i·sens

Electrolyte analyzer i-Smart 30

Overview

i-SENS'electrolyte analyzer, i-Smart 30 uses 60 $\mu\ell$ of blood sample to measure ions such as Na+, K+, Cl- and hematocrit automatically. Unlike other competitors' products, our electrolyte analyzer is the world's only multi-usable cartridge-based electrolyte analyzer that satisfies today's medical environment and customer's needs with the advanced IT and sensor technologies.

### Electrolyte analyzer with the latest IT Technology

The electrolyte uses whole blood, serum and plasma to yield the result in 60 seconds with direct ISE measurement system. The result will appear on screen and can be printed out. It is easy to use with 7 inch color touch screen and voice assistance. In addition, i-Smart 30 electrolyte analyzer is a small device with attached handle and rechargeable built-in batteries so it can be moved to the places where Point Of Care Testing is needed such as health screening and emergency diagnosis room, intensive care unit at the hospitals. The Windows® XP Embedded OS based device offers powerful features of Windows operating system as well as connectivity, stability and reliability. Result management is very easy to use because of database feature that can store more than 300,000 results. Data can be downloaded via USB data storage devices and software upgrade is convenient.

The world's first all-in-one electrolyte analyzer cartridge

The state-of-art technology is used to manufacture multi-usable cartridges for the electrolyte analyzer. Cartridges are all-in-one product. All consumable parts such as reagent, electrode, valve, tubing, sampler and especially waste bagare enclosed within a cartridge. Users are protected from the secondary infections because samplers are cleaned automatically and cartridges can be removed after

use or expiration date. Therefore, electrolyte analyzer maintenance is easy. Except regular cartridge change, replacing reagents or other consumable part is not needed.

Moreover, the cost for electrolyte analyzer maintenance is already included in cartridge so no additional cost (deprotienization reagent, cleaning solution, electrode conditioning solution, and wiper) would incur. Unlike other competitors' products, reagents will not be wasted because of automatic reagent replacement. No regular cost for electrode is incurred and a user can easily predict the time to replace cartridges. Therefore, inventory control for consumable parts is convenient. In addition, cartridges are manufactured to meet the demand for low, medium, high test volume at each hospital so users can choose cartridges suitable for their need.
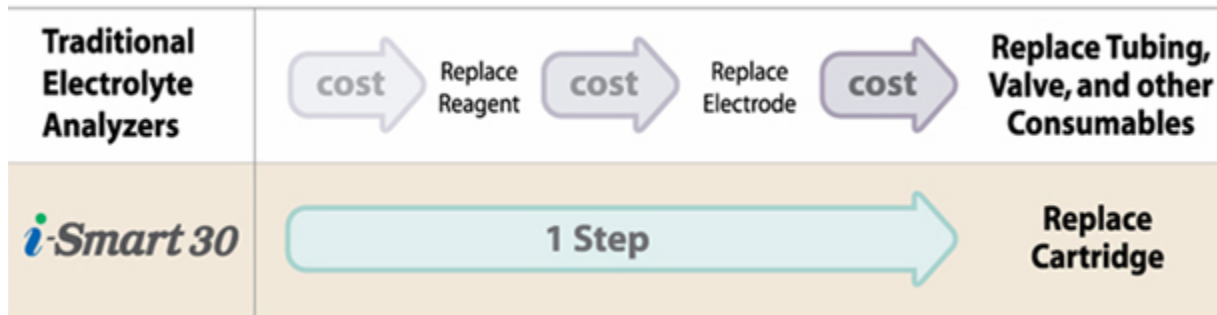
Features and Benefits

- Easy-to-use touch screen menu on color LCD and graphic user interface
- Pop-ups and voice assistance service for user guide: convenient feature to minimize user mistakes
- Stable Windows® XP Embedded based operating system
- More than 300,000 data storage and search features
- Automatic data transmission to hospital systems (HIS/LIS)
- USB port to download data and upgrade operating software
- Rechargeable battery that can work without external power for two hours
- Compact design: easy to fit in small or jam-packed laboratories
- Light-weight (5.5 kg) device ideal for any POCT area in the hospitals and doctor's office
- Fast time to result with only 60 $\mu\ell$ of sample volume in 60 seconds
- Cartridge contains electrodes, reagents, tubings and waste bag
- Minimal maintenance and reduced labor
- Reduce cost through simple inventory control
- Easy inventory control: user can predict the time to replace cartridges
- Reduced time from simplified A/S
- No additional cost for maintenance
- No wasted reagents by calibration process
- Cartridge designed to minimize likelihood of secondary infection for users
- Long shelf life (room temperature, 12 months)

Technical specifications

Measured Parameters

Parameter	Unit	Measuring Range	Resolution
Na+	mmol/L	20~250	1
K+	mmol/L	0.5~20.0	0.1
Cl-	mmol/L	20~250	1
Hct	%	10~60	1

Operating Parameters

Sample type	Whole blood, Plasma, Serum
Sample volume	60 $\mu\ell$
Sample introduction	Aspiration
Sample container	Syringe, Capillary
Time to analysis	60 seconds
Measuring temperature	37 ± 0.2 ℃
Measuring principle	Electrochemistry (Direct ISE)
Calibration	Automatic or on demand
Temperature	15 ~ 35 ℃
Relative humidity	5 ~ 85%

Cartridge

Sample No. / Onboard lifetime	50 samples / 2 weeks, 100 samples / 2 weeks
	150 samples / 2 weeks, 200 samples / 2 weeks
	300 samples / 1 week

Dimensions / Weight	138 mm (H) x 139 mm (W) x 80 mm (D) / 0.8 kg
Storage condition	10~30 ℃
Shelf life	12 months

Instrument

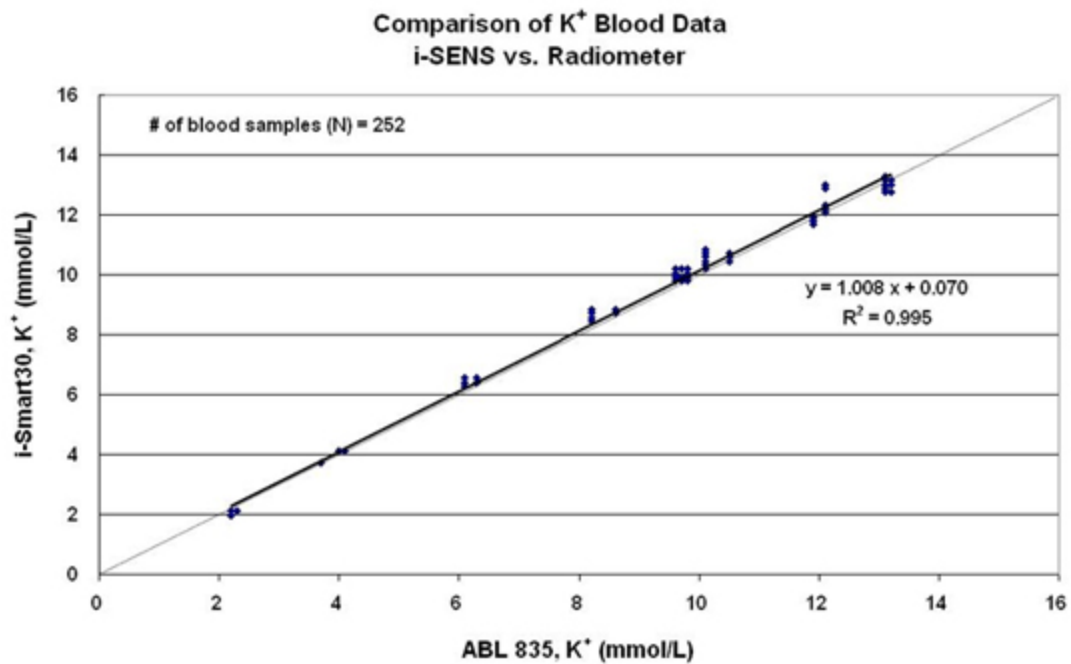| Computer	1GHz Process, 1GByte RAM, 4GByte Flash Memory
Operating system	Microsoft Windows® XP Embedded
Display	7 inch TFT LCD, Touch screen
Printer	Thermal, 2 inch width paper
Interface	Barcode scanner (USB type)
Communication port	USB (3 port), Serial port (RS-232), LAN (RJ45 Ethernet)
Dimensions / Weight	292 mm (H) x 256 mm (W) x 177 mm (D) / 5.5 kg

Power requirement

Voltage / Frequency	100~240 VAC / 47~63 Hz
Power adapter	Offer a medical AC-DC power supply (Output: DC 24 V, 2.7 A)
Battery operation	Max. up to 2 hours (rechargeable Li ion battery)

Clinical performance

Comparison of Na+ Blood Data

Comparison of Na$^+$ Blood Data
i-SENS vs. Radiometer

# of blood samples (N) = 252

$y = 0.979 x + 3.984$
$R^2 = 0.998$

i-Smart30, Na$^+$ (mmol/L)

ABL 835, Na$^+$ (mmol/L)
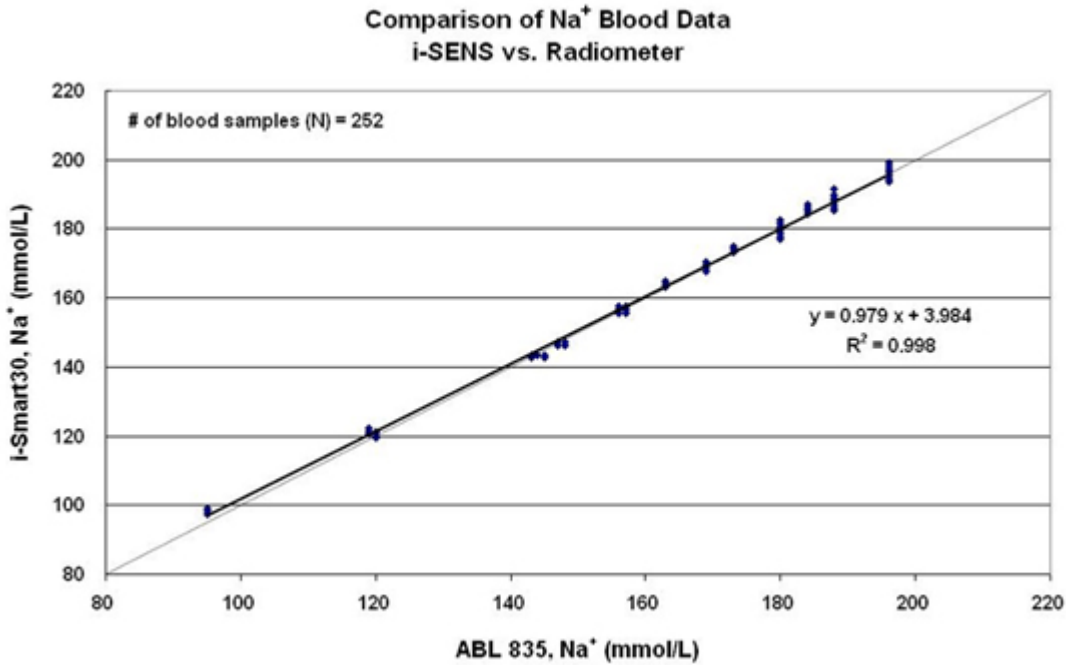
Comparison of K+ Blood Data

Comparison of K$^+$ Blood Data
i-SENS vs. Radiometer

# of blood samples (N) = 252

$y = 1.008 x + 0.070$
$R^2 = 0.995$

i-Smart30, K$^+$ (mmol/L)

ABL 835, K$^+$ (mmol/L)

Comparison of Cl- Blood Data

Comparison of Cl⁻ Blood Data
i-SENS vs. Radiometer

# of blood samples (N) = 252

$y = 1.007 x - 1.115$
$R^2 = 0.999$

i-Smart30, Cl⁻ (mmol/L)

ABL 835, Cl⁻ (mmol/L)
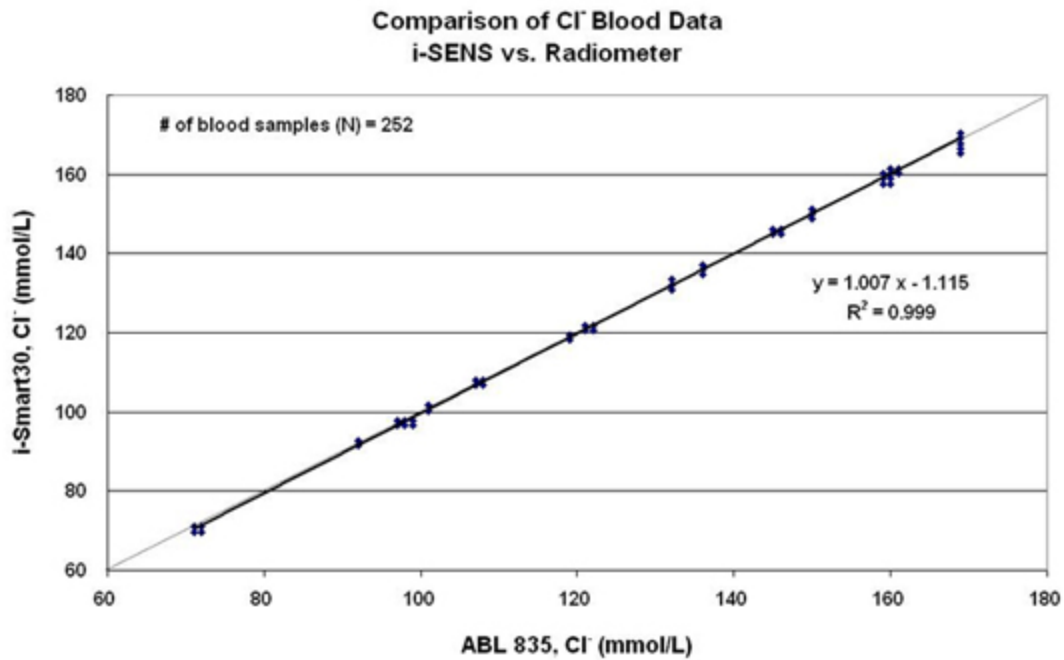
Comparison of Hct Blood Data

Whole Blood Correlation for Hematocrit
i-SENS vs. Spun Hematocrit

# of blood samples (N) = 142

$y = 0.990x + 0.357$
$R^2 = 0.990$

i-Smart30, Hct (%)

Spun Hematocrit (%)