

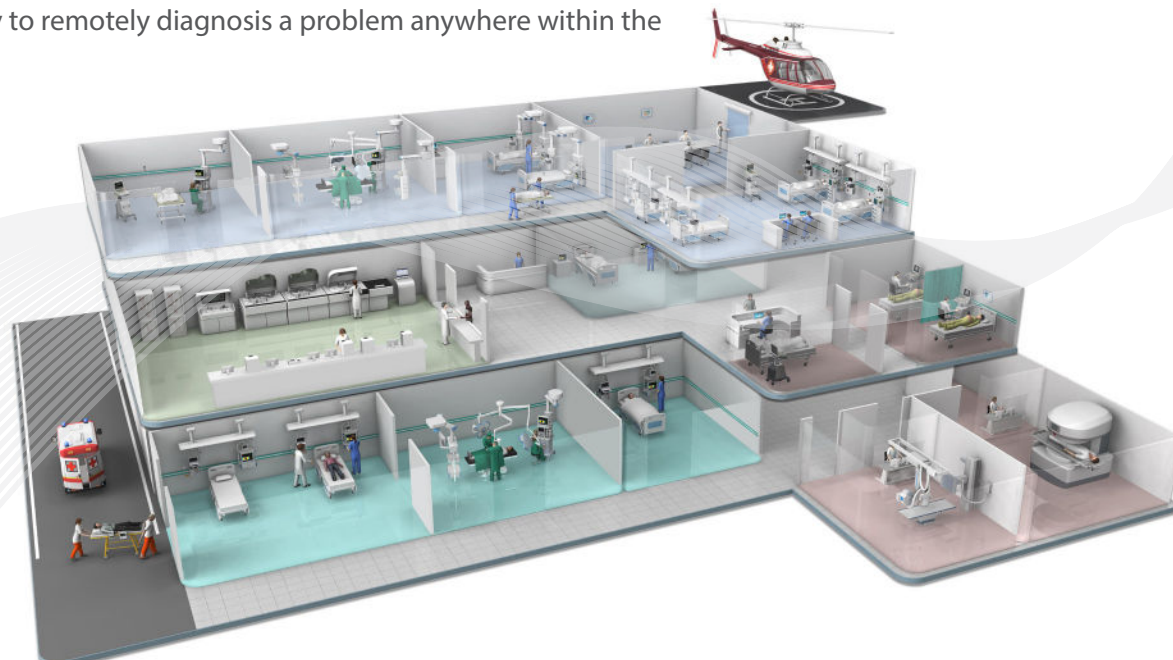
# System Management Console

## Supporting the Continuity of Care

The management of hospital health technology is growing in complexity and cost as medical device systems continue to grow, become more geographically distributed, and the devices within the system are increasingly mobile. Every day, Healthcare Technology Managers (HTM) face multiple challenges – managing and supporting equipment efficiently within their facility. Inconsistent tracking of devices and location, unknown end-user identities, incorrect software and configuration settings, or device malfunctions can significantly decrease hospital productivity, increase operational spend, and negatively impact patient care.

Mindray understands these challenges and delivers a comprehensive solution for device technology management within the Mindray System Network.

The M-IoT (Mindray Internet of Things) service is embedded within all Mindray Patient Monitoring devices and designed to provide notifications and remote management tools needed to manage the Mindray System either at the monitoring device or remotely, from within the healthcare enterprise. Providing event-driven notifications, built upon the industry standard Simple Network Management Protocol (SNMP) and the Mindray System Management Console (SMC) to centralize the system management, the HTM will be notified and provided the ability to remotely diagnosis a problem anywhere within the healthcare system.



# SMC Device Asset Management Dashboard

Management of devices within the Mindray System starts with identifying all devices and determining their location(s). The Mindray SMC Device Asset Management Dashboard provides this ability throughout the healthcare enterprise.

## SMC Device Asset Management Dashboard:

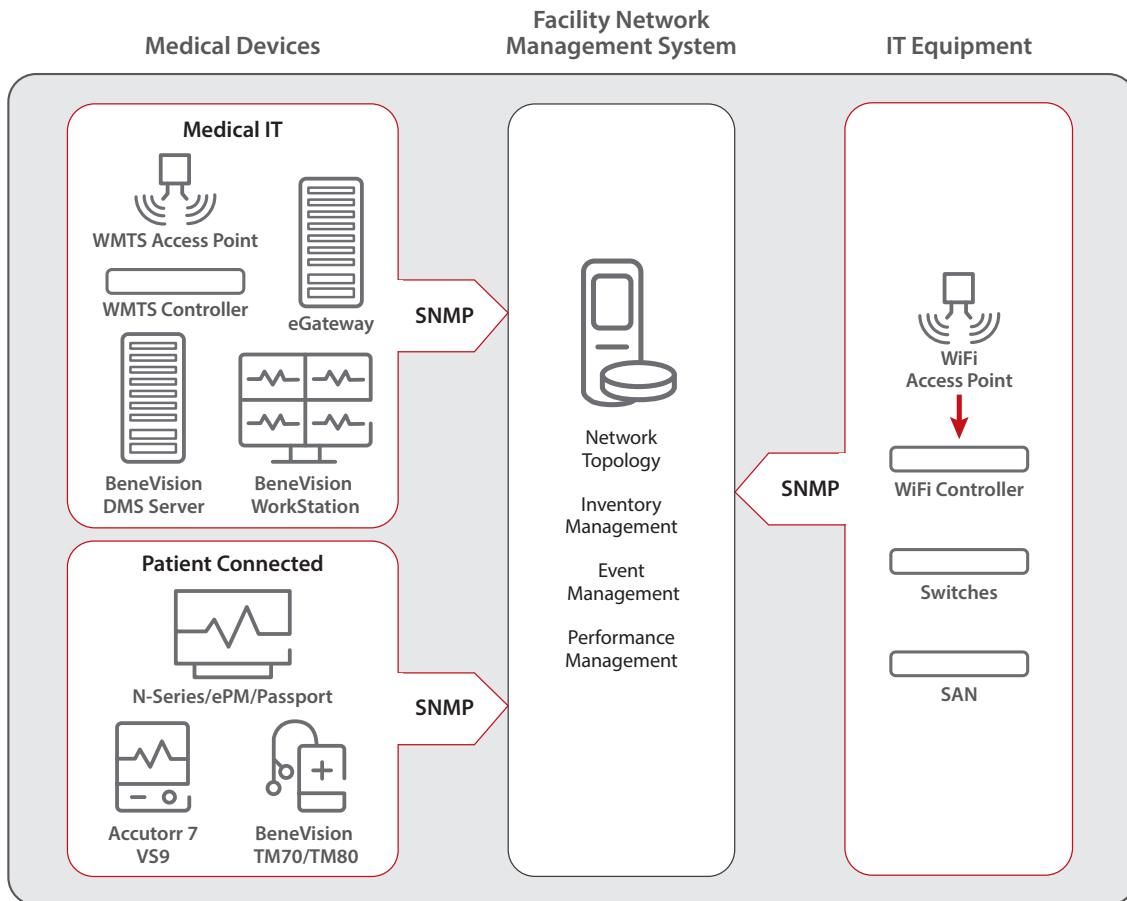
- Displays an inventory list of Mindray devices and their status within the healthcare system. The SMC Device Asset Management Dashboard:
- Is filterable and searchable to assist HTM in quickly finding a device
- Provides details for each asset and displays information to help identify the device within the care environment, such as serial number, software/hardware version, and device type
- Provides the last twenty known locations of each asset, equipping the HTM the data needed to locate the device
- Supports remote system log collection from one or multiple assets, without travelling to and locating the device, reducing time and cost related to investigating reported issues
- Provides an exported list of the Mindray assets which can be merged into an enterprise system, for convenient management of multiple vendors' devices and/or to generate custom reports of Mindray assets

Device Category	Device Model	Device Serial Number	Device Code	Device Name	Device Status	Location	Device ID	Facility
Monitor	BeneVision N22/19	SN_MR234		DeviceName0	Shutdown (2020-11-2)	Room44 Bed11	00-0B-AB-04-9B-96-B	
Monitor	BeneVision N12	SN_MR229		DeviceName0	Offline (2020-12-09 1	Cardiology Room48 Bed	00-0F-14-04-9B-0C-3	West Area
Monitor	TMS80 Monitor	SN_XF100		DeviceName0	Offline (2020-12-09 1	GW Room27 Bed3	AC-9A-22-00-A5-18-0	West Area
Monitor	BeneVision N12	SN_MR291		DeviceName0	Shutdown (2020-12-0	MICU Room4 Bed27	00-0F-14-04-9B-0C-3	West Area
Monitor	BeneVision N12	SN_XF167		DeviceName0	Shutdown (2020-12-0	OICU Room45 Bed27	00-0F-14-04-9B-0C-3	West Area
Monitor	BeneVision N12	SN_MR245		DeviceName0	Shutdown (2020-12-0	PICU Room28 Bed18	00-0F-14-04-9B-0C-3	West Area
Monitor	BeneVision N12	SN_MR242		DeviceName0	Offline (2020-12-09 1	PICU Room49 Bed3	00-0F-14-04-9B-0C-3	West Area
Monitor	BeneVision N12	SN_XF125		DeviceName0	Shutdown (2020-12-0	RICU Room11 Bed1	00-0F-14-04-9B-0C-3	West Area
Monitor	BeneVision N12	SN_XF142		DeviceName0	Offline (2020-12-09 1	RICU Room20 Bed25	00-0F-14-04-9B-0C-3	West Area
Monitor	BeneVision N12	SN_MR235		DeviceName1	Shutdown (2020-12-0	Cardiology Room11 Bed	00-0F-14-04-9B-0C-37	East Area
Monitor	BeneVision N22/19	SN_XF167		DeviceName1	Shutdown (2020-12-0	GW Room40 Bed9	00-0B-AB-04-9B-96-B	
Monitor	BeneVision N12	SN_XF117		DeviceName1	Shutdown (2020-12-0	MICU Room0 Bed29	00-0F-14-04-9B-0C-3	West Area
Monitor	BeneVision N12	SN_MR299		DeviceName1	Offline (2020-12-09 1	RICU Room4 Bed15	00-0F-14-04-9B-0C-3	West Area
Monitor	BeneVision N22/19	SN_XF198		DeviceName2	Shutdown (2020-12-0	GW Room8 Bed15	00-0B-AB-04-9B-96-B	West Area
Monitor	BeneVision N12	SN_MR200		DeviceName2	Shutdown (2020-12-0	ICU Room13 Bed10	00-0F-14-04-9B-0C-3	West Area
Monitor	BeneVision N12	SN_XF169		DeviceName2	Offline (2020-12-09 1	RICU Room47 Bed13	00-0F-14-04-9B-0C-3	West Area
Monitor	BeneVision N22/19	SN_MR283		DeviceName3	Shutdown (2020-11-2	Room15 Bed23	00-0B-AB-04-9B-96-B	
Monitor	BeneVision N22/19	SN_MR210		DeviceName3	Shutdown (2020-11-2	Room41 Bed8	00-0B-AB-04-9B-96-B	
Monitor	BeneVision N12	SN_XF165		DeviceName3	Shutdown (2020-12-0	Cardiology Room27 Bed	00-0F-14-04-9B-0C-3	West Area
Monitor	BeneVision N12	SN_MR283		DeviceName3	Shutdown (2020-12-0	ICU Room15 Bed23	00-0F-14-04-9B-0C-37	West Area



# Event Notifications

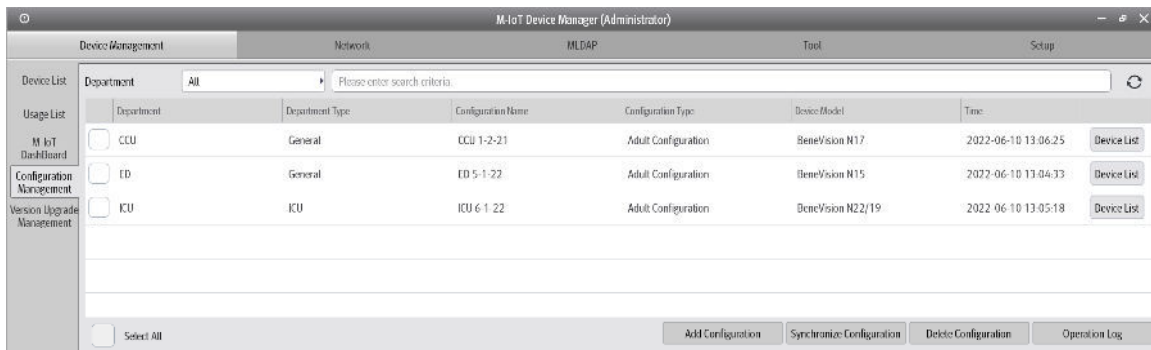
Providing remote tools to manage devices used in the healthcare system is key to ensuring HTM productivity. However, with the increasing number of devices within healthcare systems, oftentimes this is no longer adequate. The HTM is facing more responsibilities and demands which can limit time spent identifying and mitigating equipment failures. Fortunately, an event-driven notification system such as Mindray's Event Notifications can alert the HTM to devices needing attention and help to prioritize quick intervention and optimize uptime.



**Medical devices and IT equipped with SNMP communication provide notifications to a facilities SNMP compatible Network Management System (NMS)**

- SNMP queries and SNMP traps ensure the HTM will get notified through facility NMS of all issues occurring within the Mindray system, allowing them to leverage the existing facility NMS and workflows for notifications, reducing the cost and time needed to deploy solutions.
- SNMP interfaces provide a complete view of the Mindray system for standard IT equipment (switches, wireless network components, and servers) and Mindray medical devices to ensure the HTM is aware of any issues which may impact the delivery of patient care.

# SMC Device Configuration Management



The screenshot shows the M-LoT Device Manager (Administrator) interface. The main window displays a table of device configurations. The table has columns for Department, Department Type, Configuration Name, Configuration Type, Device Model, and Time. There are three rows of data, each with a 'Device List' button to its right. Below the table, there are buttons for 'Add Configuration', 'Synchronize Configuration', 'Delete Configuration', and 'Operation Log'. A 'Select All' checkbox is also present at the bottom left of the table area.

Department	Department Type	Configuration Name	Configuration Type	Device Model	Time	
<input type="checkbox"/> CCU	General	CCU 1-2-21	Adult Configuration	BeneVision N17	2022-06-10 13:06:25	Device List
<input type="checkbox"/> ED	General	ED 5-1-22	Adult Configuration	BeneVision N15	2022-06-10 13:04:33	Device List
<input type="checkbox"/> ICU	ICU	ICU 6-1-22	Adult Configuration	BeneVision N22/19	2022-06-10 13:05:18	Device List

Devices and device configurations within a healthcare system are constantly evolving. From replacing devices to swapping them out for repair or updating clinical default settings to address a new patient care protocol or alarm fatigue initiative, the need to ensure all devices have the correct configuration is paramount. The Mindray SMC Device Configuration Management Tool provides a centralized and documented management console to reduce the time, travel, and manual documentation required of the HTM, in turn helping to increase productivity and reduce maintenance costs.

## The SMC Device Configuration Console:

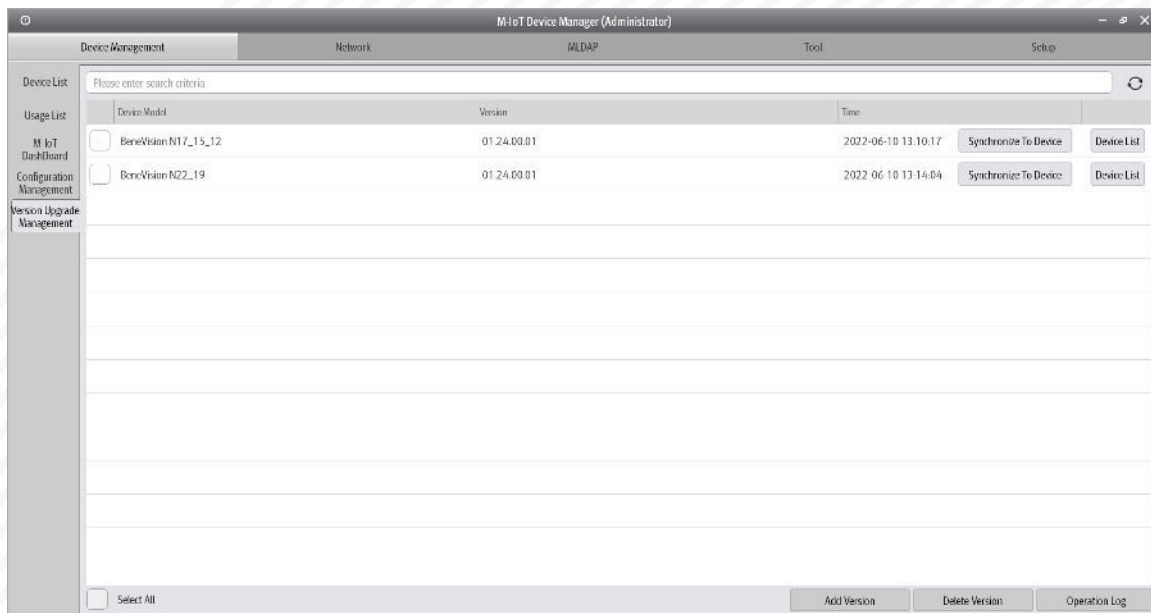
- Once loaded, device configurations can be pushed to the selected devices within the healthcare system, ensuring the HTM is aware of which devices are required to receive the new configurations
- Enables the management of multiple configuration sets that can be specialized to specific care areas, types of patients, device types, or departments and can be deployed anywhere within the healthcare system
- Improves workflow productivity of the HTM by eliminating the need to visit each device manually
- Provides a log detailing: the configuration pushed to each device, which devices received the configuration, and when the settings were downloaded
- Provides a log of devices that failed to receive the new configuration so the HTM can quickly identify which devices need to be addressed

# SMC Software Version Management

When software updates are required to expand capabilities, address issues, or patch security vulnerabilities, the HTM must ensure all required devices are addressed. The Mindray SMC Software Version Management Tool provides a centralized and documented software version management tool to help reduce the time, travel, and manual documentation requirements on the HTM, with the goal of increasing productivity and reducing maintenance costs.

## Software Version Management Console:

- Users can load software packages, then push them to the selected device within the healthcare system, all in the software version console to ensure the HTM is aware of which devices are required to receive the new software
- Allows management of multiple software releases that can be deployed anywhere with the healthcare system
- Eliminates the need for the HTM to travel to each device and manually update it with a USB
- Software upgrades can be deployed when a patient is not being monitored by the device to reduce any disruption or continuity in care; before the upgrade is performed, the user would acknowledge that the device is not in use
- Provides a list of upgraded devices and documents when the device received the new software and to which version it was upgraded
- Provides a log of devices that were not upgraded due to failure or not being acknowledged on the device so the HTM can quickly identify which devices need to be addressed



# SMC System Log Tool

Notifications of issues are received two ways – either automatically or by a healthcare provider contacting the HTM – allowing the HTM to have immediate remote access to begin troubleshooting using the Mindray SMC System Log Tool.

The screenshot displays the SMC System Log Tool interface. It features a main log table with columns for Time, Description, Department, Room No. - Bed No., and Device Name. The log entries include:

Time	Description	Department	Room No. - Bed No.	Device Name
2022-04-29 18:14:47	!!!Network is disconnected. Please check. [End Time: 2022-05-09 17:42:38]			
2022-04-29 16:38:12	Station - Network Disconnected			
2022-04-29 16:38:11	WorkStation (192.168.0.50, 08-00-27-04-9D-F5-05-B2 ) Disconnected			
2022-04-29 13:35:04	System Setup(Other)Time: Set System Time: 04-29-2022 13:35:04			
2022-04-29 16:37:56	System Setup, Close			
2022-04-29 16:37:52	System Setup(Other)Time: Set System Time: 04-29-2022 16:37:52			
2022-04-29 13:34:34	System Setup(Other)Time: Set System Time: 04-29-2022 13:34:34			
2022-04-29 16:37:56	System Setup, Close			
2022-04-29 13:34:12	Login Successfully. Password Type: User Maintenance			

On the left, there are filter panels for Central Station (set to POD1), Department (set to All), Bed No., and Device Name. Below these are checkboxes for various log categories, including:

- Technical Alarm (High, Med, Low, Prompt)
- Physiological Alarm (High, Med, Low, Prompt)
- Analy Alarm (Lethal Analy, Non-Lethal Analy)
- Alarm Management (Alarm Paused/Off, Alarm Reset, Global Silence, Alarm Sound Adjusted/Off, Alarm Sound/Reminder Played, Alarm Setup, Mode Switch)
- Measurements (Measurement On/Off, Measurement Setup)
- Patient Management (Patient ADT, Patient Information Modified, Patient Data Managed)
- Security (Login/Logout, Remote Data Access, Storage Device, Network, Device Management)
- System Setup (Alarm Setup, Patient Management, Adjust System Time, Authorization Setup, Network Setup, Other)

Buttons for 'Cancel All', 'Search', 'Select All', 'Export Log', and 'Jump To' are visible at the bottom of the interface.

## SMC System Log Tool:

- Provides remote access to review logs from anywhere within the healthcare system to decrease response time and eliminate travel for the HTM
- Enables search, sort, and filter by physiological, technical, or security logs to assist the HTM in quickly finding a device or generating reports around the events of interest
- Enables the HTM to export a report detailing the filtered log entries from the Mindray system

Using automated notifications and the ability to access data from anywhere within the healthcare system, the Mindray SMC and M-iOT provide HTMs with the tools required to overcome daily challenges and achieve the critical goal of delivering quality care everywhere. With these tools, HTMs are empowered to reduce response time and maintenance costs, as well as increase productivity and uptime within their healthcare system.

# healthcare within reach



monitoring • anesthesia • ultrasound

**Vision:** Better healthcare for all

**Mission:** Advance medical technologies to make healthcare more accessible

Mindray is a leading developer, manufacturer and supplier of medical device solutions and technologies used in healthcare facilities around the globe. We believe we can change lives by making the most advanced healthcare technology attainable for all. We do this by empowering healthcare professionals through innovative, high-value solutions that help create the next generation of life-saving tools across patient monitoring, anesthesia delivery and ultrasound imaging.

At Mindray, we understand the shift in healthcare from volume to value and continuously deliver solutions that matter in this evolving environment. Our team is disrupting the industry, radically addressing today's needs with the technology of tomorrow. We are creating innovative, game-changing products and partnerships, shaping a new conversation for healthcare providers across North America. We work with thousands of healthcare providers day-to-day to drive the development and implementation of smarter technology – solutions that are simple and affordable, easy to adapt, and return bottom line results and meaningful outcomes. Together, we are creating a higher standard for healthcare.

**Mindray North America is headquartered in Mahwah, New Jersey. Our Ultrasound Innovation Center is located in San Jose, California with additional facilities in Nashville, Tennessee and Seattle, Washington.**



Mindray North America Corporate Headquarters, Mahwah, NJ



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