



M50

Modular Patient Monitor

Comprehensive Solution for your needs in Critical and Intermediate Care

Product Intro of M50 Modular Patient Monitor

“ Our most comprehensive application ”

- 5 modules for extensive clinical application with widely scalable and post upgradable design
- All about user-friendliness with optimal SW & HW design with touch screen
- Extensive event review for Max' 10days
- Full disclosure of all parameters of event data review before & after 10sec' per each event case
- Optimized parameters for operation, ICU application : Multi-gas, Cardiac output, BIS, 12CH ECG, ETco2, 4CH-IBP
- User friendly connectivity : HDMI, direct USB printer, USB/SD card for data management , USB for SW upgrade / Barcode reader usability
- Advanced communication connectivity : Ethernet (Lan, Wifi , WCDMA wireless and TCP/IP) for MEDIANA YM9000 Central Monitoring System /direct HL7 data output



Mini USB Direct data transfer to PC for data management
 USB USB Printer (recommended model only)
 Barcode reader usability , SW upgrade
 HDMI Dual display for bigger screen
 SD Slot Extended data retrieval

Color LCD Screen 7 wave form LCD with resolution 1024 X 768
 Touch Icon buttons for quick command
 Control knob for easy configuration

15" LCD TFT Touch screen



HDMI for dual slave monitor

Ethernet Nurse call



Fully modular design with wide range of application from ward to ICU



Standard configuration : M50 ENS

- ECG, Spo2, Resp, 2CH Temp
- Basic 3CH, 5CH / 12CH optional (Glasgow)
- Spo2 : Nellcore OXIMAX / MEDIANA Spo2
- NIBP : AND / OMRON
- 2CH Temperature connector



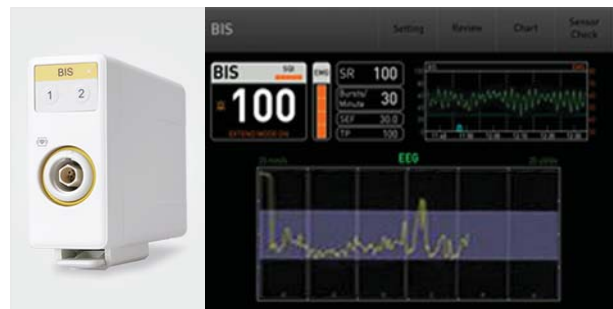
Phasein Multi-gas module Main / Side stream
Auto-calibration technology with water trap free technology
(CO2, N2O, HAL, ISO, ENF, SEV, DES, O2)



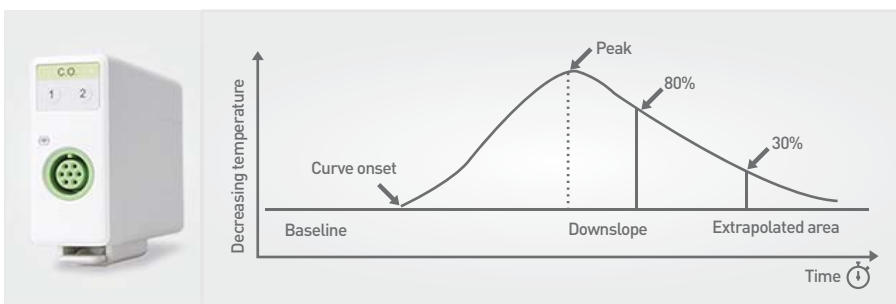
Oridian Microstream™ ETCO2 Main / Side stream
Auto-calibration with Molecular Correlation Spectroscopy™ technology that makes it possible to use very low sample flow rate(5ml/min) unaffected by the presence other gases.



Dual IBP module
2 or 4CH IBP Selectable label
(ABP, ART, AO, UAP, P, PAP, ICP, RAP, LAP, UVP)



The BIS™ from Covidien
Bispectral Index from 4 CH of frontal EEG helps monitoring and maintaining optimized sedation status.



TDCO : Thermal dilution Cardiac output
The most widely used application by injecting contrast agent into the blood stream (by pulmonary artery catheter at right atrium) to create thermal deficit to sense the change in blood temperature for cardiac output calculation.



OXI-CRG

ECG + SpO2 + respiration combined parameter for Neonatal breathing sufficiency & brain maturity

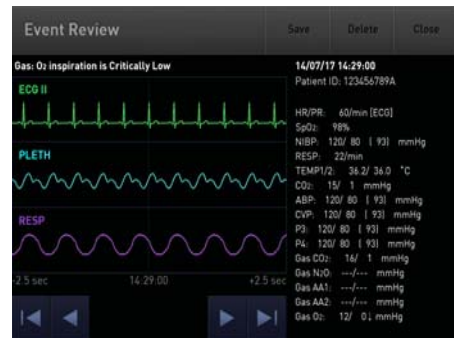


12CH ECG Glasgow algorithm

The most advanced & clinically proven 12CH ECG algorithm based on extensive studies of myocardial infarction and other cardiac abnormalities

Full disclosure event review function

TIME	Event
2014/01/12 17:45:22	ECG: Asystole
2014/01/24 12:22:30	ECG: V-FIB
2014/02/01 14:05:19	SpO2: Loss of pulse
2014/02/12 07:12:45	EtCO2: APNEA
2014/03/04 09:25:01	Gas: O2 inspiration is Critically Low
2014/03/27 11:19:30	ECG: Asystole
2014/04/16 22:05:58	ECG: V-FIB
2014/05/08 16:42:05	ECG: Asystole
2014/05/17 02:44:55	ECG: V-FIB
2014/06/02 15:22:17	ECG: Asystole



- Full disclosure event review 10sec' before/after event / Max' 100 event review display
- Display 3 wave forms and vital signs with event log, Storage All waveform
- Volatile memory / Auto-deletion from old data

Extended data memory for 10 days for graphic, tabular trend

Total memory of 14,400 data sets per minute for 10 days

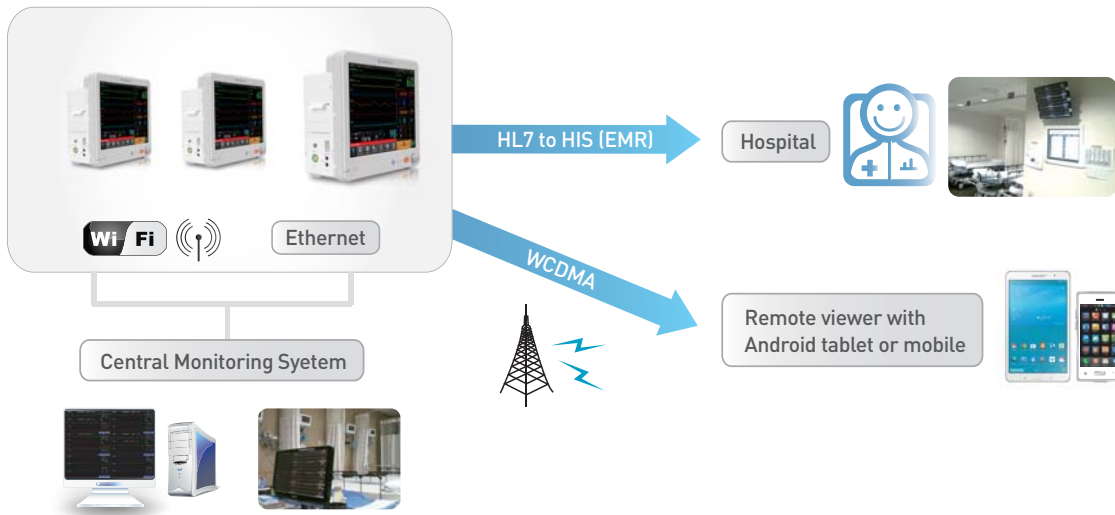


Graphic trend display



Tabular trend display

Networking



Module pole for convenient module mounting



Various Installation



Specifications - Patient Monitor M50

General

AC Power : 100V ~ 240V, 50Hz/60Hz
Battery : Lithium-ion battery packs, 9cells, 10.8V
Operation temperature : 0°C ~ 40°C
Storage Temperature : -20°C ~ 60°C
Humidity : 5 to 95% relative humidity, non-condensing

Display

Screen type : Color TFT LCD (LED backlight)
Screen size : 15"
Resolution : 1024 by 768 pixel
Number of Traces : 4-7 waveforms

Recorder

Paper : 50mm thermal paper
Speed : 25mm/s or 50mm/s
Number of trace : 3 waveforms
Automatic function : Auto printing and 20 second recording initiated by alarm or NIBP measurement.

ECG

Patient connection : 3 lead ECG cable, 5 lead ECG cable, 12 lead ECG cable (Option)
Input defibrillator-protected.
Pacemaker pulse display on ECG trace
Bandwidth : Monitor(0.5Hz to 40Hz), Filter(0.5Hz to 30Hz),
Low extend(0.05Hz to 40Hz), Interpretation(0.05Hz to 150Hz)
Heart rate : 20bpm ~ 300bpm
Accuracy : ± 3 BPM or $\pm 5\%$, whichever is greater
ST level measurement range : -5.00mV to 5.00mV
ST level measurement position : J + 60msec or J + 80msec
Tall T-wave rejection : Max. T-wave amplitude 1.8mV
Average response time : 5 seconds (From 80 to 120bpm), 9 seconds (From 80 to 40bpm)

Respiration

Technique : Impedance pneumography, Airway1, 2, Plethysmograph
Technique : Impedance
Range : 0, 3 ~ 150bpm
Accuracy : ± 3 bpm
Lead : RA to LA
Defibrillator protection
Technique : EtCO₂(Airway1)
Range : 0 ~ 150bpm
Accuracy : ± 1 bpm
Technique : Multi gas(Airway2)
Range : 0 ~ 150bpm
Accuracy : ± 1 bpm
Technique : SpO₂
Range : 4 ~ 40bpm
Accuracy : ± 1 bpm

NIBP - Omron/AND

Pulse Rate Range : Adult 40 to 200 BPM, Neonatal 40 to 240 BPM
Pulse Rate Accuracy ± 2 BPM or $\pm 2\%$, whichever is greater
Technique Oscillometric Measurement
Measurement Modes : MANUAL, AUTO, and CONT
NIBP AUTO Mode Intervals : Off, cont, 1, 2, 2.5, 3, 5, 10, 15, 20, 30, 45, 60, 90, 120, or 180minutes
Measurement Range : Adult -SYS 60 to 250 mmHg, MAP 45 to 235 mmHg, DIA 40 to 200 mmHg
Neonatal- SYS 40 to 120 mmHg, MAP 30 to 100 mmHg, DIA 20 to 90 mmHg
NIBP Accuracy : Mean error and standard deviation per ANSI/AAMI SP10:2002+A1:2003
Pressure Display Accuracy : Within ± 3 mmHg
Initial Cuff Inflation : Adult -120, 140, 160, 180, 200, 220, mmHg
Neonatal - 80, 100, 120, 140 mmHg
Overpressure Protector : 300 \pm 10 mmHg for Adult, 150 \pm 5 mmHg for Neonatal
Measurement Speed : About 20 seconds
At the following condition : Adult, Cuff size 12 cm,
SYS 120 mmHg
MAP 90 mmHg
DIA 80 mmHg/ PR 80 BPM
Manual Measurements (180 mmHg)

SpO₂ - Nellcor / Mediana

Pulse rate range : 20 ~ 300BPM/30 ~ 300BPM
Pulse rate accuracy : ± 3 BPM/ $\pm 2\%$ or ± 2 BPM
SpO₂ range : 1 ~ 100 %
Low Perfusion : 0.03 to 20 %
Accuracy : Without Interference - Adult 70 to 100 % ± 2 digits, 1 to 69 % unspecified
With Interference - Adult 70 to 100% ± 3 digits, 1 to 69% unspecified
Low Perfusion - 70 to 100 % ± 2 digits, 1 to 69 % unspecified
Display Update : Within 30 seconds

Temperature

Probe Type : Thermistor probe YSI 400 series and 700 series
Measurement Method : Thermistor
Range : 0 to 50°C
Display Accuracy : $\pm 0.1^\circ\text{C}$
Probe Accuracy : $\pm 0.1^\circ\text{C}$

Invasive Blood Pressure (Option)

Number of channel : 2 or 4
Pulse rate : 20 ~ 250bpm
Pulse rate accuracy : $\pm 1\%$ or ± 1 bpm, whichever is greater
Pressure range : -50 to 300mmHg
Input sensitivity : 5uV/V/mmHg
Zero calibration range : ± 100 mmHg
Frequency response : 25Hz
Accuracy : ± 3 mmHg
Selectable label : ABP, ART, AO, UAP, P, PAP, ICP, RAP, LAP, UVP

EtCO₂ (Option) - Oridion

Transducer Type : MicroMediCo₂
Technique : non-dispersive IR absorption of the CO₂ in the breath sample using the Oridion IR source
Measurement range : 0 ~ 150mmHg
Accuracy : 0 - 38 mmHg, ± 2 mmHg
39 - 99 mmHg, $\pm 5\%$ of reading + 0.08% x (reading-39mmHg)
100 - 150 mmHg, $\pm 5\%$ of reading + 0.08% x (reading-39mmHg)
Resolution : 0.1 mmHg
Rise time (10-90%) : 190msec max
Delay time : 2.7 seconds typical
Respiration Rate range : 0 ~ 150bpm
Respiration Rate accuracy : 0 ~ 70bpm, ± 1 bpm
71 ~ 120bpm, ± 2 bpm
121 ~ 150bpm, ± 3 bpm
Sample flow rate : 50ml/min - 7.5 + 15ml/min

12 Lead ECG (Option)

Interpretive 12 lead ECG monitoring
Filter : 0.05 ~ 150Hz, 0.05 ~ 40Hz, selectable
Detection : Hear rate, PR interval, QRS duration, QT/ QTc duration, P-axis, QRS axis, T-axis,
PA/PPA(P wave minimum and maximum value), QA/RA/SA (QRS absolute amplitude),
STJ (ST level at J point), STM/STE (ST level middle and end point),
TA/TPA (T wave minimum and maximum value), QD/RD/SD (QRS duration),
RPA/RPD/SPA (RSR pattern[^]) amplitude[^] duration
Waveform Display : 2x6 format LCD display, 4x3 recorder print out
Data transmission : 12 lead ECG data transmission to Central system with wireless network or WCDMA

Multi-Gas Analysis (Option)

Transducer Type : Main or Sidestream
Technique : Multi channel infrared beam, Barometric pressure sensor
Warm up time : 10 ~ 20 seconds
Measurement Gases : CO₂, N₂O, HAL, ISO, ENF, SEV, DES, O₂
Measurement range and accuracy :
CO₂ : 0 ~ 15vol%, ± 0.2 vol% + 2% of reading
N₂O : 0 ~ 100vol%, ± 2 vol% + 2% of reading
HAL, ISO, ENF : 0 ~ 8vol%, ± 0.15 vol% + 5% of reading
SEV : 0 ~ 10vol%, ± 0.15 vol% + 5% of reading
DES : 0 ~ 22vol%, ± 0.15 vol% + 5% of reading
O₂ : 0 ~ 100vol%, ± 1 vol% + 2% of reading
Rise time : CO₂<90ms, N₂O and Agents <350ms, O₂<450ms
Respiration Rate range : 0 ~ 150bpm ± 1 bpm
Respiration Rate accuracy : ± 1 bpm
Total system response time : < 1-3 sec

Cardiac Output (Option)(TBD)

Measurement method : Thermodilution
Measurement range : 0.1 ~ 20L/min (23-43°C, 0-27°C)
Resolution : 0.1 L/min (0.1°C)
Accuracy : $\pm 5\%$ or ± 0.1 L.min

BIS (Option)

Technique : Bispectral Index
Measured parameters : EEG, BIS
Calculated parameters : SQI, EMG, SR, DSA, TP
Impedance range : 0-999kohm
EEG bandwidth : 0.25 ~110Hz
Input signal range : ± 1 mV

Oxy-CRG

Measured parameters :btb Heart Rate, Desaturation, Apnea
Display : btbHR, SpO₂ trend and respiration waveform
Data management : USB or SD data storage
Support event trigger function

Others

Data storage : USB memory or SD card, Trend data Serial Transmit
Record : Support USB Printer
Display Output : HDMI Clon display support
External communication : Nurse call, Barcode reader
Network : Wi-fi or WCDMA wireless and TCP/IP wired connection.
Central monitoring system : Receiving program (vital sign and 12 lead ECG data)
Event review program (Display 3 wave forms and vital signs with event log, Storage All waveform)