Maxwell

ISO 13485 CE 0197 CFDA

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 sumultaneously
- Optional **HDMI** output

Printer

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

Central System

- Optional **built-in wireless network modue**, 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

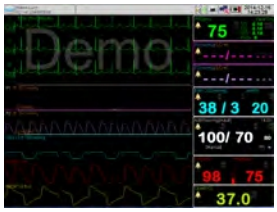
- Support **operation with mouse and computer keyboard** (Option)

- **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 ℃
- Humidity: 15% ~ 90% (non-condensing)
- Atmosphere pressure: 86 KPa ~ 110 KPa

Environment

- Temperature: -20～50 ℃
- 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:
  ≤ 3safter defibrillation (Monitor mode)
  ≤ 1safter 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 ℃~ 50 ℃ (32℉~ 122℉)
- Unit: Celsius (℃), Fahrenheit (℉)
- Resolution: 0.1℃or 1℉
- Accuracy: ±0.1℃(exclusive probe)

Performance Specifications

SpO2 (Digital Technic)

- Measurement Range: 0 ~ 100 %
- Resolution: 1 %
- Response Modes: Low, Medium, High
- 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

Pulse Rate

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

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: 1bpm
- 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: 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, ±5% of reading
  71 ~ 100 mmHg, ±8% of reading
  101~ 150 mmHg, ±10% of reading
  at 760 mmHg, ambient temperature of 25℃)
- 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 ±10mL/min
- Resolution: 0.1 mmHg (0 ~ 50 mmHg)
  0.25 mmHg (50 ~ 114 mmHg)
- CO2 Accuracy: 0 ~ 40 mmHg, ±2 mmHg
  41 ~ 70 mmHg, ±5% of reading
  71 ~ 100 mmHg, ±8% of reading
  101~ 150 mmHg, ±10% of reading
  at 760 mmHg, ambient temperature of 35℃)
- Respiratory Rate: Range: 3 ~120 BrPM
  Accuracy: ±1 bpm

Depth of Anesthesia (CSI) (Option)

- EEG sensitivity: ± 400μV
- Noise: < 2μVp-p, < 0.4μV 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, ±2%
  Impedance 300 to 3000Ω
- 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)
  P1/ P2
- Measuring and alarm range:

ART	0 ~ +350mmHg
PA	-10 ~ +120 mmHg
CVP/ RAP/ LAP/ ICP	-10 ~ +40 mmHg
P1/ P2	-50 ~ +350mmHg

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