

F8 Modular Patient Monitor (12.1-inch)



- Release 4.0

Model Configuration

Standard Configuration:	12.1-inch LED, 3/5 Lead ECG, NIBP, SpO2, Pulse Rate, 2-Temperature, Respiration
Optional Configuration:	1/2/4 IBP, 12-lead ECG, Nellcor SpO2, Masimo SpO2, Suntech NIBP, Perfusion Index (PI), Laser Printer Interface, EtCO2 (Mainstream / Sidestream / Microstream), Cardiac Output, Anesthesia Depth Monitoring (CSM), Multi-gas (AG) Monitoring, Large capacity battery, HL7 interface, Bed View, Nurse call, Spirometry, StO2
Optional Accessories:	Printer, USB Mouse, Touch Screen (capacitive type), Central Monitoring Station, Neo / Ped Accessories, HDMI Output, Wall-mounting, Trolley



MEDI WAVES INC.
ISO 9001:2015 CERTIFIED
WHO-GMP CERTIFIED | ISO 14001:2004 CERTIFIED | OHSAS 18001:2007
ISO 13485 : 2016 CERTIFIED | CE CERTIFIED

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Features

Core

- Newly advanced A10 main board with Linux OS
- Support **storage** of 2160 hours trend table and graph review, 2 hours waveform review (expandable to 168 hours), 2000 groups NIBP review and 2000 alarm events review

Body

- **12.1 inch** high-brightness TFT **LED**
- Support display **9 ~ 13 waveforms**
- Support **7 channel** ECG waveform display simultaneously
- Optional **HDMI** output

Printer

- Built-in high-speed 50mm thermal printer (Brand: SEIKO, Japan)
- Alarm-triggered printing (option)

Central System

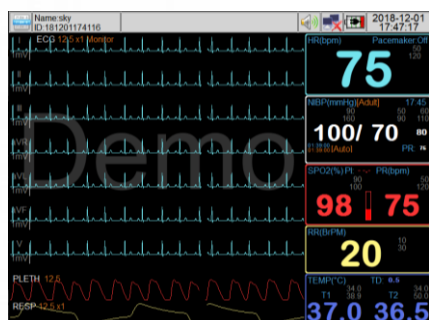
- Wired or wireless connection
- Optional Support HL7 (Health Level Seven)

Alarm

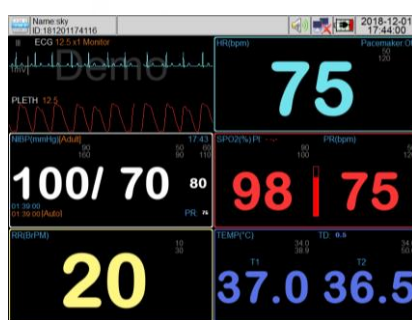
- Three-level acousto-optic alarm
- Sensor-off alarm
- Paper out alarm
- Support alarm review
- Support alarm pause

Linux OS

- **Multi-display mode**
- **NIBP self-test mode**
- Support **medical history search** by patient ID, name and mobile number
- 18 types of **Arrhythmia analysis** and real-time **S-T** segment analysis and **pacemaker detection**
- Drug calculation and titration table and **EWS**
- Optional **Hemodynamics**
- **Multi-language** display
- **Online software upgrading** by net / USB
- **Optional analog output of ECG or synchrony for defibrillation**
- Support **Standby mode, Night mode and Privacy mode**
- Optional 15-second quick blood pressure measurement function



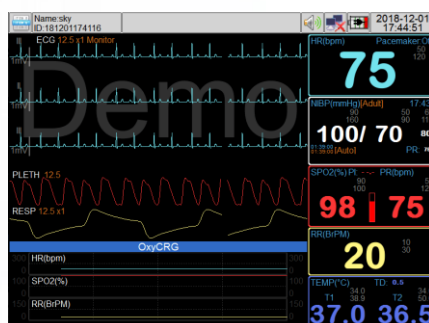
ECG Full Lead



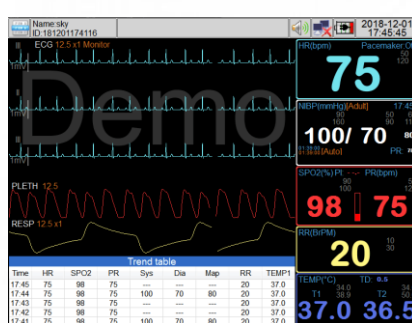
Big Font Display



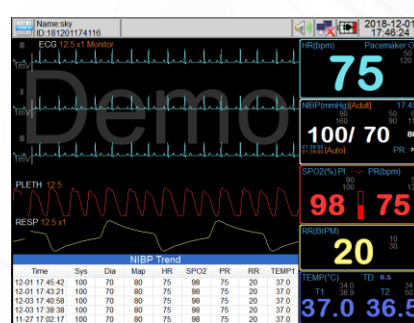
Standard Display



Oxy CRG



Trend Table



NIBP Review

Performance Specifications

Dimension and Weight

- Dimension: 283 mm*312 mm*168 mm
- Weight: 4 kg (excluding accessories)

Power Supply

- Voltage: AC 100 ~ 240 V, 50/60 HZ, Power ≤60 W

Display

- 12.1" color TFT LED
- Resolution: 800*600 pixels

Battery (Pluggable)

- Type: Rechargeable lithium battery 14.8 V /2200 mAh
- Charge Cycle: ≥500 times
- Working time: 3.5 hours (optional large battery for 5 hours)

Recorder (Option)

- Method: Thermal printer
- Paper width: 50 mm (1.97 in)
- Printing speed: 12.5 / 25 / 50 mm/s
- Trace: Max. 3 tracks
- Recording way: Real-time Recording, Review Printing, Periodic Recording, Alarm Recording

Alarm

- Level: Low, medium and high, message
- Indication: Auditory and visual
- Alarm volume adjustable
- Alarm pause time: 1 min, 2 min
- Parameter alarm type: Latch / Unlatch

Input Device

- Standard: Knob / Key press
- Option: USB Mouse / Touch screen

System Output & Extensible

Interface

- Ethernet Network: standard RJ45 socket * 1 pc
- USB Port: 1 pc
- HDMI port (option) * 1 pc

Operating Environment

- Temperature: 5 ~ 40 °C
- Humidity: 15% ~ 90% (non-condensing)
- Atmosphere pressure: 86 KPa ~ 110 KPa

Transportation and Storage

- Temperature: -20 ~ 50 °C
- Humidity: 10% ~ 90% (non-condensing)
- Atmosphere pressure: 86 KPa ~ 110 KPa

Safety

- IEC60601-1 Approved, CE marking according to MDD93/42/EEC
- With reference to RoHS Directive 2011/65/EU recasting

Trend & Reviewing

- Trend: 2160 hours
- ARR events: 128 groups of ARR events and associated waveform
- NIBP measurement reviewing: 2000 groups
- Waveform review: 2 hours (expandable to 168 hours)
- Alarm event: 2000 groups of parameter alarms events and associated parameter

Respiration

- Method: Impedance between RA-LL, RA-LA
- Gain: ×0.25, ×0.50, ×1, ×2, ×4
- Respiration Rate: 0 ~ 150 BrPM
- Sweep speed: 6.25 mm/s, 12.5 mm/s, 25 mm/s
- Resolution: 1 BrPM

- Accuracy: ±2 BrPM or ±2% whichever is greater (7 ~ 150 BrPM)
- Unspecified (0% ~ 6 BrPM)
- Apnea Alarm: 10 ~ 60 s

Temperature

- Technique: Thermistor probe (2.25 K)
- Channel: Dual-channel, provide T1; T2; Δ T
- Measuring and Alarm Range: 0.0°C ~ 50°C (32°F ~ 122°F)
- Unit: Celsius (°C), Fahrenheit (°F)
- Resolution: 0.1°C or 1°F
- Accuracy: ±0.1°C (exclusive probe)

ECG

- Lead mode: 3/5 Leads, I, II, III or I, II, III, AVR, AVL, AVF, V 12 leads, I, II, III, AVR, AVL, AVF, V1, V2, V3, V4, V5, V6, GND
- Protection: Breakdown Voltage AC 4000 V 50/60 Hz; Defibrillator proof
- Gain: 2.5 mm/mV(×0.25), 5.0 mm/mV(×0.5), 10 mm/mV (×1), 20 mm/mV (×2), 40 mm/mV (×4), Auto
- Sweep speed: 6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s
- ECG signal range: ±5 mV (p-p)
- Leakage Current < 10 μ A
- Baseline Recovery: ≤ 3s after defibrillation
- Bandwidth: Surgery 1 ~ 20 Hz
Monitor 0.5 ~ 40 Hz
Diagnostic 0.05 ~ 130 Hz
- Indication of Electrode Separation: Every electrode (exclusive of RL)

Heart Rate

- Measure range: Adult: 0 ~ 300 bpm
Neo / Ped: 0 ~ 350 bpm
- Resolution: 1 bpm
- Accuracy: ± 1%

ST Measurement

- Range: -2.0 ~ +2.0 mV
- Accuracy: -0.8 mV ~ +0.8 mV: ±0.02 mV or ±10%, whichever is greater
- Other range: unspecified
- Resolution: 0.01 mV

SpO2 (Digital Technic)

- Measurement Range: 0 ~ 100 %
- Resolution: 1 %
- Accuracy: ±2% (70% ~ 100%)
±3 % (35% ~ 69%)
Unspecified (0 ~ 34%)
- Support Pitch tone and multi-level volume
- User-selectable waveform speed: 6.25, 12.5, 25, 50 mm/s
- PI range (Option): 0.075% ~ 20%
- Pleth Variability Index Measurement Range: 0 ~ 100%

Pulse Rate

- Measuring and Alarm Range: 25 ~ 250 bpm
- Accuracy: ±1% or ±1 bpm, whichever is greater
- Resolution: 1 bpm

Nellcor - SpO2 (Option)

- Measurement Range: 0 ~ 100 %
- Resolution: 1 %
- Accuracy: 70% ~ 100%, ±2 % (Adult)
70% ~ 100%, ±3 % (Neonate)
70% ~ 100%, ±2 % (Low Perfusion)

0% ~ 69%, unspecified

Pulse Rate

- Measurement range: 20 ~ 300 bpm
- Resolution: 1 bpm
- Accuracy: ±3 bpm (20 ~ 250 bpm)
Unspecified (251 ~ 300 bpm)

Masimo SpO2 (Option)

- Measurement Range: 0 ~ 100 %
- Resolution: 1 %
- Accuracy: 70% ~ 100%, ±2 % (adult / pediatric, non-motion conditions)
70% ~ 100%, ±3 % (neonate, non-motion conditions)
70% ~ 100%, ±3 % (motion conditions)
0% ~ 69% unspecified

Pulse Rate

- Measurement range: 25 ~ 240 bpm
- Resolution: 1 bpm
- Accuracy: ±3 bpm (non-motion condition)

NIBP

- Method: Oscillometry
- Measure mode: Manual, Auto, STAT
- Measure Interval in AUTO Mode 1~480 min
- STAT mode cycle time: Keep 5 minutes, at 5 seconds interval
- Measure and Alarm Range:
Adult:
SYS: 0 ~ 350 mmHg
DIA: 0 ~ 300 mmHg
MEAN: 0 ~ 300 mmHg
Pediatric:
SYS: 40 ~ 220 mmHg
DIA: 0 ~ 160 mmHg
MEAN: 20 ~ 170 mmHg
Neonate:
SYS: 30 ~ 135 mmHg
DIA: 0 ~ 110 mmHg
MEAN: 20 ~ 110 mmHg
- Static pressure accuracy: ±3 mmHg
- Resolution: 1 mmHg
- Accuracy: Maximum Mean error ±5 mmHg
Maximum Standard deviation ≤8 mmHg
- Over pressure Protection: Dual protection via software & hardware

Suntech NIBP (Option)

- Measure Method: Oscillometry. Diastolic values correspond to Phase 5 Korotkoff sound
- Measure Range:
Adult: SYS: 40 ~ 260 mmHg
DIA: 20 ~ 220 mmHg
MEAN: 26 ~ 220 mmHg
Pediatric: SYS: 40 ~ 230 mmHg
DIA: 20~ 160 mmHg
MEAN: 26 ~ 183 mmHg
Neonate: SYS: 40 ~ 130 mmHg
DIA: 20 ~ 100 mmHg
MEAN: 26 ~ 110 mmHg
- PR Range: 30 to 220 BPM
- PR Accuracy: ±2% or ±3 BPM, whichever is greater
- Pressure Transducer Accuracy: ±3 mmHg between 0 mmHg and 300 mmHg
- for operating conditions between 0°C and 50°C
- Deflate Rate: Deflation step size varies with heart rate, cuff pressure and cuff volume
- Initial Inflation Pressure:

ADULT:	160 mmHg (default)
	Variable from 120 to 280 mmHg
PEDIATRIC:	140 mmHg (default)
	Variable from 80 to 280 mmHg
NEONATE:	90 mmHg (default)
	Variable from 60 to 140 mmHg

EtCO₂ (Mainstream / Sidestream)

(Option)

- Measure method: Non-dispersive infrared (NDIR)
- Measure Range: 0 ~ 19.7% (0 ~ 150 mmHg)
0 ~ 20 kPa
- Resolution: 0.1 mmHg
- CO₂ Accuracy:
0 ~ 40 mmHg, ± 2 mmHg
41 ~ 70 mmHg, $\pm 5\%$ of reading
71 ~ 100 mmHg, $\pm 8\%$ of reading
101 ~ 150 mmHg, $\pm 10\%$ of reading
at 760 mmHg, ambient temperature of 25°C
- Respiratory Rate: Range: 3 ~ 150 BrPM
Accuracy: ± 1 BrPM

EtCO₂ (Micro-stream) (Option)

- Measure method: Non-dispersive infrared (NDIR)
- Measure Range: 0 ~ 19.7% (0 ~ 150 mmHg)
0 ~ 20 kPa
- Sample Rate: 50 mL/min ± 10 mL/min
- Resolution: 0.1 mmHg (0 ~ 50 mmHg)
0.25 mmHg (50 ~ 114 mmHg)
- CO₂ Accuracy: 0 ~ 40 mmHg, ± 2 mmHg
41 ~ 70 mmHg, $\pm 5\%$ of reading
71 ~ 100 mmHg, $\pm 8\%$ of reading
101 ~ 150 mmHg, $\pm 10\%$ of reading
at 760 mmHg, ambient temperature of 35°C
- Respiratory Rate: Range: 3 ~ 120 BrPM
Accuracy: ± 1 BrPM

Cardiac Output

- Measuring Method: Right heart thermo dilution
- Unit: °C/°F
- C.O. range: 0.1 l/min ~ 20.0 l/min
- C.O. accuracy: ± 0.2 l/min or $\pm 5\%$, whichever is greater

- Blood temperature range: 27°C ~ 43°C (80.6°F ~ 109.4°F)
- Blood temperature accuracy: ± 0.1 °C
- Injectate temperature: 0°C ~ 27°C (32°F ~ 80.6°F)
- Alarm delay: < 10 s

Depth of Anesthesia / CSM (Option)

- EEG sensitivity: $\pm 400 \mu V$
- Noise: $< 2 \mu V$ -p, $< 0.4 \mu V$ RMS, 1-250 Hz
- CMRR: > 140 dB
- Input impedance: > 50 Mohm
- Sample rate: 2000 samples / sec, (14 bits equivalent)
- BS%: 0-100, filter 1-42 Hz, 1 sec. display update
- EMG: 0-100 Logarithmic. Filter 75-85 Hz, 1 sec. update
- Alarms: High / Low with user selectable limit
- Artifact rejection: Automatic
- Sensor impedance range: 0 - 10 kOhm / measurement current 0.01 μA

Multi-gas / O₂ (Anesthetic Gas)

(Option)

- Method: Infrared absorption
- Gas sorts: CO₂, N₂O, Des, Iso, Enf, Sevo, Hal, O₂ (Optional paramagnetic sensor)
- Calibration: Room air calibration performed automatically when changing airway
Airway adapt (< 5 sec)
- Measurement range:
CO₂: 0 ~ 25%, N₂O: 0 ~ 100%
O₂: 0 ~ 100%, Enf, Iso, Hal: 0 ~ 25%,
Sevo, Des: 0 ~ 25%
- Data output: Fi and ET values
- Respiration rate: 0 ~ 150 BrPM
- Other: Up to 5 waveforms displayed
Agent mixture detection
MAC value displayed

IBP (Option)

- Max Channel: 4
- Measurement way: Direct invasive measurement
- Press Sensor: Sensitivity 5 uV/V/mmHg, $\pm 2\%$
Impedance 300 to 3000 Ω
- Resolution: 1 mmHg
- Unit: mmKg, kPa, cmH₂O
- Transducer sites:

Arterial Pressure (ART)
Pulmonary Arterial (PA)
Left Arterial (LAP)
Right Arterial (RAP)
Central Venous Pressure (CVP)
Intracranial Pressure (ICP)
PI / P2

- Measuring and alarm range:

ART	0 ~ +350 mmHg
PA	-10 ~ +120 mmHg
CVP / RAP / LAP / ICP	-10 ~ +40 mmHg
PI / P2	-50 ~ +350 mmHg

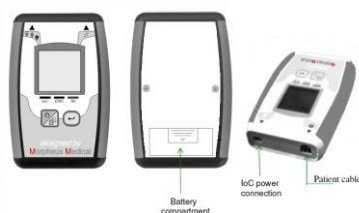
- Accuracy:

Static: ± 1 mmHg or $\pm 2\%$, whichever is greater (exclusive of transducer)
 ± 4 mmHg or $\pm 4\%$, whichever is greater (inclusive of transducer)
Dynamic: ± 4 mmHg or $\pm 4\%$, whichever is greater

StO₂ (Option)

- Waterproof rating: IPX1
- Dimensions (L x W x H): 308 x 288 x 148 mm
- Temperature Range:
Working: 5 ~ 40°C
- Humidity Range:
Working: $\leq 85\%$, non-condensing
- Atmospheric Pressure: 50kpa ~ 106kpa.
- Altitude Range:
Working: 70kpa ~ 106kpa
Transportation and Storage: 50kpa ~ 106kpa
- Electrical Specifications:
AC: 100~240V, 50Hz/60Hz
DC: 7.2V, 16VA~48VA
- StO₂ Display Range: 0 ~ 100%;
- StO₂ Measurement Range and Accuracy: 20% ~ 90%,
with an error of $\pm 1.5\%$;
- BVI Measurement Range and Accuracy: 0% ~ 500%,
with an error of ± 4.3 ml/l;
- THI Measurement Range and Accuracy:
0.0g/dl ~ 3.0g/dl, with an error of ± 0.07 g/dL.

* Specifications subject to change without prior notice



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