C90 Modular Monitor

C90 modular monitor is integrated with the world-leading life parameter monitoring technology and its application technology to make a high-end life monitoring platform and provide comprehensive monitoring solution.
Comprehensive management in hospital and out of hospital

To monitor the patient parameter comprehensively and integratively from the first-aid spot to the recovery as a complete management system.

1. First-aid on the spot
2. Put on to ambulance
3. Lifted onto stretcher
4. Sent to an emergency room
   After C30 ambulance transport monitor is connected into c90 modular monitor, the patient would be fully monitored with c90. C90 will take over to monitor and start working.
5. Transferred from emergency room to an operating room
**Treated in the operating room**

C30 modular monitor will carry out all-round monitoring and diagnosing of patient’s condition in the operating room, thereby displaying twelve-channel ECG on the screen simultaneously. The accurate ECG measurements will help doctors to make good diagnosis thereby allowing operation carried out more smoothly. Combination of an anesthesia machine, respirator and c30 will help doctors to control operation time more accurately.

**Transferred from the operating room to ICU Unit**

**ICU Ward**
C30 modular monitor has taken an important position in ICU ward; as a device to directly display the patient’s condition after operation, it allows doctors to control the condition at any time in ICU, and it will give an alarm under abnormal condition to remind medical staff such so that the patient’s condition could be effectively controlled until the patients are gradually recovered.

**Transferred a general ward**
The patients will be transferred to general ward after their condition improved and became stable; the patient’s information accumulated in operating room and ICU unit will be transferred through a small host C30 to a large frame c90 modular monitor to ensure the continuity and real-time updating for patient’s information.

**Discharged from hospital**
Filing up the patient’s records.
Modular monitor C90 is processed and manufactured by CINCINNATI Processing center and Charmill WEDM-LS machine, product injection mold is adapted with the world's most advanced molding machine from Kraus maffei. It greatly ensures the stability and reliability mold is applied with Germany process, technology and materials.

- Al Zn alloy heat dissipation element: having an extraordinary heat dissipation effect
The world leading technology and high-level materials and advanced manufacturing process ensure that C90 modular monitor provides a high-end life monitoring platform.

External Design

- 17 inch high resolution LCD touch screen 1280 X 1024
- Touch-screen and keyboard dual operation and dual assurance
- Built-in lithium battery for 4 hours continuous monitoring
- Multi mount solutions: Wall mounting, trolley
- External laser printer and built-in thermal printer
- Gold-plated module contacts, automatic data exchange through IR transmission

- Handle: built-in handle for space saving and ease to carry around
- 360 visual alarm lamp: three-color alarm lamp to strike your eye definitely, and make clear for physiological alarm and technical alarm

- SD socket: to expand memory capacity
- Multiple USB interfaces can support keyboard, mouse and USB for data transfer as well as software upgrade.
- Various ports for external devices: auxiliary plug-in box, monitor, CIS and cable network interface and so on
- External ports management house: to conceal interfaces, to keep dust away, to prevent foreign matter to drop in, and to manage uniformly the data lines
Hardware technology – module

- 4+1 functional module slot, which is hot swappable, supporting full-module random combination, automatic identification with software, and interface dynamic combination (picture attached)

Diversified C90A 6-parameter plug-in module

- C90A with in-situ 4.3” LCD display, coped with independent operating system which can be used either for C90 plug-in module and a separate monitor.
- C90A used together with C90 can be displayed with double screens simultaneously.
- Patient data can be swapped between C90A and C90, such that C90A can help to realize the data transfer and to share the data between C90 one another.
- C90A built-in 2600mAh lithium cell can support hot swap with power on thereby transferring patient’s information monitored without any obstacle.
- C90A 6-parameter module: electrocardiography/heart rate/respiratory rate/body temperature/pulse oxygen saturation.

1. ECG twelve channel electrocardiograph technology
   With CardioTec™ twelve channel electrocardiograph it can realize to display 12-channel electrocardiographic wave at the same screen simultaneously. The accurate measurements can help doctors to give a good diagnosis. A common mode rejection ratio (CMRR) can reach 105dB such that it has an extreme interference-free capability in ECG. It also can analyze heart rate timely and can retrieve alarm.

2. SpO₂/pulse oxygen saturation technology
   Gold standard Oximeter pulse oxygen saturation system in the worldwide blood oxygen monitoring field is ensured to take a leading position in the technology with its unique LoSat™ technique thereby ensuring the widest range of accuracy to extend its accurate measurement range to 60%-100%. The special SatSeconds™ intelligent alarm management system can effectively reduce false alarm so as to relieve workload on the medical personnel.

3. NPSP, non-invasive blood pressure technique
   Use of AccuTec™ non-invasive blood pressure technique to allow C90 accuracy to reach world leading level in the light of blood pressure measurement.
• **IBP invasive blood pressure module**
  By using US Abbott/Medex invasive blood pressure attachment it can monitor arterial pressure, pulmonary arterial pressure, central venous pressure, and intracranial pressure, etc.

• **EtCO₂ respiration CO₂ module**
  To work together with US RESPIRONICS we chose mainstream/side stream (miniflow) CO₂ module. As small in size, durable and light in weight the mainstream sensor can be used to provide all intubated patients from new born child to adults for an accurate reliable CO₂ monitoring. It can be automatically corrected. An LoFlo side flow probe (without dewatering bottle) is used to monitor non-intubated patients. Its flexible and compact CO₂ sensor can provide adults, child and newborn babies for a continuous and reliable CO₂ monitoring. And, sampling rate (miniflow) is ≤50mL/min.

• **AG anesthetic gases module**
  Collaborated with Sweden PHASE/N an advanced anesthetic gases module is used is able to monitor eight different gases (O₂, CO₂, N₂O, ENF, ISO, DES, SEV, HAL). It can automatically identify what kind of anesthetic gas is in use, characterized by its short period of preheat time and long service life as well as MAC value provided (minimum alveolar concentration)
- **Environmental oxygen concentration module**
  It can monitor oxygen concentration with the help of an oxygen concentration sensor such that the medical personnel can control and understand at any time the oxygen concentration variation in an incubator.

- **Apnea self-rescue module**
  It can solve choking symptom resulted from apnea, help the newborn to free from the danger of choking thereby protecting fully the newborn.

- **ICG noninvasive blood flow dynamics module**
  Collaborated with US BIOZ® an impedance ECG is adopted to realize noninvasive blood flow dynamics monitoring, which is characterized by its noninvasive, continuous and highly accurate and strong interference-resistant capability as well as lower cost and easy operation. A disposable special electrode is used to transmit a tiny electric signal through chest. The impedance of the electric signal can be measured and displayed in an ICG waveform. As blood volume and blood flow rate in the aorta vary along with each subsequent heartbeat a DISQ® (digital impedance signal quantification) technology is used to cope with variation of impedance signal. The impedance variation is used in non-invasive ZMARC™ algorithm (the aorta compliance regulation) so as to obtain hemodynamic parameters, such as stroke volume (SV), cardiac output (CO), systemic vascular resistance (SVR), myocardial contractility and fluid state (TFT), etc.

  On the basis of collaboration with Aspect Co. we adopt BIS (Bispectral Index). Bispectral is a generic term of a kind of a algorithm, which is widely applied in various fields for graphic record and analysis. The Aspect Co. is the first and unique company so far to use bispectral analysis technique to monitor life sign. BIS technique can analyze variation of EEG waveform, amplitude and rhythm to reduce PONV (Postoperative Nausea and Vomiting) such that length of stay in PACU (Post-Anesthesia Care Unit) is shortened.

- **BIS VISTATM EEG bispectral index monitoring (depth of anesthesia module)**
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**C.O. invasive cardiac output**

C90 is involved in the invasive cardiac output technique, but C.O. measurement is conducted with conventional thermo dilution invasive cardiac output and other hemodynamic parameters. The monitor can measure "blood temperature", "calculating cardiac output", "calculating hemodynamics". The cardiac output is measured with floating catheter led from vein to pulmonary artery followed by injecting a certain amount at 0°C–25°C injecta such that the blood temperature will be varied after the injecta and blood output from the heart are mixed together thereby achieving cardiac output by measuring blood temperature variation before and after infected in accordance with the principle of heat balance.

**Respiratory mechanics module**

It is used to display waveform of airway flow (FLOW), airway pressure (PAW), gas volume (VOL), flow-volume ring (F-V), Pressure-volume ring (P-V) and relevant respiratory mechanics parameters.

**C90 plug-in expansion slot**

It can provide eight module slots to provide C90 for function expansion.
Software technology-interface
High-informatization and high-intelligence operation system and analysis software can provide precise digital support for clinical decision-making. Self-adapting working interface adjustment function and humanized operation system allow you to enjoy the best operation experience.

Software technology

Unique I-Klok™ intelligent alarm system: to identify alarm level automatically according to variation of measurement parameters. There are high, middle and lower alarm levels. There are different sounds and lighting prompts for every level with delay alarm and delay time which can be adjusted. There is also automatic alarm & printing function. Different from traditional alarm, there is practical clinical significance for alarm to reduce mis-alarm and useless alarm.

- Powerful network function to support wire and wireless access;
- Prompt module identification and interface switching without flashing feeling during interface switching;
- Unlimited extension function module with automatic detection software and dynamic interface adjustment

Interface

Module MAP diagram: To display operating status of modules.

Informatization integration function of record archives a complete medical record management to record all life monitoring information from hospital entry to exit.

At most 12 channels of waveform display; Various parameter waveforms can be combined and switched over freely according to user’s demand;

Complete touch operation design to bring in new touch experience;

Detailed patient information, convinient for checking

ECG waveform review interface: 90 minutes ECG waveform review, important waveform segment withdraw for clinical judgment, analysis & judgment of important information.
New data storage mode without compression, waveform distortion; With data power failure storage function; Power failure data-stroe for 1,200 hours trend diagram & chart; Storage for 5,000 groups NIBP list and 60 minutes waveform review;

Respiration oxygenation interface: It consists of HR, SpO2 and RR trend or compressed respiration wave, 4 trend periods such as 1 minute, 2 minutes, 4 minutes and 8 minutes is selectable. Compressed respiration wave or dynamic trend diagram of RR also can be selected.

7 -lead/12-lead ECG waveform displayed in one screen: lead acquisition & amplification. Rhythm lead calculation can be selected randomly and synchronous display on the screen.

List interface: to record NIBP, HR, PR and pulse oxygen respiration for clinical comparison & observation.

With ST analysis, arrhythmia analysis, drug dose calculation, titration form and CIS electronic medical record;

Trend coexistence interface: Trend review for 12, 48 and 96 hours shall be selected. It captures different scopes of date precisely according to clinical demand.
Large-character interface: Long-distance clear observation is especially suitable for ICU, CCU, operating room, night guard or patrol inspection.

Other bed review interface: To display other bed information such as bed No., patient’s name, alarm information and parameter setup. It supports at most 4 other bed waveforms. Users can configure dynamic configuration and waveform.

Calculation interface: It includes calculation for drug, oxygenation, ventilation and renal function (The system can store the records of the last 10 calculations)
ICU
Digital ICU
life informationsolution

- Built-in ICU electronic medical record system (including temperature chart and liquid entrance & exit balance form)

- Perfect physiological score system (including Apache II and Apache III)

- Powerful clinical information integration engine (Connected to ICU equipment such as respirator and infusion pump, etc)

- To realize multi-platform working of various kinds of medical information (Such as PACS image invoking)
Digital application

Electronic management for the future-information integration engine technology
Information integration engine technology can be connected to patient monitor and medical equipment near the bed with centralized and real-time display & review of equipment information near the bed based on the information network in the hospital. Messages of different administrative or technical offices such as RIS, PACS and LIS, etc in the court can be integrated to integrate clinical information.

- Comprehensive clinical equipment information (Connected to operating equipment such as anesthesia machine and infusion pump, etc)
- Built-in electronic record system for anesthesia department/operating room
- Automatic acquisition of physiological indications and important events during operative period
- Convenient input mode
C60 Neonatal Monitor

C60 equips with 8.4 high-definition color TFT screen, providing the touch screen and information hand-writing input function, embody the user-friendly design with special care to all users. According to the character of neonatal cardiovascular system, COMEN develops ExNeo® Neonate ECG technology, Adap-DSP® NIBP measurement technique, caring for the life with precision and profession attitude. Also, world famous OxiMax® neonatal SpO2 technology, SatSecondsTM intellectualized alarming system, Specialized neonatal suffocation self-saving function equipped with oxygen density monitoring function; special newborn accessories are applied to model provide more care to the neonates. C60 model fills up the blank of the Chinese Neonatal Monitoring field, giving more energy to the world neonatal monitoring field.

C80 Intensive Care Unit Monitor

C80 uses CardioTec™ ECG technology, world leading OxiMax® technology, high precision AcuTec™ hypertension monitoring technology as standard configuration. C80 incorporates world’s best medical technology for SpO2, ICG, FiCO2, Anesthesia Gas Monitoring from the world’s best OEM technology providers like NELLCOR, RESPIRONICS, ARTERA & BICOZ. Precisely, C80 provides medical professionals with powerful monitoring options and functionality to match the demands of a wide range of care, in any hospital environment.