



Maxwell



ISO 13485



F8 Multi-parameter Patient Monitor (12.1 inches)

Technical Data Sheet - Release 2.5

F8 patient monitor is designed to match the pace and unique needs of adult, pediatric and neonatal intensive care; anesthesia and peri-operative care; OR and cardiac care environments.


An optional **USB Mouse/Keyboard control** eases navigation and data entry.


An optional **HDMI output** eases observation from a long distance.

The unique **Accessory Box** design can keep the accessories in order at the backside of the monitor.

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Features

Core

- Newly advanced A9 main board with Linux OS.
Calculating speed is 4 times faster than traditional products
- Support **storage** of 2160 hours trend table and graph review, 2 hours waveform review, 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

- USB External high-speed 50mm thermal printer (Brand: SEIKO, Japan)

Central System

- Optional **built-in wireless network module**, supporting wired or wireless connection to the central monitoring station
- 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

- Support **operation with mouse and computer keyboard** (Option)
- **Multi-display mode** to meet different clinical requirement, including standard interface, big font, OxyCRG, trend graph, NIBP review and full leads ECG interface.
- **NIBP self-test mode:** including overpressure test, static pressure test and air leakage test.
- **Generate ID** automatically when register a new patient. 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**
- Support **multi-language** display
- Support **online software upgrading** by net/USB



ECG Full Lead



Big Font Display



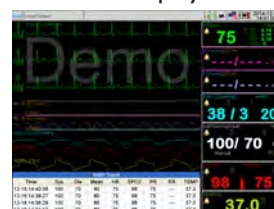
Standard Display



Oxy CRG



Trend Table



NIBP Review

Interface

Transducer socket

- ECG
- SPO2
- NIBP
- IBP 1 / IBP 2
- TEMP 1 / TEMP 2
- Mainstream EtCO2
- AG (multi-gas)
- Sidestream EtCO2

Input device interface

- This optional interface provides an USB ports to enable the monitor to be connected to off-the-shelf input devices:
- Mouse: any specified trackball or USB mouse may be used for navigation and data entry.
- Computer keyboard: an USB computer keyboard can be used for data entry instead of the on-screen pop-up keyboard.

[Remark: user has to restart the machine after plug and unplug the mouse / computer keyboard.]

- Knob (Standard)

LAN / Central monitor system interface

- The LAN port is for connecting the monitor to a central monitor system network.

Service Features

- The Support Tool helps technical personnel to
 - carry out configuration, upgrades and troubleshooting on an individual monitor.
 - back up the monitor settings.
- The Service Mode is password-protected and ensures that only trained staff can access service tests and tasks. It includes Skin Type, Brightness Setting, Clear Data and NIBP Calibration.
- The Support Tool uses the USB interface of the monitor for software upgrading.

Performance Specifications

Dimension and Weight

- Dimension: 312mm*212mm*168mm
- Weight: 4 kg(excluding accessories)

Power Supply

- Voltage: AC100~240V, 50/60HZ, Power≤60W

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

Battery (Pluggable)

- Type: Rechargeable lithium battery 14.8V/2200mAh
- Charge Cycle: ≥500 times
- Working time: 2 hours (optional second-battery for 4-5 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
- Indication: Auditory and visual
- Alarm volume adjustable
- Alarm pause time: 1min, 2min
- Parameter alarm type: Latch/ Unlatch

Input Device

- Knob (Standard)
- Keypad input (Standard)
- Mouse/ Keyboard input (option)

System Output & Extensible Interface

- Ethernet Network: 1 standard RJ45 socket
- USB Port: 1
- Video Output: 1 HDMI port (option)

Operating Environment

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

Environment

- 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
- Alarm event: 2000 groups of parameter alarms events and associated parameter

ECG

- Lead mode: 3/5 Leads, I, II, III or I, II, III, AVR, AVL, AVF, V
- Protection: Breakdown Voltage 4000VAC 50/60Hz; Defibrillator proof
- Gain: 2.5mm/mV(×0.25), 5.0mm/mV(×0.5), 10mm/mV (×1), 20mm/mV (×2), 40 mm/ mV (×4), Auto
- Sweep speed: 6.25mm/s, 12.5mm/s, 25mm/s, 50mm/s
- ECG signal range: ±12 mV (Gain ×0.25)
- Accuracy: ±1bpm/ ±1%, whichever is greater
- Resolution: 1 bpm
- Leakage Current < 10 μA
- Baseline Recovery:
 - ≤ 3s after defibrillation (Monitor mode)
 - ≤ 1s after defibrillation (Surgery mode)
- Bandwidth: Surgery 1 ~ 25 Hz
 - Monitor 0.5 ~ 40 Hz
 - Diagnostic 0.05 ~ 120 Hz
- Indication of Electrode Separation: Every electrode (exclusive of RL)

Heart Rate

- Measure range:
 - Adult: 0bpm; 10 ~ 300 bpm
 - Neo/Ped: 0bpm; 10 ~ 350 bpm
- Resolution: 1 bpm
- Accuracy: ± 1% or ± 1bpm, whichever is greater

ST Measurement

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

Respiration

- Method: Impedance between RA-LL, RA-LA
- Gain: ×0.25, ×0.50, ×1, ×2, ×4
- Respiration Rate: 0bpm, 6 ~ 150 BrPM
- Sweep speed: 6.25 mm/s, 12.5 mm/s, 25mm/s
- Resolution: 1 BrPM
- Accuracy: ±2 bpm or ±2%, whichever is greater
- Apnea Alarm: 10 ~ 60 s

NIBP

- Method: Oscillometric
- 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: 30 ~ 270 mmHg
	DIA: 10 ~ 220 mmHg
	MEAN: 20 ~ 235 mmHg
Pediatric:	SYS: 40 ~ 235 mmHg
	DIA: 10 ~ 220 mmHg
	MEAN: 20 ~ 225 mmHg
Neonate:	SYS: 30 ~ 135 mmHg
	DIA: 10 ~ 110 mmHg
	MEAN: 20 ~ 125 mmHg
- Static pressure accuracy: ±3mmHg
- Resolution: 1mmHg
- Accuracy: Maximum Mean error ±5mmHg
Maximum Standard deviation ≤8mmHg
- Over pressure Protection: Dual protection via software & hardware

Temperature

- Technique: Thermistor probe (2.25K)
- Channel: Dual-channel, provide T1; T2; ΔT
- 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)

Performance Specifications

SpO2 (Digital Technic)

- Measurement Range: 0 ~ 100 %
- Resolution: 1 %
- Response Modes: Low, Medium, High
- Accuracy: $\pm 2\%$ (70% ~ 100%)
 $\pm 3\%$ (35% ~ 69%)
Unspecified (0 ~ 34%)
- Support Pitch tone and multi-level volume
- User-selectable waveform speed:
6.25, 12.5, 25, 50 mm/s

Pulse Rate

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

Nellcor-SpO2 (Option)

- Measurement Range: 0 ~ 100 %
- Resolution: 1 %
- Accuracy: 70% ~ 100%, $\pm 2\%$ (adult)
70% ~ 100%, $\pm 3\%$ (Neonate)
70% ~ 100%, $\pm 2\%$ (Low Perfusion)
0% ~ 69%, unspecified

Pulse Rate

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

Masimo SpO2 (Option)

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

Pulse Rate

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

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 bpm

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 bpm

Depth of Anesthesia (CSI) (Option)

- EEG sensitivity: $\pm 400\mu V$
- Noise: $< 2\mu Vp-p$, $< 0.4\mu V$ 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: 2
- Measurement way: Thermal resistance way
- 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 ~ +350mmHg
PA -10 ~ +120 mmHg
CVP/ RAP/ LAP/ ICP -10 ~ +40 mmHg
PI/ P2 -50 ~ +350mmHg
- 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

* Specifications subject to change without prior notice

Model Configuration

Standard Config.	12.1 inch LED, 3/5 Lead ECG, NIBP, SpO2, Pulse Rate, Temperature, Respiration
Optional Config.	1/2 IBP, 2 -Temperature, Nellcor SpO2, Masimo SpO2 EtCO2 (Mainstream/Sidestream/Microstream), Anesthesia Depth Monitoring (CSM module), Multi-gas (AG) Monitoring
Optional Accessories:	Printer, USB Mouse/Computer Keyboard Input Function, Central Monitoring Station, Neo/Ped Accessories, HDMI Output, Wall-mounting, Trolley,
Remark:	1) User can NOT choose USB mouse function and WIFI at the same time.

Gallery for Optional Accessories:



NellcorExtensionCable



ReusableNellcor NeoProbe



ReusablePed.SpO2Probe



Disposable Ped SpO2
Probe



DisposableNeoSpO2Probe



IBPDisposableKits



HDMItoVGAtransverter



CentralMonitoringStation



TrolleywithBasket



Wall-mountwithbasket



Printer



AGMainstreamProbe



AGIRMAAirwayAdapter
(Adult/Infant)



AGSidestreamAnalyser



DisposableElectrodes of
AnaesthesiaDepth
Monitoring

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