CNAP® OEM Module – Product overview

CNSystems’ CNAP® OEM Module enables continuous, noninvasive monitoring of blood pressure, cardiac output and derived parameters as well as dynamic fluid parameters with a simple double finger sensor. Full integration into patient monitoring systems and other medical devices is easy due to a serial interface and low power consumption.

CNAP® technology

CNAP® (Continuous Noninvasive Arterial Pressure) combines the vascular unloading technique with our new VERIFI method for long-term stability.

A double finger sensor provides continuous readings of arterial blood pressure with a quality comparable to an invasive arterial line. Each finger sensor is equipped with an air cushion and a light sensor for signal generation and uses an integrated chip for clone protection and for controlling lifetime depending on quality requirements and business model.

Calibration to heart level can be achieved using a “gold standard” upper arm cuff, which is usually the existing NBP of the host device.

Cardiac output and dynamic fluid parameters are calculated using a pulse contour algorithm. Optionally, the CNAP® OEM Module can also operate as computer to generate these parameters, provided that the patient has an arterial line placed.

Integration of the CNAP® technology

The CNAP® OEM Module is built for the integration into host devices, which display the continuous blood pressure signal and the derived hemodynamic parameters.

The CNAP® hardware (main board, air pump, air reservoir) is typically integrated in the host device, which fully controls the module software.

The front-end to the patient is connected to the main board via the CNAP® connector cable. It consists of the CNAP® Cuff Controller (placed on the forearm) and a double finger sensor (S, M, L).

Features of the CNAP® OEM Module

- Continuous non-invasive blood pressure
- Full hemodynamics (CO, SV, SVR, ...) and dynamic fluid parameters (PPV, SVV)
- Quick and error free application
- Low power consumption
- Easy integration into host systems via serial interface or USB
- Reference devices for CE, FDA and CFDA

With the CNAP® Development Kit we also provide the optimal tool for a fast integration.
### Parameter and Module Specification

**Measurement Method:**
- CNAP® (Advanced Vascular Unloading Technique and VERIFI method)

**Measured Parameters:**
- **Blood pressure waveform**
- **Beat-to-beat hemodynamics**
  - Systolic Blood Pressure (SBP)
  - Diastolic Blood Pressure (DBP)
  - Mean Blood Pressure (MBP)
  - Pulse Rate (PR)
  - Stroke Volume (SV) | Stroke Index (SI)
  - Cardiac Output (CO) | Cardiac Index (CI)
  - Systemic Vascular Resistance (SVR) |
  - Systemic Vascular Resistance Index (SVRI)

### Dynamic fluid parameters
- Pulse Pressure Variation (PPV)
- Stroke Volume Variation (SVV)

**Measurement Range:**
- **SBP:** 40 – 250 mmHg (5.3 - 33.3 kPa)
- **DBP:** 30 – 210 mmHg (4 - 28 kPa)
- **MBP:** 35 – 230 mmHg (4.7 - 30.7 kPa)
- **PR:** 30 – 200 bpm
- **SV:** 0 – 500 ml
- **CO:** 0 – 100 l/min
- **SVR:** 0 – 10000 dyne*s/cm^5
- Indexed parameters accordingly

**Resolution:**
- PPV: 0.2 – 40 %
- SVV: 0.2 – 40 %

**Accuracy:**
- ±5 mmHg (0.6 kPa)

**Inflation Pressure:**
- Minimum: 30 mmHg (4 kPa)
- Maximum/Overpressure limit: 300 ± 10 mmHg (40 kPa ± 0.1 kPa)
- Response time: < or = 3 sec.
- Deflation time: (to reach <15 mmHg) < or = 15 sec.

**Dimensions:**
- Circuit board (HxWxD) 18 x 40 x 120 mm (0.71 x 1.57 x 4.72 in.)
- Pump (HxWxD) 30 x 30x 70 mm (1.18 x 1.18 x 2.76 in.)
- Air reservoir volume 141ml (0.031 gal)

**Weight:**
- Module: 190g (with pump and air chamber);
- CNAP® Cuff controller: 142g (with fixation 220g);
- CNAP® Finger Cuffs: Small 27g, Medium 31g, Large 40g;
- CNAP® cable: 147g

**Environmental Requirements:**
- Temperature range Operating: 10 - 40°C (50 - 104° F)
- Storage/Transport: -5 - 40°C (23 - 104° F)
- Relative humidity Operating: 15% to 85%, non-condensing
- Storage/Transport: 15% to 95%
- Atmospheric pressure Operating: 485 to 795 mmHg (65 kPa to 106 kPa)
- Storage/Transport: 375 to 795 mmHg (50 kPa to 106 kPa)

**Electrical requirements:**
- Input Voltage: 8-14VDC unregulated
- Power Consumption: 5 Watt max (2.5 Watt average)

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