KT-NCS

OPERATOR'S MANUAL

Wireless Nurse Call System

KT-NCS

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This guide describes all features and functions of Wireless Nurse Call system product of Kahroba Tarasheh Company (ISO 9001/13485 certified by the IQ-NET member certification body (C.B.) CISQ/IMQ which is accredited by International Accreditation Forum (IAF) member Accredia) under the brand "KT-NCS".

Your Nurse Call System is highly customizable and may not have some of the features given in this manual.

Manual Purpose:

This manual provides the instructions necessary to operate Kahroba Tarasheh Wireless Nurse Call System in accordance with its intended use. It also describes all parameters and options that your system may have depending on the way it has been customized.

Study of this manual is a prerequisite for proper operation and ensures patient and operator safety. If you have any question about the Wireless Nurse Call System, please contact our customer service. This manual is an essential part of the system and should always be kept close to it to be used whenever necessary.

Intended Audience:

This manual is provided for facility staff members and the patients. The users of this manual are expected to have working knowledge of simple button-based devices and English language.

Product Lifetime:

Since electric parts have lifetime of 10 years and recommended maintenance interval of the device is 1 year and its mandatory maintenance interval is 2 years, the expected lifetime of the device is 10 years.

Version Information:

This manual has a version number. The version number changes whenever the manual is updated due to software or technical specification changes. The version information of this manual is as follows.

Release Date	June 2023
Version Number	WIRELESS-NCS-user-ver-02

Explanations of the used expressions in this Manual

A WARNING symbol advises against certain actions or situations that could result in personal injury or equipment damage.

A NOTE symbol provides useful information and recommendations about device function.

Explanation of Symbols used on modules

			100-240 VAC 0.4 A 50/60 Hz			S/N
•This symbol means that consult user manual of the system and pay attention to the warnings and cautions.	•This symbol indicates that the equipment shall be disposed of in an environmentally-friendly manner.	•Risk of Electric Shock		•AC POWER SUPPLY	•Protection fast fuse	•Serial number

Patient Safety:

KT-NCS Nurse Call Systems are designed to comply with the international safety standard requirements for medical electrical equipment with UMDNS code 15614.

KT-NCS Wireless Nurse Call System is categorized as " Low Risk" or "Type I " (EU, Canada, USA) or " Type A" (CHTF) device in IAF Medical Devices Risk Classification.

KT-NCS Wireless Nurse Call System is in Compliance with IEC 60601-1 standard (Basic safety and essential performance requirements of medical electrical equipment).

According to IEC 60601-1 standard:

- KT-NCS Wireless Nurse Call System is evaluated as "Type II" in Electric Shock criteria and Type "B" in safety of applied parts as there is no floating contact to the patient.
- Operation in Oxygen-rich and in the vicinity of flammable anesthetics for KT-NCS Wireless Nurse Call System is considered as Not Applicable.
- The sterilization of KT-NCS Wireless Nurse Call System modules can be done using Gamma Ray when applicable.
- KT-NCS Wireless Nurse Call System has "Fixed" installation and " Permanent" mode of usage and "Continuous" Mode of operation .

KT-NCS Smart Nurse Call System has obtained the product standard IEC 60601-1-2 Certificate (collateral standard applying to electromagnetic compatibility of medical electrical equipment and medical electrical systems specifying general requirements and tests for electromagnetic compatibility) certified by EPIL company (accredited calibration & testing Laboratory member of International Laboratory Accreditation Cooperation (ILAC))

KT-NCS SMART Nurse Call System also has compliance to   UL-1069 product standard (UL Standard for Safety of Hospital Signaling and Nurse Call) tested by "Behineh Sanjesh Sadra" company accredited by National Accreditation Center of IRAN (NACI) which is a member of International Accreditation Forum (IAF).

TABLE OF CONTENTS

This guide describes all features and functions of Kahroba Tarasheh Company Wireless Nurse Call System under the brand "KT-NCS" .
Your Nurse Call System is highly customizable and may not have some of the features given in this manual.

1   INTRODUTION

1.1   GENERAL WARNINGS

⚠️

Before use, carefully read this manual, directions for use of any accessories, all precautions, and all specifications.

⚠️

There could be hazard of electrical shock by opening the system casing. Watch for the sign ⚡ to avoid risk of electric shock. All servicing and future upgrading to this equipment must be carried out by personnel trained and authorized by manufacturer.

⚠️

The operator must check that system and accessories function safely and see that it is in proper working condition before being used.

⚠️

Alarm must be set according to different situations of individual patient. Make sure that audio sounds can be activated when an alarm occurs.

⚠️

Do not use cellular phone in the vicinity of this equipment. High level of electromagnetic radiation emitted from such devices may result in strong interference with the wireless modules of the wireless NCS performance.

⚠️

There will be some risks of polluting the environment associated with the disposal of the device and cables at the end of their useful lives. The device and accessories shall be disposed in accordance with national laws after their useful lives. Contact your municipality to check where you can safely dispose of old batteries.

⚠️

Do not expose the system near any local heating item such as the direct radiation.

⚠️

To prevent EMC effect on the Nurse Call System, it should not be used adjacent to or stacked with other equipment and that if adjacent or stacked use is necessary, the equipment should be observed to verify normal operation in the configuration in which it will be used.

⚠️

If any liquid is spilled on the system or accessories, immediately turn off the system and wipe up it by a soft cloth.

⚠️

Make sure that cables and accessories are not under tension during operation.

1.2   GETTING STARTED

✓   CONNECT THE POWER CABLES

Connection procedure of the AC power line:

- Make sure the AC power supply complies with following specification: 100-240 VAC,50 /60Hz
- Plug the 5V DC Adapter of the Staff Display to the mains socket and check if the display turns On.. Make sure that the Batteries of the Pull Cord and Patient Panel Switches are not depleted.

Check all the functions of modules that may be used and make sure that the system is fully operational.

⚠️

If any sign of damage is detected, or the system seems not have normal function, do not use it.Contact technical staff in the hospital or local After Sale Service immediately.

1.3   GENERAL INFORMATION

1.3.1   ENVIRONMENT

Temperature working	5~40º C
Temperature of Transport and Storage	-25 ~60º C
Humidity	20~90 %
Altitude	-200 to 3500m
Power Supply	100-240 VAC 60VA, 50/60 Hz

1.3.2   DEFINITION

Nurse Call system is an assembly of electronic devices, integrated within a facility infrastructure and/or wireless network, designed to provide an audio/visual signal to summon help when activated in response to a patient's need for (urgent) assistance. It typically consists of and/or interacts with user- or sensor-activated signal transmitters (e.g., patient-worn pendant, push-buttons, microphones, speakers, fall sensors, smoke alarm, door sensors), a network communicator, and alert communication devices (e.g., server computer, phone, dome lights, audible alarm). The device notifies medical professionals and caregivers and is intended for use in the healthcare facility.

The patient uses the pear-push call switch from his bed or pull-cord switch from the washroom to initiate a call which will be presented on the staff console by vocal and visual annunciation. The staff will have to press the cancel switch at the calling point for deactivation of the initiated call.

1.3.3   MAIN FEATURES

- Maximum 240 Calling points support
- House-hold device 433 MHz frequency band
- Three-Level call Prioritization
- Displaying the 4 calls with the highest priority on Staff display unit
- Queue management on the last 120 calls
- Maximum 100 meters open space coverage radius
- IP X5 for washroom switches and IP 54 for pear push switches
- Six-month-long battery life
- Mains power or internal battery options
- Easy installation with no need for cable ducts in the facility
- Anti-disinfectant / Washable module compound
- Non-volatile memory option for user settings
- Visual reassurance light on call switches
- Low-battery LED indicator
- Non-Editable call statistics reporting log
- Outlier/Breaching staff tracking
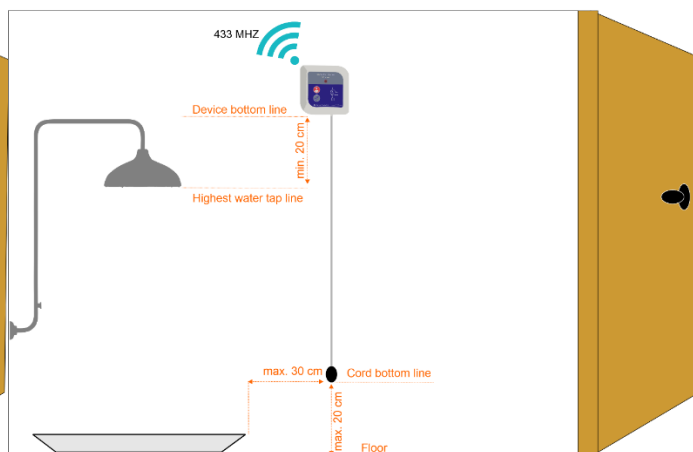
1.4 MOUNTING / WIRING / CLEARANCE LAYOUT
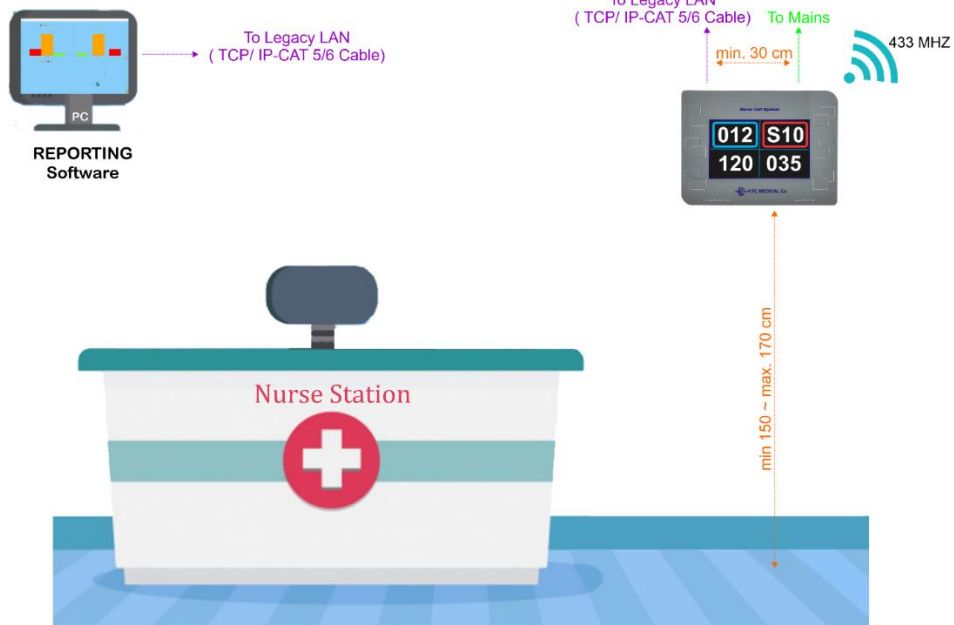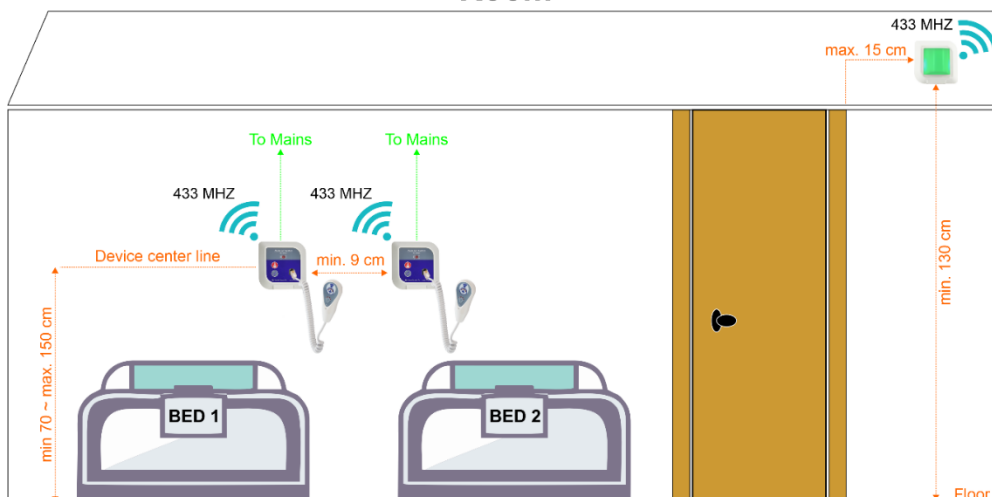
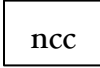- Minimum vertical clearance of the Pull cord switches from the highest water tap is 20 cm.
- Maximum horizontal clearance of the pulling cord from the toilet seat/shower is 30 cm.
- Maximum clearance of the end of the pulling cord from the bathroom floor is 20 cm.
- Patient call switches clearance from floor is between 150 ~ 170 cm.
- Maximum horizontal clearance for corridor light from the corresponding door is 15 cm.
- Corridor light clearance from the floor is 150 ~ 220 cm.
- Corridor display clearance from the floor is 170 ~ 220 cm.
- The power mains should have emergency power backup (UPS/Redundant Generator).
- Reporting is done via the legacy LAN of the hospital (TCP/IP protocol)
- The table below shows the features to be used when making the layout in ACAD.

Nurse Call Related Feature in AutoCAD	
Discipline	Electrical
Designator	EY
Description	Electrical Interior Auxiliary System
Major Group Layer Name	NURS
Minor Group Layer Name	CIRC : Nurse call system circuits
Minor Group Layer Name	CLNG: Nurse call system ceiling
Minor Group Layer Name	CNMB: Nurse call system numbers
Minor Group Layer Name	EQPM: Nurse call system equipment
Minor Group Layer Name	WALL: Nurse call system wall
Pen/Color/Line	3 / Green / Dashed
Patient Nurse Call Panel Symbol	NC
Emergency Pull Cord Station Symbol	E
Nurse Call Annunciator Symbol	NCA
Duty Station Symbol	DS
Staff Station Symbol	SS
NCS Central Cabinet Symbol	ncc
Dome Light with Tone Symbol	
Floor Duplex Receptacle Symbol	F f
Data Outlet Symbol	

2   WIRELESS STAFF CONSOLE/DISPLAY (CUN02-W)

2.1   INTRODUCTION

CUN02-W is the display unit installed in the Nurse station. It is used to display the four highest priority Calls (i.e. : Code Blue , Washroom/bathroom , Bed) in a queue of maximum 120.

The higher priority calls are visually marked by both the location on the display (Top left for the highest to bottom right for the lowest) and a colored border (Blue color for Code Blue , Red color for Washroom /Bathroom & No colored border for Normal bed calls).

The highest priority is for Blue Code followed by Washroom/Bathroom calls as the second highest followed by Normal calls from the Bed as the lowest priority. Same priority calls are prioritized chronologically.

The Alarm for a new call regardless of the type is played by an internal speaker with melodies stored on a local Micro-SD card.

CUN02-W can be connected to the legacy LAN of the facility to pass the events log to the reporting software (CUS).

Weight	828 g		
Dimensions	W: 245 mm	H: 178 mm	D: 47 mm
Raw Material	Plexiglass + Plexi print		
Color	Black		
Power Supply	5 V via external AC adapter		
Display Type	7-inch TFT		
Internal Speaker	2 W, 8 Ohms		
Wireless Range	100 meters open space radius outdoors		
Wireless Frequency	433 MHz		
Port	RJ45		
Operating Temperature	-10°C ~ +50° C		
Operating Humidity	30% ~ 80% RH		
Ingress Protection	20 or better		
Mounting	Surface / flush		
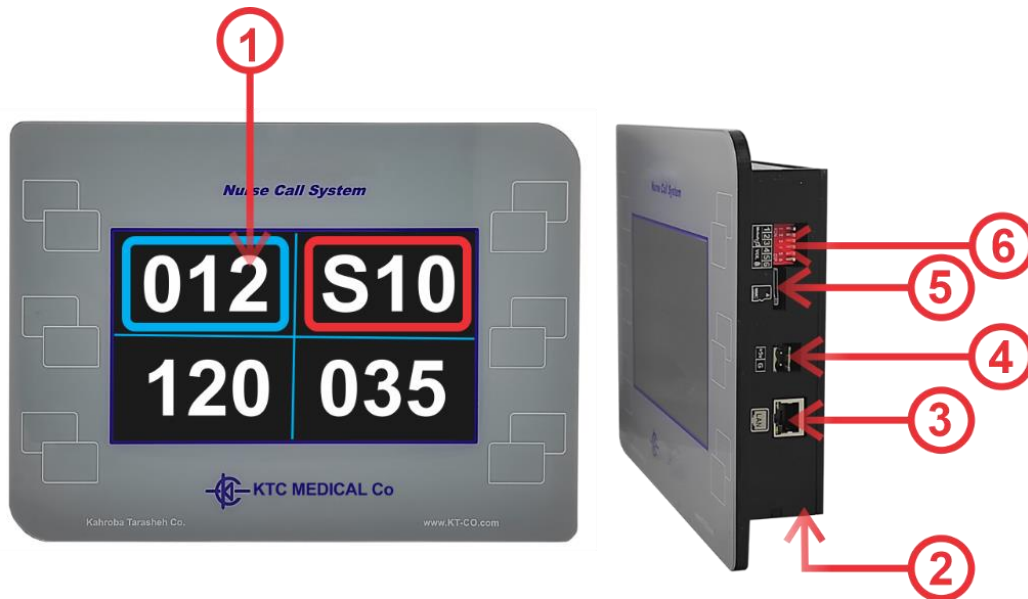
Number	Item	Description
①	7-inch TFT Display	To Display the 4 incoming Calls with highest priority order
②	Speaker	To play the chime for call alert
③	RJ45 Socket	To connect to the Legacy LAN of the facility
④	Input DC power Socket	5 V DC Power from the external adapter
⑤	Micro SD Socket	To store the Chimes
⑥	Melody/Volume Dip Switch	Switches 1-3 to set the chime melody & 4-6 to set the volume

3   WIRELESS NCS- PATIENT'S PANEL-PENDANT (WB-02/P-PBW-02)
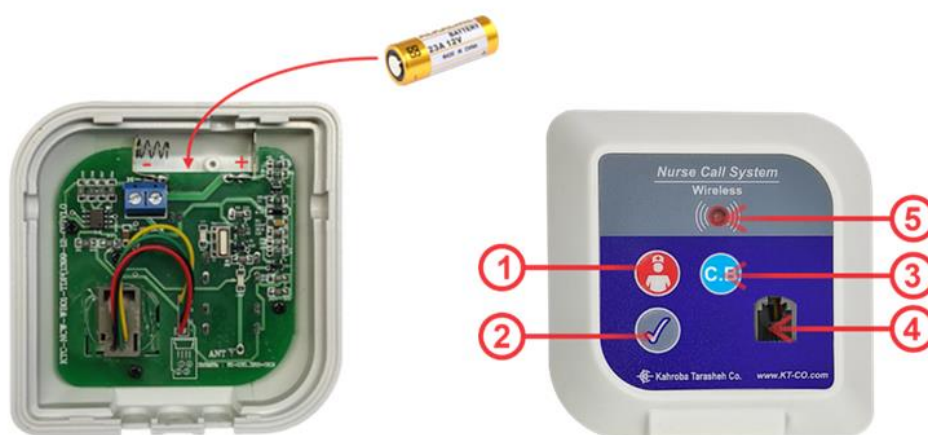
3.1   INTRODUCTION

3.1.1   WB-02/P

WB-02/P comes with an RJ9 socket for Pear push Switch (PBW-01). It has a Blue code, Emergency Nurse Call and a Cancel/Presence Switch onboard. The Normal Nurse Call can be initiated through the pear push switch.

It is powered by a 12 V -23A Battery or an external 12 VDC power adapter (WB-02P) to eliminate the battery life issue. WB-02 can be installed easily next to patient's bed regardless of the wiring layout of the facility.

This module is equipped with low-level battery indicator feature to help the staff replace the battery when needed. The LED blinks 4 times once a call is initiated if the battery level is full. The blinking times is reduced to 3 times when the battery level is 75% and 2 times when the battery level is at 50%. The battery needs to be replaced if the blinking happens just once.

The LED will blink four times when a call is initiated if the patient panel is powered by a DC adaptor

Weight	60 g		
Dimensions	W:80 mm	H:80 mm	D: 20 mm
Raw Material	Polycarbonate + ABS		
Color	White		
Port	RJ9 Socket		
Power Supply	12 V (23A) Battery (WB-02) / 12 V DC external Adapter (WB-02/P)		
Battery Life	6 months		
Wireless Range	100 meters radius outdoors		
Wireless Frequency	433 MHz		
Operating Temperature	-10°C ~ +50° C		
Operating Humidity	30% ~ 80% RH		
Ingress Protection	20 or better		
Mounting	Flush/Surface		

| Number	Item	Description
①	Emergency Call Switch	To initiate an emergency call
②	Cancel / Presence Switch	To cancel any initiated call
③	Blue Code Switch	To initiate a blue code call
④	RJ-٩ Socket	To connect the Pear-push call switch to the Panel
⑤	LED/ Battery Level Indicator	To provide a visual assurance for call initiation and monitor the battery level

The battery in the patient's panel (If present) can be replaced by the facility staff by opening the back cover of the module as illustrated below:

A: Open the Philips Screw

B: Enter and twist a flat screwdriver in the slots to release the 2 bottom latches

C & D: Remove the back cover by sliding out the top from under the 2 top latches

The procedure for closing the back cover after replacing the battery is vice versa.
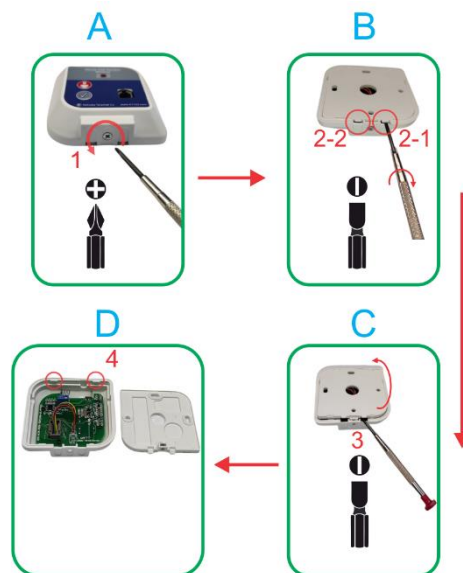
3.1.2   PENDANT (PBW-02)

Wireless Patient Panel call switch can also come in the form of a Pendant to enable the patient to initiate a normal call while walking in the vicinity of his room/bed.

PBW-02 is powered by a **3V** coin battery the level of which is gauged by the number of blinks once the call is initiated.(Same as WB-02). The battery should be replaced by opening the case of the module if the blinking times is reduced to only one after the call is initiated.

Weight	40 g		
Dimensions	W:40 mm	H:100 mm	D: 28 mm
Raw Material	Polycarbonate +ABS		
Power Supply	3V DC Coin Battery		
Color	White		
Wireless Range	100 meters		
Wireless Frequency	433 MHz		
Operating Temperature	-10°C ~ +50°C		
Operating Humidity	30-% ~ 80% RH		
Ingress Protection	54 or better		
Mounting	Cradle/Pendant		

Number	Item	Description
①	Normal Call Switch	To initiate an emergency call
②	LED-Battery Level Indicator	To provide a visual assurance for call initiation and monitor the battery level
③	Hanging cord	To hang the switch from the neck
④	Cancel Switch	To cancel the initiated Call

4   WIRELESS NCS- PEAR PUSH SWITCH (PBW-01)

4.1   INTRODUCTION

PBW-01 is the pear push nurse call switch attached to the wireless patient's panel (WB-01/02/P) via an RJ-9 coiled phone cord. Pushing the PBW-01 pear push switch activates a Nurse call on the Wireless Staff Console alerting the facility staff of the call.

The LED on the unit will blink four times if the battery level of the connected Patient Panel is full and three times if the level is at 75% and two times if the battery level is at 50% and just once if the battery level drops to 25% indicating the time for battery replacement.

The LED will blink four times if the patient panel is powered by a DC adaptor.

Weight	75 g		
Dimensions	W:40 mm	H:100 mm	D: 28 mm
Raw Material	Polycarbonate +ABS		
Power Supply	12 VDC		
Color	White		
Connection	RJ9 Plug		
Cable Length	3.5 m		
Operating Temperature	-10°C ~ +50°C		
Operating Humidity	30-% ~ 80% RH		
Ingress Protection	54 or better		
Mounting	Tabular at the bedside/Wall		

Number	Item	Description
①	Normal Nurse Call Button	To initiate a Nurse Call when pressed
②	LED/ Battery Level Indicator	To provide a visual assurance for call initiation and monitor the battery level
③	RJ9 Plug	To be connected to the RJ9 Socket on the patient's Panel
④	Coiled Cord	To make the pear push switch extendable for easy handling

5   WIRELESS NCS-WIRELESS PULL CORD SWITCH (WT-02)

5.1   INTRODUCTION

WT-02 is used in patient's bathroom, shower or similar areas making the call easier by pulling the cord and therefore activating an emergency nurse call on the Staff Display.

WT-02 comes with an Emergency nurse call , a Cancel/Presence and a Code blue call switch on the panel and is powered by a 12 V -23A type battery to prevent any electrical shock due to wet environment.

This module is equipped with low-level battery indicator feature to help the staff replace the battery when needed.

The LED blinks 4 times once a call is initiated if the battery level is full. The blinking times is reduced to 3 times when the battery level is at 75% and 2 times when the battery level is at 50%. The battery needs to be replaced if the blinking happens just once.

WT-02 has ingress protection rating (IP) against liquids up to IPX5.
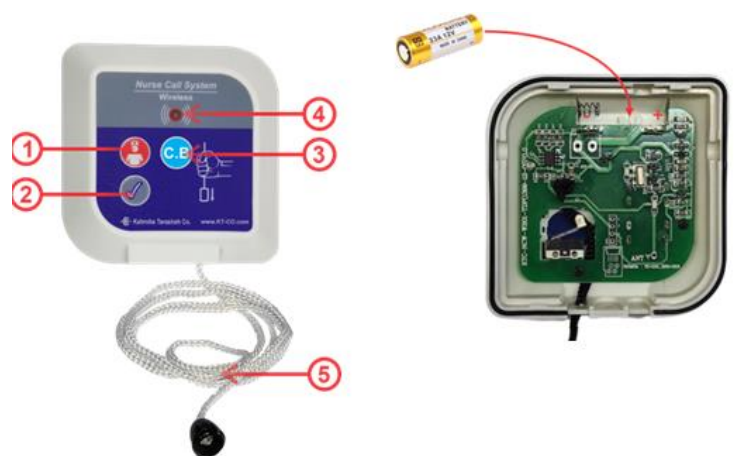
Weight	60g
Dimensions	W: 80mm H: 80mm D:20 mm
Raw Material:	Polycarbonate + ABS
Color	White
Power Supply	12 V Battery
Battery Type	23A Alkaline
Battery Life	6 Months
Wireless Range	100 meters radius outdoors
Wireless Frequency	433 MHz
Cord Capacity	Max20Kg
Operating Temperature	-10°C +50°C
Operating Humidity	30-% 80% RH
Ingress Protection	X4 or better
Mounting	Surface/Flush

| Number	Item	Description
①	Emergency Nurse Call Button	To initiate an emergency nurse call when pressed
②	Cancel/Presence Button	To cancel an initiated call
③	Code Blue Switch	To initiate a code blue call when pressed
④	LED/ Battery Level Indicator	To provide a visual assurance for call initiation and monitor the battery level
⑤	Pull Cord Switch	To initiate an emergency nurse call when pulled

The battery in the pull cord switch panel may be replaced by the facility staff by opening the back cover of the module and replacing the battery as illustrated below:

A: Open the Philips Screw

B: Enter and twist a flat screwdriver in the slots to release the 2 bottom latches

C & D: Remove the back cover by sliding out the top from under the 2 top latches

The procedure for closing the back cover after replacing the battery is vice versa.
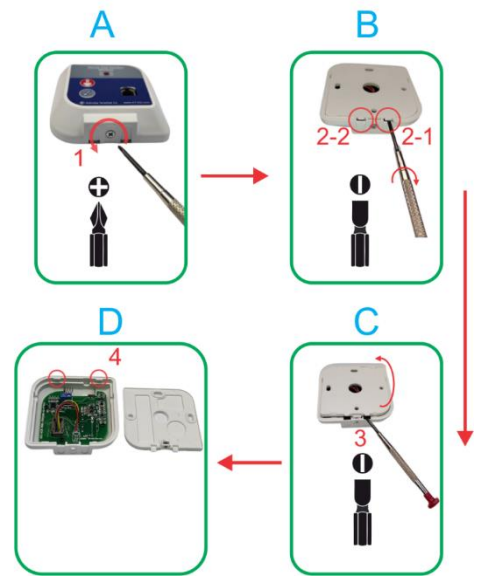
6   WIRELESS CORRIDOR LIGHT (WL-02)

6.1   INTRODUCTION

WL-02 is a dome-shape wireless corridor light installed above the door of the patients room. It can support up to 10 wireless nurse calling devices in the room next to the beds or in the washrooms. WL-02 has 3 different colors for 3 priority levels as below:
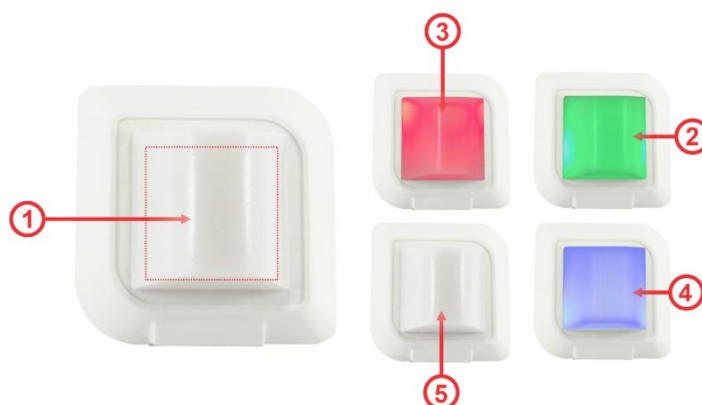
1-Steady Green for Normal calls.

2-Blinking Red for emergency calls/washrooms.

3-Steady Blue for Blue code Emergency Code Call.

The WL-02 also acts as a repeater/booster to pass the initiated 433 MHz call signal from the calling switch in the room to the staff display and therefore eliminating the need for WR-02 repeater implementation in most cases.

Weight	115 g
Dimensions	L: 78 mm W:78 mm H:60 mm
Raw Material	Polycarbonate+ ABS
Color	White
Power Supply	5 V /2 A DC via external adapter
Max. Call Switch Support	30
Number of Alarm Chimes	4
Wireless Boost Range	100 Meters Radius Outdoors
Wireless Frequency	433 MHz
Light Type	LED
LED Colors	Red / Green / Blue
Operating Temperature	-10°C ~ +50°C
Operating Humidity	30-% ~ 80% RH
Ingress Protection	20 or better
Mounting	Wall/ Surface

Number	Item	Description
①	Dome	To provide the wedge shape for the light to be observed from 5 angles
②	Green Color	Lit (Steady) when initiating a normal call
③	Red Color	Lit (Blinking) when initiating an emergency call
④	Blue Color	Lit (Steady when initiating blue code
⑤	No Color	No Active Call is Present

7 WIRELESS REPEATER (WR02)

7.1 INTRODUCTION

WR-02 repeater boosts the radio frequency signals transmitted by wireless call modules to reach the staff display when the facility has an architecture with obstacles for the 433MHz radio frequency signal. It increases the wireless coverage radius by 100 meters from the installing point.

|	
Weight	70 g
Dimensions	W:80 mm H: 80 mm D: 60 mm
Raw Material	ABS
Color	white
Power Supply	5 V Dc through Adapter
Frequency Bands	433 MHz
Wireless Coverage	100 meters radius
Operating Temperature	-10°C ~ +50° C
Operating Humidity	30% ~ 80% RH
Ingress Protection	20 or better
Mounting	Surface

8 REPORTING SOFTWARE (CUS)

8.1 INTRODUCTION

CUS is a windows-based application to Record, Monitor and Analyze Call types, Staff Performance, Call Response Delay and Call Breaches in any given time period. The reports can be in PDF format or column charts.

CUS is installed on the managerial computer connected to the LAN querying the events from the staff displays connected to the LAN and showing them on a graphical user interface.

Both the staff display and the reporting computer should be ON to maintain a log of the events.
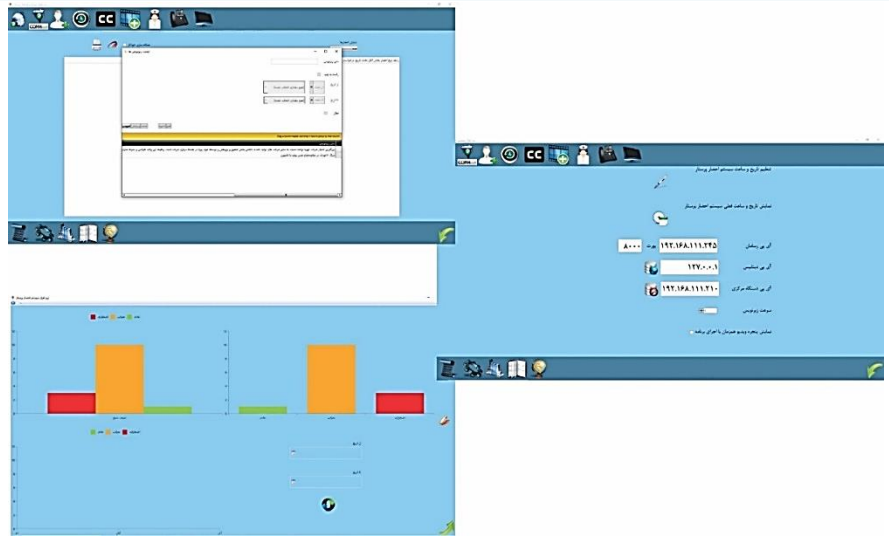
| Required Operating System	Windows 10/Server
Required H.D.D.	Min.120 GB
Required RAM	Min 4G
Required Hardware	Ethernet Port
Required Processor	Min Core i3 or equivalent
Centralized Database	MS SQL

The useful tabs of the home screen are given in the following table. The remaining tabs are used by the technicians at the time of installation of the system.
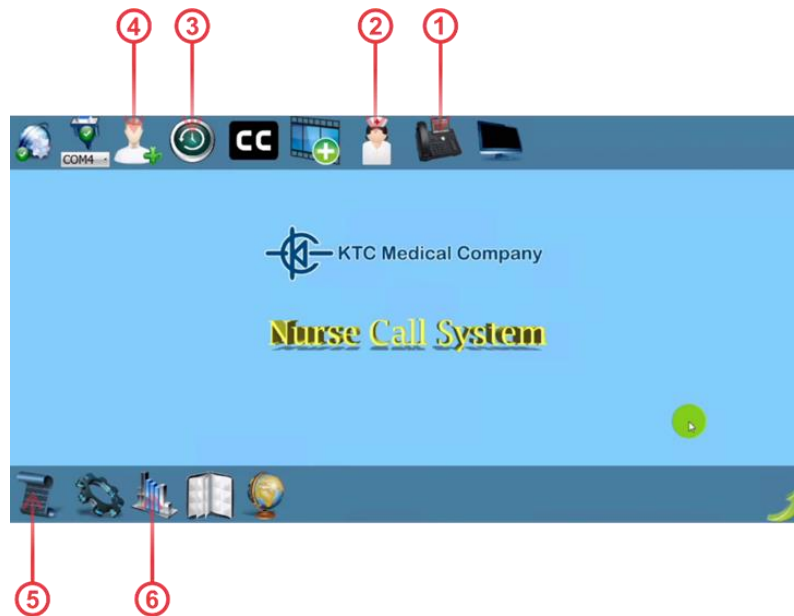
Number	Item	Description
①	Staff Console I.P Setting Tab	Check Section 08-1
②	Staff RFID Card Setting Tab	Check Section 08-2
③	Work Shift Time Setting Tab	Check Section 08-3
④	Access Level Setting Tab	Check Section 08-4
⑤	Intercom Tab	Check Section 08-5
⑥	Graphical Chart Intercom Tab	Check Section 08-6

8.2 STAFF CONSOLE I.P. SETTING TAB

This Tab enables adding new staff console units in the facility to be considered for logging and intercom means. The operator needs to add the corresponding I.P. of the unit in the pop up screen as illustrated below:
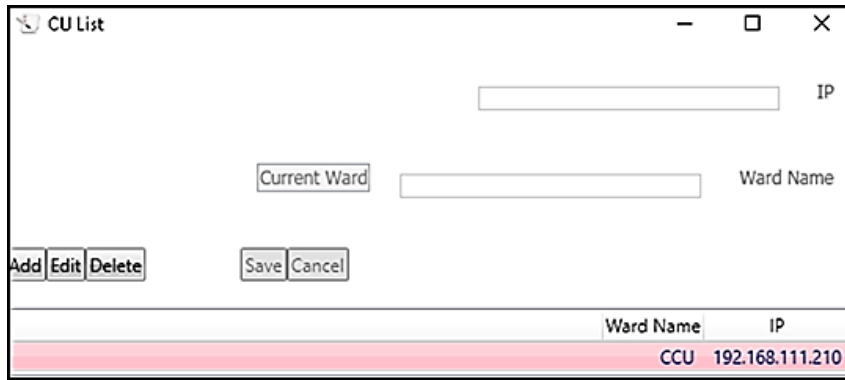

8.3 STAFF RFID CARD SETTING TAB

This tab will associate each RFID tag to one of the staff members so that the activity of the work force using RFID cards can be logged and reported accordingly as illustrated below:


8.4 WORK SHIFT TIME SETTING TAB

This tab enables setting the timings for different working shifts in the facility for shift filtering purposes of the report based on the time of an incident as illustrated below:
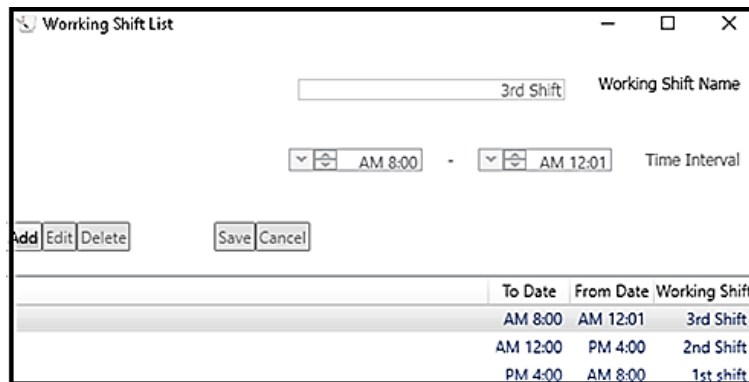
8.5   ACCESS LEVEL SETTING TAB

This tab is used to set the access level of different staff to the logs of the incidents available for intercom as illustrated below:
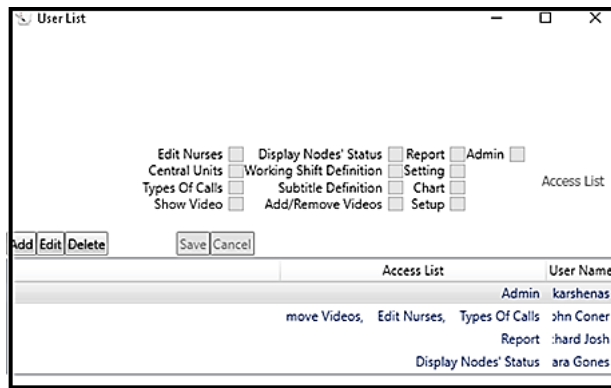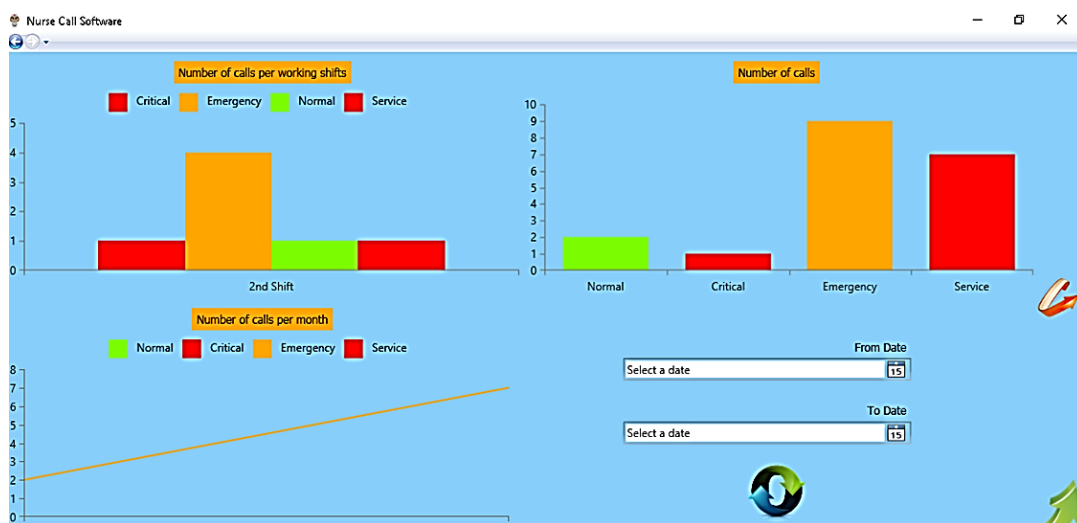

8.6   REPORTING TAB

This tab gives a chronological report of the incidents in the facility along with the related staff activity as illustrated below:

8.7   GRAPHICAL CHART REPORT TAB

The reports can be presented in graphical chart for better analysis of the type of incidents and staff response characteristics using this tab as illustrated below:

9   CARE AND CLEANING

9.1   SYSTEM CHECK

Before using the Nurse Call System,

- Check if there is any mechanical damage in the system and accessories.
- Check if all the power cable and accessories are firmly connected.
- Check all the functions of keyboard and modules to make sure that the monitor is in proper condition.

If you find any damage on any module in the system stop using it and contact the biomedical engineer of the hospital or local After Sale Service.

The overall check of the system, including the safety check, should be performed only by qualified personnel.

All checks which need any module to be opened and safety and maintenance checks should be performed by After Sales Service.

9.2   CLEANING AND DISINFECTION

9.2.1   GENERAL POINTS

Use only the substances approved by us and methods listed in this chapter to clean or disinfect your equipment.

Manufacturer makes no claims regarding the efficacy of the listed chemicals or methods as a means for controlling infection. For the method to control infection, consult your hospital's Infection Control Officer or Epidemiologist. See also any local policies that apply within your hospital.

KT-NCS Wireless Nurse Call System elements fall in the following Ingress Protection groups:

CUN02/WL02/WR02/WB02: IP 20 or better

PBW02/01: IP 54 or better

WT02: IP X4 or better.

- **Sterilization may cause damage to the device and is therefore not recommended.**
- **If you see any signs of damage or deterioration in the device and its accessories, do not use it, and if necessary, contact the after-sales service company.**
- **Allow the modules of the system to dry completely before making connections. And please make sure all connectors tightly connected to the system before using the system.**

Please pay special attention to the following items:

- All the modules in the system shall be kept dust-free.
- Do not use strong solvents such as acetone or ammonia.
- Most cleaning agents must be diluted before use.
- Don't use rough or sharp material or your fingernail to remove stubborn stains.
- Do not let the cleaning agent enter into the chassis of the system.
- Do not leave the cleaning agents on any part of the equipment.

Do not use ETO gas to disinfect any module in the system.

9.2.2   EXTERNAL SURFACES

In-between patients and as required:

For cleaning: wipe gently using a moist cloth for disinfection use Alcohol 70%

9.2.3 DISPLAY SCREEN

Use clean and soft cloth with screen cleaner or moist with Isopropyl alcohol may be used for cleaning and disinfection.

- Take extra care when cleaning the screen of the staff console because it is more sensitiveto rough cleaning methods than the housing.
- Don't spray a liquid directly on the screen.

9.2.4 ACCESSORIES

Accessory holders and extension cables should be cleaned and disinfected after each patient or when necessary, using a soft, clean cloth soaked in mild soapy water and, if necessary, Isopropyl alcohol, and then wiped with a soft and dry cloth.

- **To avoid damaging of the cable, probe, sensor or connector, do not immerse it in any liquid.**
- **Disposable accessories shall not be sterilized or reused.**
- **To prevent environmental pollution, the disposal of any part shall be done inaccordance with the policies of the hospital.**

The following table summarizes the methods of cleaning, disinfecting and sterilizing differentparts of the device:

Device parts	Cleaning	Disinfection	Sterilization
External surface of device	In-between patients and as required wipe gently using a moist cloth and warm soapywater or mild detergent.	In-between patients and as required with: • Alcohol 70% • Isopropyl Alcohol • N-Propanol	If needed, can be done using Ultra-violate or gamma ray methods.
Holders of accessory, Extension cables		I In-between patients and as required with: • Isopropyl Alcohol	
Display screen	In-between patients and as required: Clean and soft cloth with screen cleaner.		

9.3 PREVENTIVE MAINTENANCE (PM)

To ensure that the device is kept in the best condition, it shall be kept clean and all points relatedto the maintenance of the system shall be observed. There are no repairable parts in the system and all repairs shall be done by the manufacturer.

9.3.1 STORAGE

The storage environment shall be clean and dry. If possible, use the original packaging of thedevice.

If any module falls from falls from a height and is damaged or in the vicinity of a very high temperature and high humidity, contact the company's after-sales service at the earliest opportunity to ensure the correct operation.
Thoroughly clean the system before and after the system is not used for a while.

9.3.2 WEEKLY CHECKS

- Device cleanness
- Visual inspection of device (case, screen, keys and indicators)
- Visual inspection of accessories
- Function of accessories

9.3.3 MONTHLY CHECKS

- Visual inspection of device
- Device cleanness
- Function of keys and indicators
- Visual inspection of accessories

The preventive maintenance (PM) checklist # KT-NCS-PM-CHK-WIRLSS-NCS should be completed by responsible individuals of healthcare center. It should be noted that PM checklist only is used to perform systematic inspection of the equipment and will not guarantee their correct function.

9.4   PREVENTIVE MAINTENANCE (PM) CHECKLIST

KT-NCS Co Form # KT-NCS-PM-CHK WIRLSS-NCS.					
City:		**Facility:**		**Ward:**	
Bedside:		**Corridor/Ward/Room:**		**Management Center:**	
Model:		**Serial Number:**	**Installation Date:**	**Inspection Date:**	
No.	**Test and Inspection Item**		**OK**	**NOT OK**	**N/A**
1	Visual inspection	No damage or breakage in the back case and panel			
		Cleaning and disinfection according to the user manual			
2	Display screen	Correct display of information			
3	Alarms	Alarm activation			
		Clarity of alarm sound			
		Correct function of alarm LEDs			
4	Setup	Saving date & time settings			
5	Switches	Correct function			
6	Connectors	Firmly fastened			
7	Pull Cords	Correct function			
8	Assurance LEDs	Correct function			
9	Speakers	Clarity of sound			
Final Decision:		**PASS:**		**FAIL:**	
Recommendation:					
Name and signature of responsible individual		Name and signature of expert:			

10 TROUBLESHOOTING

Repairing the internal parts of any module in the system must be only done by trained and authorized personnel of "After Sale Service"; otherwise manufacturer will not take any responsibility for any possible hazard to the patient and the monitor.

Troubleshooting guide is intended to help users to solve minor problems caused by incorrect use of any module.

When you face any problem, please make sure that you have followed all procedure mentioned in Correct Action column before contacting "After Sale Service".

For symptoms not mentioned in the table, please turn OFF the system and contact "After Sales Services" department.

Fault Symptom	Possible Cause	Correct Action
Staff Display is OFF	12 V DC adapter not connected	Connect the 12 V DC adapter to the mains
Staff Display is OFF	12 V DC adapter Broken	Replace the 12 V DC Adapter
No Nurse Calling Function from all rooms in the ward	Staff display not programmed	Contact the technician to set the staff display
No Nurse Calling function from a specific room	The adaptor not connected/broken	Connect/replace the adapter
No Nurse Calling function from a specific room	The battery depleted	Replace battery
Self-triggering	Another transmitter at 433 MHz present	Intermittent problem, contact the technician
Service room Alarm Self Triggering	The unit has been exposed to water	Dry the Unit and check the sealing /Replace the unit
One of the Nurse call panels in a room not working	No Power to the panel	Connect the power supply
One of the Nurse call panels in a room not working	No Power to the panel	Replace the Battery
No Chime from staff console	Broken staff console	Replace the unit /Factory Reset the unit
No Chime from staff console	Volume down	Raise the volume
Bed/Room wrong numbering	Wrong initial setup / Change of bed number after setup	Contact the technician to do the setup
Call/Cancel switch on the Nurse call panel not working	No Power to the unit	Replace the battery/Connect the adapter
Pull cord switch not working	No Power to the unit	Replace the battery/