CARESCAPE Central Station

User's Manual

Software version 1

Hardware series MP100

CARESCAPE Central Station
English
2048003-001 (CD)
2048002-001E (paper)

The information in this manual applies to the software and hardware version listed on the first page of the manual. Due to continuing innovation, specifications in this manual are subject to change without notice.

For technical documentation purposes, the abbreviation GE is used for the legal entity name, GE Medical Systems *Information Technologies*, Inc., and GE Healthcare Finland Oy.

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About this manual

Manual intended use

This manual is an integral part of the system. It should always be kept close to the system. Observance of the manual is a prerequisite for proper performance and correct operation and ensures patient and user safety.

This publication conforms with the specifications and applicable IEC publications on safety and essential performance, as well as applicable UL and CSA requirements and AHA recommendations.

Manual conventions

This manual uses the following styles to emphasize text or indicate action.

Item	Description
bold	Indicates hardware terms.
bold italic	Indicates software terms.
italic	Indicates terms for emphasis.
+	Indicates keyboard keys to select simultaneously.
>	Indicates menu options to select consecutively.
X	supported
—	not supported
(7)	Indicates page number.

Illustrations and names

This manual uses illustrations as examples only. Illustrations in this manual may not necessarily reflect all settings, features, configurations, or displayed data.

Names of persons, institutions, and places and related information are fictitious; any similarity to actual persons, entities, or places is purely coincidental.

Common terms

This manual uses the following terms to simplify common terms:

Item	Description
acquisition device	Refers to acquisition modules or other acquisition devices used to acquire and process parameter data.
bedside monitor	Refers to bedside monitors, including patient monitors, transport monitors, or wireless monitors on the network.
central station	Refers to the CARESCAPE Central Station.
monitoring device	Refers to bedside monitors or telemetry monitoring devices.
printer	Refers to direct digital writers or laser printers.
network	Refers to the CARESCAPE Network. The Unity Network has been renamed to the CARESCAPE Network. Not all references to the Unity Network will be changed immediately; Unity may appear in some places and CARESCAPE in others. It is important to understand that while the CARESCAPE Network replaces the Unity Network name, they refer to the same GE monitoring network.
telemetry monitoring device	Refers to telemetry monitoring devices, including transmitters, transceivers, and the established telemetry system.
writer	Refers to direct digital writers (DDW).

Ordering manuals

A paper copy of this manual will be provided upon request. Contact your local GE representative and request the paper manual part number on the first page of the manual.

Related manuals

The release notes supplement is created on an as needed basis. If provided, this supplement should be read prior to reading the documents listed below. Release notes provide one or more of the following: updates to this document and/or the document(s) below, additional information, and workarounds.

The technical manual provides installation instructions and contact information for persons qualified to perform the installation.

The supplies and accessories supplement provides information on supplies and accessories approved for use with this system.

The compatible devices supplement provides information on compatible devices approved for use with this system.

The technical specifications supplement provides information on the physical and design characteristics of this system.

Additional resources

For white papers, guides, and other instructive materials about our clinical measurements, technologies, and applications, please visit: http://clinicalview.gehealthcare.com

Revision history

The part number and revision letter for this manual are at the bottom of each page. The revision letter changes whenever the manual is revised. The first letter shown in the following table is the first customer-released version of this manual.

Revision	Description
E	Initial release.

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Safety precautions

Safety message signal words

Safety message signal words designate the severity of a potential hazard. The signal words danger, warning, caution, and notice are used throughout this manual to point out hazards and to designate a degree or level of seriousness. A hazard is defined as a source of potential injury to a person. Learn their definitions and significance.

DANGER	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a hazardous situation not related to personal injury that, if not avoided, could result in property damage.

The order in which safety messages are presented in no way implies the order of importance. The following safety messages apply to the system. Safety messages specific to parts of the system are found in the relevant section of this manual.

Danger safety messages

No danger safety messages apply to this system.

Warning safety messages

The following warning safety messages apply to this system:

WARNING	ACCIDENTAL SPILLS — To avoid electric shock or device malfunction, liquids must not be allowed to enter the device. If liquids have entered a device, take it out of service and have it checked by authorized service personnel before it is used again.
WARNING	ACCURACY — If the accuracy of any value displayed on the screen or printed is questionable, first determine the patient's vital signs by alternative means. Then, verify the monitoring devices and printers are working correctly.

WARNING ACCURACY — Regardless of the units of measurement used to display the values at the monitoring device, the monitoring device sends CO2 values in mmHg, an absolute pressure, to the central station. If the central station is configured to display CO2 in relative values (i.e., percent), a conversion including barometric pressure is used to display relative values. If the accuracy of any value displayed on the screen or printed is questionable, refer to the values displayed on the monitoring device.

WARNING ACCURACY — Regardless of the units of measurement used to display the values at the monitoring device, the monitoring device sends O2 and Gas values in percent, a relative pressure, to the central station. If the central station is configured to display either O2 or Gas in absolute values (i.e., mmHg or kPa), a conversion including barometric pressure is used to display absolute values. If the accuracy of any value displayed on the screen or printed is questionable, refer to the values displayed on the monitoring device.

WARNING ADJUSTING WAVEFORM COLORS — For a locked patient Multi-Viewer window, the color changes remain in effect until a user manually changes the colors. Depending on the bedside monitor and acquisition device, waveform colors may change when removing a parameter from the bedside monitor and then adding it back again (e.g., removing and then re-inserting a TRAM module).

WARNING ADJUSTING WAVEFORM COLORS — For an unlocked patient Multi-Viewer window, the waveform color changes remain in effect until the patient is removed from the Multi-Viewer, discharged, or the patient is moved to another patient Multi-Viewer window. Depending on the bedside monitor and acquisition device, waveform colors may change when removing a parameter from the bedside monitor and then adding it back again (e.g., removing and then re-inserting a TRAM module).

WARNING ALARM ACTIVATION — Audio alarms do not sound and visual alarm indicators do not display at the central station until a patient is admitted. The central station will not provide alarm notification if an unadmitted patient enters an alarm condition. You must admit the patient to activate the alarm notification, automatic alarm printing, and events storage.

WARNING ALARM CONTROL SETTINGS — Parameter alarm limits or alarm priority levels adjusted at the central station are also implemented at the bedside monitor, unless the settings are locked. Always notify the bedside clinician when parameter alarm limits or alarm priority levels are adjusted.

WARNING ALARM LIMITS — Always make sure that necessary alarm limits are active and set according to the patient's clinical condition when you start monitoring a patient. Setting alarm limits lower than clinically relevant for a patient may result in reduced awareness of patient critical conditions (i.e., alarms).

WARNING ALARM NOTIFICATION — ***HIGH*** (***CRISIS***) priority level alarms will continue to audibly and visually alarm until the alarm ***AUDIO PAUSE*** button or alarm **AUDIO PAUSE** keyboard key is manually selected.

WARNING ALARM PRIORITY LEVEL — The CARESCAPE Central Station has different ***Telemetry Alarm Setup Defaults*** > ***Technical Alarm Priorities*** custom default options than the CIC Pro Clinical Information Center for telemetry monitoring devices.

Use the latest version CARESCAPE Central Station in the unit when making changes to the Technical Alarm Priorities custom defaults.

Failure to use the latest version CARESCAPE Central Station in the unit will render some options unavailable (e.g., ***HIGH*** (***CRISIS***) alarm priority level).

For more information, see the technical manual accompanying the central station.

WARNING ALARM VOLUME — Adjustment of the minimum alarm volume to a low level or off may allow the actual volume to be adjusted to a low level or off during monitoring, which may result in a hazard to patients.

WARNING ALARMS OFF — The telemetry monitoring device alarms remain off until you manually select ***ON***.

WARNING ARRHYTHMIA DETECTION — Manually changing the arrhythmia detection level to ***Lethal*** may result in a missed arrhythmia or adverse patient outcome, as only lethal arrhythmia alarms will be detected. Do not rely exclusively on the audio arrhythmia alarms. Always keep patients under close observation and notify the bedside clinician whenever arrhythmia detection settings are changed. Before changing the setting, assess the patient condition to ensure the change is appropriate for the patient.

WARNING ARRHYTHMIA DETECTION — Manually changing the arrhythmia detection level to ***OFF*** may result in a missed arrhythmia or adverse patient outcome, as no arrhythmia alarms will be detected. Always keep patients under close observation and notify the bedside clinician whenever arrhythmia detection settings are changed. Before changing the setting, assess the patient condition to ensure the change is appropriate for the patient.

WARNING AUDIO ALARM PAUSE — Do not continuously try to pause audio alarms. New alarms could be inadvertently paused.

WARNING AUDIO ALARM PAUSE — Do not rely exclusively on the alarm pause breakthrough feature for alarm notification during an audio alarm pause. This may result in a hazard to the patient as only ***HIGH*** (***CRISIS***) priority alarms break through.

WARNING AUDIO ALARMS — Some bedside monitors (e.g., CARESCAPE Monitor B850) provide the ability to turn off alarm notifications at the bedside monitor (e.g., sleep mode, display off/alarm off). In the event that a network disconnection occurs, and the central station ***NO COMM AUDIO*** was set to ***Disable*** before clinical use, then only a visual ***NO COMM*** notification appears at the central station for that bedside monitor. For additional information on turning off alarm notifications at the bedside monitors, see the documentation accompanying the bedside monitor.

For additional information about ***NO COMM AUDIO*** configuration, see the central station technical manual.

WARNING AUDIO ALARM TONES — To comply with international specifications for alarming (e.g., IEC 60601-1-8), newer devices like the CARESCAPE Central Station and CARESCAPE Monitor B850 use a slightly different order for alarm priorities than older devices like the CIC Pro Clinical Information Center and Dash 3000 patient monitor. This results in occasional differences between audio and/or visual annunciation of alarms between the newer and older devices. Different audio alarm tones may occur from a CARESCAPE Central Station verses a CIC Pro Clinical Information Center for certain combinations of alarms. Across multiple older devices displayed by the same central station, when the two highest alarms are ***SYSTEM WARNING*** and physiological ***LOW*** (***ADVISORY***), then CARESCAPE Central Station sounds the ***MEDIUM*** (***WARNING***) audio alarm tone while the CIC Pro Clinical Information Center sounds the ***LOW*** (***ADVISORY***) audio alarm tone.

WARNING AUDIO ALARM TONES — GE recommends using the same audio alarm tones for all monitoring devices within the same unit to reduce the chance of difficulty differentiating between alarm priority levels based on audio alarm tones which could result in missed higher priority alarm.

WARNING AUDIO ALARMS — Do not rely exclusively on the audio alarm system for monitoring. Remember that the most reliable method of monitoring combines close personal surveillance with correct operation of monitoring devices.

WARNING AUDIO ALARMS — Audio alarms will not sound at the central station when a bedside monitor is configured for use in operating rooms.

WARNING AUDIO ALARMS — The functions of the alarm system must be verified at regular intervals. Check speaker volume of all connected speakers periodically to ensure audio alarm functionality.

WARNING BEFORE INSTALLATION — Compatibility is critical to safe and effective use of this device. Only external devices specifically designed to be connected to the CARESCAPE Central Station, or approved by GE for use with the CARESCAPE Central Station, should be connected, as specified in this manual or as otherwise specified by the manufacturer. To avoid possible reduced system performance, please contact your local GE representative prior to installation to verify equipment compatibility.

WARNING BEFORE USE — Before putting the system into operation, visually inspect all connecting cables for signs of damage. Damaged cables and connections must be replaced immediately.

Before using the system, the user must verify that it is in correct working order and operating condition.

Periodically, and whenever the integrity of the product is in doubt, test all functions.

Consult the technical manual for information related to installation of this device prior to clinical use.

WARNING DISCONNECTION FROM MAINS — When disconnecting the system from the power line, remove the plug from the wall outlet first. Then you may disconnect the power cord from the device. If you do not observe this sequence, there is a risk of coming into contact with line voltage by inserting metal objects, such as the pins of leadwires, into the sockets of the power cord by mistake.

WARNING EXCESSIVE LEAKAGE CURRENT — Do not place non-medical grade devices (e.g., laser printers, remote displays) within the patient environment without an additional isolating or separating transformer providing basic isolation to avoid unacceptable enclosure leakage current.

WARNING EXCESSIVE LEAKAGE CURRENT — Do not use a multiple socket outlet or extension cord.

WARNING EXCESSIVE LEAKAGE CURRENT — Do not plug the CARESCAPE Central Station into a power strip used by other non-medical grade devices, such as a laser printer. Laser printers are UL 60950/IEC 60950 certified equipment, which may not meet the leakage current requirements of patient care equipment. This equipment must not be located in the patient environment unless the medical system standard EN 60601-1-1 is followed. Do not connect a laser printer to a multiple socket outlet supplying patient care equipment. The use of multiple socket outlet for a system will result in an enclosure leakage current equal to the sum of all the individual earth leakage currents of the system if there is an interruption of the multiple socket outlet protective earth conductor. Consult authorized service personnel before installing a laser printer.

WARNING EXPLOSION HAZARD — Do not use this device in the presence of flammable anesthetics, vapors, or liquids, or in an oxygen-rich environment.

WARNING INCORRECT ALGORITHMS, ARRHYTHMIA PROCESSING, AND CALCULATIONS BASED ON PATIENT AGE — After manually updating or automatically retrieving patient information from a network database, *always* confirm that the entered patient's date of birth matches the patient's actual date of birth. Otherwise the appropriate age-related algorithms, arrhythmia detection, and calculations will not be applied.

WARNING INSTRUCTIONS FOR USE — For continued safe use of this device, it is necessary that the listed instructions are followed. However, instructions listed in this manual in no way supersede established medical practices concerning patient care.

WARNING INTENDED USE — This device is for use by qualified medical personnel only.

WARNING INTERFACING OTHER DEVICES — Devices may only be interconnected with each other or to parts of the system when it has been determined by authorized service personnel that there is no danger to the patient, the user, or the environment as a result.

In those instances where there is any element of doubt concerning the safety of connected devices, the user must contact the manufacturers concerned (or other informed experts) for proper use.

In all cases, safe and proper operation should be verified with the applicable manufacturer's instructions for use and system standards IEC 60601-1-1/EN 60601-1-1 must be complied with.

WARNING LOSS OF DATA — If the bedside monitor does not automatically resume operation after 60 seconds, power cycle the monitor using the power on/off switch. Use alternative monitoring devices or close patient observation until monitoring at the central station is restored. Once monitoring at the central station has been restored, check the monitoring state and alarm system function. If monitoring is not restored, contact authorized service personnel.

WARNING LOSS OF MONITORING — Do not use viewing ***Other Patients*** as a substitute for having enough patient Multi-Viewer windows configured to display in the Multi-Viewer to support all patients monitored in a care unit. Loss of monitoring at the central station may result.

WARNING LOSS OF MONITORING — If monitoring at the central station is temporarily interrupted, alternative monitoring devices or close observation of the patients must be used until the monitoring function at the central station is restored.

Indications of a loss of monitoring at the central station are as follows:

- A red screen indicates the central station is restarting itself and monitoring at the central station is not occurring. Monitoring at the central station will automatically resume in less than 30 seconds. No user action is required.
- A blue screen indicates the Windows operating system has a functional error and monitoring at the central station is not occurring.

If the central station does not automatically restart after 120 seconds, monitoring at the central station will not resume until you turn off the central station then turn it back on using the power on/off switch. Monitoring should resume in less than three minutes.

Once monitoring at the central station has been restored, check the monitoring state and alarm system function. If monitoring is not restored, contact authorized service personnel.

WARNING LOSS OF MONITORING — If ***Browser*** is inappropriately used, loss of monitoring at the central station may result. Use alternative monitoring devices or close patient observation until the central station monitoring function is restored.

When using ***Browser***, follow these restrictions:

- Do not attempt to access the file systems of the central station.
- Do not attempt to download files of any type (e.g., audio or video files).
- Do not play user-defined audio (e.g., Media Player or streaming radio stations).
- Do not attempt to access web applications or web sites outside of the protected and isolated hospital intranet environment.

If the central station does not automatically resume operation after 120 seconds, turn off the central station then turn it back on using the power on/off switch. Monitoring should resume in less than three minutes. Once monitoring at the central station has been restored, check the monitoring state and alarm system function. If monitoring is not restored, contact authorized service personnel.

WARNING LOSS OF MONITORING — Leave space for circulation of air to prevent the equipment from overheating. The manufacturer is not responsible for damage to equipment caused by improperly vented cabinets, improper or faulty power, or insufficient wall strength to support equipment mounted on such walls. The environmental operating conditions specified in the technical specifications must be ensured at all times.

WARNING LOSS OF MONITORING — Periodically, and whenever the integrity of the device is in doubt, test all functions.

WARNING LOSS OF MONITORING — Safely turning off this device and/or removal of the device from mains power should be done by authorized service personnel.

For more information, see the technical manual.

WARNING MAINTENANCE — Regular preventative maintenance should be carried out annually. Following any applicable country-specific requirements is the responsibility of the hospital.

WARNING MISMATCHED PATIENT DATA — Always verify that the displayed patient information corresponds to the patient identification number of the patient on the bedside monitor.

WARNING MISSED ALARMS — Do not rely on receipt of the following alarm conditions at a central station when connected to the CARESCAPE Network MC. Notification of any of these alarm conditions will only be given when it is the most recent, highest priority active alarm coming from the monitor. This applies to the following parameter alarm limits and technical (system status) alarms:

- ECG HR limit (if Single HR mode and Primary HR is not ECG)
- QT and QTc high limit
- CPP high/low limit
- Tblood-T1 Delta and Tblood-T3 Delta high limit
- RE and SE high/low limit
- PEEPtot, PEEPe, PEEPi high/low limit
- MVexp high limit
- IP systolic & diastolic high/low limit for sites: P1-P8, ICP, CVP, RAP, RVP, LAP, UVC, FemV
- No Px Transducer
- SvO2 Cable Off
- Measurement Removed for ECG, Pressure, NIBP, SpO2, SvO2, CO, Temp, Gas
- Identical Modules for IP, SpO2, COP, Temp, Gas, Entropy
- Remove One ECG Module

WARNING MISSED ALARMS — Failure to have enough patient Multi-Viewer windows to cover the total of both hard-wired bedside monitors and telemetry monitoring devices in the unit may result in unmonitored patients and a potential to miss audio and visual alarm notification for those unmonitored patients.

WARNING MISSED ALARMS — If multiple high priority system status alarms occur at the same time, only one displays. Select the central station system status button/drop-down menu to display other system status alarms.

WARNING MISSED ALARMS — Only the most recent, highest priority alarm is sent to remote devices on the CARESCAPE Network MC. Therefore, less recent alarms of equal or lower priority may not be displayed remotely.

WARNING MIXED ENVIRONMENT — A hazard can exist when the same type of bedside monitors in the same unit are using different configuration settings.

WARNING NETWORK INTEGRITY — This device resides on the hospital's network, and it is possible that inadvertent or malicious network activity could adversely affect monitoring. The integrity of the network is the responsibility of the hospital.

WARNING OUT-OF-UNIT ALARMS — Depending on the central station configuration, audio alarms may not sound at the central station for any viewed out-of-unit patients. Only visual alarm indicators display unless the central station is configured to also sound audio alarms. For more information, contact authorized service personnel.

WARNING OUT-OF-UNIT ALARMS — If the central station is configured to sound audio out-of-unit alarms, any patient displayed on the out-of-unit central station can have the active audio alarms paused at the out-of-unit central station.

WARNING PACEMAKER DETECTION — A pacemaker pulse can be counted as a QRS during ***ASYSTOLE*** when pacemaker detection is enabled. Keep pacemaker patients under close observation.

WARNING PACEMAKER PATIENTS — Rate meters may continue to count the pacemaker rate during occurrences of cardiac arrest or some arrhythmias. Do not rely entirely upon rate meter alarms. Keep pacemaker patients under close surveillance. See the monitoring device manual for disclosure of the pacemaker pulse rejection capability.

WARNING PERMANENT INSTALLATION — Do not move the central station or any system device while the central station is running. Doing so could result in failure of the system to work properly. Refer all installation modifications to authorized service personnel.

WARNING POWER REQUIREMENTS — Before connecting the device to the power line, check that the voltage and frequency ratings of the power line are the same as those indicated on the device's label. If this is not the case, do not connect the system to the power line until authorized service personnel adjust the device to match the power source. In the US, if the installation of this device will use 240 V rather than 120 V, the source must be a center-tapped, 240 V, single-phase circuit. This device is suitable for connection to public mains as defined in CISPR 11.

WARNING POWER SUPPLY — This device must be connected to a properly installed power outlet with protective earth contacts only. If the installation does not provide for a protective earth conductor, disconnect the device from the power line and operate it on battery power, if possible. GE recommends the use of an Uninterrupted Power Supply (UPS) with the central station, including displays. If a UPS is not used, improper shutdowns of the system could result from power outages and cause a lengthy disk scan delays when the device reboots. Data could be lost in the event of a power outage. All system devices must be connected to the same power supply circuit. Devices that are not connected to the same power supply circuit must be electrically isolated when operated.

For more information, see the technical manual.

WARNING QUALIFIED PERSONNEL — The service mode and alarm service mode are intended for use only by qualified personnel with training and experience in their use. The consequences of misuse include loss of alarm configuration, loss of patient data, corruption of the operating system software, or disruption of the network.

WARNING REQUEST ADMIT INFO — Verify the accuracy of any displayed information after requesting admit information. Patient information entered here may be truncated on the central station display based on limitations of the monitoring device.

WARNING RESPIRATION — If the ***CARDIFACT*** alarm is disabled, ***APNEA*** events may not be detected.

WARNING RESTRICTED SALE — US federal law restricts this device to sale by or on order of a physician.

WARNING SAFETY TESTS — Failure on the part of all responsible individuals, hospitals, or institutions employing the use of this device to implement the recommended maintenance schedule may cause device failure and possible health hazards. The manufacturer does not in any manner assume the responsibility for performing the recommended maintenance schedule, unless an Equipment Maintenance Agreement exists. The sole responsibility rests with the individuals, hospitals, or institutions utilizing the device.

WARNING SHOCK HAZARD — Disconnect AC-powered devices from the power line before cleaning or disinfecting its surface. Turn off the power to battery-powered devices before cleaning or disinfecting its surface.

WARNING SHOCK HAZARD — Do not pour or spray any liquid directly on cables or leadwires or permit fluid to seep into connections or openings.

WARNING SHOCK HAZARD — Never immerse devices, cables, or leadwires in any liquid or allow liquid to enter the interior.

WARNING SITE REQUIREMENTS — Do not route cables in a way that they may present a stumbling hazard. For devices installed above the user or patient, adequate precautions must be taken to prevent them from dropping on the user or patient.

WARNING SMART ALARMS — Audio alarms do not sound, events are not stored, alarms do not print, and alarms are not sent to the Network when the alarms are turned off.

WARNING SUPERVISED USE — This device is intended for use under the direct supervision of a licensed health care practitioner.

WARNING UNINTENTIONAL RADIO FREQUENCY (RF) INTERFERENCE — Unintentional RF interference could degrade the reliability and performance of the wireless data link. Maintaining an RF environment free from unintentional interference is the responsibility of the hospital.

WARNING UNTESTED SOFTWARE — Do not load any software other than that specified by GE onto this device. Installation of other software may cause damage to the server or loss or corruption of data.

WARNING USER — Medical devices such as this monitoring system must only be used by medically trained persons who are familiar with the functions, features and workflows of this device and who are capable of applying this knowledge properly.

Caution safety messages

The following caution safety messages apply to this system:

CAUTION DEVICE DAMAGE — Do not autoclave any part of the system with steam (including cables).

CAUTION DEVICE DAMAGE — Never use conductive solutions, solutions that contain chlorides, wax, or wax compounds to clean devices, cables or leadwires.

CAUTION DEVICE DAMAGE — Never use solutions or products that contain the following:

- Any type of Ammonium Chloride such as, but not limited to:
  - Dimethyl Benzyl Ammonium Chloride
  - Quaternary Ammonium Chloride solutions
- Abrasive cleaners or solvents of any kind
- Acetone
- Ketone
- Betadine
- Alcohol-based cleaning agents
- Sodium salts

CAUTION DISCHARGE TO CLEAR PATIENT DATA — When admitting a new patient, you must clear all previous patient data from the system. To accomplish this, disconnect patient cables, then discharge the patient.

CAUTION DISPOSAL — At the end of its service life, the device described in this manual, as well as its accessories, must be disposed of in compliance with the guidelines regulating the disposal of such products. If you have questions concerning disposal of this device, contact your local GE representative.

CAUTION DISPOSAL — Dispose of the packaging material, observing the applicable waste control regulations, and keep it out of children's reach.

CAUTION ELECTROMAGNETIC COMPATIBILITY (EMC) — Changes or modifications to this device/system not expressly approved by GE may cause EMC issues with this or other devices. This device/system is designed and tested to comply with applicable standards and regulations regarding EMC and needs to be installed and put into service according to the EMC information stated as follows:

Use of known RF sources, such as cell/portable phones, or other radio frequency (RF) emitting devices near the system may cause unexpected or adverse operation of this device/system. Consult qualified personnel regarding device/system configuration.

The device/system should not be used adjacent to, or stacked with, other devices. If adjacent or stacked use is necessary, the device/system should be tested to verify normal operation in the configuration in which it is being used. Consult qualified personnel regarding device/system configuration.

The use of accessories, transducers, and cables other than those specified may result in increased emissions or decreased immunity performance of the device/system.

This device/system is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes. Mains power should be that of a typical commercial or hospital environment.

Refer to the electromagnetic compatibility and guidelines in the technical manual for additional compliance and safety information.

CAUTION EMC INTERFERENCE — Magnetic and electrical fields are capable of interfering with the proper performance of the device. For this reason make sure that all external devices operated in the vicinity of the device comply with the relevant EMC requirements. X-ray or MRI devices are a possible source of interference as they may emit higher levels of electromagnetic radiation.

CAUTION INADEQUATE DATA RESOLUTION — Images displayed on this device are not to be used for diagnostic purposes. Always review the original images.

CAUTION INCORRECT HISTORICAL DATA — The 12SL ECG Analysis Program installed in bedside monitors expects 12 ECG leads to perform a complete analysis. The bedside monitor can get 12 ECG leads by using a 10-leadwire ECG cable or by using a 6-leadwire ECG cable. If a 6-leadwire ECG cable is used, the bedside monitor must also have the 12RL program installed so it can compute the other ECG waveforms, after which it then indicates interpolated leads on the 12SL reports.

Some bedside monitors still compute 12SL analysis even though they do not have 12 ECG leads and don't have the 12RL program installed. These bedside monitors do not include the interpolated leads statement on the reports. Missing lead data appears as a zero-level (flat-line) in the corresponding waveform channel and the 12SL report includes a statement that data quality is poor. 12SL reports based on less than 12 ECG leads may not provide a complete analytic interpretation.

The central station retrieves 12SL analysis reports in all the above cases. If the accuracy of the displayed 12SL data is questionable or data is missing, first confirm patient status, then review the data at the primary monitoring device.

CAUTION INSPECTION — Failure on the part of the responsible hospital or institution employing use of this device to implement a satisfactory maintenance schedule may cause undue device failure and possible health hazards.

Notice safety messages

No notice safety messages apply to this system.

Safety symbols

The following symbols appear on one or more of the system devices:

Symbol	Description
	Caution, consult accompanying documents.
	Electrostatic discharge. Connections should not be made to this system unless ESD precautionary procedures are followed.
	Potential equalization conductor (IEC 60601-1). Use this conductor to bring the processing unit to the same potential as other devices in the care unit by connecting a green and yellow potential equalization cable to the pin labeled with the equipotential symbol, and connecting the other end of the cable to the equalization bus bar for the care unit.
	Type B (IEC 60601-1) protection against electric shock. Non-isolated applied part suitable for intentional external and internal application to the patient, excluding direct cardiac application.

Symbol	Description
	Type BF (IEC 60601-1) protection against electric shock. Isolated (floating) applied part suitable for intentional external and internal application to the patient, excluding direct cardiac application.
	Type CF (IEC 60601-1) protection against electric shock. Isolated (floating) applied part suitable for intentional external and internal application to the patient, including direct cardiac application.

Safety tests

WARNING MAINTENANCE — Regular preventative maintenance should be carried out annually. Following any applicable country-specific requirements is the responsibility of the hospital.

WARNING SAFETY TESTS — Failure on the part of all responsible individuals, hospitals, or institutions employing the use of this device to implement the recommended maintenance schedule may cause device failure and possible health hazards. The manufacturer does not in any manner assume the responsibility for performing the recommended maintenance schedule, unless an Equipment Maintenance Agreement exists. The sole responsibility rests with the individuals, hospitals, or institutions utilizing the device.

General safety tests must be performed every 12 months. Detailed information and frequency of safety tests can be found in the technical manual. Safety tests should only be performed by authorized service personnel. If a service contract exists, safety tests may be performed by GE Service.

Refer to the electromagnetic compatibility and guidelines in the technical manual for additional compliance and safety information.

Verifying proper operation

WARNING AUDIO ALARMS — Audio alarms will not sound at the central station when a bedside monitor is configured for use in operating rooms.

WARNING AUDIO ALARMS — The functions of the alarm system must be verified at regular intervals. Check speaker volume of all connected speakers periodically to ensure audio alarm functionality.

WARNING BEFORE USE — Before putting the system into operation, visually inspect all connecting cables for signs of damage. Damaged cables and connections must be replaced immediately.

Before using the system, the user must verify that it is in correct working order and operating condition.

Periodically, and whenever the integrity of the product is in doubt, test all functions.

Consult the technical manual for information related to installation of this device prior to clinical use.

WARNING LOSS OF MONITORING — Periodically, and whenever the integrity of the device is in doubt, test all functions.

To verify proper operation, complete the following procedure:

1. Turn on the central station and primary display.
2. Check that the Multi-Viewer displays within three minutes.
3. Check that monitoring devices in the unit are assigned to patient Multi-Viewer window as appropriate.
4. Check that the central station displays parameter numerics and waveforms for admitted monitoring devices.
5. Check that dialog boxes, command prompts, or other visual elements are not obstructing the view of the patient Multi-Viewer windows or alarm notification. Dismiss, acknowledge, or close these elements as appropriate.
6. Check that the keyboard and mouse can be used to enter text and select items.
7. Check that objects (e.g., books) are not depressing keyboard keys.
8. Check that external speakers are connected to the processing unit.
9. Check that alarm volume settings are appropriate for individual patients and the unit.
10. Check that alarm settings are appropriate for individual patients and the unit, including parameter alarm limits, alarm priority levels, and alarm deactivation (i.e., ***AUDIO PAUSE***, alarms off indicator, etc.).
11. Select a bedside monitor not in patient use with all alarm notification activated, including automatic alarm printing, then check that the central station alarm notification is active:
    a. Connect an SPO2 sensor.
    b. Decrease the SPO2 ***High*** parameter alarm limit until the patient's current SPO2 value exceeds the new setting.
    c. Set the ***SPO2*** alarm priority level to ***LOW*** (***ADVISORY***), ***MEDIUM*** (***WARNING***), or ***HIGH*** (***CRISIS***).

       Some bedside monitors do not allow the ***SPO2*** alarm priority level to be set to ***LOW*** (***ADVISORY***). For more information, see the documentation accompanying the bedside monitor.
    d. Check that the audio alarm sounds the correct tone. For more information, see Audio alarm tones (91).

e. Check that the pulse rate in the parameter window flashes the correct color. For more information, see Visual alarm indicators (92).

f. Check that an automatic alarm printout is sent to the configured printer.

g. Pause the active audio alarms.

h. Check that the visual alarm notification continues during the audio alarm pause.

i. Check that the audio alarm pause ends within two minutes.

j. Return the SPO2 ***High*** parameter alarm limit and ***SPO2*** alarm priority level to the original settings.

Safely turning off the device

WARNING LOSS OF MONITORING — Safely turning off this device and/or removal of the device from mains power should be done by authorized service personnel.

For more information, see the technical manual.

WARNING QUALIFIED PERSONNEL — The service mode and alarm service mode are intended for use only by qualified personnel with training and experience in their use. The consequences of misuse include loss of alarm configuration, loss of patient data, corruption of the operating system software, or disruption of the network.

3

About this system

Intended use

The CARESCAPE Central Station is intended for use under the direct supervision of a licensed healthcare practitioner. The intended use is to provide clinicians with adult, pediatric and neonatal patient data within a hospital or clinical environment.

The CARESCAPE Central Station is intended to collect, display and print information from a network, including patient demographics, physiological parameters and waveforms, alarm annunciation and/or other non-medical information from monitors and telemetry systems. Physiological parameters and waveforms include electrocardiograph (ECG), pulse oximetry (SPO2), invasive blood pressures (IBP), non-invasive blood pressure (NIBP), respiration (RR), ventilator (VNT), carbon dioxide (CO2), oxygen (O2), mass spectrometry (Gas), temperature (Temp) and bispectral index (BIS). Beat to beat patient information for parameters and waveforms from the bedside and telemetry systems can be displayed. Patient monitor and telemetry system settings can be adjusted. Parameter values derived from patient data can be calculated, displayed, and printed.

The CARESCAPE Central Station supports the ability to access information from GE products and hospital intranet in a web browser format. Additionally, CARESCAPE Central Station supports the ability to access patient information collected from the CARESCAPE network and stored on a network server.

User profile

WARNING INTENDED USE — This device is for use by qualified medical personnel only.

WARNING RESTRICTED SALE — US federal law restricts this device to sale by or on order of a physician.

WARNING SUPERVISED USE — This device is intended for use under the direct supervision of a licensed health care practitioner.

WARNING USER — Medical devices such as this monitoring system must only be used by medically trained persons who are familiar with the functions, features and workflows of this device and who are capable of applying this knowledge properly.

Users are expected to have a working knowledge of medical procedures, practices, and terminology required to provide patient care. Operation of the system should neither circumvent nor take precedence over required patient care, nor should it

impede the human intervention by users in a manner that would have a negative impact on patient health.

Required training and skills

WARNING INSTRUCTIONS FOR USE — For continued safe use of this device, it is necessary that the listed instructions are followed. However, instructions listed in this manual in no way supersede established medical practices concerning patient care.

WARNING USER — Medical devices such as this monitoring system must only be used by medically trained persons who are familiar with the functions, features and workflows of this device and who are capable of applying this knowledge properly.

No special training is required to operate the central station besides reading the user manual which describes the workflows, features, and functionality of the system. If you are unsure of the system operation, contact your local GE representative.

CE marking information

The CARESCAPE Central Station bears CE mark CE-0459 indicating its conformity with the provisions of the Council Directive 93/42/EEC concerning medical devices and fulfills the essential requirements of Annex I of this directive. The system is in radio-interference protection class A in accordance with EN 55011.

The system complies with the requirements of standard IEC/EN 60601-1-2 "Electromagnetic Compatibility - Medical Electrical Equipment".

Device classification

The processing unit is afforded the following protection according to its device classification. All other components (e.g., keyboard and mouse, displays) have the degree of protection afforded by their device classification. For more information, see the documentation accompanying the device.

Item	Classification
The type of protection against electric shock	Class I.
The degree of protection against electric shock	Not applicable (no applied parts).
The degree of protection against harmful ingress of water	IPX0 (enclosed equipment without protection against the ingress of water).
The degree of safety application in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide or within an oxygen-rich environment	Equipment is not suitable for use in the presence of flammable anesthetic mixture with air or oxygen or nitrous oxide or within an oxygen-rich environment.

Item	Classification
Method(s) of sterilization or disinfection recommended by the manufacturer	Not applicable (no applied parts).
Mode of operation	Continuous operation.

Manufacturer responsibility

GE is responsible for the effects on safety, reliability, and performance of the system only if:

- Assembly operations, extensions, readjustments, modifications, servicing, or repairs are carried out by authorized service personnel.
- The electrical installation of the relevant room complies with the requirements of the appropriate regulations.
- The device is used in accordance with the instructions for use.

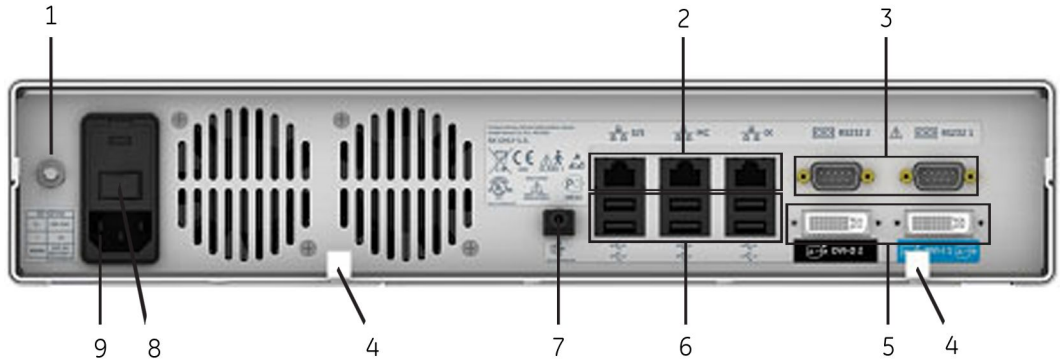
System components

Processing unit

The processing unit runs the central station software application.

The processing unit has the following controls, indicators, and connections.

Item	Description	
1	Power on indicator	Illuminates when processing unit is powered on.



Item	Description	
1	Potential equalization conductor	Connect the green and yellow potential equalization cable to the pin labeled with the equipotential symbol, and connect the other end of the cable to the equalization bus bar for the care unit.
2	Network connection/interface	• **S/5**: Do not connect any device (reserved for potential future use). • **MC**: Connect to the CARESCAPE Network. • **IX**: Connect to the hospital enterprise network for access to printers, Citrix, and Intranet.
3	Serial connection/interface	• **RS232 1**: Connect to a touchscreen display. • **RS232 2**: Connect to a writer.
4	Cable clamps	Clamp the power cable and speaker wire.
5	Color video output	• **DVI-I 1**: Connect to the primary display. • **DVI-D 2**: Connect to a secondary display.
6	USB connection/interface	Connect to a mouse, keyboard, or touchscreen display.
7	Speaker output	Connect to the external speakers.
8	Power switch	Press the switch to power on the processing unit.
9	Power connection	Connect the power cord.

Primary display

Primary displays can be a standard or touchscreen display used to display the Multi-Viewer.

If a secondary display is not used, the Multi-Viewer displays on the top half of the screen and the Single Viewer or one of the data review tools displays on the bottom half of the screen.

Secondary display

Secondary displays can be a standard or touchscreen display used to show the Single Viewer and data review tools in a half-screen or full-screen format, allowing the primary display to show the Multi-Viewer in full-screen format.

If configured for half-screen format, the Single Viewer and two data review tools display in the top and bottom halves of the screen.

If configured for full-screen format, the Single Viewer or the most recently used data review tool displays on the entire screen.

Mirrored central displays

When configured to Mirror Central Display, the primary central station can have up to two mirrored central displays. The patient Multi-Viewer windows are synchronized between the primary central station and the mirrored central display (e.g., the same monitoring devices are shown in each patient Multi-Viewer window). Making changes on the mirrored central display (e.g., moving patients, admitting patients)

also applies to the primary central station. Mirrored central displays provide audio alarm notification.

Remote display

WARNING EXCESSIVE LEAKAGE CURRENT — Do not place non-medical grade devices (e.g., laser printers, remote displays) within the patient environment without an additional isolating or separating transformer providing basic isolation to avoid unacceptable enclosure leakage current.

Remote displays provide non-interactive access to the same monitoring devices displayed on the primary central station by replicating the video output on up to four additional displays. Remote displays do not provide audio alarm notification.

Keyboard and mouse

The keyboard is used to enter text and has a special alarm ***AUDIO PAUSE*** key. Keyboards for the CARESCAPE Central Station have an alarm ***AUDIO PAUSE*** key marked with a dotted cross-out over a bell. Keyboards for previous versions of the central station, including the CIC Pro Clinical Information Center, have an alarm ***AUDIO PAUSE*** key marked with a solid cross-out over a bell. There is no change in function for the alarm ***AUDIO PAUSE*** key, both function identically. The dotted cross-out symbol conforms to the IEC 60601-1-8 standard.

The mouse is used to select items. The cursor changes to indicate the current operation mode:

- When in the user mode, the arrow cursor displays. This cursor changes to an I-beam when the user can enter text.
- When in the service mode, the cross cursor displays.
- When in the alarm service mode, the alarm cursor displays.

Symbol	Description
	Alarm service mode cursor
	Alarm ***AUDIO PAUSE*** keyboard key (CARESCAPE Central Station)
	Alarm ***AUDIO PAUSE*** keyboard key (CIC Pro Clinical Information Center)
	MultiKM indicator
	Service mode cross cursor

Symbol	Description
	User mode arrow cursor
	User mode I-beam cursor

When enabled, MultiKM allows one mouse and keyboard to control data entry for a configured group of up to eight displays. The MultiKM indicator displays on the top of the Multi-Viewer when the mouse cursor is active on that central station. To change the focus to the central station where the mouse and keyboard are connected, select **Ctrl** + **F1**.

External speakers

The external speakers provide audio alarm notification.

Laser printer

WARNING EXCESSIVE LEAKAGE CURRENT — Do not place non-medical grade devices (e.g., laser printers, remote displays) within the patient environment without an additional isolating or separating transformer providing basic isolation to avoid unacceptable enclosure leakage current.

WARNING EXCESSIVE LEAKAGE CURRENT — Do not plug the CARESCAPE Central Station into a power strip used by other non-medical grade devices, such as a laser printer. Laser printers are UL 60950/IEC 60950 certified equipment, which may not meet the leakage current requirements of patient care equipment. This equipment must not be located in the patient environment unless the medical system standard EN 60601-1-1 is followed. Do not connect a laser printer to a multiple socket outlet supplying patient care equipment. The use of multiple socket outlet for a system will result in an enclosure leakage current equal to the sum of all the individual earth leakage currents of the system if there is an interruption of the multiple socket outlet protective earth conductor. Consult authorized service personnel before installing a laser printer.

A laser printer can be configured to print data for the central station.

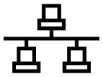
Writer

A writer can be connected to the central station to print data.

Device symbols

The following symbols may appear on one or more of the system devices:

Symbol	Description
	Alarm ***AUDIO PAUSE*** keyboard key (CARESCAPE Central Station)
	Alarm ***AUDIO PAUSE*** keyboard key (CIC Pro Clinical Information Center)
	Analog color video output
	Atmospheric pressure limitations
	Catalogue or orderable part number
	Caution, consult accompanying documents.
	Date of manufacture. This symbol indicates the date of manufacture of this device. The first four digits identify the year and the last two digits identify the month.
	Digital color video output
	Electrostatic discharge. Connections should not be made to this device unless ESD precautionary procedures are followed.
	European authorized representative
	European Union declaration of conformity
	Fragile. Handle with care.
	Fuse
	Humidity limitations

Symbol	Description
	International Safe Transit Association Shipper Member
	Keep dry. Protect from rain.
	Manufacturer name and address
	Menu keyboard key
	Network connection/interface
	Potential equalization conductor (IEC 60601-1). Use this conductor to bring the processing unit to the same potential as other devices in the care unit by connecting a green and yellow potential equalization cable to the pin labeled with the equipotential symbol, and connecting the other end of the cable to the equalization bus bar for the care unit.
	Power on
	Power off
	Power on
Rx Only **Rx ONLY U.S.**	**WARNING** RESTRICTED SALE — US federal law restricts this device to sale by or on order of a physician.
	Press to open writer door.
	Recycled materials or may be recycled
	Russian GOST-R certification

Symbol	Description
	Serial connection/interface
	Serial number
	Speaker output
	Temperature limitations
	This side up.
	The following symbols (required by China law only) are representative of what you may see on the device. The number in the symbol indicates the EFUP period in years, as explained below. Check the symbol on the device for its EFUP period. This symbol indicates the product contains hazardous materials in excess of the limits established by the Chinese standard SJ/T11363-2006 Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products. The number in the symbol is the Environment-friendly User Period (EFUP), which indicates the period during which the toxic or hazardous substances or elements contained in electronic information products will not leak or mutate under normal operating conditions so that the use of such electronic information products will not result in any severe environmental pollution, any bodily injury or damage to any assets. The unit of the period is "Year". In order to maintain the declared EFUP, the product shall be operated normally according to the instructions and environmental conditions as defined in the product manual, and periodic maintenance schedules specified in Product Maintenance Procedures shall be followed strictly. Consumables or certain parts may have their own label with an EFUP value less than the product. Periodic replacement of those consumables or parts to maintain the declared EFUP shall be done in accordance with the Product Maintenance Procedures. This product must not be disposed of as unsorted municipal waste, and must be collected separately and handled properly after decommissioning.

Symbol	Description
	The following symbol (required by China law only) is representative of what you may see on the device. This symbol indicates that this electronic information product does not contain any toxic or hazardous substance or elements above the maximum concentration value established by the Chinese standard SJ/T11363-2006, and can be recycled after being discarded, and should not be casually discarded.
	This symbol indicates that the waste of electrical and electronic device must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of the device.
	Type B (IEC 60601-1) protection against electric shock. Non-isolated applied part suitable for intentional external and internal application to the patient, excluding direct cardiac application.
	Type BF (IEC 60601-1) protection against electric shock. Isolated (floating) applied part suitable for intentional external and internal application to the patient, excluding direct cardiac application.
	Type CF (IEC 60601-1) protection against electric shock. Isolated (floating) applied part suitable for intentional external and internal application to the patient, including direct cardiac application.
	Underwriters Laboratories product certification mark. Medical Equipment. With respect to electric shock, fire, and mechanical hazards only in accordance with IEC 60601-1; EN60601-1; UL 60601-1; CAN/CSA C22.2 NO.601.1.
	USB connection/interface
	Windows keyboard key

4

About this software

Configuration levels

WARNING QUALIFIED PERSONNEL — The service mode and alarm service mode are intended for use only by qualified personnel with training and experience in their use. The consequences of misuse include loss of alarm configuration, loss of patient data, corruption of the operating system software, or disruption of the network.

The following configuration levels define the central station software application:

- Licenses: Licenses enable the standard and specialized features. Licenses are installed before clinical use by authorized service personnel. Instructions for installing licenses are provided in the technical manual. To view the licenses installed on this central station, select ***Setup*** > ***Licensing***.
- Factory presets: Factory presets are specified by the manufacturer and define the initial value for the central station's custom defaults. Factory presets cannot be changed. For more information, see the Factory presets appendix of the user's manual.
- Custom defaults: Custom defaults specify the initial value for monitoring parameters controlled by the central station (e.g. Telemetry Parameter Limits and Alarm Levels settings). They also include defaults for non-monitoring parameters (e.g. Full Disclosure Print settings). Monitoring devices have their own custom defaults. Custom defaults at the monitoring devices are controlled by those monitoring devices, not the central station. Custom defaults are persistent and apply to all patients monitored on the central station and are retained when individual patients are discharged. For more information, see the Custom defaults appendix of the user's manual. There are three types of defaults:
  - Alarm-level defaults: Alarm-level defaults are password protected. They are configured by authorized personnel before clinical use. In user mode, the alarm-level defaults display in light, dimmed text and cannot be modified. Instructions for setting alarm-level defaults in the alarm service mode are provided in the technical manual.
  - Service-level defaults: Service-level defaults are password protected. They are configured by authorized service personnel before clinical use. In user mode, the service-level defaults display in light, dimmed text and cannot be modified. Instructions for setting service-level defaults in the service mode are provided in the technical manual.
  - User-level defaults: User-level defaults are not password protected. Any user can configure them. In user mode, the user-level defaults display in dark,

undimmed text. Instructions for setting user-level defaults are provided in the user's manual.

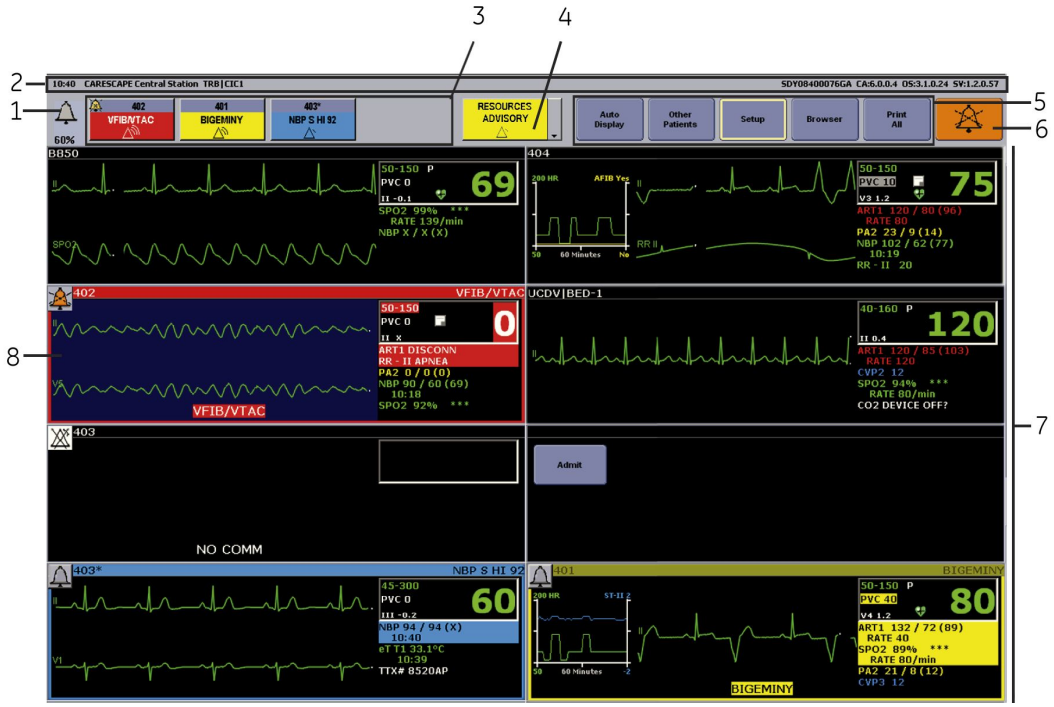
- Control settings: Control settings are temporary and patient-specific; they apply immediately to the monitoring device and revert to the custom default values when the patient is discharged from the device. Instructions for adjusting control settings are provided in the user's manual.
  - Central station specific control settings adjust functions and views specific to the central station, such as screen layout (e.g. Graphic Trends Groups). Central station control settings persist across patients and between patient monitoring sessions. Control settings may be either service-level or user-level controlled. Not all control settings have corresponding custom defaults. When there is no custom default, the control setting initial value is the central station factory preset.
  - There are also control settings for the monitoring devices. Those adjust patient monitoring parameters (e.g., ECG arrhythmia analysis). Control settings for monitoring devices can be adjusted both from the central station and from the monitoring device itself. Not all monitoring device control settings are remotely adjustable by the central station.

Some bedside monitors (e.g., CARESCAPE Monitor B850) do not permit modification from remote devices like the central station. For more information, see the documentation accompanying the bedside monitor.

Multi-Viewer overview

The Multi-Viewer displays parameter numerics and waveforms for up to 16 patients at a time. Up to four waveforms can be displayed per patient.

The following elements display on the Multi-Viewer:



Item	Description
1	Multi-Viewer alarm volume indicator
2	Multi-Viewer title bar
3	Multi-Viewer monitoring devices alarm buttons (i.e., alarm display units or ADUs)
4	Multi-Viewer central station system status alarm button/drop-down menu
5	Multi-Viewer menu
6	Multi-Viewer alarm ***AUDIO PAUSE*** button
7	Patient Multi-Viewer windows
8	Selected patient Multi-Viewer window (blue background)

Patient Multi-Viewer window overview

Each patient Multi-Viewer window displays parameter numerics and waveforms for one patient. Up to four waveforms can be displayed. When the patient Multi-Viewer window is selected, the background color changes to blue in the Multi-Viewer and the patient displays in the Single Viewer.

The following elements display on the patient Multi-Viewer window:

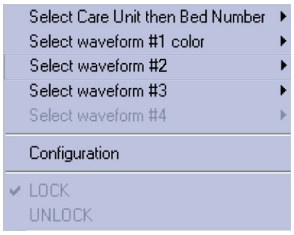
Item	Description
1	Patient Multi-Viewer window title bar and border
2	Patient Multi-Viewer window pacemaker detection indicator
3	Patient Multi-Viewer window ST Monitoring Status indicator
4	Patient Multi-Viewer window Real-time Trend Graph
5	Patient Multi-Viewer window heart rate parameter alarm limits
6	Patient Multi-Viewer window parameter window
7	Patient Multi-Viewer window parameter numerics area
8	Patient Multi-Viewer window ***Admit*** button
9	Patient Multi-Viewer window alarms off indicator
10	Patient Multi-Viewer window waveform message area

Item	Description
11	Patient Multi-Viewer window Note indicator
12	Patient Multi-Viewer window alarm ***AUDIO PAUSE*** indicator
13	Patient Multi-Viewer window waveform area
14	Patient Multi-Viewer window alarm status indicator

The central station automatically assigns unmonitored patients in the same care unit as the central station to empty unlocked patient Multi-Viewer windows.

If an in-unit bedside monitor has not been assigned to a patient Multi-Viewer window, the monitoring device message ***Unmonitored Beds Exist*** displays. When this message displays, the unmonitored in-unit bedside monitor needs to be manually assigned to any available patient Multi-Viewer window. For more information, see Admitting patients (73).

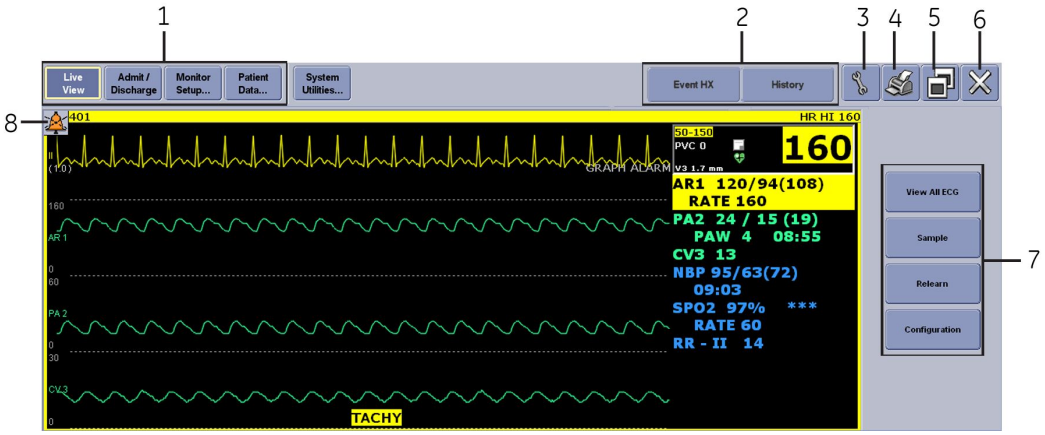
Any in-unit patient Multi-Viewer window can be permanently displayed (locked) in the Multi-Viewer. Locked patient Multi-Viewer windows are configured before clinical use. For more information, see the technical manual. If a patient Multi-Viewer window is locked, a check mark displays next to the word ***LOCK*** in light, dimmed text that cannot be modified in the patient Multi-Viewer window's right-click menu.



Single Viewer overview

The Single Viewer displays parameter numerics and waveforms, as well as historical data, for one patient at a time, including temporarily displaying an additional (17th) patient. Up to nine waveforms can be displayed per patient.

The following elements display on the Single Viewer:



Item	Description
1	Single Viewer menu
2	Save As Favorites buttons
3	Configuration button
4	Print button
5	Minimize/Maximize button
6	Close button
7	Single Viewer control buttons
8	Single Viewer alarm ***AUDIO PAUSE*** button

The Single Viewer cannot display a monitoring device when there is a space at the end of the bed number.

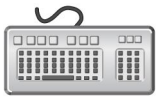
User interface symbols

The following symbols appear on one or more of the system devices:

Symbol	Description
	Alarm ***AUDIO PAUSE*** button
	Alarm ***AUDIO PAUSE*** indicator
	Alarm ***AUDIO PAUSE*** button Audio alarm signal indicator Alarm volume indicator
	Alarm service mode cursor
	Alarms off indicator
	All audio alarms off indicator
	Ascending or up arrow
	Bedside Event Source icon

Symbol	Description
	Browser Back button
	Browser Favorites button
	Browser Forward button
	Browser History button
	Browser Home button
	Browser Internet Options button
	Browser Printer button
	Browser Refresh button
	Browser Stop button
	Close button
	Configuration button
	Deleted event button/indicator
	Descending or down arrow

Symbol	Description
	Enter button
	Error indicator Warning indicator
	Full Disclosure or PDS (Patient Data Server) Event Source icon
	***HIGH*** (***CRISIS***) alarm priority level indicator
	Left, previous, or backward arrow
	***LOW*** (***ADVISORY***) alarm priority level indicator
	Maximize button
	***MEDIUM*** (***WARNING***) alarm priority level indicator
	Minimize button
 	MultiKM indicator
	New event indicator
	No alert event indicator
	Note indicator

Symbol	Description
	On-screen keyboard button
	Pacemaker detection indicator
	Print button/icon
	Refresh Event Source button
	Report button
	Reviewed event button/indicator
	Right, next, or forward arrow
	Scan newer event button
	Scan newer data button
	Scan newer event fast button Scan newer data fast button
	Scan older event button
	Scan older data button
	Scan older event fast button Scan older data fast button

Symbol	Description
	Service mode cross cursor
	ST Monitoring error button/indicator
	ST Monitoring ***Status*** button/indicator
	ST Monitoring stop button/indicator
	Stop event scan button Stop data scan button
	User mode arrow cursor
	User mode I-beam cursor

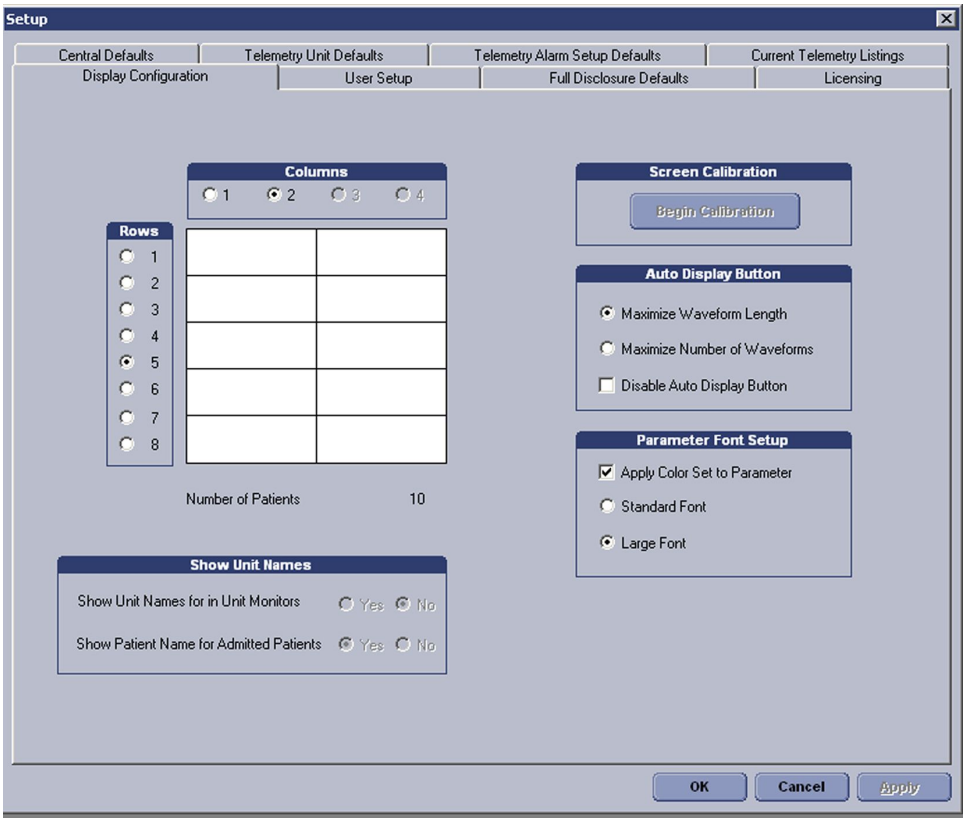
Multi-Viewer user-level defaults overview

Display Configuration is removed from Setup when the central station has been configured to mirror another central station. For more information, see the technical manual.

Adjusting Auto Display user-level defaults

To adjust these user-level defaults, complete the following procedure:

1. From the Multi-Viewer menu, select ***Setup*** > ***Display Configuration***.



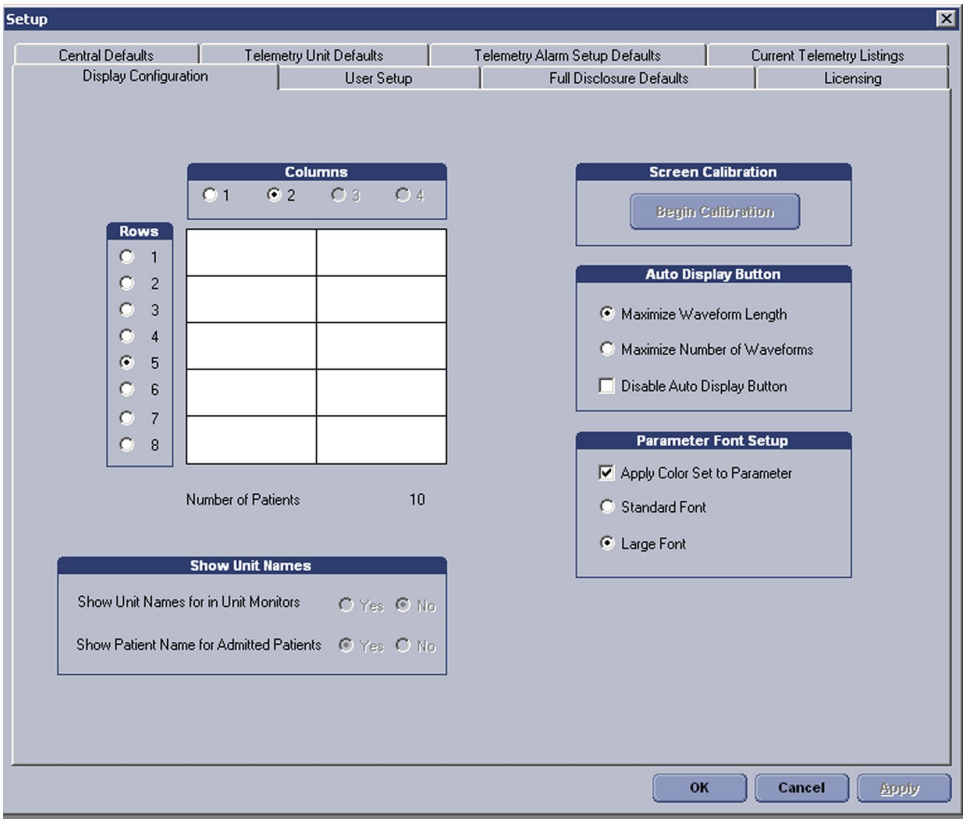
2. Under ***Auto Display Button***, select the appropriate option:
   - ***Maximize Waveform Length***: Maximize the horizontal length of the patient Multi-Viewer windows to display the maximum waveform duration.
   - ***Maximize Number of Waveforms***: Maximize the vertical height of the patient Multi-Viewer windows to display the maximum number of waveforms.
3. Under ***Auto Display Button***, select ***Disable Auto Display Button*** to remove the Auto Display button from the Multi-Viewer menu.
4. Select the appropriate option:
   - ***Apply***: Save the changes without closing the window.
   - ***Cancel***: Disregard the changes and close the window.
   - ***OK***: Save the changes and close the window.

Adjusting parameter color and size user-level defaults

The primary parameter (ECG 1) waveform color can be adjusted. The secondary parameter numerics font size can also be adjusted.

To adjust these user-level defaults, complete the following procedure:

1. From the Multi-Viewer menu, select ***Setup*** > ***Display Configuration***.



2. Under ***Parameter Font Setup***, select ***Apply Color Set to Parameter*** to use the parameter waveform color for the parameter numerics. White is the factory preset.
3. Under ***Parameter Font Setup***, select the appropriate option:
   - ***Standard Font***: Use the smaller font for the parameter numerics.
   - ***Large Font***: Use the larger font for the parameter numerics. This option may reduce the number of parameters that display on the Multi-Viewer. To view all monitored parameters, select the Single Viewer.
4. Select the appropriate option:
   - ***Apply***: Save the changes without closing the window.
   - ***Cancel***: Disregard the changes and close the window.
   - ***OK***: Save the changes and close the window.

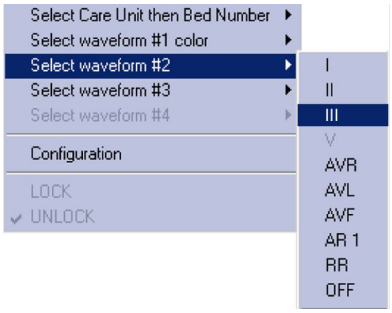
Patient Multi-Viewer window control settings

Adjusting displayed waveform control settings

Up to four waveforms can be displayed in each patient Multi-Viewer window. Pressure waveforms are scaled for display at the central station, however, scale indicators are not shown.

To adjust these control settings, complete the following procedure:

1. Right-click in the appropriate patient Multi-Viewer window.
2. Highlight ***Select Waveform #2***. Select the waveform from the displayed list.



3. Highlight ***Select Waveform #3***. Select the waveform from the displayed list.
4. Highlight ***Select Waveform #4***. Select the waveform from the displayed list.

Adjusting waveform color control settings

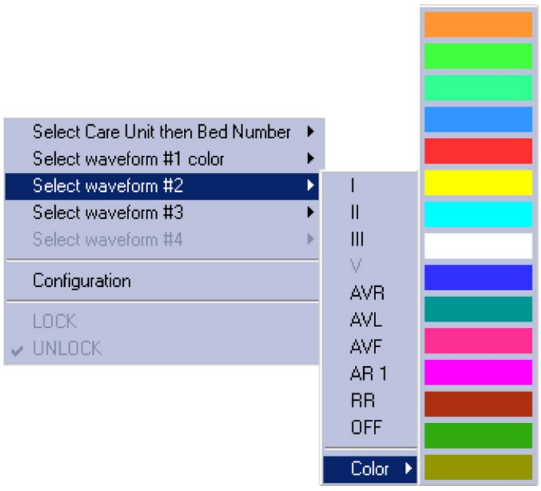
WARNING ADJUSTING WAVEFORM COLORS — For a locked patient Multi-Viewer window, the color changes remain in effect until a user manually changes the colors. Depending on the bedside monitor and acquisition device, waveform colors may change when removing a parameter from the bedside monitor and then adding it back again (e.g., removing and then re-inserting a TRAM module).

WARNING ADJUSTING WAVEFORM COLORS — For an unlocked patient Multi-Viewer window, the waveform color changes remain in effect until the patient is removed from the Multi-Viewer, discharged, or the patient is moved to another patient Multi-Viewer window. Depending on the bedside monitor and acquisition device, waveform colors may change when removing a parameter from the bedside monitor and then adding it back again (e.g., removing and then re-inserting a TRAM module).

The waveform colors can be changed for each patient Multi-Viewer window. The color settings display in both the Multi-Viewer and the Single Viewer.

To adjust these control settings, complete the following procedure:

1. Right-click in the appropriate patient Multi-Viewer window.
2. Highlight ***Select Waveform #1 color***. Select the color from the displayed palette.



3. Highlight ***Select Waveform #2*** > ***Color***. Select the color from the displayed palette.

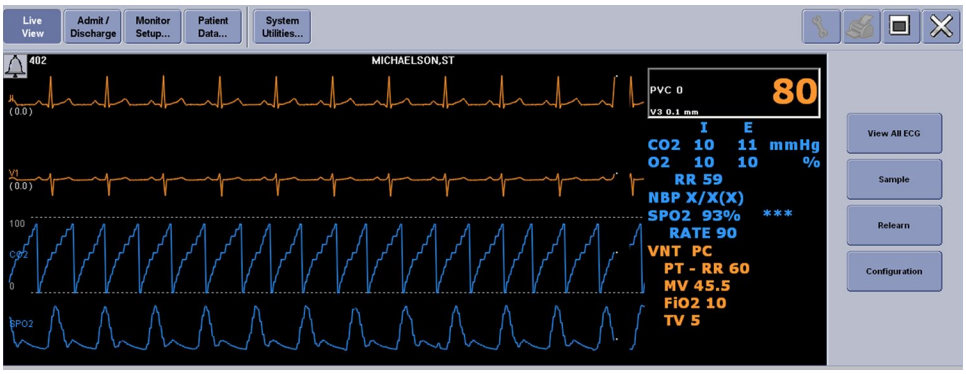
Adjusting Real-time Trend Graph control settings

Real-time Trend Graph displays up to one hour of Graphic Trends for two parameters in the patient Multi-Viewer window, including AFIB trending with select monitoring devices.

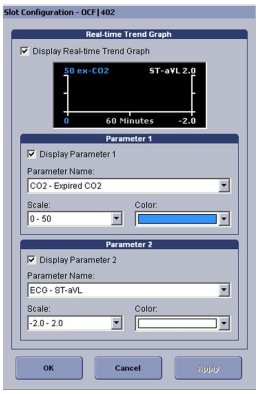
If the Multi-Viewer ***Display Configuration*** > ***Columns*** setting is set to display more than two columns, the Real-time Trend Graph window will not display.

To adjust these control settings, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Live View***.



3. Select ***Configuration***.



4. Select ***Display Real-time Trend Graph*** to display the Real-time Trend Graph in the patient Multi-Viewer window.
5. Under ***Parameter 1***, select the appropriate options:
   - ***Display Parameter 1***: Enable the Real-time Trend Graph for this parameter.
   - ***Parameter Name***: Select the parameter from the list.
   - ***Scale***: Select the waveform scale.
   - ***Color***: Select the parameter numerics and waveform color.
6. Under ***Parameter 2***, select the appropriate options:
   - ***Display Parameter 2***: Enable the Real-time Trend Graph for this parameter.
   - ***Parameter Name***: Select the parameter from the list.
   - ***Scale***: Select the waveform scale.
   - ***Color***: Select the parameter numerics and waveform color.
7. Select the appropriate option:
   - ***Apply***: Save the changes without closing the window.
   - ***Cancel***: Disregard the changes and close the window.
   - ***OK***: Save the changes and close the window.
8. Select the Close button to close the Single Viewer.
9. Check that the Real-time Trend Graph displays in the appropriate patient Multi-Viewer window.

Parameter control settings overview

WARNING ALARM CONTROL SETTINGS — Parameter alarm limits or alarm priority levels adjusted at the central station are also implemented at the bedside monitor, unless the settings are locked. Always notify the bedside clinician when parameter alarm limits or alarm priority levels are adjusted.

Control settings can be adjusted for any in-unit patient displayed in the Multi-Viewer. Out-of-unit patient control settings can only be viewed at the central station; they cannot be adjusted by the central station. Control setting changes at the central station are immediately applied to the monitoring device.

When adjusting a monitoring device's parameter control settings at the central station, the following guidelines apply:

- Some control settings for non-GE monitoring devices via the Unity Network ID interface device cannot be adjusted at the central station.
- Some bedside monitors (e.g., CARESCAPE Monitor B850) allow locked settings, which cannot be adjusted at the central station. Some bedside monitors also have a locked setting indicator. The locked setting indicator does not display on the central station. Any changes made at the central station will be ignored by the bedside monitor and the setting will revert to the bedside monitor's setting within two seconds. For more information, see the documentation accompanying the bedside monitor.
- Some monitoring devices may have different control setting options than the central station. If the monitoring device does not support an option on the central station, any changes made at the central station will be ignored by the monitoring device and the central station setting will revert to the monitoring device's setting within two seconds. For more information, see the documentation accompanying the monitoring device.
- Some bedside monitors (e.g., CARESCAPE Monitor B850) can be set to single mode for heart rate alarms. If the bedside monitor is set to single mode, only ECG heart rate alarm notification occurs; ART or SPO2 pulse rate alarm notification will not occur.
- Some bedside monitors (e.g., CARESCAPE Monitor B850) do not allow ART or SPO2 pulse rate values to be removed from the display. Any changes made at the central station will be ignored by the bedside monitor. For more information, see the documentation accompanying the bedside monitor.
- Some bedside monitors (e.g., CARESCAPE Monitor B850) allow heart rate/pulse rate values to be hidden (not displayed). However, the central station will still display the ART and SPO2 pulse rate values and ART and SPO2 pulse rate alarm limit violation notification will still occur. The central station does not provide an indication that the heart rate/pulse rate values were hidden at the bedside monitor.
- Some bedside monitors (e.g., CARESCAPE Monitor B850) can use the ECG heart rate, SPO2 pulse rate, or certain invasive pressure sites as the source of heart rate alarms. If the heart rate is disabled at the central station, the pulse rate values from SPO2 or certain invasive pressure sites will not display on the bedside monitor; however, the pulse rate alarm notification for SPO2 or certain invasive pressure sites will still occur at the bedside monitor and central station.

ECG control settings overview

WARNING ARRHYTHMIA DETECTION — Manually changing the arrhythmia detection level to ***Lethal*** may result in a missed arrhythmia or adverse patient outcome, as only lethal arrhythmia alarms will be detected. Do not rely exclusively on the audio arrhythmia alarms. Always keep patients under close observation and notify the bedside clinician whenever arrhythmia detection settings are changed. Before changing the setting, assess the patient condition to ensure the change is appropriate for the patient.

WARNING ARRHYTHMIA DETECTION — Manually changing the arrhythmia detection level to ***OFF*** may result in a missed arrhythmia or adverse patient outcome, as no arrhythmia alarms will be detected. Always keep patients under close observation and notify the bedside clinician whenever arrhythmia detection settings are changed. Before changing the setting, assess the patient condition to ensure the change is appropriate for the patient.

WARNING PACEMAKER DETECTION — A pacemaker pulse can be counted as a QRS during ***ASYSTOLE*** when pacemaker detection is enabled. Keep pacemaker patients under close observation.

WARNING PACEMAKER PATIENTS — Rate meters may continue to count the pacemaker rate during occurrences of cardiac arrest or some arrhythmias. Do not rely entirely upon rate meter alarms. Keep pacemaker patients under close surveillance. See the monitoring device manual for disclosure of the pacemaker pulse rejection capability.

The diagnostic ECG capabilities vary by monitoring device, including the following:

- The performance accuracy of the automated measurements.
- The way amplitude values for P-, QRS-, ST-, and T- waves are determined.
- The way isoelectric segments within QRS complex are treated.
- The intended use of the analyzing electrocardiograph.
- The accuracy measures for the interpretative statements.
- The accuracy measures for rhythm categories.

For more information, see the documentation accompanying the monitoring device.

Pacemaker detection options vary by monitoring device. When pacemaker detection is enabled, a ***P*** displays in the parameter window and the detected pacemaker spike is indicated with white segments on the ECG waveform. If the ECG waveform color setting is white, the pacemaker spike will be yellow. When pacemaker detection is turned off, the monitoring device ignores pacemaker pulse detections which may adversely affect the heart rate accuracy. For more information, see the documentation accompanying the monitoring device.

Derived lead values and derived ST segment deviation values obtained from a monitoring device using 12RL display on the central station with a ***d*** prefix (e.g., ***ST-dV2***).

Some bedside monitors (e.g., CARESCAPE Monitor B850) support a secondary heart rate. The central station will only display the primary heart rate value.

Relearn is intended to be used in situations where the ECG waveform data that was previously acquired by the monitoring device might not be an accurate representation of the patient's current baseline ECG. Typical scenarios would include:

- ECG changes due to replacement or repositioning of a patient's ECG electrodes.
- Changes to the patient's underlying baseline heart rate or rhythm.

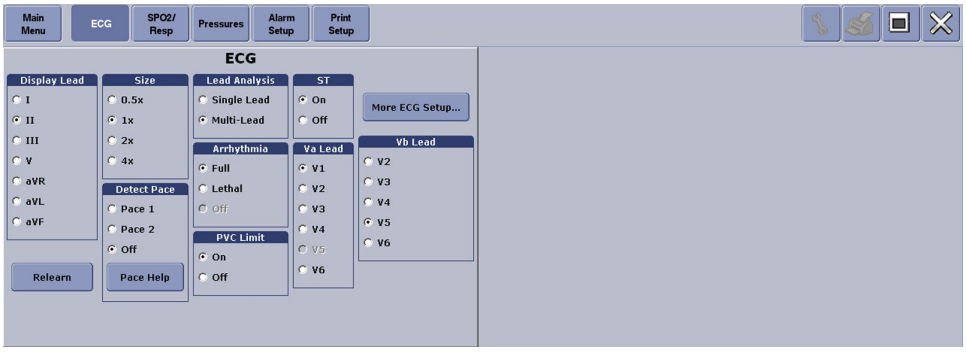
The heart rate value briefly displays as ***X***'s during the relearn process and returns to parameter numerics when ***Relearn*** is complete.

The ECG waveform speed is not adjustable and is fixed at ***25 mm/s***.

Adjusting ECG control settings

To adjust these control settings, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Monitor Setup*** > ***ECG***.



3. Under ***Display Lead***, select the appropriate lead to acquire the heart rate value. The lead options are: ***I***, ***II***, ***III***, ***V***, ***aVR***, ***AVL***, and ***aVF***.

   This lead is also used for automatic alarm prints and any manual print requests.

4. Select ***Relearn*** to prompt the monitoring device to use the current complexes to relearn the patient's ECG pattern.
5. Under ***Size***, select the appropriate ECG gain option:

   - ***0.5x***: 5 mm/mV
   - ***1x***: 10 mm/mV
   - ***2x***: 20 mm/mV
   - ***4x***: 40 mm/mV

   When the central station display is calibrated correctly and the monitoring device ECG gain setting is ***1x***, ECG waveforms have an aspect ratio of 0.4 ± 0.08 seconds per millivolt.

6. Under ***Detect Pace***, select the pacemaker detection mode:

   - ***Pace 1*** or ***Pace 2***: Enable the pace algorithm.
   - ***Off***: If the monitoring device only supports a single pace detection algorithm and allows the pacemaker detection mode to be remotely enabled and disabled from the central station, selecting ***Off*** disables the pace algorithm at the central station and the bedside monitor.

   Some acquisition devices (e.g., PSM) do not support ***Pace 1***. If ***Pace 1*** is selected at the central station, the settings will automatically be changed to ***Pace 2***.

   For more information on the ***Detect Pace*** options and functionality, select ***Pace Help***.

7. Under ***Lead Analysis***, select the leads for ECG and arrhythmia data processing:

   - ***Single Lead***: Processes the ***Display Lead***.
   - ***Multi-Lead***: Processes leads I, II, III, V, AVR, AVL, and AVF.

   Switching from ***Multi-Lead*** to ***Single Lead*** will trigger an automatic ***Relearn*** at the monitoring device.

8. Under ***Arrhythmia***, select the arrhythmia detection level:
   - ***Full***: Enable all arrhythmia detections at the bedside monitor.
   - ***Lethal***: Enable only lethal arrhythmia detections at the bedside monitor. Selecting this option also changes ***PVC Limit*** to ***Off***.
   - ***Off***: Disable all arrhythmia detections at the bedside monitor. This setting is only available if ***Allow Arrhythmia Off on this Central*** is set to ***Yes***. This option is configured before clinical use. For more information, see the technical manual.
9. Under ***PVC Limit***, select the appropriate option to determine if a PVC counter displays in the parameter window:
   - ***On***: Display the PVCs counted per minute.
   - ***Off***: Do not display the PVCs counted per minute. This setting is automatically applied when ***Arrhythmia*** is set to ***Lethal*** or ***Off***.
10. Under ***V Lead*** or ***Va Lead***, select the appropriate option to label the lead position. The lead options are: ***V1***, ***V2***, ***V3***, ***V4***, ***V5***, and ***V6***.

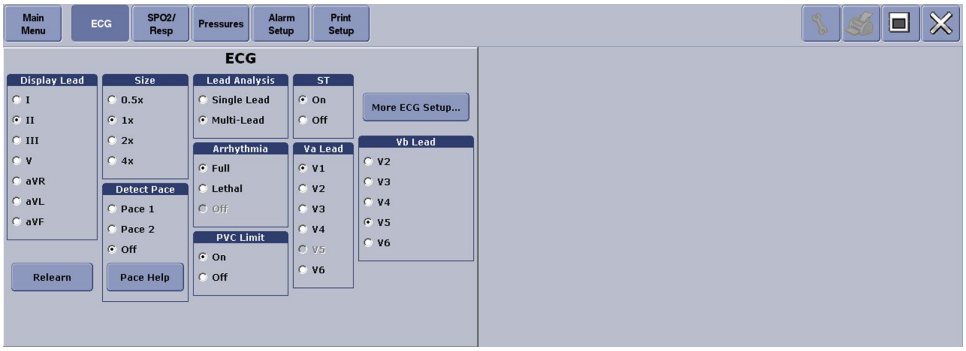
    Va Lead is only supported for telemetry monitoring devices when a 6-leadwire ECG cable is used.
11. Under ***Vb Lead***, select the appropriate option to label the lead position. The lead options are: ***V2***, ***V3***, ***V4***, ***V5***, and ***V6***.

    Vb Lead is only supported for telemetry monitoring devices when a 6-leadwire ECG cable is used.
12. Select the Close button to close the window.

Adjusting ST control settings

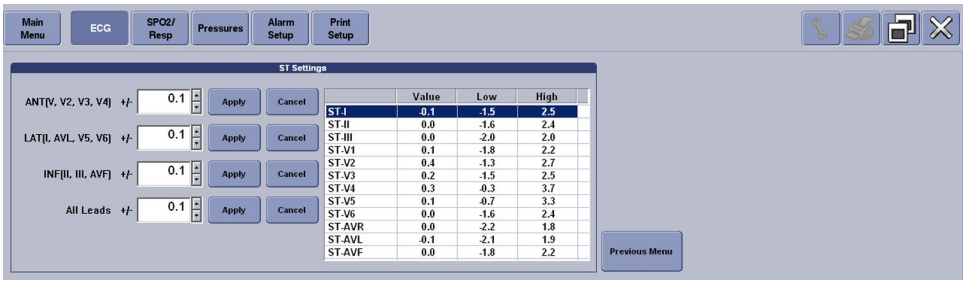
To adjust these control settings, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Monitor Setup*** > ***ECG***.



3. Under ***ST***, select the appropriate option to determine whether ST analysis mode is enabled at the monitoring device:
   - ***On***: Enable display of ST segment deviation values at the monitoring device and at the central station, and enable monitoring device alarming when ST limits are violated.
   - ***Off***: Disable ST analysis mode on the monitoring device and associated ST limit violation alarm detection.

4. Adjust the ST parameter alarm limit control settings for individual leads, see Adjusting alarm control settings overview (98).
5. Adjust the ST parameter alarm limit control settings for a lead group or for all leads relative to the patient's current ST value(s):
   a. Select ***More ECG Setup***.



   b. Locate the appropriate lead group or all leads. The leads associated with each lead group are as follows:
      - ***ANT(V, V2, V3, V4)***: Anterior lead group, including V1, V2/dV2, V3/dV3, and V4/dV4 leads.
      - ***LAT(I, AVL, V5, V6)***: Lateral lead group, including I, V5, V6/dV6, and aVL leads.
      - ***INF(II, III, AVF)***: Inferior lead group, including II, III, and aVF leads.
      - ***All Leads***: Lead group, including all leads.

      If an ST lead group is selected for alarming at some bedside monitors, the central station will alarm for each lead in the ST lead group.
   c. Use the up/down arrows to adjust the setting. The available range is -12.0 to 12.0 mm.

      The ***High*** and ***Low*** parameter alarm limits will be adjusted around the current ***Value*** of the leads.
   d. Select the appropriate option:
      - ***Apply***: Save the changes.
      - ***Cancel***: Disregard the changes.
   e. Repeat for each lead group, if applicable.
   f. Select ***Previous Menu*** to return to the ECG menu.

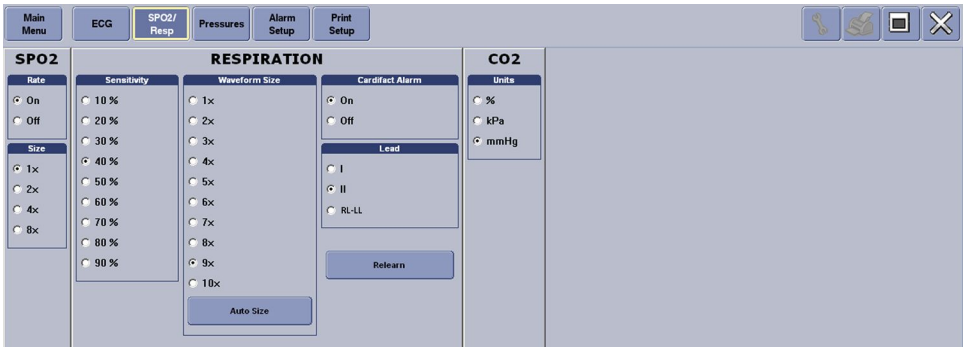
Adjusting SPO2 control settings

The central station refreshes SPO2 parameter data every two seconds.

To adjust these control settings, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.

2. From the Single Viewer menu, select ***Monitor Setup*** > ***SPO2/Resp***.



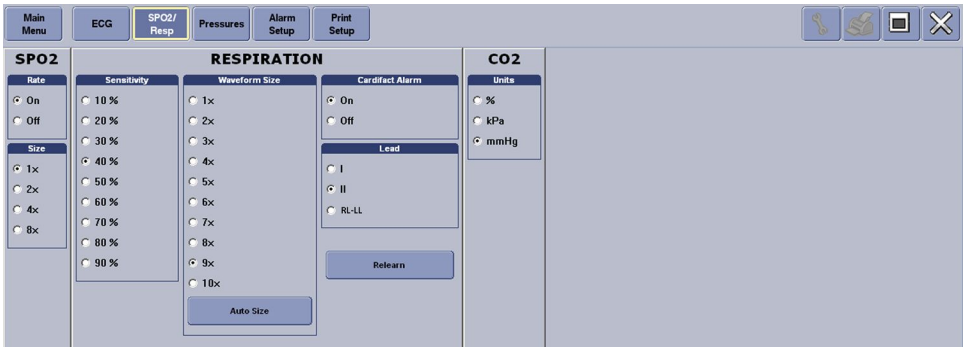
3. Locate the ***SPO2*** control settings.
4. Under ***Rate***, select the appropriate option to determine if an acquired heart rate value displays:
   - ***On***: Enable the heart rate display.
   - ***Off***: Disable the heart rate display.
5. Under ***Size***, select the appropriate waveform size. The options are: ***1x***, ***2x***, ***4x***, and ***8x***.
6. Select the Close button to close the window.

Adjusting Respiration control settings

WARNING RESPIRATION — If the ***CARDIFACT*** alarm is disabled, ***APNEA*** events may not be detected.

To adjust these control settings, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Monitor Setup*** > ***SPO2/Resp***.



3. Locate the ***RESPIRATION*** control settings.
4. Under ***Sensitivity***, select the appropriate breath detection threshold. The options are ***10 %*** to ***90 %*** in 10 percent increments. To increase the detection of shallow breaths, decrease the percentage number.

   Some acquisition devices (e.g., PSM) have different sensitivity options than the central station. Selecting an unsupported option at the central station will be ignored by the acquisition device. For more information, see the documentation accompanying the acquisition device.

5. Under ***Waveform Size***, select the appropriate waveform size. The options are: ***1x*** to ***10x*** in whole number increments.
6. Select ***Auto Size*** to automatically size the waveform to fit the available display space in the parameter window.

   Some acquisition devices (e.g., PSM) do not support this option. Selecting this option at the central station will be ignored by the acquisition device.
7. Under ***Cardifact Alarm***, select the appropriate option:
   - ***On***: Enable the ***CARDIFACT*** alarm.
   - ***Off***: Disable the ***CARDIFACT*** alarm.

   Some acquisition devices (e.g., PSM) do not support this option. Selecting this option at the central station will be ignored by the acquisition device.
8. Under ***Lead***, select the respiration lead to derive the respiration rate:
   - ***I***: Best for detecting thoracic breathing, but is more susceptible to cardiogenic artifact.
   - ***II***: Equally good at detecting thoracic or abdominal breathing, but is more susceptible to cardiogenic and motion (head, neck, or arm) artifact.
   - ***RL-LL***: Best at detecting abdominal breathing and is not as susceptible to cardiogenic or motion artifact.
     This option is only available with select monitoring devices. For more information, see the documentation accompanying the monitoring device.

   Some bedside monitors (e.g., CARESCAPE Monitor B850) automatically select the respiration lead and do not allow the respiration lead to be changed at the central station. Any changes made at the central station will be ignored by the bedside monitor and the setting will revert to the bedside monitor setting within two seconds.

   Some acquisition devices (e.g., PSM) indicate to remote devices like the central station that ***I*** is the selected respiration lead.
9. Select ***Relearn*** to prompt the bedside monitor to use the current breaths to relearn the respiration pattern.

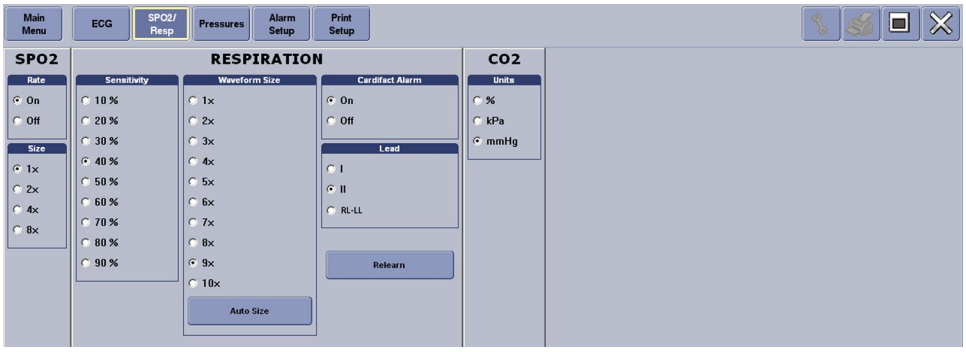
   Some acquisition devices (e.g., PSM) do not support this option. Selecting this option at the central station will be ignored by the acquisition device.
10. Select the Close button to close the window.

Adjusting CO2 control settings

To adjust these control settings, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.

2. From the Single Viewer menu, select ***Monitor Setup*** > ***SPO2/Resp***.



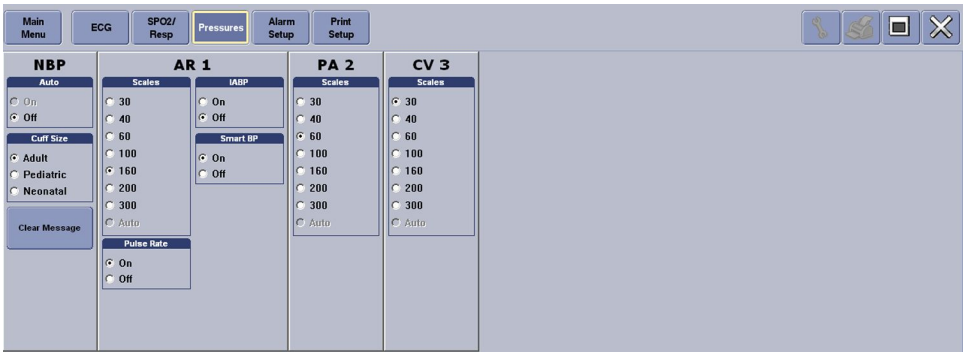
3. Locate the ***CO2*** control settings.
4. Under ***Units***, select the appropriate option.
   - ***%:*** Select percent as the unit of measurement.
   - ***kPa***: Select kilopascals as the unit of measurement.
   - ***mmHg***: Select millimeters of mercury as the unit of measurement.
5. Select the Close button to close the window.

Pressures control settings

Adjusting Non-Invasive Blood Pressure control settings

To adjust these control settings, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Monitor Setup*** > ***Pressures***.



3. Locate the ***NBP*** control settings.
4. Under ***Auto***, view the automatic non-invasive blood pressure measurement setting.

   When automatic non-invasive blood pressure measurements are enabled (***On***) at the monitoring device, non-invasive pressure measurements are automatically acquired at regular intervals. From the central station, this setting can be turned ***Off***, but it cannot be turned ***On***.

   Some bedside monitors do not support automatic non-invasive blood pressure measurements.

5. Under ***Cuff Size***, select the appropriate non-invasive blood pressure cuff size setting.
   - ***Adult***: Select the adult non-invasive blood pressure cuff size.
   - ***Pediatric***: Select the pediatric non-invasive blood pressure cuff size.
   - ***Neonatal***: Select the neonatal non-invasive blood pressure cuff size.

   The cuff size setting determines the inflation pressure used during the first non-invasive pressure measurement and is used to calculate the non-invasive blood pressure value. For more information, see the documentation accompanying the monitoring device.
6. Select ***Clear Messages*** to remove the inflation message or current non-invasive pressure values from the central station parameter window.

   Some bedside monitors (e.g., CARESCAPE Monitor B850) do not support this option. Selecting this option at the central station will be ignored by the bedside monitor.
7. Select the Close button to close the window.

Adjusting Invasive Pressures control settings

The control settings for up to ten invasive pressure sites can be displayed, depending on the available pressure sites supported by the monitoring device. Monitoring devices group invasive pressures by site groups (e.g., ART1, ART2, FEM1, FEM2). The central station supports the following invasive pressure group labels: ***ART***, ***CVP***, ***FEM***, ***ICP***, ***LA***, ***PA***, ***RA***, ***SP***, ***UAC***, and ***UVC***. ***SP*** corresponds to a special pressure used when an invasive pressure does not fit into one of the supported invasive pressure groups (e.g., FEMV from CARESCAPE Monitor B850 displays as ***SP*** on the central station). The central station numbers the pressures in each site group (e.g., ART and ABP on the monitoring device will display as ***AR 1*** and ***AR 2*** on the central station). The channel numbers displayed on the central station match the channel number on the monitoring device (e.g. CARESCAPE Monitor B850 has channels P1 to P8 with ART configured as P3; this channel will display as ***AR 3*** at the central station).

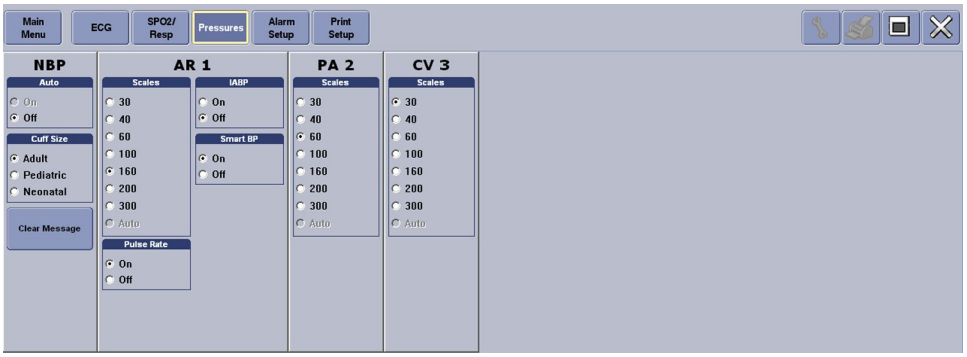
Monitoring devices allow remote adjustment to alarm priority levels from the central station for each site group as a whole. Changing the site group alarm priority level on the central station applies to all pressures in that site group (e.g., changing FEM applies to FEM1 to FEM8).

Some monitoring devices (e.g., CARESCAPE Monitor B850) allow individual pressure alarm priority level in a site group to adjusted at the bedside monitor. Individual pressure site alarm priority levels cannot be displayed or adjusted at the central station. When there are different alarm priority levels for individual pressures in the same site group, the monitoring device sends the highest priority in the site group to the central station (e.g., if ART is set to ***HIGH (CRISIS)*** alarm priority level and ABP is set to ***LOW (ADVISORY)*** alarm priority level at the bedside monitor, ***AR 1*** and ***AR 2*** both display as ***HIGH (CRISIS)*** alarm priority level at the central station).

To adjust these control settings, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.

2. From the Single Viewer menu, select ***Monitor Setup*** > ***Pressures***.



3. Locate the appropriate pressure site (e.g., ***AR 1***) control settings.

   Some bedside monitor options may be different than those displayed on the central station. For more information, see the documentation accompanying the bedside monitor.

4. Under ***Scales***, select the appropriate displayed waveform scale. The options are: ***30***, ***40***, ***60***, ***100***, ***160***, ***200***, ***300***, and ***Auto***. The higher the number, the smaller the waveform size. ***Auto***: Automatically size the waveform to fit the available display space.

   Some bedside monitors (e.g., CARESCAPE Monitor B850) do not support ***Auto***. Selecting this option at the central station will be ignored by the bedside monitor.

   Some bedside monitor options may be different than those displayed on the central station. For more information, see the documentation accompanying the bedside monitor.

5. Under ***Pulse Rate***, select the appropriate option to determine if the arterial pressure pulse rate should be calculated from ART, FEM, or UAC pressure site when there is a minimum difference of 10 mmHg between the systolic and diastolic pressures:

   - ***On***: Enable the calculated arterial pressure pulse rate. When enabled, the calculated arterial pressure pulse rate displays in the parameter window.
   - ***Off***: Disable the calculated arterial pressure pulse rate.

6. Under ***IABP***, select the appropriate option to determine if irregularities in the ART or FEM pressure waveforms caused by the use of an intra-aortic balloon pump should be compensated for:

   - ***On***: Enable intra-aortic balloon pump identification. When enabled, an ***I*** precedes the invasive arterial pressure site label.
   - ***Off***: Disable intra-aortic balloon pump identification.

   Some acquisition devices do not support this option. For more information, see the documentation accompanying the acquisition device.

7. Under ***Smart BP***, select the appropriate option to determine if the arterial artifact rejection program for the ART or FEM pressure sites is enabled:

   - ***On***: Enable the arterial artifact rejection program. When enabled, this program substantially reduces the alarms associated with zeroing the transducer, fast flushing the system, and drawing blood.
   - ***Off***: Disable the arterial artifact rejection program.

   Some acquisition devices do not support this option. For more information, see the documentation accompanying the acquisition device.

8. Select the Close button to close the window.

kPa value conversion

WARNING ACCURACY — If the accuracy of any value displayed on the screen or printed is questionable, first determine the patient's vital signs by alternative means. Then, verify the monitoring devices and printers are working correctly.

WARNING INCORRECT ALGORITHMS, ARRHYTHMIA PROCESSING, AND CALCULATIONS BASED ON PATIENT AGE — After manually updating or automatically retrieving patient information from a network database, *always* confirm that the entered patient's date of birth matches the patient's actual date of birth. Otherwise the appropriate age-related algorithms, arrhythmia detection, and calculations will not be applied.

The central station can convert kPa to/from mmHg.

The following formula is used for this calculation:

P[kPa] = 0.1333 * P[mmHg]

Any other uncertainties of calculation are based on the precision and accuracy of inputs.

Since stored data uses the unit of measurement configured by the bedside monitor, the stored data and parameter numerics that display on the central station are not synchronized and can be different (e.g., Multi-Viewer could display non-invasive pressure values in kPa, but Numeric Trends could display and print non-invasive pressure values in mmHg).

5

Managing patients

Monitoring modes overview

The central station supports the following monitoring modes:

- Combo monitoring mode: Monitoring with both a telemetry monitoring device (i.e. a transmitter) and a bedside monitor acting together to both provide parameter data for a single patient. Combo monitoring mode telemetry monitoring devices should always be admitted at the central station. Combo monitoring mode bedside monitors can be admitted at either the bedside monitor or the central station as dictated by the institution's policies.
  - Bedside monitoring: Monitoring with beside monitors connected directly to the patient. Parameter data is processed by the bedside monitor itself. Patients can be admitted at either the bedside monitor or the central station, as dictated by the institution's policies.
  - Telemetry monitoring: Monitoring with telemetry monitoring devices connected directly to the patient. Parameter data is processed by the telemetry system.
- Rover monitoring mode: The patient and an ambulatory bedside monitor rove (move from room to room). Rover monitoring mode patients should be admitted at the bedside monitor, not the central station. However, Rover monitoring mode patients can be viewed at the central station.
- Rover Combo monitoring mode: The patient and a stationary or ambulatory bedside monitor or telemetry monitoring device rove. Rover Combo monitoring mode bedside monitor patients should be admitted at the bedside monitor, not the central station. However, Rover Combo monitoring mode bedside monitor patients can be viewed at the central station. Rover Combo monitoring mode telemetry monitoring device should always be admitted at the central station.

The monitoring mode is established when a patient is admitted at a bedside monitor or at the central station.

The following are guidelines to remember when monitoring in Combo or Rover Combo monitoring modes:

- It is not likely that the Combo or Rover Combo monitoring modes are used when the bedside monitor is configured for an operating room.
- Audio alarm pause can be initiated at the monitoring device.
- Waveforms from telemetry monitoring devices and bedside monitors joined in Combination monitoring are not time synchronous. If absolute synchronicity is required, Combo monitoring mode should be discontinued and the ECG waveforms should be acquired from the bedside monitor.

- When monitoring ECG from telemetry monitoring device, do not turn off the bedside monitor until the patient has been discharged from the bedside monitor. ***LEADS FAIL*** may display at the central station if the bedside monitor is turned off first.
- When switching ECG monitoring from the bedside monitor to telemetry monitoring device:
  - Arrhythmia alarm histories from the bedside monitor are merged in the telemetry system.
  - When discharging the bedside monitor in Combination monitoring with a telemetry monitoring device, the telemetry monitoring device arrhythmia alarm detection capabilities inherit those supported by the bedside monitor. Therefore, when the bedside monitor uses the BASIC software package, only lethal arrhythmia alarm levels will be detected from telemetry monitoring device. If the bedside monitor uses the CARDIAC software package, full arrhythmia alarm levels will be detected from telemetry monitoring device.
- When switching ECG monitoring from telemetry monitoring device to the bedside monitor:
  - The telemetry monitoring device is automatically discharged and the most recent alarm histories are transferred to the bedside monitor. The number of events is dependent on the data source.
  - The ECG parameter alarm limits, arrhythmia alarm priority levels, and display defaults are changed back to the bedside monitor settings.

The following table describes the impact the monitoring mode has on stored data (Trends and events), including why data may not be available in certain cases separate from data availability in Full Disclosure and PDS (Patient Data Server).

Previous monitoring mode	New monitoring mode	Source of patient data	Trends visible at the central station	Events visible at the central station
Discharged	Telemetry monitoring	Telemetry monitoring device	Trends for telemetry monitoring device patients.	Events are generated by the telemetry server.
Discharged	Bedside monitoring	Bedside monitor	Trends for bedside monitor patients.	Events are generated by the bedside monitor.
Telemetry monitoring and/or Bedside monitoring	Combination monitoring	• ECG data: Telemetry monitoring device • Non-ECG data: Bedside monitor	Trends available for: • ECG data collected by the bedside monitor before Combination monitoring. • ECG data collected by the telemetry monitoring device during Combination monitoring. • Non-ECG data collected by the bedside monitor both before and during	Events generated by the telemetry monitoring device and the bedside monitor are merged together. The number of events is restricted to the telemetry server maximum.

Previous monitoring mode	New monitoring mode	Source of patient data	Trends visible at the central station	Events visible at the central station
			Combination monitoring.	
Combination monitoring	Telemetry monitoring (Bedside monitoring discharged)	Telemetry monitoring device	Trends available for: • ECG data collected by the telemetry monitoring device before, during, and after Combination monitoring. • Non-ECG data collected by the telemetry monitoring device before and after Combination monitoring. • Non-ECG data collected by the bedside monitor during Combination monitoring is lost due to discharge.	Events generated by the telemetry monitoring device and the bedside monitor are merged together. The number of events is restricted to the telemetry server maximum.
Combination monitoring	Bedside Monitoring (Telemetry monitoring discharged)	Bedside monitor	Trends available for: • ECG and non-ECG data collected by the bedside monitor before Combination monitoring. • ECG data collected by telemetry monitoring device during Combination monitoring. • Non-ECG data collected by the beside monitor during Combination monitoring. • ECG and non-ECG data collected by the bedside monitor after Combination monitoring.	Events generated by the telemetry monitoring device and the bedside monitor are merged together. The number of events is restricted to the bedside monitor maximum.

In all scenarios, trend and event data already stored in PDS and event data already stored in Full Disclosure continue to be available after entering and leaving

Combination monitoring. ST records from the telemetry monitoring device are excluded.

Adjusting patient Multi-Viewer windows overview

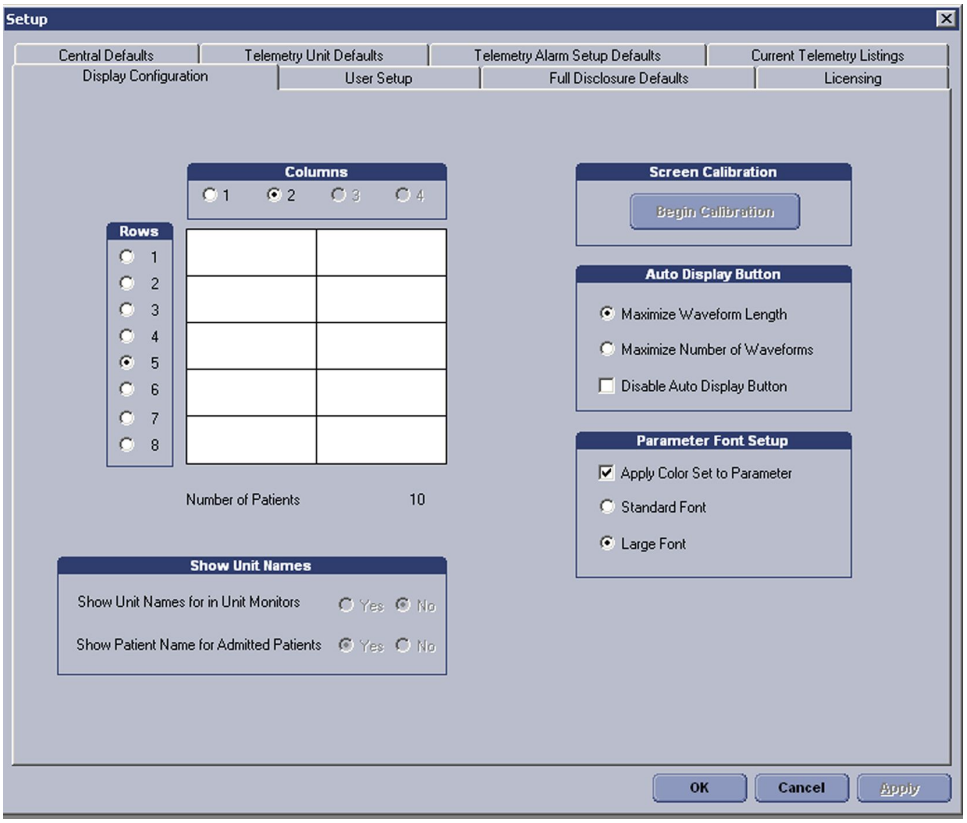
When a central station is mirrored by other central stations, do not change the display layout, either by use of the ***Auto Display*** button or by adjusting the ***Setup*** > ***Display Configuration*** > ***Rows*** or ***Columns*** settings. Adjusting these settings will cause inconsistent Multi-Viewer screen arrangements between the central stations within a mirror group. Central stations that mirror other central stations will have those controls automatically disabled. On the mirrored central displays, the Auto Display button can be permanently disabled by authorized service personnel, but Display Configuration settings cannot be disabled. The Auto Display button can also be temporarily removed by selecting ***Setup*** > ***Display Configuration*** > ***Disable Auto Display Button***.

For central stations belonging to a mirror group (i.e., either a central station that is being mirrored or a central station that is a mirror of another), certain operations performed on one central station in this group apply to all central stations within the group. These operations include locking and unlocking patient Multi-Viewer windows, assigning or removing monitoring devices from patient Multi-Viewer windows, and moving or swapping monitoring devices from one patient Multi-Viewer window to another.

Adding patient Multi-Viewer windows

To add patient Multi-Viewer windows, complete the following procedure:

1. From the Multi-Viewer menu, select ***Setup*** > ***Display Configuration***.



2. Under ***Columns***, select the number of patient Multi-Viewer windows to display as columns (left to right).
3. Under ***Rows***, select the number of patient Multi-Viewer windows to display as rows (top to bottom).
4. Select the appropriate option:
   - ***Apply***: Save the changes without closing the window.
   - ***Cancel***: Disregard the changes and close the window.
   - ***OK***: Save the changes and close the window.

The changes will be ignored if locked patient Multi-Viewer windows are affected or if unmonitored patient(s) would be created by reducing the number of patient Multi-Viewer windows to less than the number of patient monitored on the central station.

Using Auto Display

When enabled, Auto Display automatically adjusts the patient Multi-Viewer windows. Auto Display is not available when this central station is configured to mirror another central station.

Auto Display may not change the layout if there is not enough room for additional patient Multi-Viewer windows (e.g., all 16 patient Multi-Viewer windows actively monitoring a patient). Auto Display will not remove or move locked patient Multi-Viewer windows from the Multi-Viewer.

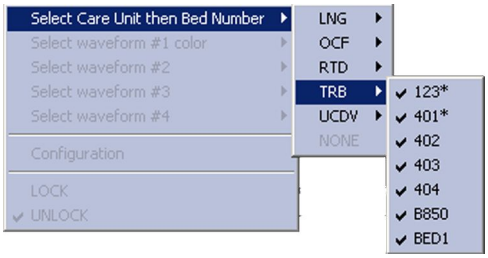
To use Auto Display:

- From the Multi-Viewer menu, select ***Auto Display***.
  Check that empty patient Multi-Viewer windows and that the remaining patient Multi-Viewer windows were re-sized to optimize the Multi-Viewer.
- After approximately five seconds, select ***Auto Display*** for a second time.
  Check that at least one empty patient Multi-Viewer window with an ***Admit*** button displays.
- After approximately five seconds, select ***Auto Display*** for a third (final) time.
  Check that empty patient Multi-Viewer windows and that the remaining patient Multi-Viewer windows were re-sized to optimize the Multi-Viewer according to the Auto Display user-level defaults. For more information, see Adjusting Auto Display user-levels defaults (49).

Rearranging patient Multi-Viewer windows

To rearrange unlocked patient Multi-Viewer windows, complete the following procedure:

1. Right-click in the appropriate patient Multi-Viewer window.
2. Select ***Select Care Unit then Bed Number***.
3. Select a monitoring device from the list of care units and bed numbers.



   - An unlocked patient Multi-Viewer window can be moved to another available unlocked patient Multi-Viewer window.
   - A locked patient Multi-Viewer window *cannot* be moved.
   - A locked patient Multi-Viewer window *cannot* be removed from the Multi-Viewer, whether a patient is admitted or not.
4. Verify the appropriate patient displays in the patient Multi-Viewer window.

Swapping patient Multi-Viewer windows

When a patient Multi-Viewer window is reassigned (moved) to another patient Multi-Viewer window, the Bed Number of the two patient Multi-Viewer windows are swapped. The original monitoring device moves to the patient Multi-Viewer window of the destination monitoring device; the destination monitoring device moves to the patient Multi-Viewer window of the original monitoring device.

Patient Multi-Viewer windows are only swapped when the central station is in user mode (not service mode). The following swaps may occur:

- A telemetry monitoring device can swap with another telemetry monitoring device on the same central station or on another central station.
- A bedside monitor can swap with another bedside monitor on the same central station or on another central station.

- A telemetry monitoring device can swap with a beside monitor on the same central station or it can swap with a bedside monitor on another central station if the Bed Numbers are not the same (e.g., ICU2 and ICU4*). If the Bed Numbers are the same (e.g., ICU4 and ICU4*), a telemetry monitoring device and a bedside monitor can only swap within the Multi-Viewer of the same central station.

Removing unlocked patient Multi-Viewer windows

To remove unlocked patient Multi-Viewer windows, complete the following procedure:

1. Remove out-of-unit patients from the Multi-Viewer:
   a. Right-click in the appropriate patient Multi-Viewer window.
   b. Select ***Select Care Unit then Bed Number*** > ***None***.
   c. Check that the patient Multi-Viewer window was removed.
   d. Repeat for each patient to be removed from the Multi-Viewer.
2. Move patients admitted at this central station to another in-unit central station:
   a. Locate an in-unit central station with unlocked patient Multi-Viewer windows available.
   b. From the other in-unit central station, right-click on an empty patient Multi-Viewer window with an ***Admit*** button.
   c. Select ***Select Care Unit then Bed Number***.
   d. Select a monitoring device from the list of care units and bed numbers.
   e. Verify the appropriate patient displays in the patient Multi-Viewer window.
   f. Repeat for each patient to be added to the Multi-Viewer.
   g. Return to the original central station.
   h. Right-click on the patient Multi-Viewer window to be removed.
   i. Select ***Select Care Unit then Bed Number*** > ***None***.
   j. Check that the patient Multi-Viewer window was removed.
   k. Repeat for each patient to be removed from the Multi-Viewer.
3. Discharge admitted patients.

   For more information, see Discharging patients (79).

Admitting patients overview

WARNING ALARM ACTIVATION — Audio alarms do not sound and visual alarm indicators do not display at the central station until a patient is admitted. The central station will not provide alarm notification if an unadmitted patient enters an alarm condition. You must admit the patient to activate the alarm notification, automatic alarm printing, and events storage.

WARNING INCORRECT ALGORITHMS, ARRHYTHMIA PROCESSING, AND CALCULATIONS BASED ON PATIENT AGE — After manually updating or automatically retrieving patient information from a network database, *always* confirm that the entered patient's date of birth matches the patient's actual date of birth. Otherwise the appropriate age-related algorithms, arrhythmia detection, and calculations will not be applied.

WARNING REQUEST ADMIT INFO — Verify the accuracy of any displayed information after requesting admit information. Patient information entered here may be truncated on the central station display based on limitations of the monitoring device.

CAUTION DISCHARGE TO CLEAR PATIENT DATA — When admitting a new patient, you must clear all previous patient data from the system. To accomplish this, disconnect patient cables, then discharge the patient.

The Single Viewer cannot display a monitoring device when there is a space at the end of the bed number.

When the ***Show Patient Name for Admitted Patients*** and ***Show Unit Names for in Unit Monitors*** settings are set to ***Yes***, the patient name and unit name displays in the patient Multi-Viewer window title bar. The patient Multi-Viewer window title bar displays up to 13 characters of the patient's last name and first name combined, up to seven characters of the unit name, and up to five characters of the bed number. The character limits vary by monitoring device, therefore the patient name, unit name, or bed number may be truncated at the central station.

If a patient is moved to another in-unit central station, the patient retains the printer settings from the original central station.

Telemetry monitoring devices use alarm presets for one of the four supported age groups defined and stored by the telemetry monitoring system. When a telemetry patient is admitted, either the central station custom defaults or a combination of the central station custom defaults and the telemetry monitoring system alarm presets are used for the initial alarm control settings for the patient.

When a telemetry monitoring device is admitted to the central station, the ***Age*** determines whether the central station Telemetry Unit Defaults or the telemetry system factory presets are used. If the ***Age*** matches the ***Setup*** > ***Telemetry Unit Defaults*** > ***Patient Age*** setting, then the central station Telemetry Unit Defaults are used. If the ***Age*** does not match the ***Setup*** > ***Telemetry Unit Defaults*** > ***Patient Age*** setting, then the telemetry system factory presets are used. For more information on the telemetry system factory presets for each age group, see the documentation accompanying the telemetry monitoring device.

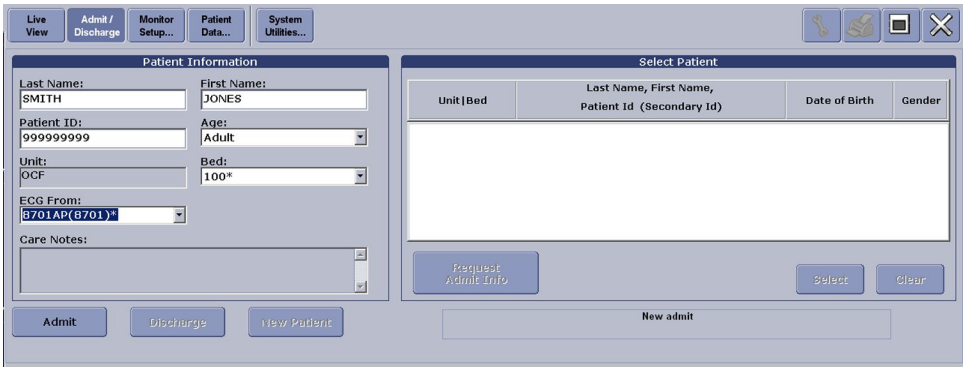
When admitting a telemetry patient at the central station, the ***0-2 Years Age*** range option is available, however telemetry monitoring is not suitable for neonatal patients. For more information, see the documentation accompanying the telemetry monitoring device.

Some monitoring devices may not allow remote devices like the central station to adjust the ***Age***. Any changes made at the central station will be ignored by the monitoring device and revert to the monitoring device settings. For more information, see the documentation accompanying the monitoring device.

Admitting Standard monitoring patients

To admit Standard monitoring patients to monitoring devices assigned to the central station, complete the following procedure:

1. From the Multi-Viewer, select ***Admit*** on any empty patient Multi-Viewer window.



2. To automatically retrieve in-unit patient information from a Hospital Information System (HIS), complete the following procedure:

   a. Under ***Patient Information***, enter one or more of the following:

      - ***Last Name***: Enter the last name.
        When searching by name, delete the default ***Patient ID*** (***999999999***).
      - ***Patient ID***: Enter the patient identification number.
        When searching by Patient ID, the central station can only return search results when the Patient ID is composed of numbers and/or upper case letters. It cannot return search results if the Patient ID contains lower case letters.

   b. Select ***Request Admit Info*** to display the search results.

      The Hospital Information System (HIS) will either automatically select a patient or display a list of patients.

      - If the patient was automatically selected and the patient information is correct, select ***Select***.
      - If the patient was not automatically selected, highlight the correct patient in the list and select ***Select***.
      - If the patient information is not correct, or the patient is not in the list, select ***Clear*** and manually enter patient information.
      - If the message ***There is no ADT server present*** displays, the Hospital Information System (HIS) is either not available or not present on the network.

   c. After selecting a patient from the ***Request Admit Info*** search results, verify the accuracy of any displayed information before admitting the patient.

3. To manually enter patient information for any in-unit patient, complete the following procedure:

   a. Under ***Patient Information***, enter one or more of the following:

      - ***Last Name***: Enter the last name.
      - ***First Name***: Enter the first name.
      - ***Age***: Select the appropriate age range from the displayed list. The options are: ***Adult***, ***11-13 Years***, ***3-10 Years***, and ***0-2 Years***.
        The age range default setting can be configured before clinical use. For more information, see the technical manual.

        When admitting a telemetry patient at the central station, the ***0-2 Years Age*** range option is available, however telemetry monitoring is not suitable for neonatal patients. For more information, see the documentation accompanying the telemetry monitoring device.

        Some monitoring devices may not allow remote devices like the central station to adjust the ***Age***. Any changes made at the central station will be ignored by the monitoring device and revert to the monitoring device settings. For more information, see the documentation accompanying the monitoring device.
      - ***Patient ID***: Enter the patient identification number.

   b. Under ***Bed***, select the appropriate bed number:

      - For bedside monitors, select a bed number without a symbol at the end (e.g., ICU4).
      - For telemetry monitoring devices, select a bed number with an asterisk at the end (e.g., ICU4*).
        i. Under ***ECG From***, select the TTX number for appropriate telemetry monitoring device.
      - For interface devices, select a bed number with a plus sign at the end (e.g., ICU4+).

4. Select ***Admit***.
5. If manual Full Disclosure data collection is enabled and the message ***Would you like to start Full Disclosure?*** displays, select one of the following:

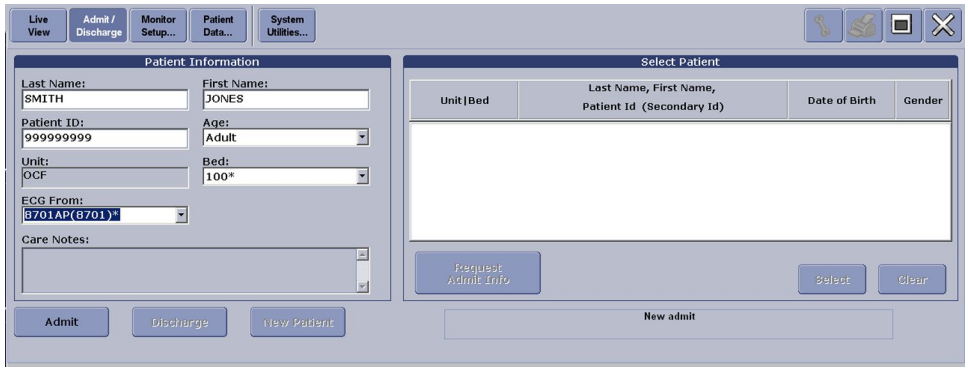
   - ***Yes***: Collect Full Disclosure data for this patient.
   - ***No***: Do not collect Full Disclosure data for this patient at this time.

6. Check that the correct patient displays in the patient Multi-Viewer window.

Admitting Combination monitoring patients

To admit Combination monitoring patients to monitoring devices assigned to the central station, complete the following procedure:

1. From the Multi-Viewer, select ***Admit*** on any empty patient Multi-Viewer window.



2. To automatically retrieve in-unit patient information from a Hospital Information System (HIS), complete the following procedure:

   a. Under ***Patient Information***, enter one or more of the following:

      - ***Last Name***: Enter the last name.
        When searching by name, delete the default ***Patient ID*** (***999999999***).
      - ***Patient ID***: Enter the patient identification number.
        When searching by Patient ID, the central station can only return search results when the Patient ID is composed of numbers and/or upper case letters. It cannot return search results if the Patient ID contains lower case letters.

   b. Select ***Request Admit Info*** to display the search results.

      The Hospital Information System (HIS) will either automatically select a patient or display a list of patients.

      - If the patient was automatically selected and the patient information is correct, select ***Select***.
      - If the patient was not automatically selected, highlight the correct patient in the list and select ***Select***.
      - If the patient information is not correct, or the patient is not in the list, select ***Clear*** and manually enter patient information.
      - If the message ***There is no ADT server present*** displays, the Hospital Information System (HIS) is either not available or not present on the network.

   c. After selecting a patient from the ***Request Admit Info*** search results, verify the accuracy of any displayed information before admitting the patient.

3. To manually enter patient information for any in-unit patient, complete the following procedure:
   a. Under ***Patient Information***, enter one or more of the following:
      - ***Last Name***: Enter the last name.
      - ***First Name***: Enter the first name.
      - ***Age***: Select the appropriate age range from the displayed list. The options are: ***Adult***, ***11-13 Years***, ***3-10 Years***, and ***0-2 Years***.
        The age range default setting can be configured before clinical use. For more information, see the technical manual.

        When admitting a telemetry patient at the central station, the ***0-2 Years Age*** range option is available, however telemetry monitoring is not suitable for neonatal patients. For more information, see the documentation accompanying the telemetry monitoring device.

        Some monitoring devices may not allow remote devices like the central station to adjust the ***Age***. Any changes made at the central station will be ignored by the monitoring device and revert to the monitoring device settings. For more information, see the documentation accompanying the monitoring device.
      - ***Patient ID***: Enter the patient identification number.
   b. Under ***Bed***, select a bed number without a symbol at the end (e.g., ICU4).
   c. Under ***ECG From***, select the TTX number for the appropriate telemetry monitoring device.
4. Select ***Admit***.
5. If manual Full Disclosure data collection is enabled and the message ***Would you like to start Full Disclosure?*** displays, select one of the following:
   - ***Yes***: Collect Full Disclosure data for this patient.
   - ***No***: Do not collect Full Disclosure data for this patient at this time.
6. Check that the correct patient displays in the patient Multi-Viewer window.

Changing patient information

WARNING INCORRECT ALGORITHMS, ARRHYTHMIA PROCESSING, AND CALCULATIONS BASED ON PATIENT AGE — After manually updating or automatically retrieving patient information from a network database, *always* confirm that the entered patient's date of birth matches the patient's actual date of birth. Otherwise the appropriate age-related algorithms, arrhythmia detection, and calculations will not be applied.

Once a patient is monitored at the central station, the patient information can be updated.

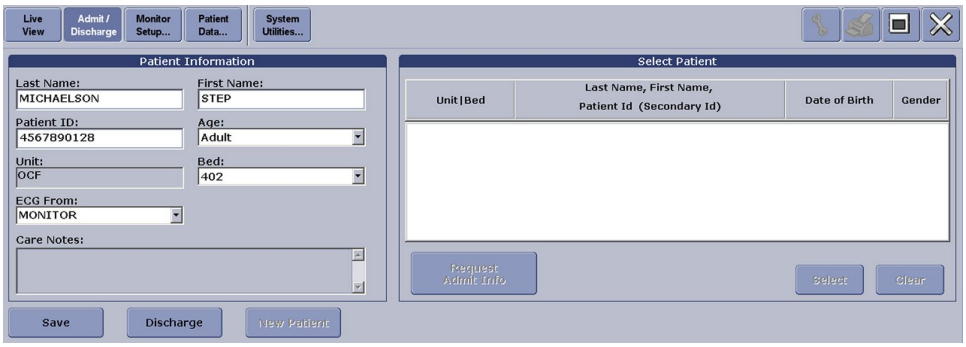
To change patient information, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Admit/Discharge***.

3. Under ***Patient Information***, place the cursor in any of the following fields and make the appropriate changes:

   - ***Last Name***: Enter the last name.
   - ***First Name***: Enter the first name.
   - ***Patient ID***: Enter the patient identification number.
   - ***Age***: Select the appropriate age range from the displayed list. The options are: ***Adult***, ***11-13 Years***, ***3-10 Years***, and ***0-2 Years***.
     When admitting a telemetry patient at the central station, the ***0-2 Years Age*** range option is available, however telemetry monitoring is not suitable for neonatal patients. For more information, see the documentation accompanying the telemetry monitoring device.

     Some monitoring devices may not allow remote devices like the central station to adjust the ***Age***. Any changes made at the central station will be ignored by the monitoring device and revert to the monitoring device settings. For more information, see the documentation accompanying the monitoring device.
   - ***Care Notes***: Enter notes about the patient.



   The ability to enter Care Notes may not be available until two minutes after the patient is admitted to the monitoring device. Full Disclosure must also be enabled, properly licensed, and an patient Multi-Viewer window must be available. Care Notes is a free text box. When text is entered, the note indicator displays in the parameter numerics area of the patient Multi-Viewer window.

4. Select ***Save***.

Discharging patients overview

CAUTION DISCHARGE TO CLEAR PATIENT DATA — When admitting a new patient, you must clear all previous patient data from the system. To accomplish this, disconnect patient cables, then discharge the patient.

Some bedside monitors (e.g., CARESCAPE Monitor B850) can be configured to not allow remote devices like the central station to discharge patients; if remote discharged is disabled, the patient must be discharged locally at the bedside monitor.

If you are unable to discharge a remote bedside monitor within the same unit as the central station, see the documentation accompanying the bedside monitor for troubleshooting.

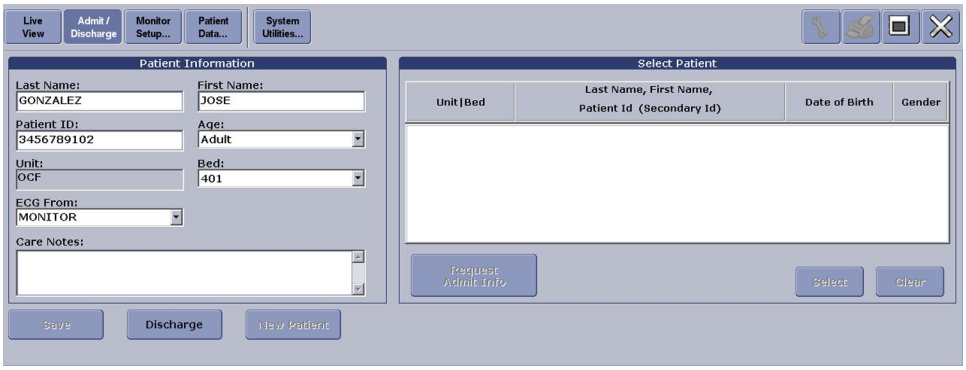
After the discharge is complete, the patient Multi-Viewer window displays the following:

- Telemetry monitoring devices discharged from a locked patient Multi-Viewer window display the message ***DISCHARGED***.
- Telemetry monitoring devices discharged from an unlocked patient Multi-Viewer window display the ***Admit*** button.
- Bedside monitor patient Multi-Viewer windows may display the message ***NO COMM*** briefly then display the message ***DISCHARGED***. The bedside monitor is also discharged.

Discharging patients

To discharge patients from monitoring devices remotely, complete the following procedure:

1. Disconnect all patient monitoring cables.
2. Select the appropriate patient Multi-Viewer window.
3. From the Single Viewer menu, select ***Admit/Discharge***.



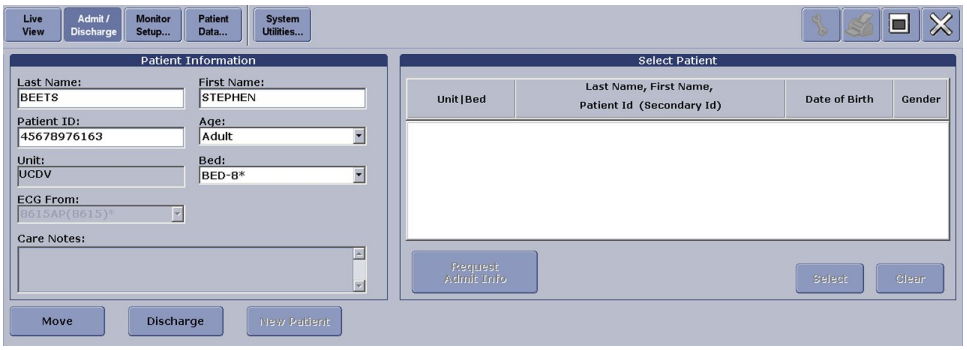
4. Select ***Discharge***.
5. When the message ***Are you sure you want to DISCHARGE this patient?*** displays, select the appropriate option:
   - ***Yes***: Discharge this patient. The message ***Discharging patient...*** displays.
   - ***No***: Cancel the discharge process.

Breaking Combination monitoring by discharging the bedside monitor

To break Combination monitoring by discharging the bedside monitor, complete the following procedure:

1. Disconnect all patient monitoring cables from the bedside monitor.
2. Select the appropriate patient Multi-Viewer window.
3. From the Single Viewer menu, select ***Admit/Discharge***.

4. Under ***Bed*** select the appropriate telemetry monitoring device bed number with an asterisk at the end (e.g., ICU4*).

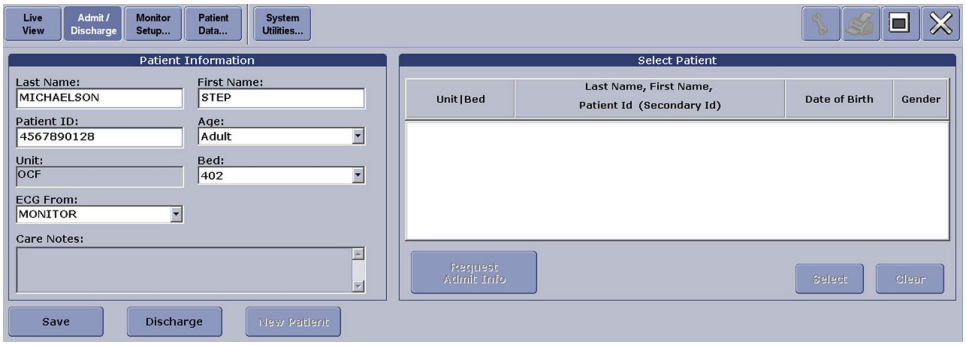


5. Select ***Move*** to discharge a patient from the bedside monitor and continue monitoring the patient with the telemetry monitoring device.

Breaking Combination monitoring by discharging the telemetry monitoring device

To break Combination monitoring by discharging the telemetry monitoring device, complete the following procedure:

1. Disconnect all patient monitoring cables from the telemetry monitoring device.
2. Select the appropriate patient Multi-Viewer window.
3. From the Single Viewer menu, select ***Admit/Discharge***.
4. Under ***ECG From*** select ***Monitor***.



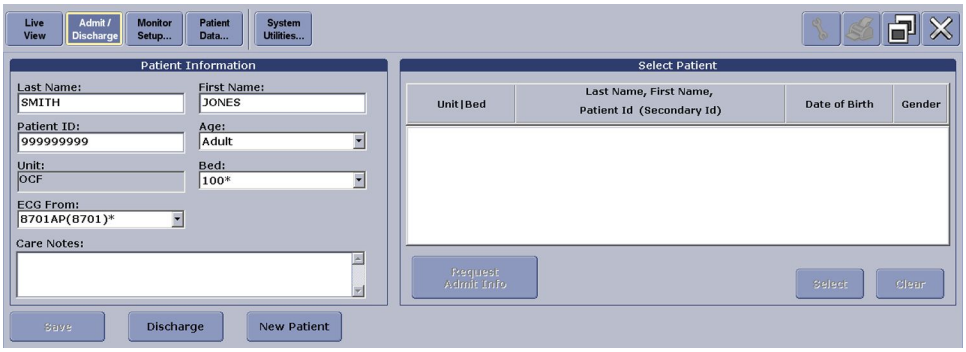
5. Select ***Save*** to discharge the patient from a telemetry monitoring device and continue monitoring the patient with the bedside monitor.

Admitting new telemetry patients

To discharge an existing telemetry patient and admit a new telemetry patient to the same telemetry monitoring device and display in the same patient Multi-Viewer window, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.

2. From the Single Viewer menu, select ***Admit/Discharge***.



3. Select ***New Patient***. This option is only available for telemetry monitoring devices. It is not available for bedside monitors.
4. When the message ***Are you sure you want to assign a NEW PATIENT?*** displays, select the appropriate option:
   - ***Yes***: Discharge the currently admitted patient and admits the telemetry monitoring device to a new patient in the same Multi-Viewer window. The Telemetry Unit Defaults will be applied for this new patient.
   - ***No***: To cancel this process.
5. Select the appropriate patient Multi-Viewer window for the new telemetry patient.
6. From the Single Viewer menu, select ***Admit/Discharge***.
7. Under ***Patient Information***, enter the following:
   - ***Last Name***: Enter the last name.
   - ***First Name***: Enter the first name.
   - ***Age***: Select the appropriate age range from the displayed list. The options are: ***Adult***, ***11-13 Years***, ***3-10 Years***, and ***0-2 Years***. The age range default setting can be configured before clinical use. For more information, see the technical manual.

     When admitting a telemetry patient at the central station, the ***0-2 Years Age*** range option is available, however telemetry monitoring is not suitable for neonatal patients. For more information, see the documentation accompanying the telemetry monitoring device.
   - ***Patient ID***: Enter the patient identification number.
8. Select ***Save***.
9. Check that the correct patient displays in the patient Multi-Viewer window.

Moving telemetry patients to another in-unit bed

To move a telemetry patient to another available (empty) in-unit bed, complete the following procedure:

1. From the Multi-Viewer, select the telemetry patient to be moved to another available (empty) in-unit bed.

   The selected patient Multi-Viewer window must be unlocked.
2. From the Single Viewer menu, select ***Admit/Discharge***.

3. Under ***Bed***, select the destination bed number with an asterisk at the end (e.g., ICU4*).
4. Select ***Move***.
5. When the message ***Are you sure you want to MOVE this patient?*** displays, select the appropriate option:
   - ***Yes***: Move to the selected ***Bed***.
   - ***No***: Cancel the move process.
6. Check that the correct patient displays in the patient Multi-Viewer window.

Replacing telemetry monitoring devices

To replace the telemetry monitoring device, complete the following procedure:

1. Exchange the patient's telemetry monitoring device.
2. Select the appropriate patient Multi-Viewer window.
3. From the Single Viewer menu, select ***Admit/Discharge***.
4. Under ***ECG From***, select the appropriate TTX number.
5. Select ***Save***.
6. Check that the correct TTX number displays in the patient Multi-Viewer window.

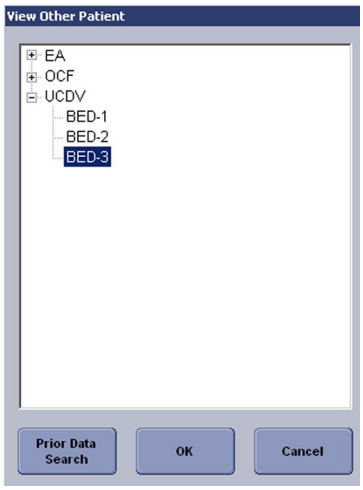
Viewing other patients

WARNING LOSS OF MONITORING — Do not use viewing ***Other Patients*** as a substitute for having enough patient Multi-Viewer windows configured to display in the Multi-Viewer to support all patients monitored in a care unit. Loss of monitoring at the central station may result.

Any patient on the CARESCAPE Network MC can be temporarily viewed on the central station. This is called the 17th patient view. When viewing out-of-unit patients, alarm and parameter settings cannot be adjusted. Only one patient can be displayed in the Single Viewer at a time.

To view other patients, complete the following procedure:

1. From the Multi-Viewer menu, select ***Other Patients***.



2. From the displayed list of devices, select the appropriate unit and bed number.
3. Select ***OK***.
4. Check that the correct patient displays in the Single Viewer.

6

Alarms

Alarm safety precautions

WARNING ALARM ACTIVATION — Audio alarms do not sound and visual alarm indicators do not display at the central station until a patient is admitted. The central station will not provide alarm notification if an unadmitted patient enters an alarm condition. You must admit the patient to activate the alarm notification, automatic alarm printing, and events storage.

WARNING ALARM CONTROL SETTINGS — Parameter alarm limits or alarm priority levels adjusted at the central station are also implemented at the bedside monitor, unless the settings are locked. Always notify the bedside clinician when parameter alarm limits or alarm priority levels are adjusted.

WARNING ALARM LIMITS — Always make sure that necessary alarm limits are active and set according to the patient's clinical condition when you start monitoring a patient. Setting alarm limits lower than clinically relevant for a patient may result in reduced awareness of patient critical conditions (i.e., alarms).

WARNING ALARM VOLUME — Adjustment of the minimum alarm volume to a low level or off may allow the actual volume to be adjusted to a low level or off during monitoring, which may result in a hazard to patients.

WARNING AUDIO ALARM PAUSE — Do not continuously try to pause audio alarms. New alarms could be inadvertently paused.

WARNING AUDIO ALARM PAUSE — Do not rely exclusively on the alarm pause breakthrough feature for alarm notification during an audio alarm pause. This may result in a hazard to the patient as only ***HIGH*** (***CRISIS***) priority alarms break through.

WARNING AUDIO ALARM TONES — To comply with international specifications for alarming (e.g., IEC 60601-1-8), newer devices like the CARESCAPE Central Station and CARESCAPE Monitor B850 use a slightly different order for alarm priorities than older devices like the CIC Pro Clinical Information Center and Dash 3000 patient monitor. This results in occasional differences between audio and/or visual annunciation of alarms between the newer and older devices. Different audio alarm tones may occur from a CARESCAPE Central Station verses a CIC Pro Clinical Information Center for certain combinations of alarms. Across multiple older devices displayed by the same central station, when the two highest alarms are ***SYSTEM WARNING*** and physiological ***LOW*** (***ADVISORY***), then CARESCAPE Central Station sounds the ***MEDIUM*** (***WARNING***) audio alarm tone while the CIC Pro Clinical Information Center sounds the ***LOW*** (***ADVISORY***) audio alarm tone.

WARNING AUDIO ALARM TONES — GE recommends using the same audio alarm tones for all monitoring devices within the same unit to reduce the chance of difficulty differentiating between alarm priority levels based on audio alarm tones which could result in missed higher priority alarm.

WARNING AUDIO ALARMS — Do not rely exclusively on the audio alarm system for monitoring. Remember that the most reliable method of monitoring combines close personal surveillance with correct operation of monitoring devices.

WARNING AUDIO ALARMS — Audio alarms will not sound at the central station when a bedside monitor is configured for use in operating rooms.

WARNING AUDIO ALARMS — Some bedside monitors (e.g., CARESCAPE Monitor B850) provide the ability to turn off alarm notifications at the bedside monitor (e.g., sleep mode, display off/alarm off). In the event that a network disconnection occurs, and the central station ***NO COMM AUDIO*** was set to ***Disable*** before clinical use, then only a visual ***NO COMM*** notification appears at the central station for that bedside monitor. For additional information on turning off alarm notifications at the bedside monitors, see the documentation accompanying the bedside monitor.

For additional information about ***NO COMM AUDIO*** configuration, see the central station technical manual.

WARNING AUDIO ALARMS — The functions of the alarm system must be verified at regular intervals. Check speaker volume of all connected speakers periodically to ensure audio alarm functionality.

WARNING MISSED ALARMS — Do not rely on receipt of the following alarm conditions at a central station when connected to the CARESCAPE Network MC. Notification of any of these alarm conditions will only be given when it is the most recent, highest priority active alarm coming from the monitor. This applies to the following parameter alarm limits and technical (system status) alarms:

- ECG HR limit (if Single HR mode and Primary HR is not ECG)
- QT and QTc high limit
- CPP high/low limit
- Tblood-T1 Delta and Tblood-T3 Delta high limit
- RE and SE high/low limit
- PEEPtot, PEEPe, PEEPi high/low limit
- MVexp high limit
- IP systolic & diastolic high/low limit for sites: P1-P8, ICP, CVP, RAP, RVP, LAP, UVC, FemV
- No Px Transducer
- SvO2 Cable Off
- Measurement Removed for ECG, Pressure, NIBP, SpO2, SvO2, CO, Temp, Gas
- Identical Modules for IP, SpO2, COP, Temp, Gas, Entropy
- Remove One ECG Module

WARNING MISSED ALARMS — Failure to have enough patient Multi-Viewer windows to cover the total of both hard-wired bedside monitors and telemetry monitoring devices in the unit may result in unmonitored patients and a potential to miss audio and visual alarm notification for those unmonitored patients.

WARNING MISSED ALARMS — If multiple high priority system status alarms occur at the same time, only one displays. Select the central station system status button/drop-down menu to display other system status alarms.

WARNING MISSED ALARMS — Only the most recent, highest priority alarm is sent to remote devices on the CARESCAPE Network MC. Therefore, less recent alarms of equal or lower priority may not be displayed remotely.

WARNING MIXED ENVIRONMENT — A hazard can exist when the same type of bedside monitors in the same unit are using different configuration settings.

WARNING OUT-OF-UNIT ALARMS — Depending on the central station configuration, audio alarms may not sound at the central station for any viewed out-of-unit patients. Only visual alarm indicators display unless the central station is configured to also sound audio alarms. For more information, contact authorized service personnel.

WARNING OUT-OF-UNIT ALARMS — If the central station is configured to sound audio out-of-unit alarms, any patient displayed on the out-of-unit central station can have the active audio alarms paused at the out-of-unit central station.

WARNING SMART ALARMS — Audio alarms do not sound, events are not stored, alarms do not print, and alarms are not sent to the Network when the alarms are turned off.

Alarm conditions

The central station does not determine or detect alarm conditions. The monitoring device detects the alarm condition, including arrhythmia events (e.g., ***TACHY***), limit violations (e.g., ***HR LO***), parameter message alarms (e.g., ***APNEA***), and parameter technical alarms (e.g., ***PROBE OFF***).

After the monitoring device makes the alarm determination, it notifies the central station of the alarm condition. Alarm notification at the central station is indicated by audio alarm tones and visual alarm indicators. The central station continues to provide alarm notification until the monitoring device stops sending the alarm condition notification.

Alarm delays at the central station are due to first the delay at the monitoring device to detect and generate the alarm signal and second, the delay of the network and network protocol to transfer the alarm signal from the monitoring device to the central station. Delay between onset of a clinical event, the alarm determination, and alarm signaling for that event varies by device. For more information, see the documentation accompanying the device. After the monitoring device determines an alarm condition exists and produces an alarm signal, there may be up to two seconds of further delay (average is one second) before the central station receives notification of that alarm condition and generates a remote alarm signal.

As for any arrhythmia alarm (e.g., tachycardia), the time to alarm at the central station is up to two seconds beyond the time delay for the arrhythmia alarm on the monitoring device.

There are two types of alarm conditions:

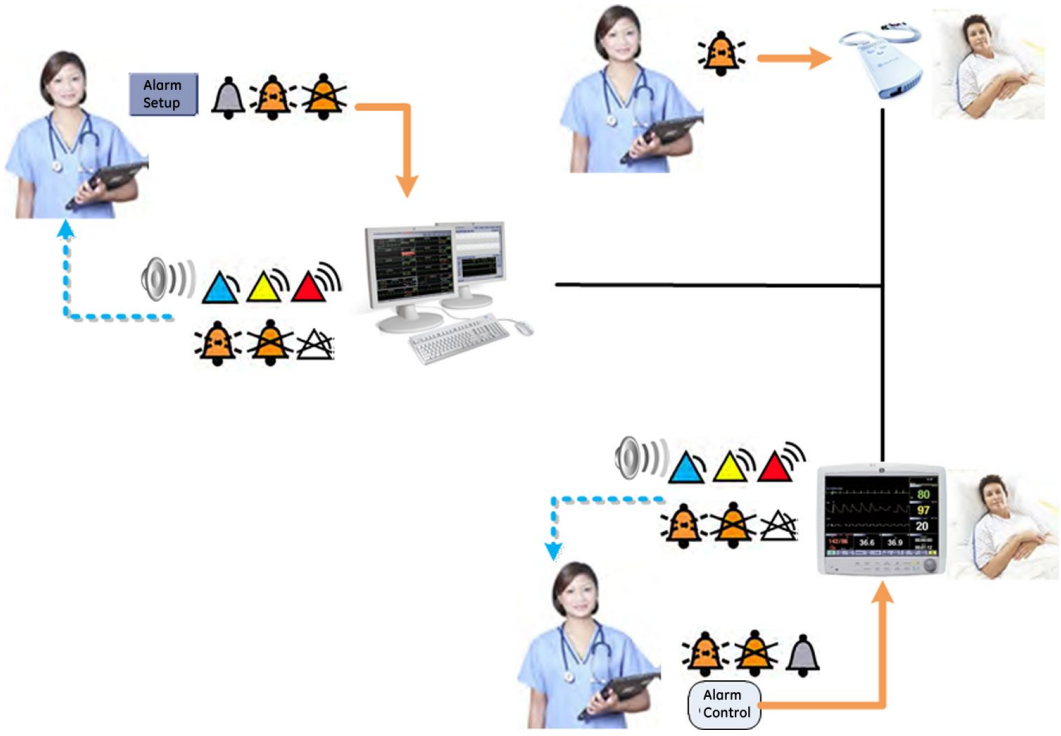
- Physiological (patient status) alarm conditions are triggered by a patient measurement exceeding the parameter alarm limits or by an arrhythmia condition.
- Technical (system status) alarm conditions are triggered by an electrical, mechanical, or other failures of the system or system component. Technical alarm conditions may also be caused when an algorithm cannot classify or interpret the available data.

When a patient experiences an alarm condition, users can display the patient data in a Single Viewer. Use one of the following methods to display the Single Viewer of an alarming patient Multi-Viewer window:

- Select the patient Multi-Viewer window.
- Select the monitoring devices alarm buttons (ADUs).

Alarm system diagram

The following interactions occur between the user, monitoring devices, and patient with respect to audio and visual alarm notification, alarm inactivation, and alarm configuration.



Symbol	Description
	Network
	Alarm control
	Alarm notification
	Visual alarm notification
	Alarm status indication/control
	Audio alarm notification

Alarm priority levels

WARNING AUDIO ALARM TONES — To comply with international specifications for alarming (e.g., IEC 60601-1-8), newer devices like the CARESCAPE Central Station and CARESCAPE Monitor B850 use a slightly different order for alarm priorities than older devices like the CIC Pro Clinical Information Center and Dash 3000 patient monitor. This results in occasional differences between audio and/or visual annunciation of alarms between the newer and older devices. Different audio alarm tones may occur from a CARESCAPE Central Station verses a CIC Pro Clinical Information Center for certain combinations of alarms. Across multiple older devices displayed by the same central station, when the two highest alarms are ***SYSTEM WARNING*** and physiological

LOW (***ADVISORY***), then CARESCAPE Central Station sounds the ***MEDIUM*** (***WARNING***) audio alarm tone while the CIC Pro Clinical Information Center sounds the ***LOW*** (***ADVISORY***) audio alarm tone.

WARNING AUDIO ALARM TONES — GE recommends using the same audio alarm tones for all monitoring devices within the same unit to reduce the chance of difficulty differentiating between alarm priority levels based on audio alarm tones which could result in missed higher priority alarm.

Alarm priority levels can be configured for IEC or Legacy nomenclature before clinical use. For more information, see the technical manual.

The nomenclature setting is specific to the central station and is not applied to monitoring devices. Compatible monitoring devices use one of the two alarm priority nomenclatures (i.e., IEC or Legacy). For more information, see the documentation accompanying the monitoring device.

The ramifications of having a clinical environment that uses more than one alarm priority nomenclature include:

- Different monitoring devices use different terms for each of the alarm priorities within the unit.
- Printouts use the selected nomenclature based on the monitoring device that produces the content of the printout.
- Displays use the selected nomenclature.

Alarm condition	IEC priority level	Legacy priority level	Priority definition
Physiological	***HIGH***	***CRISIS***	Requires an immediate response.
Technical	***HIGH***	***CRISIS***	
Physiological	***MEDIUM***	***WARNING***	Requires a prompt response.
Technical	***MEDIUM***	***SYSTEM WARNING***	
Physiological	***LOW***	***ADVISORY***	Requires awareness of this condition.
Technical	***LOW***	***SYSTEM ADVISORY***	
Physiological	***INFORMATIONAL***	***MESSAGE***	Provides additional information.
Technical	***INFORMATIONAL***	***SYSTEM MESSAGE***	

For more information about alarm priority nomenclature, select ***Monitor Setup*** > ***Alarm Setup*** from the Single Viewer menu, then select > ***Alarm Help***.

The central station alarm priority level matches the alarm priority level set by the monitoring device for the active alarm condition, including escalation and de-escalation of alarm priority level and latching alarm conditions.

An escalating alarm starts at a designated priority level (***LOW*** (***ADVISORY***) or ***MEDIUM*** (***WARNING***)) and will escalate to the next higher priority level of alarm after a set number of seconds (usually 30 seconds) if the alarm condition has not been resolved. It is important to note that these escalate up to the next level but will not reset until the condition has been resolved. Alarm priority escalation affects the currently ongoing alarm condition, not any future alarms of the same type. Any new alarms will alarm at their designated priority level, not at the escalated level. Not all bedside monitors support escalating alarms. For more information, see the documentation accompanying the bedside monitor.

When alarms are latched, the audio alarm and visual message remains after the alarm condition no longer exists. Alarms can be configured to latch for all high priority alarms only, all alarm priorities, or none. Alarm latching is controlled by the monitoring device. For more information, see the documentation accompanying the monitoring device.

The monitoring device determines the highest priority visual alarm and the highest priority audio alarm and sends this information to the central station for remote alarm notification. For some monitoring devices, the visual and audio alarm notification may differ. This typically occurs when a monitoring device permits a particular alarm to remain in an audio alarm pause and at the same times provide an audio alarm signal for some other alarm. Not all monitoring devices support this capability. For more information, see the documentation accompanying the monitoring device.

To comply with international specifications for alarming (e.g., IEC 60601-1-8), newer devices like the CARESCAPE Central Station and CARESCAPE Monitor B850 use a slightly different order for alarm priorities than older devices like the CIC Pro Clinical Information Center and Dash 3000 patient monitor. This results in occasional differences between audio and/or visual annunciation of alarms between the newer and older devices. When the two highest alarm conditions at an older bedside monitor are ***SYSTEM WARNING*** and physiological ***LOW*** (***ADVISORY***), instead of displaying a yellow patient Multi-Viewer window border and sounding a ***MEDIUM*** (***WARNING***) audio alarm tone, the CARESCAPE Central Station displays a cyan patient Multi-Viewer window border and sounds a ***LOW*** (***ADVISORY***) audio alarm tone. The CIC Pro Clinical Information Center displays a non-colored patient Multi-Viewer window borders and sounds a ***LOW*** (***ADVISORY***) audio alarm tone.

Audio alarm tones

WARNING

AUDIO ALARM TONES — To comply with international specifications for alarming (e.g., IEC 60601-1-8), newer devices like the CARESCAPE Central Station and CARESCAPE Monitor B850 use a slightly different order for alarm priorities than older devices like the CIC Pro Clinical Information Center and Dash 3000 patient monitor. This results in occasional differences between audio and/or visual annunciation of alarms between the newer and older devices. Different audio alarm tones may occur from a CARESCAPE Central Station verses a CIC Pro Clinical Information Center for certain combinations of alarms. Across multiple older devices displayed by the same central station, when the two highest alarms are ***SYSTEM WARNING*** and physiological ***LOW*** (***ADVISORY***), then CARESCAPE Central Station sounds the ***MEDIUM*** (***WARNING***) audio alarm tone while the CIC Pro Clinical Information Center sounds the ***LOW*** (***ADVISORY***) audio alarm tone.

WARNING

AUDIO ALARM TONES — GE recommends using the same audio alarm tones for all monitoring devices within the same unit to reduce the chance of difficulty differentiating between alarm priority levels based on audio alarm tones which could result in missed higher priority alarm.

Audio alarms sound at the bedside monitor and the central station. Audio alarm tones can be configured for IEC or Legacy alarm tones. The following tables describe the alarm tones by alarm priority level:

IEC audio alarm tones

Alarm condition	*HIGH* priority level	*MEDIUM* priority level	*LOW* priority level	*INFORMATIONAL* priority level
Physiological and technical alarms	Repeats pattern of two * 5-beep tones	Repeats pattern of 3-beep tones	Repeats pattern of 1-beep tone[1]	None

Legacy audio alarm tones

Alarm condition	*CRISIS* priority level	*WARNING* priority level	*ADVISORY* priority level	*MESSAGE* priority level
Physiological (patient status) alarms	Repeats pattern of 3-beep tones	Repeats pattern of 2-beep tones	Repeats pattern of 1-beep tone	None
Technical (system status) alarms	Repeats pattern of 3-beep tones	Repeating foghorn	Single foghorn	None

For more information about alarm priority nomenclature, select ***Monitor Setup*** > ***Alarm Setup*** from the Single Viewer menu, then select ***Alarm Help***.

When more than one alarm occurs at the same time, the central station will sound an alarm tone for the highest priority alarm. Any lower priority alarms are suppressed by the higher priority alarm.

When IEC alarm tones are used, the same tone sounds for both physiological ***LOW*** priority level alarms and technical ***LOW*** priority level alarms. However, Legacy alarm tones sound a different tone for physiological ***ADVISORY*** priority level alarms and technical ***SYSTEM ADVISORY*** priority level alarms.

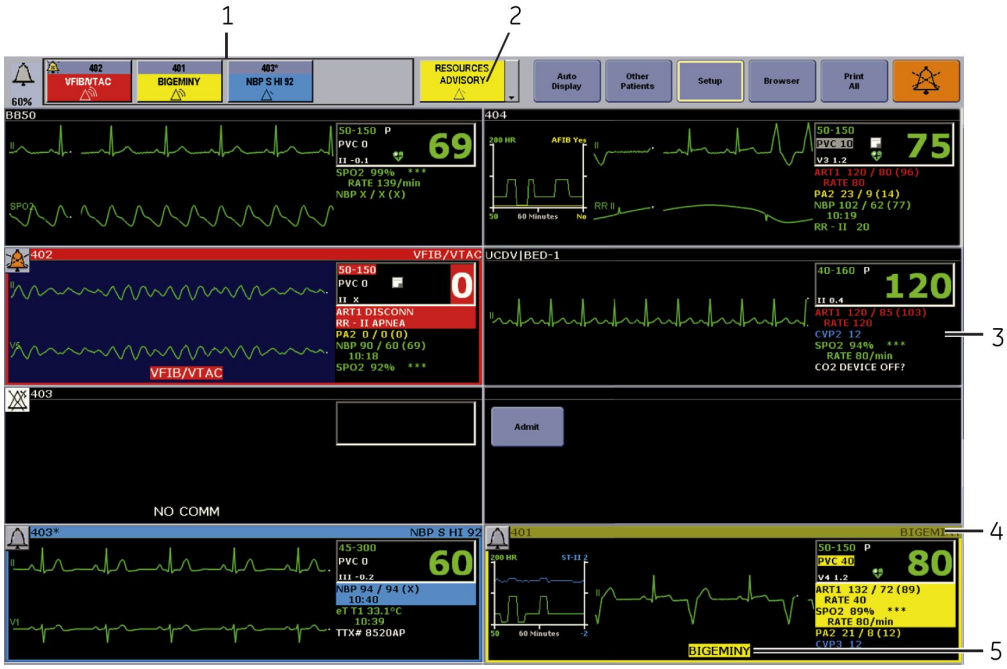
When IEC alarm tones are used, the same tone sounds for both physiological ***MEDIUM*** priority level alarms and technical ***MEDIUM*** priority level alarms. However, Legacy alarm tones sound a different tone for physiological ***WARNING*** priority level alarms and technical ***SYSTEM WARNING*** priority level alarms.

Central station system status messages do not provide audio alarm tones; only visual alarm indicators will display in the central station system status alarm button/drop-down menu.

Visual alarm indicators

Visual alarm indicators can be displayed in the following locations on the central station:

1. LOW priority level technical alarms can be configured before clinical use to either repeat or not repeat the audio alarm tone. The factory preset is to repeat the audio alarm tone. For more information, see the technical manual.



Item	Description
1	Monitoring devices alarm buttons (ADUs)
2	Central station system status button/drop-down menu
3	Parameter numerics area
4	Patient Multi-Viewer window title bar and border
5	Waveform message area

Visual alarm indicators have the following characteristics:

Alarm location	***HIGH* (*CRISIS*) priority level**	***MEDIUM* (*WARNING*) priority level**	***LOW* (*ADVISORY*) priority level**	***INFORMATIONAL* (*MESSAGE*) priority level**	**Characteristics**
Parameter numerics area and waveform message area	White text inside a red box.	Black text inside a yellow box.	Black text inside a cyan box.	Black text inside a gray box.	The highest priority, most recent alarm condition that displays until the condition is resolved or acknowledged.
Monitoring devices alarm buttons (ADUs)	Red box with the alarm message in white text.	Yellow box with the alarm message in black text.	Cyan box with the alarm message in black text.	None	Up to four alarm buttons (ADUs) display in decreasing order of priority until the condition is resolved or acknowledged. If more than four monitoring devices are in alarm, only the four of the highest priority alarms display.

Alarm location	*HIGH* (*CRISIS*) priority level	*MEDIUM* (*WARNING*) priority level	*LOW* (*ADVISORY*) priority level	*INFORMATIONAL* (*MESSAGE*) priority level	Characteristics
Central station system status button	Red box with the alarm message in white text.	Yellow box with the alarm message in black text.	Cyan box with the alarm message in black text.	None	The highest priority alarm displays until the condition is resolved or acknowledged. When more than one alarm condition occurs, a drop-down menu allows users to display the other active alarm conditions.
Patient Multi-Viewer window title bar and border	Flashes red with the alarm message in white text.	Flashes yellow with the alarm message in black text.	Displays cyan with the alarm message in black text.	None	Displays the highest (non-acknowledged) visual alarm condition. The title bar and border display in the color of highest priority visual alarm condition.

Up to four monitoring devices alarm buttons display in decreasing order of priority until the condition is resolved or acknowledged. If more than four monitoring devices are in alarm, only the four of the highest priority alarms display.

In the parameter numerics area and the waveform message area, the most recent highest priority active alarm condition displays until the condition is resolved or in case of ***HIGH*** (***CRISIS***) priority level alarm conditions, until the condition is resolved and acknowledged.

The patient Multi-Viewer window title bar and border changes color to match the highest priority visual alarm signal from the monitor device. The title bar also shows the alarm text of the highest alarm at the monitoring device. This is the same message shown in the alarm buttons (ADUs).

If the patient window has one of the four of the highest priority alarms and is displaying as one of the monitoring devices alarm buttons (ADUs), the patient Multi-Viewer window title bar will show the same message. The highest priority alarm may be either from a latched alarm or from an active alarm condition. Latched alarms continue to alarm after the alarm condition has been resolved. To clear latched alarms, the ***HIGH*** (***CRISIS***) priority level alarm condition must be acknowledged. Non-latched alarms ***MEDIUM*** (***WARNING***) and ***LOW*** (***ADVISORY***) priority level alarms automatically clear when the alarm condition is resolved.

Previous versions of the central station, including the CIC Pro Clinical Information Center, display ***LOW*** (***ADVISORY***) priority level alarms as a yellow box with black text. They also do not display a colored patient Multi-Viewer window title bar.

The following visual alarm indicators display on the central station:

Symbol	Description
	Alarm ***AUDIO PAUSE*** button
	Alarm ***AUDIO PAUSE*** indicator
	Alarm ***AUDIO PAUSE*** button Audio alarm signal indicator Alarm volume indicator
	Alarms off indicator
	All audio alarms off indicator
	***HIGH*** (***CRISIS***) alarm priority indicator
	***LOW*** (***ADVISORY***) alarm priority indicator
	***MEDIUM*** (***WARNING***) alarm priority indicator

Adjusting alarm volume

WARNING ALARM VOLUME — Adjustment of the minimum alarm volume to a low level or off may allow the actual volume to be adjusted to a low level or off during monitoring, which may result in a hazard to patients.

Audio alarm notification will occur at the central station when ALL of the following conditions are met:

- The central station ***Volume Current*** is set to ***10%*** or higher.
- The telemetry monitoring device ***Alarm Audio On/Off*** is set to ***ON***.
- The bedside monitoring device is not configured for use in operating rooms.

If the central station ***Volume Current*** is set to 0%, the ***Alarm Audio Off Reminder*** sounds every 120 seconds ± 10 seconds until the alarm condition is resolved or acknowledged.

The central station will not sound the ***Alarm Audio Off Reminder*** when ANY of the following conditions are met:

- The monitoring device audio alarms are paused.
- The telemetry monitoring device ***Alarm Audio On/Off*** is set to ***OFF***.

- The telemetry monitoring device ***Alarm Audio On/Off*** is set to ***Alarm Audio Pause - Smart Alarm***.
- The bedside monitoring device is configured for use in operating rooms.
- The monitoring device ***Alarm Audio Off Reminder*** is set to ***No***.

To adjust the alarm volume for this central station, complete the following procedure:

1. Select the alarm volume indicator in the Multi-Viewer menu.

2. Select the ***Volume Current*** percent from the displayed options.

   The ***Volume Current*** level cannot be set below the ***Volume Minimum*** level. The ***Volume Minimum*** level is configured before clinical use. For more information, see the technical manual.

3. Choose the appropriate option:
   - ***Apply***: Save the changes without closing the window.
   - ***Cancel***: Disregard the changes and close the window.
   - ***OK***: Save the changes and close the window.
4. Check that the correct Volume Current percent displays under the alarm volume indicator.

Pausing audio alarms

WARNING ALARM NOTIFICATION — ***HIGH*** (***CRISIS***) priority level alarms will continue to audibly and visually alarm until the alarm ***AUDIO PAUSE*** button or alarm **AUDIO PAUSE** keyboard key is manually selected.

WARNING AUDIO ALARM PAUSE — Do not continuously try to pause audio alarms. New alarms could be inadvertently paused.

WARNING AUDIO ALARM PAUSE — Do not rely exclusively on the alarm pause breakthrough feature for alarm notification during an audio alarm pause. This may result in a hazard to the patient as only ***HIGH*** (***CRISIS***) priority alarms break through.

Some bedside monitors (e.g., CARESCAPE Monitor B850) can be configured to not allow remote devices like the central station to pause audio alarms. Some bedside monitors (e.g., DINAMAP Pro 1000 and Dash 2500 patient monitors) do not allow remote devices like the central station to pause audio alarms. If remote audio alarm pausing is disabled, the audio alarms must be paused locally at the bedside monitor. For more information, see the documentation accompanying the bedside monitor.

Active audio alarms can be paused for in-unit bedside monitors from the central station. When audio alarms are paused at the central station, the central station automatically sends an audio alarm pause request to the bedside monitor. When configured to allow remote audio alarm pause, the bedside monitor will also pause active audio alarms up to two minutes. Once an audio alarm pause request is sent to the bedside monitor it cannot be cancelled remotely at the central station; audio alarm pause can only be cancelled locally at the bedside monitor.

Out-of-unit bedside monitors will display the alarm ***AUDIO PAUSE*** button if an audio alarm is present for that bedside monitor.

The ability to remotely pause audio alarms for out-of-unit monitoring devices is configured before clinical use.

Some bedside monitors (e.g., CARESCAPE Monitor B850) can be configured to pause audio alarms for either individual or all audio alarms before clinical use. For more information, see the documentation accompanying the bedside monitor.

- When configured to pause individual audio alarms, the active audio alarm will be paused. If another audio alarm occurs, it will sound, breaking the audio alarm pause.
- When configured to pause all audio alarms, all active audio alarms will be paused. If an audio alarm of equal or greater priority occurs, the audio alarm will sound, breaking the audio alarm pause.

The ability to pause audio alarms for individual patients by pressing the alarm ***AUDIO PAUSE*** button in the patient Multi-Viewer window is configured before clinical use. For more information, see the technical manual.

There are two types of audio alarm pause, based on the duration:

- Short alarm audio pause: Audio alarms will not sound for up to two minutes at a time, unless alarm pause breakthrough condition(s) occur or the user cancels or reinstates the audio alarm pause at the monitoring device. Visual alarm indicators continue to display.
- Long alarm audio pause: Audio alarms will not sound for more than two minutes at a time, unless alarm pause breakthrough condition(s) occur or the user cancels or reinstates the audio alarm pause at the monitoring device. Visual alarm indicators continue to display. Long alarm audio pause must be activated from the monitoring device.

Audio pause breakthrough allows alarm conditions to break through or interrupt an audio alarm pause:

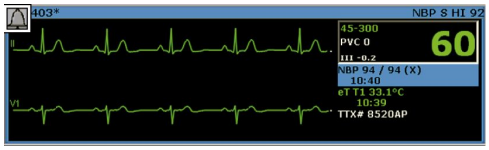
- Bedside monitors break through the audio alarm pause if an alarm of equal or greater priority occurs. For more information, see the documentation accompanying the bedside monitor.
- When configured before clinical use, telemetry monitoring devices break through the long audio alarm pause for ***HIGH*** (***CRISIS***) priority alarms. For more information, see the technical manual.

To pause audio alarms, complete the following procedure:

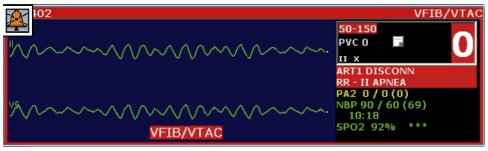
1. To pause audio alarms for all patients displayed in the Multi-Viewer and any other viewed patient (17th patient), select one of the following options:
   - Press the alarm ***AUDIO PAUSE*** keyboard key.
   - Select the Multi-Viewer alarm ***AUDIO PAUSE*** button.

   The alarm ***AUDIO PAUSE*** keyboard key will be disabled if the Alarms license is not enabled.

2. To pause audio alarms for a single patient, select one of the following options:
   - Select the alarm ***AUDIO PAUSE*** button in the appropriate patient Multi-Viewer window.

     The alarm ***AUDIO PAUSE*** button only displays in the patient Multi-Viewer window when an active alarm condition is occurring.
   - Select the appropriate patient Multi-Viewer window and select the alarm ***AUDIO PAUSE*** button in the Single Viewer.
3. Check that the patient Multi-Viewer window alarm ***AUDIO PAUSE*** indicator displays.

To comply with international specifications for alarming (e.g., IEC 60601-1-8), newer devices like the CARESCAPE Central Station and CARESCAPE Monitor B850 use a slightly different order for alarm priorities than older devices like the CIC Pro Clinical Information Center and Dash 3000 patient monitor. This results in occasional differences between audio and/or visual annunciation of alarms between the newer and older devices.

- When the two highest alarm conditions at an older bedside monitor are technical ***SYSTEM ADVISORY*** and physiological ***INFORMATIONAL*** (***MESSAGE***), the cyan border on a CARESCAPE Central Station patient Multi-Viewer window disappears during an audio alarm pause and reappears when the audio alarm pause expires. The CIC Pro Clinical Information Center displays a non-colored patient Multi-Viewer window border both during and after audio alarm pause.
- When the two highest alarm conditions for an older bedside monitor are technical ***SYSTEM WARNING*** and a physiological ***INFORMATIONAL*** (***MESSAGE***), the yellow border on a CARESCAPE central station patient Multi-Viewer window disappears during an audio alarm pause and reappears when the audio alarm pause expires. The CIC Pro Clinical Information Center displays a non-colored patient Multi-Viewer window border both during and after audio alarm pause.

Adjusting alarm control settings overview

WARNING SMART ALARMS — Audio alarms do not sound, events are not stored, alarms do not print, and alarms are not sent to the Network when the alarms are turned off.

WARNING ALARM CONTROL SETTINGS — Parameter alarm limits or alarm priority levels adjusted at the central station are also implemented at the bedside monitor, unless the settings are locked. Always notify the bedside clinician when parameter alarm limits or alarm priority levels are adjusted.

Control settings can be adjusted for any in-unit patient displayed in the Multi-Viewer. Out-of-unit patient control settings can only be viewed; they cannot be adjusted by the central station.

Control setting changes at the central station are sent to the monitoring device within two seconds to be adopted by the bedside monitor. Some control settings for non-GE monitoring devices via the Unity Network ID interface device cannot be adjusted at the central station. For more information, see the documentation accompanying the monitoring device.

Excluding ***Telemetry Unit Defaults*** and ***Telemetry Alarm Setup Defaults***, alarm control settings are controlled and stored by the monitoring device. For more information, see the documentation accompanying the monitoring device.

Power off, power interruptions, loss of network connectivity or removal of the central station in any way will not affect the alarm control settings stored at the monitoring device. Monitoring device alarm control settings function independently of a central station and do not depend on the central station for alarm control setting functionality, storage or persistence. For more information, see the documentation accompanying the monitoring device.

Depending on the acquisition device, some bedside monitors (e.g., CARESCAPE Monitor B850) may not allow the ***SPO2*** alarm priority level to be set to ***LOW*** (***ADVISORY***). For more information, see the documentation accompanying the bedside monitor.

Some bedside monitors (e.g., CARESCAPE Monitor B850) have the following alarm control adjustment limitations at the central station. Attempts to adjust these alarm control settings at the central station will be ignored by the bedside monitor; the setting will revert to the bedside monitor's setting within two seconds. These alarm control settings must be adjusted at the bedside monitor. For more information, see the documentation accompanying the bedside monitor.

- Some alarm priority levels cannot be adjusted remotely from the central station.
- Alarm settings can be locked and a locked setting indicator displays on the bedside monitor. The central station does not display this indicator.
- Parameter alarm limit alarms can be disabled and an alarms off indicator displays on the bedside monitor. The central station does not display this indicator. If the alarm limits are disabled at the bedside monitor, the limit range that displays on the central station will be lowest possible and/or highest possible values (e.g., HR will be -1 and 300). If the alarm limits are adjusted at the central station, the changes apply to the bedside monitor and the alarm is re-enabled. For more information, see the documentation accompanying the bedside monitor.
- Alarm priority levels set to escalate at the bedside monitor cannot be adjusted remotely.
- Alarm priority levels can be set for both high and low alarm limits separately, while other bedside monitors only allow alarm priority levels to be set for the entire parameter.

Alarm priority level control settings that have been adjusted from the monitoring device default setting display in blue.

Parameter alarm limit ranges vary. Parameter alarm limits are adjustable in one whole digit increments, unless otherwise indicated. For a list of the alarm limit ranges, see Custom defaults (227).

The following alarm priority level options are available for all parameters, unless otherwise indicated.

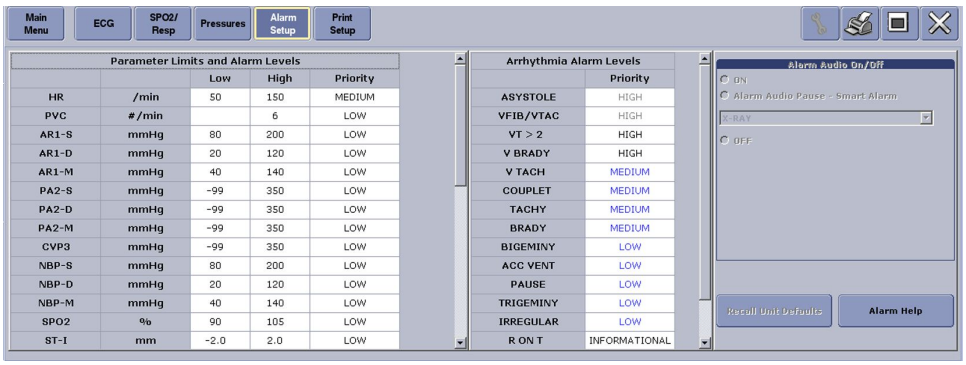
- ***HIGH*** (***CRISIS***)
- ***MEDIUM*** (***WARNING***)
- ***LOW*** (***ADVISORY***)
- ***INFORMATIONAL*** (***MESSAGE***)

Some bedside monitors (e.g., CARESCAPE Monitor B850) may limit which alarm priority levels can be used for specific alarm conditions. If an restricted alarm priority level is selected, the bedside monitor will ignore the request and the central station will revert to the original setting within two seconds. For more information, see the documentation accompanying the bedside monitor.

Adjusting bedside monitor alarm control settings

To adjust the bedside monitor alarm control settings, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Monitor Setup*** > ***Alarm Setup***.



3. To adjust the parameter alarm limits, complete the following procedure:
   a. Under ***Parameter Limits and Alarm Levels***, locate the parameter in the table.
   b. Select the ***Low*** or ***High*** parameter alarm limit field.
   c. Select a value with the up/down arrows or enter a value into the field.
   d. Select the **Enter** keyboard key.
   e. Repeat for each parameter.
4. To adjust the parameter alarm priority levels, complete the following procedure:
   a. Under ***Parameter Limits and Alarm Levels***, locate the parameter in the table.
   b. Select the ***Priority*** field.
   c. Select a value from the displayed list.
   d. Repeat for each parameter.
5. To adjust the arrhythmia alarm priority levels, complete the following procedure:
   a. Under ***Arrhythmia Alarm Levels***, locate the arrhythmia alarm condition.
   b. Select the ***Priority*** field.
   c. Select a value from the displayed list.
   d. Repeat for each arrhythmia alarm condition.

6. If prompted to save the changes, select the appropriate option:
   - ***Yes***: Save the changes and close the window.
   - ***No***: Disregard the changes and close the window.

Adjusting telemetry monitoring device alarm control settings

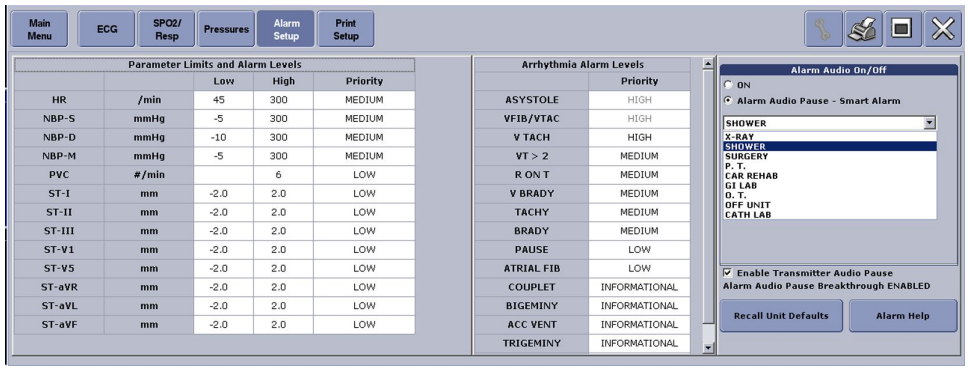
WARNING ALARMS OFF — The telemetry monitoring device alarms remain off until you manually select ***ON***.

Smart Alarms reduce false patient alarms for telemetry monitoring devices. After five minutes, alarms reactivate if the telemetry monitoring device is within range of the antenna system for 15 seconds or longer and continuous ECG data is detected.

If the telemetry monitoring device remains out of antenna range or ECG data is not being acquired (leads off), the audio alarm pause will continue. When a patient is connected to the telemetry monitoring device and continuous ECG data is recorded, the audio alarm pause automatically clears. If the telemetry monitoring device is in ***LEADS FAIL*** or ***NO TELEM*** and an alarms off reason is selected, the alarms off reason displays in the patient Multi-Viewer window. The alarms off reason prints on manual print requests. Text may be truncated to fit the writer paper.

To adjust the telemetry monitoring device alarm control settings, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Monitor Setup*** > ***Alarm Setup***.



3. To adjust the parameter alarm limits, complete the following procedure:
   a. Under ***Parameter Limits and Alarm Levels***, locate the parameter in the table.
   b. Select the ***Low*** or ***High*** parameter alarm limit field.
   c. Select a value with the up/down arrows or enter a value into the field.
   d. Select the **Enter** keyboard key.
   e. Repeat for each parameter.

4. To adjust the parameter alarm priority levels, complete the following procedure:
   a. Under ***Parameter Limits and Alarm Levels***, locate the parameter in the table.
   b. Select the ***Priority*** field.
   c. Select a value from the displayed list.
   d. Repeat for each parameter.
5. To adjust the arrhythmia alarm priority levels, complete the following procedure:
   a. Under ***Arrhythmia Alarm Levels***, locate the arrhythmia alarm condition.
   b. Select the ***Priority*** field.
   c. Select a value from the displayed list.
   d. Repeat for each arrhythmia alarm condition.
6. Under ***Alarm Audio On/Off***, select the appropriate option:
   - ***ON***: Enable alarms for this telemetry monitoring device.
   - ***Alarm Audio Pause – Smart Alarm***: Select this option to avoid sounding audio alarms at the central station when monitoring will be temporarily interrupted for less than five minutes for one of available alarms off reasons. Selecting any reason establishes an audio alarm pause for up to five minutes in the presence of a valid waveform and displays the alarms off reason in the appropriate patient Multi-Viewer window.
     The following alarms off reasons can be selected:

Reason	Displayed	Printed
OFF	***AUDIO OFF***	***ALARM OFF***
X-ray	***AUDIO OFF – X-RAY***	***AT X-RAY***
Shower	***AUDIO OFF – SHOWER***	***AT SHOWER***
Surgery	***AUDIO OFF – SURGERY***	***AT SURGERY***
P.T.	***AUDIO OFF – P.T.***	***AT PHYSICAL THERAPY***
CAR REHAB	***AUDIO OFF – CAR REHAB***	***AT CARDIAC REHAB***
GI LAB	***AUDIO OFF – GI LAB***	***AT GI LAB***
O.T.	***AUDIO OFF – O.T.***	***AT OCCUPATIONAL THERAPY***
Off unit	***AUDIO OFF – OFF UNIT***	***OFF UNIT***
CATH LAB	***AUDIO OFF – CATH LAB***	***AT CARDIAC CATH LAB***

   - ***OFF***: Select this option when the available alarms off reasons are not a sufficient explanation or to prevent the telemetry monitoring system from detecting the patient location when transporting a telemetry patient. Selecting this option will disable alarms for this telemetry monitoring device and display the Alarms off indicator in the appropriate patient Multi-Viewer window.
     OFF is only available if ***Allow Telemetry Alarm Audio OFF on this Central*** is set to ***Yes***. This setting is configured before clinical use. For more information, see the technical manual.

     WARNING ALARMS OFF — The telemetry monitoring device alarms remain off until you manually select ***ON***.

7. Select ***Enable Transmitter Audio Pause*** to allow audio alarms to be paused from telemetry monitoring devices.
8. Select ***Recall Unit Defaults*** to apply the Telemetry Unit Defaults to this telemetry monitoring device and overwrite the existing alarm control settings for this patient. For more information, see Telemetry Unit Defaults factory presets (218).

   This option is not available for bedside monitors.

7

Data review tools

Time focus

When parameter data is collected and stored, the historical data is linked to a specific time focus. When viewing an area of interest for one type of patient data, choosing another type of patient data will display for that same time focus (e.g., choosing Numeric Trends to view data that was collected and stored at 7:28 PM on January 10, then choosing Graphic Trends will display the data that was also collected and stored at 7:28 PM on January 10).

When reviewing stored ECG data samples or strips, only Full Disclosure data stored within the time span identified by the Full Disclosure license can be viewed. When attempting to view data that exceeds the Full Disclosure license, the message ***No patient data is available for the selected time*** displays.

Full Disclosure overview

Full Disclosure collects patient data from the bedside monitor. The amount of data available per patient is determined by licensing. One hour of data collection and storage, with up to 500 events per session, is available without additional licensing. A maximum of 144 hours is available, with up to 2000 events per session.

When the monitoring device is offline for less than the Offline Storage time, there will be a gap in the Full Disclosure data equal to the amount of time the monitoring device was offline. When the monitoring device returns online, the Full Disclosure data displays the gap.

When the monitoring device is offline for more than the Offline Storage time, the current session becomes a prior (discharge) session. When the monitoring device returns online, a new session is created. The prior session can be viewed with Data Sessions.

When the central station collecting the Full Disclosure data (central station A) is offline for more than five minutes but less than the Offline Storage time, another in-unit central station starts collecting data for the monitoring devices Full Disclosed by central station A. When central station A returns online, a gap is added to the session equal to the offline time plus up to five minutes, and new collected Full Disclosure data gets appended after that. Central station A then resumes collection of Full Disclosure data. The other central station converts whatever amount of Full Disclosure data it collected into a discharge session. This results in one current session, one prior sessions, and no more than five minutes of Full Disclosure data lost.

When the central station collecting the Full Disclosure data (central station A) is offline for more than the Offline Storage time, another in-unit central station starts collecting Full Disclosure data. When central station A returns online, the Full Disclosure data it

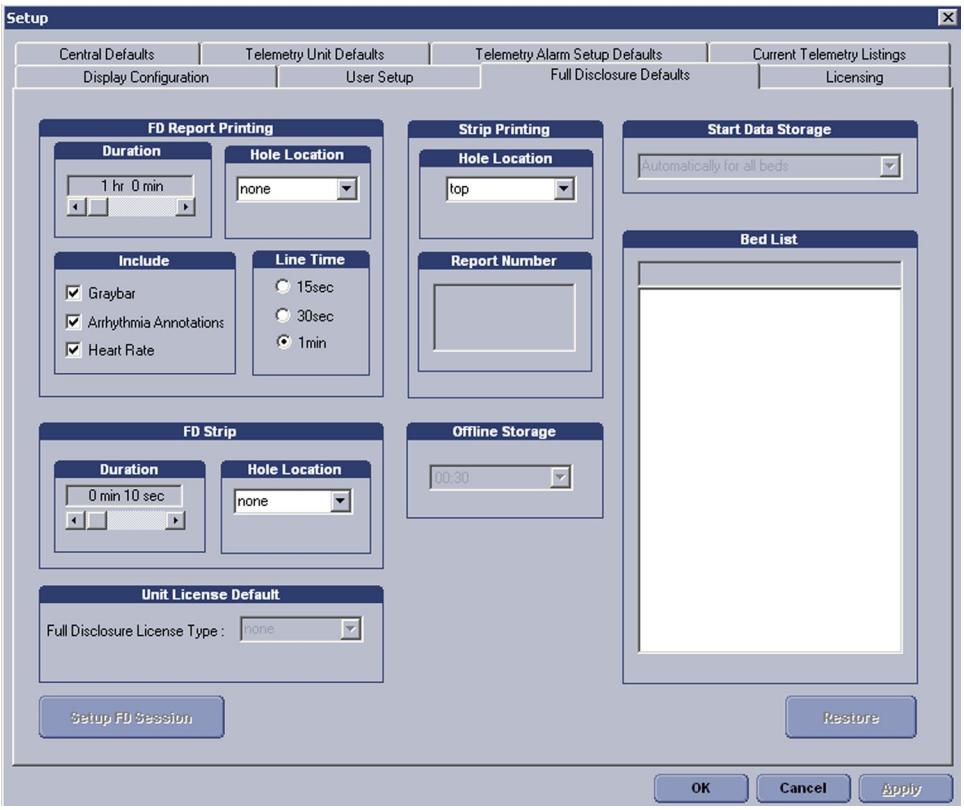
collected goes into a discharge session. The other central station continues to collect the Full Disclosure data instead of the central station A. This results in one current session and one prior session with no Full Disclosure data lost.

Time offline		Current session(s)	Prior (discharge) session(s)	Visible gap in Full Disclosure data	Full Disclosure data loss
Monitoring device	≤ Offline Storage time	One	None	Yes	Equal to the amount of time offline.
	> Offline Storage time	One	One	No	Equal to the amount of time offline.
Central station	≤ Offline Storage time	One	One	Yes	No more than five minutes.
	> Offline Storage time	One	One	No	No more than five minutes.

Adjusting Full Disclosure user-level defaults

To adjust these user-level defaults, complete the following procedure:

1. From the Multi-Viewer menu, select ***Setup*** > ***Full Disclosure Defaults***.



2. Under ***FD Report Printing***, select the appropriate FD Report options:
   - ***Duration***: Select the default amount of data to include in FD Page printouts. The options are ***0 hr 1 min*** to ***144 hr 0 min*** in one minute intervals. This is the initial value when printing a FD Page report and can be adjusted on an individual report basis.
     The central station can print up to 50 pages, depending on the amount of data available, the ***Duration*** and the ***Line Time*** settings.
   - ***Hole Location***: Select the appropriate option to include space for binding the printed report:
     - ***none***: Leave no space for binding.
     - ***top***: Leave space for binding on the top of the page.
     - ***bottom***: Leave space for binding on the bottom of the page.
     - ***left***: Leave space for binding on the left side of the page.
     - ***right***: Leave space for binding on the right side of the page.
   - ***Include***: Define the appearance and data displayed on the report.
     - ***Graybar***: Print every other line of the data with a shaded background to differentiate between lines of data.
     - ***Arrhythmia Annotations***: Print the arrhythmia event name on the waveform.
     - ***Heart Rate***: Print the heart rate at the end of each report line.
   - ***Line Time***: Select the appropriate option to determine the amount of data printed on each line of the report. Printing more data per line results is higher compression of the printed waveform. This setting also applies to FD Page printouts.
     - ***15sec***: Print 15 seconds of waveform across the page width.
     - ***30sec***: Print 30 seconds of waveform across the page width.
     - ***1min***: Print 60 seconds of waveform across the page width.
3. Under ***FD Strip***, select the appropriate FD Strip Report options:
   - ***Duration***: Select the amount of data to include in FD Strip printouts. The options are ***0 min 5 sec*** to ***60 min 0 sec*** in five second intervals.
   - ***Hole Location***: Select the appropriate option to include space for binding the printed report:
     - ***none***: Leave no space for binding.
     - ***top***: Leave space for binding on the top of the page.
     - ***bottom***: Leave space for binding on the bottom of the page.
     - ***left***: Leave space for binding on the left side of the page.
     - ***right***: Leave space for binding on the right side of the page.
4. Under ***Unit License Default***, view the ***Full Disclosure License Type*** enabled on the central station. For more information, see the technical manual.

   When viewing an earlier version of the central station, the license duration maximum displays as 72 hours, even if the unit maximum is 96 hours or 144 hours.

5. Under ***Strip Printing***, select the appropriate options:
   - ***Hole Location***: Select the appropriate option to include space for binding the printed report:
     - ***none***: Leave no space for binding.
     - ***top***: Leave space for binding on the top of the page.
     - ***bottom***: Leave space for binding on the bottom of the page.
     - ***left***: Leave space for binding on the left side of the page.
     - ***right***: Leave space for binding on the right side of the page.
   - ***Report Number***: Enter up to 50 characters of information (e.g., report type, hospital name and address) to display in the footer of an FD Strip Report PDF files.

   These settings apply to the central station being configured only; they do not apply to all central stations in the unit.
6. Under ***Offline Storage***, view the Offline Storage time configured for this central station. For more information, see the technical manual.
7. Under ***Start Data Storage***, view when this central station is configured to begin Full Disclosure data storage. For more information, see the technical manual.
8. Under ***Bed List***, view the beds that are configured to collect and store Full Disclosure data on the central station when ***Start Data Storage*** is set to ***Automatically if listed***. For more information, see the technical manual.
9. Select the appropriate option:
   - ***Apply***: Save the changes without closing the window.
   - ***Cancel***: Disregard the changes and close the window.
   - ***OK***: Save the changes and close the window.

Using FD Strip

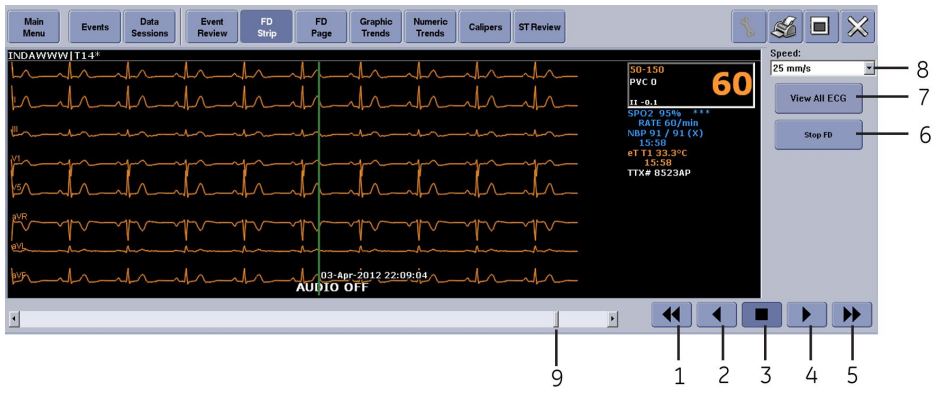
FD Strip allows review of multiple ten second waveforms of Full Disclosure data on one page.

It is possible that waveform gaps could display. Waveform gaps can be caused by events (e.g., time changes, ***NO COMM***, ***OFF NETWORK***). Waveform gaps are indicated with a vertical bar.

To use this data review tool, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.

2. From the Single Viewer menu, select ***Patient Data*** > ***FD Strip***.



Item	Description
1	Scan older data fast button
2	Scan older data button
3	Stop data scan button
4	Scan newer data button
5	Scan newer data fast button
6	Full Disclosure collection button
7	Data type selection button
8	Speed drop-down menu
9	Scroll bar (thumb tack)

3. From the data type selection button, select the type of data to view. This button toggles between these two options:
   - ***View All ECG***: Display all available ECG leads numerics and waveforms.
   - ***Monitor***: Display all parameter numerics and waveforms displayed on the bedside monitor when the central station collected the data.
     This option is not available for telemetry monitoring device.
4. From the Full Disclosure collection button, select the appropriate option. This button toggles between these two options:
   - ***Stop FD***: Stop manual Full Disclosure data collection.
   - ***Start FD***: Start manual Full Disclosure data collection.

   The Full Disclosure collection button only displays if ***Full Disclosure Defaults*** > ***Start Data Storage*** is set to ***Manual***. This option is configured before clinical use. For more information, see the technical manual.
5. Under ***Speed***, select the sweep speed of the waveforms. The options are: ***12.5 mm/s***, ***25 mm/s***, and ***50 mm/s***. If ***25 mm/s*** is selected, displayed data scrolls in eight second increments.

   When the sweep speed is changed, the displayed data will refresh. As a result, there is a brief delay.

6. Select any of the following buttons to scan the data:
   - Scan newer data fast button to scan forward by approximately one screen width.
   - Scan newer data button to scan in one second increments.
   - Stop data scan button.
   - Scan older data button to scan in one second increments.
   - Scan older data fast button to scan backward by approximately one screen width.

   When the end of the data has been reached, the scan automatically stops and the message ***End of Full Disclosure Data.*** displays.
7. Position the cursor on the waveform area of interest.

   The cursor identifies the displayed waveform data location, accompanying parameter numeric data, and the time focus when this data was recorded. Use the scroll bar or mouse to incrementally move the cursor through the waveform, while reviewing the patient data preceding and succeeding an event.
   - Click in the scroll bar to move the displayed data one page at a time.
   - Click the scroll bar arrows to move the displayed data in one-second increments.
   - Drag the scroll bar (thumb tack) to desired time.
   - Place and click the cursor in the waveform area.
8. Select the Print button.

   The printed strip displays the parameter numerics and waveforms for the chosen time focus. The amount of data printed corresponds to the ***Full Disclosure Defaults*** > ***FD Strip*** > ***Duration*** user-level default. The time focus is marked on the printout with an arrow.

   The patient name and patient identification number used on the printout corresponds to the patient name and patient identification number used when the data was collected.

Using FD Page

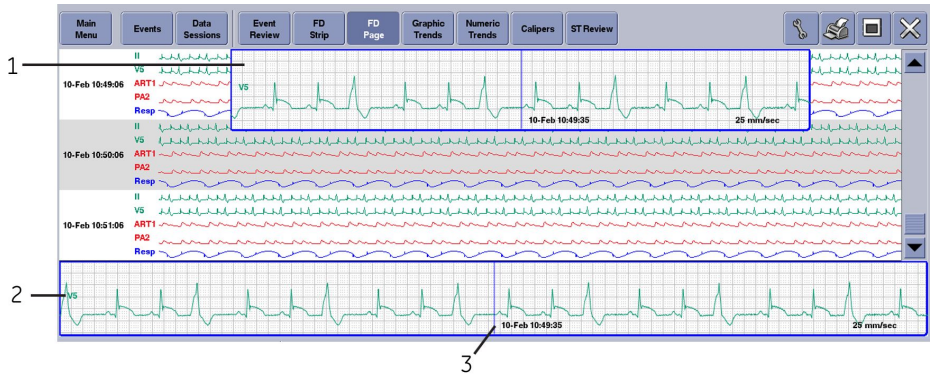
FD Page displays the Full Disclosure data for the selected time focus, including ECG, SPO2, Respiration, and invasive blood pressure waveforms. Up to five waveforms can display per row of data.

Waveform gaps display when Full Disclosure is missing data. Waveform gaps can be caused by events (e.g., time changes, ***NO COMM***, ***OFF NETWORK***). Waveform gaps are indicated with a vertical bar.

To use this data review tool, complete the following procedure:

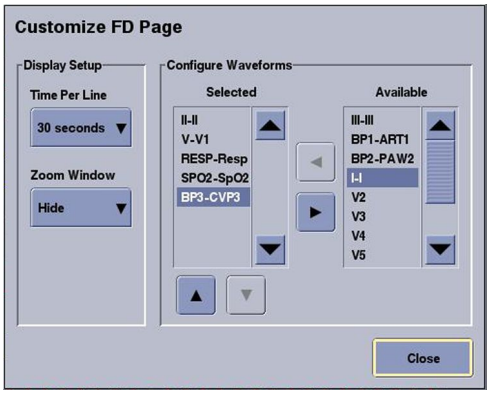
1. Select the appropriate patient Multi-Viewer window.

2. From the Single Viewer menu, select ***Patient Data*** > ***FD Page***.



Item	Description
1	Floating zoom window
2	Zoom window
3	Time focus (blue line)

3. Select the Configuration button.



4. Under ***Display Setup***, select the appropriate options:
   - ***Time Per Line***: Select the amount of data displayed in each row. The options are: ***15 seconds***, ***30 seconds***, and ***1 minute***.
   - ***Zoom Window***: Select appropriate option:
     - ***Show***: Display enlarged waveform in the Zoom Window with grid lines.
     - ***Hide***: Do not display the Zoom Window.
5. Under ***Configure Waveforms***, select the waveforms available for display from ***Available*** and move them to ***Selected*** with the right/left arrows.

   Use the up/down arrows under ***Selected*** to change the waveform display order.
6. Select the Close button to close the window.

7. Use the scroll bar or scroll arrows to move backward or forward in time to find a waveform area of interest.

   It is also possible to select a specific time focus or an alarm event from Events, FD Strip, Graphic Trends, or Numeric Trends, then select FD Page to automatically display the available Full Disclosure data for that time focus or event. Otherwise, the most current Full Disclosure data displays.

8. Select the waveform area to view in more detail. A small blue-colored zoom box moves to this waveform location.

9. To view this waveform area in more detail in the floating zoom window, click and hold down the left mouse button inside the small blue-colored zoom box to display an enlarged view of the waveform segment.

Printing FD Page

To print an FD Page report to a laser printer, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Patient Data*** > ***FD Page***.
3. Select the Print button.
4. Select the ***Start*** and ***End*** times.
   - Drag the scroll bar to move the start or end time.
   - Click the scroll bar arrows to move the start or end time by one minute increments.
   - Click the left or right arrows to move the start or end time by 15 second increments.
5. From ***Time Per Line***, select the amount of data to be printed in each report line. The options are: ***15 seconds***, ***30 seconds***, and ***1 minute***.
6. Under ***Waveform Selection***, select up to eight waveforms from the displayed list to include in the report.

   Use the up/down arrows to select the waveform print order. The waveforms print in the order displayed.

7. Select ***Refresh Preview*** to update the print preview.

   The ***Duration*** (in hours:minutes:seconds format), ***Time Per Page*** and ***Total Pages*** values are also calculated and displayed.

   If more than 50 pages of data are selected, only the first 50 pages will print. If the ***Refresh Preview*** indicates more than 50 pages, reduce the selected time range, increase the ***Time Per Line***, or reduce the ***Waveform Selection*** to get the total page count to 50 or less.

8. Select ***Print*** to print the report.

   Depending on the amount of data selected and the number of pages, it could take up to ten minutes before the printout is sent to the printer.

   The patient name and patient identification number used on the printout corresponds to the patient name and patient identification number used when the data was collected.

Using Data Sessions

Data Sessions provides access to historical data as patients change monitoring devices, move across care units, and after patients are discharged. Users can search and display the patient data on the central station, even if the patient moves from patient Multi-Viewer window to patient Multi-Viewer window, unit to unit, or is discharged from the central station.

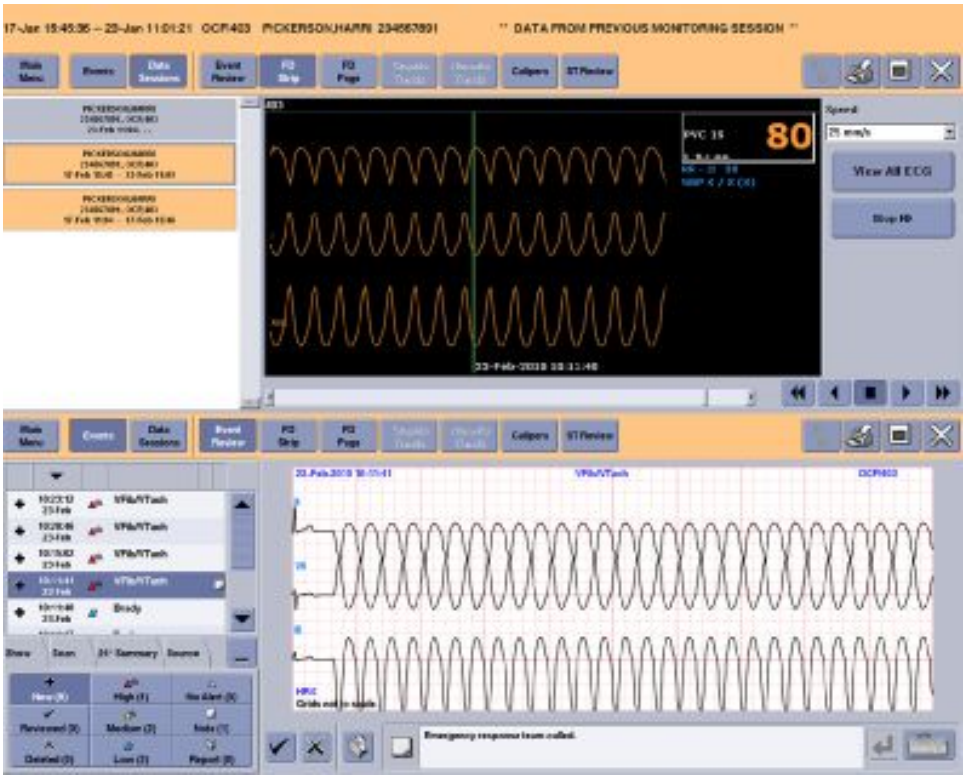
During a Combo monitoring mode transition, if both monitoring devices have pre-existing Full Disclosure data, the monitoring device which has the oldest data will be maintained in the active session for the Combo monitoring mode bedside monitor. The opposite session will become inactive if the stored session data is greater than five minutes. The inactive session may have the name of either the telemetry monitoring device or hard-wired bedside monitor. If the stored session data is less than five minutes, the data may not be retained.

To select a data session, complete the following procedure:

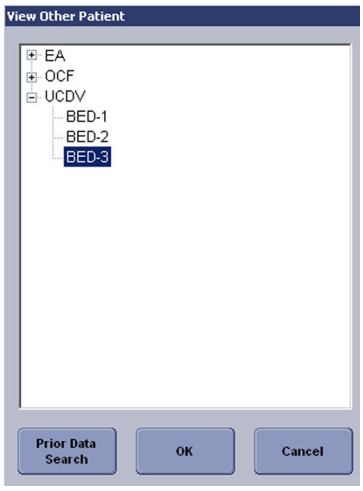
1. If the patient is displayed in the Multi-Viewer, complete the following procedure:
   a. Select the appropriate patient Multi-Viewer window.
   b. From the Single Viewer menu, select ***Patient Data*** > ***Data Sessions***.

      All Data Sessions for the selected patient identification number will be automatically displayed.

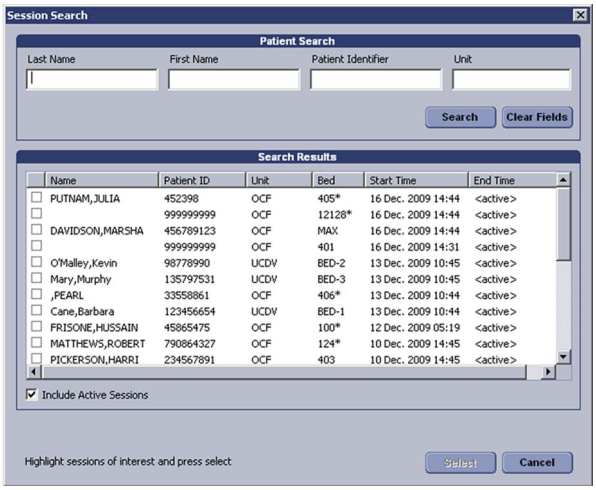
      - The sessions are displayed according to start time, with the most recent session at the top.
      - All sessions will display the unit name and bed number.
      - The current session displays in grey blue with a start time only timestamp.
      - Prior sessions display in orange with both start and end time timestamp.
      - Numeric Trends and Graphic Trends are not available post-discharge and the data review tool buttons will be disabled.



2. If the patient is not displayed in the Multi-Viewer (no patient identification number, discharged patient, ***NO COMM***, or out-of-unit patient), complete the following procedure:
   a. From the Multi-Viewer menu, select ***Other Patients***.



b. Select ***Prior Data Search***.



c. To search for a patient, enter the search criteria.

   The search criteria you can enter depends on this central station's configuration. The FD Session Configuration service-level default is configured before clinical use. The settings determine the available Patient Search fields, whether sessions with non-matching patient identifiers can be selected, and whether partial or complete search criteria can be used to search for a patient. For more information, see the technical manual.

d. When ***Include Active Sessions*** is enabled, all sessions are displayed. To show only inactive (post-discharge) sessions, disable ***Include Active Sessions***.

e. Choose session(s) by selecting the row and enabling the check box for each session, then select ***Select***.

   The selected session(s) automatically display in Data Sessions. If multiple sessions were selected with non-matching patient identifiers, the message ***Warning: Sessions with non-matching PIDs selected*** displays.

3. Select one of the sessions from the list to display the selected data.

4. Select any of the available data review tools to review the data.

   Any data review tools that are not supported when viewing prior sessions will be grayed out and cannot be used to view the patient data. The data displays at the end of the session. Use the scroll bar to scroll back to earlier data.

Events overview

Some monitoring devices (e.g., B40 patient monitor) do not provide waveform data or numerics for events. Only the event type and time of occurrence will be available from these monitoring devices. For more information, see the documentation accompanying the monitoring device.

The Event Source determines what event processing can be done at the central station. The following table shows what actions each Event Source allows:

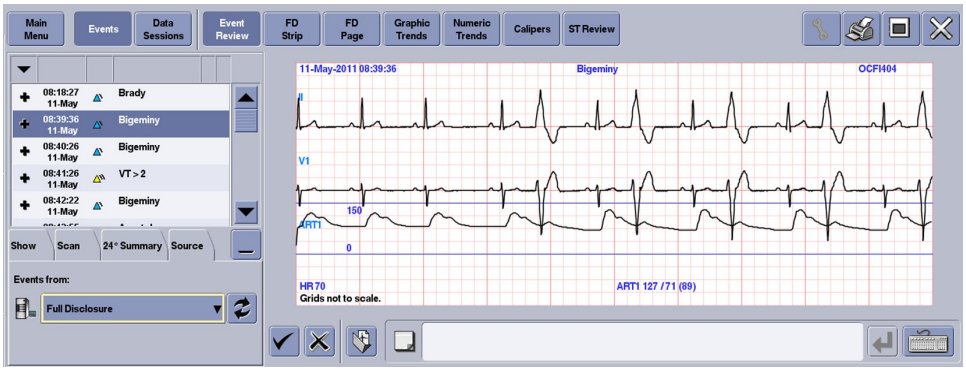
Event Source	View events at the central station	Review events at the central station	Delete events at the central station	Annotate events at the central station	Request event printouts at the central station	Include events in reports by the central station
Bedside	Yes	No	Yes	No	Yes	No
PDS (Patient Data Server)	Yes	No	No	No	Yes	No
Full Disclosure	Yes	Yes	Yes	Yes	Yes	Yes

Selecting Event Source

Not all Event Source options are available at all times or for all monitoring devices. If a monitoring device has events in Full Disclosure, then only the ***Full Disclosure*** Event Source will be available.

To select the Event Source, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Patient Data*** > ***Events***.
3. Select ***Source*** and select the appropriate option:



- ***Bedside***: When Full Disclosure data is not being collected for this monitoring device.
- ***Full Disclosure***: When Full Disclosure data is being collected for this monitoring device.

- ***PDS***: When Full Disclosure data is not being collected for this monitoring device and this monitoring device is on the PDS bed list.

4. Select the Refresh Event Source button to refresh the list of available Event Source options.

Viewing events

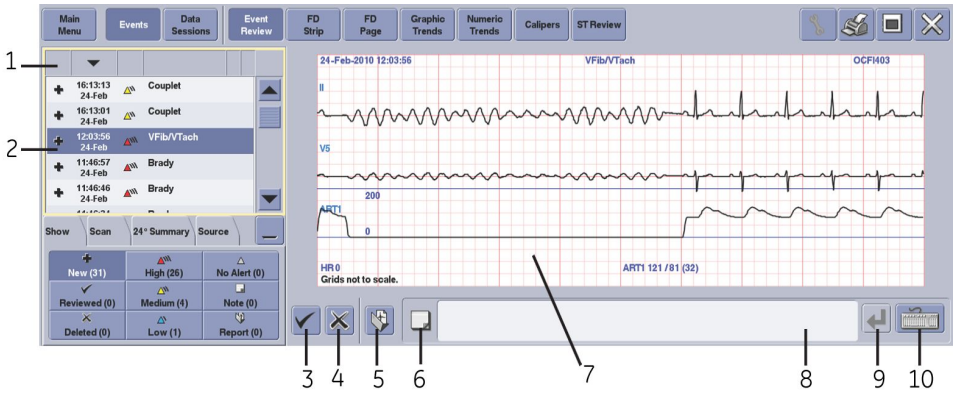
When the Event Source is Bedside, the number of events displayed at the central station is determined by the bedside monitor. For more information, see the documentation accompanying the bedside monitor.

When the Event Source is Full Disclosure, up to 2000 events are displayed at the central station, depending on which licenses are enabled on the central station. For more information, see the technical manual.

When the Event Source is PDS, up to 500 events are displayed at the central station, depending on which licenses are enabled on the central station and the number of events available for the patient. For more information, see the technical manual.

To view events, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Patient Data*** > ***Events***.

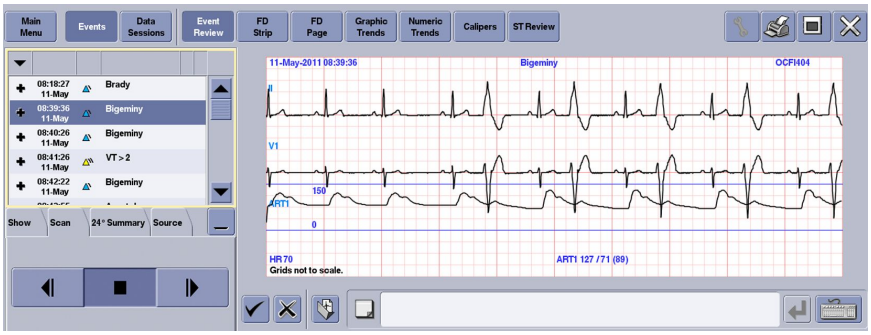


Item	Description
1	Event Directory header
2	Event Directory
3	Reviewed event button
4	Deleted event button
5	Report button
6	Note indicator
7	Event Review
8	Note text box
9	Enter button
10	On-screen keyboard button

3. To filter the events displayed in the Event Directory, select ***Show*** and select the appropriate options:
   - The following event states display. These event states can be adjusted independently for each event and are mutually exclusive (i.e., only one event state is applied to each event):
     - ***New***: Display un-reviewed events.
     - ***Reviewed***: Display reviewed events. For more information, see Reviewing events (120).
     - ***Deleted***: Display events marked as deleted. For more information, see Deleting events (120).
   - The following event alarm priority levels display. The alarm priority setting is determined by the monitoring device. These levels cannot be adjusted and are mutually exclusive (i.e., only one is applied to each event):
     - ***High***: Display ***HIGH*** (***CRISIS***) alarm priority level events.
     - ***Medium***: Display ***MEDIUM*** (***WARNING***) alarm priority level events.
     - ***Low***: Display ***LOW*** (***ADVISORY***) alarm priority level events.
     - ***No Alert***: Display events not associated with an alarm (e.g., samples).
   - ***Note***: Display events that have notes. Notes are added to individual events. For more information, see Annotating events (121).
   - ***Report***: Display events that are marked for report. One or more events are selected to be included in a printed or PDF report. For more information, see Creating event reports (122).
4. To sort the events displayed in the Event Directory, place the cursor in the Event Directory header and select the ascending or descending arrow for the appropriate column. The following columns are available:
   - Review state (New, Reviewed, or Deleted events)
   - Time and date
   - Alarm priority level
   - Event

5. To scan through the events in the Event Directory, complete the following procedure:

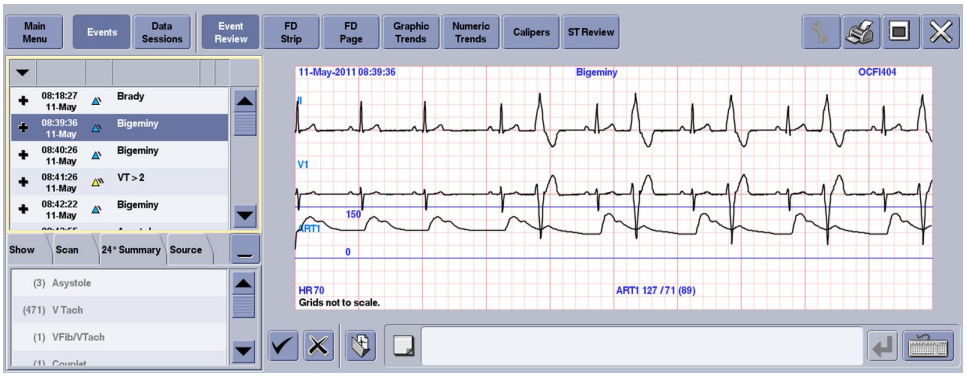
   a. Select ***Scan***.



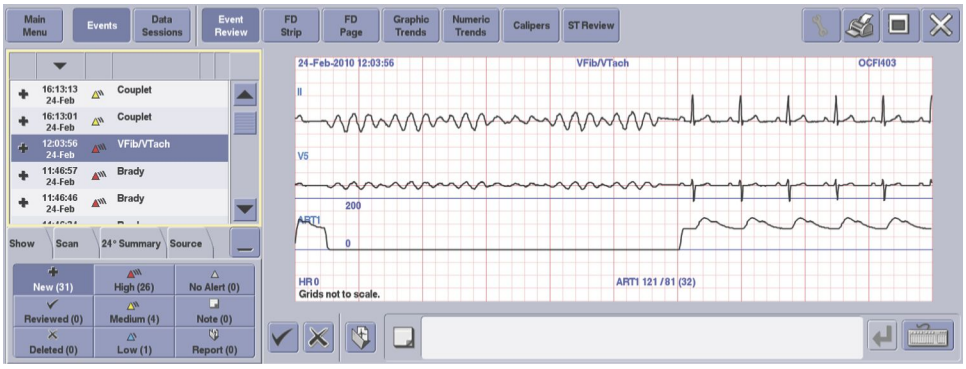
   b. Scan to find the data to view:

      - Select the Scan newer event button to view newer events.
      - Select the Stop event scan button to stop scanning the events.
      - Select the Scan older event button to view older events.

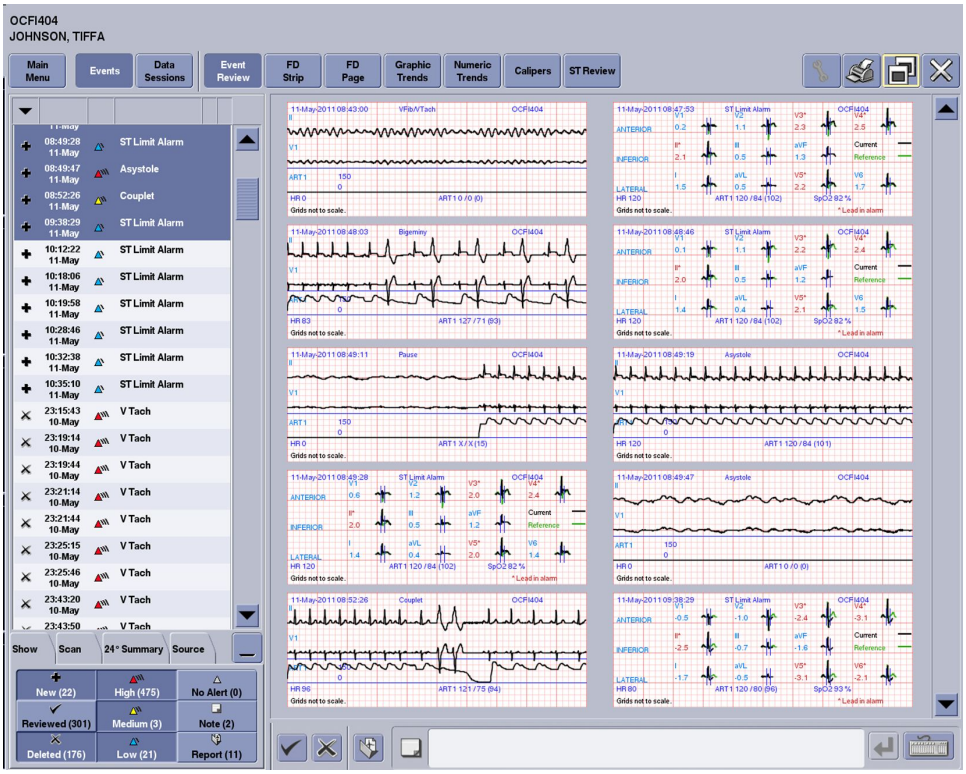
6. To display a summary of the patient's event history, including a count of each new and reviewed that occurred in the last 24 hours, select ***24° Summary***.



7. To select one event, highlight the event in the Event Directory. The selected event displays in Event Review.



8. To select up to ten events, complete the following procedure:
   a. Highlight the first event in the Event Directory.
   b. To select consecutive events, press and hold the **Shift** keyboard key and select the appropriate events in the Event Directory.
   c. To select nonconsecutive events, press and hold the **Ctrl** keyboard key and select the appropriate events in the Event Directory.



Reviewing events

When the Event Source is Full Disclosure, events can be reviewed. When the Event Source is Bedside or PDS, events cannot be reviewed.

To review events, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Patient Data*** > ***Events***.
3. Select the event(s) in the Event Directory.
4. Select the Reviewed event button in Event Review.

   Changing the event state in Event Review updates the events displayed in Event Directory.
5. Check that the event displays in the Event Directory as Reviewed.

Deleting events

When the Event Source is Bedside or Full Disclosure, the central station sends a request to the bedside monitor to delete the event. Some bedside monitors (e.g., CARESCAPE Monitor B850) do not allow events to be remotely deleted. Any attempts to

delete events will be ignored by the bedside monitor. If the request fails, the message ***Failed to delete*** displays on the central station. To manually delete the event at the bedside monitor, see the documentation accompanying the bedside monitor.

If the Event Source is PDS, events cannot be deleted and the Deleted option is not available. When the 500 event limit is reached, older events are removed to make room for newer events.

Events marked as Deleted are not deleted from the central station and can still be viewed at the central station. If the 2000 event limit is reached, space for new events is created by removing events marked as Deleted first. If there are no Deleted events, the oldest Reviewed event is automatically removed. Older events are removed one at a time to accommodate newer events. Unlike events marked as Deleted, events removed from the central station are no longer available for viewing.

To mark events as Deleted, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Patient Data*** > ***Events***.
3. Select the event(s) in the Event Directory.
4. Select the Deleted event button in Event Review.
5. When the message ***Delete this event?*** displays, select the appropriate option:
   - ***OK***: Mark the event as Deleted.
   - ***Cancel***: Do not mark the event as Deleted.

   Changing the event state in Event Review updates the events displayed in Event Directory.

   Once an event is marked as Deleted, it cannot be moved to the New or Reviewed state.
6. Check that the event displays in the Event Directory as Deleted.

Annotating events

When the Event Source is Full Disclosure, events can be annotated.

To annotate events, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Patient Data*** > ***Events***.
3. Select the event in the Event Directory.

   Events must be displayed and annotated one at a time.
4. Place the cursor in the Note text box.
5. Type the event note in the Note text box.
6. Select the Enter button or the **Enter** keyboard key.
7. Check that the event displays as a Note event.

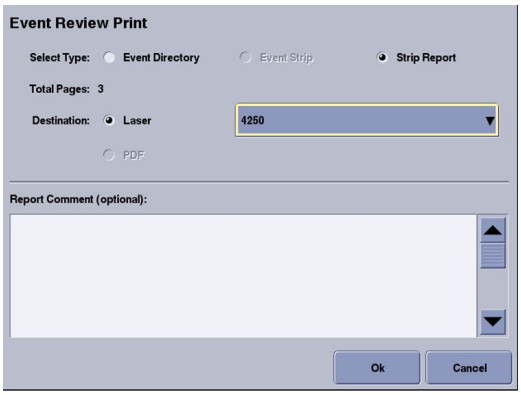
   A note indicator will also display in the Event Directory when an event has a note associated with it.

Printing events

When the Event Source is Bedside, Full Disclosure, or PDS, events can be printed.

To print events, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Patient Data*** > ***Events***.
3. Select the event(s) in the Event Directory.
4. Select the Print button.



5. Under ***Select Type*** select ***Event Strip*** to print a single strip and notes for the selected event.

   Under ***Select Type*** select ***Event Directory*** to print the selected list of events in the Event Directory. The review state, date, time, alarm priority level, type, and notes will print for each selected event.

   Notes may be truncated when printed.

6. Select ***Ok***.

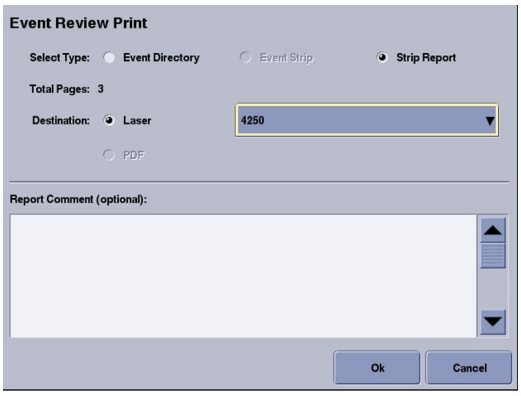
Creating event reports

When the Event Source is Full Disclosure, events can marked to be included in an events Strip Report.

To create event reports, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Patient Data*** > ***Events***.
3. Select the event(s) in the Event Directory.
4. Select the Report button in Event Review.
5. Check that the selected events display as Report events.

6. Select the Print button.



7. Under ***Select Type***, select ***Strip Report*** to create a events Strip Report containing the events currently marked for report. The first page of the report will contain a summary including the date and time range of events, number of events, report comment, signature lines, and form number.
8. From ***Destination***, select the appropriate option:
   - ***PDF***: Creates a PDF file that is automatically sent to the PDF printer configured before clinical use. For more information, see the technical manual.
   - ***Laser***: Prints the report to the configured network laser printer selected from the displayed list.
9. In ***Report Comment***, enter any applicable report notes or comments.
10. Select ***Ok***.
11. When the message ***Clear all the report flags?*** displays, select the appropriate option:
    - ***Yes***: Removes the marked for report flags from all the selected events.
    - ***No***: Keeps all events previously marked for report for future printing.

Trends overview

WARNING ACCURACY — If the accuracy of any value displayed on the screen or printed is questionable, first determine the patient's vital signs by alternative means. Then, verify the monitoring devices and printers are working correctly.

WARNING INCORRECT ALGORITHMS, ARRHYTHMIA PROCESSING, AND CALCULATIONS BASED ON PATIENT AGE — After manually updating or automatically retrieving patient information from a network database, *always* confirm that the entered patient's date of birth matches the patient's actual date of birth. Otherwise the appropriate age-related algorithms, arrhythmia detection, and calculations will not be applied.

Parameter numerics are retrieved and displayed at one-minute resolution. Data is sent to the central station after the full minute of data is measured, therefore the data displayed on the central station is for the prior minute (one minute after the timestamp). Since the central station collects data every minute, and the most recent data is always for the previous minute, the most recent data that displays on the central station is typically two minutes old.

Some episodic data (i.e., Cardiac Calculations) require the user to save the value. Extended time between starting and saving the calculation may cause the central station to miss the episodic trend numerics during the one minute retrieval. The central station performs an additional retrieval every ten minutes for data that was missed during the one minute retrieval. Therefore, some episodic data may take up to ten minutes to display on the central station.

Trends displayed on the central station can differ from the units of measurement used to display numerics. The trends units of measurement are configured at the monitoring device. For more information, see the documentation accompanying the bedside monitor.

Trends are configured with factory preset Groups to display organized trend views. For more information, see Factory presets (217). Up to 12 Numeric Trends Groups and 12 Graphic Trends Groups can be customized. For more information, see Custom defaults (227).

Some monitoring devices (e.g., CARESCAPE Monitor B850) may provide time stamps on alarm histories (i.e., arrhythmia events, ST limit violation events) that could be several seconds offset from the time the event actually occurred.

When enabled, the ST vector magnitude (ST-VM) data trend displays in Graphic Trends, Numeric Trends, and ST Review. The ST-VM value is automatically calculated with 12SL data if all 12 ST deviations are measured or augmented. The means to compute ST-VM was developed on an adult patient population. The twelve ST deviations are: I, II, III, V1-V6, aVF, aVL, and aVR. The ST-VM value will not be calculated if any ST deviation is omitted or was computed from a derived waveform (i.e., from the 12RL algorithm).

The following formula is used for this calculation:

$ST\text{-}VM = \sqrt{((STx)^2 + (STv)^2 + (STz)^2)}$; with a loss of precision of 0.1 mm.

Where STx is the ST value in lead X, STy is the ST value in lead Y, and STz is the ST value in lead Z and the transform coefficients X, Y, Z are:

X = (0.3872*I) - (0.1993*II) - (0.1106*V1) + (0.045*V2) - (0.040*V3) + (0.2146*V4) - (0.067*V5) + (0.6868*V6)

Y = (-0.0695*I) + (1.145*II) + (0.1855*V1) - (0.0728*V2) + (0.0186*V3) + (0.0154*V4) - (0.1148*V5) + (0.0682*V6)

Z = (0.0587*I) + (0.0815*II) + (0.3665*V1) - (0.0363*V2) + (0.165*V3) + (0.2041*V4) + (0.1395*V5) - (0.4688*V6)

Any other uncertainties of calculation are based on the precision and accuracy of inputs.

Using Graphic Trends

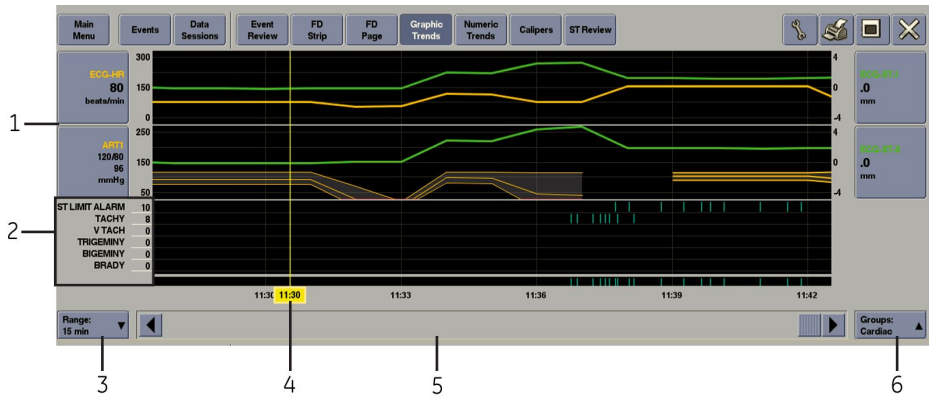
Graphic Trends displays parameter numerics over a period of time in graph format, including AFIB trending with select monitoring devices. Up to six parameters display in half-screen format; up to 12 parameters in full-screen format.

If more than one episodic event occurs during the same minute, the more recent episodic event overwrites the older episodic event. When viewing episodic data, any data reading collected after the minute mark will display in the next trended minute.

To use this data review tool, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.

2. From the Single Viewer menu, select ***Patient Data*** > ***Graphic Trends***.



Item	Description
1	Parameter button(s)
2	Events parameters
3	Range drop-down menu
4	Time focus
5	Scroll bar
6	Groups drop-down menu

3. Select ***Groups*** then select the trend group from the displayed list. For a list of the factory preset Groups, see Factory presets (217). Custom default Groups can also be configured and may display in the list.
4. Select the Configuration button to display the parameters contained in each trend Group. Groups are configured before clinical use. For more information, see the technical manual.
5. Select the time range of the displayed Graphic Trends:
   - Use the scroll bar to move backward and forward in time.
   - Select ***Range*** then select a time range from the displayed list. The options are: ***15 min***, ***30 min***, ***1 hr***, ***2 hrs***, ***4 hrs***, ***8 hrs***, ***12 hrs***, and ***24 hrs***.

   When two trends share the same row in the Graphic Trends window, with one trend label shown on the left and one trend label shown on the right, and both trends have the same data values, the waveform areas will overlap each other. The overlapping waveform colors will not blend together. As the trend values change, the waveform shape will also change, allowing its individual waveform color to become visible.

   If there is missing trend data, a gap appears. If the time cursor is positioned within that gap, parameter numerics still display. Depending upon the position of the time cursor within the gap, the displayed parameter numerics are either the last known parameter values before the gap or the first known parameter values after the gap.

6. Select the parameter button and select the appropriate scale from the displayed list. Scale options vary by parameter. For more information, see Adjusting parameter control settings (50).

   If the parameter value is outside the range of the selected scale, the waveform will display as red.

   The Events parameter displays arrhythmia alarm trend as vertical bars at the time of occurrence in the displayed time frame.

7. Select the Print button of the currently viewed ***Group*** and ***Range*** to the configured laser printer.

   - Graphic Trends may only be sent to a central station laser printer; printing by the central station to a writer is not supported.
   - Graphic Trends print in the same scale as displayed on screen.
   - Up to four Graphic Trends can be printed on each page.
   - Events print on a separate page and include all the events that occurred during the report period.

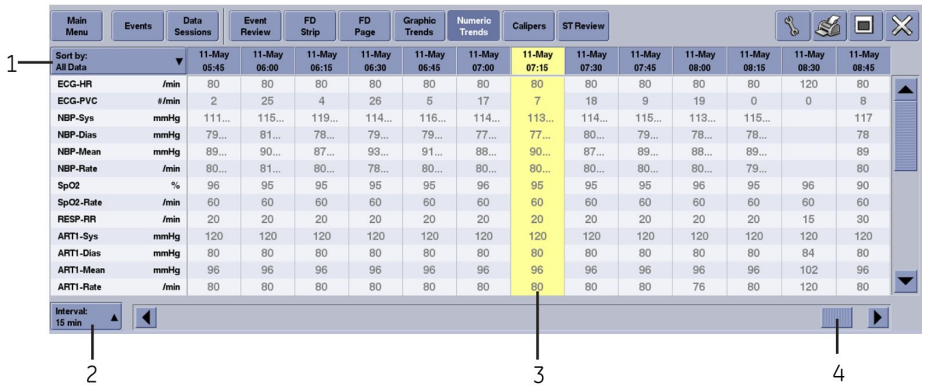
Using Numeric Trends

Numeric Trends displays parameter numerics in a tabular format.

When reviewing data, be aware that when the V- lead changes at a monitoring device, both the current and previous V lead data is trended and both V lead labels will display. In addition, the V lead numeric data appears at the time the V lead data was collected.

To use this data review tool, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Patient Data*** > ***Numeric Trends***.



Item	Description
1	Sort by drop-down menu
2	Interval drop-down menu
3	Time focus
4	Scroll bar

3. Select the ***Sort by*** button, then select a group from the displayed list to automatically sort the data.

   Groups define the order that parameters are displayed. For a list of the factory preset Groups, see Factory presets (217). Custom Groups can also be configured and display in the list.

   When the first parameter on the list is an episodic parameter (e.g., NBP), all other parameters in the list only display data at the episodic measurement points (e.g., NBP is the first parameter on the list, and NBP measurements were taken at 10:10, 10:15, and 10:20, then data for all other parameters on the list is only available for the same times).

   Episodic data is displayed at the closest time interval for the selected time. An ellipsis symbol (...) is appended after the episodic value when more than one sample exists for the same time interval (i.e., two Cardiac Calculations) or if the timestamp is more than 30 seconds off the displayed time interval.

4. Select ***Interval*** to select the time interval (amount of time between columns) of the displayed data. The options for periodic parameter Groups are: ***1 min***, ***5 min***, ***15 min***, ***30 min***, and ***60 min***.
5. Use the scroll bars to move through the displayed data.
6. Select the Print button.

Using Calipers

WARNING ACCURACY — If the accuracy of any value displayed on the screen or printed is questionable, first determine the patient's vital signs by alternative means. Then, verify the monitoring devices and printers are working correctly.

WARNING INCORRECT ALGORITHMS, ARRHYTHMIA PROCESSING, AND CALCULATIONS BASED ON PATIENT AGE — After manually updating or automatically retrieving patient information from a network database, *always* confirm that the entered patient's date of birth matches the patient's actual date of birth. Otherwise the appropriate age-related algorithms, arrhythmia detection, and calculations will not be applied.

Calipers are used to measure the horizontal (time) and vertical (voltage) distances along waveforms. When Full Disclosure data is collected and stored at the central station, Calipers can be used to measure the PR, QRS, QT, and R-R waveform intervals and the ST waveform. After manually measuring the QT and the R-R intervals, the QTc value is automatically calculated and displayed.

The following formula is used for this calculation:

$QTc = QT/\sqrt{(R\text{-}R)}$; with a loss of precision of 0.1 mm.

Any other uncertainties of calculation are based on the precision and accuracy of inputs.

Calipers measurements are not stored on the central station. After closing the Calipers window, all measurements are cleared. To keep a record of measurements, print a copy of the measurement results before closing the Calipers window.

Calipers uses the same display calibration as the Multi-Viewer and Single Viewer. The displays must be calibrated before clinical use for accurate waveform amplitude and time display on the central station. For more information, see the technical manual.

To use this data review tool, complete the following procedure:

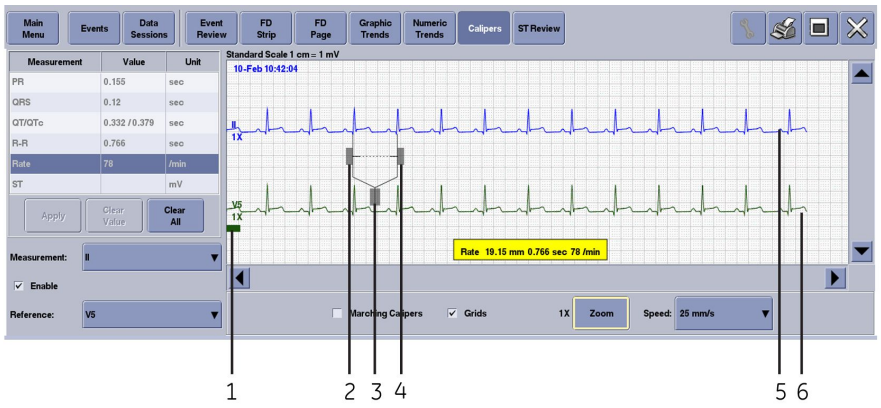
1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Patient Data***.
3. Locate the waveform segment or waveform strip by finding the time focus with FD Strip, FD Page, Graphic Trends, or Numeric Trends.

   If a valid time focus has not been selected, the most recent waveform from Full Disclosure displays. This will also clear any existing measurements.

   Selecting the patient Multi-Viewer window will clear the time focus and display the most recent waveform from Full Disclosure. This will also clear any existing measurements.
4. Select ***Calipers*** to display up to ten seconds of waveform data.

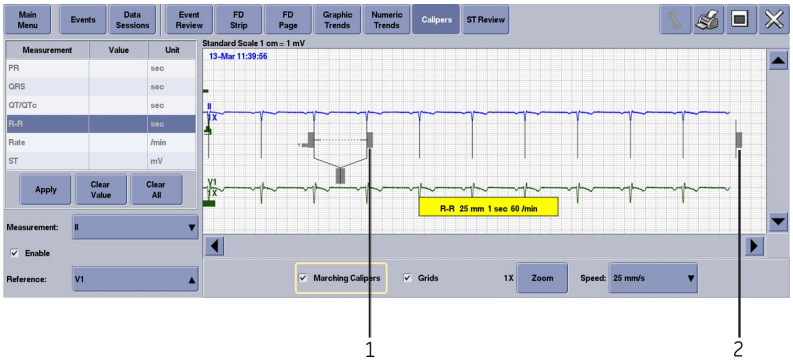
   The timestamp represents the midpoint of the ten second waveform displayed in the Calipers window. The left waveform edge is the timestamp minus five seconds; the right waveform edge is the timestamp plus five seconds.

   When an event or ECG data sample occurs outside of the storage time of the Full Disclosure license, the data will not be available to view with Calipers.



Item	Description
1	Reference waveform drag bar
2	Calipers left arm drag bar
3	Calipers drag bar
4	Calipers right arm drag bar
5	Measurement waveform
6	Reference waveform

5. To adjust the waveform display, select the appropriate options:
   - Select ***Grids*** to apply an on-screen background grid.
     When the sweep speed is 25 mm/s, each heavy grid line is 5 mm apart.
   - Select ***Zoom*** to cycle through the choices until the appropriate zoom scale displays. The options are: ***1x***, ***2x***, and ***3x***.
     When zoomed, the grids and waveform are magnified by the same amount.
   - Select ***Speed*** then select the sweep speed for the displayed waveform from the displayed list. The options are: ***12.5 mm/s***, ***25 mm/s***, and ***50 mm/s***.
     - When the sweep speed is changed, the displayed data will refresh. As a result, there is a brief delay.
     - Changing the sweep speed clears existing measurement values.
     - Only the time (horizontal) span of the waveform is affected by the sweep speed setting.
     - When the sweep speed is 25 mm/s, an ECG waveform with a heart rate of 60 beats-per-minute (one beat-per-second) will show one QRS complex every 25 mm.
6. To use Marching Calipers to compare the rate of multiple beats, complete the following procedure:
   a. From the measurement table, select ***Rate*** or ***R-R***.
   b. Select ***Marching Calipers***. Vertical lines display on both sides of the Calipers cursor that are equal to the span of the Calipers arms.
   c. To more precisely measure the Rate and R-R interval, complete the following procedure:
      i. Select the Calipers right or left arm drag bar until the Marching Calipers drag bar displays.



Item	Description
1	Calipers left arm drag bar
2	Marching Calipers drag bar

      ii. Move the Marching Calipers drag bar to line up the vertical lines on the first R point in the waveform with the R point of the last QRS complex in the waveform.

7. To calculate a waveform interval or waveform amplitude, complete the following procedure:
   a. From ***Measurement***, select the measurement lead from the displayed list.
   b. Select ***Enable*** to add a reference lead for comparison.
   c. From ***Reference***, select the reference lead from the displayed list.

      A green reference lead displays under the blue measurement lead. You can select the green reference waveform drag bar to move the reference waveform vertically up and down.

      All measurements will correspond with the measurement lead. Taking measurements from the reference lead could provide misleading information in the printed report.
   d. From the ***Value*** column in the measurement table, select the measurement value to record.
   e. Position the Calipers over the waveform complex to measure:
      - Use the Calipers right or left arm drag bar to adjust the Calipers jaw separation.
      - Use the Calipers drag bar to reposition the Calipers over the waveform.
      - To easily compare intervals from one QRS complex to another, including ST, select a point on the waveform to reposition the Calipers left arm to the selected point without changing the Calipers jaw separation.
   f. Select ***Apply*** to calculate the measurement and display in the measurement table.

      Once a measurement is applied, select the measured value again to reposition the Calipers left arm to the selected point without changing the Calipers jaw separation.
8. To clear measurements from the measurement table, select the appropriate options:
   - Select a measurement value and select ***Clear Value*** to remove a specific measurement value.
   - Select ***Clear All*** to remove all measurements.
9. Select the Print button.
   - The report can only be printed to a laser printer.
   - The report is printed to scale and is not dependent on the screen calibration.
   - The report is printed using the same sweep speed as the Calipers window and the speed setting is printed on the report.
   - The report timestamp is a range showing the time at the left edge of the waveform and the time at the right edge of the waveform.
   - The report is printed with the background grid.
   - The report includes the any stored measurement values.
   - The report includes the reference waveform if applicable. The waveforms print at 1x zoom.

Enabling ST Monitoring Status indicator

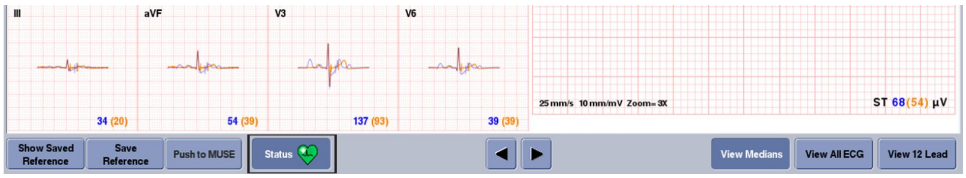
The ST Monitoring Status Indicator conveys the current state, as either successful or failing, of ST records transfer from the monitoring device to the central station. It does not enable or disable this ST records transfer. The transfers occur automatically whenever possible and cannot be disabled.

The central station requests an ST record every minute from the monitoring devices. The central station retrieves the generated ST record and updates the Full Disclosure data record. In order for ST records to be retrieved from a monitoring device, the monitoring device must have the following:

- 12SL Analysis Program enabled.
- 10-leadwire cable or 6-leadwire cable and the 12RL algorithm enabled.
- Full Disclosure data collection at the central station enabled.

To show the ST Monitoring Status indicator in the patient Multi-Viewer window, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Patient Data*** > ***ST Review***.
3. Select the ST Monitoring ***Status*** button.



4. When the message ***START ST Monitoring?*** displays, select the appropriate option
   - ***Yes***: Allow the ST Monitoring Status indicator to display in the patient Multi-Viewer window.
     If there is a problem collecting ST records from the monitoring device, the ST Monitoring error indicator displays in the patient Multi-Viewer window. To determine the cause of the error, hover over the ST Monitoring Status button.

     Errors at the monitoring device that could produce the ST Monitoring error indicator on the central station include:
     - 12SL Analysis Program not enabled or license not activated.
     - Incorrect ECG cable.
     - Insufficient working ECG leads or ***LEADS FAIL***.
   - ***No***: Do not display the ST Monitoring Status indicator to display in the patient Multi-Viewer window.
5. To remove the ST Monitoring Status indicator from the patient Multi-Viewer window, select the ST Monitoring Status button. When the message ***STOP ST Monitoring?*** displays, select the appropriate option:
   - ***Yes***: Remove the ST Monitoring Status indicator from the patient Multi-Viewer window.
   - ***No***: Continue to display the ST Monitoring Status indicator from the patient Multi-Viewer window.

Using ST Review

CAUTION

INCORRECT HISTORICAL DATA — The 12SL ECG Analysis Program installed in bedside monitors expects 12 ECG leads to perform a complete analysis. The bedside monitor can get 12 ECG leads by using a 10-leadwire ECG cable or by using a 6-leadwire ECG cable. If a 6-leadwire ECG cable is used, the bedside monitor must also have the 12RL program installed so it can compute the other ECG waveforms, after which it then indicates interpolated leads on the 12SL reports.

Some bedside monitors still compute 12SL analysis even though they do not have 12 ECG leads and don't have the 12RL program installed. These bedside monitors do not include the interpolated leads statement on the reports. Missing lead data appears as a zero-level (flat-line) in the corresponding waveform channel and the 12SL report includes a statement that data quality is poor. 12SL reports based on less than 12 ECG leads may not provide a complete analytic interpretation.

The central station retrieves 12SL analysis reports in all the above cases. If the accuracy of the displayed 12SL data is questionable or data is missing, first confirm patient status, then review the data at the primary monitoring device.

ST Review requires a secondary display and an enabled license.

ST Review uses the same display calibration as the Multi-Viewer and Single Viewer. The displays must be calibrated before clinical use for accurate waveform amplitude and time display on the central station. Waveforms displayed on the central station are to scale provided that screen calibration is correct. For more information, see the technical manual.

ST Review allows users to display and print ST records on the central station. ST Review is not intended to make diagnostic interpretations.

The central station will automatically request monitoring devices to generate a ST record every minute for all monitoring devices for which Full Disclosure data is being acquired. The central station will then retrieve the generated ST records every minute from the monitoring device and place it into the monitoring device's Full Disclosure data record. Not all monitoring devices can generate ST records. No ST records will be placed into Full Disclosure for those devices.

The central station will not request ST records from some bedside monitors (e.g., CARESCAPE Monitor B850 software version 1). For more information, see the documentation accompanying the bedside monitor.

Monitoring devices full disclosed at previous versions of the central station, like CIC Pro Clinical Information Center, will not have ST records in Full Disclosure.

It may take a couple minutes after starting Full Disclosure at a monitoring device before the first ST record appears in ST Review.

ST records are generated by the monitoring device via the 12SL ECG Analysis Program. The 12SL ECG Analysis Program will accept derived ECG waveforms and still produce a ST record. The central station cannot display derived ECG waveforms except as part of an ST record.

Derived lead values obtained from a bedside monitor using 12RL display on the central station with a ***d*** prefix (e.g., ***ST-dV2***). When ST records generated using derived

data are printed, the message ***LEADS V2, V3, V4 AND V6 ARE INTERPOLATED*** is included in the printout.

12SL records based on 12RL can also be displayed and printed at the central station, with select monitoring devices. If a 6-leadwire ECG cable is used (V2, V3, V4 and V6 leads are not present) a 12RL algorithm can compute those missing waveforms.

ST records generated with 12RL based data display on the central station with the ***d*** prefix for the applicable waveforms and complexes.

Not all monitoring devices are capable of creating the derived ECG waveforms via the 12RL algorithm.

ST segment deviation values obtained from a bedside that uses the 12RL algorithm can also be displayed in Numeric Trends, Graphic Trends, in the Multi-Viewer and in the Single Viewer without ST records and the 12SL Analysis Program. For more information on 12RL, see the documentation accompanying the monitoring device.

The diagnostic ECG capabilities vary by monitoring device, including the following:

- The performance accuracy of the automated measurements.
- The way amplitude values for P-, QRS-, ST-, and T- waves are determined.
- The way isoelectric segments within QRS complex are treated.
- The intended use of the analyzing electrocardiograph.
- The accuracy measures for the interpretative statements.
- The accuracy measures for rhythm categories.

For more information, see the documentation accompanying the monitoring device.

To use this data review tool, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.

2. From the Single Viewer menu, select ***Patient Data*** > ***ST Review***.

Item	Description
1	***Current*** ST record button
2	***Reference*** ST record button
3	***Range*** drop-down menu
4	Selected Median
5	***Show Saved Reference*** and ***Save Reference*** buttons
6	***Push to Muse*** button
7	ST Monitoring ***Status*** button
8	ST segment deviations in microvolts
9	Previous and next ST record button
10	***View Medians***, ***View All ECG***, and ***View 12 Lead*** buttons
11	Selected Median 3x zoom window
12	Current ST record cursor with timestamp

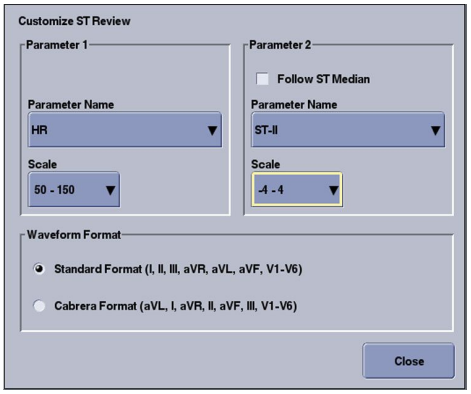
3. To select the time range, select the appropriate option from ***Range***. The options are: ***15 min***, ***30 min***, ***1 hr***, ***2 hrs***, ***4 hrs***, ***8 hrs***, ***12 hrs***, and ***24 hrs***.
4. To change the data displayed, select the appropriate option:
   - ***View All ECG***: Display all ECG data for the current ST record.
   - ***View Medians***: Display 12 median complexes for the current ST record (blue) and 12 reference median complexes for the current ST record (orange). Also displays a 3x magnified median complex.
   - ***View 12 Lead***: Display 12 lead data for the current ST record.

5. To view Graphic Trends for specific ST records, select the appropriate option:
   - Select ***Current*** to set (mark) the Current ST record time focus in Graphic Trends. The cursor displays as blue.
   - Select ***Reference*** to set (mark) the Reference ST record in Graphic Trends. The first available ST record is stored as the reference record if no reference record has been previously saved. The cursor displays as orange.

   The ST record cursor displays a timestamp, parameter names, values, units of measure, and the selected scales.
6. To change the reference, complete the following procedure:
   a. Select ***Reference***.
   b. Move the cursor to the appropriate position and select the appropriate option:
      - ***Save Reference***: Save a new ST reference. If there is an existing reference, the message ***Over-write existing saved reference?*** displays. Select the appropriate option:
        - ***Yes***: Overwrites the previously saved reference.
        - ***No***: Does not overwrite the previously saved reference.
      - ***Show Saved Reference***: Displays the Reference ST Record Cursor at the time of the saved reference record in Graphic Trends when the Reference ST Record Cursor is active with an ST record presented.

7. To change the Graphic Trends parameters, scales, and waveform format, complete the following procedure:

   a. Select the Configuration button.



   b. Under ***Parameter 1***, select the appropriate options:

   - ***Parameter Name***: Select the parameter from the list. For more information, see ECG supported parameters (168).
   - ***Scale***: Select the waveform scale. Scale options vary by parameter. For more information, see Custom defaults (227).

   c. Under ***Parameter 2***, select the appropriate options:

   - ***Follow ST Median***: Select to follow any of the 12 ST medians. The selected median is displayed in the 3x zoom window. The trend graph parameter automatically switches to the ST deviation corresponding to the lead of the selected median.
   - ***Parameter Name***: Select the parameter from the list. For more information, see ECG supported parameters (168).
   - ***Scale***: Select the waveform scale. Scale options vary by parameter. For more information, see Custom defaults (227).

   d. Under ***Waveform Format***, select the appropriate options:

   - ***Standard Format (I, II, III, aVR, aVL, aVF, V1-V6)***: Also known as Einthoven. The waveforms display as follows:

I	aVR	V1	V4
II	aVL	V2	V5
III	aVF	V3	V6

   - ***Cabrera Format (aVL, I, -aVR, II, aVF, III, V1-V6)***: An alternate limb lead order in which aVR is inverted and shown as -aVR, making it easier to visualize waveform progression in the frontal plane. The waveforms display as follows:

aVL	II	V1	V4
I	aVF	V2	V5
-aVR	III	V3	V6

   e. Select ***Close***. The ST Review data will automatically refresh to these settings.

8. ***Push to MUSE***: Transfer an ST record file to MUSE (if available). ST records generated with 12RL based data cannot be pushed to the MUSE server; only ST records generated with purely measured data can be pushed.

   This button will be disabled if:

   - The patient does not have both a patient identification number and a last name.
   - The ST record contains data derived with a 12RL algorithm.
   - The central station cannot find a MUSE system on the Network. For more information, see the technical manual.

9. Select the Print button.
10. Select the appropriate print report option. All of the reports include ECG measurement values, timestamp, and patient information:

    - ***All ECG***: Includes 12 ECG waveforms with ten seconds of data associated with each waveform, printed on two pages. If the ST record contained derived data, then the message ***LEADS V2, V3, V4 AND V6 ARE INTERPOLATED*** displays, otherwise the 12SL statement codes are listed and the message ***UNCONFIRMED*** displays.
    - ***Medians***: Includes current and saved reference median complexes, differentiated by levels of grayscale (current complexes are darker than reference complexes). Also includes QRS start marker and QRS end marker (J point).
    - ***12 Lead***: Includes 12 ECG waveforms with 2.5 seconds of data associated with each waveform. Also includes ten seconds of data for ECG lead II and ECG lead V1. If the ST record contained derived data, then the message ***LEADS V2, V3, V4 AND V6 ARE INTERPOLATED*** displays, otherwise the 12SL statement codes are listed and the message ***UNCONFIRMED*** displays.

11. Select ***OK***.

    The waveforms print within 1% to scale for both amplitude and time.

    The patient name and patient identification number used on the printout corresponds to the patient name and patient identification number used when the printout was requested.

Using Browser

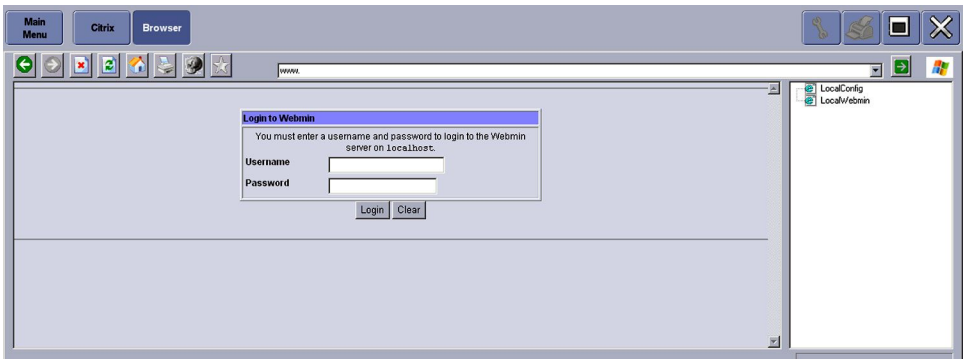
WARNING	MISMATCHED PATIENT DATA — Always verify that the displayed patient information corresponds to the patient identification number of the patient on the bedside monitor.
CAUTION	INADEQUATE DATA RESOLUTION — Images displayed on this device are not to be used for diagnostic purposes. Always review the original images.

The Browser settings are configured before clinical use, including Citrix settings and/or Internet Explorer Favorites. The Browser and Citrix portal which runs in conjunction with the central station are intended for hospital intranet use only. If confidential patient information is made available from the hospital intranet, the security of the data is the responsibility of the hospital.

When configured, Browser provides access to web applications, patient data (e.g., labs, images), and repositories (e.g., Hospital Information System) on the hospital enterprise network.

To use this data review tool, complete the following procedure:

1. From the Multi-Viewer menu, select ***Browser***.



2. To use Internet Explorer, either manually enter a web address or select the Favorites button and select the appropriate option from the list.
3. To use Citrix, select ***Citrix*** on the menu bar.
4. Select the Close button to close the window.

8

Printing

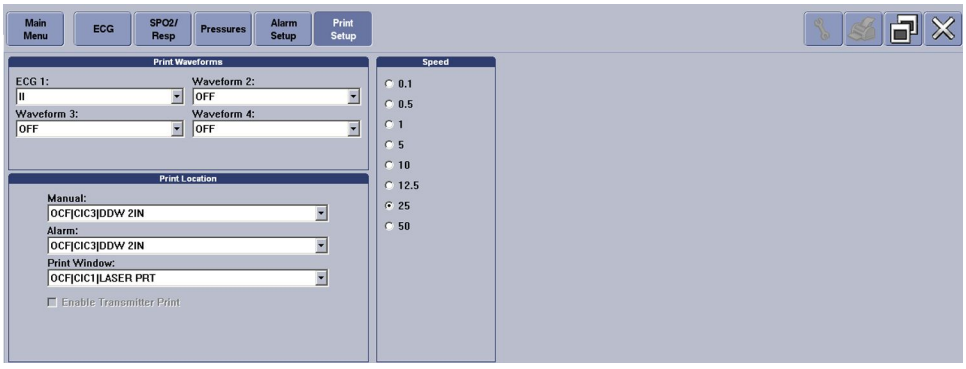
Adjusting printer control settings

Some monitoring devices (e.g., B40 patient monitor) do not allow remote devices like the central station to change the Print Location for the monitoring device or allow remote devices like the central station to use the monitoring device's writer as a Print Location for the central station. For more information, see the documentation accompanying the monitoring device.

When some bedside monitors (e.g., CARESCAPE Monitor B850) are set to print to a laser printer for manual or alarm graphs, the laser printer name will display as a blank in these two locations at the central station. In these cases, the print location for these monitors cannot be adjusted at the central station. Any changes made will be ignored and revert to the laser printer specified by the bedside monitor.

To adjust printer control settings, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. From the Single Viewer menu, select ***Monitor Setup*** > ***Print Setup***.



3. Under ***Print Waveforms***, select the waveforms to print:
   - ***ECG 1***: Select the ECG lead from the list for the first waveform to be printed.
   - ***Waveform 2***: Select the ECG lead or parameter from the list for the second waveform to be printed.
   - ***Waveform 3***: Select the ECG lead or parameter from the list for the third waveform to be printed.
   - ***Waveform 4***: Select the ECG lead or parameter from the list for the fourth waveform to be printed.

   ECG waveforms are always printed first; other parameter waveforms print after ECG waveforms.

4. Under ***Print Location***, select the printer where the following print requests will print:
   - ***Manual***: Printer for manually initiated ECG strip printouts.
   - ***Alarm***: Printer for automatically initiated ECG strip printouts printed by monitoring devices in response to alarms.
   - ***Print Window***: Printer for stored data print requests.
     Some bedside monitors do not support this option.
   - ***Enable Transmitter Print***: Allow telemetry monitoring devices to initiate manual print requests.
     Some telemetry monitoring devices do not support this option.
5. Under ***Speed***, select the print speed in mm/s. The options are: ***0.1***, ***0.5***, ***1***, ***5***, ***10***, ***12.5***, ***25***, and ***50***. The slower the speed, the more condensed the data.

Manually printing ECG strips

To manually print a continuous ECG strip, complete the following procedure:

1. Select the appropriate patient Multi-Viewer window.
2. Hover over the parameter numerics area.
3. When the Printer icon displays, click in the parameter numerics area.

   The printout continues until the user stops the printout request.
4. To stop manual ECG strip printout requests, hover over the parameter numerics area and click the Printer icon again.

The ECG strip is sent to the printer configured for Print Location > Manual, unless the central station has a writer attached and configured for use. If the central station writer is configured for use, all manual printouts will be sent to the writer, even if another printer is defined for the Print Location > Manual. Manually printed ECG strips initiated directly from the bedside monitor will go to the Print Location > Manual regardless if the central station has an attached writer. The format and duration varies by monitoring device. For more information, see the documentation accompanying the monitoring device.

Printing all parameter alarm limits and waveforms

Monitoring devices can only save a single print request at any one time. When a print request occurs, the most recent saved print request is sent to the central station. It may take several minutes to generate the printout. The patient data may not be in same sequential order as the patient Multi-Viewer windows.

To print the parameter limits or waveforms, complete the following procedure:

1. From the Multi-Viewer menu, select ***Print All***.

2. Select ***Limits*** to print the parameter alarm limits for all telemetry monitoring devices displayed in the Multi-Viewer.

   Each printout contains the patient identification and the corresponding parameter limit settings, parameter alarm priorities, and arrhythmia alarm priorities. These printouts are only available from telemetry monitoring devices. The same printout can be created for a individual telemetry monitoring device by selecting the Print button in ***Monitor Setup*** > ***Alarm Setup***.

3. Select ***Waveforms*** to print the waveforms for all monitoring devices displayed in the Multi-Viewer.

   An individual manual ECG strip will be printed for each monitoring device.

4. Select ***OK*** to print.

The printout is sent to the printer configured for ***Print Location*** > ***Manual***. The format and duration varies by monitoring device. For more information, see the documentation accompanying the monitoring device.

Automatic alarm printouts

If the monitoring device is configured for automatic alarm printouts, an automatic alarm printout is generated when a patient experiences a ***HIGH*** (***CRISIS***) or ***MEDIUM*** (***WARNING***) priority alarm. If the printer is not available at the time of the alarm, a 20 second printout is saved. The saved printout will print when the printer is available.

For more information, see the documentation accompanying the monitoring device.

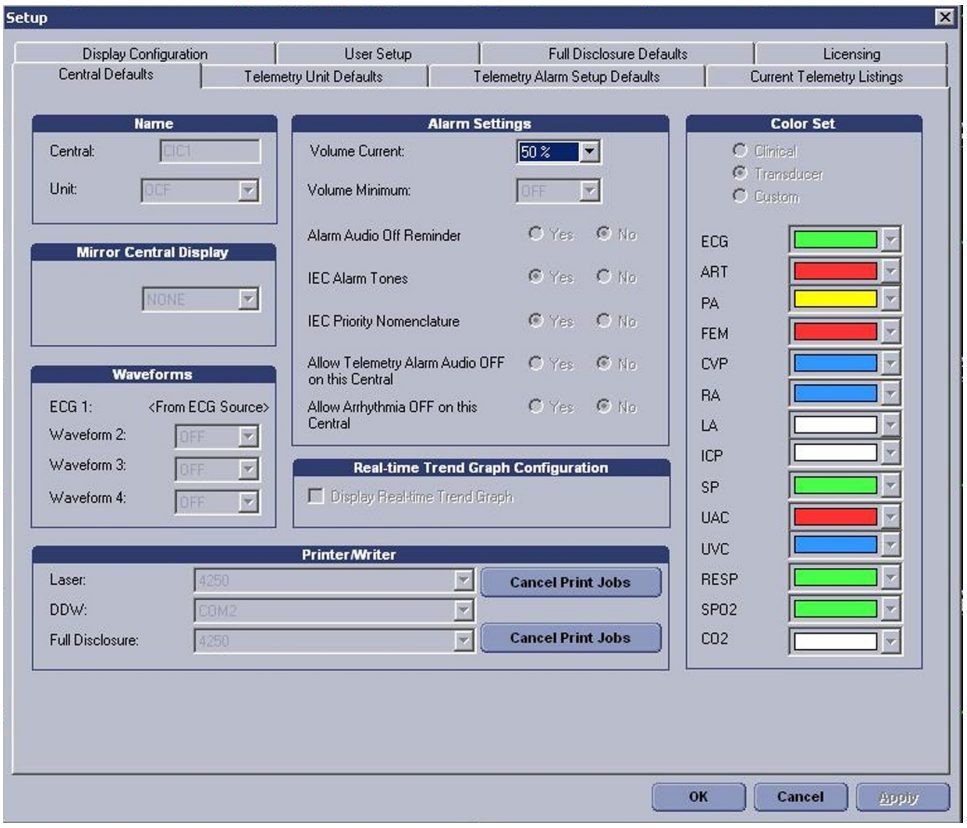
Stop printing

Print requests initiated at the central station and rendered at the central station laser printer, must be stopped at the central that initiated the print request.

Manual ECG strip print requests generated by a bedside monitor, regardless of the print destination, can be stopped from the bedside monitor that generates the printouts or from an in-unit central station.

To stop print requests rendered by the central station laser printer, complete the following procedure:

1. From the Multi-Viewer menu, select ***Setup*** > ***Central Defaults***.



2. Under ***Printer/Writer***, select ***Cancel Print Jobs*** for the printer.
3. Select ***OK***.

To stop print requests at a writer, press the **Graph Stop** button on the writer.

To stop manual ECG strip printout requests, hover over the parameter numerics area and click the Printer icon again.

Alarm graphs cannot be stopped from a central station. For more information, see the documentation accompanying the monitoring device.

Supported printouts

All parameter data is printed to scale unless otherwise noted. Event Strip, events Strip Report, Graphic Trends, Flow/Volume Loop, and Flow/Volume Loop Report are not printed to scale.

Print Setup control settings can be adjusted. For more information, see Adjusting printer control settings (139).

Central Defaults and Telemetry Unit Defaults are configured before clinical use. For more information on the printing dependencies, limitations, and configuration options, see the technical manual.

Central station initiated and bedside monitor initiated printouts will not look the same when configured to print to the central station laser printer.

Event Directory, Event Strip, and Graphic Trends printouts may only be sent to a central station laser printer; printing by the central station to a writer is not supported.

The following symbols are used to indicate whether a printout is supported by the central station:

- — indicates an unsupported printout.
- X indicates a supported printout.

Printouts with content generated by the central station

Printout	Initiated from central station	Initiated from monitoring device	PDF	Laser printer	Central station printout configuration location
FD Strip	X	—	—	X	***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser***
FD Page	X	—	—	X	***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser***
Calipers	X	—	—	X	***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser***
ST Review (***Medians***)	X	—	—	X	***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser***
ST Review (***12 Lead***)	X	—	—	X	***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser***
ST Review (***All ECG***)	X	—	—	X	***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser***
Events (***Strip Report***)	X	—	X	X	***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser*** or ***PDF***
Event Strip (ST reference)	X	X	—	X	• Central station initiated: ***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser*** • Monitoring device initiated: ***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Print Window***

Printout	Initiated from central station	Initiated from monitoring device	PDF	Laser printer	Central station printout configuration location
Event Strip (ST limit violation)	X	X	—	X	• Central station initiated: ***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser*** • Monitoring device initiated: ***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Print Window***
Browser	X	—	X	X	Laser printer or PDFCreator selected from the Print dialog box.
Event Directory	X	—	—	X	***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser***
Event Strip (Arrhythmia)	X	—	—	X	***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser***
Graphic Trends	X	—	—	X	***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser***
Numeric Trends	X	—	—	X	***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser***
Alarm limits (***Print All*** > ***Limits***)	X	—	—	X	***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser***
Telemetry monitoring device Discharge Report	—	X	—	X	• ***Setup*** > ***Central Defaults*** > ***Printer/Writer*** > ***Laser*** • ***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Print Window***
Bedside monitor 12SL Analysis Report	—	X	—	X	Cannot be configured from the central station.

When the central station has a writer attached and configured and a manual printout request is initiated at the central station, the central station writer will be used even if the ***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Manual*** for the monitoring device is set to a different device.

Printouts with content generated by the monitoring device

Printout	Initiated from central station	Initiated from monitoring device	Writer	Laser printer	Central station printout configuration location
Event Directory	—	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Print Window***
Event Strip (Arrhythmia)	—	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Print Window***
Graphic Trends	—	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Print Window***
Numeric Trends	X	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Print Window***
Alarm limits (***Print All*** > ***Limits***)	X	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Print Window***
Manual ECG strip printout	X	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Manual***
Telemetry monitoring device ***Transmitter Graph***	—	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Manual***
Telemetry monitoring device ***Event Marker Graph***	—	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Manual***
Telemetry monitoring device ***Alarm Graph***	—	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Alarm***
Cardiac Calculations	—	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Print Window***
Pulmonary Calculations	—	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Print Window***
Dose Calculations	—	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Print Window***
Titration Table	—	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Print Window***
CRG 6 Hour Summary	—	X	X	X	***Monitor Setup*** > ***Print Setup*** > ***Print Location*** > ***Print Window***

Printout	Initiated from central station	Initiated from monitoring device	Writer	Laser printer	Central station printout configuration location
CRG Trends	—	X	X	X	*Monitor Setup* > *Print Setup* > *Print Location* > *Print Window*
CRG Trends Events	—	X	X	X	*Monitor Setup* > *Print Setup* > *Print Location* > *Print Window*
Flow/Volume Loop	—	X	—	X	*Monitor Setup* > *Print Setup* > *Print Location* > *Print Window*
Flow/Volume Loop Report	—	X	—	X	*Monitor Setup* > *Print Setup* > *Print Location* > *Print Window*

9

Maintenance

Maintenance overview

CAUTION INSPECTION — Failure on the part of the responsible hospital or institution employing use of this device to implement a satisfactory maintenance schedule may cause undue device failure and possible health hazards.

An effective maintenance schedule should be established for the monitoring devices and reusable supplies. This should include inspection as well as general cleaning on a regular basis. The maintenance schedule must comply with the policies of the institution's infection control unit and/or biomedical engineering department. For more information, see the technical manual.

Cleaning safety precautions

WARNING LOSS OF MONITORING — Safely turning off this device and/or removal of the device from mains power should be done by authorized service personnel.

For more information, see the technical manual.

WARNING SHOCK HAZARD — Disconnect AC-powered devices from the power line before cleaning or disinfecting its surface. Turn off the power to battery-powered devices before cleaning or disinfecting its surface.

WARNING SHOCK HAZARD — Do not pour or spray any liquid directly on cables or leadwires or permit fluid to seep into connections or openings.

WARNING SHOCK HAZARD — Never immerse devices, cables, or leadwires in any liquid or allow liquid to enter the interior.

CAUTION DEVICE DAMAGE — Never use conductive solutions, solutions that contain chlorides, wax, or wax compounds to clean devices, cables or leadwires.

CAUTION DEVICE DAMAGE — Never use solutions or products that contain the following:

- Any type of Ammonium Chloride such as, but not limited to:
  - Dimethyl Benzyl Ammonium Chloride
  - Quaternary Ammonium Chloride solutions
- Abrasive cleaners or solvents of any kind
- Acetone
- Ketone
- Betadine
- Alcohol-based cleaning agents
- Sodium salts

CAUTION DEVICE DAMAGE — Do not autoclave any part of the system with steam (including cables).

Permitted cleaning agents

The following are permitted cleaning agents:

- Water
- Mild soap (diluted)
- Clorox bleach (active ingredient: 5.25% sodium hypochlorite) mixed 10:1 with water
- Any sodium hypochlorite wipe product that meets these above guidelines
- Sagrotan (dilution 3:100, containing 75 mg tartaric acid per 100 ml solution).

Harmful cleaning agents

The following cleaning agents have been demonstrated to cause one or more of the results of improper cleaning:

- Formula 409
- Isopropyl alcohol
- Ethanol
- Virex 256
- Cavicide surface cleaner/disinfectant
- Lysol Coverage spray disinfectant
- Kleenaseptic
- Sufanios
- Cidex Plus
- Cidex OPA
- Sporicidin
- Vesphene
- Lysol Basin Tub and Tile Cleaner
- Sani-Cloth HB

Results of improper cleaning

Use of cleaning agents other than the permitted cleaning agents is considered improper cleaning and could lead to the following:

- Discoloration
- Metal part corrosion
- Reduced cable life
- Brittle wires/cables
- Brittle and breaking device case
- Brittle and breaking connectors
- Melting, dulling, or distorting device case
- Overall system performance degradation
- Device malfunction
- Total mechanic failure requiring replacement
- Void warranty

Cleaning external surfaces

WARNING LOSS OF MONITORING — Safely turning off this device and/or removal of the device from mains power should be done by authorized service personnel.

For more information, see the technical manual.

Use the following procedure to clean the external surfaces of the processing unit and other devices.

1. Turn off the power to the device.
2. Disconnect the equipment from the power supply.
3. Remove all cables.
4. Dampen a clean, soft, lint-free cloth with one of the permitted cleaning agents.
5. Wring excess fluid from the cloth.
6. Wipe the exterior with a soft lint-free cloth, lightly moistened with the permitted cleaning agent. Do not allow fluids to pool around connections. If this should happen, blot the area dry with a cotton swab or soft cloth
7. Wipe off the cleaning agents with a clean, lightly moistened cloth.
8. Dry thoroughly with a dry lint-free cloth and let air dry for at least 30 minutes. Drying times may vary based on the environmental conditions.
9. Reconnect the device to the power supply.
10. Turn on the power to the device.

Cleaning displays and touchscreens

WARNING LOSS OF MONITORING — Safely turning off this device and/or removal of the device from mains power should be done by authorized service personnel.

For more information, see the technical manual.

Use the following procedure to clean the displays, including touchscreen displays.

1. Turn off the power to the device.
2. Disconnect the equipment from the power supply.
3. Remove all cables.
4. Dampen a clean, soft, lint-free cloth with one of the permitted cleaning agents.
5. Wring excess fluid from the cloth.
6. Wipe the exterior with a soft lint-free cloth, lightly moistened with household glass cleaner. Do not allow fluids to pool around connections. If this should happen, blot the area dry with a cotton swab or soft cloth.
7. Wipe off the household glass cleaner with a clean, lightly moistened cloth.
8. Dry thoroughly with a dry lint-free cloth and let air dry for at least 30 minutes. Drying times may vary based on the environmental conditions.
9. Reconnect the device to the power supply.
10. Turn on the power to the device.

Disinfecting external surfaces

WARNING LOSS OF MONITORING — Safely turning off this device and/or removal of the device from mains power should be done by authorized service personnel.

For more information, see the technical manual.

The decision to disinfect or sterilize must be made per the institution's requirements with an awareness of the effect on the integrity of the device. Do not use excessive drying techniques, (e.g., oven, forced heat, sun drying).

1. Turn off the power to the device.
2. Disconnect the equipment from the power supply.
3. Remove all cables.
4. Dampen a clean, soft, lint-free cloth with the following solution as recommended in the APIC Guidelines for Selection and Use of Disinfectants (1996):
   - Sodium hypochlorite (5.2% household bleach) minimum 1:500 dilution (minimum 100 ppm free chlorine) and a maximum 1:10 dilution.
   - Any sodium hypochlorite wipe product that meets the above guidelines can be used.
5. Wring excess fluid from the cloth.

6. Allow disinfecting solution to remain on device for a minimum of one minute or per hospital guidelines. Do not let fluid pool around connections. If this happens, blot with a cotton swab or soft cloth.
7. Wipe off the disinfecting solution with a clean, lightly moistened cloth.
8. Dry thoroughly with a dry lint-free cloth and let air dry for at least 30 minutes. Drying times may vary based on the environmental conditions.
9. Reconnect the device to the power supply.
10. Turn on the power to the device.

Touchscreen display guidelines

The following guidelines should be followed when using a touchscreen display:

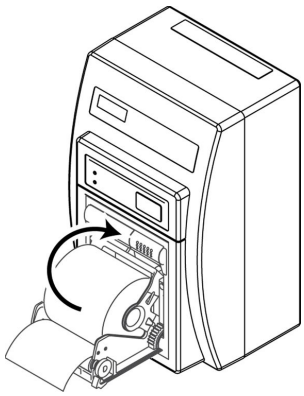
- Do not apply tape or other items to touchscreens.
- Do not use pencils or other sharp objects to select items on touchscreens.
- Right-click menus are not supported on touchscreens.

Writer maintenance

Changing writer paper

To change the writer paper, complete the following procedure:

1. Press the button on the front of the writer to open the writer door.
2. Remove the old spool and install a new paper roll. For more information, see the writer technical manual.



If using paper with the thermal coating (printable surface) on the inside of the roll, such as those sold by GE, install the paper roll so that it unrolls from the bottom. Reverse this (have the paper unroll from the top), if the printable surface is on the outside of the roll. The paper must be oriented so that the printable surface side (the shiny side) of the paper must be in contact the print head assembly, not the roller assembly.

3. Close the door. Make sure the paper protrudes from the opening.
4. Test the writer by initiating a test strip.
5. Remove the test strip by tearing downward.

Storing writer paper

Paper manufacturers advise that thermal products should retain traces for three to five years when properly imaged and stored. If the institution's retention requirements exceed these guidelines, consider alternate image storage techniques.

To assure maximum trace image life, thermal paper should be stored separately in manila folders or polyester or polymide protectors. Plastic document protectors, envelopes, or sheet protectors made of polystyrene, polypropylene, or polyethylene will not degrade thermal traces in themselves. However, these materials afford no protection against fading from other sources. Use only mounting forms and pressure-sensitive tapes made with starch or water-based adhesives.

To avoid deterioration or fading of traces, follow these precautions for unused paper and printed graph strips:

- Store in a cool, dark location. Temperature must be below 27°C (80°F). Relative humidity must be between 40 and 65%.
- Avoid exposure to bright light or ultraviolet sources (e.g., sunlight, florescent lighting).
- Do not store thermal paper with any of the following:
  - Carbon or carbon-less forms.
  - Non-thermal chart papers or any other products containing tributyl phosphate, dibutyl phthalate, or any organic solvents. Many medical and industrial charts contain these chemicals.
  - Document protectors, envelopes, and sheet separators containing polyvinyl chloride or other vinyl chlorides.
- Avoid contact with cleaning fluids and solvents (e.g., alcohols, ketones, esters, ether).
- Do not use mounting forms, pressure-sensitive tapes, or labels containing solvent-based adhesives.

A

Alarm characteristics

Audio alarm tone characteristics

IEC HIGH audio alarm tone characteristics

The following lists the frequency, duration, and repetition rate for the indicated audio alarm tone. This sound pattern repeats.

- Beep "C" (523 Hz/140 ms), silence (90 ms)
- Beep "F" (698 Hz/140 ms), silence (90 ms)
- Beep "G" (784 Hz/140 ms), silence (320 ms)
- Beep "A" (880 Hz/140 ms), silence (90 ms)
- Beep "B" (988 Hz/140 ms), silence (534 ms)
- Beep "C" (523 Hz/140 ms), silence (90 ms)
- Beep "F" (698 Hz/140 ms), silence (90 ms)
- Beep "G" (784 Hz/140 ms), silence (320 ms)
- Beep "A" (880 Hz/140 ms), silence (90 ms)
- Beep "B" (988 Hz/140 ms), silence (5000 ms)

IEC MEDIUM audio alarm tone characteristics

The following lists the frequency, duration, and repetition rate for the indicated audio alarm tone. This sound pattern repeats.

- Beep "C" (523 Hz/190 ms), silence (190 ms)
- Beep "G" (784 Hz/190 ms), silence (190 ms)
- Beep "B" (988 Hz/190 ms), silence (19000 ms)

IEC LOW audio alarm tone characteristics

The following lists the frequency, duration, and repetition rate for the indicated audio alarm tone. ***LOW*** priority level technical alarms can be configured before clinical use to either repeat or not repeat the audio alarm tone. The factory preset is to repeat the audio alarm tone. For more information, see the technical manual.

- Beep "C" (523 Hz/190 ms), silence (24810 ms)

Legacy CRISIS audio alarm tone characteristics

The following lists the frequency, duration, and repetition rate for the indicated audio alarm tone. This sound pattern repeats.

- Beep (500 & 510 Hz/100 ms), silence (100 ms)
- Beep (500 & 510 Hz/100 ms), silence (100 ms)
- Beep (500 & 510 Hz/100 ms), silence (500 ms)

Legacy WARNING audio alarm tone characteristics

The following lists the frequency, duration, and repetition rate for the indicated audio alarm tone. This sound pattern repeats.

- Beep (397 & 441 Hz/100 ms), silence (100 ms)
- Beep (397 & 441 Hz/100 ms), silence (2400 ms)

Legacy SYSTEM WARNING audio alarm tone characteristics

The following lists the frequency, duration, and repetition rate for the indicated audio alarm tone. This sound pattern repeats.

- Beep (150 & 200 Hz/500 ms), silence (2400 ms)

Legacy ADVISORY audio alarm tone characteristics

The following lists the frequency, duration, and repetition rate for the indicated audio alarm tone. This sound pattern repeats.

- Beep (397 Hz/500 ms), silence (5000 ms)

Legacy SYSTEM ADVISORY audio alarm tone characteristics

The following lists the frequency, duration, and repetition rate for the indicated audio alarm tone. This sound pattern does not repeat.

- Beep (150 & 200 Hz/500 ms)

Alarm Audio Off Reminder alarm tone characteristics

The following lists the frequency, duration, and repetition rate for the indicated audio alarm tone. This sound pattern repeats.

- Beep (523 Hz/125 ms), silence (120000 ms)

Audio alarm tone sound pressure ranges overview

The following sound pressure ranges were tested in accordance with IEC 60601-1-8 sub-clause 6.3.3.2 with alarm volume control set to minimum volume setting and maximum volume setting for the central station with speakers:

IEC audio alarm tone sound pressure ranges

Alarm priority level	Minimum alarm volume	Maximum alarm volume
HIGH priority alarm	52.5 dB (A)	85.0 dB (A)
MEDIUM priority alarm	50.6 dB (A)	84.0 dB (A)
LOW priority alarm	45.3 dB (A)	77.1 dB (A)

Legacy audio alarm tones sound pressure ranges

Alarm priority level	Minimum alarm volume	Maximum alarm volume
CRISIS priority alarm	50.0 dB (A)	83.3 dB (A)
WARNING priority alarm	46.6 dB (A)	77.9 dB (A)
ADVISORY priority alarm	45.2 dB (A)	76.7 dB (A)

Visual alarm indicator characteristics

The following lists the color, size, and modulation rate for visual alarm indicators.

All visual alarm indicators share the following color RGB values:

- Red (255, 50, 50)
- Yellow (255, 255, 0)
- Cyan (30, 165, 255)
- White (255, 255, 255)
- Black (0, 0, 0)
- Orange (255, 250, 50)

All visual alarm indicators have the following sizes when displayed on the 19 inch displays recommended by GE for use with the central station.

- Approximately 4 mm high to 5 mm high depending on the alarm type and location on the central station.
- Approximately 10 mm for monitoring devices alarm buttons (ADUs).
- Approximately 15 mm for HR limit alarms.

The following modulation rate (frequency of flash) of the patient Multi-Viewer window border only occurs for ***HIGH (CRISIS)*** and ***MEDIUM (WARNING)*** priority level alarm conditions:

- ***HIGH (CRISIS)*** flash frequency: approximately 1.5 Hz
- ***HIGH (CRISIS)*** flash cycle: approximately 50%
- ***MEDIUM (WARNING)*** flash frequency: approximately 0.5 Hz
- ***MEDIUM (WARNING)*** flash cycle: approximately 50%

B

Supported parameters

Supported parameters overview

The central station can retrieve and display parameter data from monitoring devices connected to the network and secondary monitoring devices via the Unity Network ID interface device. When used in conjunction with bedside monitors, the central station is not a primary monitoring device. The central station supports the following parameters with one or more compatible monitoring devices. Not all parameters or sub-parameters are supported by all compatible monitoring devices. For more information, see the documentation accompanying the monitoring device.

The following symbols are used to indicate whether a parameter is supported by the central station:

- — indicates an unsupported parameter.
- X indicates a supported parameter.

Improper skin preparation and electrode placement can reduce the quality of displayed waveforms. For more information on proper electrode placement and how to improve electrode signal quality, see the documentation accompanying the monitoring device.

Unless otherwise noted, pressure value numerics in mmHg display with 1 mmHg precision and numerics in kPa display with either 2 or more digits and/or a precision of 0.1 kPa or better. When shown in percent, only the first two digits are significant. For a central station configured for the Chinese language, the pressure units of measurement can set to either kPa or mmHg; all other pressure values are shown in mmHg.

Parameter labels may include an interface number, channel number, or site number, represented with an ***x*** (e.g., ***ARx***). For more information, see the documentation accompanying the monitoring device.

Parameter labels displayed on the central station may vary depending on the user interface location and/or the parameter label sent by the monitoring device. For example, Graphic Trends and Numeric Trends may display a different parameter label for the same parameter (***VENT-PT-RR*** or ***vPT-RR*** for Ventilator Respiratory Rate). For more information, see the documentation accompanying the monitoring device.

For some monitoring devices (e.g., DINAMAP Pro 1000) timestamps for measurements (e.g., NBP, TEMP) may differ between the values displayed on the monitoring device and the central station. This difference is due to the fact that some monitoring devices do not synchronize the time automatically to the network. For these monitoring devices, time synchronization must be done manually at the monitoring device. For more information, see the documentation accompanying the monitoring device.

Some monitoring devices (e.g., CARESCAPE Monitor B850) may provide time stamps on alarm histories (i.e., arrhythmia events, ST limit violation events) that could be several seconds offset from the time the event actually occurred.

Some monitoring devices (e.g., B40 patient monitor) may send parameter data to the central station for parameters that are not currently connected to the patient.

Arterial Blood Gas (ABG/POC) supported parameters

The central station supports the following parameters with Unity Network ID.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
pH	none	—	—	—	—	***ABG-pH***	—	—
Partial Pressure Carbon Dioxide	mmHg or kPa	—	—	—	—	***ABG-PaCO2***	—	—
Partial Pressure Oxygen	mmHg or kPa	—	—	—	—	***ABG-PaO2***	—	—
Bicarbonate	mmol/L	—	—	—	—	***ABG-HCO3***	—	—
Base Excess Of Blood	mmol/L	—	—	—	—	***ABG-BE***	—	—
Total CO2	mmol/L	—	—	—	—	***ABG-TCO2***	—	—
Base Excess Extracellular Fluid	mmol/L	—	—	—	—	***ABG-ECF BE***	—	—
O2 Saturation	%	—	—	—	—	***ABG-SaO2***	—	—
Hematacrit	% or SI Unit	—	—	—	—	***ABG-HCT***	—	—
Total Hemoglobin	mmol/L or g/dL	—	—	—	—	***ABG-tHb***	—	—
Ionized calcium	mmol/L or mg/dL or meq/L	—	—	—	—	***ABG-iCa++***	—	—
Potassium	mmol/L or meq/L	—	—	—	—	***ABG-K+***	—	—
Blood Urea Nitrogen	mmol/L or mg/dL	—	—	—	—	***ABG-BUN***	—	—
Sodium	mmol/L or meq/L	—	—	—	—	***ABG-Na+***	—	—
Chloride	mmol/L or meq/L	—	—	—	—	***ABG-Cl-***	—	—

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Creatinine	mg/dL	—	—	—	—	***ABG-CREA***	—	—
Glucose	mmol/L or mg/dL	—	—	—	—	***ABG-Glucose***	—	—

Arterial (AR/ART) pressure supported parameters

The central station supports the following parameters with compatible bedside monitors.

Numerics display in the units of measurement configured for the central station.

The systolic, diastolic, and mean pressure alarm priority displays as one parameter group.

The systolic, diastolic, and mean pressure data displays as one waveform (composite).

Alarm notification is indicated for the parameter group, including rate.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Arterial Pressure Systolic	mmHg	***ARTx***	X	***ARx***	***ARx-S***	***ARTx-Sys***	***ART-S***	X
Arterial Pressure Diastolic	mmHg		X		***ARx-D***	***ARTx-Dias***	***ART-D***	
Arterial Pressure Mean	mmHg		X		***ARx-M***	***ARTx-Mean***	***ART-M***	
Arterial Pressure Peripheral Pulse Rate	/min	—	X	***ARx-R***	***ARx-R***	***ARTx-Rate***	—	
Arterial Pressure Composite	mmHg	—	—	—	—	—	***ART+***	—

Bispectral Index (BIS/BISm) supported parameters

The central station supports the following parameters with Unity Network ID.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Bispectral Index Suppression Ratio	%	—	X	—	—	—	—	—
Bispectral Index Signal Quality Index	none	—	X	—	—	—	—	—
Bispectral Index	none	—	X	—	—	—	—	—
Bispectral Index Electromyograph	dB	—	X	—	—	—	—	—

The central station supports the following parameters with compatible CARESCAPE/Solar bedside monitors.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Bispectral Index Suppression Ratio	%	—	—	—	—	***BISm-SR***	—	—
Bispectral Index	none	—	—	—	—	***BISm-BIS***	—	—
Bispectral Index Electromyograph	dB	—	—	—	—	***BISm-EMG***	—	—

Carbon Dioxide (CO2) supported parameters

WARNING ACCURACY — Regardless of the units of measurement used to display the values at the monitoring device, the monitoring device sends CO2 values in mmHg, an absolute pressure, to the central station. If the central station is configured to display CO2 in relative values (i.e., percent), a conversion including barometric pressure is used to display relative values. If the accuracy of any value displayed on the screen or printed is questionable, refer to the values displayed on the monitoring device.

The central station supports the following parameters with Unity Network ID and compatible bedside monitors.

Some monitoring devices do not allow remote adjustment of alarm priority by the central station. For those monitoring devices, the alarm priority values will be read-only at the central station.

Numeric data displays in the units of measurement configured by the monitoring device.

Alarm notification occurs for the entire parameter group when any of the supported sub-parameter alarms occur.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Expired CO2	mmHg or kPa or %	*CO2*	X	*CO2-EXP*	*CO2-EXP*	*CO2-expCO2*	*ex-CO2*	
Inspired CO2	mmHg or kPa or %	—	X	*CO2-INSP*	*CO2-INSP*	*CO2-inspCO2*	—	
Breath Rate	/min	—	X	*CO2-RESP*	*CO2-RESP*	*CO2-CO2 Rate*	—	X
Expired Oxygen	mmHg or kPa or %	—	X	*O2-EXP*	*O2-EXP*	*CO2-expO2*	—	
Inspired Oxygen	mmHg or kPa or %	—	X	*O2-INSP*	*O2-INSP*	*CO2-inspO2*	—	
CO2 No Breath	—	—	—	X	*NO BREATH*	—	—	*CO2 NO BREATH*

Cardiac Calculations (CC) supported parameters

The central station supports the following parameters with compatible Dash/Solar bedside monitors.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Cardiac Output	L/min	—	—	—	—	***CC-CO***	—	—
Mean Arterial Pressure	mmHg	—	—	—	—	***CC-MAP***	—	—
Central Venous Pressure	mmHg	—	—	—	—	***CC-CVP***	—	—
Pulmonary Artery Mean	mmHg	—	—	—	—	***CC-PAM***	—	—
Pulmonary Artery Wedge	mmHg	—	—	—	—	***CC-PAW***	—	—
Pulmonary Artery Diastolic	mmHg	—	—	—	—	***CC-PAD***	—	—
Left Atrial	mmHg	—	—	—	—	***CC-LA***	—	—
Body Surface Area	m^2	—	—	—	—	***CC-BSA***	—	—
Cardiac Index	$L/min/m^2$	—	—	—	—	***CC-CI***	—	—
Stroke Volume	mL or mL/beat	—	—	—	—	***CC-SV***	—	—
Systemic Vascular Resistance	$dyn\ s/cm^5$	—	—	—	—	***CC-SVR***	—	—
Systemic Vascular Resistance Index	$dyn\ s\ m^2/cm^5$	—	—	—	—	***CC-SVRI***	—	—
Pulmonary Vascular Resistance	$dyn\ s/cm^5$	—	—	—	—	***CC-PVR***	—	—
Pulmonary Vascular Resistance Index	$dyn\ s\ m^2/cm^5$	—	—	—	—	***CC-PVRI***	—	—
Left Ventricular Stroke Work Index	$g\ m/m^2$	—	—	—	—	***CC-LVSWI***	—	—
Right Ventricular Stroke Work Index	$g\ m/m^2$	—	—	—	—	***CC-RVSWI***	—	—
Heart Rate	/min	—	—	—	—	***CC-HR***	—	—

Cardiac Output (CO) supported parameters

The central station supports the following parameters with compatible bedside monitors.

Numerics display in the units of measurement configured for the monitoring device.

Alarm notification does not differentiate between High and Low parameter alarm limit violations; either parameter alarm limit violation causes the entire parameter to alarm.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Last Avg CO	L/min	—	X	—	—	—	—	—
Blood Temp	°C or °F	—	X	***BT***	***BT***	***CO-BT***	—	X

Central Venous pressure (CV/CVP) supported parameters

The central station supports the following parameters with compatible bedside monitors.

Numerics display in the units of measurement configured for the central station.

Parameter	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Central Venous Pressure Mean	mmHg	***CVPx***	X	***CVx***	***CVPx***	***CVPx***	***CVP-M***	X

Continuous Cardiac Output (CCO) supported parameters

The central station supports the following parameters with Unity Network ID and compatible bedside monitors.

The monitoring device does not send all CCO parameters to the central station. The numerics shown at the central station depend on the monitoring device configuration settings.

Alarm notification does not differentiate between High and Low parameter alarm limit violations; either parameter alarm limit violation causes the entire parameter to alarm.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Blood Temp	°C or °F	—	X	—	—	***CCO-BT***	—	—
Continuous Cardiac Output	L/min	—	X	—	—	***CCO-CCO***	***CCO***	X
Continuous Cardiac Index	L/min/m^2	—	X	—	—	***CCO-CCI***	***CCI***	X
Cardiac Output	L/min	—	X	—	—	—	—	—
Cardiac Index	L/min/m^2	—	X	—	—	—	—	—
Systemic Vascular Resistance	dyn s/cm^5	—	X	—	—	***CCO-SVR***	***SVR***	—
Systemic Vascular Resistance Index	dyn s m^2/cm^5	—	X	—	—	***CCO-SVRI***	—	—

Electrocardiograph (ECG) supported parameters

The central station supports the following parameters with compatible monitoring devices.

The arrhythmia events (e.g., ***ASYSTOLE***) display in Graphic Trends when the Events parameter is selected; they do not display in Numeric Trends.

All ST deviations share the same alarm priority.

Numerics display the highest ECG ST deviation except when an ST limit alarm exists, then numerics displays one of the ST deviations that is in alarm.

The number of ECG waveforms displayed at the central station depends on the type of ECG cable attached to the monitoring device.

- 3-leadwire cables provide a single waveform (I, II, or III).
- 5-leadwire cables provide seven waveforms: I, II, III, and V, plus aVR, AVF, and AVL.
- 6-leadwire cables provide eight waveforms: I, II, III, and Va, plus aVR, AVF, and AVL. For telemetry monitor devices only, Vb is can be viewed at the central station as the eight waveform. The 12RL derived waveforms are not displayed on the central station.
- 10-leadwire cables provide the same waveforms as 5-leadwire cables. The additional V leads are not displayed on the central station.

The most frequent arrhythmia events for the selected range appear in Graphic Trends under ***Event***.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Heart Rate	/min	—	X	***HR***	***HR***	***ECG-HR***	***HR***	X
PVC	#/min	—	X	***PVC***	***PVC***	***ECG-PVC***	***PVC***	X
I	10 mm/mV	***I***	—	—	—	—	—	—
II	10 mm/mV	***II***	—	—	—	—	—	—
III	10 mm/mV	***III***	—	—	—	—	—	—
aVL	10 mm/mV	***aVL***	—	—	—	—	—	—
aVR	10 mm/mV	***aVR***	—	—	—	—	—	—

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
aVF	10 mm/mV	*aVF*	—	—	—	—	—	—
V1	10 mm/mV	*V1*	—	—	—	—	—	—
V2	10 mm/mV	*V2*	—	—	—	—	—	—
V3	10 mm/mV	*V3*	—	—	—	—	—	—
V4	10 mm/mV	*V4*	—	—	—	—	—	—
V5	10 mm/mV	*V5*	—	—	—	—	—	—
V6	10 mm/mV	*V6*	—	—	—	—	—	—
ST-I	mm	—	X	*ST*	*ST-I*	*ECG-ST-I*	*ST-I*	X
ST-II	mm	—	X		*ST-II*	*ECG-ST-II*	*ST-II*	X
ST-III	mm	—	X		*ST-III*	*ECG-ST-III*	*ST-III*	X
ST-V1	mm	—	X		*ST-V1*	*ECG-ST-V*	*ST-V1*	X
ST-V2	mm	—	X		*ST-V2*	*ECG-ST-V2*	*ST-V2*	X
ST-V3	mm	—	X		*ST-V3*	*ECG-ST-V3*	*ST-V3*	X
ST-V4	mm	—	X		*ST-V4*	*ECG-ST-V4*	*ST-V4*	X
ST-V5	mm	—	X		*ST-V5*	*ECG-ST-V5*	*ST-V5*	X
ST-V6	mm	—	X		*ST-V6*	*ECG-ST-V6*	*ST-V6*	X
ST-aVR	mm	—	X		*ST-AVR*	*ECG-ST-aVR*	*ST-aVR*	X
ST-aVL	mm	—	X		*ST-AVL*	*ECG-ST-aVL*	*ST-aVL*	X
ST-aVF	mm	—	X		*ST-AVF*	*ECG-ST-aVF*	*ST-aVF*	X
ST-dV2	mm	—	X		*ST-V2*	*ECG-ST-dV2*	*ST-dV2*	X
ST-dV3	mm	—	X		*ST-V3*	*ECG-ST-dV3*	*ST-dV3*	X
ST-dV4	mm	—	X		*ST-V4*	*ECG-ST-dV4*	*ST-dV4*	X
ST-dV6	mm	—	X		*ST-V6*	*ECG-ST-dV6*	*ST-dV6*	X
ST-VM	mm	—	—	—	—	*ECG-ST-VM*	*ST-VM*	—

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
AFIB Trend	none	—	—	—	—	***ECG-afibTrend***	***AFIB***	—
Accelerated ventricular	—	—	—	***ACC VENT***	—	***Events***	—	X
Asystole	—	—	—	***ASYSTOLE***	—		—	X
Atrial fibrillation	—	—	—	***ATRIAL FIB***	—		—	X
Bigeminy	—	—	—	***BIGEMINY***	—		—	X
Bradycardia	—	—	—	***BRADY***	—		—	X
Couplet	—	—	—	***COUPLET***	—		—	X
Irregular	—	—	—	***IRREGU-LAR***	—		—	X
Pause	—	—	—	***PAUSE***	—		—	X
PVC	—	—	—	***PVC***	—		—	X
R-on-T	—	—	—	***R ON T***	—		—	X
Tachycardia	—	—	—	***TACHY***	—		—	X
Trigeminy	—	—	—	***TRIGEMINY***	—		—	X
Ventricular fibrillation/Ventricular tachycardia	—	—	—	***VFIB/VTAC***	—		—	X
Ventricular bradycardia	—	—	—	***V BRADY***	—		—	X
Ventricular tachycardia	—	—	—	***V TACH***	—		—	X
Ventricular tachycardia > 2	—	—	—	***VT > 2***	—		—	X

As a result of enhancements to monitoring devices and ECG acquisition devices, some monitoring devices may support the recognition of additional arrhythmias. This could result in slightly different recognition capabilities between monitoring devices. Some remote devices like the central station may not recognize these additional arrhythmias. In these instances, the monitoring devices may rename the following arrhythmias to closely match an existing arrhythmia.

Arrhythmia displayed at the monitoring device	Arrhythmia displayed at the central station
SV Tachy	***TACHY***
Frequent SVCs	***IRREGULAR***
Multifocal PVCs	***PVC***
Missing beat	***PAUSE***
HR low alarm limit violation	***BRADY***
HR high alarm limit violation	***TACHY***

Not all monitoring devices rename HR low and HR high alarm limit violations to ***BRADY*** and ***TACHY***.

Electroencephalograph (EEG) supported parameters

The central station supports the following parameters with compatible Solar bedside monitors.

Parameter labels displayed in Graphic Trends and Numeric Trends include a channel number (represented by an ***x*** in the following table) for each available channel: 1, 2, 3, or 4.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
EEG Spectral Edge Frequency	Hz	—	—	—	—	***EEG-SEF-x***	—	—
EEG Median Frequency	Hz	—	—	—	—	***EEG-MEF-x***	—	—
EEG Suppression Ratio	%	—	—	—	—	***EEG-SR-x***	—	—
EEG Amplitude	dB	—	—	—	—	***EEG-AMP-x***	—	—
EEG Electromyograph	dB	—	—	—	—	***EEG-EMG-x***	—	—
EEG Relative Delta Power	%	—	—	—	—	***EEG-Delta-x***	—	—
EEG Relative Theta Power	%	—	—	—	—	***EEG-Theta-x***	—	—
EEG Relative Alpha Power	%	—	—	—	—	***EEG-Alpha-x***	—	—
EEG Relative Beta Power	%	—	—	—	—	***EEG-Beta-x***	—	—
EEG Signal Quality Index	none	—	—	—	—	***EEG-SQI-x***	—	—

Femoral (FE/FEM) pressure supported parameters

The central station supports the following parameters with compatible bedside monitors.

The systolic, diastolic, and mean pressure data displays as one waveform (composite).

The systolic, diastolic, and mean pressure alarm priority displays as one parameter group.

Alarm notification is indicated for the parameter group, including rate.

Numerics display in the units of measurement configured for the central station.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Femoral Pressure Systolic	mmHg	*FEMx*	X	*FEx*	*FEx-S*	*FEMx-Sys/FEx-Sys*	—	X
Femoral Pressure Diastolic	mmHg		X		*FEx-D*	*FEMx-Dias/FEx-Dias*	—	
Femoral Pressure Mean	mmHg		X		*FEx-M*	*FEMx-Mean/FEx-Mean*	—	
Femoral Pressure Peripheral Pulse Rate	/min	—	X	*FEx-R*	*FEx-R*	*FEMx-Rate/FEx-Rate*	—	

Impedance Cardiography (ICG) supported parameters

The central station supports the following parameters with compatible bedside monitors.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Heart Rate	/min	—	—	—	—	*ICG-HR*	—	—
Mean Arterial Pressure	mmHg	—	—	—	—	*ICG-MAP*	—	—
Cardiac Output	L/min	—	—	—	—	*ICG-CO*	*iCO*	—
Cardiac Index	L/min/m^2	—	—	—	—	*ICG-CI*	*iCI*	—
Stroke Volume	mL	—	—	—	—	*ICG-SV*	—	—
Stroke Index	mL/m^2	—	—	—	—	*ICG-SI*	—	—
Systemic Vascular Resistance	dyn s/cm^5	—	—	—	—	*ICG-SVR*	*iSVR*	—
Systemic Vascular Resistance Index	dyn s m^2/cm^5	—	—	—	—	*ICG-SVRI*	—	—
Thoracic Fluid Content	1/kohm	—	—	—	—	*ICG-TFC*	—	—
Acceleration Index	1/100s^2	—	—	—	—	*ICG-ACI*	—	—
Velocity Index	1/1000s	—	—	—	—	*ICG-VI*	—	—
Left Ventricular Stroke Work Index	g m/m^2	—	—	—	—	*ICG-LVSWI*	—	—
Left Cardiac Work Index	kg m/m^2	—	—	—	—	*ICG-LCWI*	—	—
ICG Strength	—	—	—	—	—	*ICG-STR*	—	—
Pre Ejection Period	ms	—	—	—	—	*ICG-PEP*	—	—
Left Ventricular Ejection Time	ms	—	—	—	—	*ICG-LVET*	—	—
Oxygen Delivery Index	mL/min/m^2	—	—	—	—	*ICG-DO2I*	—	—

Intra-Cranial Pressure (ICP) supported parameters

The central station supports the following parameters with compatible bedside monitors.

Numerics display in the units of measurement configured for the central station.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Intra-Cranial Pressure Mean	mmHg	*ICPx*	X	*ICPx*	*ICPx*	*ICPx*	*ICP-M*	X
Cerebral Perfusion Pressure	mmHg	—	X	—	—	*ICPx-CPP*	*ICP-CPP*	—

Left Atrial (LA) pressure supported parameters

The central station supports the following parameters with compatible bedside monitors.

Numerics display in the units of measurement configured for the central station.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Left Atrial Pressure Mean	mmHg	***LAx***	X	***LAx***	***LAx***	***LAx***	—	X

Mass Spectrometry (Gas) supported parameters

WARNING ACCURACY — Regardless of the units of measurement used to display the values at the monitoring device, the monitoring device sends O2 and Gas values in percent, a relative pressure, to the central station. If the central station is configured to display either O2 or Gas in absolute values (i.e., mmHg or kPa), a conversion including barometric pressure is used to display absolute values. If the accuracy of any value displayed on the screen or printed is questionable, refer to the values displayed on the monitoring device.

The central station supports the following parameters with Unity Network ID and compatible bedside monitors.

Numeric data displays in the units of measurement configured by the monitoring device.

The alarm priority can be set for this parameter as a group only.

The entire parameter alarms when any one or more sub-parameter goes into alarm.

Some acquisition devices (e.g., SAM module) allow the parameter alarm limits to be adjusted.

Some monitoring devices allow the parameter alarm limits to be adjusted from a remote device like the central station. For more information, see the documentation accompanying the monitoring device.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Expired Nitrogen	% or mmHg or kPa	—	X		—	***Gas-expN2***	—	X
Inspired Nitrogen	% or mmHg or kPa	—	X		—	***Gas-inspN2***	—	X
Expired Nitrous Oxide	% or mmHg or kPa	—	X	X	X	***Gas-expN2O***	—	X
Inspired Nitrous Oxide	% or mmHg or kPa	—	X		X	***Gas-inspN2O***	—	X
Expired Halothane	% or mmHg or kPa	—	X		X	***Gas-expHAL***	—	X

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Inspired Halothane	% or mmHg or kPa	—	X		X	***Gas-inspHAL***	—	X
Expired Isoflurane	% or mmHg or kPa	—	X		X	***Gas-expISO***	—	X
Inspired Isoflurane	% or mmHg or kPa	—	X		X	***Gas-inspISO***	—	X
Expired Enflurane	% or mmHg or kPa	—	X		X	***Gas-expENF***	—	X
Inspired Enflurane	% or mmHg or kPa	—	X		X	***Gas-inspENF***	—	X
Expired Desflurane	% or mmHg or kPa	—	X		X	***Gas-expDES***	—	X
Inspired Desflurane	% or mmHg or kPa	—	X		X	***Gas-inspDES***	—	X
Expired Sevoflurane	% or mmHg or kPa	—	X		X	***Gas-expSEV***	—	X
Inspired Sevoflurane	% or mmHg or kPa	—	X		X	***Gas-inspSEV***	—	X
Expired Helium	% or mmHg or kPa	—	X		—	***Gas-expHE***	—	X

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Inspired Helium	% or mmHg or kPa	—	X		—	***Gas-inspHE***	—	X
Expired Argon	% or mmHg or kPa	—	X		—	***Gas-expAR***	—	X
Inspired Argon	% or mmHg or kPa	—	X		—	***Gas-inspAR***	—	X

Non-Invasive Blood Pressure (NBP) supported parameters

The central station supports the following parameters with compatible monitoring devices.

The systolic, diastolic, and mean pressure data displays as one trend (composite).

The NBP Timestamp time is collected by the central station and can be displayed in Graphic and Numeric Trends.

Alarm notification is indicated as a parameter group.

Numerics display in the units of measurement configured for the central station.

For some compatible bedside monitors, the timestamp may differ by up to two minutes between the bedside monitor and the central station.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
NBP Systolic	kPa or mmHg	—	X	***NBP***	***NBP-S***	***NBP/NBP-Sys***	—	X
NBP Diastolic	kPa or mmHg	—	X		***NBP-D***	***NBP/NBP-Dias***	—	
NBP Mean	kPa or mmHg	—	X		***NBP-M***	***NBP/NBP-Mean***	—	
NBP Timestamp	—	—	X	—	—	X	—	—
NBP Peripheral Pulse Rate	/min	—	—	—	—	***NBP-Rate***	—	—
NBP Composite	kPa or mmHg	—	—	—	—	—	***NBP+***	—

Non-Invasive Cardiac Output (NICO) supported parameters

The central station supports the following parameters with compatible bedside monitors.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Non-Invasive Cardiac Output	L/min	—	X	—	—	***NICO-CO***	—	X
Non-Invasive Pulmonary Capillary Blood Flow	L/min	—	X	—	—	***NICO-PCBF***	—	—
Non-Invasive Cardiac Index	L/min/m^2	—	X	—	—	***NICO-CI***	—	—
Non-Invasive Stroke Volume	mL	—	X	—	—	***NICO-SV***	—	—

Pulmonary Artery (PA) pressure supported parameters

The central station supports the following parameters with compatible bedside monitors.

Numerics display in the units of measurement configured for the central station.

Alarm notification occurs as a parameter group.

Alarm priority is one setting for systolic, diastolic, and mean pressure.

The systolic, diastolic, and mean pressure data displays as one waveform (composite).

Parameter	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Pulmonary Artery Pressure Systolic	kPa or mmHg	***PAx***	X	***PAx***	***PAx-S***	***PAx-Sys***	***PA-S***	X
Pulmonary Artery Pressure Diastolic	kPa or mmHg		X		***PAx-D***	***PAx-Dias***	***PA-D***	
Pulmonary Artery Pressure Mean	kPa or mmHg		X		***PAx-M***	***PAx-Mean***	***PA-M***	
Pulmonary Artery Wedge Pressure	kPa or mmHg	—	X	—	—	***PAx-PAW***	—	—
Pulmonary Artery Pressure Composite	kPa or mmHg	—	—	—	—	—	***PA+***	—

Pulmonary Calculations (PC/estPC) supported parameters

The central station supports the following parameters with compatible Dash/Solar bedside monitors.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Cardiac Output	L/min	—	—	—	—	*PC-CO*	—	—
Body Surface Area	m^2	—	—	—	—	*PC-BSA*	—	—
Cardiac Index	$L/min/m^2$	—	—	—	—	*PC-CI*	—	—
Fractional Inspired O2	%	—	—	—	—	*PC-FIO2*	—	—
Positive End Expiratory Pressure	cm H2O	—	—	—	—	*PC-PEEP*	—	—
Respiration Rate	/min	—	—	—	—	*PC-RR*	—	—
Tidal Volume	mL	—	—	—	—	*PC-TV*	—	—
Peak Inspiratory Pressure	cm H2O	—	—	—	—	*PC-PIP*	—	—
Barometric Pressure	mmHg	—	—	—	—	*PC-PBAR*	—	—
Hemoglobin	g/100mL	—	—	—	—	*PC-Hb*	—	—
Arterial CO2 Pressure	mmHg	—	—	—	—	*PC-PaCO2*	—	—
Arterial O2 Pressure	mmHg	—	—	—	—	*PC-PaO2*	—	—
Arterial O2 Saturation	%	—	—	—	—	*PC-SaO2*	—	—
Mixed Venous Oxygen Pressure	mmHg	—	—	—	—	*PC-PvO2*	—	—
Mixed Venous Oxygen Saturation	%	—	—	—	—	*PC-SvO2*	—	—
Dynamic Compliance	mL/cm H2O	—	—	—	—	*PC-Cdyn (CEd)*	—	—
Minute Volume	L/min	—	—	—	—	*PC-MV*	—	—
Alveolar Arterial O2 Gradient	mmHg	—	—	—	—	*PC-AaDO2*	—	—
Arterial Oxygen Content	mL/100mL	—	—	—	—	*PC-CaO2*	—	—

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Oxygen Delivery Index	mL/min/m²	—	—	—	—	***PC-DO2I (O2DI)***	—	—
Mixed Venous Oxygen Content	mL/100mL	—	—	—	—	***PC-CvO2***	—	—
Arterial Venous Oxygen Content Difference	mL/100mL	—	—	—	—	***PC-a-vO2***	—	—
Oxygen Consumption Index	mL/min/m²	—	—	—	—	***PC-VO2I (O2CI)***	—	—
Oxygen Extraction Ratio	%	—	—	—	—	***PC-O2ER (O2R)***	—	—
Oxygenation Ratio	%	—	—	—	—	***PC-PaFiO2***	—	—
Shunt Fraction	%	—	—	—	—	***PC-Qs/Qt***	—	—
Fick Cardiac Output	L/min	—	—	—	—	***PC-FICKCO***	—	—

The central station supports the following estimated Pulmonary Calculations parameters with Solar 8000M bedside monitors. These estimated calculations can only be obtained when SPO2 and/or SVO2 are monitored and a hemoglobin value is entered. Estimated values are obtained for a 12 hour period following a hemoglobin entry.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Estimated Arterial Oxygen Content	mL/100mL	—	—	—	—	***estPC-CaO2***	—	—
Estimated Mixed Venous Oxygen Content	mL/100mL	—	—	—	—	***estPC-CvO2***	—	—
Estimated Arterial Venous Oxygen Content Difference	mL/100mL	—	—	—	—	***estPC-a-vO2***	—	—
Estimated Shunt Fraction	%	—	—	—	—	***estPC-Qs/Qt***	—	—
Estimated Oxygen Extraction Ratio	%	—	—	—	—	***estPC-O2ER***	—	—

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Estimated Oxygen Delivery Index	mL/min/m²	—	—	—	—	***estPC-DO2I***	—	—
Estimated Oxygen Consumption Index	mL/min/m²	—	—	—	—	***estPC-VO2I***	—	—

Right Atrial (RA) pressure supported parameters

The central station supports the following parameters with compatible bedside monitors.

Numerics display in the units of measurement configured for the central station.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Right Atrial Pressure Mean	mmHg	***RAx***	X	***RAx***	***RAx***	***RAx***	—	X

Respiration (RESP) supported parameters

The central station supports the following parameters with compatible monitoring devices.

The respiration parameter provides a single waveform, but it can be derived from one of several ECG leads (I, II or RL-LL) and is determined by the monitoring device. The waveform label typically lists the ECG lead used for the derivation.

Only alarm high limit for RR can be adjusted.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Respiration Rate	/min	X	X	***RR***	***RR***	***RESP-RR***	***RR***	X
No Breath	—	—	—	***RR-APNEA***	***RR-APNEA***	—	—	***APNEA***

Respiratory Mechanics (RM) supported parameters

The central station supports the following parameters with compatible CARESCAPE and Solar bedside monitors.

Some bedside monitors (e.g., CARESCAPE Monitor B850) do not support the RM parameter when acquired via Unity Network ID interface device.

Ventilators connected to some bedside monitors (e.g., CARESCAPE Monitor B850) will send measured data, including waveforms, to the respiratory mechanics parameter; other data, including settings will be sent to the ventilator parameter.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Peak Expiratory Flow	L/min	—	X	—	—	***RM-PEF***	—	—
Expired Minute Volume Total	L/min	—	X	—	—	***RM-MV***	—	—
Expired Minute Volume Spontaneous	L/min	—	X	—	—	***RM-MVs***	—	—
Expired Minute Volume Mechanical	L/min	—	X	—	—	***RM-MVm***	—	—
Expired Tidal Volume Total	mL	—	X	—	—	***RM-TV***	—	—
Expired Tidal Volume Spontaneous	mL	—	X	—	—	***RM-TVs***	—	—
Expired Tidal Volume Mechanical	mL	—	X	—	—	***RM-TVm***	—	—
Peak Inspiratory Pressure	cm H2O	—	X	—	—	***RM-PIP***	—	—
Mean Airway Pressure	cm H2O	—	X	—	—	***RM-MAWP***	—	—
Positive End Expiratory Pressure	cm H2O	—	X	—	—	***RM-PEEP***	—	—
Intrinsic Positive End Expiratory Pressure	cm H2O	—	X	—	—	***RM-PEEPi***	—	—
Respiratory Rate Total	breaths/min	—	X	—	—	***RM-RR***	—	—
Respiratory Rate Spontaneous	breaths/min	—	X	—	—	***RM-RRs***	—	—
Respiratory Rate Mechanical	breaths/min	—	X	—	—	***RM-RRm***	—	—

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
I:E ratio denominator	none	—	X	—	—	***RM-I:E***	—	—
Compliance (dynamic)	mL/cm H2O	—	X	—	—	***RM-CDYN***	—	—
Resistance (expiratory)	cm H2O/L/s	—	X	—	—	***RM-RAWe***	—	—
Work of breathing (ventilator)	J/L	—	X	—	—	***RM-WOBm***	—	—
No Resp	—	—	—	—	—	—	—	***NO RESP***

Special (SP) pressure supported parameters

The central station supports the following parameters with compatible bedside monitors.

Numerics display in the units of measurement configured for the central station.

Special pressure sites must all have the same alarm priority level. Some bedside monitors allow the special pressure site alarm priority levels to be set independently.

The central station only displays the special pressure mean, regardless of data source, even though some bedside monitors (e.g., CARESCAPE Monitor B850) display the systolic, diastolic, and mean special pressure.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Special Pressure Mean	mmHg	***SPx***	X	***SPx***	***SPx***	***SPx***	—	X

SPO2 (SPO2m/SPO2x) supported parameters

The central station supports the following parameters with Unity Network ID and compatible monitoring devices.

Alarm notification occurs as a parameter group.

The central station does not meet ISO 9919:2005 clause 49.101 pertaining to notification of a power failure of a SPO2 device attached to a remote monitoring device.

The patient Multi-Viewer window displays the current SPO2 value, the signal strength, and the derived pulse rate (when enabled). Any displayed SPO2 waveform is normalized and should not be used as an indication of signal strength. The signal strength is represented by zero to three asterisks:

- Zero asterisks indicates no signal.
- One asterisk (*) indicates a weak signal.
- Two asterisks (**) indicates an average signal.
- Three asterisks (***) indicates a strong signal.

Some bedside monitors (e.g., CARESCAPE Monitor B850) provide two alarm priority levels for SPO2 Oxygen Saturation, one for the High alarm limit and one for the Low alarm limit. The central station only supports the Low alarm limit. Attempting to change SPO2 Oxygen Saturation alarm limit at the central station will only change the SPO2 Oxygen Saturation Low limit on the bedside monitor. For more information, see the documentation accompanying the bedside monitor.

The Graphic Trends Group configuration must include multiple instances of SPO2 and SPO2-R to show Graphic Trends for more than one SPO2 parameter at a time (e.g., SPO2 and SPO2m).

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
SPO2 Pulse Rate	/min	—	X	***SPO2-R***	***SPO2-R***	***SpO2-Rate***	—	X
SPO2 Oxygen Saturation	%	***SPO2***	X	***SPO2***	***SPO2***	***SpO2***	***SpO2***	
SPO2 Signal Strength	—	—	X	—	—	—	—	—

The central station supports the following parameters with Unity Network ID and compatible CARESCAPE/Solar bedside monitors.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
SpO2x1 Pulse Rate	/min	—	—	—	—	***SpO2x1-Rate***	—	—
SpO2x1 Oxygen Saturation	%	—	—	—	—	***SpO2x1***	—	—
SpO2x2 Pulse Rate	/min	—	—	—	—	***SpO2x2-Rate***	—	—
SpO2x2 Oxygen Saturation	%	—	—	—	—	***SpO2x2***	—	—

The central station supports the following parameters with compatible CARESCAPE/Solar bedside monitors.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
SpO2m Pulse Rate	/min	—	X	***SPO2-R***	***SPO2-R***	***SpO2-Rate***/***SpO2m-Rate***	—	X
SpO2m Oxygen Saturation	%	***SPO2m***	X	***SPO2***	***SPO2***	***SpO2***/***SpO2m***	—	
SpO2m Signal Strength	—	—	X	—	—	—	—	—

SVO2 supported parameters

The central station supports the following parameters with Unity Network ID and compatible bedside monitors.

SVO2 can be systemic venous oxygen or mixed venous oxygen saturation.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Signal Strength	—	—	X	—	—	—	—	—
Oxygen Saturation	%	—	X	X	X	*SvO2*	—	X

Temperature (TP/TEMP) supported parameters

The central station supports the following parameters with compatible bedside monitors.

Delta temperatures and delta temperature alarms are not supported on the central station.

Numerics display in the units of measurement configured by the bedside monitor.

Alarm notification is indicated as a parameter group.

The alarm priority can be set for this parameter as a group only.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Temperature 1	°C or °F	—	X	X	*TP1-1*	*TEMP1-temp1*	—	X
Temperature 2	°C or °F	—	X		*TP1-2*	*TEMP1-temp2*	—	

The central station supports the following parameters with compatible CARESCAPE/Solar bedside monitors.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Temperature 1	°C or °F	—	X	X	*TP6-1*	*TEMP6-temp1*	—	X
Temperature 2	°C or °F	—	X		*TP6-2*	*TEMP6-temp2*	—	

The central station supports the following parameters with compatible Solar bedside monitors.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Temperature 1	°C or °F	—	X	X	*TP8-1*	*TEMP8-temp1*	—	X
Temperature 2	°C or °F	—	X		*TP8-2*	*TEMP8-temp2*	—	

The central station supports the following episodic temperature parameters with compatible telemetry monitoring devices and compatible Dash bedside monitors.

For some compatible bedside monitors, the timestamp may differ by up to two minutes between the bedside monitor and the central station.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Episodic Temperature 1	°C or °F	—	***eT T1***	—	—	***TEMP1-temp1***	—	—
Episodic Temperature 1 Time Stamp	HH:MM	—	X	—	—	X	—	—

Transcutaneous CO2 (TC/TCm) supported parameters

The central station supports the following parameters with Unity Network ID.

Numerics display in the units of measurement configured by the bedside monitor.

Alarm notification occurs for the entire parameter group when any of the supported sub-parameters alarms occur.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Transcutaneous CO2	mmHg or kPa or %	—	X	—	—	*TCx-CO2*	—	X
Transcutaneous O2	mmHg or kPa or %	—	X	—	—	*TCx-O2*	—	
Sensor Temp	°C	—	X	—	—	*TCx-Temp*	—	
Power	mWatt	—	X	—	—	*TCx-Power*	—	—

The central station supports the following parameters with compatible bedside monitors.

Numerics display in the units of measurement configured by the bedside monitor.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Transcutaneous CO2	mmHg or kPa or %	—	X	—	—	*TCm-CO2*	—	—
Transcutaneous O2	mmHg or kPa or %	—	X	—	—	*TCm-O2*	—	—
Sensor Temp	°C	—	X	—	—	*TCm-Temp*	—	—
Power	mWatt	—	X	—	—	*TCm-Power*	—	—
Timer	—	—	X	—	—	—	—	—

Umbilical Artery (UA/UAC) pressure supported parameters

The central station supports the following parameters with compatible bedside monitors.

Numerics display in the units of measurement configured for the central station.

Alarm notification occurs as a parameter group including rate.

The systolic, diastolic, and mean pressure data displays as one waveform (composite).

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Umbilical Pressure Systolic	mmHg	*UACx*	X	*UAx*	*UAx-S*	*UACx-Sys*	*UAC-S*	X
Umbilical Pressure Diastolic	mmHg		X		*UAx-D*	*UACx-Dias*	*UAC-D*	
Umbilical Pressure Mean	mmHg		X		*UAx-M*	*UACx-Mean*	*UAC-M*	
Umbilical Pressure Peripheral Pulse Rate	/min	—	X	*UAx-R*	*UAx-R*	*UACx-Rate*	—	
Umbilical Pressure Composite	mmHg	—	—	—	—	—	*UAC+*	—

Umbilical Venous (UV/UVC) pressure supported parameters

The central station supports the following parameters with compatible bedside monitors.

Numerics display in the units of measurement configured for the central station.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Umbilical Venous Pressure Mean	mmHg	***UVCx***	X	***UVx***	***UVx***	***UVCx***	—	X

Ventilator (VENT) supported parameters

The central station supports the following parameters with Unity Network ID and compatible bedside monitors.

The central station highlights the entire VENT parameter to indicate an alarm was detected by the monitoring device. The VENT alarm displays in the ADUs if the VENT alarm is the highest priority of active alarms.

Ventilators connected to some bedside monitors (e.g., CARESCAPE Monitor B850) will send measured data, including waveforms, to the respiratory mechanics parameter; other data, including settings will be sent to the ventilator parameter.

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Respiratory Rate	/min	—	X		—	***VENT-PT-RR***	—	
Positive End Expiratory Pressure	cm H2O	—	X		—	***VENT-PEEP***	—	
Minute Volume	L/min	—	X		—	***VENT-MV***	—	
Fraction of Inspired Oxygen	%	—	X		—	***VENT-FiO2***	—	
Exhaled Tidal Volume	mL	—	X		—	***VENT-TV***	—	
Peak Inspiratory Pressure	cm H2O	—	X		—	***VENT-PIP***	—	
Plateau Pressure	cm H2O	—	X		—	***VENT-PPLAT***	—	
Mean Airway Pressure	cm H2O	—	X		—	***VENT-MAWP***	—	
Sensitivity	cm H2O	—	X	***VENT***	—	***VENT-SENS***	—	X
Ventilator Pressure	cm H2O	***PRES***	—		—	—	—	
Ventilator Flow	L/min	***FLOW***	—		—	—	—	
Ventilator Rate	/min	—	—		—	***VENT-VNT-RR***	—	
Ventilator Flow Rate	L/min	—	—		—	***VENT-FLW-RT***	—	
VENT Inspiration Hold Time	s	—	—		—	***VENT-IN-HLD***	—	
Positive Pressure Support	cm H2O	—	—		—	***VENT-PPS***	—	
Inspiratory Time	s	—	—		—	***VENT-INSP***	—	
Inspiratory Percent	%	—	—		—	***VENT-INSP%***	—	

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
Inspiratory:Expiration Ratio denominator	—	—	—		—	*VENT-I:E*	—	
High Frequency Ventilation Flow Setting	L/min	—	—		—	*VENT-HF-FLW*	—	
High Frequency Ventilation Resp Rate	Hz	—	—		—	*VENT-HF-RR*	—	
High Frequency Ventilation Peak To Peak Pressure Setting	cm H2O	—	—		—	*VENT-HF-PRS*	—	
Spontaneous Minute Volume	L/min	—	—		—	*VENT-SPO-MV*	—	
Tidal Volume Setting	mL	—	—		—	*VENT-SET-TV*	—	
Pressure Control Pressure Setting	cm H2O	—	—		—	*VENT-SET-PCP*	—	
I:E Setting	—	—	—		—	*VENT-SET-I:E*	—	
Base Flow Setting	L/min	—	—		—	*VENT-BS-FLW*	—	
Flow Trigger Setting	L/min	—	—		—	*VENT-FLW-TRG*	—	
Total PEEP	cm H2O	—	—		—	*VENT-T-PEEP*	—	
Auto PEEP	cm H2O	—	—		—	*VENT-A-PEEP*	—	
Static Compliance	mL/cm H2O	—	—		—	*VENT-S-COMP*	—	
Static Resistance	cm H2O/L/s	—	—		—	*VENT-S-RES*	—	
Dynamic Compliance	mL/cm H2O	—	—		—	*VENT-D-COMP*	—	
Dynamic Resistance	cm H2O/L/s	—	—		—	*VENT-D-RES*		
FiO2 Setting	%	—	—		—	*VENT-SET-FiO2*	—	
Measured Inspiratory Time	s	—	—		—	*VENT-MEAS-INSP*	—	

Parameters	Units	Display waveforms	Display numerics	Set alarm priority level	Set parameter alarm limits	Display Graphic/Numeric Trends	Display Real-time Trend Graph	Alarm notification
ASB Ramp Time	s	—	—		—	***VENT-RAMP-Time***	—	
APRV Low Pressure	cm H2O	—	—		—	***VENT-LO-PR***	—	
APRV High Pressure	cm H2O	—	—		—	***VENT-HI-PR***	—	
APRV Low Time	s	—	—		—	***VENT-LO-PR-Time***	—	
APRV High Time	s	—	—		—	***VENT-HI-PR-Time***	—	
Compliance	mL/cm H2O	—	—		—	***VENT-COMP***	—	
Resistance	cm H2O/L/s	—	—		—	***VENT-RES***	—	
Measured PEEP	cm H2O	—	—		—	***VENT-M-PEEP***	—	
Intrinsic PEEP	cm H2O	—	—		—	***VENT-I-PEEP***	—	
Spontaneous Respiration Rate	/min	—	—		—	***VENT-SPO-RR***	—	
Inspired Tidal Volume	mL	—	—		—	***VENT-TV-in***	—	
Flow Trigger Setting X10	L/min	—	—		—	***VENT-FLW-TRGx10***	—	

The central station detects the following alarms signaled by a monitoring device. The central station visually indicates the alarm by highlighting the entire VENT parameter. The following messages may display in the ADUs for the monitoring device if the ventilator alarm is the highest priority of active alarms.

- ***APNEA***
- ***APNEA VENTILN***
- ***CHECK VENT***
- ***DISCON VENTIL***
- ***HI RESP RATE***
- ***HIGH PRESSURE***
- ***LOW BATTERY***
- ***LOW INSP PRES***
- ***LOW MIN VOL***

- ***LOW PEEP/CPAP***
- ***LOW RESP RATE***
- ***LOW TIDAL VOL***
- CONNECT OFF as ***PT-RR VENT OFF***

The central station recognizes and displays the following ventilator operation modes in the parameter numerics area:

Message	Description
VNT APNEA VENT	APNEA ventilator operation mode
VNT ASB	Assisted spontaneous breathing ventilator operation mode
VNT ASSIST CONTROL	Assist control ventilator operation mode
VNT AST-CTRL TCPL	Assist control time-cycle pressure-limited ventilator operation mode
VNT ASV	Adaptive support ventilator operation mode
VNT BILEVEL	Biphasic level ventilator operation mode
VNT BIPAP	Biphasic positive airway pressure ventilator operation mode
VNT BIPAP/ASB	Biphasic positive airway pressure assisted spontaneous breathing ventilator operation mode
VNT BIPAP-APRV	Biphasic positive airway pressure airway pressure release ventilator operation mode
VNT BIPAP-SIMV	Biphasic positive airway pressure synchronized intermittent mechanical ventilator operation mode
VNT BIPAP-SIMV/ASB	Biphasic positive airway pressure synchronized intermittent mechanical assisted spontaneous breathing ventilator operation mode
VNT CONT FLOW	Synchronized intermittent mechanical with continuous flow ventilator operation mode
VNT CONTROL	Controlled ventilator operation mode
VNT CPAP	• Continuous positive airway pressure ventilator operation mode • Continuous positive airway pressure demand ventilator operation mode
VNT CPAP/ASB	Continuous positive airway pressure assisted spontaneous breathing ventilator operation mode
VNT CPAP/IMV TCPL	Continuous positive airway pressure time-cycle pressure-limited ventilator operation mode
VNT CPAP/PPS	Continuous positive airway pressure positive pressure support ventilator operation mode
VNT CPPV/ASSIST	Continuous positive airway pressure assist ventilator operation mode
VNT CPPV	Continuous positive airway pressure ventilator operation mode

Message	Description
VNT DS	Dead space ventilator operation mode
VNT EMMV	Extended mandatory minute ventilator operation mode
VNT FRSH GAS EXT	Fresh gas extension ventilator operation mode
VNT HFV	High frequency ventilator operation mode
VNT IMV	• Intermittent mechanical ventilator operation mode • Intermittent mechanical demand ventilator operation mode • Intermittent mechanical continuous ventilator operation mode
VNT IND	Induction ventilator operation mode
VNT IPPV	Intermittent positive pressure ventilator operation mode
VNT IPPV/AF	Intermittent positive pressure autoflow ventilator operation mode
VNT IPPV/ASSIST	Intermittent positive pressure assist ventilator operation mode
VNT IPPV/ASSIST/AF	Intermittent positive pressure assist autoflow ventilator operation mode
VNT MAN	Manual bag ventilation ventilator operation mode
VNT MAN/SPONT	Manual spontaneous ventilator operation mode
VNT MMV	Mandatory minute ventilator operation mode
VNT MMV/AF	Mandatory minute autoflow ventilator operation mode
VNT MMV/ASB	Mandatory minute assisted spontaneous breathing ventilator operation mode
VNT MMV/ASB/AF	Mandatory minute assisted spontaneous breathing autoflow ventilator operation mode
VNT PC	Pressure control ventilator operation mode
VNT PCV	Pressure control ventilator operation mode
VNT PCV-ASSIST CONTROL	Pressure control assist control ventilator operation mode
VNT PCV-CMV	Pressure control controlled mandatory ventilator operation mode
VNT PCV-CMV+APV	Pressure control controlled mandatory airway pressure ventilator operation mode
VNT PCV-CPAP	Pressure control continuous positive airway pressure ventilator operation mode
VNT PCV-SIMV	Pressure control-synchronized intermittent mechanical ventilator operation mode

Message	Description
VNT PCV-SIMV+APV	Pressure control synchronized intermittent mechanical airway pressure ventilator operation mode
VNT PPS	Positive pressure support ventilator operation mode
VNT PS	Pressure support ventilator operation mode
VNT SB	Spontaneous breathing ventilator operation mode
VNT SIMV	Synchronized intermittent mandatory ventilator operation mode
VNT SIMV/ASB	Synchronized intermittent mandatory assisted spontaneous breathing ventilator operation mode
VNT SIMV/ASB/AF	Synchronized intermittent mandatory assisted spontaneous breathing autoflow ventilator operation mode
VNT SIMV/AF	Synchronized intermittent mandatory autoflow ventilator operation mode
VNT SIMV/CPAP	Synchronized intermittent mandatory ventilation with continuous positive airway pressure ventilatory operation mode
VNT SIMVPS	Synchronized intermittent mandatory with pressure support ventilator operation mode
VNT SPONT	Spontaneous ventilator operation mode
VNT STNBY	Standby ventilator operation mode
VNT SYNC	• Synchronized master ventilator operation mode • Synchronized slave ventilator operation mode
VNT VACI	French synchronized intermittent mechanical ventilator operation mode
VNT VC/VA	French controlled mandatory ventilator operation mode
VNT VOL ASSIST	Assist control volume ventilator operation mode
VNT VS	French continuous positive airway pressure ventilator operation mode

C

Messages

Monitoring device messages

WARNING MISSED ALARMS — Do not rely on receipt of the following alarm conditions at a central station when connected to the CARESCAPE Network MC. Notification of any of these alarm conditions will only be given when it is the most recent, highest priority active alarm coming from the monitor. This applies to the following parameter alarm limits and technical (system status) alarms:

- ECG HR limit (if Single HR mode and Primary HR is not ECG)
- QT and QTc high limit
- CPP high/low limit
- Tblood-T1 Delta and Tblood-T3 Delta high limit
- RE and SE high/low limit
- PEEPtot, PEEPe, PEEPi high/low limit
- MVexp high limit
- IP systolic & diastolic high/low limit for sites: P1-P8, ICP, CVP, RAP, RVP, LAP, UVC, FemV
- No Px Transducer
- SvO2 Cable Off
- Measurement Removed for ECG, Pressure, NIBP, SpO2, SvO2, CO, Temp, Gas
- Identical Modules for IP, SpO2, COP, Temp, Gas, Entropy
- Remove One ECG Module

Some bedside monitor (e.g., CARESCAPE Monitor B850) technical messages will not display at the central station, including:

- Lead change
- Faulty Cable
- All CO technical messages
- Some NBP technical messages
- Resp Curve information message
- APNEA deactivated information message

The following messages display on the central station. An asterisk (*) indicates that a message may display throughout the Single Viewer. Under all circumstances, the message, description, and action are the same.

Messages that originate from the network or monitoring devices are not listed in this manual. For more information, see the documentation accompanying the monitoring device.

Message	Location	Description	Action
ACC VENT	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display).
Are you sure you want to assign a NEW PATIENT?	***Admit*/*Discharge*** dialog box	Attempting to admit a new patient to a telemetry monitoring device admitted on the central station.	Select one of the displayed options.
Are you sure you want to DISCHARGE this patient?	***Admit*/*Discharge*** dialog box	Attempting to discharge a patient from a monitoring device admitted on the central station.	Select one of the displayed options.
Are you sure you want to MOVE this patient?	***Admit*/*Discharge*** dialog box	Attempting to move a patient from one monitoring device admitted to the central station to another monitoring device.	Select one of the displayed options.
Are you sure you want to stop Full Disclosure?	***FD Strip*** dialog box	Attempting to manually stop Full Disclosure data collection.	Select one of the displayed options.
ARR OFF	Patient Multi-Viewer window/Single Viewer*	Indicates that arrhythmia detection at the monitoring device is disabled.	Check the monitoring device's arrhythmia detection settings.
ASYSTOLE	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display). When this is a latched alarm, the alarm condition must be acknowledged to clear the message.

Message	Location	Description	Action
ATRIAL FIB	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display).
AUDIO OFF	Patient Multi-Viewer window/Single Viewer*	Smart Alarms are enabled and ***Alarm Audio On/Off*** is set to ***OFF***.	Message clears when ***Alarm Audio On/Off*** is set to ***ON***.
AUDIO OFF – CAR REHAB	Patient Multi-Viewer window/Single Viewer*	Smart Alarms are enabled and this alarms off reason is selected.	Message clears when ***Alarm Audio On/Off*** is set to ***ON*** or when the telemetry monitoring device detects physiological data.
AUDIO OFF – CATH LAB	Patient Multi-Viewer window/Single Viewer*	Smart Alarms are enabled and this alarms off reason is selected.	Message clears when ***Alarm Audio On/Off*** is set to ***ON*** or when the telemetry monitoring device detects physiological data.
AUDIO OFF – GI LAB	Patient Multi-Viewer window/Single Viewer*	Smart Alarms are enabled and this alarms off reason is selected.	Message clears when ***Alarm Audio On/Off*** is set to ***ON*** or when the telemetry monitoring device detects physiological data.
AUDIO OFF – OFF UNIT	Patient Multi-Viewer window/Single Viewer*	Smart Alarms are enabled and this alarms off reason is selected.	Message clears when ***Alarm Audio On/Off*** is set to ***ON*** or when the telemetry monitoring device detects physiological data.
AUDIO OFF – O.T.	Patient Multi-Viewer window/Single Viewer*	Smart Alarms are enabled and this alarms off reason is selected.	Message clears when ***Alarm Audio On/Off*** is set to ***ON*** or when the telemetry monitoring device detects physiological data.
AUDIO OFF – P.T.	Patient Multi-Viewer window/Single Viewer*	Smart Alarms are enabled and this alarms off reason is selected.	Message clears when ***Alarm Audio On/Off*** is set to ***ON*** or when the telemetry monitoring device detects physiological data.

Message	Location	Description	Action
AUDIO OFF – SHOWER	Patient Multi-Viewer window/Single Viewer*	Smart Alarms are enabled and this alarms off reason is selected.	Message clears when ***Alarm Audio On/Off*** is set to ***ON*** or when the telemetry monitoring device detects physiological data.
AUDIO OFF – SURGERY	Patient Multi-Viewer window/Single Viewer*	Smart Alarms are enabled and this alarms off reason is selected.	Message clears when ***Alarm Audio On/Off*** is set to ***ON*** or when the telemetry monitoring device detects physiological data.
AUDIO OFF – X-RAY	Patient Multi-Viewer window/Single Viewer*	Smart Alarms are enabled and this alarms off reason is selected.	Message clears when ***Alarm Audio On/Off*** is set to ***ON*** or when the telemetry monitoring device detects physiological data.
AUDIO PAUSE	Patient Multi-Viewer window/Single Viewer*	Audio alarms are paused for up to two minutes (short alarm pause) or up to five minutes (long alarm pause); visual alarm notification continues.	No action required, message clears automatically when condition is resolved.
BIGEMINY	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display).
BRADY	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display).
CARDIFACT	Patient Multi-Viewer window/Single Viewer*	The respiration rate is within 5% of the heart rate over a span of 30 consecutive breaths. This could indicate that heartbeat artifact is also being counted and included in the respiration rate.	No action required, message clears automatically when condition is resolved or acknowledged.

Message	Location	Description	Action
CHANGE BATTERY	Patient Multi-Viewer window/Single Viewer*	The telemetry monitoring device batteries are low. If the batteries are extremely low or completely dead, a ***NO TELEM*** message displays, and an audio notification sounds.	Change the telemetry monitoring device battery. For more information, see the documentation accompanying the telemetry monitoring device.
CHECK DEVICE	Patient Multi-Viewer window/Single Viewer*	An alarm condition was detected at the monitoring device but the monitoring device did not provide enough information for the central station to provide alarm notification for a specific alarm condition.	Check the monitoring device status and/or network status. If the problem persists, contact authorized service personnel.
Clear all the report flags?	Events dialog box	Attempting to remove selected events from the event report.	Select one of the displayed options.
COUPLET	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display).
Delete the X selected events?	Events dialog box	Attempting to delete the indicated number of events.	Select one of the displayed options.
Delete this event?	Events dialog box	Attempting to delete events.	Select one of the displayed options.
DISCHARGED	Patient Multi-Viewer window/Single Viewer*	Monitoring device is a discharged state.	No action required; the message displays until the monitoring device resumes patient monitoring.
Discharging patient...	***Admit/Discharge***	Attempting to discharge a patient from a monitoring device assigned to the central station.	No action required; message clears without user action.
Display license unavailable	Multi-Viewer title bar	A license is required to use a feature has not been enabled before clinical use.	Contact authorized service personnel.
End of Full Disclosure Data	***FD Strip***	Reached the end of available stored data for this data session.	No action required; message clears without user action. Use the Scan newer event button to view earlier Full Disclosure data.

Message	Location	Description	Action
Event not available	***Events***	Request to display the selected event on the central station was unsuccessful.	No action required; message clears without user action.
Failed to delete	***Events***	Request to delete event from the monitoring device was unsuccessful.	No action required; message clears without user action.
GRAPHING	Patient Multi-Viewer window/Single Viewer*	An automatic or manual printout was requested and is in the process of being printed.	No action required; message clears without user action.
IRREGULAR	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display).
LEADS FAIL	Patient Multi-Viewer window/Single Viewer*	All leads have failed, right leg lead failed, right arm lead failed, leadwires unplugged or reference lead failed. Some bedside monitors (e.g., CARESCAPE Monitor B850) also display this message if a lead is removed from the patient or if the bedside monitor determines an electrode has failed.	Check patient connections.
LEARNING	Patient Multi-Viewer window/Single Viewer*	The monitoring device is attempting to Relearn patient HR or RR.	No action required; message clears without user action.
No bed is displayed in this slot.	Single Viewer*	No monitoring device is assigned to this patient Multi-Viewer window.	No action required; message clears without user action.
NO COMM	Patient Multi-Viewer window/***Live View***	There is no communication between the bedside monitor and the central station. If ***NO COMM*** is disabled, only the visual indicator will display in the Multi-Viewer. Enabled is the factory preset. The audio notification will not sound. If ***NO COMM*** is enabled, before 188 seconds and in addition to the already displayed visual indicator, an additional audible	Check the bedside monitor status. The message will clear when communication with the bedside monitor resumes.

Message	Location	Description	Action
		signal sounds to indicate the ***NO COMM*** condition.	
NO COMM Click button to set Audio Off	Patient Multi-Viewer window/***Live View***	More than 188 seconds after a loss of network communication with a bedside monitor.	If ***NO COMM*** audio notification is enabled, use the alarms off button to toggle the audio notification on and off.
NO COMM Click button to set Audio On	Patient Multi-Viewer window/***Live View***	***NO COMM*** is disabled by the user in response to a ***NO COMM*** notification.	If ***NO COMM*** audio notification is enabled, use the alarms off button to toggle the audio notification on and off.
No matches found for the picklist request	***Admit/Discharge***	The Hospital Information System (HIS) search did not find any valid matches.	Attempt to admit a patient by manually entering the patient information. If the problem persists, contact authorized service personnel
No patient data is available for the selected time	***Graphic Trends***	Attempting to display the specified range of stored patient data did not return any results.	Attempt the search again after adjusting the time range.
No PDS server	***Events***	Attempting to select Patient Data Server (PDS) as the event source.	Check the monitoring device status and/or network status. If the problem persists, contact authorized service personnel.
NO TELEM	Patient Multi-Viewer window/***Live View***	The telemetry monitoring device was out of range for more than 30 seconds, the telemetry monitoring device battery has been depleted, or a communication failure between the telemetry server and the telemetry monitoring device has occurred. If ***LEADS FAIL*** occurs before ***NO TELEM***, ***LEADS FAIL*** takes priority.	For more information, see the documentation accompanying the telemetry monitoring device. If the problem persists, contact authorized service personnel.
OFF NETWORK	Patient Multi-Viewer window/***Live View***	A device is no longer being detected on the network (offline).	Contact authorized service personnel.
Over-write existing saved reference?	***ST Review***	Attempting to save a new ST record reference.	Select one of the displayed options.

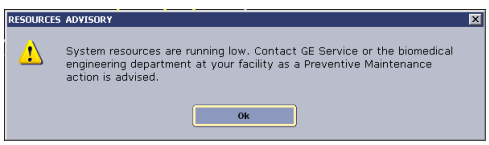
Message	Location	Description	Action
PAUSE	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display).
PDF file transfer failed. Contact IT/Biomed	Multi-Viewer title bar	Attempting to send an event report PDF did not reach the server location configured before clinical use.	Contact authorized service personnel.
R ON T	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display).
Reconfiguration failed!	***Display Configuration*** dialog box	Attempting to remove patient Multi-Viewer windows from the Multi-Viewer that resulted in fewer patient Multi-Viewer windows that monitoring devices being monitored on this central station.	Attempt the display configuration again after determining the minimum number of patient Multi-Viewer windows that must be available.
Remote Event	Patient Multi-Viewer window/***Live View***	The Event Marker button on the telemetry monitoring device was pressed.	No action required; message clears without user action.
SAVING	Patient Multi-Viewer window/***Live View***	Automatic or manual print request was initiated, but the writer is in use or not functioning. The most recent print request is saved until the writer is available to print.	Verify the writer is turned on and the paper is installed correctly. If the problem persists, contact authorized service personnel.
START ST Monitoring?	***ST Review*** dialog box	Attempting to display the ST Monitoring Status indicator on the patient Multi-Viewer window.	Select one of the displayed options.
STOP ST Monitoring?	***ST Review*** dialog box	Attempting to remove the ST Monitoring Status indicator from the patient Multi-Viewer window.	Select one of the displayed options.
TACHY	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display).

Message	Location	Description	Action
There is no ADT server present	***Admit/Discharge***	Searching for patient information on a Hospital Information System (HIS) was unsuccessful.	Attempt to admit a patient by manually entering the patient information. If the problem persists, contact authorized service personnel
This is the only display of X. Display at another location, then remove from this display.	***Display Configuration*** dialog box	Attempting to remove a monitoring device assigned to a patient Multi-Viewer window that is not monitored by another central station in the unit.	Attempt to remove the patient window after the monitoring device is monitored on another central station in the unit.
TRIGEMINY	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display).
Unmonitored Beds Exist	Patient Multi-Viewer window/Single Viewer*	An in-unit bedside monitor has not been assigned to a patient Multi-Viewer window.	The unmonitored in-unit bedside monitor needs to be manually assigned to any available patient Multi-Viewer window.
V BRADY	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display).
V TACH	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display).
VFIB/VTAC	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display). When this is a latched alarm, the alarm condition must be acknowledged to clear the message

Message	Location	Description	Action
VT > 2	Patient Multi-Viewer window/Single Viewer*	The indicated arrhythmia alarm condition was detected by the monitoring device.	The monitoring device alarm configuration dictates whether this message requires user action to resolve (remove from the display).
Warning: Sessions with non-matching PIDs selected	***Session Search*** dialog box	Selected data sessions have non-matching patient identification.	Verify the selected sessions are for the same patient; remove sessions that are not for the same patient.
Would you like to start Full Disclosure?	***Admit/Discharge*** dialog box	Attempting to manually start collection of Full Disclosure data.	Select one of the displayed options.
Which Admit information would you like to use?	***Admit/Discharge*** dialog box	Searching for patient information on a HIS produced more than one possible patient match.	Select one of the displayed options.
X FAIL	Patient Multi-Viewer window/Single Viewer*	The monitoring device has determined the indicated lead (***X***) is not functioning or has failed	Check the patient connections.
X is admitted but not full disclosed	Multi-Viewer title bar	The indicated monitoring device is being monitored on the central station, but Full Disclosure data is not being collected.	No action required; message clears without user action.
X is offline	Multi-Viewer title bar	The indicated primary central station with mirrored central displays is offline.	Contact authorized service personnel.
X is unmonitored	Multi-Viewer title bar	The indicated monitoring device is not being monitored by any central station in the unit.	Check the monitoring device status and/or network status. If the problem persists, contact authorized service personnel.

Central station system status messages

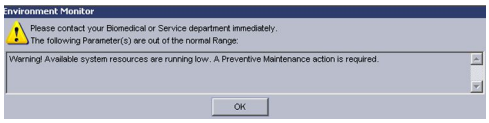
The System Resource Monitor dialog box displays when the central station is experiencing limited or compromised system resources and sends the message to display in the central station system status alarm button/drop-down menu. When the user selects the central station system status alarm button/drop-down menu the following messages may display:



- If any system resource levels reach a ***MEDIUM*** (***WARNING***) alarm priority level, the ***Resources Advisory*** dialog box displays with the following message: ***System resources are running low. Contact GE Service or the biomedical engineering department or your facility as a Preventive Maintenance action is advised.***
- If any system resource levels reach a ***HIGH*** (***CRISIS***) alarm priority level, the ***Resources Low*** dialog box displays with the following message: ***Warning! Available system resources are running low. A Preventive Maintenance action is required.***

Central station system status messages do not provide audio alarm tones; only visual alarm indicators will display in the central station system status alarm button/drop-down menu.

The Environment Monitor automatically displays when the central station is experiencing limited or compromised system resources or when central station device failures have been detected.



The Environment Monitor dialog box will display ***Please contact your Biomedical or Service department immediately. The following parameter(s) are out of the normal Range*** message and then list the specific device failures:

- ***Chassis Fan 1 speed out of range (X -X). Currently: X rpm.***
- ***Chassis Fan 2 speed out of range (X -X). Currently: X rpm.***
- ***CPU Fan speed out of range (X -X). Currently: X rpm.***
- ***CPU temperature out of range (X - X). Currently: X °C.***
- ***Enclosure temperature out of range (X - X). Currently: X °C.***
- ***External speaker is unplugged.***
- ***Flash Disk Drive Failure.***
- ***Flash Disk temperature out of range (X - X). Currently: X °C***
- ***Hard Disk Drive Failure.***
- ***Hard Disk temperature out of range (X - X). Currently: X °C.***
- ***Internal speaker is unplugged.***
- ***Power supply - 1.8V out of range (X - X). Currently: X V.***
- ***Power supply - 3.3V out of range (X - X). Currently: X V.***
- ***Power supply - 5V out of range (X - X). Currently: X V.***
- ***Power supply - 12V out of range (X - X). Currently: X V.***
- ***Power supply - VCCP out of range (X - X). Currently: X V.***
- ***System environment monitor driver is not available.***
- ***The Automatic Daylight Savings Time Checkbox is enabled.***
- ***Warning! Available system resources are running low. System restart is required to correct the problem. Patients will not be monitored at this Central while the System is restarting. If the system is not restarted now, it will restart automatically in approximately X minutes.*** When this message displays, a countdown timer shows the amount of time remaining until the central station will

automatically initiate a complete system reboot to attempt to repair the system. A complete system reboot will cause a temporary loss of all functionality.

When any System Resource Monitor or Environment Monitor message displays, select ***OK*** to acknowledge the message and close the dialog box. Then contact authorized service personnel as soon as possible.

D

Factory presets

Factory presets overview

When the supply mains to the device is interrupted for any amount of time while the on/off mains switch is in the “on” position, the subsequent operation reverts to the last settings used.

An asterisk (*) indicates settings that are different than previous versions of the central station, including the CIC Pro Clinical Information Center. For more information, see the documentation accompanying the CIC Pro center.

Central Defaults factory presets

From the Multi-Viewer menu, select ***Setup*** > ***Central Defaults*** to display the following factory presets:

Item		Factory presets
Name	*Central*	—
	Unit	—
Mirror Central Display		*NONE*
Waveforms	*ECG 1*	*From ECG Source*
	Waveform 2	*OFF**
	Waveform 3	*OFF*
	Waveform 4	*OFF*
Printer/Writer	*Laser*	*OFF*
	DDW	*OFF*
	Full Disclosure	*OFF*

Item		Factory presets
Alarm Settings	*Volume Current*	*100 %*
	Volume Minimum	*100 %*
	Alarm Audio Off Reminder	*Yes*
	IEC Alarm Tones	*Yes*
	IEC Priority Nomenclature	*Yes*
	*Allow Telemetry Alarm Audio OFF on this Central**	*No**
	*Allow Arrhythmia OFF on this Central**	*No**
Real-time Trend Graph Configuration	*Display Real-time Trend Graph*	Disabled
Color Set		*Clinical*

Allow Telemetry Alarm Audio OFF on this Central and ***Allow Arrhythmia OFF on this Central*** must be set to the same value. Previous versions of the central station, including the CIC Pro Clinical Information Center, only supports one option (***Allow Alarms OFF on this CIC***).

Telemetry factory presets

Telemetry Unit Defaults factory presets

From the Multi-Viewer menu, select ***Setup*** > ***Telemetry Unit Defaults*** to display the following factory presets:

Item		Factory presets
Default Print Location	*Manual*	—
	Alarm	—
	Print Window	—
Waveforms	*ECG 1*	*II*
	Waveform 2	*V*
	Waveform 3	*OFF*
	Waveform 4	*OFF*
Transmitter Graph		*On*
Alarm Graph		*Always on*
Event Marker Graph		*ON**

Item		Factory presets
ECG	*Display Lead*	*II*
	Arrhythmia	*Full*
	Lead Analysis	*Multi-Lead*
	ST-Analysis	*On**
	Va Lead	*V1*
	Vb Lead	*V5**
	Detect Pace	*Off*
Patient Age		*Adult*
Transmitter Audio Pause		*Enabled*
Alarm Pause Breakthrough		*Always on*
Event Marker		*ON**

Telemetry Parameter Limits and Alarm Levels factory presets

From the Single Viewer menu, select ***Monitor Setup*** > ***Alarm Setup*** to display the following ***Parameter Limits and Alarm Levels*** factory presets:

Parameter	Unit of measurement factory presets	Low alarm limit factory presets	High alarm limit factory presets	Alarm priority level factory presets
HR	*bpm*	*50*	*150*	*MEDIUM* (*WARNING*)
ST-I	*mm*	*-2.0*	*2.0*	*LOW* (*ADVISORY*)*
ST-II	*mm*	*-2.0*	*2.0*	*LOW* (*ADVISORY*)*
ST-III	*mm*	*-2.0*	*2.0*	*LOW* (*ADVISORY*)*
ST-V	*mm*	*-2.0*	*2.0*	*LOW* (*ADVISORY*)*
ST-V2	*mm*	*-2.0*	*2.0*	*LOW* (*ADVISORY*)*
ST-V3	*mm*	*-2.0*	*2.0*	*LOW* (*ADVISORY*)*
ST-V4	*mm*	*-2.0*	*2.0*	*LOW* (*ADVISORY*)*
ST-V5	*mm*	*-2.0*	*2.0*	*LOW* (*ADVISORY*)*
ST-V6	*mm*	*-2.0*	*2.0*	*LOW* (*ADVISORY*)*
ST-aVR	*mm*	*-2.0*	*2.0*	*LOW* (*ADVISORY*)*
ST-aVL	*mm*	*-2.0*	*2.0*	*LOW* (*ADVISORY*)*
ST-aVF	*mm*	*-2.0*	*2.0*	*LOW* (*ADVISORY*)*
NBP-S	*mmHg*	*80*	*200*	*MEDIUM* (*WARNING*)
NBP-D	*mmHg*	*20*	*120*	*MEDIUM* (*WARNING*)
NBP-M	*mmHg*	*40*	*140*	*MEDIUM* (*WARNING*)
SPO2	*%*	*90*	*105*	*MEDIUM* (*WARNING*)

Parameter	Unit of measurement factory presets	Low alarm limit factory presets	High alarm limit factory presets	Alarm priority level factory presets
SPO2–R	*bpm*	*50*	*150*	*MEDIUM* (*WARNING*)
RR	*breaths/min*	*5*	*30*	*MEDIUM* (*WARNING*)
RR-APNEA	*seconds*	—	*20**	*HIGH* (*CRISIS*)*
PVC	*#/min*	—	*6*	*LOW* (*ADVISORY*)

Telemetry Arrhythmia Alarm Levels factory presets

From the Single Viewer menu, select ***Monitor Setup*** > ***Alarm Setup*** to display the following ***Arrhythmia Alarm Levels*** factory presets:

Alarm condition	Factory presets
ASYSTOLE	*HIGH* (*CRISIS*)
VFIB/VTAC	*HIGH* (*CRISIS*)
V TACH	*HIGH* (*CRISIS*)
VT > 2	*MEDIUM* (*WARNING*)*
R ON T	*MEDIUM* (*WARNING*)*
V BRADY	*MEDIUM* (*WARNING*)*
TACHY	*MEDIUM* (*WARNING*)*
BRADY	*MEDIUM* (*WARNING*)*
PAUSE	*LOW* (*ADVISORY*)
IRREGULAR	*LOW* (*ADVISORY*)*
ATRIAL FIB	*LOW* (*ADVISORY*)*
ACC VENT	*INFORMATIONAL* (*MESSAGE*)*
COUPLET	*INFORMATIONAL* (*MESSAGE*)
BIGEMINY	*INFORMATIONAL* (*MESSAGE*)
TRIGEMINY	*INFORMATIONAL* (*MESSAGE*)
PVC	*INFORMATIONAL* (*MESSAGE*)

Telemetry Technical Alarm Priorities factory presets

WARNING

ALARM PRIORITY LEVEL — The CARESCAPE Central Station has different ***Telemetry Alarm Setup Defaults*** > ***Technical Alarm Priorities*** custom default options than the CIC Pro Clinical Information Center for telemetry monitoring devices.

Use the latest version CARESCAPE Central Station in the unit when making changes to the Technical Alarm Priorities custom defaults.

Failure to use the latest version CARESCAPE Central Station in the unit will render some options unavailable (e.g., ***HIGH*** (***CRISIS***) alarm priority level).

For more information, see the technical manual accompanying the central station.

Some bedside monitors (e.g., CARESCAPE Monitor B850) may be configured to disable ***SPO2 PROBE OFF*** alarm determination. This could result in some bedside monitors determining the alarm condition and sending it for display at the central station while the bedside monitor would not.

From the Single Viewer menu, select ***Monitor Setup*** > ***Alarm Setup*** to display the following ***Technical Alarm Priorities*** factory presets:

Alarm condition	Factory presets
OFF NETWORK	*HIGH* (*CRISIS*)*
ARR SUSPEND	*HIGH* (*CRISIS*)*
LEADS FAIL	*HIGH* (*CRISIS*)*
CHANGE BATTERY	*MEDIUM (SYSTEM WARNING)*
PROBE OFF	*MEDIUM (SYSTEM WARNING)*

Since the telemetry monitoring device alarm priority level factory preset for ***ARR SUSPEND*** is ***HIGH*** (***CRISIS***), if used to admit a telemetry monitoring device that latches ***HIGH*** (***CRISIS***) priority alarm level, ***ARR SUSPEND*** will latch once the alarm condition has passed. Whenever an alarm priority level is latched, alarms of lower priority will be suppressed.

Display Configuration factory presets

From the Multi-Viewer menu, select ***Setup*** > ***Display Configuration*** to display the following factory presets:

Item		Factory presets
Columns		*1*
Rows		*4**
Show Unit Names	*Show Unit Names for in Unit Monitors*	*No*
	Show Patient Name for Admitted Patients	*No*
Auto Display Button	*Maximize Waveform Length*	Enabled
	Maximize Number of Waveforms	Disabled
	Disable Auto Display Button	Disabled
Parameter Font Setup	*Apply Color Set to Parameter*	Enabled
	Standard Font	Enabled
	Large Font	Disabled
Real-time BP UOM configuration[1]		*mmHg*

1. This item only displays when the central station is configured for the Chinese language.

Full Disclosure Defaults factory presets

From the Multi-Viewer menu, select ***Setup*** > ***Full Disclosure Defaults*** to display the following factory presets:

Item		Factory presets
FD Report Printing	*Duration*	*1 hr 0 min*
	Hole Location	*none*
	Graybar	Enabled
	Arrhythmia Annotations	Enabled
	Heart Rate	Enabled
	Line Time	*1min*
FD Strip	*Duration*	*0 min 10 sec*
	Hole Location	*none*
Unit License Default (Full Disclosure License Type)		*none*
Strip Printing	*Hole Location*	*top*
	Report Number	—
Offline Storage		*00:30*
Start Data Storage		*Automatically for all beds*
Bed List		—

FD Page factory presets

From the Single Viewer menu, select ***Patient Data*** > ***FD Page***, select the Configuration button to display the following ***Customize FD Page*** factory presets:

Item		Custom defaults
Display Setup	*Time Per Line*	*30 seconds*
	Zoom Window	*Show*

Graphic Trends Groups factory presets

From the Single Viewer menu, select ***Patient Data*** > ***Graphic Trends***, then select the Configuration button to display the following ***Customize Graphic Trends*** factory presets:

Group name:	*Cardiac*	
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format	*HR*	*afibTrend*
	ART	*SpO2*
	Event	

Group name:	*Cardiac*	
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in full-screen format	*PVC*	*ST-II*
	NBP	*ST-III*
	ST-I	*ST-V1*

Group name:	*Pressures*	
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format	*HR*	*CVP*
	ART	*NBP*
	PA	*ccCO*
Parameter windows displayed in full-screen format	*LA-M*	*ICP*
	RA	*SpO2*
	Event	

Group name:	*Basic Resp*	
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format	*HR*	*CO2-expCO2*
	RR	*CO2-expO2*
	SpO2	*Temp1*
Parameter windows displayed in full-screen format	*ST-I*	*ST-V1*
	ST-II	*ST-aVF*
	ST-III	*ST-aVL*

Group name:	*Basic View*	
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format	*HR*	*Temp1*
	PVC	*NBP*
	Event	
Parameter windows displayed in full-screen format	*SpO2*	*ST-I*
	RR	*ST-II*
	afibTrend	*ST-V1*

Group name:	*Ventilator*	
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format	*HR*	*CO2-inspCO2*
	SpO2	*vVNT-RR*
	CO2-expCO2	*vSPO-MV*

Group name:	*Ventilator*	
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in full-screen format	*ART*	*vPIP*
	vT-PEEP	*vMAWP*
	vSET-FiO2	*vPPLAT*

Group name:	*Neuro*	
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format	*HR*	*RR*
	ART	*SpO2*
	ICP	*CPP*
Parameter windows displayed in full-screen format	*Event*	
	Temp1	*afibTrend*
	ccCO	—

Group name:	*ST Group*	
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format	*ST-I*	*ST-V2*
	ST-II	*ST-aVF*
	ST-III	*ST-aVL*
Parameter windows displayed in full-screen format	*ST-aVR*	*ST-V4*
	ST-V1	*ST-V5*
	ST-V3	*ST-V6*

Group name:	*Basic Tele*	
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format	*HR*	*ST-II*
	PVC	*ST-V2*
	Event	
Parameter windows displayed in full-screen format	—	

Numeric Trends Groups factory presets

From the Single Viewer menu, select ***Patient Data*** > ***Numeric Trends***, then select the Configuration button to display ***Customize Numeric Trends***.

Group name:			*All Data*		
Parameter display order:					
1. *ECG*	2. *NBP*	3. *SpO2*	4. *RESP*	5. *CO2*	6. *TEMP*
7. *ART*	8. *PA*	9. *RA*	10. *FEM*	11. *CVP*	12. *LA*

Group name:			*All Data*		
Parameter display order:					
13. *ICP*	14. *SP*	15. *UAC*	16. *UVC*	17. *CO*	18. *CC*
19. *PC*	20. *ST*	21. *VENT*	22. *Gas*	23. *ABG*	24. *BIS*
25. *EEG*	26. *SvO2*	27. *CCO*	28. *RM*	29. *ICG*	30. *NICO*
31. *TC*	32. *BTCO*				

Group name:			*NBP*		
Parameter display order:					
1. *NBP*	2. *SpO2*	3. *RESP*	4. *ECG*	5. *CO2*	6. *TEMP*
7. *ART*	8. *PA*	9. *RA*	10. *FEM*	11. *CVP*	12. *LA*
13. *ICP*	14. *SP*	15. *UAC*	16. *UVC*	17. *CO*	18. *CC*
19. *PC*	20. *ST*	21. *VENT*	22. *Gas*	23. *ABG*	24. *BIS*
25. *EEG*	26. *SvO2*	27. *CCO*	28. *RM*	29. *ICG*	30. *NICO*
31. *TC*	32. *BTCO*				

Group name:			*Cardiac Calcs*		
Parameter display order:					
1. *CC*	2. *CO*	3. *CCO*	4. *NICO*	5. *ABG*	6. *ECG*
7. *NBP*	8. *SpO2*	9. *RESP*	10. *CO2*	11. *TEMP*	12. *ART*
13. *PA*	14. *RA*	15. *FEM*	16. *CVP*	17. *LA*	18. *ICP*
19. *SP*	20. *UAC*	21. *UVC*	22. *PC*	23. *ST*	24. *VENT*
25. *Gas*	26. *BIS*	27. *EEG*	28. *SvO2*	29. *RM*	30. *ICG*
31. *TC*	32. *BTCO*				

Group name:			*Pulmonary Calcs*		
Parameter display order:					
1. *PC*	2. *RESP*	3. *ABG*	4. *CO2*	5. *VENT*	6. *RM*
7. *CO*	8. *CCO*	9. *NICO*	10. *SpO2*	11. *ECG*	12. *NBP*
13. *TEMP*	14. *ART*	15. *PA*	16. *RA*	17. *FEM*	18. *CVP*
19. *LA*	20. *ICP*	21. *SP*	22. *UAC*	23. *UVC*	24. *ST*
25. *BIS*	26. *EEG*	27. *SvO2*	28. *ICG*	29. *TC*	30. *Gas*
31. *CC*	32. *BTCO*				

Group name:			*Ventilator*		
Parameter display order:					
1. *VENT*	2. *CO2*	3. *Gas*	4. *RESP*	5. *RM*	6. *SpO2*
7. *SvO2*	8. *ECG*	9. *NBP*	10. *TEMP*	11. *ART*	12. *PA*
13. *RA*	14. *FEM*	15. *CVP*	16. *LA*	17. *ICP*	18. *SP*
19. *UAC*	20. *UVC*	21. *CO*	22. *ABG*	23. *PC*	24. *ST*

Group name:			*Ventilator*		
Parameter display order:					
25. ***BIS***	26. ***EEG***	27. ***CCO***	28. ***ICG***	29. ***NICO***	30. ***CC***
31. ***TC***	32. ***BTCO***				

Group name:			*Gas*		
Parameter display order:					
1. ***Gas***	2. ***CO2***	3. ***VENT***	4. ***RESP***	5. ***RM***	6. ***SpO2***
7. ***SvO2***	8. ***ECG***	9. ***NBP***	10. ***TEMP***	11. ***ART***	12. ***PA***
13. ***RA***	14. ***FEM***	15. ***CVP***	16. ***LA***	17. ***ICP***	18. ***SP***
19. ***UAC***	20. ***UVC***	21. ***CO***	22. ***ABG***	23. ***PC***	24. ***ST***
25. ***BIS***	26. ***EEG***	27. ***CCO***	28. ***ICG***	29. ***NICO***	30. ***CC***
31. ***TC***	32. ***BTCO***				

ST Review factory presets

From the Single Viewer menu, select ***Patient Data*** > ***ST Review***, select the Configuration button to display ***Customize ST Review***.

Item		Factory presets
Parameter 1	*Parameter Name*	*HR*
	Scale	*50 - 150*
Parameter 2	*Follow ST Median*	Disabled
	Parameter Name	*ST-II*
	Scale	*-2.0 - 2.0*
Waveform Format		*Standard Format (I, II, III, aVR, aVL, aVF, V1-V6)*

E

Custom defaults and settings

Custom defaults and settings overview

When creating custom defaults, make copies of this appendix to record custom default values.

Central Defaults settings

From the Multi-Viewer menu, select ***Setup*** > ***Central Defaults*** to display the following settings:

Item		Options	Settings
Name	***Central***	Unit configured central station name.	
	Unit	Unit configured central station name.	
Mirror Central Display		***NONE*** or unit configured central station name.	
Waveforms	***Waveform 2***	***OFF***, ***I***, ***II***, ***III***, ***V***, ***aVR***, ***aVL***, ***aVF***, ***AR***, ***PA***, ***FE***, ***CVP***, ***RA***, ***LA***, ***ICP***, ***SP***, ***UA***, ***UV***, ***RESP***, ***SPO2***, or ***SPO2m***.	
	Waveform 3	***OFF***, ***I***, ***II***, ***III***, ***V***, ***aVR***, ***aVL***, ***aVF***, ***AR***, ***PA***, ***FE***, ***CVP***, ***RA***, ***LA***, ***ICP***, ***SP***, ***UA***, ***UV***, ***RESP***, ***SPO2***, or ***SPO2m***.	
	Waveform 4	***OFF***, ***I***, ***II***, ***III***, ***V***, ***aVR***, ***aVL***, ***aVF***, ***AR***, ***PA***, ***FE***, ***CVP***, ***RA***, ***LA***, ***ICP***, ***SP***, ***UA***, ***UV***, ***RESP***, ***SPO2***, or ***SPO2m***.	
Printer/Writer	***Laser***	***OFF*** or unit configured printer name.	
	DDW	***OFF***, ***COM2***, or unit configured writer name.	
	Full Disclosure	***OFF*** or unit configured printer name.	

Item		Options	Settings
Alarm Settings	*Volume Current*	*OFF*, *100 %*, *90 %*, *80 %*, *70 %*, *60 %*, *50 %*, *40 %*, *30 %*, *20 %*, or *10 %*.	
	Volume Minimum	*OFF*, *100 %*, *90 %*, *80 %*, *70 %*, *60 %*, *50 %*, *40 %*, *30 %*, *20 %*, or *10 %*.	
	Alarm Audio Off Reminder	*Yes* or *No*.	
	IEC Alarm Tones	*Yes* or *No*.	
	IEC Priority Nomenclature	*Yes* or *No*.	
	Allow Telemetry Alarm Audio OFF on this Central	*Yes* or *No*.	
	Allow Arrhythmia OFF on this Central	*Yes* or *No*.	
Real-time Trend Graph Configuration	*Display Real-time Trend Graph*	Enable or disable.	
Color Set		*Clinical*, *Transducer*, or *Custom*.	

Telemetry custom defaults overview

For telemetry monitoring device custom defaults, once changes are made and custom defaults are active, they apply to any newly admitted patient.

After changes to the telemetry custom defaults are made any new subsequently admitted telemetry monitoring devices will receive the new values.

Telemetry Unit Defaults custom defaults

From the Multi-Viewer menu, select ***Setup*** > ***Telemetry Unit Defaults*** to display the following custom defaults:

Item		Options	Custom defaults
Default Print Location	*Manual*	*OFF* or unit configured printer name.	
	Alarm	*OFF* or unit configured printer name.	
	Print Window	*OFF* or unit configured printer name.	

Item		Options	Custom defaults
Waveforms	*ECG 1*	*I*, *II*, *III*, *V*, *aVR*, *aVL*, or *aVF*.	
	Waveform 2	*OFF*, *I*, *II*, *III*, *V*, *aVR*, *aVL*, or *aVF*.	
	Waveform 3	*OFF*, *I*, *II*, *III*, *V*, *aVR*, *aVL*, or *aVF*.	
	Waveform 4	*OFF*, *I*, *II*, *III*, *V*, *aVR*, *aVL*, or *aVF*.	
Transmitter Graph		*Off* or *On*.	
Alarm Graph		*Always off* or *Always on*.	
Event Marker Graph		*OFF* or *ON*.	
ECG	*Display Lead*	*I*, *II*, *III*, *V*, *aVR*, *aVF*, or *aVL*.	
	Arrhythmia	*Full*, *Lethal*, or *Off*.	
	Lead Analysis	*Multi-Lead* or *Single-Lead*.	
	ST-Analysis	*Off* or *On*.	
	Va Lead	*V1*, *V2*, *V3*, *V4*, *V5*, or *V6*.	
	Vb Lead		
	Detect Pace	*Off*, *Pace 1*, or *Pace 2*.	
Patient Age		*Adult*, *0-2 Years*, *3-10 Years*, or *11-13 Years*.	
Transmitter Audio Pause		*Off*, *Enabled*, or *Disabled*.	
Alarm Pause Breakthrough		*Always off* or *Always on*.	
Event Marker		*OFF* or *ON*.	

Telemetry Parameter Limits and Alarm Levels custom defaults

The following parameter alarm limits are adjustable in one whole digit increments, unless otherwise indicated.

The following alarm priority level options are available for all parameters, unless otherwise indicated:

- *HIGH* (*CRISIS*)
- *MEDIUM* (*WARNING*)
- *LOW* (*ADVISORY*)
- *INFORMATIONAL* (*MESSAGE*)

From the Single Viewer menu, select ***Monitor Setup*** > ***Alarm Setup*** to display the following ***Parameter Limits and Alarm Levels*** custom defaults:

Parameters	Low alarm limit options	High alarm limit options	Alarm limit range custom defaults	Alarm priority level custom defaults
HR	*-1* to *300*			
ST-I	*-12.0* to *12.0*			
ST-II	*-12.0* to *12.0*			
ST-III	*-12.0* to *12.0*			
ST-V	*-12.0* to *12.0*			
ST-V2	*-12.0* to *12.0*			
ST-V3	*-12.0* to *12.0*			
ST-V4	*-12.0* to *12.0*			
ST-V5	*-12.0* to *12.0*			
ST-V6	*-12.0* to *12.0*			
ST-aVR	*-12.0* to *12.0*			
ST-aVL	*-12.0* to *12.0*			
ST-aVF	*-12.0* to *12.0*			
NBP-S	*-99* to *350*			
NBP-D	*-99* to *350*			
NBP-M	*-99* to *350*			
SPO2	*0* to *105*			
SPO2–R	*-1* to *300*			
RR	*1* to *200*			
RR-APNEA	—	*3* to *30*		
PVC	—	*1* to *100*		

Telemetry Arrhythmia Alarm Levels custom defaults

The following alarm priority level options are available for all alarm conditions, unless otherwise indicated:

- ***HIGH*** (***CRISIS***)
- ***MEDIUM*** (***WARNING***)
- ***LOW*** (***ADVISORY***)
- ***INFORMATIONAL*** (***MESSAGE***)

ASYSTOLE and ***VFIB/VTAC*** alarm priority levels cannot be adjusted. They are always set to ***HIGH*** (***CRISIS***).

From the Single Viewer menu, select ***Monitor Setup*** > ***Alarm Setup*** to display the following ***Arrhythmia Alarm Levels*** custom defaults:

Alarm conditions	Custom defaults
ASYSTOLE	
VFIB/VTAC	
V TACH	

Alarm conditions	Custom defaults
VT > 2	
V BRADY	
ACC VENT	
PAUSE	
TACHY	
BRADY	
R ON T	
COUPLET	
BIGEMINY	
TRIGEMINY	
PVC	
IRREGULAR	
ATRIAL FIB	

Telemetry Technical Alarm Priorities custom defaults

WARNING

ALARM PRIORITY LEVEL — The CARESCAPE Central Station has different ***Telemetry Alarm Setup Defaults*** > ***Technical Alarm Priorities*** custom default options than the CIC Pro Clinical Information Center for telemetry monitoring devices.

Use the latest version CARESCAPE Central Station in the unit when making changes to the Technical Alarm Priorities custom defaults.

Failure to use the latest version CARESCAPE Central Station in the unit will render some options unavailable (e.g., ***HIGH*** (***CRISIS***) alarm priority level).

For more information, see the technical manual accompanying the central station.

The CARESCAPE Central Station alarm priority level options for the following telemetry technical alarm conditions includes ***HIGH*** (***CRISIS***) and restricts the use of ***SYSTEM MESSAGE*** (***INFORMATIONAL***). Previous versions of the central station, including the CIC Pro Clinical Information Center, support different options as shown in the following table.

Alarm conditions	Technical Alarm Priorities options (CIC Pro center)	Technical Alarm Priorities options (CARESCAPE central station)
CHANGE BATTERY	• *SYSTEM WARNING* (*MEDIUM*) • *SYSTEM ADVISORY* (*LOW*) • *SYSTEM MESSAGE* (*INFORMATIONAL*)	• *HIGH* (*CRISIS*) • *SYSTEM WARNING* (*MEDIUM*) • *SYSTEM ADVISORY* (*LOW*) • *SYSTEM MESSAGE* (*INFORMATIONAL*)
OFF NETWORK		• *HIGH* (*CRISIS*)

Alarm conditions	Technical Alarm Priorities options (CIC Pro center)	Technical Alarm Priorities options (CARESCAPE central station)
ARR SUSPEND		• *SYSTEM WARNING* (*MEDIUM*) • *SYSTEM ADVISORY* (*LOW*)
LEADS FAIL		
PROBE OFF		

From the Single Viewer menu, select ***Monitor Setup*** > ***Alarm Setup*** to display the following ***Technical Alarm Priorities*** custom defaults:

Alarm conditions	Custom defaults
CHANGE BATTERY	
OFF NETWORK	
ARR SUSPEND	
LEADS FAIL	
PROBE OFF	

Display Configuration settings

When a central station is mirrored by other central stations, do not change the display layout, either by use of the ***Auto Display*** button or by adjusting the ***Setup*** > ***Display Configuration*** > ***Rows*** or ***Columns*** settings. Adjusting these settings will cause inconsistent Multi-Viewer screen arrangements between the central stations within a mirror group. Central stations that mirror other central stations will have those controls automatically disabled. On the mirrored central displays, the Auto Display button can be permanently disabled by authorized service personnel, but Display Configuration settings cannot be disabled. The Auto Display button can also be temporarily removed by selecting ***Setup*** > ***Display Configuration*** > ***Disable Auto Display Button***.

From the Multi-Viewer menu, select ***Setup*** > ***Display Configuration*** to display the settings.

Item		Options	Settings
Columns		***1*** to ***4***.	
Rows		***1*** to ***8***.	
Show Unit Names	*Show Unit Names for in Unit Monitors*	***Yes*** or ***No***.	
	Show Patient Name for Admitted Patients	***Yes*** or ***No***.	
Auto Display Button	*Maximize Waveform Length*	Enabled or disabled.	
	Maximize Number of Waveforms	Enabled or disabled.	
	Disable Auto Display Button	Enabled or disabled.	

Item		Options	Settings
Parameter Font Setup	*Apply Color Set to Parameter*	Enabled or disabled.	
	Standard Font	Enabled or disabled.	
	Large Font	Enabled or disabled.	
Real-time BP UOM configuration		***kPa*** or ***mmHg***.	

Full Disclosure Defaults settings

From the Multi-Viewer menu, select ***Setup*** > ***Full Disclosure Defaults*** to display the settings.

Item		Options	Settings
FD Report Printing	*Duration*	***0 hr 1 min*** to ***144 hr 0 min*** in one minute intervals.	
	Hole Location	***none***, ***top***, ***bottom***, ***left***, or ***right***.	
	Graybar	Enabled or disabled.	
	Arrhythmia Annotations	Enabled or disabled.	
	Heart Rate	Enabled or disabled.	
	Line Time	***15sec***, ***30sec***, or ***1min***.	
FD Strip	*Duration*	***0 min 5 sec*** to ***60 min 0 sec*** in five second intervals.	
	Hole Location	***none***, ***top***, ***bottom***, ***left***, or ***right***.	
Unit License Default (Full Disclosure License Type)		***none***, ***24 hrs***, ***48 hrs***, ***72 hrs***, ***96 hrs***, or ***144 hrs***.	
Strip Printing	*Hole Location*	***none***, ***top***, ***bottom***, ***left***, or ***right***.	
	Report Number	None or unit configured report number.	
Offline Storage		***00:05***, ***00:30***, ***01:00***, ***02:00***, ***04:00***, ***08:00***, or ***12:00***.	
Start Data Storage		***Automatically for all beds***, ***Automatically if listed***, or ***Manual***.	
Bed List		None or unit configured telemetry monitoring device bed numbers.	

FD Page settings

From the Single Viewer menu, select ***Patient Data*** > ***FD Page***, select the Configuration button to display the ***Customize FD Page*** settings.

Item		Options	Settings
Display Setup	*Time Per Line*	***15 seconds***, ***30 seconds***, or ***1 minute***.	
	Zoom Window	***Show*** or ***Hide***.	
Configure Waveforms	*Available*	***I***, ***II***, ***III***, ***V***, ***V1***, ***V2***, ***V3***, ***V4***, ***V5***, ***V6***, ***aVR***, ***aVL***, ***aVF***, ***BP1***, ***BP2***, ***BP3***, ***RESP***, or ***SPO2***.	

Graphic Trends Groups settings

From the Single Viewer menu, select ***Patient Data*** > ***Graphic Trends***, then select the Configuration button to display the following ***Customize Graphic Trends*** settings:

Custom group name:		
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format		
Parameter windows displayed in full-screen format		

Custom group name:		
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format		
Parameter windows displayed in full-screen format		

Custom group name:		
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format		
Parameter windows displayed in full-screen format		

Custom group name:		
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format		

Custom group name:		
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in full-screen format		

Custom group name:		
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format		
Parameter windows displayed in full-screen format		

Custom group name:		
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format		
Parameter windows displayed in full-screen format		

Custom group name:		
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format		
Parameter windows displayed in full-screen format		

Custom group name:		
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format		
Parameter windows displayed in full-screen format		

Custom group name:		
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format		
Parameter windows displayed in full-screen format		

Custom group name:		
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format		
Parameter windows displayed in full-screen format		

Custom group name:		
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format		
Parameter windows displayed in full-screen format		

Custom group name:		
Parameters to display	**Left side of display**	**Right side of display**
Parameter windows displayed in half-screen format		
Parameter windows displayed in full-screen format		

Numeric Trends Groups settings

From the Single Viewer menu, select ***Patient Data*** > ***Numeric Trends***, then select the Configuration button to display ***Customize Numeric Trends*** settings.

Custom group name:					
Parameter display order:					
1.	2.	3.	4.	5.	6.
7.	8.	9.	10.	11.	12.

Custom group name:					
Parameter display order:					
13.	14.	15.	16.	17.	18.
19.	20.	21.	22.	23.	24.
25.	26.	27.	28.	29.	30.
31.	32.				

Custom group name:					
Parameter display order:					
1.	2.	3.	4.	5.	6.
7.	8.	9.	10.	11.	12.
13.	14.	15.	16.	17.	18.
19.	20.	21.	22.	23.	24.
25.	26.	27.	28.	29.	30.
31.	32.				

Custom group name:					
Parameter display order:					
1.	2.	3.	4.	5.	6.
7.	8.	9.	10.	11.	12.
13.	14.	15.	16.	17.	18.
19.	20.	21.	22.	23.	24.
25.	26.	27.	28.	29.	30.
31.	32.				

Custom group name:					
Parameter display order:					
1.	2.	3.	4.	5.	6.
7.	8.	9.	10.	11.	12.
13.	14.	15.	16.	17.	18.
19.	20.	21.	22.	23.	24.
25.	26.	27.	28.	29.	30.
31.	32.				

Custom group name:					
Parameter display order:					
1.	2.	3.	4.	5.	6.
7.	8.	9.	10.	11.	12.
13.	14.	15.	16.	17.	18.
19.	20.	21.	22.	23.	24.

Custom group name:					
Parameter display order:					
25.	26.	27.	28.	29.	30.
31.	32.				

Custom group name:					
Parameter display order:					
1.	2.	3.	4.	5.	6.
7.	8.	9.	10.	11.	12.
13.	14.	15.	16.	17.	18.
19.	20.	21.	22.	23.	24.
25.	26.	27.	28.	29.	30.
31.	32.				

Custom group name:					
Parameter display order:					
1.	2.	3.	4.	5.	6.
7.	8.	9.	10.	11.	12.
13.	14.	15.	16.	17.	18.
19.	20.	21.	22.	23.	24.
25.	26.	27.	28.	29.	30.
31.	32.				

Custom group name:					
Parameter display order:					
1.	2.	3.	4.	5.	6.
7.	8.	9.	10.	11.	12.
13.	14.	15.	16.	17.	18.
19.	20.	21.	22.	23.	24.
25.	26.	27.	28.	29.	30.
31.	32.				

Custom group name:					
Parameter display order:					
1.	2.	3.	4.	5.	6.
7.	8.	9.	10.	11.	12.
13.	14.	15.	16.	17.	18.
19.	20.	21.	22.	23.	24.
25.	26.	27.	28.	29.	30.
31.	32.				

Custom group name:					
Parameter display order:					
1.	2.	3.	4.	5.	6.
7.	8.	9.	10.	11.	12.
13.	14.	15.	16.	17.	18.
19.	20.	21.	22.	23.	24.
25.	26.	27.	28.	29.	30.
31.	32.				

Custom group name:					
Parameter display order:					
1.	2.	3.	4.	5.	6.
7.	8.	9.	10.	11.	12.
13.	14.	15.	16.	17.	18.
19.	20.	21.	22.	23.	24.
25.	26.	27.	28.	29.	30.
31.	32.				

Custom group name:					
Parameter display order:					
1.	2.	3.	4.	5.	6.
7.	8.	9.	10.	11.	12.
13.	14.	15.	16.	17.	18.
19.	20.	21.	22.	23.	24.
25.	26.	27.	28.	29.	30.
31.	32.				

ST Review settings

From the Single Viewer menu, select ***Patient Data*** > ***ST Review***, select the Configuration button to display the following ***Customize ST Review*** settings:

Item		Options	Settings
Parameter 1	***Parameter Name***	***HR***, ***ST-aVF***, ***ST-aVL***, ***ST-aVR***, ***ST-I***, ***ST-II***, ***ST-III***, ***ST-V1***, ***ST-V2***, ***ST-V3***, ***ST-V4***, ***ST-V5***, ***ST-V6*** or ***ST-VM***.	
	Scale	Options depend on the parameter selected. • HR: ***0 - 100***, ***50 - 150***, ***100 - 200***, or ***0 - 300***. • ST-VM: ***0 - 2***, ***0 - 4***, ***0 - 6***, or ***0 - 10***.	

Item		Options	Settings
		• Any other ST parameter: ***-2.0 - 2.0***, ***-4.0 - 4.0***, ***-6.0 - 6.0***, or ***-10.0 - 10.0***.	
Parameter 2	***Follow ST Median***	Enabled or disabled.	
	Parameter Name	***HR***, ***ST-aVF***, ***ST-aVL***, ***ST-aVR***, ***ST-I***, ***ST-II***, ***ST-III***, ***ST-V1***, ***ST-V2***, ***ST-V3***, ***ST-V4***, ***ST-V5***, ***ST-V6***. ***ST-VM***, ***NONE***, or ***Follow ST Median***.	
	Scale	Options depend on the parameter selected. • HR: ***0 - 100***, ***50 - 150***, ***100 - 200***, or ***0 - 300***. • ST-VM: ***0 - 2***, ***0 - 4***, ***0 - 6***, or ***0 - 10***. • Any other ST parameter: ***-2.0 - 2.0***, ***-4.0 - 4.0***, ***-6.0 - 6.0***, or ***-10.0 - 10.0***.	
Waveform Format		***Standard Format (I, II, III, aVR, aVL, aVF, V1-V6)*** or ***Cabrera Format (aVL, I, -aVR, II, aVF, III, V1-V6)***.	

Save As Favorites settings

The Save As Favorites buttons display on the Single Viewer and are used to quickly access frequently used screen formats.

When using only a primary display, up to two buttons can be defined.

Save As Favorites name	
Parameter window displayed in half-screen format	
Events displayed in half-screen format	

Save As Favorites name	
Parameter window displayed in half-screen format	
Events displayed in half-screen format	

When using a secondary display, up to eight buttons can be defined.

Save As Favorites name	
Parameter window displayed in half-screen format (top)	
Parameter window displayed in half-screen format (bottom)	
Events displayed in half-screen format	

Save As Favorites name	
Parameter windows displayed in full-screen format	
Events displayed in full-screen format	

Save As Favorites name	
Parameter window displayed in half-screen format (top)	
Parameter window displayed in half-screen format (bottom)	
Events displayed in half-screen format	
Parameter windows displayed in full-screen format	
Events displayed in full-screen format	

Save As Favorites name	
Parameter window displayed in half-screen format (top)	
Parameter window displayed in half-screen format (bottom)	
Events displayed in half-screen format	
Parameter windows displayed in full-screen format	
Events displayed in full-screen format	

Save As Favorites name	
Parameter window displayed in half-screen format (top)	
Parameter window displayed in half-screen format (bottom)	
Events displayed in half-screen format	
Parameter windows displayed in full-screen format	
Events displayed in full-screen format	

Save As Favorites name	
Parameter window displayed in half-screen format (top)	
Parameter window displayed in half-screen format (bottom)	
Events displayed in half-screen format	
Parameter windows displayed in full-screen format	
Events displayed in full-screen format	

Save As Favorites name	
Parameter window displayed in half-screen format (top)	
Parameter window displayed in half-screen format (bottom)	
Events displayed in half-screen format	

Save As Favorites name	
Parameter windows displayed in full-screen format	
Events displayed in full-screen format	

Save As Favorites name	
Parameter window displayed in half-screen format (top)	
Parameter window displayed in half-screen format (bottom)	
Events displayed in half-screen format	
Parameter windows displayed in full-screen format	
Events displayed in full-screen format	

Save As Favorites name	
Parameter window displayed in half-screen format (top)	
Parameter window displayed in half-screen format (bottom)	
Events displayed in half-screen format	
Parameter windows displayed in full-screen format	
Events displayed in full-screen format	

F

Additional information

Alarm AUDIO PAUSE known issue

ISSUE — The alarm ***AUDIO PAUSE*** button may display on out-of-unit patient Multi-Viewer windows and may not display on in-unit patient Multi-Viewer windows.

DESCRIPTION — This issue may occur when the Multi-Viewer is configured to display monitoring devices from multiple care units and the password-protected central station unit name is changed while actively monitoring patients on the central station.

If the central station unit name is changed while actively monitoring patients on the central station, then the alarm ***AUDIO PAUSE*** button in the patient Multi-Viewer window may display when it should not, and may not display when it should. For the issue to occur, an alarm must exist for the monitoring device in the patient Multi-Viewer window. There are two possible outcomes from this issue:

- In-unit monitoring devices may not display an alarm ***AUDIO PAUSE*** button during alarm conditions, and
- Out-of-unit monitoring devices may incorrectly display an alarm ***AUDIO PAUSE*** button during alarm conditions. Displaying the alarm ***AUDIO PAUSE*** button is not intended for out-of-unit monitoring devices, regardless of whether the monitoring device is in alarm or not. If the alarm ***AUDIO PAUSE*** button is displayed, pressing it has no effect.

WORKAROUND — To resolve this issue, reboot the central station after changing the central station unit name.

For more information, see the technical manual accompanying the central station.

Combination monitoring known issue

ISSUE — If Combination monitoring is established using a central station (primary) that is mirrored by another central station (secondary), then the same Bed Number may display in two separate patient Multi-Viewer windows.

DESCRIPTION — This issue is known to occur on a central station that is being mirrored by other central stations. It requires the mirrored central display to have an admitted telemetry monitoring device displayed in a patient Multi-Viewer window. It also requires that a discharged hardwired bedside monitor with the same name (Bed Number) exists, but does not display in a patient Multi-Viewer window on the mirrored central display.

If an empty patient Multi-Viewer window is available on the mirrored central display and the telemetry monitoring device and the bedside monitor are placed into Combination monitoring from the mirrored central display patient Multi-Viewer

window, both the empty patient Multi-Viewer window and the original patient Multi-Viewer window (displaying the telemetry monitoring device) will display the Combination monitoring bedside monitor.

The mirrored central display will display one empty patient Multi-Viewer window and one Combination monitoring bedside monitor patient Multi-Viewer window. However, the patient Multi-Viewer window displaying the Combination monitoring bedside monitor alternates between displaying patient data and displaying ***NO COMM*** every couple of seconds.

WORKAROUND — To resolve this issue, right-click on the Combination monitoring patient Multi-Viewer window from either the primary central station or a mirrored central display. From ***Select Care Unit then Bed Number***, select ***None***.

The primary central station and the mirrored central display will automatically synchronize the patient Multi-Viewer windows and only one patient Multi-Viewer window will display on both the primary central station and the mirrored central display(s) for the Combination monitoring bedside monitor Bed Number.

To prevent this issue, always establish Combination monitoring from the telemetry monitoring device patient Multi-Viewer window instead of an empty patient Multi-Viewer window.

ST segment deviation values known issue

ISSUE — Some ST segment deviation values that generate an alarm limit violation notification can display incorrect values in the patient Multi-Viewer window parameter numerics area.

DESCRIPTION — This issue occurs when a CARESCAPE Monitor B850 or B650, running software version 1.x and using a PSM acquisition device, detects an ST segment deviation value greater than 12.7 mm or less than -12.6 mm.

WORKAROUND — To resolve this issue, select the appropriate patient Multi-Viewer window. From the Single Viewer menu, select ***Monitor Setup*** > ***ECG*** > ***More ECG Setup*** to display the actual ST segment deviation values for each lead.

Manual Full Disclosure data collection known issue

ISSUE — It is not possible to add Bed Numbers containing spaces to the list used for starting Full Disclosure for the option ***Automatically if listed***.

DESCRIPTION — When a central station is configured to start Full Disclosure data collection Automatically if listed, any Bed Number that includes a space between the bed name and number (e.g., Bed 1 instead of Bed1) cannot be added to the Bed List.

WORKAROUND — To resolve this issue, do not use space characters in the Bed Number or configure Full Disclosure data collection to ***Automatically for all beds*** or ***Manual***.

For more information, see the technical manual accompanying the central station.

G

Glossary

Glossary

Term	Definition
12RL algorithm	An algorithm that mathematically derives ECG leads based on a reduced set of leads (e.g. derived V2, V3, V4 and V6 based on I, II, III, V1 and V5 measured leads from a 6-leadwire ECG cable).
12SL analysis	An algorithm that assists the physician in interpreting and measuring resting 12 lead ECG by providing computer generated measurements and interpretations.
17th patient view	Temporarily display an additional patient that is not currently monitored on the central station in the Single Viewer.
admitted	Patient data available for display on the central station via an monitoring device.
alarm-level defaults	Password protected custom defaults configured by authorized personnel before clinical use. In user mode, the alarm-level defaults display in light, dimmed text and cannot be modified.
Alarm Audio Off Reminder	If the central station ***Volume Current*** is set to 0%, the ***Alarm Audio Off Reminder*** sounds every 120 seconds ± 10 seconds until the alarm condition is resolved or acknowledged. The central station will not sound the ***Alarm Audio Off Reminder*** when ANY of the following conditions are met: • The monitoring device audio alarms are paused. • The telemetry monitoring device ***Alarm Audio On/Off*** is set to ***OFF***. • The telemetry monitoring device ***Alarm Audio On/Off*** is set to ***Alarm Audio Pause - Smart Alarm***. • The bedside monitoring device is configured for use in operating rooms. • The monitoring device ***Alarm Audio Off Reminder*** is set to ***No***.
alarm condition	The monitoring device has determined that a potential or actual hazard exists.

Term	Definition
alarm escalation	The monitoring device increases the priority of an alarm condition or increases the sense of urgency of an alarm signal.
alarm latching	An alarm signal continues to be generated after its triggering event no longer exists until stopped by the user.
alarm limits	Parameter high and low alarm values that result in alarm conditions when the measured physiological value is above or below the defined range.
alarm notification	Audio alarm tones and visual indicators display when an alarm condition is present.
alarm priority levels	The urgency of the required user response or awareness of the situation that triggered the alarm condition.
ADT picklist	Retrieve admit, discharge, and transfer data from a Hospital Information System.
audio alarm notification	Audio alarm tones that correspond to alarm priority levels.
audio alarm pause	A state of limited duration in which the alarm system or part of the alarm system does not generate alarm signals.
audio alarm pause breakthrough	Alarm pause breakthrough allows alarm conditions to break through or interrupt an audio alarm pause when an alarm condition of the configured alarm priority level occurs.
Auto Display	Automatically adjust the patient Multi-Viewer windows.
Bedside monitoring	Monitoring with beside monitors connected directly to the patient. Parameter data is processed by the bedside monitor itself. Patients can be admitted at either the bedside monitor or the central station, as dictated by the institution's policies.
Browser	Provides access web applications, patient data, and repositories on the network.
Calipers	Measures the horizontal (time) and vertical (voltage) distances along waveforms.
caution	A hazardous situation that, if not avoided, could result in minor or moderate injury.
Check Centrals	A utility that checks the central station time zone, IP address, and subnet mask configuration.
Citrix	A utility that allows access to Clinical Information System applications via a Citrix server.
Combo monitoring mode	Both a telemetry monitoring device (i.e. a transmitter) and a bedside monitor acting together to both provide parameter data for a single patient. Combo monitoring mode telemetry monitoring devices should always be admitted at the central station. Combo monitoring mode bedside monitors can be admitted at either the bedside monitor or the central station as dictated by the institution's policies.

Term	Definition
control settings	Non-password protected temporary and patient-specific setting; they apply immediately to the monitoring device and are erased when the patient is discharged. Not all control settings have corresponding custom defaults. When there is no custom default, the control setting initial value is the central station factory preset.
current session	Patient data is being collected, the monitoring device is on the network, and in the admit state.
custom defaults	Specify the initial value for monitoring parameters controlled by the central station. They also include defaults for non-monitoring parameters (e.g. Full Disclosure Print settings). They are persistent and apply to all patients monitored on the central station and are retained when individual patients are discharged.
danger	A hazardous situation that, if not avoided, will result in death or serious injury.
data review tool	Any tool used to display and review stored patient data on the central station, including Graphic Trends, Numeric Trends, Calipers, etc.
Data Sessions	Provides access to historical data as patients move from monitoring devices, across units, and/or post-discharge.
discharged	No patient admitted to a monitoring device.
Environment Monitor	Displays messages when device failures have been detected.
episodic parameters	Parameter data that is user or monitoring device generated (e.g., Non-Invasive Blood Pressure) with a timestamp.
Event Directory	Displays text only event data retrieved from the monitoring device, including event, time and date, alarm priority level, and review state.
Event Marker	Identifies an event manually recorded at a telemetry monitoring device by pressing the Event Marker button. When enabled, audio and visual notification occurs at the central station and automatic printouts occur at the configured printer.
Event Review	Waveform event data selected from the Event Directory to display, review, delete, print, or generate a report.
Factory presets	Specified by the manufacturer and define the initial value for the central station's custom defaults. They cannot be changed.
FD Page	Displays Full Disclosure data for the selected time focus (up to five waveforms per row of data).
FD Strip	Allows review of multiple ten second waveforms of Full Disclosure data on one page.
full-screen format	Only one component (e.g., Multi-Viewer) displays across the entire screen.

Term	Definition
Full Disclosure	Full Disclosure collects patient data from the bedside monitor. The amount of data available per patient is determined by licensing.
Full Disclosure Master	The central station with the latest software version and lowest MC IP address that monitors and controls the Full Disclosure data collection, and monitoring device admit, discharge, and transfer data and rules for the unit.
Graphic Trends	Displays parameter numerics and compressed waveforms over a period of time in graph format, including AFIB trending with select monitoring devices.
half-screen format	The display is split into two; one component displays on the top half of the screen (e.g., Single Viewer), another component displays on the bottom half of the screen (e.g., Graphic Trends).
hazard	A source of potential injury to a person.
in-unit	Monitoring devices that have been assigned the same unit name as this central station.
IEC alarm nomenclature	Alarm notification nomenclature used by monitoring devices that comply with 60601-1-8, an international standard for alarm systems in medical electrical devices and systems.
inactive session	Patient no longer monitored at the central station.
IX network	The network for non-real-time information exchange data, including Full Disclosure data.
Legacy alarm nomenclature	Alarm notification nomenclature used by legacy monitoring devices.
licenses	Enable the standard and specialized features. Installed before clinical use by authorized service personnel.
long audio pause	Audio alarms will not sound for more than two minutes at a time, unless alarm pause breakthrough condition(s) occur or the user cancels or reinstates the audio alarm pause at the monitoring device. Visual alarm indicators continue to display.
MC network	The network for real-time mission critical data.
mirrored central display	When configured to Mirror Central Display before clinical use, a primary central station can have up to two mirrored central displays. The patient Multi-Viewer windows are synchronized between the primary central station and the mirrored central display (e.g., the same monitoring devices are shown in each patient Multi-Viewer window). Making changes on the mirrored central display (e.g., moving patients, admitting patients) also applies to the primary central station. Mirrored central displays provide audio alarm notification.
MultiKM	Allows one mouse and keyboard to control data entry for a configured group of up to eight central stations.
Multi-Viewer	Allows an abbreviated view of all monitoring devices admitted to the central station.

Term	Definition
mutually exclusive	Cannot use more than one options at a time.
non-episodic parameters	Periodic data updated every two seconds (e.g., SPO2).
notice	A hazardous situation not related to personal injury that, if not avoided, could result in property damage.
Numeric Trends	Displays parameter numerics in a tabular format.
out-of-unit	Monitoring devices that have been assigned a different unit name of this central station.
offline storage	The amount of time after which a monitoring device is no longer accessible via the network, causing the Full Disclosure sessions to be moved from active to inactive.
patient identification number	The unique number assigned to a patient, sometimes referred to as medical record number (MRN) or patient ID (PID).
physiological alarm conditions	Alarm conditions are triggered by a patient measurement exceeding the parameter alarm limits or by an arrhythmia condition.
primary display	Standard or touchscreen display used to display the Multi-Viewer. If a secondary display is not used, the Multi-Viewer displays on the top half of the screen and the Single Viewer or one of the data review tools displays on the bottom half of the screen.
prior session	A session for which patient data is no longer being collected. This occurs when the monitoring device goes offline for longer than the offline storage setting or when the monitoring device goes into a discharged state.
Real-time Trend Graph	Displays up to one hour of Graphic Trends for two parameters in the patient Multi-Viewer window, including AFIB trending with select monitoring devices.
remote display	Provide non-interactive access to the same monitoring devices displayed on the primary central station by replicating the video output on up to four additional displays. They do not provide audible alarm notification.
remote services	Back office service that communicates with the remote service agent.
Rover monitoring mode	The patient and an ambulatory bedside monitor rove (move from room to room). Rover monitoring mode patients should be admitted at the bedside monitor, not the central station. However, Rover monitoring mode patients can be viewed at the central station.
Rover Combo monitoring mode	The patient and a stationary or ambulatory bedside monitor or telemetry monitoring device rove. Rover Combo monitoring mode bedside monitor patients should be admitted at the bedside monitor, not the central station. However, Rover Combo monitoring mode bedside monitor patients can be viewed at the central station. Rover Combo monitoring mode telemetry monitoring device should always be admitted at the central station.

Term	Definition
RWHAT	Network directory lookup service used to discover devices and their available services.
RX network	The network for real-time unprocessed telemetry monitoring device data.
Save As Favorites	Shortcut buttons on the Single Viewer used to quickly access frequently used screen formats.
secondary display	Standard or touchscreen display used to show the Single Viewer and data review tools in a half-screen or full-screen format, allowing the primary display to show the Multi-Viewer in full-screen format.
service-level defaults	Password protected custom defaults configured by authorized service personnel before clinical use. In user mode, the service-level defaults display in light, dimmed text and cannot be modified.
short audio pause	Audio alarms will not sound for up to two minutes at a time, unless alarm pause breakthrough condition(s) occur or the user cancels or reinstates the audio alarm pause at the monitoring device. Visual alarm indicators continue to display.
Single Viewer	Displays a detailed view of a single monitoring device.
Smart Alarms	Selecting an alarms off reason establishes an audio alarm pause for up to five minutes in the presence of a valid waveform.
SMART drive	Monitoring system for computer hard disks to detect and report reliability indicators.
ST Review	Displays ST records stored in Full Disclosure.
Standard monitoring mode	The patient and a stationary bedside monitor stay in one room. Standard monitoring mode patients can be admitted at either the bedside monitor or the central station as dictated by the institution's policies.
System Resource Monitor	Displays messages when the central station is experiencing limited or compromised system resources.
technical alarm conditions	Alarm conditions triggered by an electrical, mechanical, or other failures of the system or system component. Technical alarm conditions may also be caused when an algorithm cannot classify or interpret the available data.
Telemetry monitoring	Monitoring with telemetry monitoring devices connected directly to the patient. Parameter data is processed by the telemetry system.
time focus	When parameter data is collected and stored, the historical data is linked to a specific time focus. When viewing an area of interest for one type of patient data, choosing another type of patient data will display for that same time focus.
timestamp	Time and date an episodic parameter value was recorded by the monitoring device.

Term	Definition
Ultra VNC Viewer	Screen sharing interface used to remotely service the central station.
unmonitored	A monitoring device in the same unit as the central station but not admitted to any central station.
user-level defaults	Non-password protected settings any user can configure them. In user mode, the user-level defaults display in dark, undimmed text.
visual alarm notification	Alarm conditions display on the central station in varying colors and locations with or without symbols and/or text messages.
warning	A hazardous situation that, if not avoided, could result in death or serious injury.
Webmin	An internet based application used to configure, troubleshoot, and verify central station functionality.

H

Abbreviations and symbols

Abbreviations

	#
12RL	12 reduced leads
12SL	12 simplified leads
	A
A	amperes
A	automatic
a-vO2	arterial venous oxygen content difference
AaDO2	alveolar arterial oxygen gradient
AAMI	Association of Medical Instrumentation
ABG	arterial blood gas
AC	alternating current
Acc	accelerated
ACI	acceleration index
ADUs	alarm display units
ADT	Admit Discharge Transfer
AF	autoflow
AFIB	atrial fibrillation
AHA	American Heart Association
ANSI	American National Standards Institute
ANT	anterior
APV	airway pressure ventilation
APRV	airway pressure release ventilation
AR	arterial pressure
AR	argon
Arr	arrhythmia
ART	arterial pressure
ASB	assisted spontaneous breathing

AST	assist
ASV	adaptive support ventilation
Auto	automatic
AVG	average
aVF	unipolar limb lead on the left leg in electrocardiography
aVR	unipolar limb lead on the right arm in electrocardiography
aVL	unipolar limb lead on the left arm in electrocardiography

B

BE	base excess of blood
BIPAP	biphasic positive airway pressure
BIS	bispectral index
BP	blood pressure
bpm	beats per minute
BRADY	bradycardia
BS	base
BSA	body surface area
BT	blood temperature
BTU	British thermal unit
BUN	blood urea nitrogen

C

C	celsius
Cal	calibrate
calcs	calculations
CAN	Canadian Standards Association
CaO2	arterial oxygen content
CAT5	category five
CC	Cardiac Calculations
CCI	continuous cardiac index
CCO	continuous cardiac output
CD	compact disc
CDYN	dynamic compliance
CE	European Conformity
CFM	cooling fan mechanical
CI	cardiac index
CIC	CIC Pro Clinical Information Center
CISPR	Special International Committee on Radio Interference
Cl	chloride

cm	centimeter
cm H2O	pressure exerted by water in a graduated column against the pull of gravity (graduation in cm)
CMV	controlled mandatory ventilation
CO	cardiac output
CO2	carbon dioxide
CO2-EXP	expired carbon dioxide
CO2-INSP	inspired carbon dioxide
COMM	communication
COMP	compliance
CONT	continuous
CPAP	continuous positive airway pressure
CPP	cerebral perfusion pressure
CPPV	continuous positive pressure ventilation
CPU	central processing unit
CREA	creatinine
CRG	cardiorespirogram
CRT	cathode ray tube
CSA	Canadian Standards Association
CTRL	control
CV	central venous pressure
CvO2	mixed venous oxygen content
CVP	central venous pressure

D

d	derived
D	diastolic
D	dynamic
dB	decibel
DB9F	serial interface connector (female)
DDR2	double data rate
DDW	direct digital writer
DES	desflurane
dias	diastolic
DISCON	disconnect
dL	deciliter
DO2I	oxygen delivery index
DS	dead space ventilation

DVI	digital video interface
DVI-A	digital video interface (analog)
DVI-D	digital video interface (digital)
DVI-I	digital video interface (integrated)
	E
e	episodic
E	expired
e.g.,	for example
EC	European Commission
ECF BE	base excess extracellular fluid
ECG	electrocardiograph
EEC	European Economic Community
EEG	electroencephalograph
eFUP	environment-friendly user period
EMC	electromagnetic compatibility
EMG	electromyograph
EMI	electromagnetic interference
EMMV	extended mandatory minute ventilation
EN	European Standards
ENF	enflurane
ESD	electrostatic discharge
est	estimated
ET CO2	end-tidal carbon dioxide
etc.	et cetera
EU	European Union
exp/EXP	expired
EXT	extension
	F
F	Fahrenheit
FD	Full Disclosure
FEM	femoral
FEMV	femoral venous
FICKCO	Fick cardiac output
FiO2	fractional inspired oxygen
FLW	flow
FRSH	fresh
ft	feet

G

g	gram
GB	gigabyte
GE	General Electric
GHz	gigahertz
GOST	State Standard of Russia

H

HAL	halothane
Hb	hemoglobin
HCO3	bicarbonate
HCT	hematacrit
HDD	hard disk drive
HE	helium
HF	high frequency
HFV	high frequency ventilation
HI	high
HIS	Hospital Information System
HLD	hold
hr	hour
HR	heart rate
Hz	hertz

I

I	inspired
I	intrinsic
IABP	intra-aortic balloon pump
iCa	ionized calcium
IND	induction
ICG	impedance cardiography
ICP	intracranial pressure
ICU	intensive care unit
ID	identification
i.e.,	that is
IEC	International Electrotechnical Commission
IMV	intermittent mechanical ventilation
in	inches
in/insp/INSP	inspired
IN	inspiration

INF	inferior
IP	internet protocol
IP	invasive pressure
IPPV	intermittent positive pressure ventilation
IPX	water ingression protection rating
ISO	isoflurane
ISTA	International Safe Transit Association
IX	information exchange
	J
J	joules
J	ST measurement point
	K
K	potassium
kg	kilogram
kOhm	kiloohm
kPa	kilopascals
	L
L, LD	lead
L	left
l/L	liter
LA	left arm
LA	left atrial
LAN	local area network
LAT	lateral
lb(s)	pound(s)
LCD	liquid crystal display
LCWI	left cardiac work index
LL	left leg
LO	low
LVET	left ventricular ejection time
LVSWI	left ventricular stroke work index
	M
m	mean
m	mechanical
m	meter
m	module
M/MEAS	measured

MAN	manual
MAP	mean arterial pressure
MAS	master
MAWP	mean airway pressure
max	maximum
MB	megabyte
MC	mission critical
meq	milliequivalents
mg	milligrams
min	minimum
min	minute
mL	milliliter
mm	millimeters
mmHg	millimeters of mercury
mmol	millimoles
MMV	mandatory minute ventilation
MPSO	multiple portable socket outlet
MRI	magnetic resonance image
MRN	medical record number
ms	milliseconds
mV	millivolt
MV	minute volume
mW	milliwatts
	N
n/a	not applicable
Na	Sodium
N2	nitrogen
N2O	nitrous oxide
NBP	non-invasive blood pressure
NICO	non-invasive cardiac output
No.	number
	O
O2	oxygen
O2CI	oxygen consumption index
O2DI	oxygen delivery index
O2R; O2ER	oxygen extraction ratio
OR	operating room

OS	operating system

P

P	pace
PA	pulmonary artery
PaCO2	partial pressure carbon dioxide
PaCO2	arterial carbon dioxide
PAD	pulmonary artery diastolic
PaFiO2	oxygenation ratio
PaO2	partial pressure oxygen; arterial oxygen
PAM	pulmonary artery mean
PAW	pulmonary artery wedge
PBAR	barometric pressure
PC	pressure control
PC	Pulmonary Calculations
PCB	printed circuit board
PCBF	pulmonary capillary blood flow
PCO2	partial pressure of arterial carbon dioxide
PCP	pressure control pressure
PCV	pressure controlled ventilation
PDF	portable document format
PDM	patient data module
PDS	patient data server
PEF	peak expiratory flow
PEP	pre-ejection period
PEEP	positive end expiratory pressure
PEEPi	intrinsic positive end expiratory pressure
PID	patient identification number
PIP	peak inspiratory pressure
PO2	partial pressure of arterial oxygen
POC	point of care
PPLAT	plateau pressure
PPS	positive pressure support
PR	pressure
PR	pulse rate
PRES	ventilator pressure
ppm	parts per million
PRN	writer

PRS	peak to peak pressure setting
PS	pressure support
PT	prothrombin time
PvO2	mixed venous oxygen pressure
PVC	premature ventricular contraction
PVR	pulmonary vascular resistance
PVRI	pulmonary vascular resistance index
	Q
QRS	interval of ventricular depolarization
Qs/Qt	shunt fraction
QT	time interval between the start of the Q wave and the end of the T wave in an ECG waveform
QTc	heart rate-corrected QT interval
QWERTY	most common keyboard layout
QWERTZ	keyboard layout for Central Europe
	R
R	rate
R	right
RA	right arm
RA	right atrial
RAWe	resistance (expiratory)
RES	resistance
RESP	breath rate
RESP	respiration
RF	radio-frequency
RGB	red green blue
RJ-45	registered jack connector
RL	right leg
RM	respiratory mechanics
RR	respiration rate
RS-232	serial connection/interface
RT	rate
RVSWI	right ventricular stroke work index
Rx	prescription
RX	receiver exchange
	S
s	second(s)

s	spontaneous
S	static
S	systolic
SATA	serial advanced technology attachment
SaO2	arterial oxygen saturation
SaO2	oxygen saturation
SB	spontaneous breathing
SDRAM	synchronous dynamic random access memory
sec	second
SENS	sensitivity
SEV	sevoflurane
SET	setting
SFTP	secure file transfer protocol
SI	International System of Units
SIMV	synchronized intermittent mechanical ventilation
SIMVPS	synchronized intermittent mechanical ventilation with pressure support
SLV	slave
SMART	self-monitoring, analysis, and reporting technology
SN	serial number
SP	service pack
SP	special pressure
SPO/SPONT	spontaneous
SPO2	arterial oxygen saturation
SPO2	peripheral oxygen saturation
SPO2	pulse oximetry
SQI	signal quality index
SR	suppression ratio
SSD	solid-state drive
ST	interval of ventricular repolarization
STNBY	stand-by
STR	strength
SV	stroke volume
SVO2	mixed venous oxygen saturation
SVO2	oxygen saturation
SVR	systemic vascular resistance
SVRI	systemic vascular resistance index
Sync/SYNC	synchronized

sys/Sys	systolic

T

T	total
TACHY	tachycardia
Tc/TC	transcutaneous CO2
TCO2	total CO2
TCPL	time-cycle pressure-limited
TEMP	temperature
TP	temperature probe
TFC	thoracic fluid content
tHb	total hemoglobin
TRG	trigger
TTX	telemetry monitoring device identification number
TV	tidal volume
TV	television

U

UA	umbilical artery
UAC	umbilical artery catheter
UK	United Kingdom
UL	Underwriter’s Laboratories, Inc.
UOM	unit of measurement
UPS	uninterrupted power supply
US	United States of America
USB	universal serial bus
UV	umbilical venous
UVC	umbilical venous catheter

V

v/VNT/VENT	ventilator
VENTIL/VENTILN	ventilator
V	ventrical lead
V	version
V	volt
VA	alveolar ventilation
VA	volt-ampere
VAC	voltage in an alternating current
VACI	ventilation assistée contrôlée intermittente (French)
VC	vital capacity

VGA	video graphics array
VFIB	ventricular fibrillation
VI	velocity index
VM	vector magnitude
VNC	virtual network computing
VO2I	oxygen consumption index
VOL	volume
V TACH	ventricular tachycardia

W

w	watts
WOB	work of breathing

Symbols

&	and
@	at
°	degree(s)
>	greater than
≥	greater than or equal to
°	hour(s)
"	inches
+	interface device bed number
+	keyboard keys to select simultaneously
<	less than
≤	less than or equal to
>	menu options to select consecutively
µ	micro
-	minus
*	multiply
-	negative
#	number
/	per
%	percent
+	plus
±	plus or minus
+	positive
√	square root

* telemetry monitoring device bed number
* times

Index

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GE Medical Systems
Information Technologies, Inc.
8200 West Tower Avenue
Milwaukee WI 53223 USA
Tel: + 1 414 355 5000
1 800 558 5120 (US only)
Fax: + 1 414 355 3790

EC REP

GE Medical Systems
Information Technologies GmbH
Munzingerstrasse 5
79111 Freiburg
Germany
Tel: + 49 761 45 43 - 0
Fax: + 49 761 45 43 - 233

Asia Headquarters

GE Medical Systems
Information Technologies Asia; GE (China) Co., Ltd.
No1 Huatuo Road,
Zhangjiang Hi-tech Park Pudong
Shanghai, P.R.China 201203
Tel: + 86 21 5257 4650
Fax: + 86 21 5208 2008

GE Medical Systems *Information Technologies*, Inc., a General Electric Company, doing business as GE Healthcare.
www.gehealthcare.com

CE
0459