BeneVision™

See more With ease

Central Monitoring System

Visible anywhere

Flexible system

Easier to use

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BeneVision™
Central Monitoring System

A better vision of care

BeneVision™ Central Monitoring System: A versatile partner that really enhances your clinical work

The everyday routines of modern hospitals call for ever higher efficiency and place more demanding requirements on clinical diagnosis. BeneVision Central Monitoring System(CMS) is the ideal tool to meet these requirements and redefine versatile clinical surveillance.

Make your team more efficient.

BeneVision Central Monitoring System evolves from a centralised monitoring station to a distributed and patient-oriented system. It provides several correlative system components - CentralStation, WorkStation, ViewStation, CMS Viewer, Mobile Viewer, AlarmGUARD and web client. You can combine these components in a flexible way to build various monitoring systems that satisfy different departments' needs and the whole hospital's monitoring requirements.

Make your workflows smoother.

BeneVision Central Monitoring System not only allows you to oversee patient monitor but also infusion pump, ventilator, and devices connected via the BeneLink. With diverse system component options, you can get comprehensive patient information at a nurse station, corridors, offices and so on. In addition, based on the capacitive touch screen, the intuitive and friendly user interface of the Central Monitoring enable you to operate the system quickly and reduce your training costs.

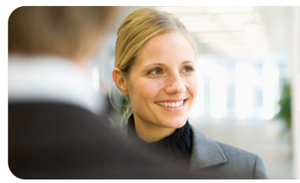
Make your clinical decisions easier.

BeneVision Central Monitoring System provides various review applications to fast-track patient conditions, and contrast windows enabling you to simultaneously view patient data in different ways .
In addition, sophisticated analysis tools help you make clinical decisions faster and easier.

Nurse:
"It is more intuitive and help me to save more time for my patients."

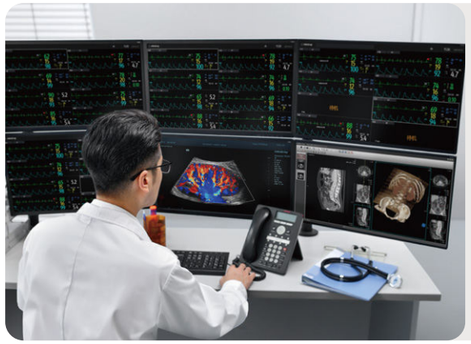
Doctor:
"I can access my patient's data immediately no matter where I am. With clinical assistant applications, I can make a quick and accurate diagnosis."

IT technicians:
"The BeneVision CMS fits seamlessly with our existing IT infrastructure, satisfies all of our safety and security strategies, and is easy to maintain."



Supervisor:
"It offers a better solution to improve our care quality within a reasonable investment."

BeneVision™ Central Monitoring System: Patient control at any point of care

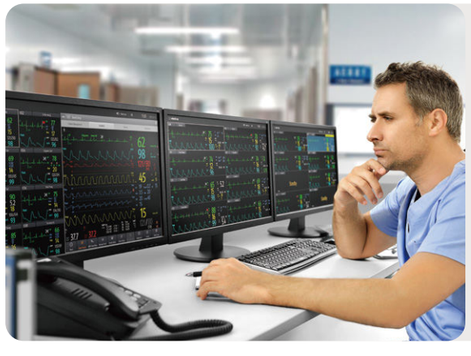


Observe patients in different departments
The WorkStation (WS) can be connected to CentralStations from different departments simultaneously, enabling clinical supervisors to conveniently observe and review multiple patients at one glance.

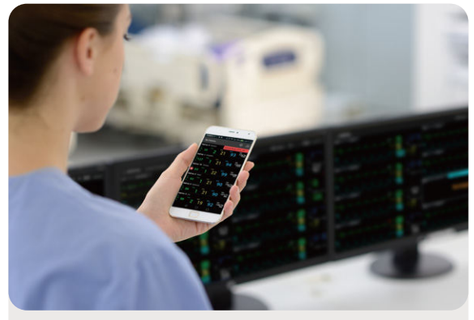
Analyse patient conditions in the office
The CMS Viewer allows access to patient monitoring information and bedside peripheral devices on the PC in your office. Comprehensive review and clinical assistive applications make diagnosis more convenient.

Get patient detailed information anywhere
The ViewStation(VS) can be located anywhere it is needed, such as the lounge or corridor. Unlike the usual CentralStation mirroring solution, the ViewStation can display patient information from one or multiple CentralStations. In addition, it allows you to view detailed information from any single patient and supports touch screen operation.

Monitor patients in a care group
The WorkStation Lite can be installed on the same host with the information system, which helps you concentrate more on your work and patients care. As well as real-time monitoring information, you can also adjust settings and admit patients. All patient data will be synchronized with that in the bedside monitor and in the CentralStation.



Access all bedside device data at the nurse station
The CentralStation (CS) not only displays information from patient monitors but also from infusion pumps, ventilators and 3rd party devices via the BeneLink module. All data is patient-centered and well-organised for easy browsing and review. These data is also transferred to other BeneVision CMS components such as WS and VS.



View patients by smart phone/pad
For even greater flexibility, the Mobile Viewer is a CentralStation in your pocket. You can get patient data for clinical decision making no matter where you are. Alarm distribution management through AlarmGUARD to ensure patient safety.

For nurses: Improve care with your own simplified workflows

Panoramic patient monitoring

Up to 64 beds can be connected to BeneVision CentralStation simultaneously. All the measurements from the patient monitors, infusion pumps, ventilators and ultrasound, plus integrated data collected from peripheral devices are displayed on multiple, full HD wide screens.

Prompt alarm

No matter where you are, BeneVision Central Monitoring System can inform you of patient's conditions according to the flexibly deployed WorkStation and ViewStation. The AlarmGUARD dedicated alarm distribution system can help you keep abreast the patient's risk at all times.

Intelligent workflows

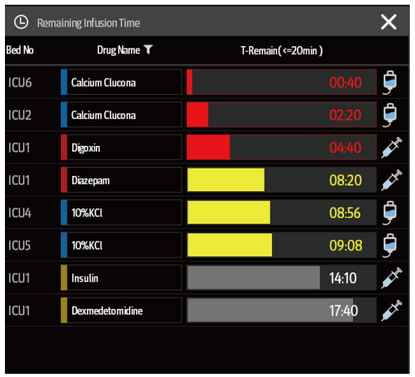
Your workflow becomes simpler and more dynamic with BeneVision Central Monitoring System. After establishing connection with your ADT system, BeneVision CentralStation/WorkStation can automatically admit patient synchronously with the information system without any operation. During patient transfer, patient data is automatically transferred and merged. Electronic reports are regularly sent to EMR. The Care Group function can help the nurse focus on patients whom she is caring for, thus simplifying workflows and reducing information overload.

Intuitive user interface

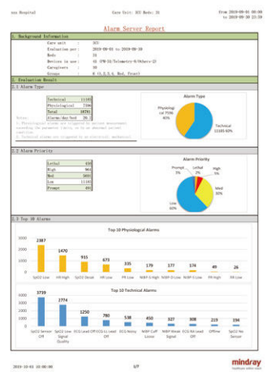
The BeneVision Central Monitoring System with capacitive touch screens makes operations more intuitive and adopts the same interface design style of the latest BeneVision N series patient monitors, ventilators and infusion pumps helping to reduce your learning time.

Patient centered multi equipment Central Monitoring System

The BeneVision Central Monitoring System integrates all bedside device information such as patient monitors, infusion pumps, ventilators, ultrasound and video, patient status information is readily available, which can better meet the needs of titration therapy.



Medication Management
Overview of all infusion pumps with remaining infusion time summary, gives clear visibility to the caregiver, facilitation timely actions.



Alarm Statistics
Count the alarm load and response, analyse the alarm types that can be reduced and improve the alarm fatigue through closed-loop management.

Alarm Distribution
AlarmGUARD supports customization to receive important alarms and view real-time and historical data. If there is no timely response, it will automatically notify the superior to ensure patient safety.

For clinicians: Confidence with comprehensive information at any time

Merged multi-device evaluation

Ultrasound-Vital Signs evaluation

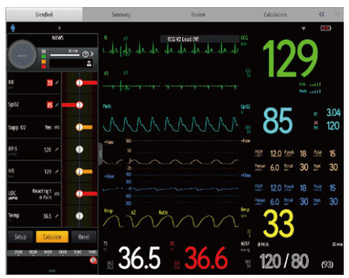
- Vital signs and waveforms are simultaneously transmitted to ultrasound and displayed on the same screen to assist ultrasound diagnosis
- The Central Monitoring System supports the storage and review of ultrasound images, videos and reports. Ultrasound examination and vital sign can be reviewed at the same timeline, which is convenient to trace the patient's condition and confirm the treatment effect.

Spontaneous breath test

- The ventilator Weaning Tool can start the spontaneous breathing experiment (SBT), and evaluate the patient's status in combination with $EtCO_2$, SpO_2, PR and other parameters, and prompt the weaning after the successful completion of SBT
- Automatically withdraw from SBT in abnormal situations to ensure patient safety and reduce the burden of medical care

Intelligent clinical assistive applications

The BeneVision Central Station supports complete clinical functions and tools which include BoA, Hemosight, SepsisSight, GCS, EWS, PACE View, 12 lead ECG reanalysis and comparision to assist clinicians understand the situation of responsible patients, intervene or modify the treatment plan in advance.

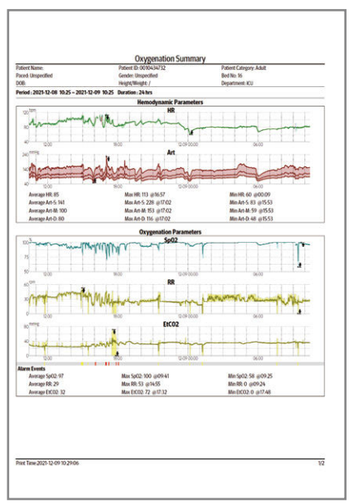


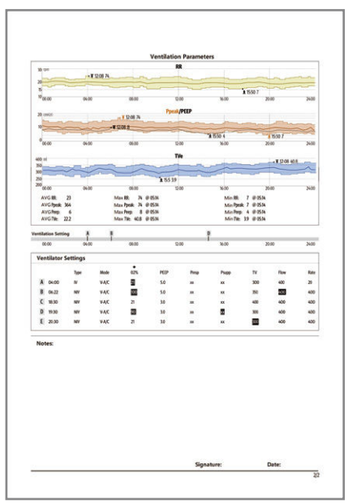
Continuous EWS scoring
Remote centralized EWS management, continuous attention to patient status.

12 lead ECG reanalysis and report comparison
Analysis of patient's typical waveform and disease evolution.

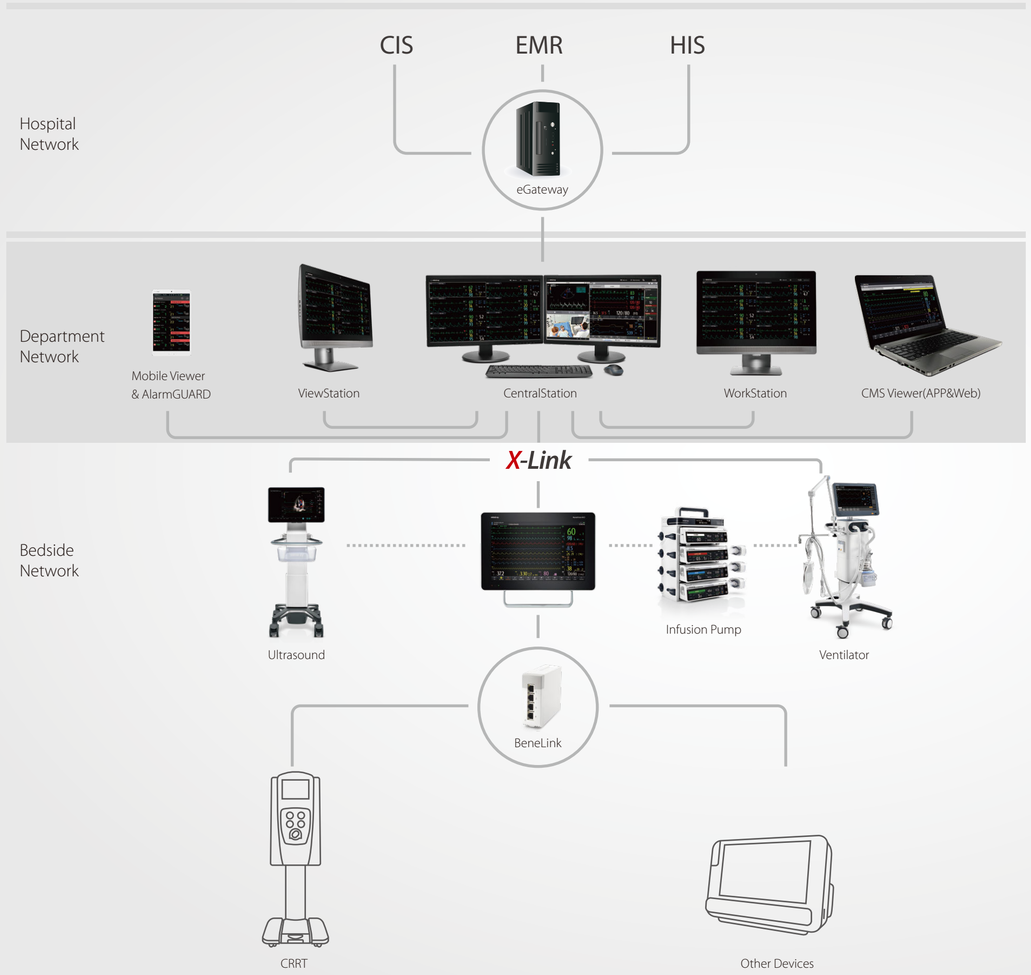
The BeneVision Central Monitoring System intelligently counts patients' physiological parameters and abnormal changes, outputs various patient status summary reports, helps clinical medical personnel quickly obtain patient status, improves diagnosis and treatment efficiency.

- Comparison and review of long-term trends to understand the evolution of the disease.
- Graphical indication of clinical thinking, intuitively summarizing patient status.
- Supports vital signs, 24h ECG, ventricular arrhythmia, atrial fibrillation, oxygenation and HRV summary.





Oxygenation Summary
Combine the patient's hemodynamics, oxygenation status, ventilation parameters and ventilator ventilation settings to quickly grasp the patient's oxygenation.



For IT technicians: Access to hospital networks with enhanced solutions following your IT strategy

Adaptable infrastructure

BeneVision Central Monitoring System supports large network deployment up to1200 beds for mixed wired, wireless and WMTS telemetry connections. The underlying infrastructure of BeneVision Central Monitoring System is full 3-layer compatible, supports both unicast and multicast communication and so fits perfectly into your existing network without any extra investment. The IHE HL7 protocol output through eGateway makes it very easy to connect BeneVision Central Monitoring System with other hospital systems such as EMR and CIS.

Reliable safety & security design

Data safety and security is a big concern for IT technicians. So, BeneVision Central Monitoring System supports SSL communication encryption, LDAP authorization and incorporates McAfee white list to block external intrusion. The system adopts RAID1 technology for error and disaster tolerance, QoS support to ensure real-time data transfer quality when the network is congested and overall backfilling strategy to guarantee no loss of patient data.

Easy to maintain

BeneVision Central Monitoring System can be fully virtualised on your own server hardware via a VMware environment, which is easier for IT clustering maintenance and cost control. In addition, BeneVision Central Monitoring System integrates powerful maintenance function which can centrally acquire maintenance information, logs of networked patient monitoring devices, and centralized configure and upgrade firmware of these devices. With authorization, Mindray can offer remote services, which makes maintenance easier and more efficient.

For supervisors: Upgradeable monitoring solution with cost-effective investment

Protected investment

BeneVision Central Monitoring System supports the whole family of Mindray patient monitoring products, protecting your investment. In addition, it is fully compatible with your existing hospital network, avoiding extra network construction costs. Through the eGateway that supports the IHE HL7 protocol, the BeneVision Central Monitoring System can easily connect to your existing hospital information system. The intuitive user interface is consistent with the latest BeneVision N series patient monitors, helping to reduce learning time and training costs.

Enhanced monitoring solution

A wide variety of BeneVison Central Monitoring System options delivers extremely flexible monitoring solutions to meet the various requirements of different departments or even the whole hospital, enhancing your working efficiency. In addition, the BeneVision Central Monitoring System not only displays information from patient monitors but also from peripheral devices such as ventilators connected to patient monitors via the BeneLink module, improving patient safety. And alarm statistics tool can help to find out meaningless alarms, assist to change alarm setting and reduce alarm fatigue.

Functions	CentralStaiton	CentralStaiton Server Edition*	WorkStation	ViewStation	CMS Viewer	Mobile Viewer
Manage networked devices	Yes	Yes	No	No	No	No
Store monitoring data locally	Yes	Yes	No	No	No	No
Admit/Discharge /Transfer patients	Yes	No	Yes	No	No	No
Manage alarm	Yes	No	Yes	No	No	No
Change monitoring devices' settings	Yes	No	Yes	No	No	No
Give visual and audio alarm indicators	Yes	No	Yes	Yes	Only visual	Only visual
Perform real-time monitoring	Yes	No	Yes	Yes	Yes	Yes
Change display settings	Yes	No	Yes	Yes	Yes	Yes
Review online patients	Yes	No	Yes	Yes	Yes	Only events
Review discharged patient	Yes	No	Yes	Yes	Yes	No
Print reports	Yes	No	Yes	Yes	Yes	No

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System Components

Software

CentralStation	System center which connects bedside devices and other remote access devices
WorkStation	Remote station with interactive capability
ViewStation	Remote station with the view-only capability
CMS Viewer	Windows based remote access software running on PC
Mobile Viewer	Remote access software running on mobile device
Mobile Server	Service running on standalone server or integrated with CentralStation for Mobile Viewer & AlarmGUARD remote access

Hardware

Main unit	Traditional PC 1U Blade Server Mini PC
Display	24-inch TFT LCD screen 23-inch PCT touch screen
Printer	Network laser printer
UPS	1000 VA, 220V / 50Hz
recorder	3-channel thermal recorder

Main System Software Specifications

Basic

Components	CentralStation(CS), WorkStation(WS), ViewStation(VS)
Number of devices	Up to 64 patient monitors and infusion pumps per station Up to 128 patient monitors and infusion pumps for CentralStation Server Edition*
Devices supported	BeneVision N series, BeneView T series, iPM series, iMEC series, uMEC series, PM series, MEC series, ePM Series patient monitors, VS series vital signs monitors, TMS-6016, BeneVision TM80/TD40 telemetry, BeneHeart series defibrillator, Infusion pump: BeneFusion nSP/nVP/nDS/eSP/eVP/eDS, SV series & NB series ventilators, TEX series ultrasound
Integrated devices	Mindray & 3rd party devices (such as Ventilators, anesthesia machines) connected to patient monitors via the BeneLink module

Display

Resolution	3840x2160, 1920x1080, 1280x1024
Max number of displays	up to 4 displays, 1 display for 3840x2160
Display config	Up to 64 patients on one display with 3840x2160 resolution Up to 36 patients on one display with 1920x1080 resolution Up to 16 patients on one display with 1280x1024 resolution
Trace	Up to 8 waveforms per patient in the sectors Up to 12 waveforms for specific patient in the ViewBed window Up to 16 infusion details for one docking station Up to 24 infusion details for two docking stations (master-slave mode)
Patient sector layout	Normal Screen, Big Numerics
ViewBed screen layout	Normal Screen, OxyCRG, Minitrends, Integrated Devices, ECG Full-Screen, ECG 12- Lead, EWS, Infusion Details, BoA Dashobard, NeuroSight

Parameters and Waveforms

Parameters	HR, ST, PVCS, QT/QTc, RR, SpO_2, PR, NIBP, TEMP, IBP, CO, $EtCO_2$, Multi-gas, O_2, N_2O, CCO, $ScVO_2$, ICG, RM, BIS, EEG, NMT, rSO_2, Pump status, parameters from integration
Waveforms	ECG, Pleth, Resp, CO_2, IBP, O_2, N_2O, Agent, ICG,RM, BIS, pArt/pCVP, EEG

Telemetry ECG

ECG vector	I, II, III, aVR, aVL, aVF, V/V1, V2, V3, V4, V5, V6
Algorithm	Mindray
ARR detection	Asystole, VFib/VTac, Vtac, Vent. Brady, Extreme Tachy, Extreme Brady, PVCs/min, Pauses/min, R on T, Run PVCs, Couplet, Multif. PVC, PVC, Bigeminy, Trigeminy, Tachy, Brady, Pacer Not Pacing, Pacer Not Capture, Missed Beat, Nonsus. Vtac, Vent. Rhythm, Pause, Irr. Rhythm and Afib
ST analysis	Supported
QT analysis	Supported

Alarm

Category	Physiological alarm, technical alarm, and system prompt
Priority	High, mediate, low and message
Notification	Audible and visual
Remote control	Alarm switch, alarm limits, alarm priority, alarm pause, and alarm reset
Alarm analysis	Support alarm statistics

Summary

Summary Vital Sign Summary, Oxygenation Summary, ECG Summary, Ventricular Arrhythmia Summary, AF Summary

Review

Trend review	Most recent 240 hours of tabular trends and graphic trends for all parameters
Full disclosure	Most recent 240 hours of full-disclosure waveforms and compressed waveforms
Events	Most recent 3000 events, including the parameter name and 16-second waveforms before and after an alarm is triggered
NIBP review	Most recent 3000 NIBP measurements
C.O. review	Most recent 720 C.O. measurements
OxyCRG review	Most recent 48 hours OxyCRG
12-lead review	Most recent 720 12-lead analysis results, with 12 analysis waveforms for each analysis result
ST review	Most recent 240 hours of ST segments
Historic review	At least 200 discharged patients' data depending on the storage volume
Minitrends	Most recent 8 hours for all parameters

Reports

Style	Paper and paperless (PDF file) report
Size	A4 or letter
Color	Monochrome, Color
Type	Titration table report, hemodynamic calculation report, oxygenation calculation report, ventilation calculation report, renal calculation report, graphic trends report, tabular trends report, full disclosure overview report, full disclosure detail report, waveform segment report, event report, event list report, 12-lead interpretation report, multi-lead ECG report, ST report, QT report, Arrh statistics report, OxyCRG report, OxyCRG review report, OxyCRG event summary report, OxyCRG event detail report, realtime report, print on alarm report, EEG report, CSA report, hemoSight parameters report, alarm limits report, pace view report, summary report, freeze report, defibrillator selftest report, ECG summary report, vital sign summary report, AF summary report, oxygenation summary, ventricular arrhythmia summary strips, CPR report,rescue report, system settings report

Calculation

Hemodynamics	100 calculations for review
Oxygenation	100 calculations for review
Ventilation	100 calculations for review
Renal	100 calculations for review

Clinical Assistant Application

ST Graphic	ST histogram and ST vectogram
ABPM	Analysis and report printouts supported
24 hours ECG	Summary Statistics and report printouts supported
PACE View	Pace Magnifier and Spike Magnifier
EWS	Continual EWS score and dashboard

Data Interface

Connection Interface	Integrated eGateway or standalone eGateway
ADT	Support getting patient demographics from ADT system Support receiving admit/discharge/transfer patient command from ADT system
CIS/EMR	Support physiological parameters output Support PDF/XML- format reports output Support infusion information output
CPOE	Support transferring doctor's prescription to connected infusion pumps
ECG System	Support full disclosure output Support XML-format 12 leads-report output, sample rate of 1000Hz for BeneVision N & ePM series patient monitor and of 500Hz for other patient monitors
Alarm system	Support alarm events output
Time	Support synchronizing with NTP server Support synchronizing with eGateway Support synchronization of time to patient monitors and infusion pumps

Minimum Runtime Environment

CPU	4 cores and 3.0 GHz or above
RAM	16GB or above for 64 beds 16GB for 128 beds (Server Edition)
Hard drives	CS: 500G or above WS/VS: 100G or above
Networking	Ethernet 802.3 100M or above self-adapted
Graphic card	Support dual or multiple displays
Speaker	Built in the host computer or display 45 to 85dB alarm tones
USB port	two or more
Operating System	Windows 7/10 or Window Server 2008/2012/2016/2019

CMS Viewer's Specifications

Operating System	Windows 7/10 or Window Server 2008/2012/2016
Resolution	Self-adaptation Optimum 1920x1080
Number of patients	View one patient at one time
Review	Tabular trends, graphic trends, events, full disclosure, 12-lead ECG, ST, Arr statistics, OxyCRG

Mobile Viewer's Specifications

AlarmGUARD's Specifications System	Android 8.0 or above 8 core and 1.8GHz CPU or above 2GB RAM or above 32GB or above memory
Resolution	1280x720 or above
ViewBed	View parameters and waveforms monitored
Alarm management	Groups alarms of different beds and assign to users of different priorities, audible and visual alarm.
Review	InfusionView, Event, Graphic Trends, 12-lead ECG
Android system	Android 4.4 or above 4 core and 1.3GHz CPU or above 1.5GB RAM or above
iOS System	iOS 9.2 or above iPhone 6/plus or above iPad mini 2 or above
Resolution	Self-adaptation optimum 1920x1080
Number of patients	View up to 32 patients simultaneously
ViewBed	View parameters and waveforms monitored
Review	InfusionView, Event, Graphic Trends, 12-lead ECG
Events	Alarm events, arrhythmia events, manual events, operation-related events
Event Notification	Support vibration and sound Support configuring trigger condition Require Android 5.0 or above Not supported by iOS

Mobile Server Specifications

Standalone Mobile Server

Operating System	Windows 10 or Windows Server 2016/2019
CPU	4 cores and 2.9 GHz or above
RAM	8 GB or above
Hard drives	128 GB or above
Number of beds	Up to 1200 beds can be connected simultaneously
Number of Mobile Viewer	Up to 500 Mobile Viewers can be connected simultaneously

Integrated Mobile Server

Number of beds	Up to 128 beds can be connected simultaneously
Number of Mobile Viewer	Up to 200 Mobile Viewers can be connected simultaneously

Network Specifications

Infrastructure

Topology	3-layer network supported, applicable for both hospital networks and dedicated networks
Scale	Up to 1200 bedside monitoring devices for the whole network
Type	Wired, wireless, and dedicated WMTS network
IP config	DHCP and DNS supported
Communication quality	QoS supported
Security	LDAP authentication supported SSL encryption supported McAfee antivirus application (Solidcore Solidifier)
Safety	Raid 1 supported Backfilling data supported Redundancy supported
Virtualization	VMware supported

Environmental Specifications

Temperature	Operating: 10 to 35°C (50 to 95°F) Non-operating: -30 to 60°C (-22 to 140°F)
Humidity	Operating: 10% to 90% Non-operating: 5% to 95%
Altitude	Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)

**means for the area only require CE*