

# KT-NCS

## OPERATOR'S MANUAL

### Basic Nurse Call System



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This guide describes all features and functions of Basic 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	BASC-NCS-user-ver-02

## Explanations of the used expressions in this Manual

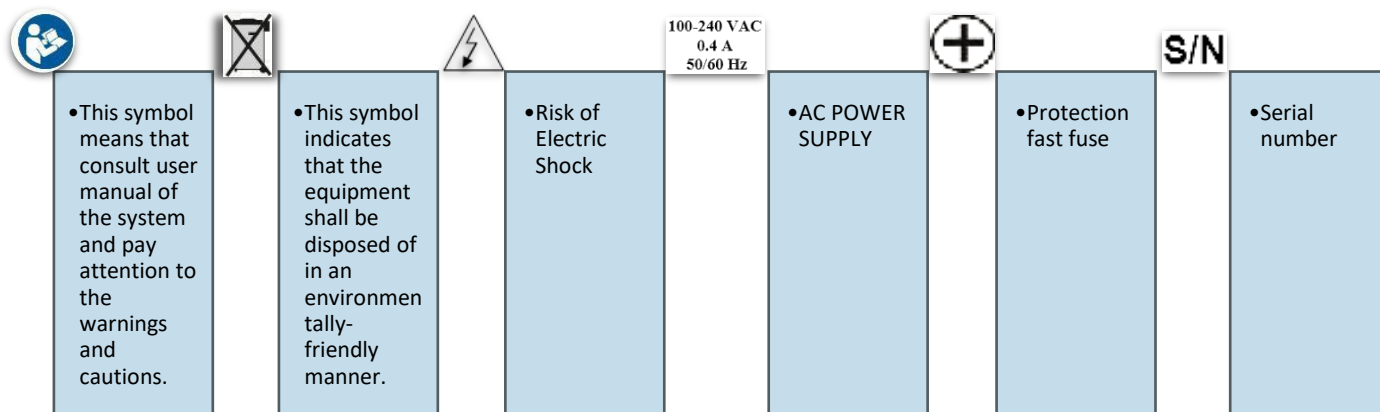


A **WARNING** symbol advises against certain actions or situations that could result in personal injury or equipment damage.



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

## Explanation of Symbols used on modules



## 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 Basic 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 Basic 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 Basic 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 Basic Nurse Call System is considered as Not Applicable.
- The sterilization of KT-NCS Basic Nurse Call System modules can be done using Gamma Ray when applicable
- KT-NCS Basic Call System has “Fixed” installation and “ Permanent” mode of usage and “Continuous” Mode of operation .

KT-NCS BASIC 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 BASIC 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

1	introduction.....	7
1.1	general warnings.....	7
1.2	getting started.....	7
1.3	general information.....	8
1.3.1	environment.....	8
1.3.2	Definition.....	8
1.3.3	main features.....	8
1.4	mounting / wiring / clearance / layout.....	9
2	Staff DISPLAY UNIT (cuN-02).....	12
2.1	introduction.....	12
3	terminal box (tbn-02).....	14
3.1	Introduction.....	14
4	patient panel (pbcn-13 & pbc-12 & pbcn-11).....	15
4.1	Introduction.....	15
5	pear push switch (pb-03).....	16
5.1	Introduction.....	16
6	pull cord switch (tb-12).....	17
6.1	Introduction.....	17
7	cancel / presence switch (cbn-11).....	18
7.1	Introduction.....	18
8	corridor status light (odl-19).....	19
8.1	Introduction.....	19
9	reporting software (cus).....	20
9.1	introduction.....	20
9.2	Staff console i.p. setting tab.....	21
9.3	Staff rfid card setting tab.....	21
9.4	Work shift time setting tab.....	22
9.5	Access level setting tab.....	22
9.6	Reporting tab.....	23
9.7	Graphical chart report tab.....	23
10	care and cleaning.....	24
10.1	system check.....	24

10.2	Cleaning and Disinfection.....	24
10.2.1	General Points.....	24
10.2.2	External surfaces.....	24
10.2.3	Display screen .....	25
10.2.4	Accessories.....	25
10.3	Preventive Maintenance (PM).....	25
10.3.1	Storage.....	25
10.3.2	Weekly Checks.....	26
10.3.3	Monthly checks .....	26
10.4	Preventive Maintenance (PM) Checklist .....	26
11	Troubleshooting .....	27

**This guide describes all features and functions of Kahroba Tarasheh Company Basic 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 INTRODUCTION

### 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 power cable to power supply socket of the terminal box module. Connect the other end of the power cable to a grounded power receptacle.



Make sure that the power indicator lights. If it does not light, check your local power supply and power cable connection. If the problem still exists, contact the local After Sale Service.

#### ✓ POWER ON THE TERMINAL BOX

Press POWER key on the Terminal box to power on the system. Please check the red indicators light on the switch to verify if the power is On. After a few seconds the LCD of the staff console module will turn on indicating that the system is powered on.



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	5~40° C
Temperature of Transport and Storage	-25 ~60° 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.

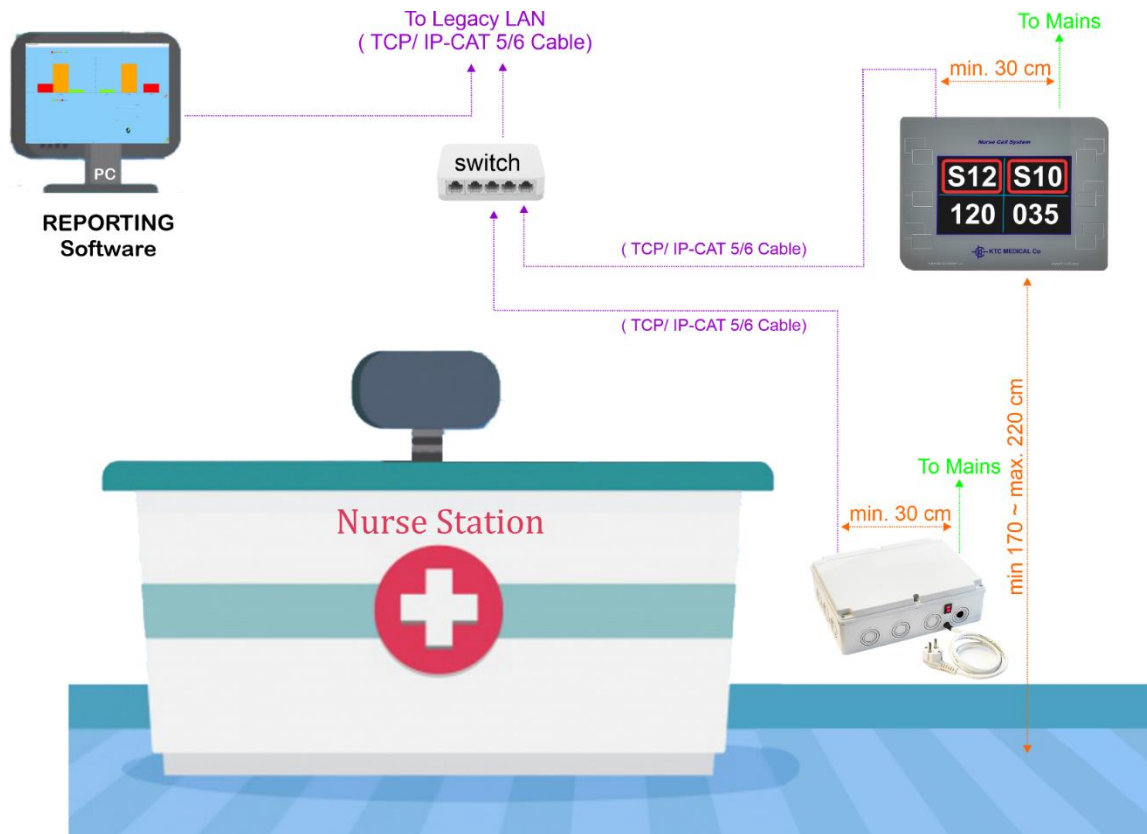
The patient uses the pear-push call switch from his bed or pull-cord switch from the washroom to initiate a call which will be presented on the staff console by vocal and visual annunciation. The staff will have to press the cancel switch at the calling point for deactivation of the initiated call.

### 1.3.3 MAIN FEATURES

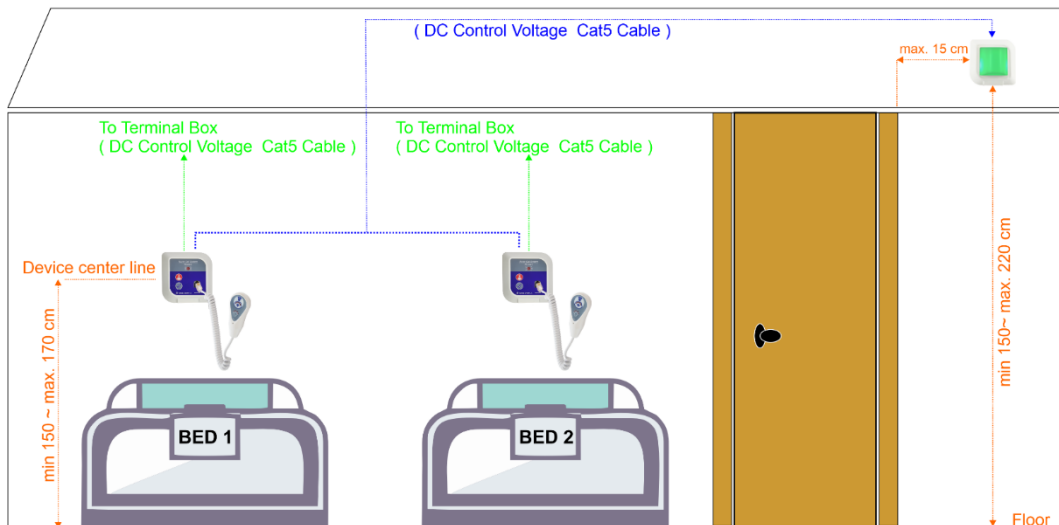
- Maximum (8 x 30) 240 calling points support
- 120-strong priority sorted calling queue
- Two-priority call configuration capability
- Flexible priority configuration for the calling points
- Chronological priority for same priority level calls
- Local volatile storage of the last 120 calls
- IP X5 for washroom switches and IP 54 for pear push switches
- Anti-disinfectant / Washable module compound
- Non-volatile memory option for user settings
- Reassurance LED on call Switches
- Non-Editable call statistics reporting log
- Outlier/Breaching staff tracking
- Not adversely affected by a shorted cord
- Power reversal protection
- Power surge protection
- Finder LED on call switches



1.4 MOUNTING / WIRING / CLEARANCE / LAYOUT



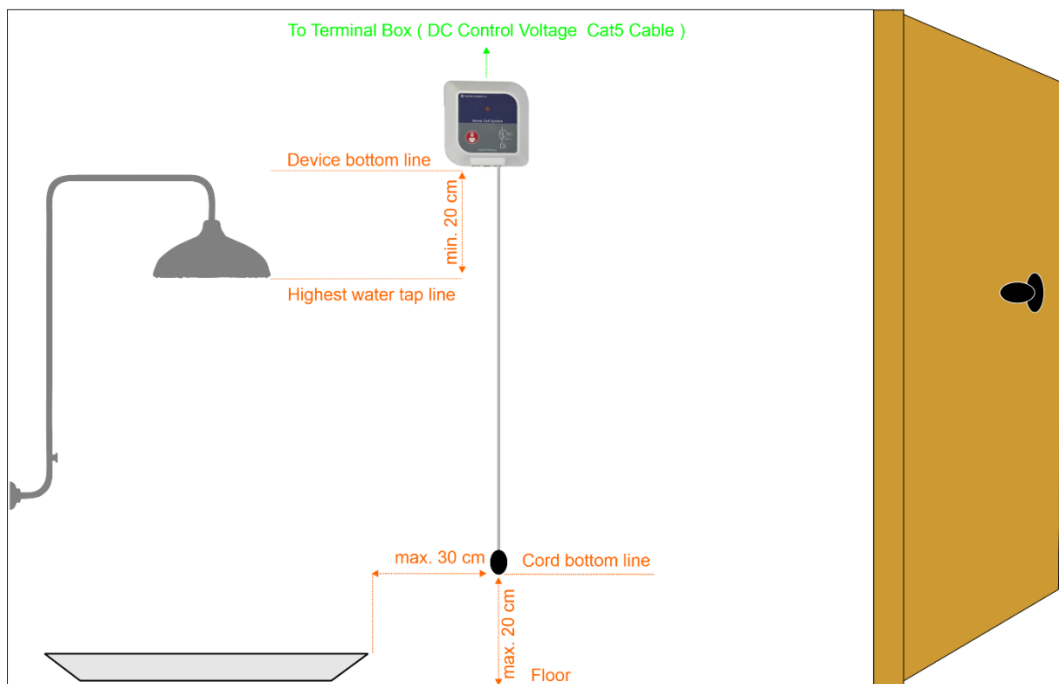
Room



## Internal WC






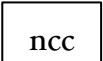





## Internal Bathroom



- Minimum clearance of data cables to the 220 V power cables is 30 cm.
- 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.
- Staff console 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)
- Nurse calling is done via CAT5/6 cables network under RS485 protocol provided by KT-NCS technicians.
- 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	
Emergency Pull Cord Station Symbol	
Nurse Call Annunciator Symbol	
Duty Station Symbol	
Staff Station Symbol	
NCS Central Cabinet Symbol	
Dome Light with Tone Symbol	
Floor Duplex Receptacle Symbol	
Data Outlet Symbol	

## 2 STAFF DISPLAY UNIT (CUN-02)

### 2.1 INTRODUCTION

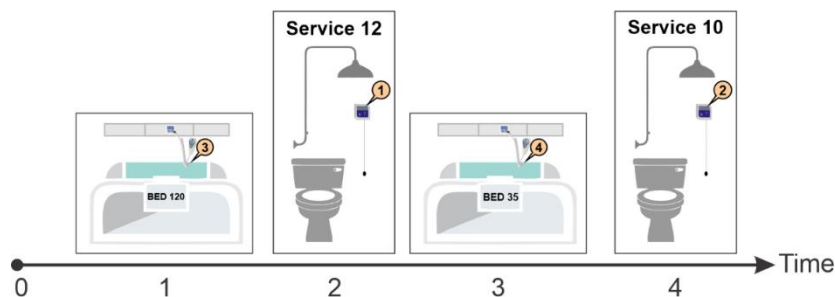
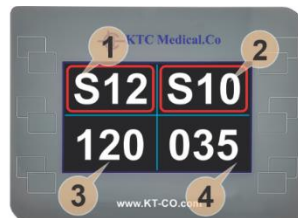
CUN-02 is the staff console for the BASIC NCS with the capability to show four initiated calls in a queue of 120 entries in 2 priority levels. The higher priority calls are displayed with a colored rectangle starting from top left and ending in bottom right in chronological order.

It connects to the terminal box through the LAN network of the hospital via its RJ45 socket

.It has an internal speaker to make acoustic notification alarm for an incoming call with custom melodies stored on its Micro-SD card. It is capable to store the log of the last 30 calls in its memory for reporting purposes in case the dedicated logging computer is off-grid for a limited time.

The content of CUN-02 is provided by the terminal box (TBN-02) via local network.

Weight	918 g
Dimensions	W: 245 mm                      H: 178 mm                      D: 47 mm
Raw Material	Plexiglass + Plexi print
Color	White
Power Supply	5 V via external AC adapter
Display Type	7-inch TFT
Internal Speaker	2 W, 8 Ohms
Port	RJ45 to the legacy LAN
Operating Temperature	-10°C ~ +50° C
Operating Humidity	30% ~ 80% RH
Ingress Protection	20 or better
Mounting	Surface





Number	Item	Description
①	7-inch TFT Display	To Display the incoming Calls in priority order
②	Speaker	To play the chime for call alerts
③	RJ45 Socket	To connect to the Nurse Call System Network
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

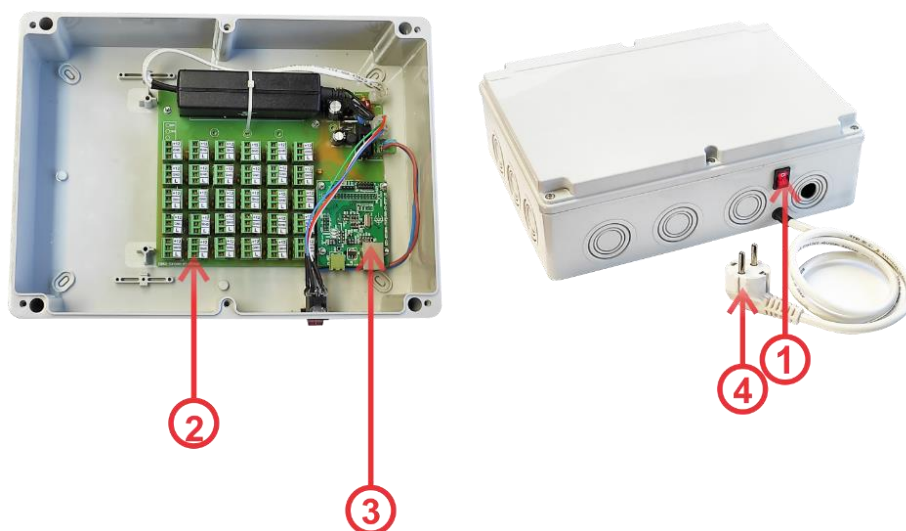
### 3 TERMINAL BOX (TBN-02)

#### 3.1 INTRODUCTION

TBN-02 is the interface between the patients' panels and the CUN-02 staff console in the BASIC NCS.

One TBN-02 can support up to 30 calling points, any number of calling points between 1 and 30 of which, can be considered as higher priority to be displayed with a colored border on the CUN-02 staff display with higher priority than the remaining calling points.

Weight	1388 g
Dimensions	W: 300 mm      H:95 mm      D: 220 mm
Raw Material	ABS
Power Supply	220 ~ 240 VAC , 0.2 A ( 50 HZ)
Color	Grey
Port1	RJ45 connector to Display Corridor (CUN-02)
Operating Temperature	-10°C ~ +50°C
Operating Humidity	30% ~ 80% RH
Ingress Protection	20 or better
Mounting	Surface (Max. 3 meters from Staff Console)



Number	Item	Description
①	ON/Off Switch	This is the one and only way to Turn the Nurse Call System ON and OFF.
②	Cat 5/6 Rooms Cables Knockouts	The cables coming from different rooms in the facility are connected to the Terminal box through these knockouts.
③	Cat 5/6 Staff Display Cable Knockout	The Cat 5/6 cable is connected to the Staff Display Console unit through this Knockout
④	Mains Cable	This cable knockout connects the terminal box to the 220 VAC

## 4 PATIENT PANEL (PBCN-13 & PBC-12 & PBCN-11)

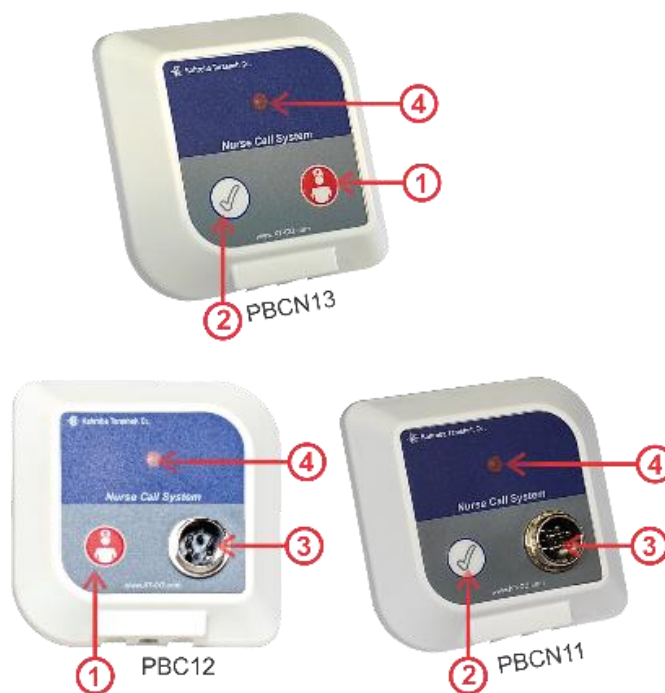
### 4.1 INTRODUCTION

PBCN-11 and PBC-12 Patient panels come with a military socket for connection to the patient pear push Nurse Call Switch (PB-03).

PBCN-11 has an additional Cancel/Presence switch whereas PBC-12 has a Nurse Call switch next to the socket.

PBCN-13 has a Nurse Call and a Cancel/Presence switch and no military socket.

Weight	PBCN-13: 61 g
Dimensions	W:80mm
Raw Material	Polycarbonate + ABS
Color	White
Connection	5-Pin Military Gx16 (Male)
Power Supply	12 V
Port	5-Pin Male (Gx1 6-5) Military connector
Operating Temperature	-10°C ~ +50° C
Operating Humidity	30% ~ 80% RH
Ingress Protection	20 or better
Mounting	Flush/Surface



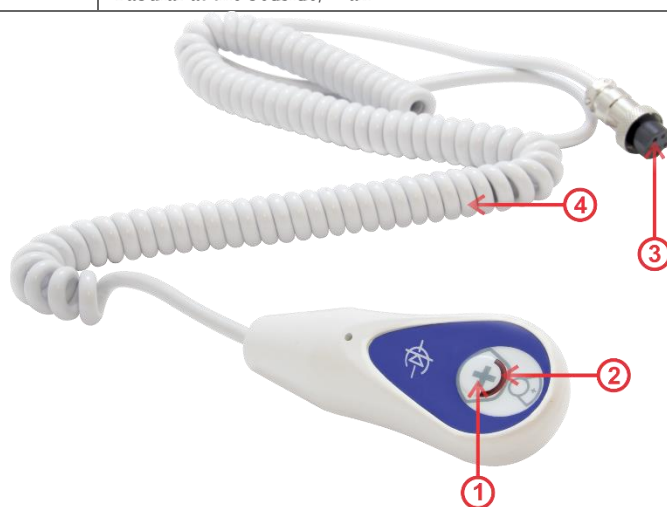
Number	Item	Description
①	Nurse Call Button	To be pressed to initiate a nurse call
②	Cancel/Presence Button	To cancel a call or declare presence following a call
③	Pear Push Call Switch Connection Socket	Male socket to connect the pear push switch
④	Nurse Call LED	To provide the visual assurance for the state of calling the nurse .

## 5 PEAR PUSH SWITCH (PB-03)

### 5.1 INTRODUCTION

PB-03 is the pear push nurse call switch attached to the patient's panel (PBC-12 or PBCN-11) via a coiled cord secured by a 5-pin military socket preventing detachment from the panel by any jolt.

Weight	150 g
Dimensions	W:40mm      H:100mm      D:28mm
Raw Material	Body: Polycarbonate +ABS Coiled Cable: PUR
Power Supply	12VDC
Color	White
Connection	5-Pin Military Gx16 (Female)
Cable Length	4m
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	Nurse Call Switch	To initiate a nurse call
②	Call Assurance/Back Illumination LED	To provide the back illumination for patient's ease of operation and bright red illumination for reassurance when call is activated
③	8-pin GX16 Female Plug	To provide the means for fastening the cord securely against any jolt introduced by patients during use.
④	Coiled Medical Grade Cord	Extendable to 5 meters with no risk of detachment with higher endurance compared to normal phone cords



## 6 PULL CORD SWITCH (TB-12)

### 6.1 INTRODUCTION

TB-12 is used in patient's bathroom, shower or similar areas making the call easier by pulling the cord and therefore activating a Nurse call on the management Staff LCD Display {CUN-02}.

TB-12 normally comes with a Nurse call switch on the panel to be used as an alternative to the Pull- cord one.

Weight	58 g
Dimensions	W: 80mm      H: 80mmD:20 mm
Raw Material:	Polycarbonate + ABS
Color	White
Power Supply	12 V
Cord Capacity	Max 20Kg
Operating Temperature	-10°C ~ +50°C
Operating Humidity	30-% ~ 80% RH
Ingress Protection	X4 or better
Mounting	Surface/Flush



Number	Item	Description
①	Plastic Cord	To be pulled to initiate a call while in the washroom/shower
②	Nurse Call Button	To initiate a nurse call

## 7 CANCEL / PRESENCE SWITCH (CBN-11)

### 7.1 INTRODUCTION

CBN-11 is a Cancel/Presence switch usually installed by the door of the patients' room. It can cancel the Nurse Calls activated from the Patient's handset (PB-02), Pull Cord Switch (TB12) or Patient Console Switches ( PBCN-13 & PBC-12).

The nurse will use CBN-11 after a call has been taken care of and there is no more activated call associated with the room

Weight	58 g
Dimensions	W: 80mm H: 80mm D: 20mm
Raw Material	Polycarbonate + ABS
Color	White
Power Supply	12 V
Operating Temperature	-10°C ~ +50° C
Operating Humidity	30% ~ 80% RH
Ingress Protection	20 or better
Mounting	Surface/Flush



Number	Item	Description
①	Cancel/Presence Button	To cancel an initiated call or declare presence by the staff after a call has been initiated
②	LED Indicator	To provide the visual assurance for an activated call

## 8 CORRIDOR STATUS LIGHT (ODL-19)

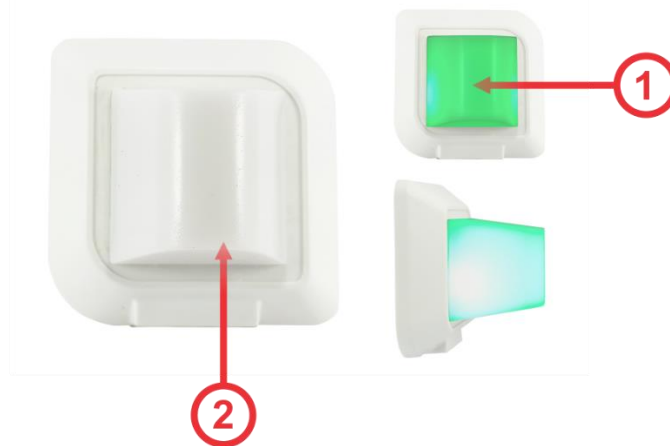
### 8.1 INTRODUCTION

ODL-19 is a wedge-shape corridor light noticeable from 5 angles which is installed above the patients' room door in the corridor.

It has one Steady Green LED Light color that will illuminate in case of a Nurse Call.

The light is OFF when no Nurse Call has been activated or after Cancel/Presence Switch has been activated after the call.

Weight	70g		
Dimensions	W: 80mm	H:80mm	D: 60mm
Raw Material	Polycarbonate+ ABS		
Color	White		
Power Supply	12 V		
Light Type	LED		
LED Color	Green		
Operating Temperature	-10°C ~ +50°C		
Operating Humidity	30-% ~ 80% RH		
Ingress Protection	20 or better		
Mounting	Flush/Surface		



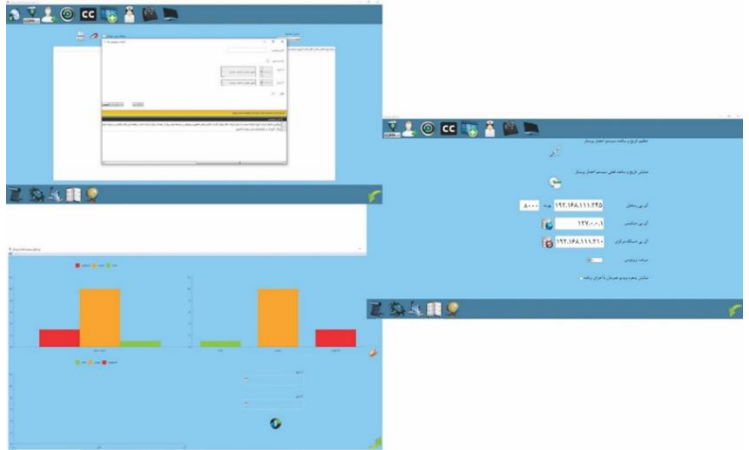
Number	Item	Description
①	Green LED	To make the visual notification for the staff for an initiated Nurse call (Steady Green)
②	Dome	To provide the wedge shape for the light to be observed from 5 angles

## 9 REPORTING SOFTWARE (CUS)

### 9.1 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.

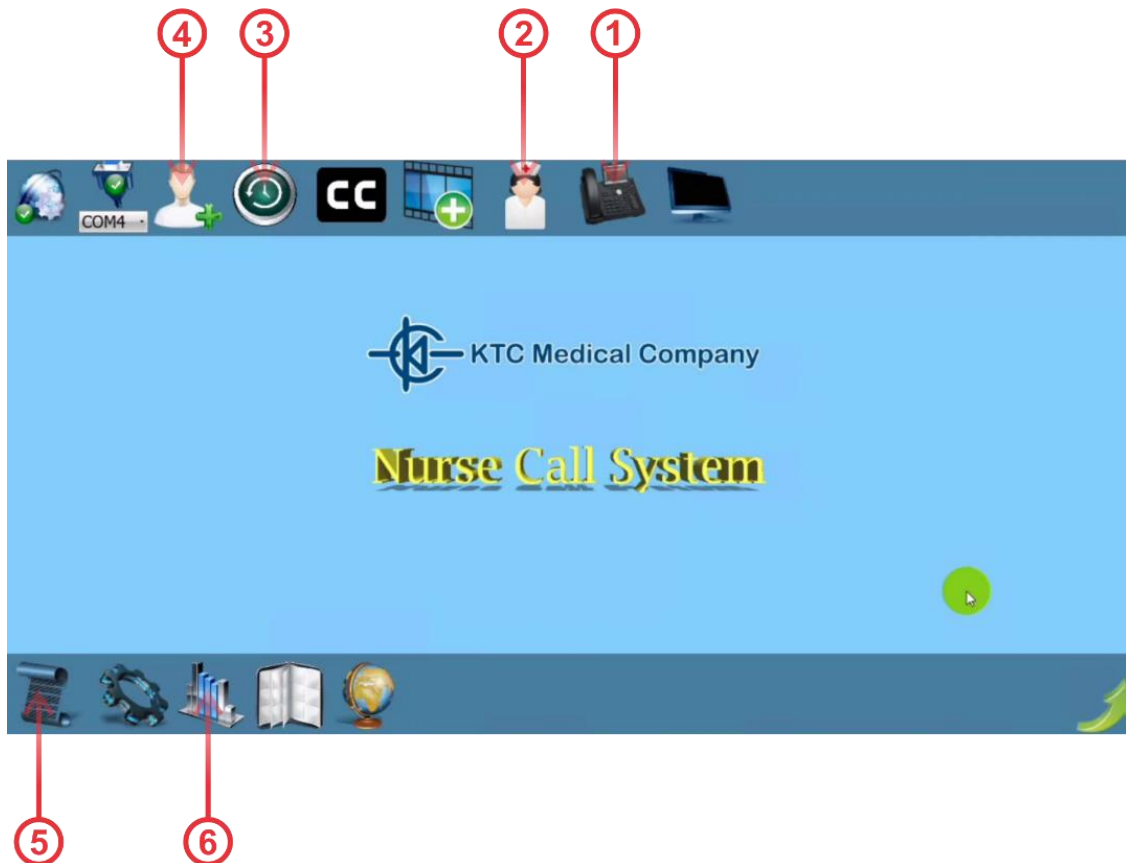
CUS is installed on the managerial computer connected to the LAN querying the events from the staff displays connected to the LAN and showing them on a graphical user interface.



Required Operating System	Windows 10/Server
Required H.D.D.	Min.120 GB
Required RAM	Min4G
Required Hardware	Ethernet Port
Required Processor	Min Core i3 or equivalent
Centralized Database	MSSQL



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
①	Staff Console I.P Setting Tab
②	Staff RFID Card Setting Tab
③	Work Shift Time Setting Tab
④	Access Level Setting Tab
⑤	Reporting Tab
⑥	Graphical Chart Reporting Tab

## 9.2 STAFF CONSOLE I.P. SETTING TAB

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

The screenshot shows a dialog box titled "CU List" with a close button (X) in the top right corner. It contains two input fields: "IP" and "Ward Name". The "Ward Name" field is preceded by a label "Current Ward". Below the input fields are two sets of buttons: "Add", "Edit", and "Delete" on the left; and "Save" and "Cancel" on the right. At the bottom, there is a table with two columns: "Ward Name" and "IP". The first row of the table is highlighted in pink and contains the text "CCU" under "Ward Name" and "192.168.111.210" under "IP".

## 9.3 STAFF RFID CARD SETTING TAB

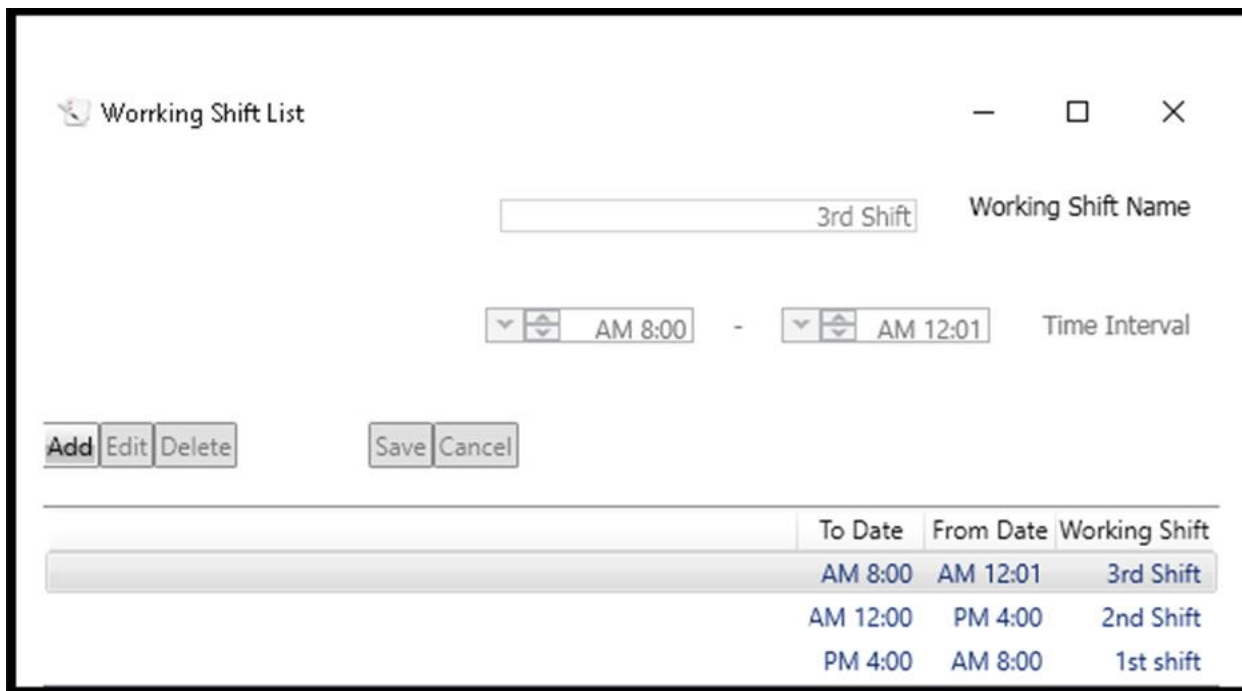
This tab will associate each RFID tag to one of the staff members so that the activity of the work force using RFID cards can be logged and reported accordingly as illustrated below:

The screenshot shows a dialog box titled "Nurse List" with a close button (X) in the top right corner. It contains two input fields: "Nurse ID" and "Nurse Name". Below the input fields are two sets of buttons: "Add", "Edit", and "Delete" on the left; and "Save" and "Cancel" on the right. At the bottom, there is a table with two columns: "Nurse Name" and "Nurse ID". The first row of the table contains the text "Sara Brightman" under "Nurse Name" and "456" under "Nurse ID".

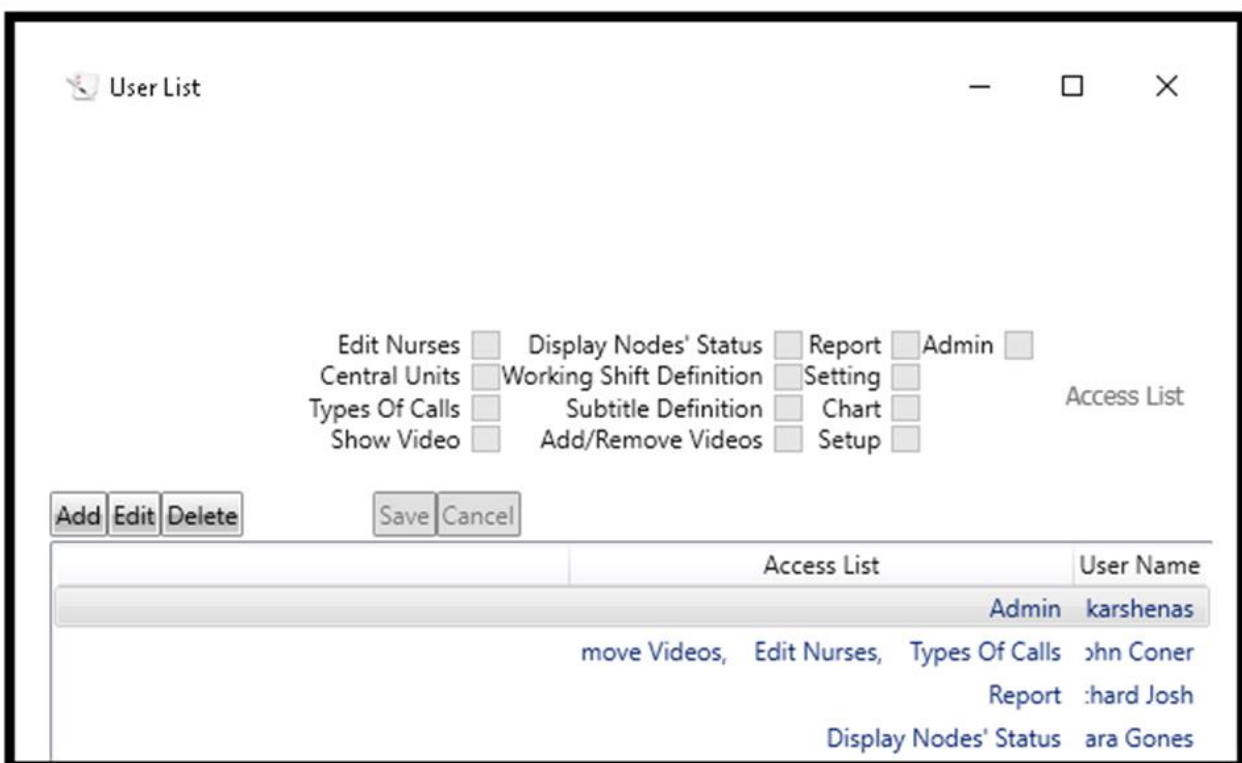
This tab will only be used if the Patient panels are equipped with RFID tag reader

### 9.4 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:



### 9.5 ACCESS LEVEL SETTING TAB



### 9.6 REPORTING TAB

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

Request	Bed	Room	Ward	Call Type	Row
2021/07/19 18:10:18	0	2	CCU	Service	1
2021/07/19 18:10:18	0	2	CCU	Service	2
2021/07/19 18:10:18	0	2	CCU	Service	3
2021/07/19 18:10:18	0	2	CCU	Service	4
2021/07/19 18:10:18	0	2	CCU	Service	5
2021/07/19 18:10:18	0	2	CCU	Service	6
2021/07/19 18:10:18	0	2	CCU	Service	7
2021/07/19 18:09:54	4	2	CCU	Critical	8
2021/07/19 18:09:17	4	2	CCU	Normal	9
2021/07/19 18:09:17	4	2	CCU	Normal	10
2021/07/19 18:09:09	4	2	CCU	Emergency	11
2021/07/19 18:09:09	4	2	CCU	Emergency	12
2021/07/19 18:09:09	4	2	CCU	Emergency	13
2021/07/19 18:09:09	4	2	CCU	Emergency	14
2021/07/19 18:09:09	4	2	CCU	Emergency	15
2021/07/19 18:09:09	4	2	CCU	Emergency	16
2021/07/14 17:54:01	4	2	CCU	Emergency	17

### 9.7 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:



## 10 CARE AND CLEANING

### 10.1 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.

### 10.2 CLEANING AND DISINFECTION

#### 10.2.1 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 SMART Nurse Call System elements fall in the following Ingress Protection groups:

- o CUI32/ODL35/NDP31/TBX31/BCU34-N/CBN31: IP 20 or better
- o NCB35/NCB33: IP 54 or better
- o TB31: IP X4 or better.



1. Sterilization may cause damage to the device and is therefore not recommended.
2. 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.
3. 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.**

#### 10.2.2 EXTERNAL SURFACES

In-between patients and as required:

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



### 10.2.3 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 sensitive to rough cleaning methods than the housing.
- Don't spray a liquid directly on the screen.

### 10.2.4 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.



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

The following table summarizes the methods of cleaning, disinfecting and sterilizing different parts 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 soapy water or mild detergent.	In-between patients and as required with: <ul style="list-style-type: none"> <li>• Alcohol 70%</li> <li>• Isopropyl Alcohol</li> <li>• N-Propanol</li> </ul>	If needed, can be done using Ultra-violet or gamma ray methods.
Holders of accessory, Extension cables		I In-between patients and as required with: <ul style="list-style-type: none"> <li>• Isopropyl Alcohol</li> </ul>	
Display screen	In-between patients and as required: Clean and soft cloth with screen cleaner.		

## 10.3 PREVENTIVE MAINTENANCE (PM)

To ensure that the device is kept in the best condition, it shall be kept clean and all points related to 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.

### 10.3.1 STORAGE

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



If any module 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.

10.3.2 WEEKLY CHECKS

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

10.3.3 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.

10.4 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:			

## 11 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.

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

