GE Healthcare

by anandic

CARESCAPE Patient Data Module

High-acuity mobile patient monitoring

The CARESCAPE* Patient Data Module helps you to transport patients to the right place at the right time so you can deliver a consistent level of care virtually anywhere.

Features

- Helps eliminate the traditional tangle of cables connected to multiple individual monitors by uniting common parameters in one convenient, compact, ergonomically designed unit, allowing better access to the patient in emergency situations and quickly prepare for transport
- With either the CARESCAPE Monitor B450 or the Transport Pro* monitoring device, provides uninterrupted flow of clinical intelligence before, during and after intra-hospital transport
- Powers the Transport Pro device in case of a depleted or missing battery to ensure monitoring continuity
- Refreshes the patient's record with the data collected before and during transport, when reconnected to the network in the new location, eliminating time-consuming ECG template resets and critical data gaps
- Supports patient monitoring in – and between – the highest-acuity clinical environments
- Exceptional parameter set including GE's clinical algorithms, including 12SL* 12-lead ECG, 12RL* derived 12-lead ECG, GE EK-Pro four-lead arrhythmia analysis, GE DINAMAP* SuperSTAT non-invasive blood pressure, and Masimo® SET® or Nellcor® OxiMax® SpO_2

Performance specifications

ECG

Standard leads available	I, II, III, V1 to V6, aVR, aVL, and aVF
Leads analyzed simultaneous	Twelve (I, II, III, V1 to V6, aVR, aVL, and aVF)
Lead fail	Identifies failed electrodes and switches to those intact
Lead fail sensing current	Active electrodes: < 30 nA each, referenced electrode < 270 nA
Gain selections	0.5x = 5 mm/mV
	1x = 10 mm/mV
	2x = 20 mm/mV
	4x = 40 mm/mV

Display bandwidth

Diagnostic	0.05 to 100 Hz
Monitoring	0.05 to 32 Hz (with 50 Hz powerline frequency)
	0.05 to 40 Hz (with 60 Hz powerline frequency)
Moderate	0.05 to 22 Hz
Maximum	5 to 25 Hz
ECG diagnostic (12SL) analysis signal bandwidth	0.05 to 150 Hz
Differential offset voltage	±1 V

Input impedance

Common mode	> 10 M Ω at 50/60 Hz
Differential	> 2.5 M Ω from dc to 60 Hz
Maximum tall t-wave rejection capability	For a 1 mV QRS test signal is 1.5 mV
Overall system error	Less than ±5%; using the method described in AAMI EC11 3.2.7.1
Leadwire supported	3-, 5-, 6-, and 10-leadwire
Input voltage range for pace detection and rejection	±2 mV to ±700 mV
Pacemaker marker	5 V, 2 ms pulse; summed with the ECG analog output
Defibrillator sync delay	< 35 ms
Defibrillation protection	5000 V, 360 J

Analog output

ECG signal output	1 V/1 mV
ECG signal bandwidth	0.05 to 100 Hz
ECG analog output delay	< 35 ms

Input specification

QRS detection range	±0.5 mV to ±5 mV
Signal width	40 ms to 120 ms (Q to S)
Heart rate range	30 to 300 beats per minute
Common mode rejection	90 dB minimum at 60 Hz
Gain accuracy	±5% (diagnostic mode)
Linearity deviation	±5%
Noise	< 30 µV (referred to input)

Sampling rate

Monitoring mode	240 samples/second
Diagnostic mode	500 samples/second

Heart rate

The ECG heart rate indicates a new heart rate for a simulated step increase of 80 to 120 bpm in less than 8.6s (range 7.9 to 9.5s), and a step decrease of 80 to 40 bpm in less than 9.8s (range .2 to 11.2s).

Heart rate calculation operates with irregular rhythms of ANSI/AAMI EC13 4.1.2.1e as follows:

a): 80 bpm

b): 60 bpm

c): 120 bpm

d): 87 bpm

Heart rate is computed by converting the total time duration of the most recent 4 or 8 RR intervals into an equivalent heart rate.

Heart rate averaging	8/4 beats
Display update interval	< 2 seconds
Response time	< 6 seconds
Heart rate alarm range	0 to 300 beats/minute, high limit > low limit

NOTE: All specifications are relevant to both Solar and CARESCAPE modular monitors, unless otherwise noted.

PVC range

Solar	1 to 100 PVCs/minute
CARESCAPE modular monitor	0 to 300 PVCs/minute
Method	QRS morphology classification and timing based on single or multiple-lead analysis
Arrhythmia calls	Full, lethal only, or no arrhythmia
PVC rate resolution	1 PVC/minute

ST segment analysis

Measurement description	ST segment deviation is measured and displayed for all acquired leads
ST display	Lead label, ST deviation, current complex superimposed over a reference complex, J-point indicator and 15-minute mini-trends are shown for all acquired leads
Measurement point	Measured at user-selectable measurement points (0, 30, 40, 50, 60, and 80 ms) following the J-point
Measurement range	-12.0 mm to 12.0 mm
Display resolution	0.1 mm
ST measurement	16 beats averaging
ST alarm limits	±12mm, high limit > low limit, for any event within a lead group (inferior, lateral, or anterior) that exceeds the alarm limit for that group

Pace detection/rejection

Input voltage range	±2 mV to ±700 mV
Input pulse width:	0.1 ms to 2 ms
Rise time	0 µs to 100 µs
Over/under shoot	Overshoot measured using Method A of AAMI EC13 4.1.4.2
Detection/rejection mode	Pacemaker artifact rejection "On" or 'Off'
Standard leads available	I, II, RL, LL
Accuracy	±1% or ±1 bpm, whichever is greater
Resolution	1 bpm
Sensitivity	≥ 0.5 mV peak
ST numeric accuracy	±0.3 mm or 20%, whichever is greater
QT numeric range	100 to 900 ms
QT numeric accuracy	±30 ms
QT numeric resolution	1 ms
QTc numeric range	100 to 900 ms
QTc numeric resolution	1 ms

Respiration

Respiration range limit	1 to 200 breaths/minute

Input impedance range

Dynamic	0.4 to 10 Ω
Static	100 to 1500 Ω @52.7 kHz
Respiration rate alarm range	1 to 200 breaths/minute
No Breath alarm range	3 to 30 seconds

Impedance respiration measurement

Accuracy	±1 breath/minute over the range of 0 to 120 breaths per minute
	±3 breaths/minute over the range of 121 to 200 breaths per minute
Impedance respiration update interval	1s

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Temperature

Number of channels	up to 2 (with Y-adapter cable)

Input specifications

Probe type	Series 400 or 700 (determined by input cable)
Temperature range	0°C to 45°C (32°F to 113°F)
Resolution	±0.1°C (±0.1°F)

Output specifications

Parameters displayed	T1, T2
Accuracy (independent of source)	±0.1°C (±0.2°F) for series 400 probes ±0.3°C (±0.5°F) for series 700 probes
Alarms	User-selectable upper and lower limits
Test measurement cycle	Every minute

Invasive pressures

Number of channels	Up to 4 (with appropriate cables)

Transducer sites, site name, and displayed values

Arterial (ART)	Systolic, diastolic, mean and rate
Femoral (FEM)	Systolic, diastolic, mean and rate
Pulmonary artery (PA)	Systolic, diastolic, mean
Central venous pressure (CVP)	Mean
Left atrial (LA)	Mean
Right atrial (RA)	Mean
Intracranial pressure (ICP)	Mean
Umbilical artery (UAC)	Systolic, diastolic, mean, and rate
Umbilical vein (UVC)	Mean
Special pressure (SP)	Mean

Transducer requirements

Excitation voltage	+2.5 V DC ±0.1%
Transducer output	5µV/V/mmHg

Input specifications range

Solar	-25 mmHg to 349 mmHg
CARESCAPE modular monitors	-98 mmHg to 349 mmHg

Output specifications

Displayed frequency response	0 to 12 Hz or 0 to 40 Hz (-3dB) user-selectable
Zero balance range	±150 mmHg (±20.0 kPa)
Zero balance accuracy	±1 mmHg (±0.1 kPa)
Accuracy	±2% or ±1 mmHg, whichever is greater (exclusive of transducer) ±2% or ±2 bpm, whichever is greater
Sweep speed options	6.25, 12.5, 25, and 50 mm/s
Pulse rate display resolution	1 bpm
Pulse rate range	30 to 300 bpm
Display scale selections	0-30, 0-40, 0-60, 0-100, 0-160, 0-200, 0-300 mmHg (0.0-2.0, to 0.0-40.0 kPa, with a step size of 2.0 kPa)
Alarms	User selectable upper and lower limits for systolic, diastolic, and mean pressures
Alarm range	-99 to 350 mmHg

Analog output

Invasive pressure output	1V/100 mmHg
Invasive pressure analog output delay	< 35 ms

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Non-invasive blood pressure

Measurement technique	Oscillometric
Displayed parameters	Systolic, diastolic, and mean pressures, pulse rate, time of last measurement
Modes	Manual, Auto and Stat

Heart rate detection

Adult and Pediatric	30 to 240 beats/min
Neonate	30 to 240 beats/min
Total cycle time	20 to 40 seconds typical (Dependent on heart rate and motion artifact)

Systolic pressure range

Adult	30 to 290 mmHg (4.0 to 38.7 kPa)
Pediatric	30 to 240 mmHg (4.0 to 32.0 kPa)
Neonatal	30 to 140 mmHg (4.0 to 18.7 kPa)

Diastolic pressure range

Adult	10 to 220 mmHg (1.3 to 29.3 kPa)
Pediatric	10 to 200 mmHg (1.3 to 26.7 kPa)
Neonatal	10 to 110 mmHg (1.3 to 14.7 kPa)

Mean pressure range

Adult	20 to 260 mmHg (2.7 to 34.7 kPa)
Pediatric	20 to 215 mmHg (2.7 to 28.7 kPa)
Neonatal	20 to 125 mmHg (2.7 to 16.7 kPa)

Cuff pressure range

Adult	0 to 290 mmHg
Pediatric	0 to 250 mmHg
Neonatal	0 to 145 mmHg

Pressure accuracy

Static	±2% or ±3 mmHg (0.4 kPa), whichever is greater
Clinical	±5 mmHg (0.7 kPa) average error, 8 mmHg (1.1 kPa) standard deviation
Auto zero	Zero pressure reference prior to each cuff inflation
Tubing length	Variable
Automatic cuff deflation	Cycle time exceeding 2 minutes (85 seconds neonatal), power off, or cuff pressure exceeds
Adult	290 ±6 mmHg (38.7 ±0.8 kPa)
Pediatric	250 ±5 mmHg (33.3 ±0.7 kPa)
Neonatal	145 ±5 mmHg (19.3 ±0.7 kPa)

Cuff sizes

Disposable	Large adult, adult, small adult, pediatric, child, and neonatal
Reusable	Adult thigh, large adult, adult, small adult, small adult/child, child, and infant
Alarms	User selectable upper and lower limits for systolic, diastolic, and mean pressures

Maximum inflation pressures

Adult/pediatric	315 ±5 mmHg (42.0 ±0.7 kPa)
Infant	157 ±5 mmHg (20.9 ±0.7 kPa)

Automatic cycle times

1 min, 2 min, 2.5 min, 3 min, 4 min, 5 min,

10 min, 15 min, 20 min, 30 min, 1 h, 2 h and 4 h

Default NIBP measurement initial inflation pressures

Adult	135 mmHg (18.0 kPa)
Pediatric	125 mmHg (16.7 kPa)
Infant	100 mmHg (13.3 kPa)

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Pulse oximetry

Display resolution	1 digit (% of SpO_2)
Peripheral pulse rate resolution	1 bpm
Display update period	Less than 30s
Sweep speed options	6.25, 12.5, 25, and 50 mm/s
Waveform scale options	1x, 2x, 4x, and 8x

Wavelength of SpO_2 probe LEDs using Masimo

LNOP and LNCS sensors	
Infrared LED	905 nm
Red	660 nm
LNOP and LNCS tip clips	
Infrared LED	880 nm
Red	653 nm
LNOP and LNCS TF-I	
Infrared LED	880 nm
Red	660 nm

Wavelength of SpO_2 probe LEDs using Nellcor

Infrared LED	900 nm
Red	660 nm
Parameters monitored	Arterial oxygen saturation (SpO_2) and pulse rate
Probe types	Masimo (reusable/single use) Nellcor (reusable/single use)
Masimo range	SpO_2: 1 to 100% Pulse Rate: 25 to 240 beats per minute
Nellcor range	SpO_2: 1 to 100% Pulse rate: 20 to 300 beats per minute

Masimo accuracy[1]

Without motion	SpO_2 (70% to 100%): ±2 Adult, ±3 Neonatal SpO_2 (< 70%): Unspecified
With motion	SpO_2 (70% to 100%): ±3 Adult, ±3 Neonatal SpO_2 (< 70%): Unspecified
Low perfusion	SpO_2 (70% to 100%): ±2 Adult, ±3 Neonatal SpO_2 (< 70%): Unspecified

Nellcor accuracy[1]

With/without motion	SpO_2 (70% to 100%): ±2 Adult, ±2 Neonatal SpO_2 (60% to 80%): ±3 Adult, ±3 Neonatal SpO_2 (< 60%): Unspecified
Low perfusion	SpO_2 (70% to 100%): ±2 Adult, ±2 Neonatal SpO_2 (< 70%): Unspecified
Messages	No Sensor, Defective Sensor, Sensor Off, Unrecognized Sensor, Low Perfusion, Pulse Search, Interference Detected, Ambient Light, Low Signal IQ
Nellcor	Probe off patient, low quality, pulse search

(1) Refer to Probe Manufacturer's specifications for probe accuracy statement.

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Cardiac output

Method	Thermodilution
Cardiac output range	0.2 to 15 liters per minute
Blood temperature range	17°C to 42°C (62.6°F to 107.6°F)
Blood temperature accuracy	±0.5°C (0.9°F): BT 17°C to 30°C (62.6°F to 86.0°F)
	±0.2°C (0.4°F): BT30°C to 42°C (86.0°F to 107.6°F)
Injectate temperature range	0°C to 30°C (32°F to 86°F)
Injectate temperature accuracy	±0.3°C (±0.6°F)
Blood temperature display resolution	0.1°C (0.1°F)
Output parameters	Cardiac output, blood temperature, injectate temperature, real-time cardiac output washout curve, last average CO

Cardiac output review accept/reject individual measurements and store average

Catheter sizes	5, 6, 7, 7.5, or 8 French
Injectate volume selections	3, 5, or 10

Environmental specifications

Operating conditions

Heat dissipation	15.36 BTU/hour
Temperature	10°C to 35°C (50°F to 95°F)
Relative humidity	15% to 95% (non-condensing)

Storage conditions

Temperature	-40°C to 60°C (-40°F to 140°F)
Relative humidity	15% to 95% (non-condensing)

Power specifications

Cooling	Natural convection

Batteries

Type	Removable lithium ion
Quantity	One
Voltage	11.1 Volt (nominal)
Capacity	1.8 Amp hour (nominal)
Charge time	Approximately 2.5 hours
Run time	Approximately 1.5 hours (new, fully charged)
Battery Life	300 cycles to 60% capacity

Physical specifications

Dimensions (H x W x D)	7.0 x 14.6 x 21.6 cm (2.75 x 5.75 x 8.5 in)
Weight	1.1 kg (2.4 lb) without battery 1.3 kg (2.9 lb) with battery

Warranty

One year

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About GE Healthcare

GE Healthcare provides transformational medical technologies and services that are shaping a new age of patient care. Our broad expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, drug discovery, biopharmaceutical manufacturing technologies, performance improvement and performance solutions services help our customers to deliver better care to more people around the world at a lower cost. In addition, we partner with healthcare leaders, striving to leverage the global policy change necessary to implement a successful shift to sustainable healthcare systems.

Our "healthymagination" vision for the future invites the world to join us on our journey as we continuously develop innovations focused on reducing costs, increasing access and improving quality around the world. Headquartered in the United Kingdom, GE Healthcare is a unit of General Electric Company (NYSE: GE). Worldwide, GE Healthcare employees are committed to serving healthcare professionals and their patients in more than 100 countries. For more information about GE Healthcare, visit our website at www.gehealthcare.com.

imagination at work

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