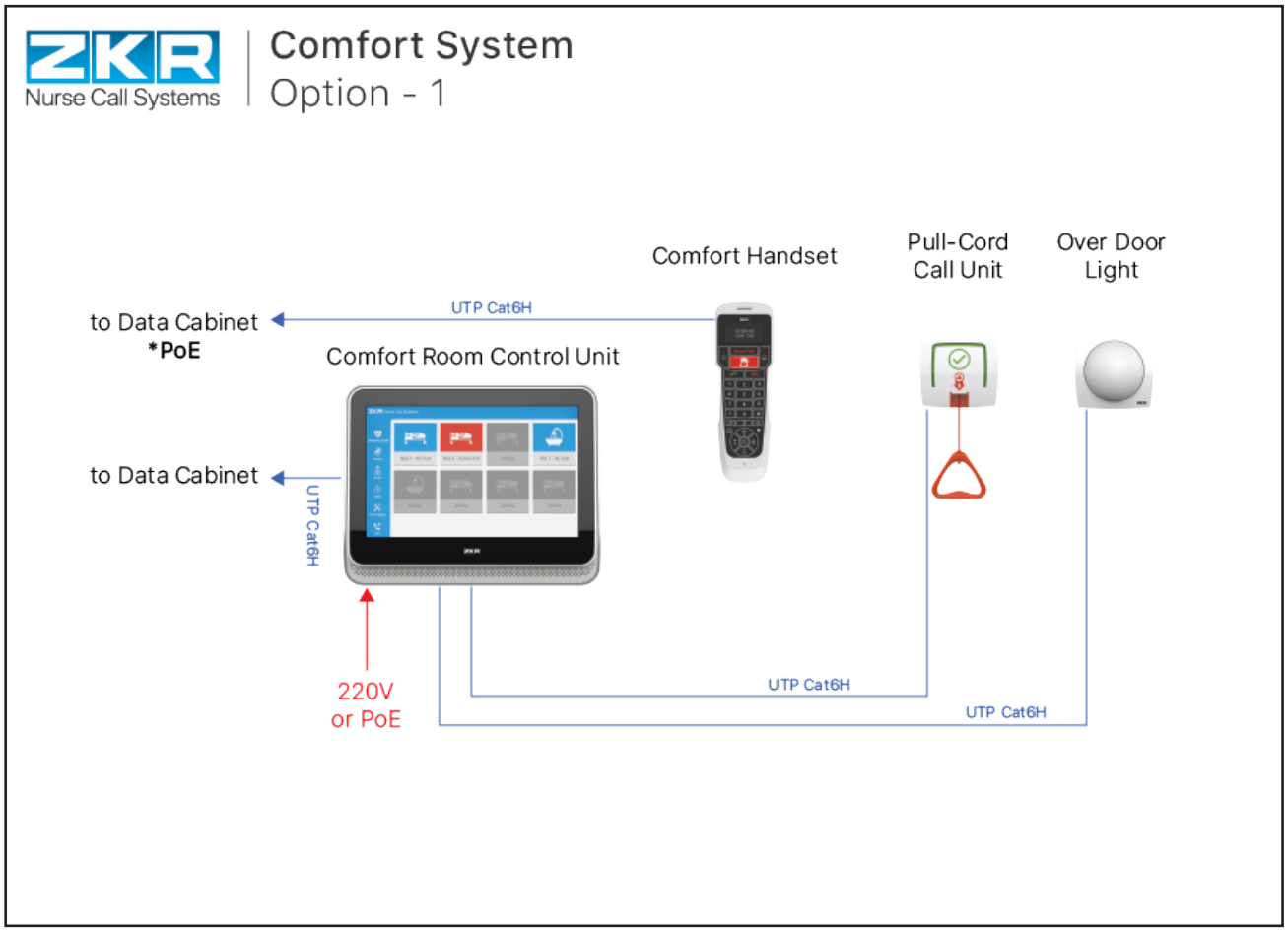
C. Wiring and Montage

C1. Cabling

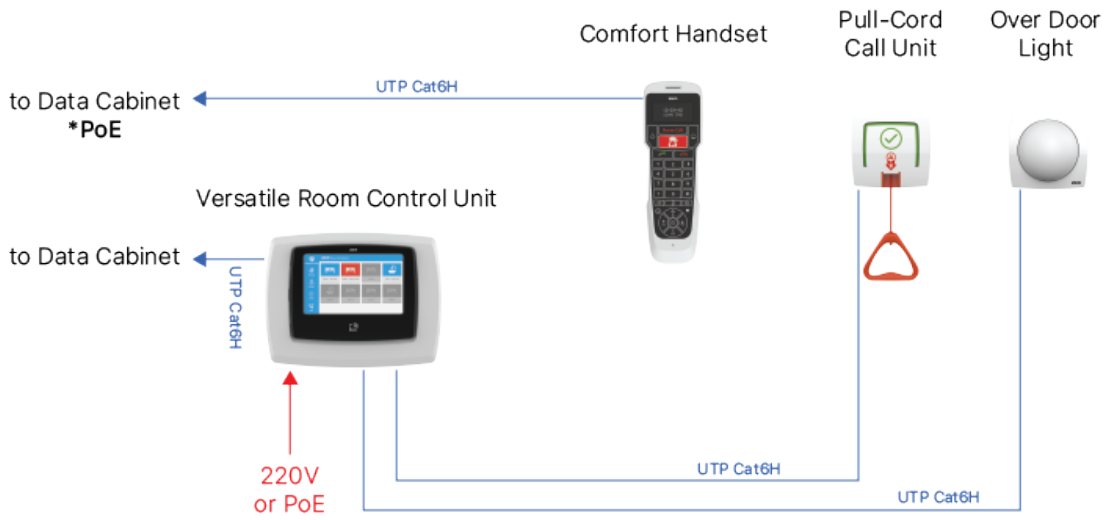
a. Cable type

Cables must be Cat 6 UTP minimum, with B-class endings. Room Control Units have PoE and non-PoE versions, if non-PoE version is chosen they require power cabling: 220 V 2x1.5 power cable.

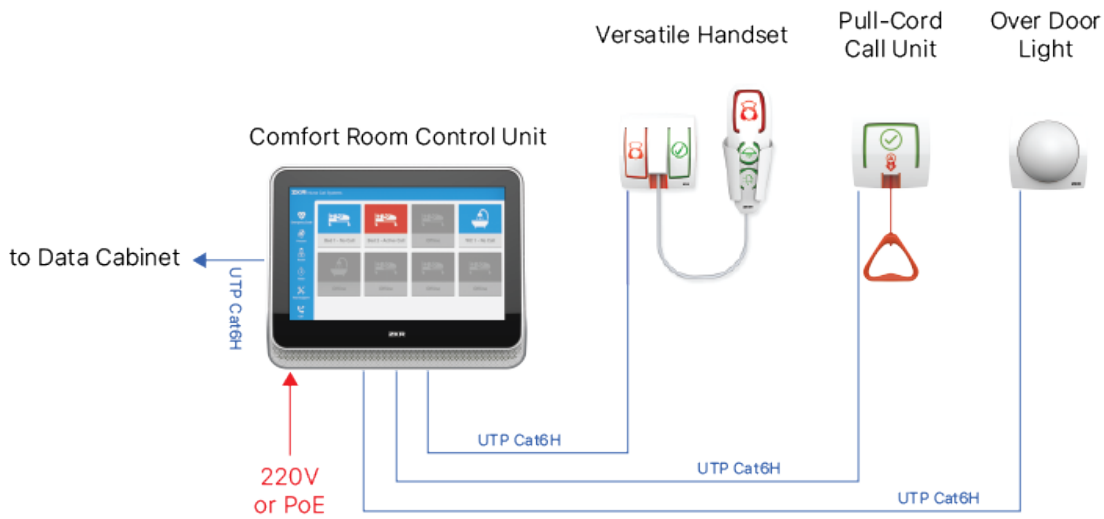
b. Cabling Diagrams



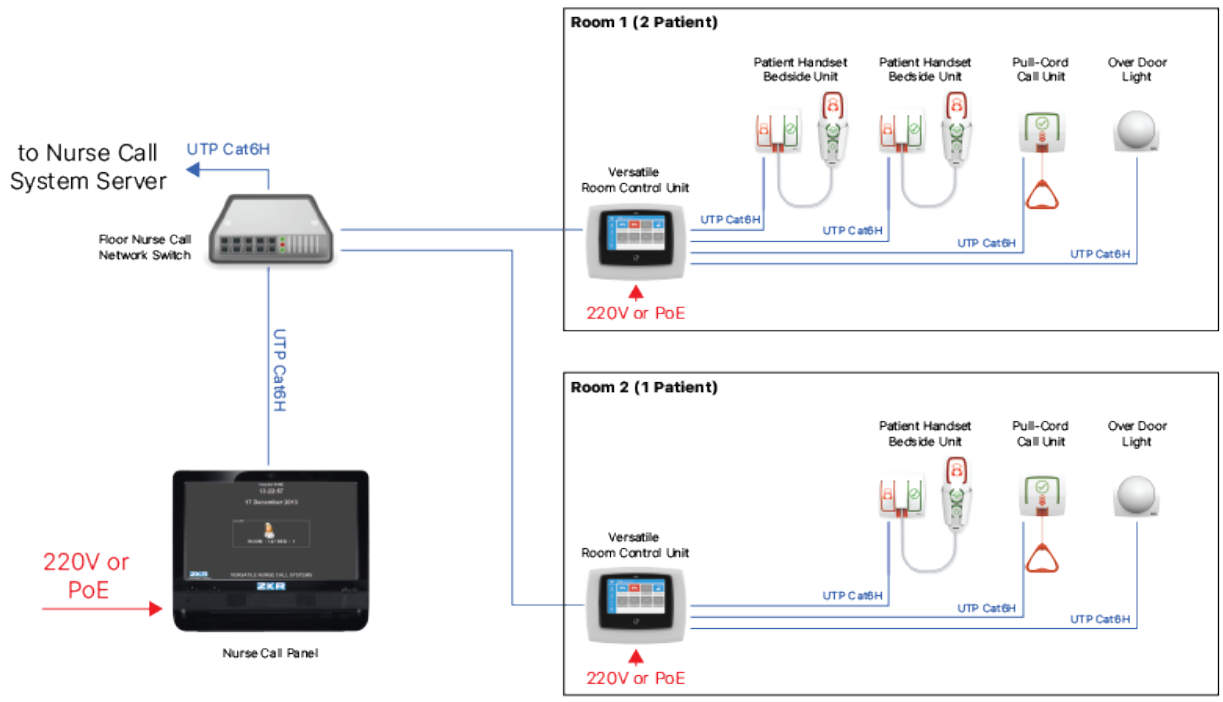
Comfort System
Option - 2



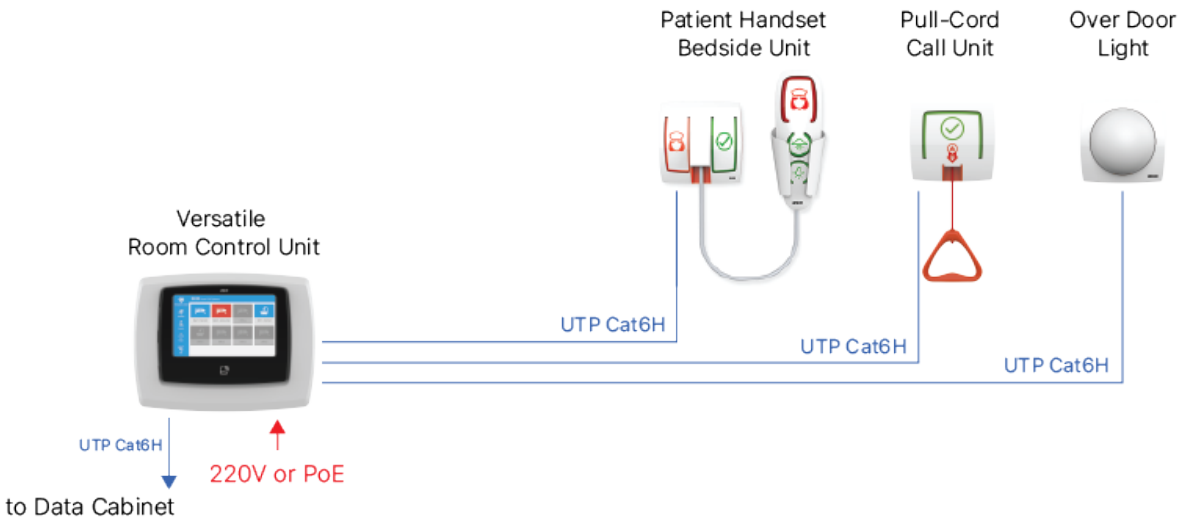
Comfort System
Option - 3



Versatile System
Block Diagram

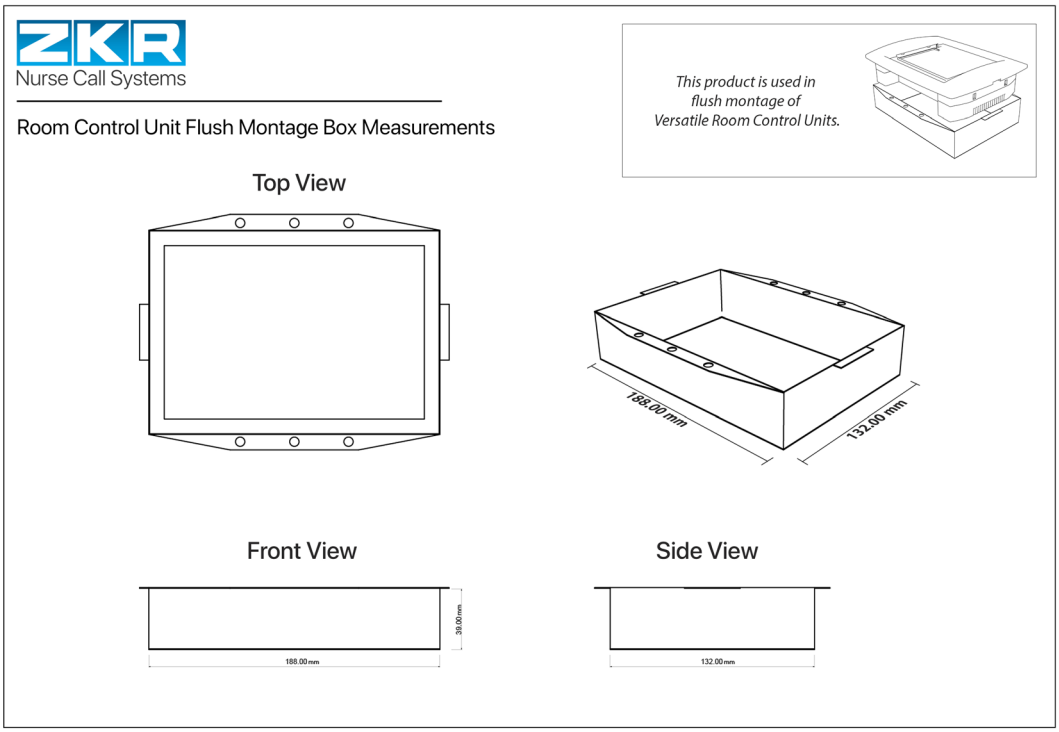


Versatile System
Room Principle Wiring

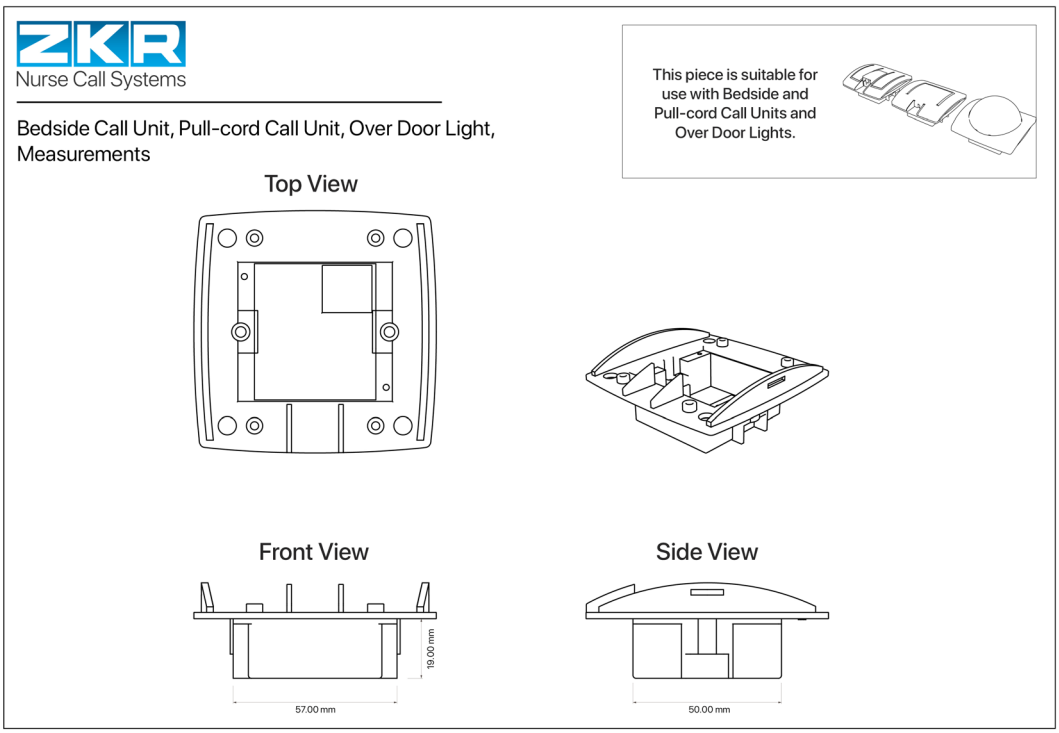


C2. Montage:

a. RCU Measurements



b. Call Units/Lamps Measurements

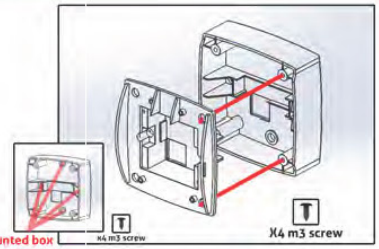


c. Call Units/Lamps installation

CAUTION !

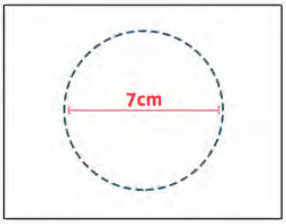
If the unit will be installed on a flush mounted box, complete this step first.

First pass the RJ45 cable through the slots in the back. After, Plug the RJ45 socket into place like in Step 2. Install the center orange part with metric #3 screws through the holes on the flush mounted box.



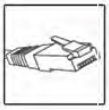
Step 1

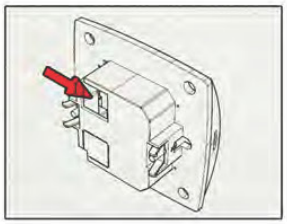
Drill a 7 cm diameter hole on the surface you want to make installation with the drilling saw.



Step 2

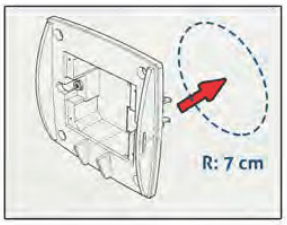
Plug the RJt45 socket to socket behind the center part. (Orange joint part)





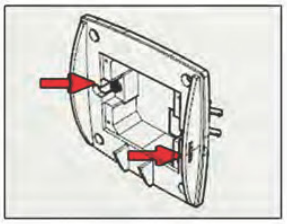
Step 3

Place the product into the hole you drilled before.



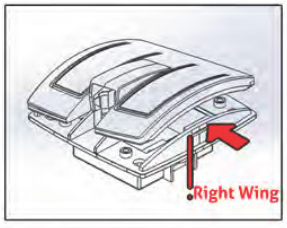
Step 4

Rotate the screws on both sides with a screwdriver. This way claws on the sides will open and stabilize the product.

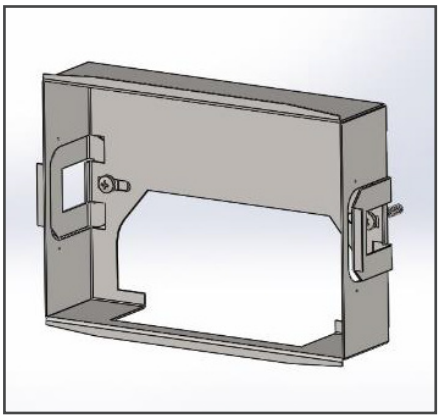


Step 5

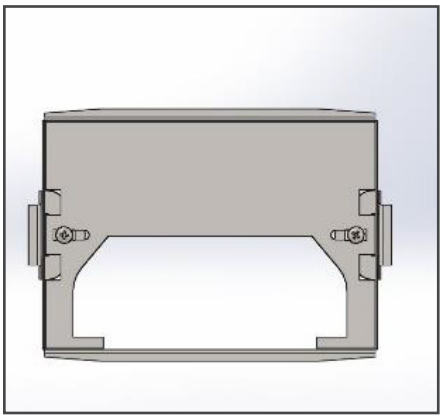
Place the left part of the top cover first. Place the other part after. While placing the right side stretch the right wing, it will fit easily.



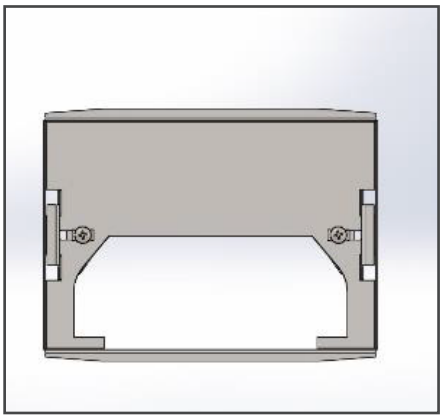
d. Room Control Unit Installation



Room Control Unit Flush Montage Box

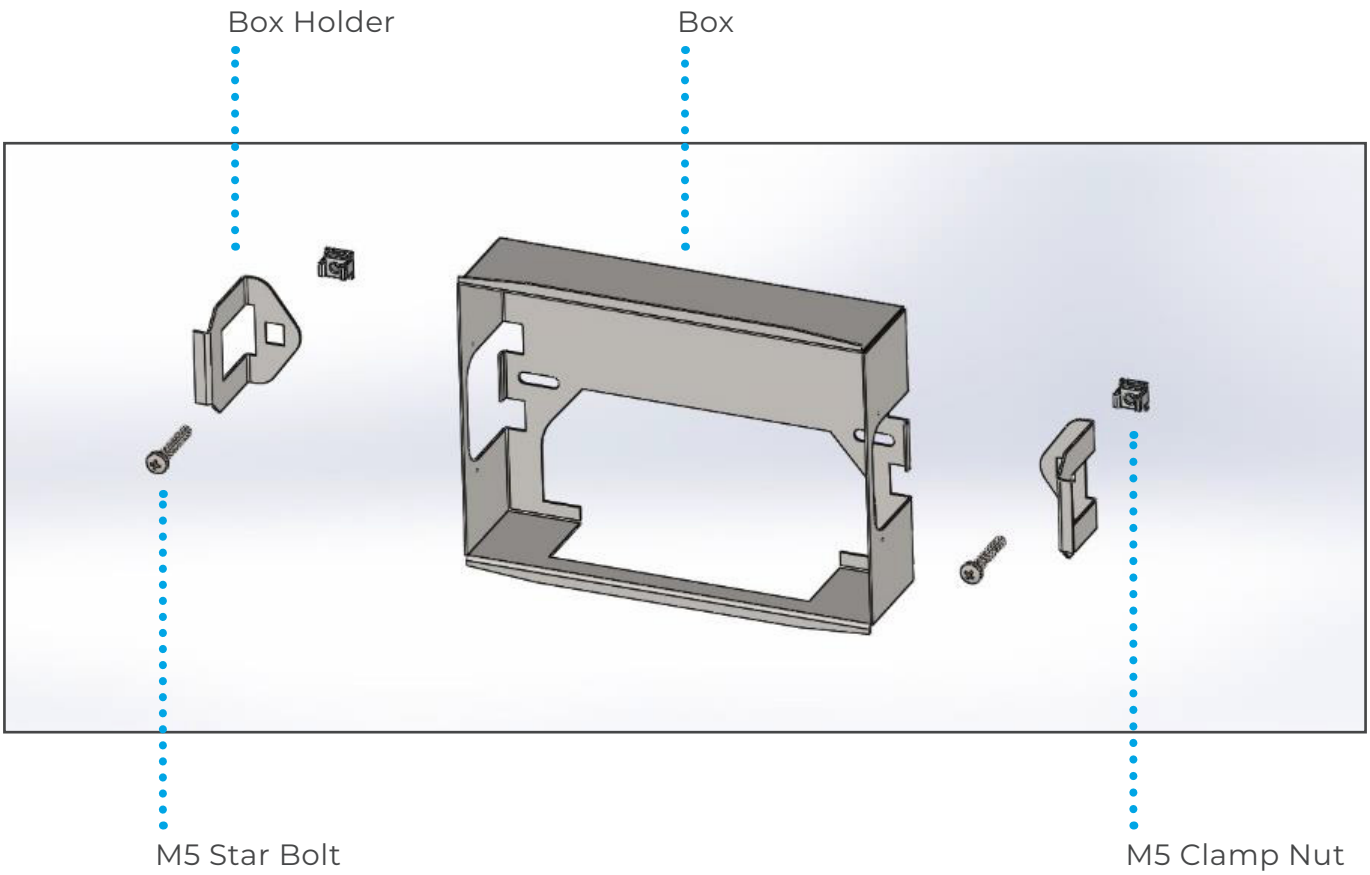


Open Position

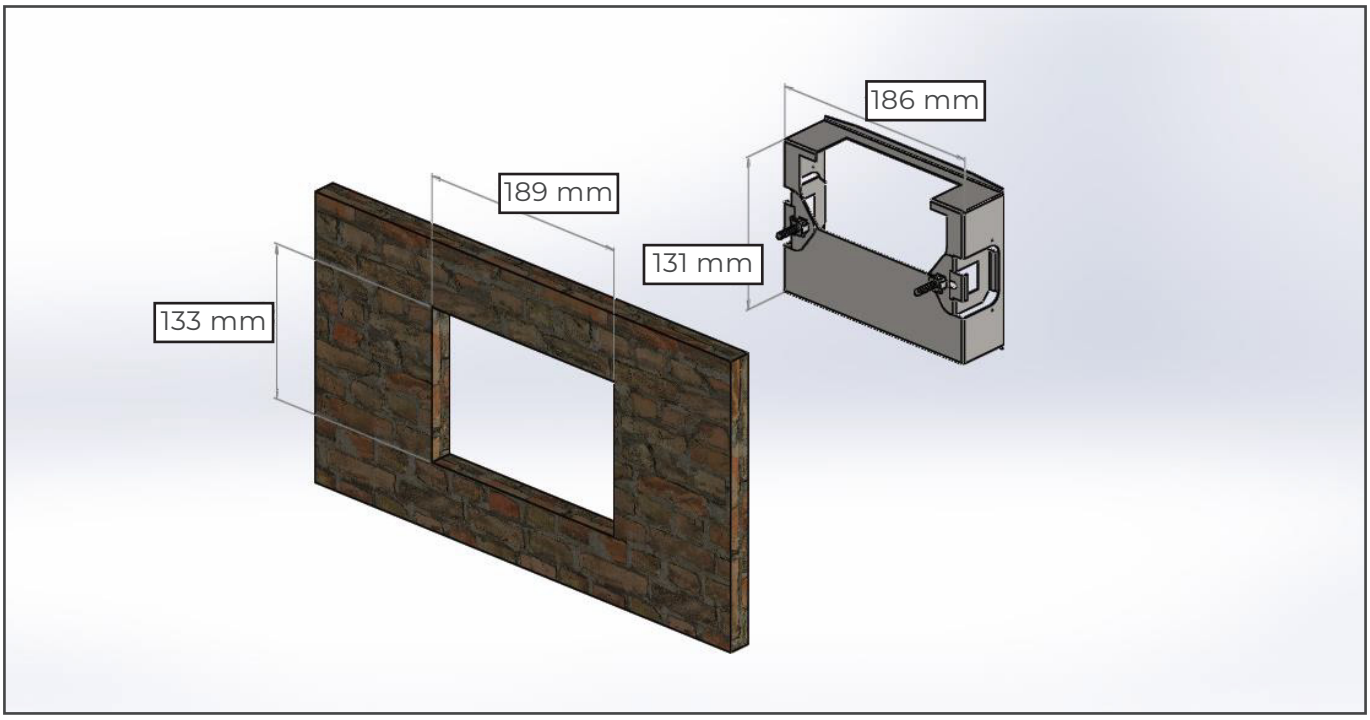


Closed Position

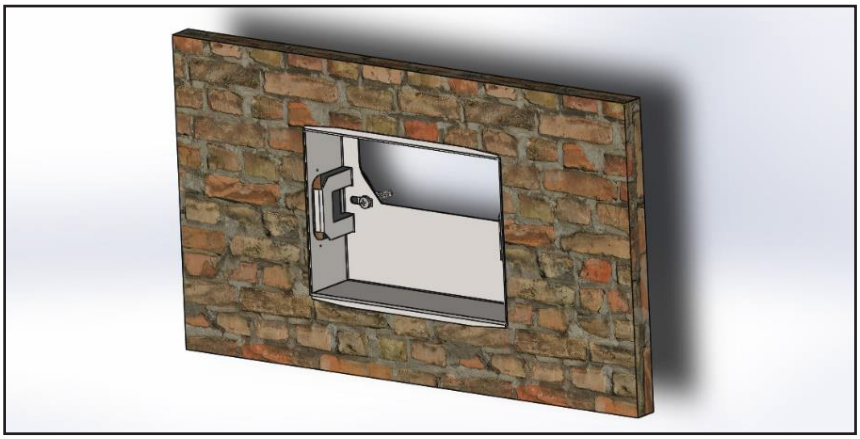
- ***Box Parts***



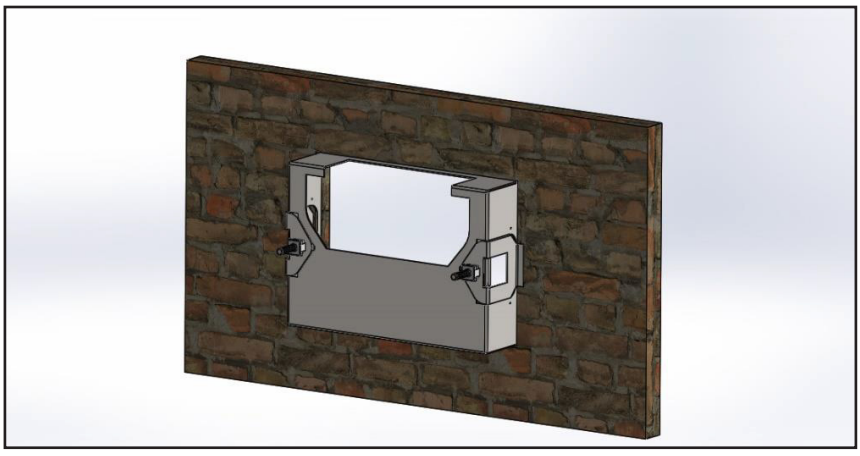
- ***Wall and Box Measurements***



During installation, the box must be in closed position.



Once the box is placed in the recess, it must be put in open position and the bolts must be tightened.



D. Call Terminal Addressing

When the wiring is complete, each Call Terminal must be assigned a unique (within the room) address from 1-8.

D1. Bedside Call Unit

To assign button addresses for the Bedside Call Units:

Step 1: Hold down both the red call and green reset buttons on the Call Unit for a few seconds to enter address configuration mode

Step 2: You will hear a trilling triple beep and the red backlight will be lit. You will see the light flash once indicating that the current address of the button is one.

Step 3: Press the red call button to change the defined button address

Step 4: Each time the call button is pressed; the green backlight will flash the number of times indicating the currently selected address (1-8). When you wish to go back to address one, simply quit the address configuration mode by confirming the correct address (seen in Step 5) and reenter configuration mode by repeating (Step 1).

Step 5: When the correct address is selected, press the green reset button to confirm the address. You will hear a double beep.

D2. Pull-cord Call Unit

To assign button addresses for the WC Call Units:

Step 1: Pull the cord and press the green reset button at the same time to enter address configuration mode

Step 2: You will hear a trilling triple beep and the red backlight will be lit

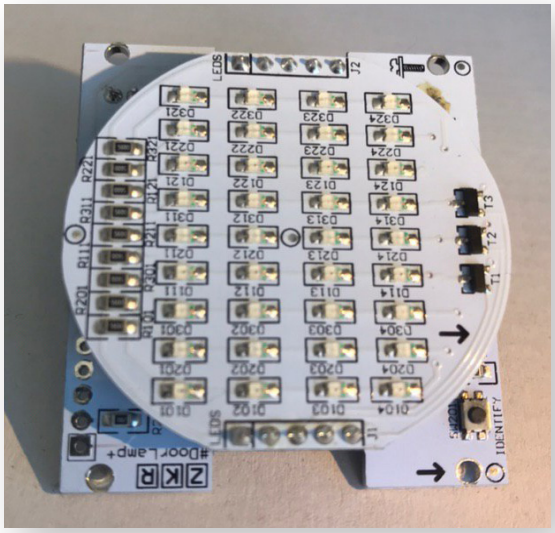
Step 3: Pull the cord to change the defined button address

Step 4: Each time the cord is pulled, the green backlight will flash the number of times indicating the currently selected address (1-8). When you wish to go back to address one, simply quit the address configuration mode by confirming the correct address (seen in Step 5) and reenter configuration mode by repeating (Step 1).

Step 5: When the correct address is selected, press the green reset button to confirm the address. You will hear a double beep

D3. I/O Auxiliary Alert Lamp

If there are double port I/O Lamps, they must be paired to the beds to which they correspond.

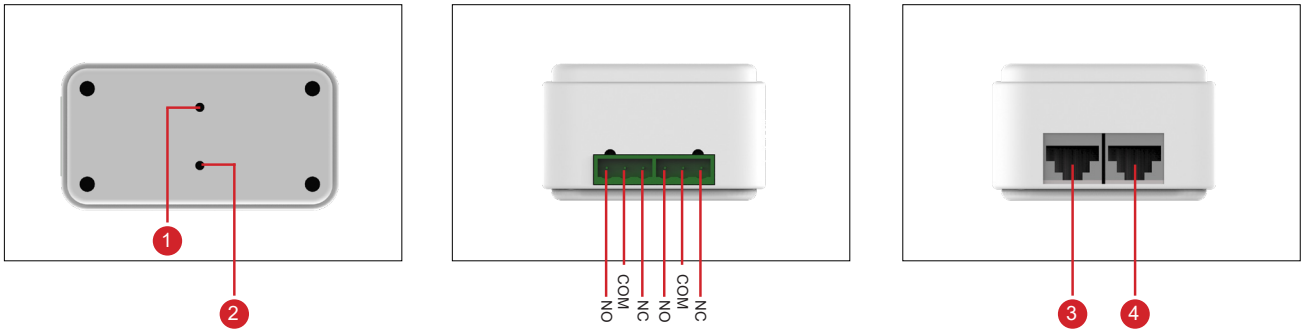


Step 1: Each lamp has a configuration button marked IDENTIFY. Hold this button down for 5 seconds to enter pairing mode.

Step 2: Press the red call button of the Bedside Call Unit (Or pull the call cord of the WC Call Unit) that you wish to pair with this lamp.

D4. Function Control Module

The Function Control Module is connected between the Room Control Unit and the Bedside Call Unit via its RJ45 dry-contact in/out ports. The other end of the module has two ports which can be connected to the lights, window blind automation, or whatever similar function that needs to be controlled via handset buttons. By default, there are two function buttons on the handset which will each control one of the automation systems connected with this module.



1. Config Button
2. Status LED
3. Out
4. In

D5. Comfort Handset

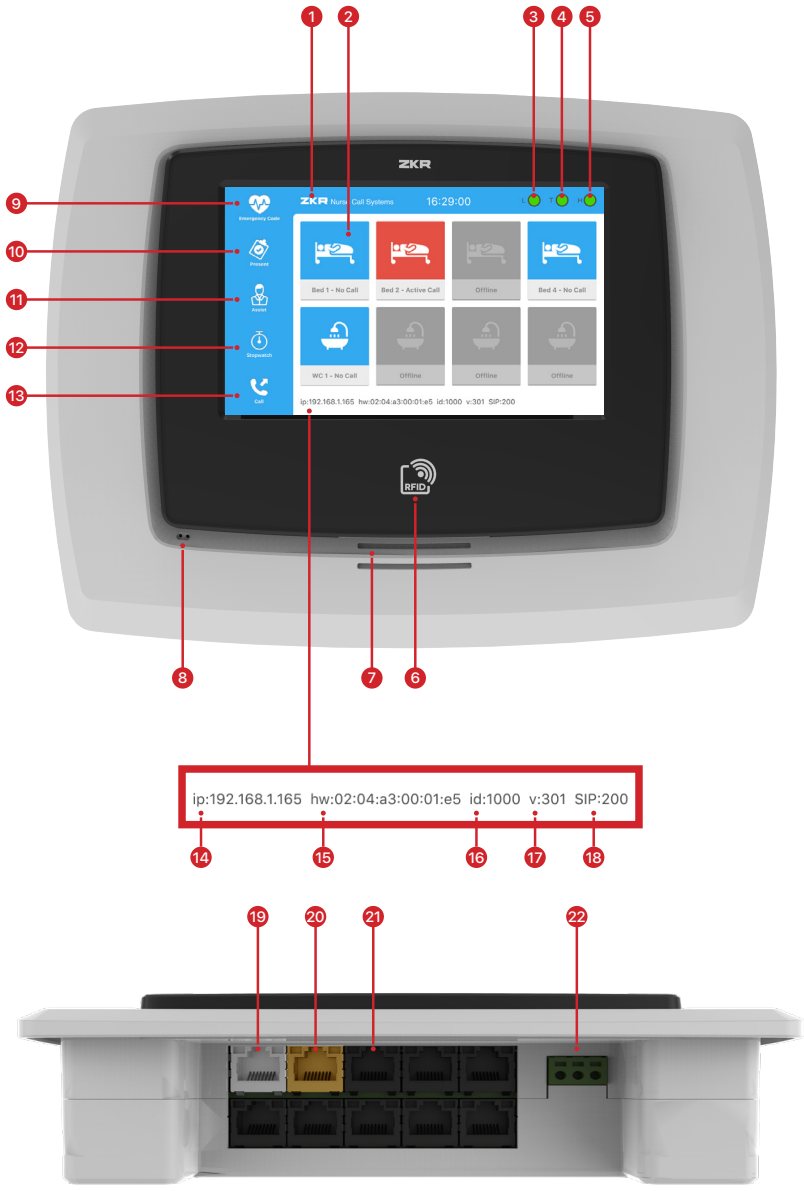
The configuration of this device is handled entirely through the web-browser interface. The Comfort handsets are connected directly to the switch.

E. IP Planning

• Determine the total number of RCUs, NCPs, Text Panels and servers to be used in the system.
• Determine which IP addresses will be assigned to which units.
• Keeping a list of these IP addresses during the configuration process will save time.
• On this list there should be the Terminal IDs and IP addresses that will be assigned to each Room Control Unit as well as each Nurse Control Panel, and the planning of which Room Control Units will be connected to which Nurse Control Panels.

F. RCU – Room Control Unit Configuration

1. Introduction to the Program Menu
2. Beds, WC, Bathroom Call Units Icons
3. Link Status (L)
4. Tcp Server Status (T)
5. Http Server Status (H)
6. Mifare Card Reader
7. Speaker (Versatile Plus Series)
8. Microphone (Versatile Plus Series)
9. Emergency codes
10. Present
11. Assist
12. Stop watch
13. Make call (Versatile Plus Serisi)
14. Device IP Address
15. Device Mac Address
16. Terminal ID
17. Firmware Version
18. SIP Status Message
19. Network Connection
20. Over Door Lamp Output
21. Bed, WC, Bathroom Terminals Connection Interfaces (8 pcs)
22. 220 V Input (Not Available with PoE Supported Models)

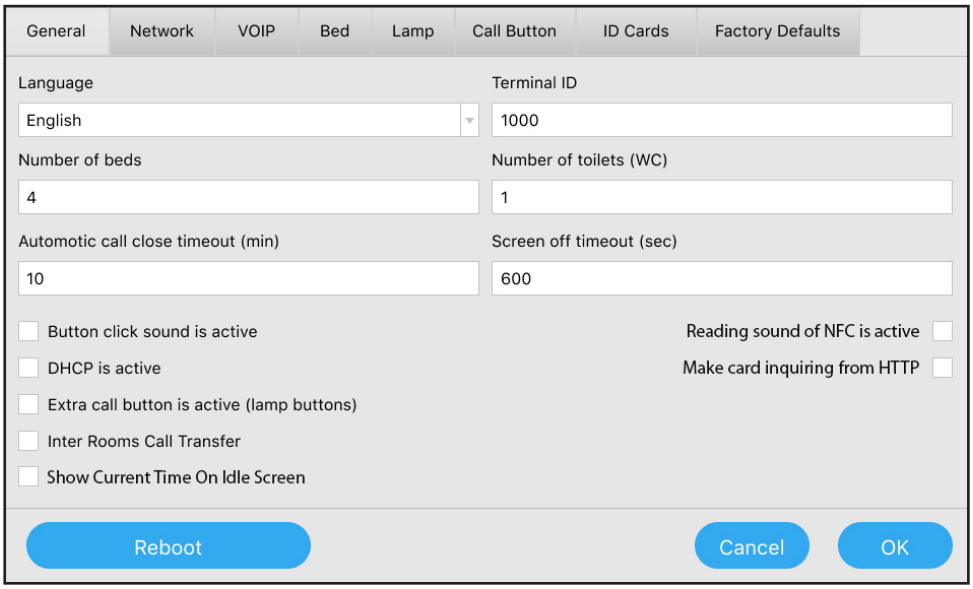


F1. Settings

Tap the ZKR logo on the home screen. Hold your Mifare card to the card reader when you see “Please get your card read”. If you have the required authorization, you will reach the following screen

F2. General

Tap the ZKR logo on the home screen. Hold your Mifare card to the card reader when you see “Please get your card read”. If you have the required authorization, you will reach the following screen



Language: Change the system language here.

Number of Beds: Set the number of Bedside Call Units to be connected to this RCU (the total number of bedside call units and WC call units cannot exceed 8)

Number of toilets (WC): Set the number of WC and bathroom Call Units to be connected to this RCU (the total number of bedside call units and WC call units cannot exceed 8)

Automatic all close timeout (Automatic call timeout):
Bed, WC, or Emergency Code calls are automatically terminated by the system at the end of the specified time. Automatically terminated calls are marked as ‘auto-off’ by the system server. Set this time in minutes.

Terminal ID: Assign an ID number to this RCU. This number will be used by the server for addressing purposes. Each RCU must be assigned a different ID number.

Screensaver Timeout: Set the time in seconds that will pass between interactions with the device before the screensaver clock is activated.

Button Click Sound: Toggle the click tone heard when touching the screen.

DHCP is Active: Toggle whether an automatic IP address will be received if there is a Dynamic Host
Configuration Protocol on the network.

Extra Call Button (Infermiera): Toggle to reconfigure the light control buttons on patient handsets to initiate different types of calls. This option is incompatible with lamp control units.

Inter-room Call Transfer: Toggle for calls from other rooms to be displayed on this RCU when there is a nurse present. This function will work when the nurse is logged into the room in Present mode.

Reading Sound of NFC: Toggle the sound heard when a Mifare Card is read by the RCU.

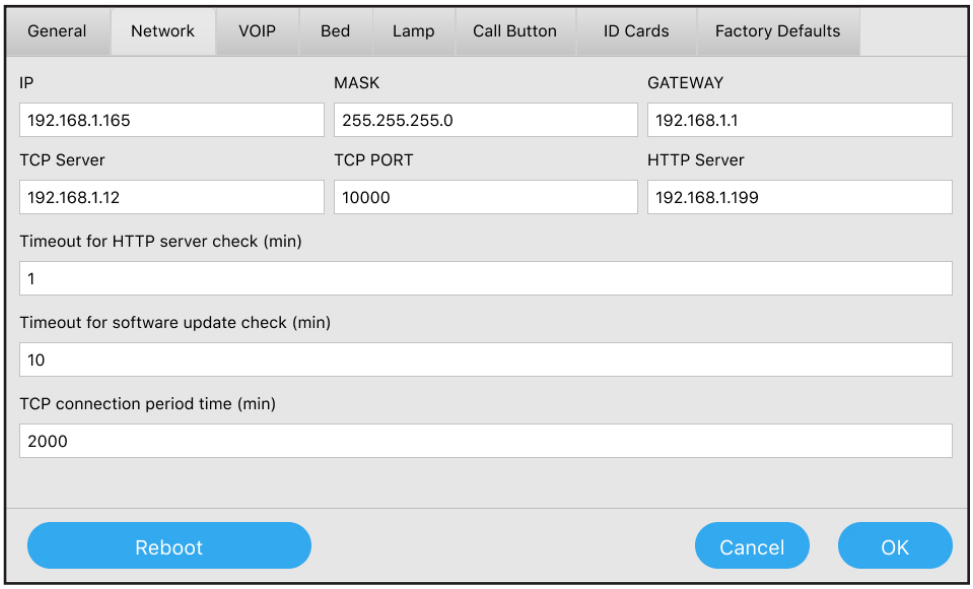
Make Card Inquiring of HTTP Server: This option enables Mifare Card privileges to be taken directly from the HTTP server.

F3. Network

IP: It is the IP number to be defined on the device.

Mask: It is the Mask value to be defined on the device.

Gateway: It is the Gateway address to be defined on the device.



TCP Server: The nurse panel IP address where the calls on the device will be monitored must be entered in this field. If the Tcp server connection is successful, the 4 numbered
T status mark will turn green. If the connection fails the status mark will turn red.

Http Server: The IP address of the ZKR system server must be entered. If the connection is successful, the 5 numbered H status mark will turn green. If the connection fails the status mark will turn red.

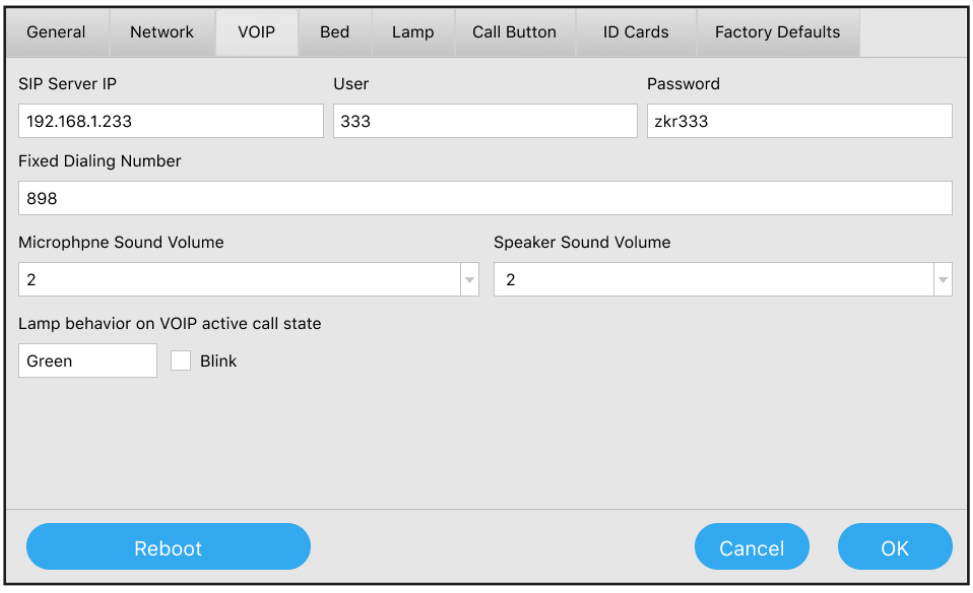
TCP Port: It is the port number to be used for the Tcp connection between the nurse panel and the room control device. 10000 is used as default.

Time outfor http servercheck: The room control device continuously checks the http connection. If no access is reached at the end of the value typed in this field, the 5 numbered H status mark wil turn red and error message will be received.

Time out for Software Update Check: The room control device can automatically update its firmware. This field checks whether there is a new software on the server in the value range to be written.

TCP Connection Period Timeout: It is the necessary timeout duration for the package to arrive during the Tcp communication between the room control device and the nurse panel. If the Tcp packet does not reach the end of this period, the Tcp connection is considered interrupted and the 4 numbered T status mark will turn red.

F4. VoIP



SIP Server IP: The SIP Registrar Server Address must be entered. If a different server will not be used, this will be the same as HTTP server.

User: Enter the username to use for the SIP register.

Password: Enter the password for the SIP register.

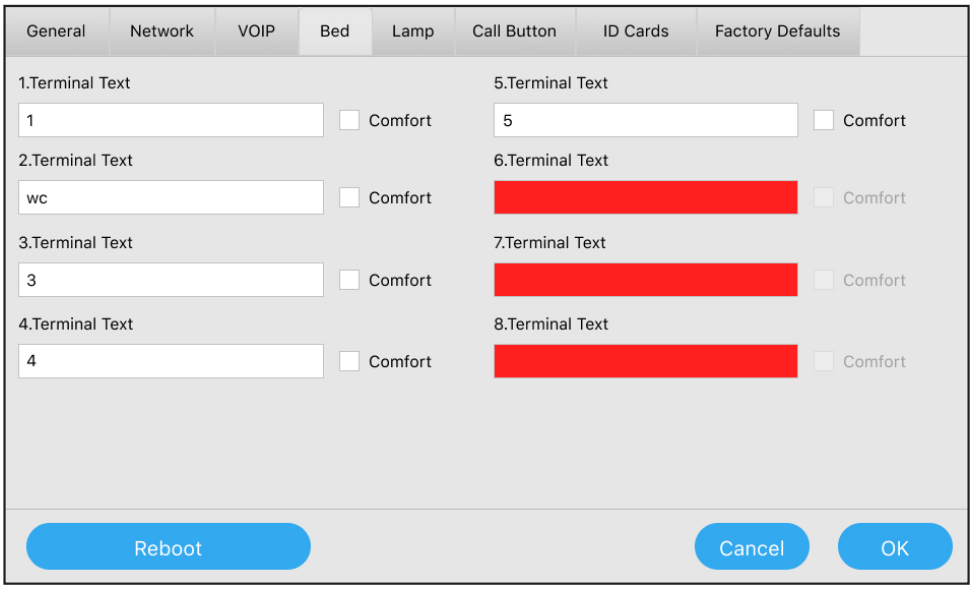
Fixed Dialing Number: Define the number to be dialed from the Speed Dial key in the search menu.

Microphone Sound: Set the microphone sensitivity.

Speaker Sound: Set the output volume of conversation in calls.

Lamp Behavior on VoIP active call state: Set the color for the Over Door Light connected to the RCU to indicate an active VoIP call. The toggle will determine whether the light will be blinking.

F5. Bed



Display names for the beds connected to this RCU can be defined here.

Terminal Text: Enter the name you wish to be displayed on the home screen under the Bed/WC icons. Red areas indicate non-connected terminals.

Comfort: If the Comfort handset is to be used with this RCU, the toggle Comfort must be checked. A name must be entered in these fields to avoid potential functionality issues

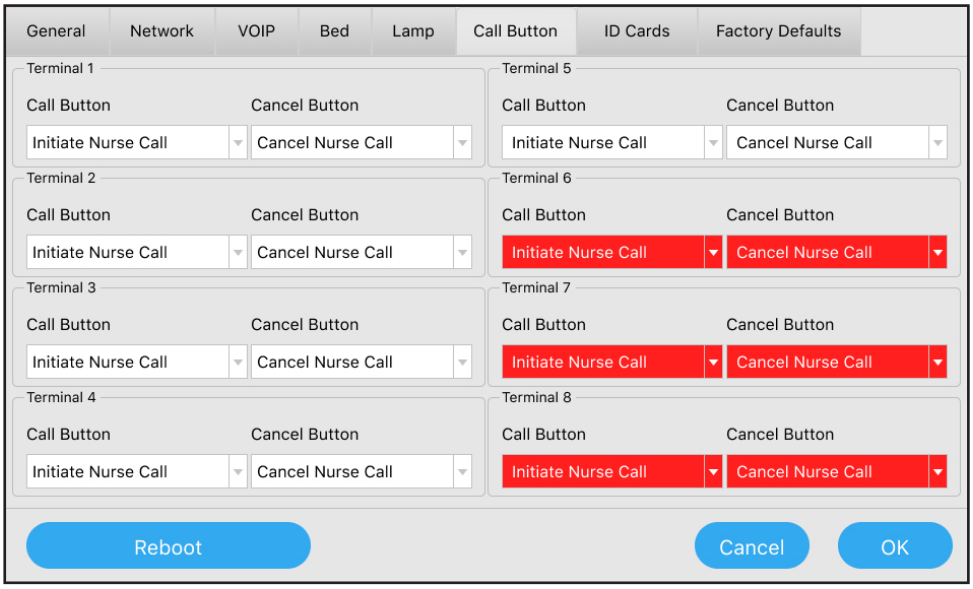
F6. Lamp

In this area, the behavior of the Over Door Light connected to the RCU depending on different situations may be configured.

Entrance the Room: When someone enters the room by using their card, select what color the Over Door Light will indicate the Present status depending on card type, and whether the light should blink in this case.

Event Notification: This will change the color of the Over Door Light for active calls.

F7. Call Button



This area allows you to set what each call button and reset button do. In WC Call Units, the pull-cord is considered the “Call Button” for these settings.

Call Button: The function assigned to Call Buttons will be “Initiate Nurse Call” by default.

Cancel Button: The function assigned to Cancel Buttons will be “Cancel Nurse Call” by default.

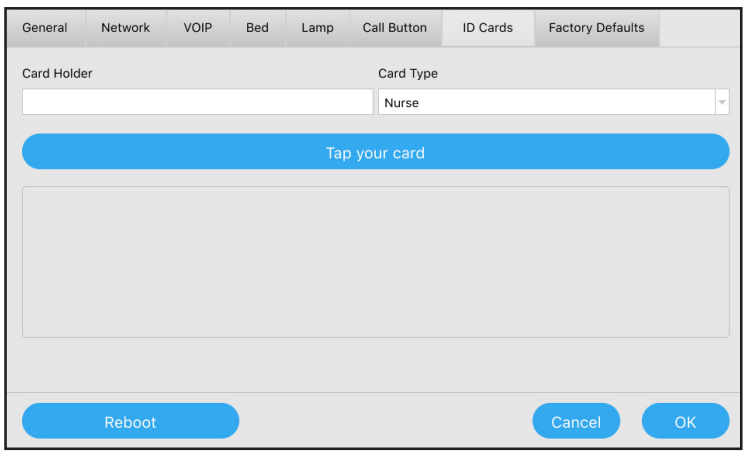
F8. ID Cards

The area designed to be able to quickly register to the server the personnel Mifare Cards which are used in the system.

Card Holder: Enter the Card Holder name or registration number.

Card Type: Enter the authorization level to be given to the card holder.

Tap your Card: Press here and have your card read by the device. If the process is successful, the added cards will be visible in the gray area below. Performing this operation with a card already defined in the system will update the current information.



F9. Factory Defaults

This area allows you to restore the device to factory settings. The factory IP address of the device is 192.168.1.251.

F10. LTH indicators

On the top right corner of the home screen you can find indicator circles labelled L T H.

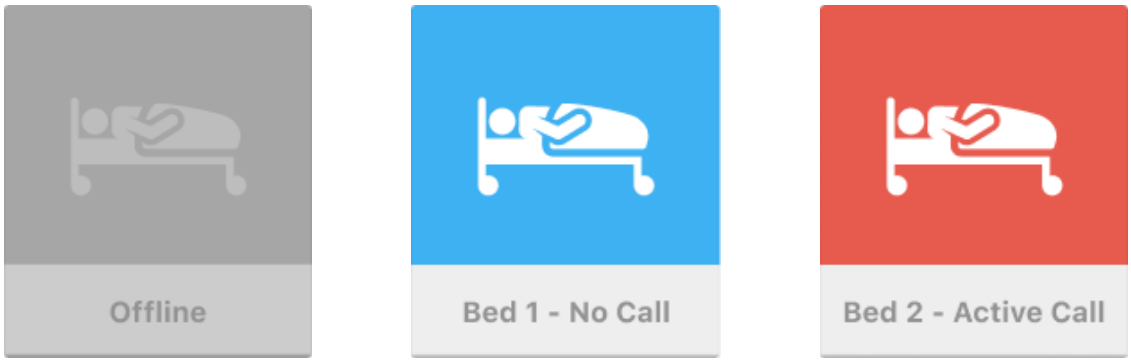
Link Status (L): This circle will indicate whether the RCU is connected to the network line and the switch connection is successful. If this circle is red, cable connections and switch should be checked.

TCP Server Status (T): This circle will indicate the Nurse Control Unit connection status. If this circle is red, check that the Nurse Control Unit is turned on and your network settings are correct.

HTTP Server Status (H): This circle will indicate the ZKR main server connection status. If this circle is red, check that server is turned on and your network settings are correct.

F11. Bed/WC Icons

These icons indicate the status of the call buttons connected to the RCU. Grey indicates lack of connection with the call unit. Red indicates there is an active call corresponding to that address. If there is a connection but no active call, the color of the icon will be blue.



F12. SIP Notifications

On the home screen this field is used to monitor the SIP status of the account on this RCU. This will read SIPxxx. The meanings of the codes are as follows.

SIP200 Registration is OK
SIP400 Bad Request
SIP401 Unauthorized: Used only by registrars. Proxies should use proxy authorization SIP407
SIP402 Payment Required (Reserved for future use)
SIP403 Forbidden
SIP404 Not Found: User not found
SIP405 Method Not Allowed
SIP406 Not Acceptable
SIP407 Proxy Authentication Required
SIP408 Request Timeout: Couldn't find the user in time
SIP409 Conflict
SIP410 Gone: The user existed once, but is not available here anymore.
SIP413 Request Entity Too Large
SIP414 Request URI Too Long
SIP415 Unsupported Media Type
SIP416 Unsupported URI Scheme
SIP420 Bad Extension: Bad SIP protocol extension used, not understood by the server
SIP421 Extension Required
SIP422 Session Interval Too Small
SIP423 Interval Too Brief
SIP480 Temporarily Unavailable
SIP481 Call/Transaction Does Not Exist
SIP482 Loop Detected
SIP483 Too Many Hops
SIP484 Address Incomplete
SIP485 Ambiguous
SIP486 Busy Here
SIP487 Request Terminated
SIP488 Not Acceptable Here
SIP491 Request Pending

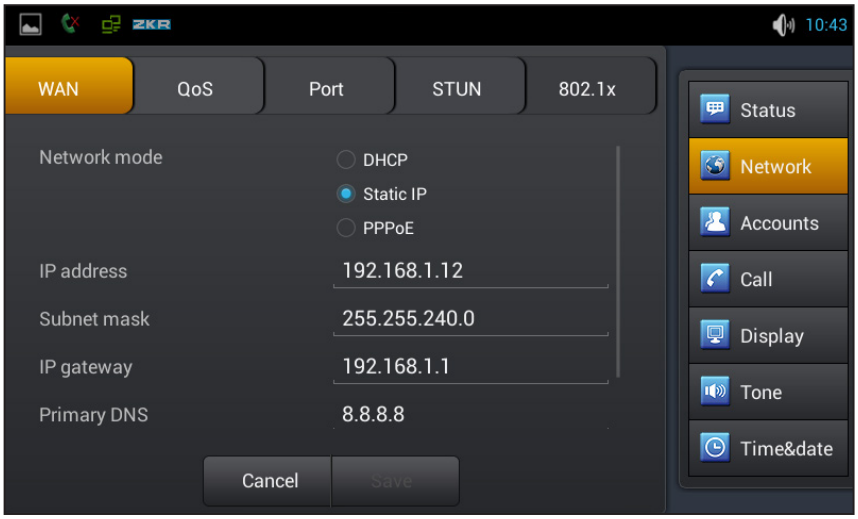
G. NCP - Nurse Control Panel Configuration

G1. VoIP 7"Nurse Control Panel

a. Panel IP Settings

Press Home button to reach this screen, go to the settings menu on bottom right
Go to Network

Define this panels IP address and settings

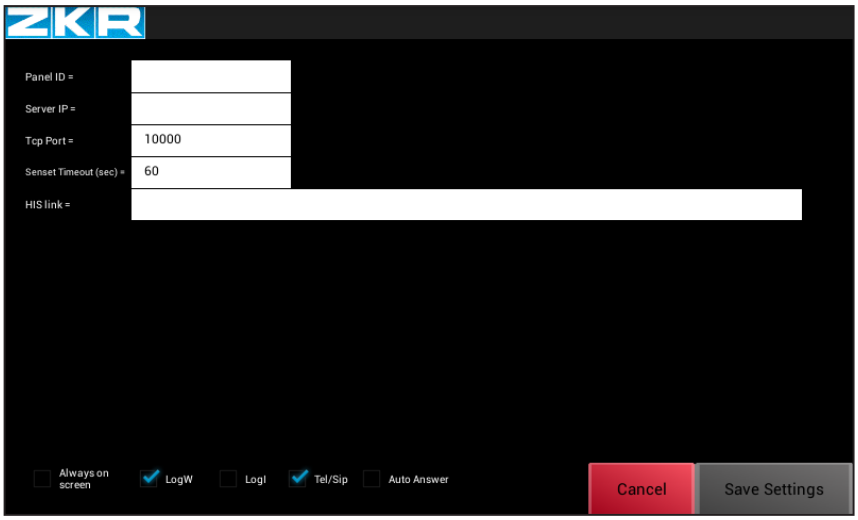


b. In-App Configuration

Launch the ZKR Nurse Call App.

Panel ID: Enter the Terminal IDfor this unit (must be same as determined in the Server settings in H1).

Server IP: Enter the server IP
The remaining settings can stay default.



c. Options

Always on screen: This will bring the ZKR Nurse Calling App back to the screen whenever someone tries to go back to the home screen or menu of the Panel.

LogW (warning): This should always be toggled on, it logs any errors the device might have and allows our technical support to sort out issues.

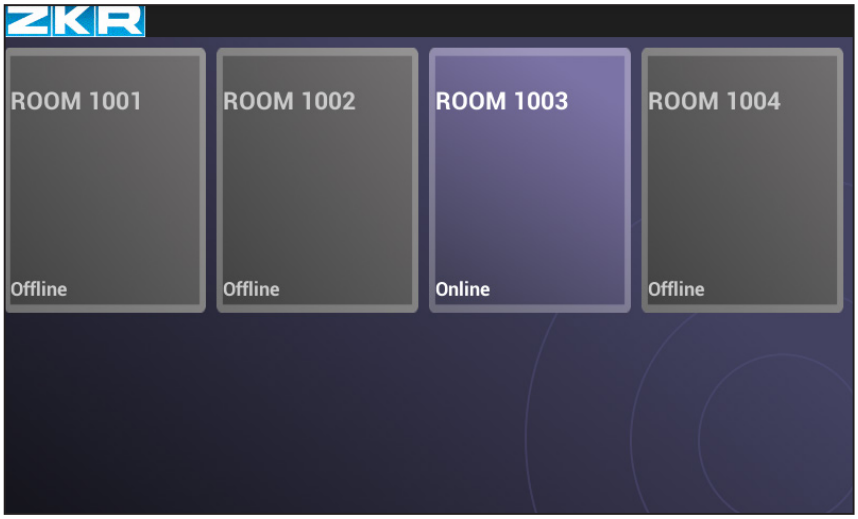
LogI(Information): This provides more detailed logging, and can remain off. Technical support might choose to turn it on for debugging.

Tel/SIP: This option differentiates the 10” and 7” Nurse Control Panels. It must be toggled ON for 7”.

Auto Answer: This option will make the Room Control Units connected to this Nurse Control Panel give full permissions to all Mifare cards. It is used during the installation process if necessary to access settings and functions before everything is configured.

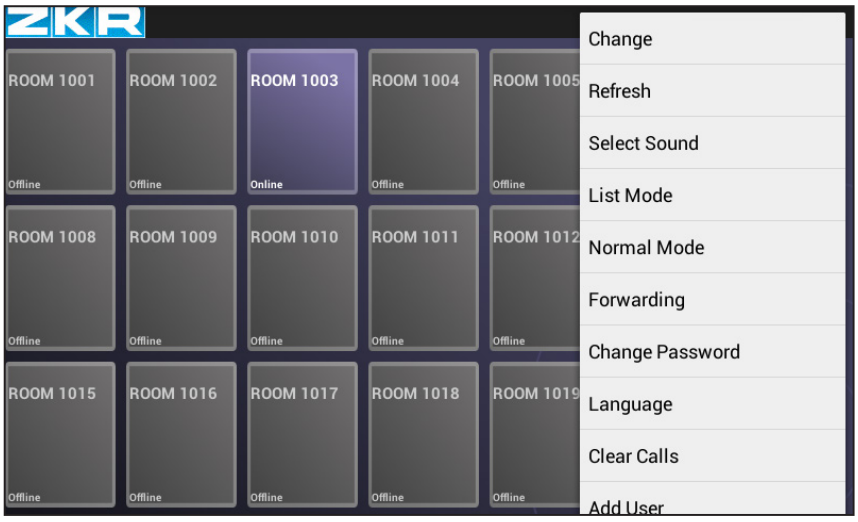
d. Main Nurse Call Screen

The buttons will appear according to the ones assigned to this Nurse Control Panel in H1.



e. Call Forwarding

Use the panel's menu button to open menu to go to Forwarding, and select the panels you wish to forward calls to.



G2. VoIP 10"Nurse Control Panel

The configuration of the 10" panel is nearly the same as the 7" one, the only differences are:

- The home screen layout is different for the panel IP configuration
- During the in app login at the bottom of the screen the checkbox for Tel/SIP must be ticked for the 10" panel

G3. Versatile 18.5” Nurse Control Panel

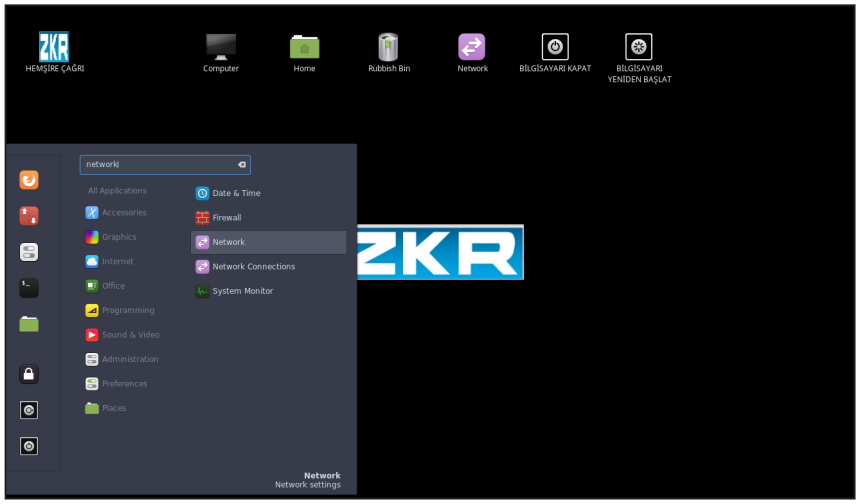
The 18.5” Nurse Control Panel application uses two function keys:

- **F9:** Exit program
- **F10:** Settings

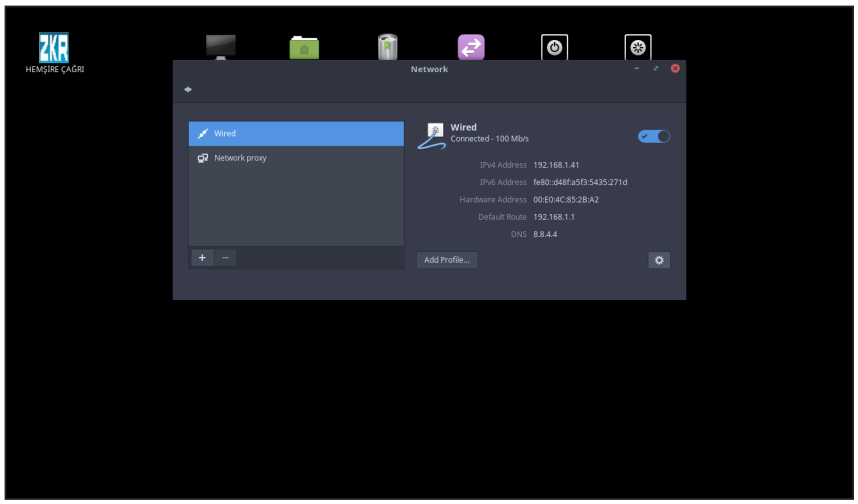
a. Network settings

To configure the network settings, exit the program by pressing F9. The default password is 1.

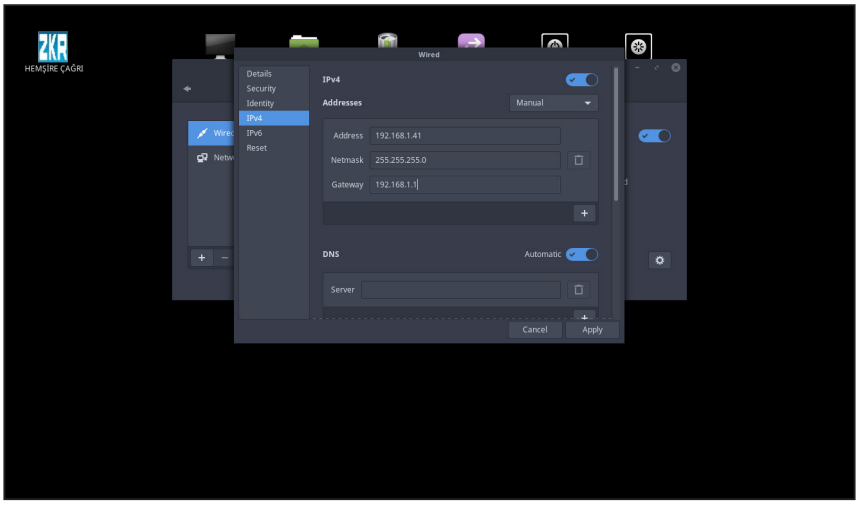
Open the start menu and navigate to Network



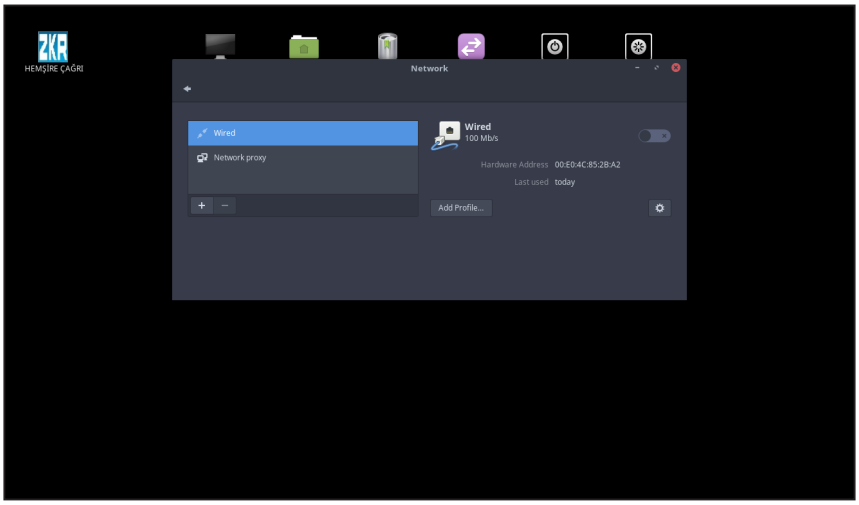
Under Wired, go to the settings menu.



- Go to IPv4
- Change Addresses from automatic to manual
- Enter the IP address, mask and gateway for this device and click Apply



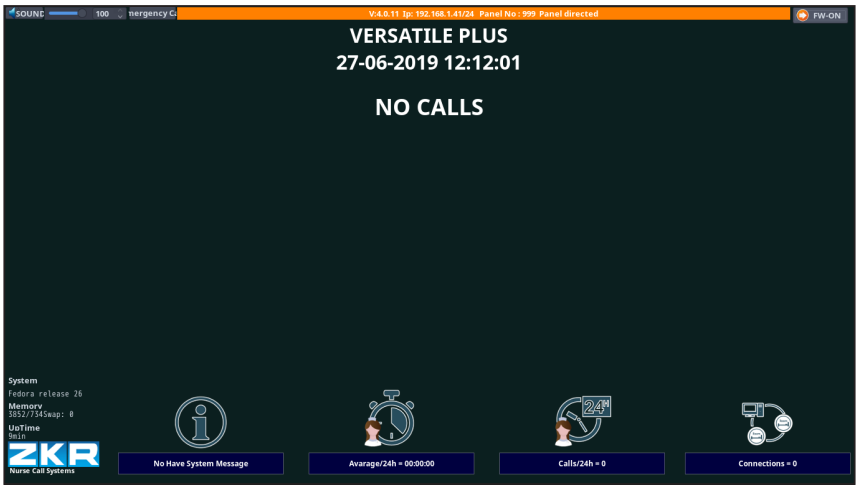
- Toggle the Wired connection off and on again



b. In-Software Settings Configuration

- ***General***

Click F10 to open settings



Panel ID is static
DO NOT ATTEMPT TO CHANGE

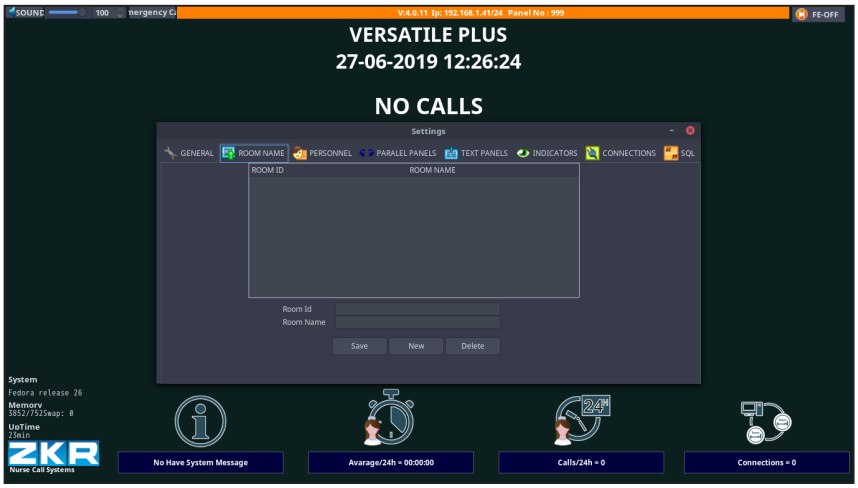
Name will change the name of the devices as shown onscreen

Server IP: Enter the server IP here

The remaining settings should stay as default.

• *Room Name*

This tab allows you to assign names to Room Control Units or Call Units within rooms. The assigned names will appear when a call from those units is made to this Nurse Control Panel.



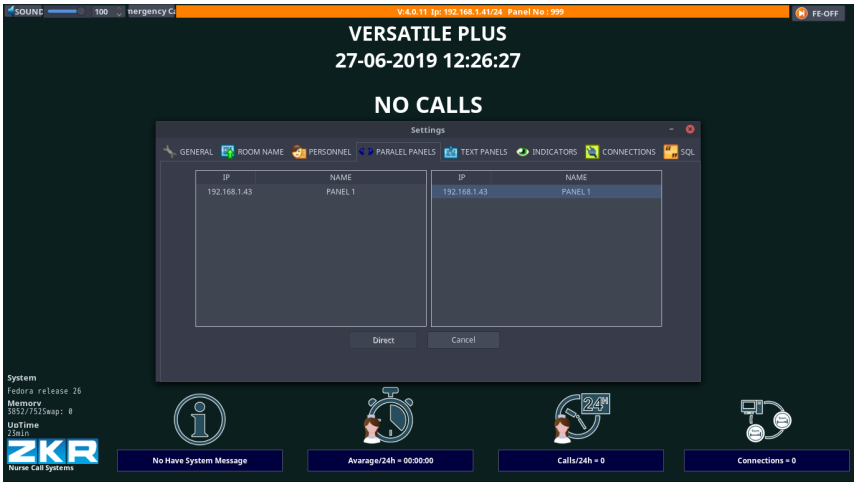
To add Room Name:
Click New

Room ID: Enter the terminal ID of the room
Room Name: Enter the name you would like to give this room

If you would like to define a name for a button in a room, use the Room ID as ****x where **** is the room terminal ID and x is the address of the button (1-8).

• *Call Forwarding – Parallel Panels*

There are options in the settings for directing calls to other panels, text panels, and light indicators, but these must first be defined on the server.

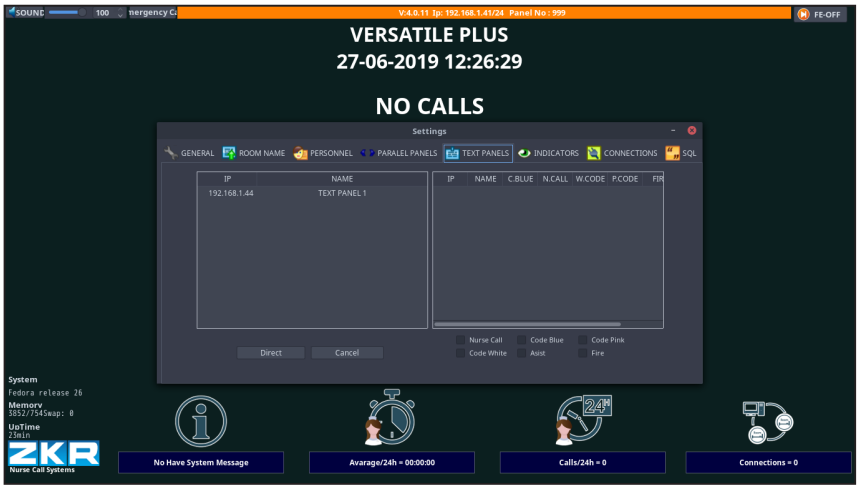


The left side field will show the connected devices which can receive forwarded calls. To begin forwarding, select the required devices, and click **Direct.** This will move those devices to the right side field which shows the currently active forwarding. **Cancel** can be used to remove addresses from the currently active forwarding list.

• *Forwarding to Text Panels*

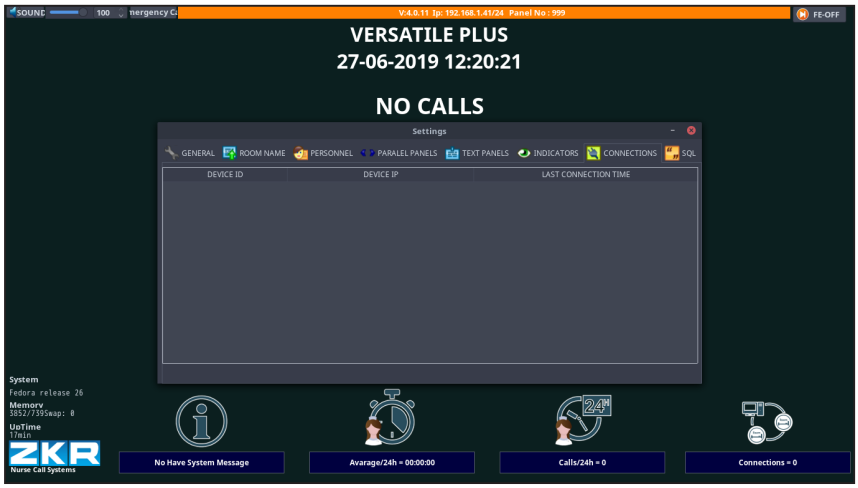
For **Text Panels**, it's possible to forward only specific types of calls, by selecting call types at the bottom before clicking **Direct.**

This feature is otherwise configured the same as in forwarding to panels.



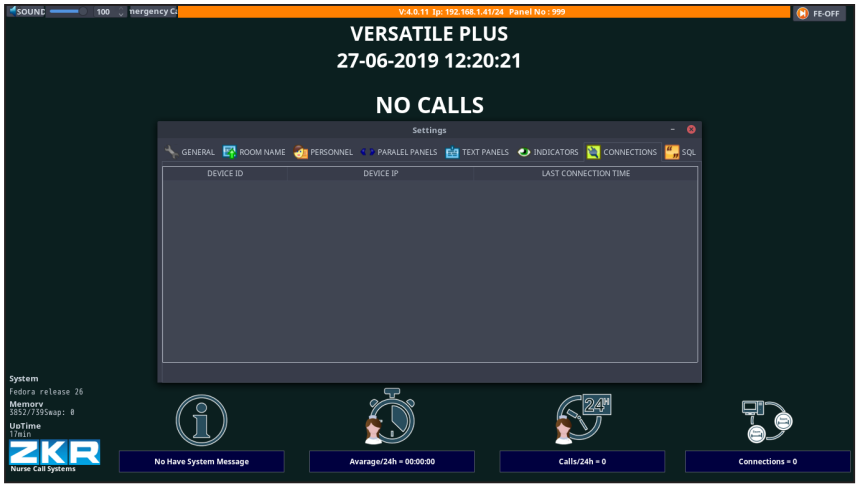
• *Connections*

The **Connections** tab will show a list of Room Control Units that are connected to this Nurse Control Panel.



• *Clearing Calls*

The **SQL** tab allows you to clear all active calls from the system by pressing **Close All Calls.**

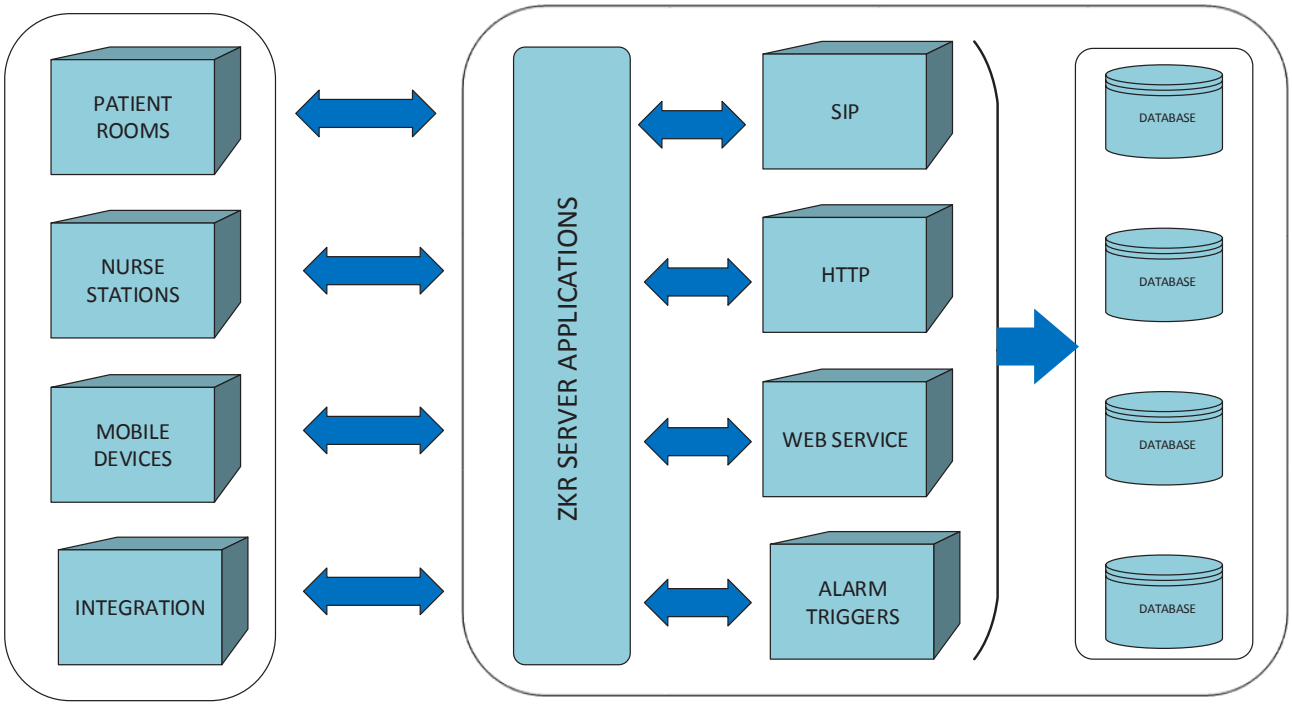


H. Server – How does it work

The ZKR Server application is the platform that facilitates communication among all the equipment used within the Hospital, stores all event logs and voice recordings of calls made on the system, allows these logs and records to be accessed by the user through a web-based interface, and allows integration with other systems used throughout the hospital.

For the system to function correctly, the most important step is proper configuration of the Point Definitions and the Call Type Notifications (Point Operations) these points can make.

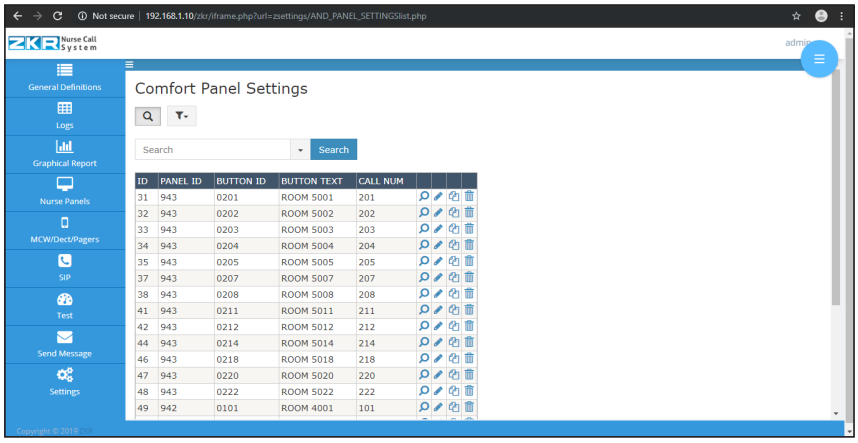
The fundamental architecture of the system is as below.



H1. Nurse Panels (Used for the Android-based Nurse Panels)

Go to **Nurse Panel/Panel Settings.**

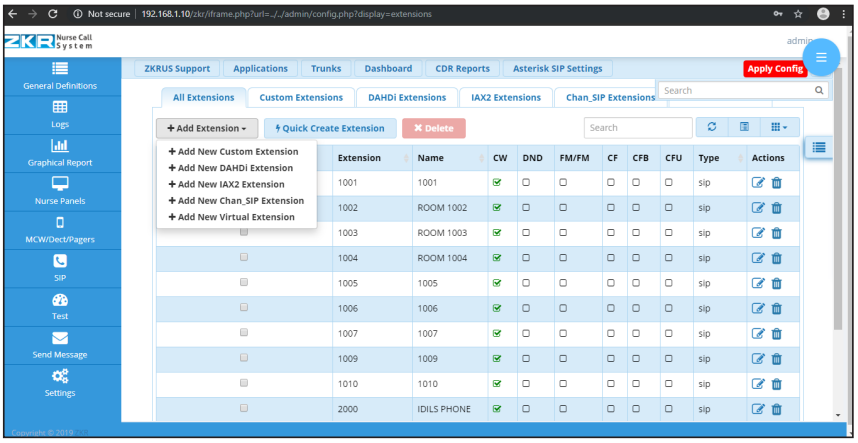
Here you can add Nurse Panel IDs and their connected Rooms. Each entry shows the Panel IDs and their connected Room IDs as well as the dialing number that will call these Rooms and the Room Names as that will appear on the Nurse Panel.



H2. SIP Extensions (Used for VoIP Devices)

Go to
SIP/Phone Extensions.

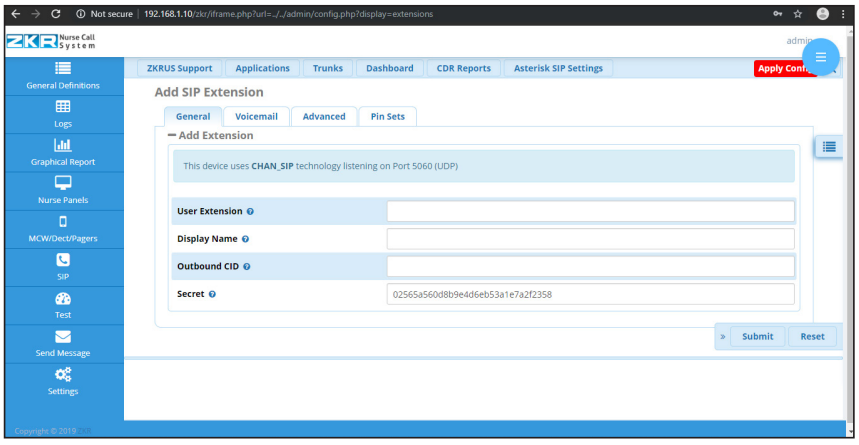
Here you can view the currently defined phone extensions, the rooms and panels that can be called and make calls in the system.



To add a new phone extension

- Click Add Extension
- Add New Chan_SIP Extension

User Extension: Enter the dialing number for the extension you wish to add here
Display Name: Enter the display name that will be shown for this device
Outbound CID: This field can be left blank for our purposes
Secret: Enter a password here



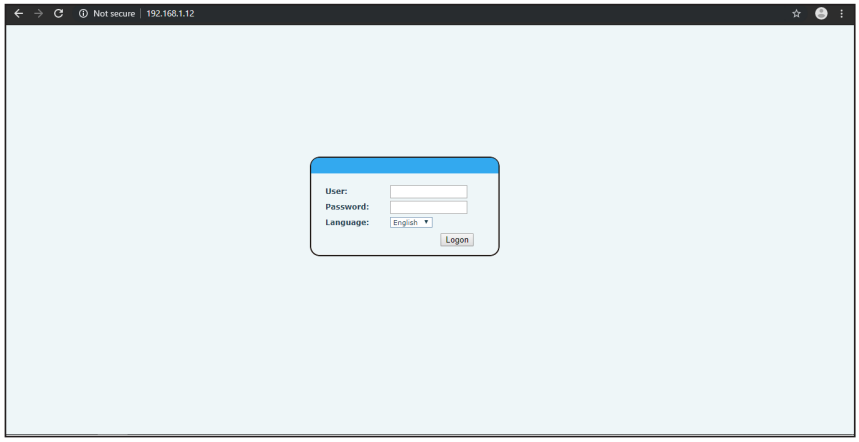
The **User Extension** for Room Control Units is usually entered as the same as the Terminal ID for those Room Control Units and the secret for all units is given as zkr**** where **** is the Terminal ID, by convention.

Comfort VoIP handsets' SIP Extensions are added here as well. Conventions for the extension numbers for these are usually the Terminal ID of the Room they are connected to, followed by the number of the bed to which they correspond, for example 10041, for the first comfort handset in room 1004.

For Android based Nurse Control Panels, enter the Nurse Control Panel's IP in a web browser URL.

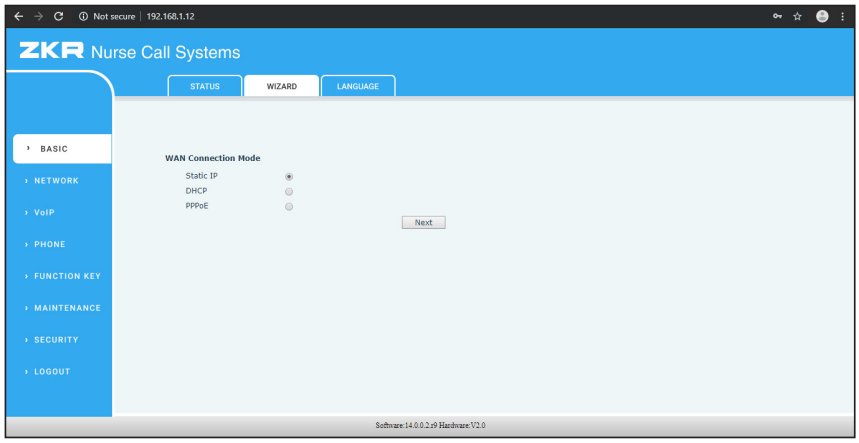
The default login information is

Username: admin
Password: admin



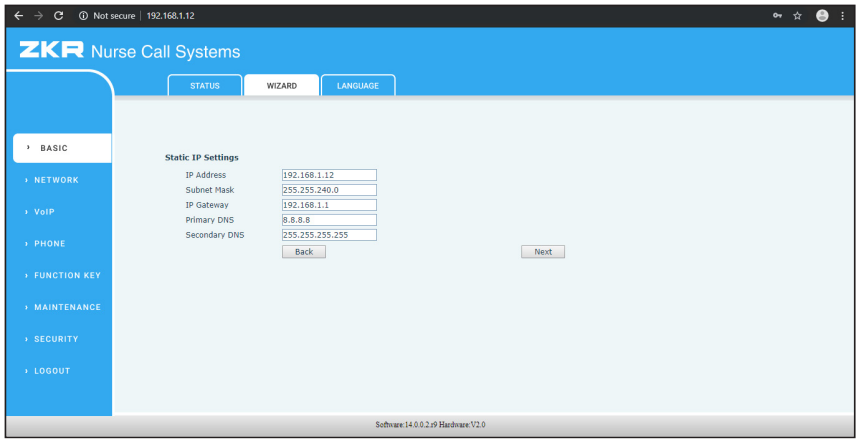
Navigate to **Basic** in the Side Menu and **Wizard** in the top menu

Select **StaticIP** and click **Next**

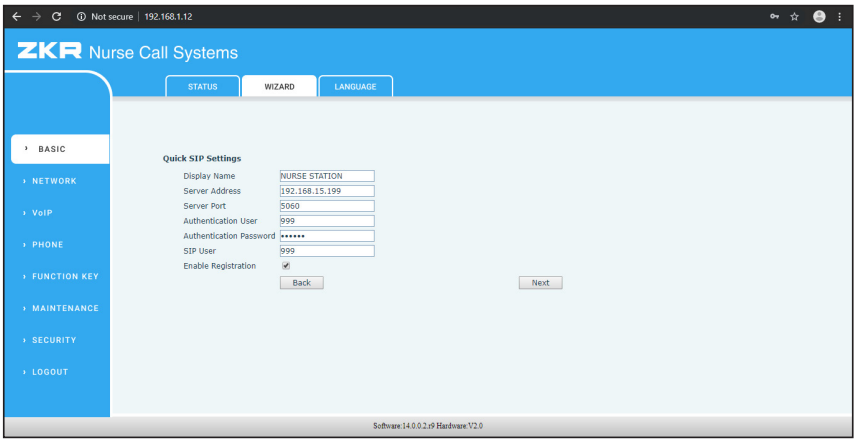


You will see the current IP settings of the device, and they can also be changed from here.

Click **Next.**

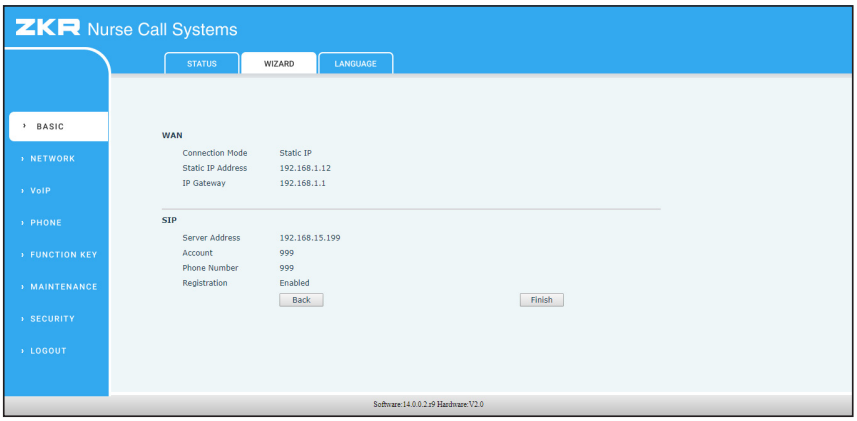


Display Name: Enter a display name for this Nurse Control Panel.
Server Address: Enter the server IP here
Server Port: This field can remain as default
Authentication User: Enter the User Extension for the Nurse Control Panel as defined in H2.



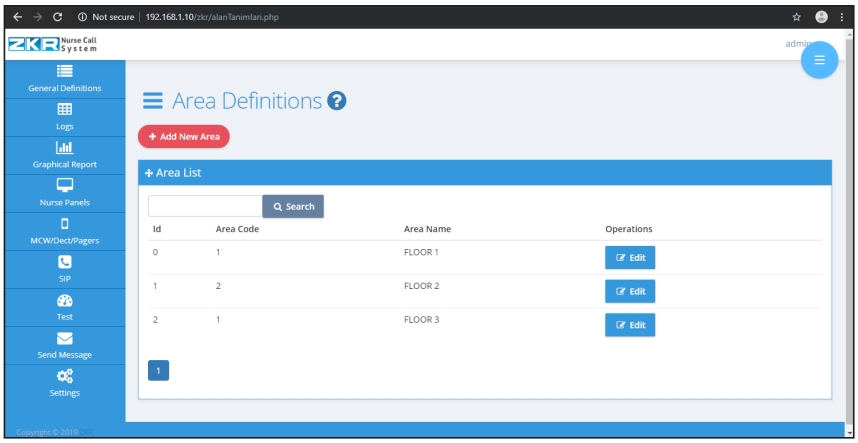
Authentication Password: Enter the Secret for the Nurse Control Panel as defined in H2.
SIP User: Same as Authentication User
Enable Registration: Select this option and click **Next**

You will see the settings you have set and confirm them by clicking **Finish.** The panel will reboot.



H3. Area Definitions

In the server interface, navigate to **General Definitions/Area Definitions.**



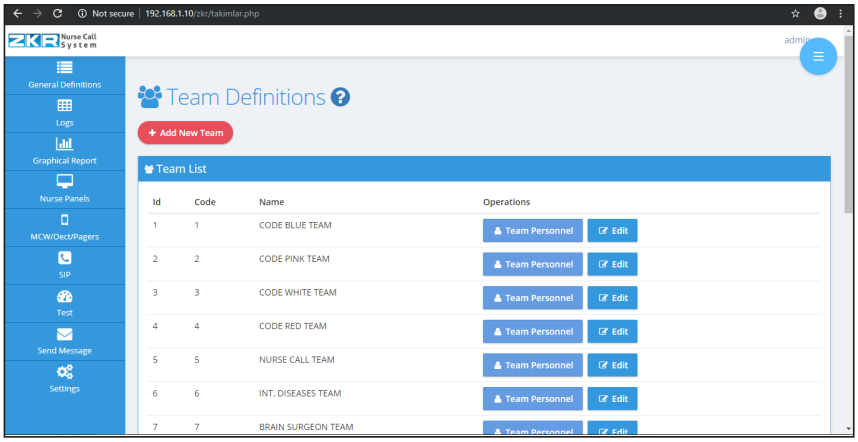
Add the areas to be used in the hospital; can be floors/departments etc.

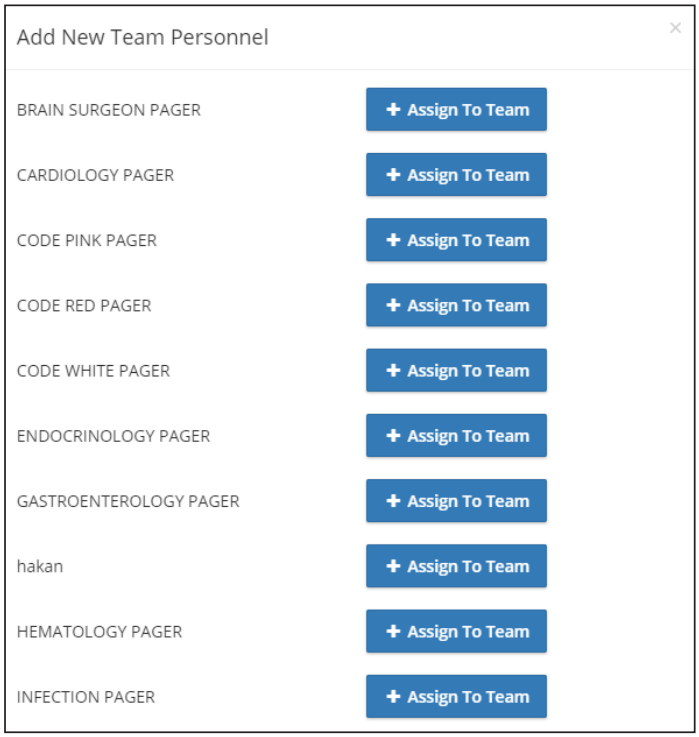
Code is an optional field to be used at the hospital's discretion.

H4. Team Definitions

On this page you can add new teams for personnel, and edit the names of existing teams.

By clicking the **Team Personnel** button next to a team, you can assign personnel to that team or remove them. You can create as many teams as desired for different call types or areas.

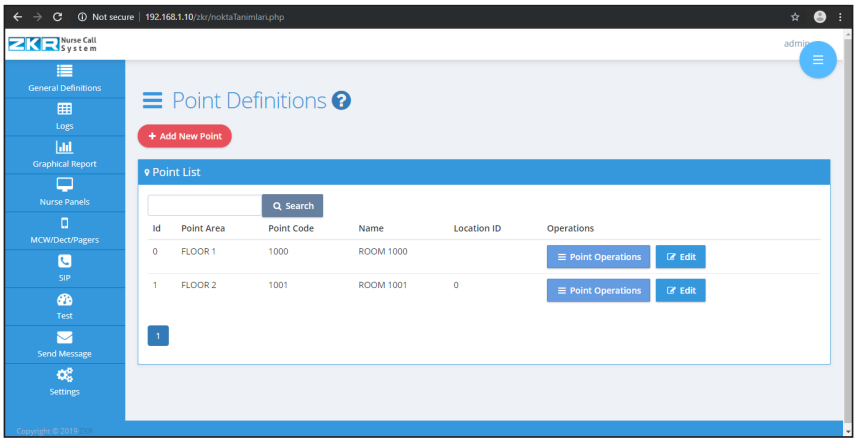




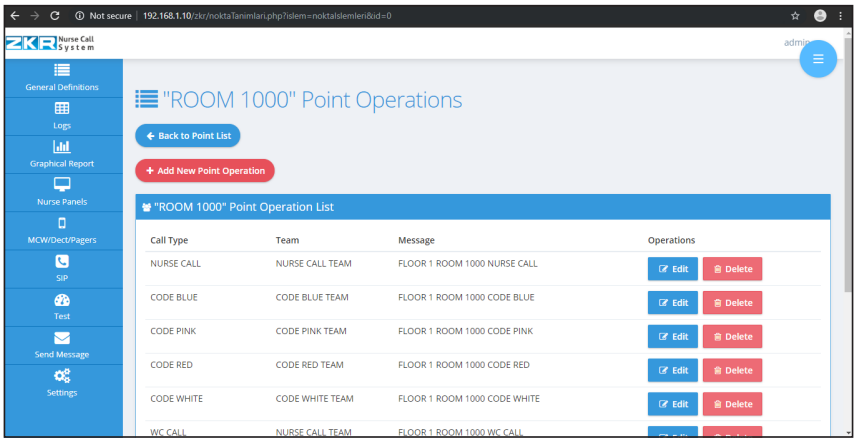
H5. Point Definitions

Define Room Control Units and the operations they can perform.

Point Code: Refers to the Terminal ID of the Room Control Unit
Location ID: Optional way to identify Rooms by architectural codes.



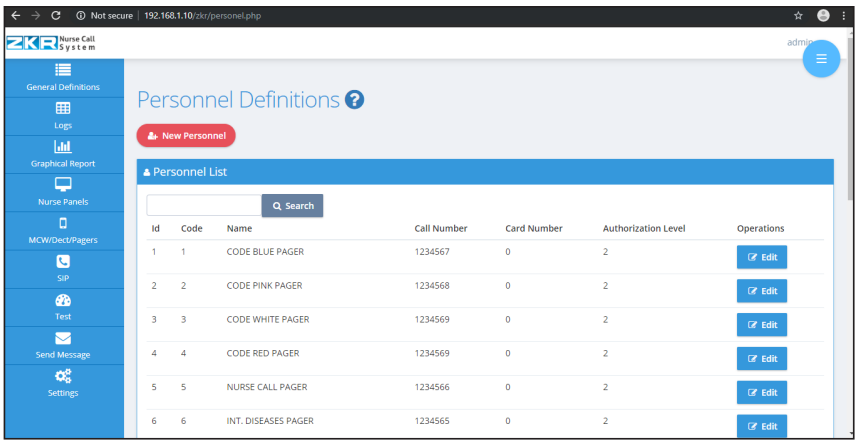
Point operations: Define which calls the point can make and which teams will receive those calls from this room, and the message that will be sent to those teams when a call of that type is made.



H6. Personnel Definitions

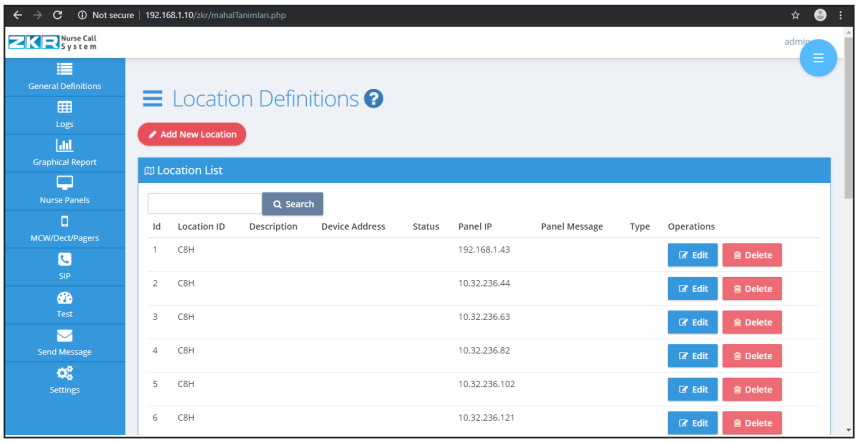
The RCU entries of Mifare Cards (see F8) will appear here, and you can add call numbers (pager numbers or DECT) to those personnel and change authorization levels of those cards.

Authorization levels are as follows:
1 – Nurse
2 – Doctor
3 – Cleaning Staff
4 – Other



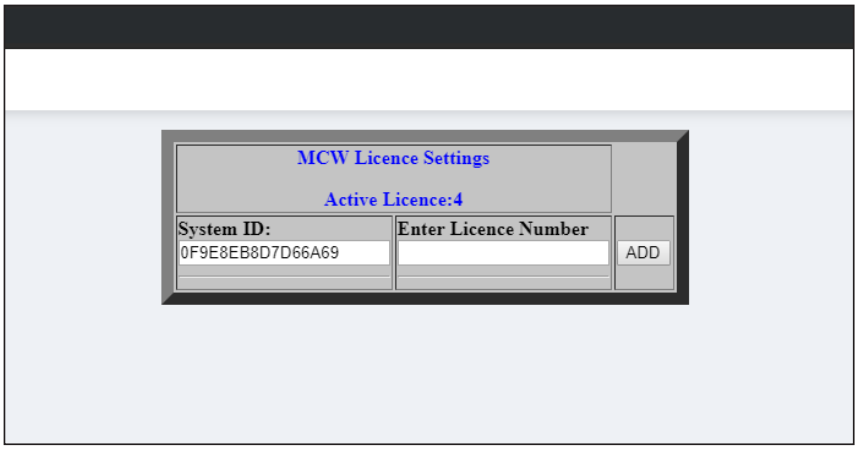
H7. Location Definitions

Used for Integrations, a common ground identifier typically based on architectural codes of areas.



H8. MCW Licenses

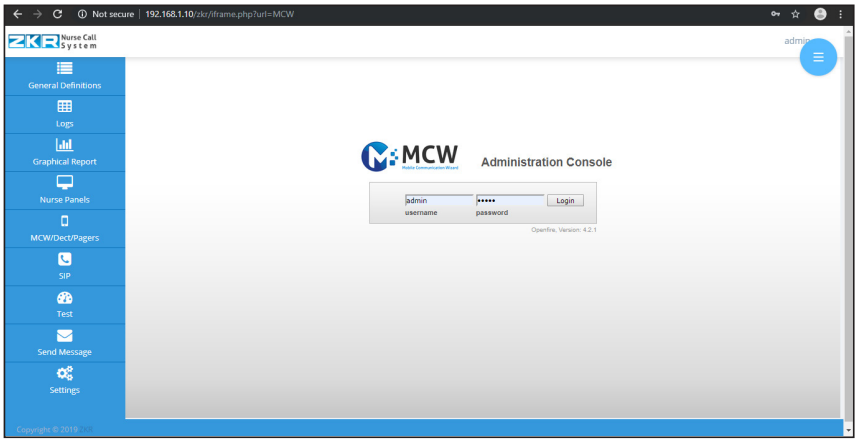
Use this page to register MCW One Licenses. The **System ID** will be static; you can provide this to ZKR headquarters when you wish to purchase MCW One Licenses.



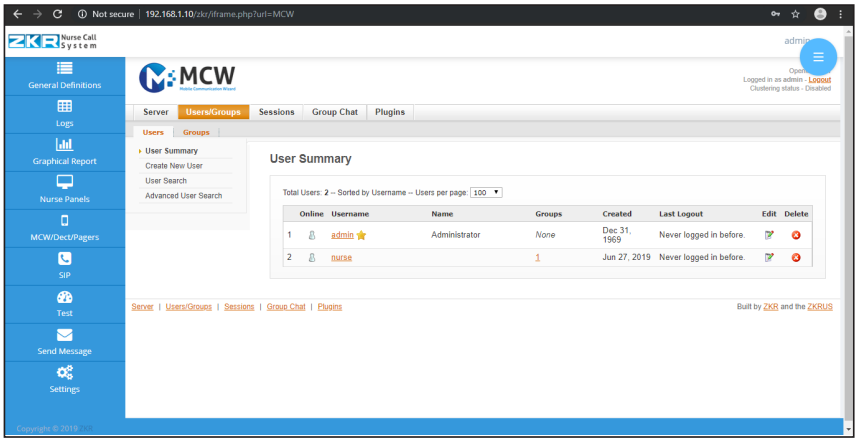
H9. MCW Settings

The default login information is

Username: admin
Password: admin

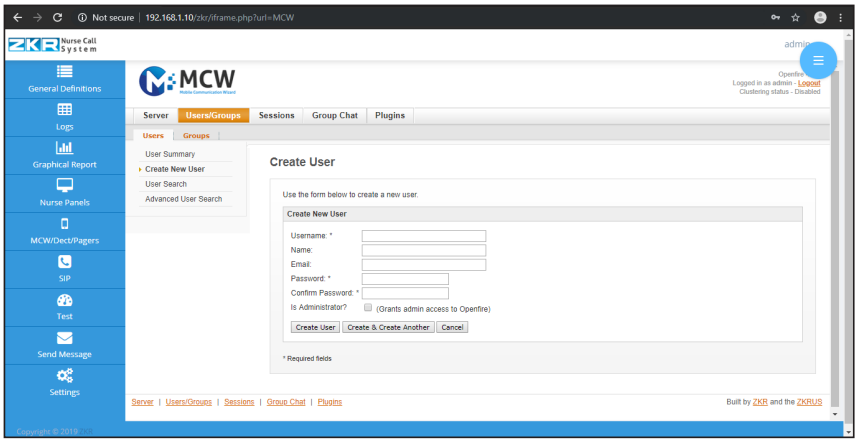


Navigate to Users/Groups on the top menu.



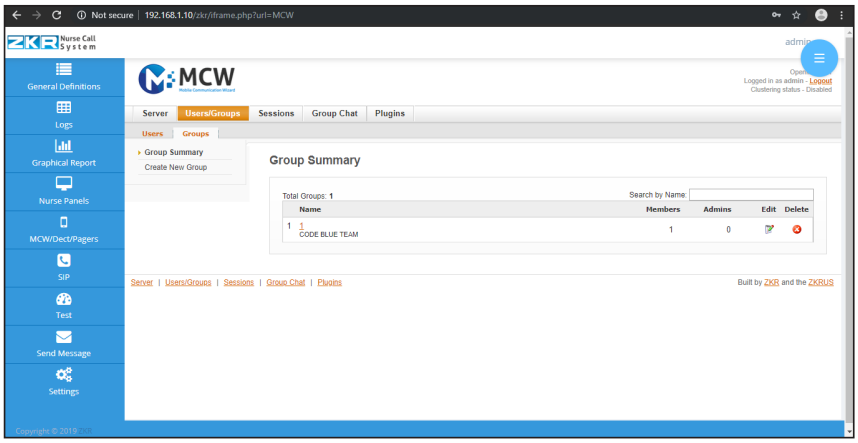
In the Users tab you can click Create New User to add a new MCW One User.

Enter new user information. Only fields marked with * are required.



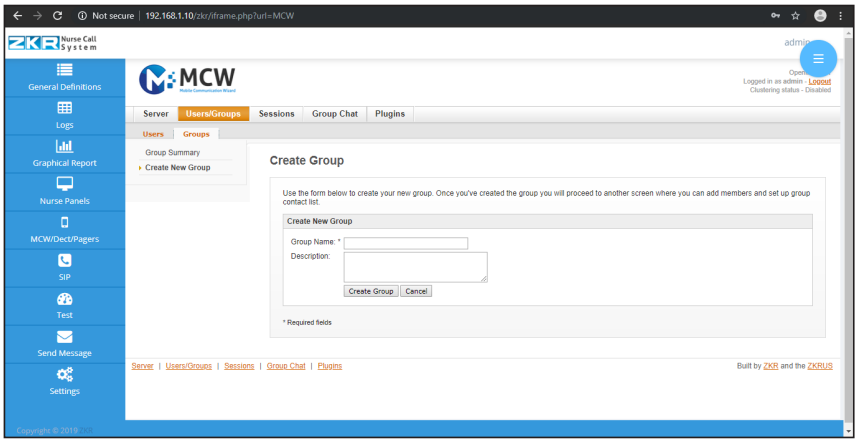
To edit groups, go to the groups tab.

You can add a new group from Create New Group.



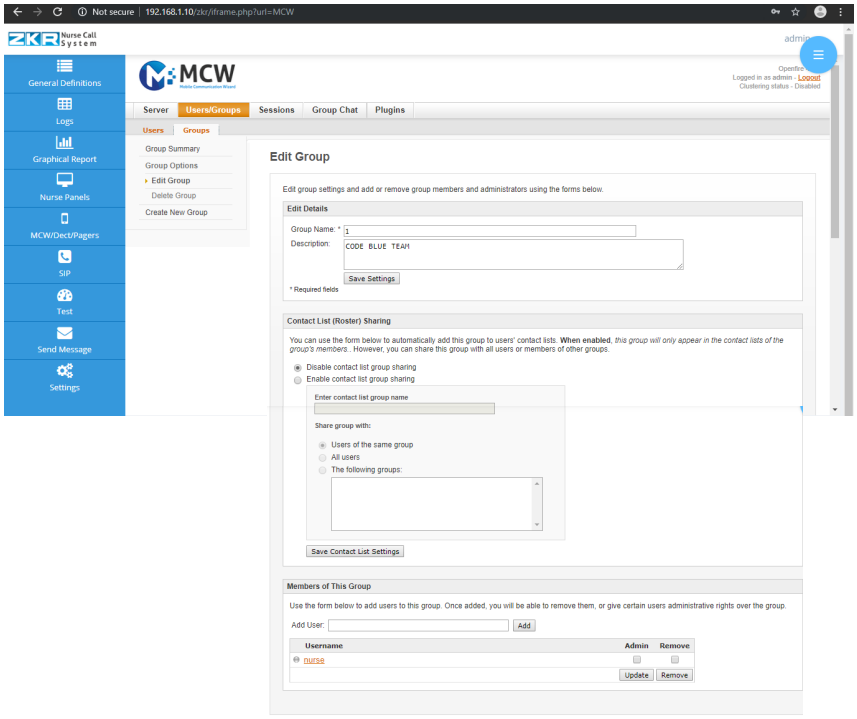
Enter the group information here. For the system to function in sync with the Teams as defined in section H4 of this guide, please follow these instructions:

Group Name: Set this as the same as the Id (list order) for the Teams in Team Definitions



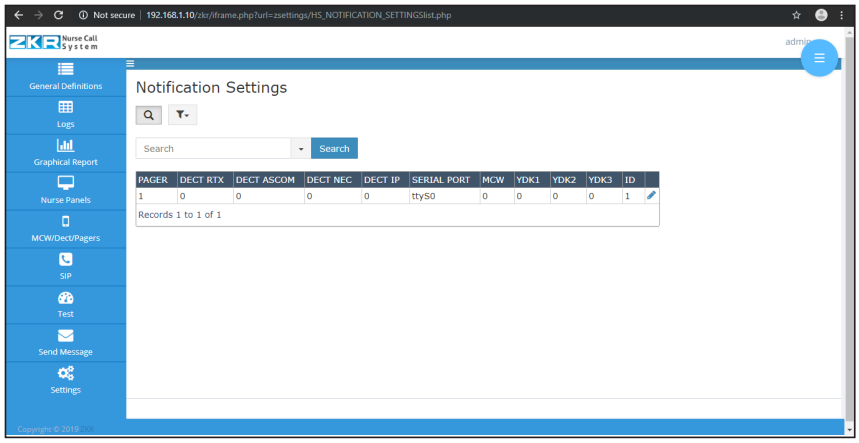
Description: Name the group here

You can add users to that group through the edit group screen.



H10. Notification Settings

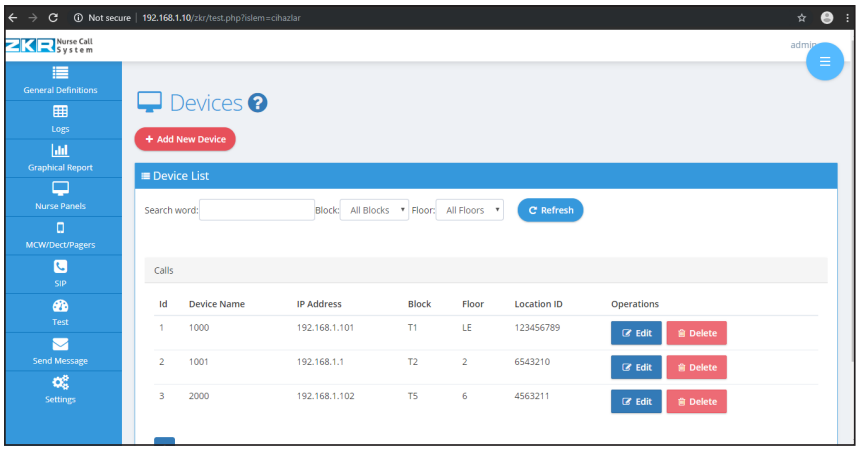
Toggle which communication systems will receive calls.



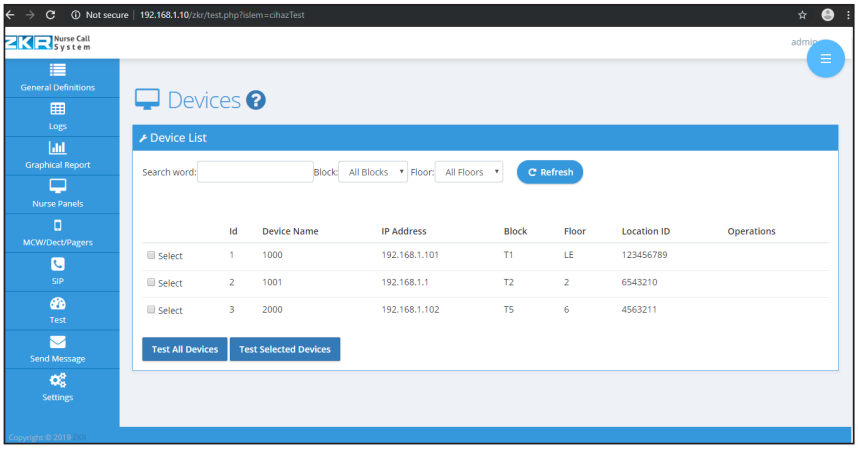
H11. Test

This is the menu where error notification and fault tracking can be done. In order to test devices, each device must be registered here.

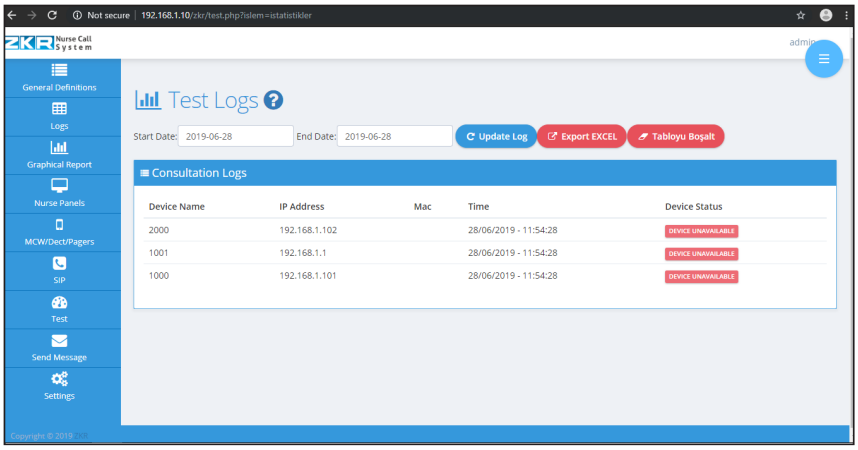
Add devices on the **Test/ Devices** screen.



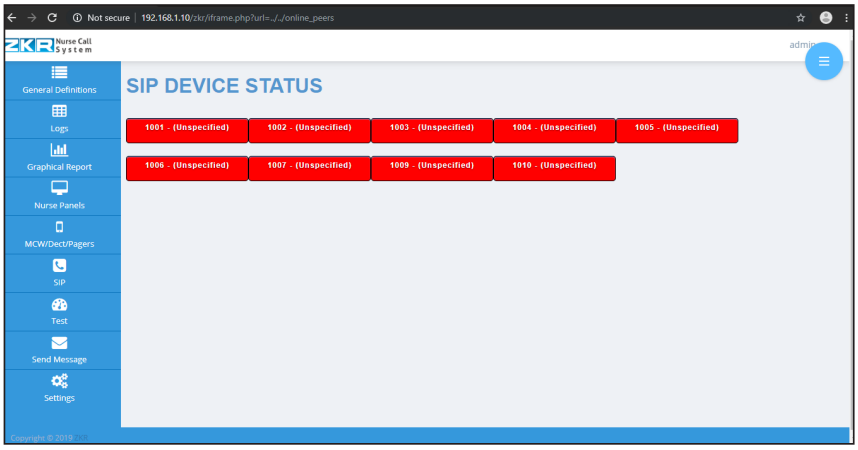
The devices can be checked for status on the Test/Device Test screen.



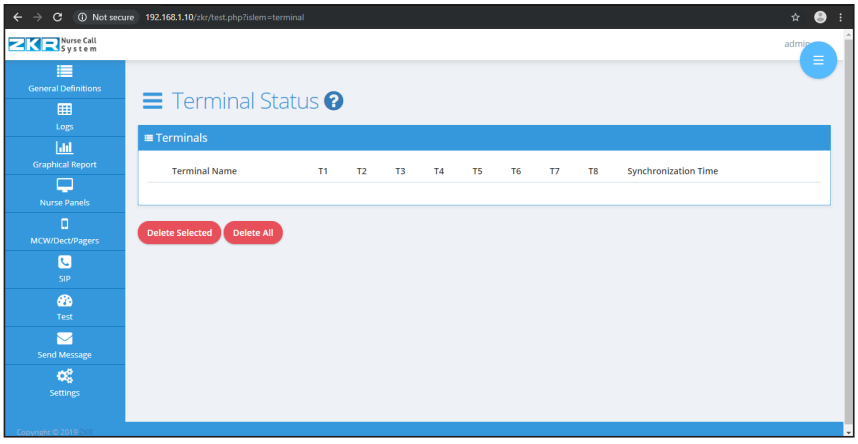
The Test/Test Logs screen will show the results of tests performed in this way.



On the Test/SIP Device Status screen the active and passive status of SIP devices will be shown. Active SIP devices will be green.



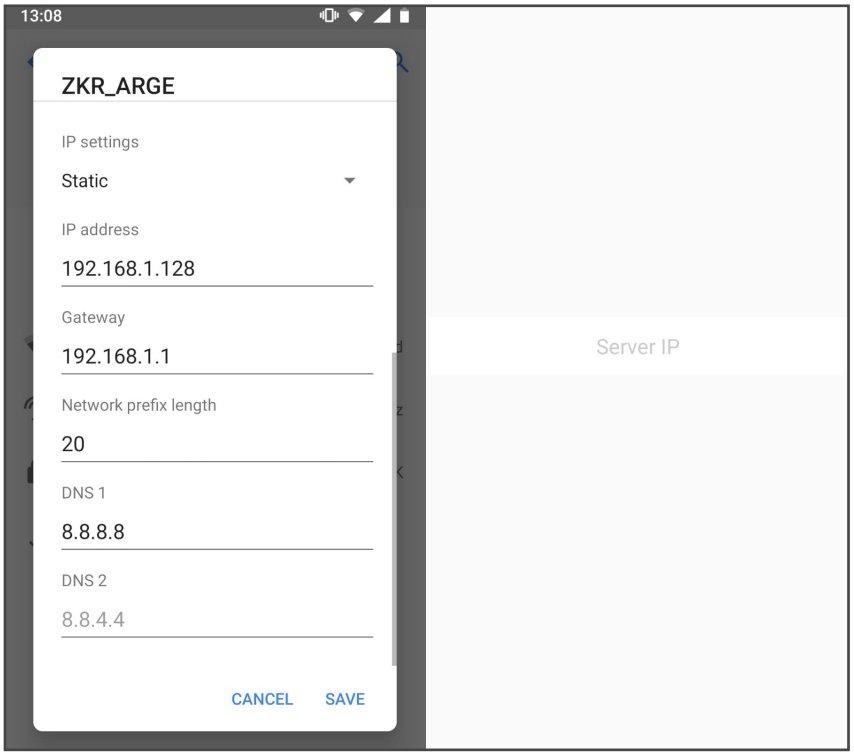
The Test/Terminal Status screen will show the status of call units connected to Room Control Units. This page will refresh itself every 20 seconds.

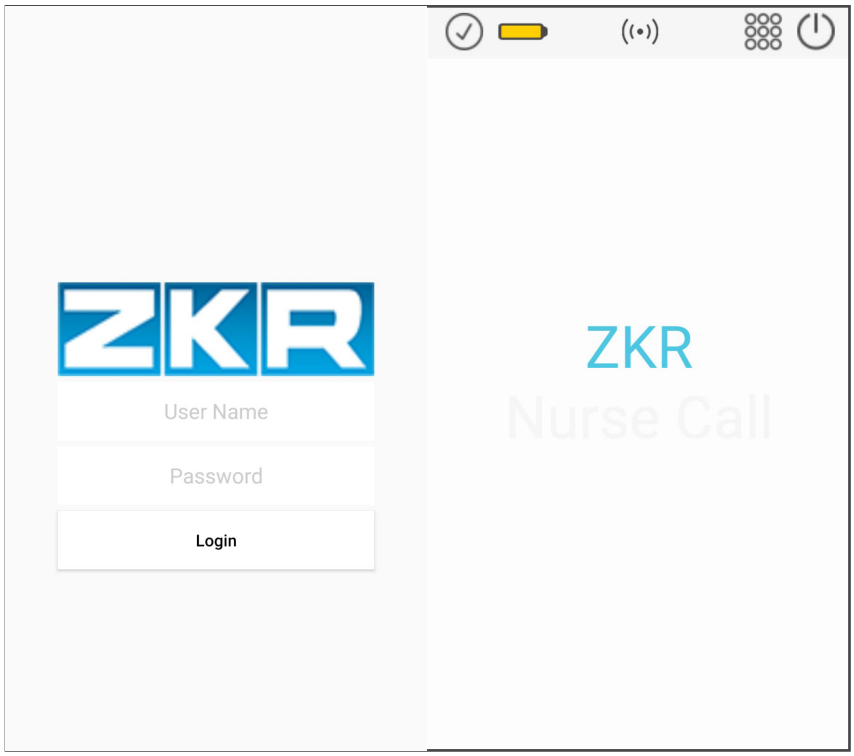


I. MCW One

Assign a static IP in the same block as the Nurse Call System to the Android device that will be using the MCW Mobile Application.

- Open the application
- Enter the Server IP
- It will come to the login screen





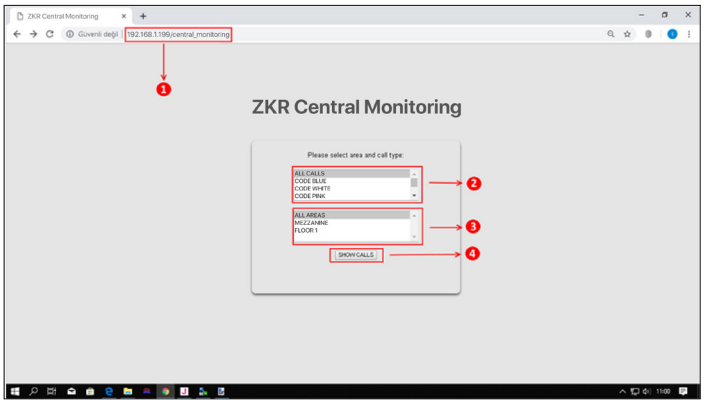
J. Central Monitoring Unit

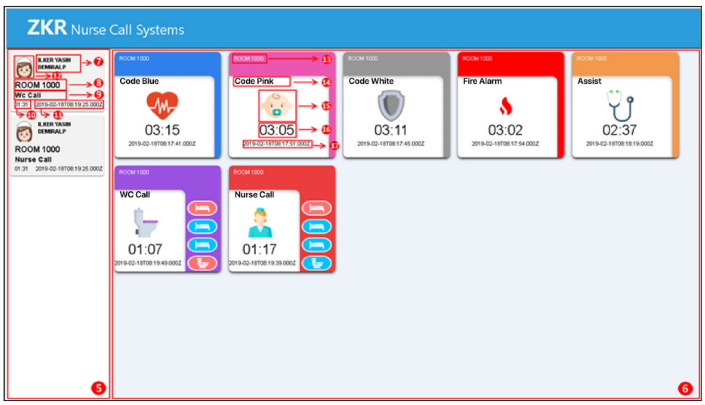
This software can be accessed from any screen with a web browser connected to the Nurse Call System network. In order to use it, license activation is required, this is configured on the server interface.

J1. Configuration

This is the menu where error notification and fault tracking can be done. In order to test devices, each device must be registered here.

a. The URL Server Address/central_ monitoring must be entered into the browser.
b. The call type or types to be shown on the Monitor are selected here.
c. The area or areas for which calls will be displayed are selected here.
d. Click here to go to the monitoring screen.
e. In this area, nurses who are present in different rooms are displayed.
f. In this area active calls are displayed based on settings made in 2 and 3.
g. The name of the nurse who responded to a call, as taken from the server personnel list.
h. The room where the nurse is currently signed in as present.
i. The call type the nurse responded to.
j. The elapsed time of how long the nurse has been in that room.
k. The timestamp for the nurse entering the room.
l. A picture of the nurse as uploaded on the server.
m. The origin room of the call.
n. Call type.
o. An icon indicating the call type.
p. Elapsed time since the call was initiated.
q. The date/timestamp of the call.



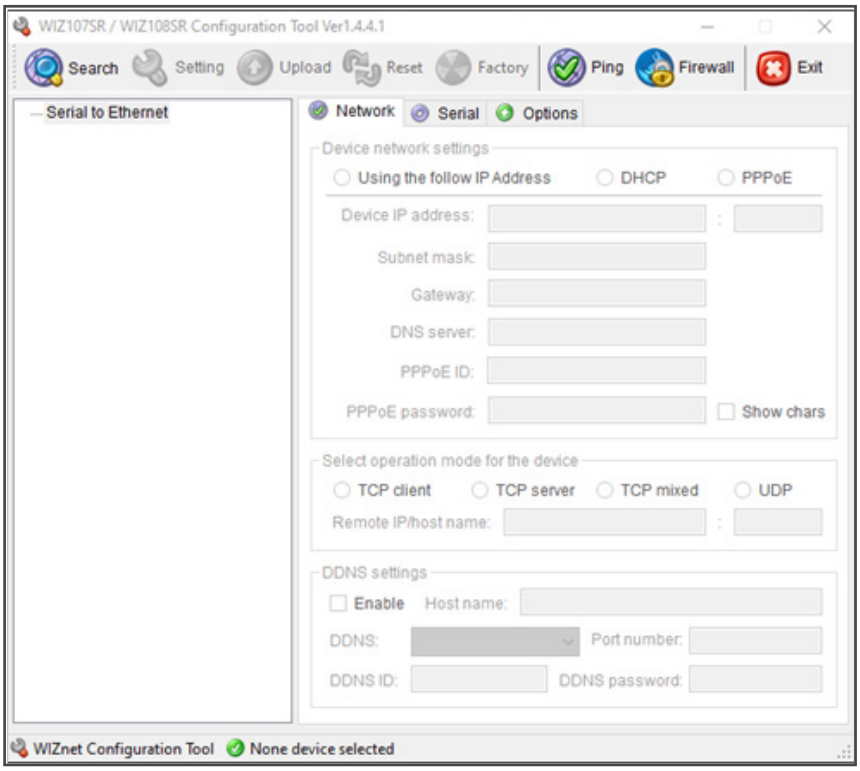


K. Text Panels

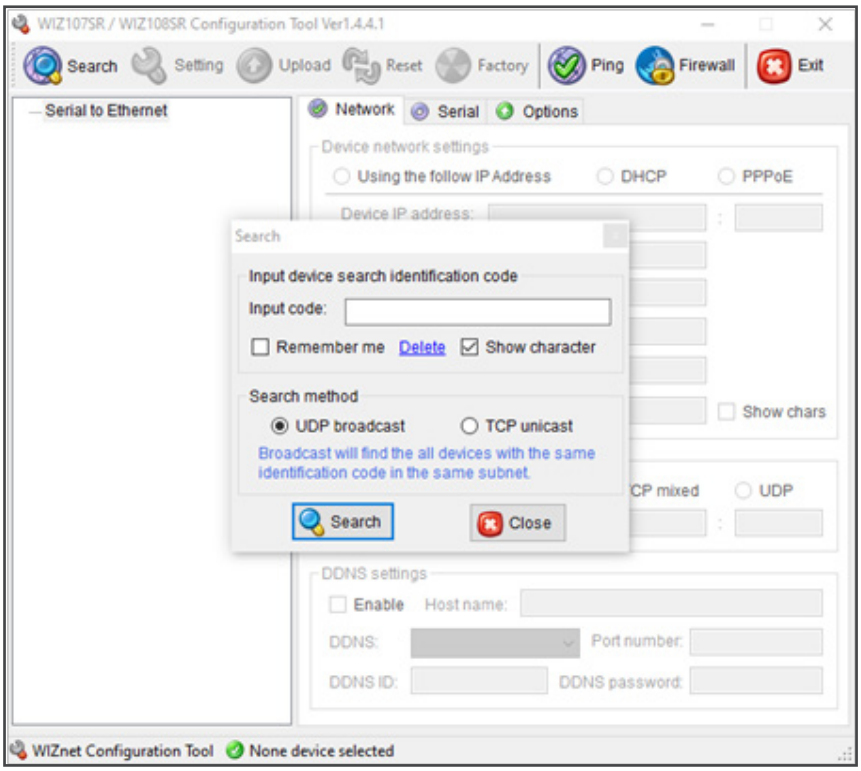
Connected to the network and supplied with 220v power

K1. Config tool

Open the config tool and click **Search** button.



Click Search again.

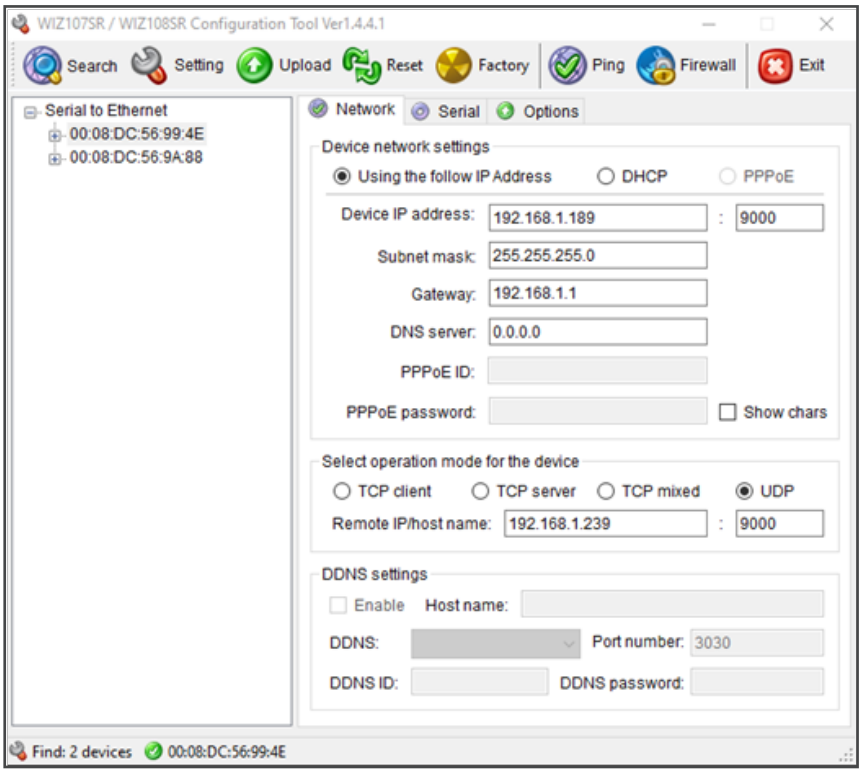


• The MAC addresses of connected devices will show up. Go to your Text Panel.

• Here are the settings that it will have. Please note that it should be set to UDP.

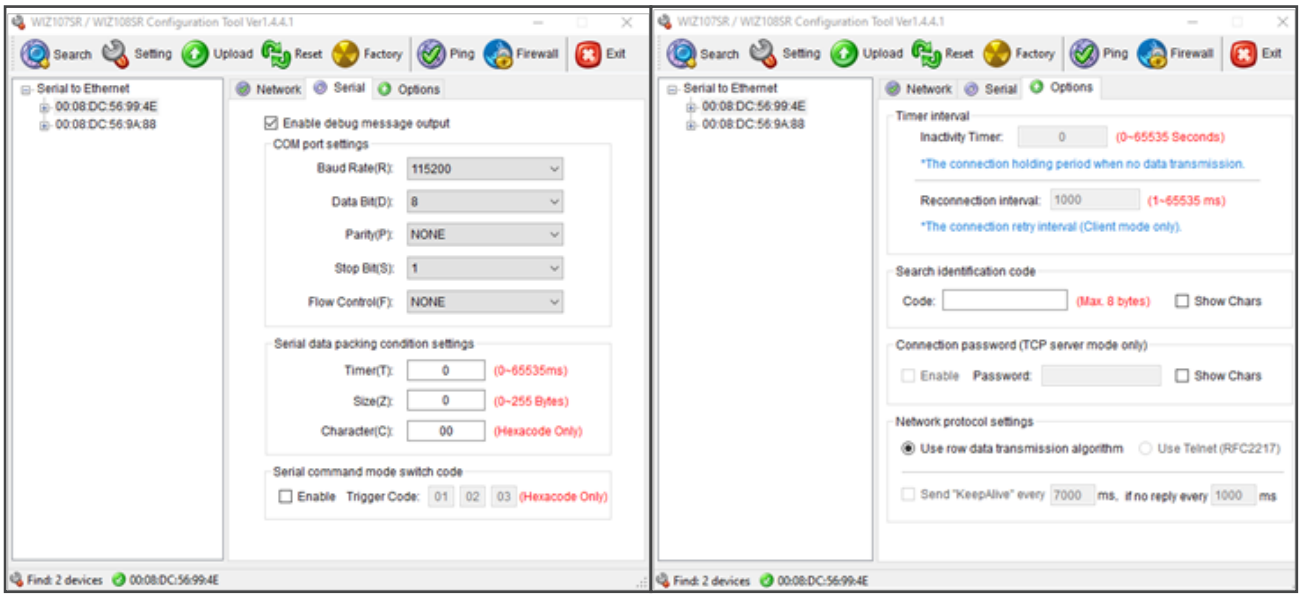
• Type in your computer's IP address in the "Remote IP/host name" field. You can see the IP on the title bar of the reporter software.

• Here are the other tabs of the settings in the config tool, please check that they are correct.



Once you are done, click **Setting** at the top.

Then Click **Reset** at the top.



K2. Defining Text Panels on the Server

Go to General Definitions/ Text Panels

On this page you can add new text panels by defining a **Panel Name** and a **Panel IP.**