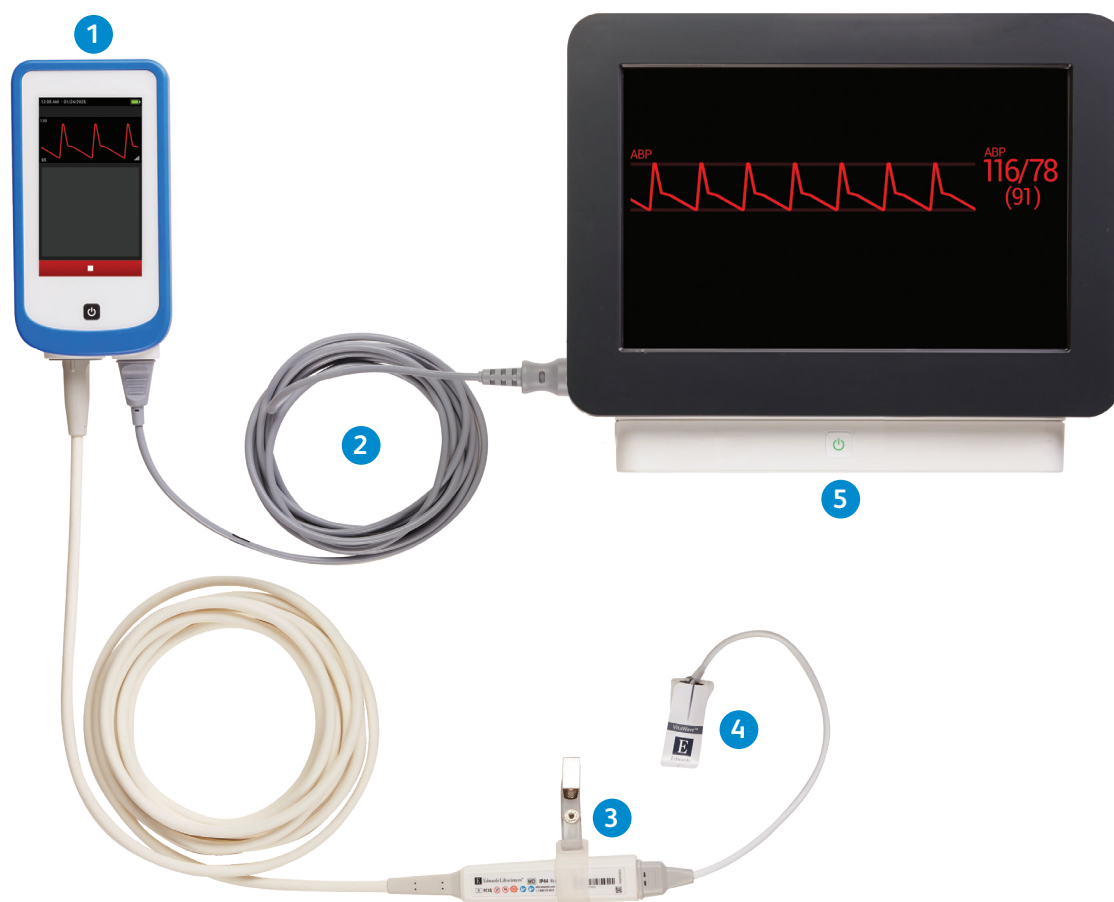


HemoSphere Stream™ Module Technology Overview

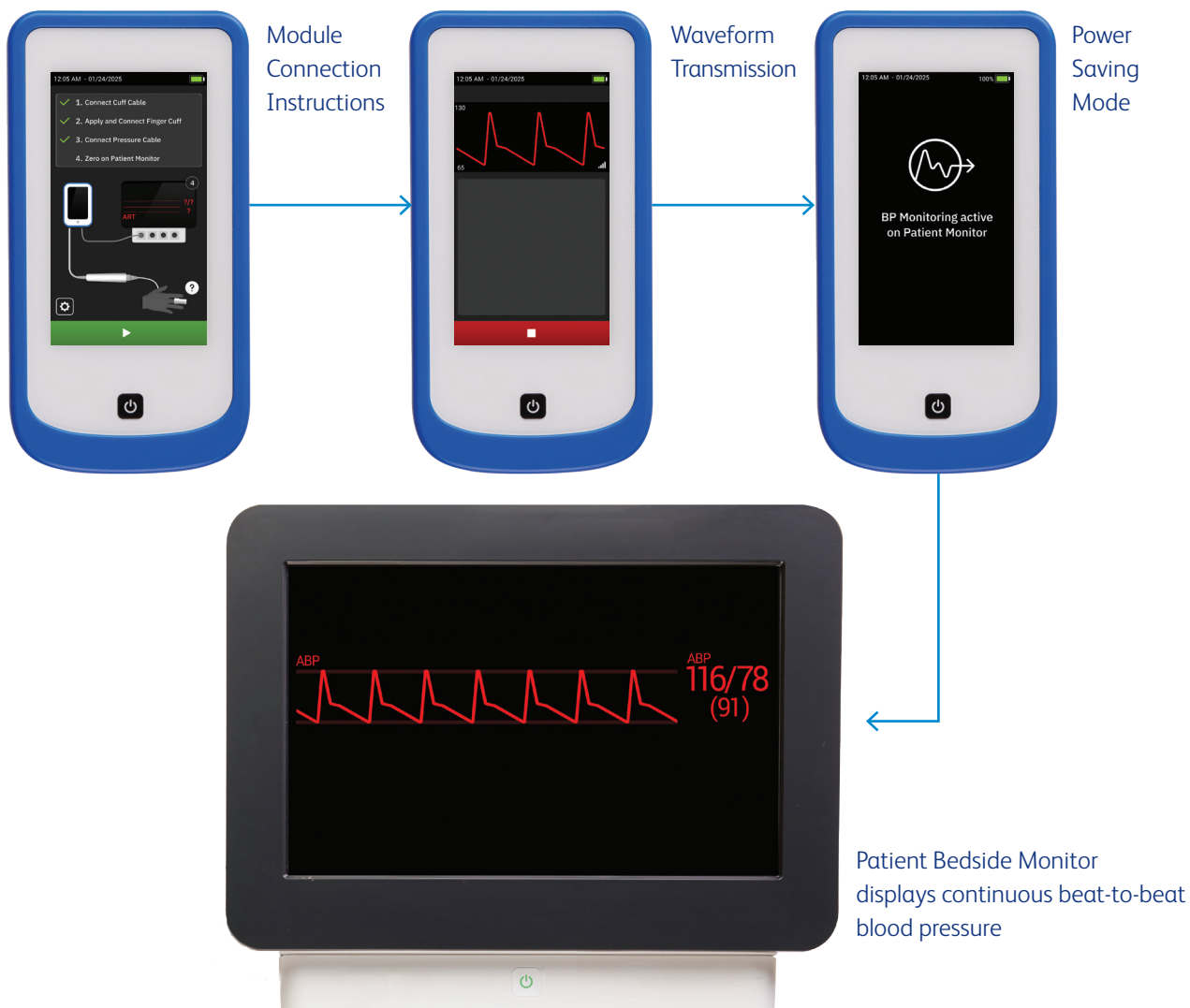
Technology Specifications

Experience noninvasive arterial pressure waveform monitoring with the HemoSphere Stream™ Module, designed for seamless integration with compatible bedside patient monitors. Utilizing the Smart Pressure Controller and VitaWave Plus™ Finger Cuff, the compact module provides real-time waveform data without the need for invasive catheters. This waveform data is then processed by the compatible bedside monitor to generate blood pressure measurements, enabling clinicians to make timely and informed decisions.



- 1 HemoSphere Stream™ Module
- 2 Compatible pressure-out to patient monitor
- 3 Smart pressure controller
- 4 VitaWave Plus™ Finger Cuff
- 5 Patient monitor

HemoSphere Stream™ Module Screens



Compatible Products

- (VWCA2) VitaWave Plus™ Cuff or (AIQCA2) Acumen IQ Plus™ Cuff
- (PC1Q) Smart Pressure Controller
- (HEMSTRM10) HemoSphere Stream™ Module
- Pressure cable compatible with bedside patient monitor
- Compatible bedside patient monitor

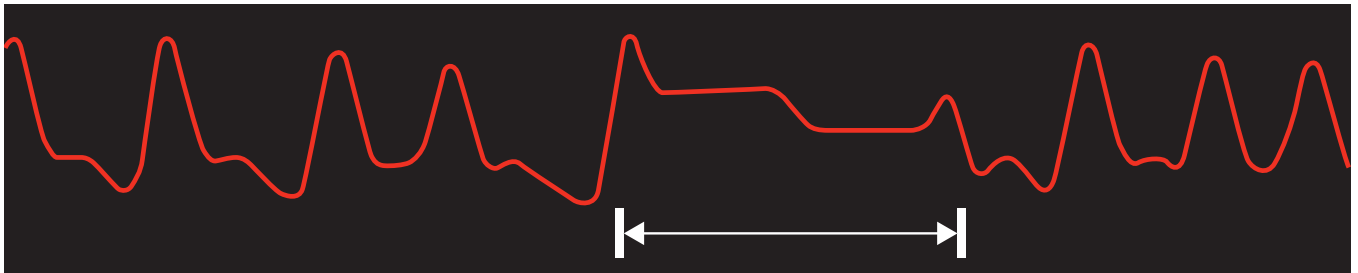
Noninvasive Finger Cuff Technology

Volume Clamp Method

The VitaWave™ Plus Finger Cuffs use the Volume Clamp method developed by Czech physiologist J. Peñáz (Penaz J 1973)¹. The finger cuff is equipped with a plethysmograph sensor, which is a combination of a light source and light receiver, to continuously monitor changes in finger arterial blood volume. An inflatable bladder within the cuff rapidly adjusts to this change in volume to equilibrate the pressure of the cuff with the pressure inside of the artery. The artery is therefore clamped at its “un-stretched” volume and the pressure of the cuff is equal to that of the finger arterial pressure at all times.



Physiocal™ Method



The Physiocal™ Method, developed by K.H. Wesseling (K.H. Wesseling et al. 1995)², is short for physiological Calibration. The Physiocal™ Method adjusts for changes in the “un-stretched” volume during a normal measurement period. Cuff pressure is kept constant for one or more heart beats and blood pressure measurement is momentarily interrupted to observe the physiological properties of the finger artery. Early in the measurement period, these interruptions occur regularly. If the properties of the artery are sufficiently constant over time, the interval between Physiocal™ Method adjustments will be increased up to 70 heart beats, with higher intervals representing increased measurement stability.

Waveform Reconstruction and Hemodynamic Analysis

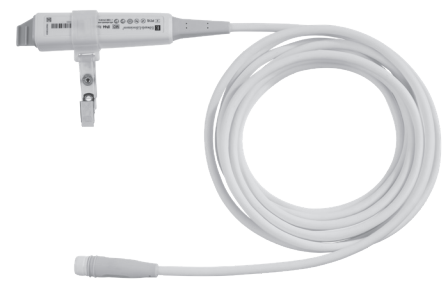
The arterial blood pressure waveform is known to change between the arm and finger arteries due to physiological reasons. Non-invasive finger cuff technology uses advanced processing methods to reconstruct the finger pressure waveform into a radial arterial pressure waveform.

Methodology References

- 1 Penaz J (1973), “Photoelectric measurement of blood pressure, volume and flow in the finger” *Digest of the 10th Int Conf Med Biol Engng*, Dresden, p. 104.
- 2 Wesseling KH, et al. (1995), “Physiocal, calibration finger vascular physiology for Finapres” *Homeostasis* 36 (23), pp. 67-82.

Smart Pressure Controller (PC1Q) Technology

The Smart Pressure Controller (model PC1Q) uses heart reference software to automatically calculate the vertical height difference, also referred to as the offset between the monitored finger relative to the heart. This is to ensure blood pressure measurements are at heart level.



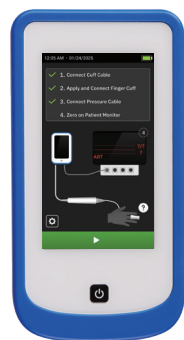
Smart Pressure Controller Physical Characteristics

Smart pressure controller		
Weight	Housing	Approximately 0.7 lbs (0.32 kg)
Dimensions	Cable length	14.8 ± 0.2 ft (4.5 ± 0.06 m)
Ingress protection	IP44	
Applied part classification	Type BF defibrillation proof	

HemoSphere Stream™ Module Specifications

Module Physical and Mechanical Characteristics

HemoSphere Stream™ Module		
Weight (with clip)	2.54 lbs (1.15 kg)	
Dimensions (with clip)	Height	8.1 in (206 mm)
	Width	4.3 in (109 mm)
	Depth	4.1 in (104 mm)
Ingress protection	IPX2	
Applied Part Classification	Type BF Defibrillation Proof	
Display	Active Area	5.0 in diagonal (127mm)
	Resolution	1280 x 720
Operating system	Linux	
Buzzer Count	Count 1	



HemoSphere Stream™ Module Specifications

Module Environmental Specifications

Environmental specification	Value	
Temperature	Operational	10 to 37 °C
	Non-operational/storage*	-18 to 45 °C
Relative humidity	Operational	20 to 85% non-condensing
	Non-operational/storage	20 to 90% non-condensing
Altitude (Pressure)	Operational	701 hPa to 1074 hPa

* Note: Battery capacity starts to degrade with extended exposure above 35 °C

Module Technical Characteristics

Input/Output	
Touch screen	Projective capacitive touch
USB port	One USB-C
Pressure output	
DPT pressure out signal from non-invasive finger cuff technology is compatible with monitors and accessories intended to interface with non-invasive pressure signal	
Post-zero minimum patient monitor display range	0 mmHg to 300 mmHg
Sensitivity	5µV/V/mmHg
Excitation Frequency	DC to 5,000 Hz
Excitation Impedance	545 ohms ± 1%
Signal Impedance	290 ohms ± 10%
Electrical	
Rated supply voltage	100 to 240 Vac; 50/60 Hz
Rated input	1.5 to 2.0 Amps
Fuses	T 2.5AH, 250V; High breaking capacity; Ceramic
Alarm	
Sound pressure level	45 to 85 dB(A)
Battery	
Model	RRC2037
Capacity*	30 minutes

* Note: This represents approximate run time with the system when using a fully charged battery. Contact your local sales representative if there are any technical issues with the battery.

CAUTION: Federal (United States) law restricts these devices to sale by or on the order of a physician. See instructions for use for full prescribing information, including indications, contraindications, warnings, precautions and adverse events.

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