

M3/M4 Compact Portable Patient Monitor

for the M3001A Multi-Measurement Server



The M3/M4 Compact Portable Patient Monitor (M3046A)¹ is a small, light patient monitor offering a flexible monitoring solution to suit a broad spectrum of monitoring needs.

The monitor works together with the M3001A² Multi-Measurement Server (MMS) and the M3012A/M3015A/M3016A Measurement Server Extensions to give you standard-of-care measurements.

Measurement Features

- Patient demographics, measurement data and trends, acquired and stored in the MMS, can be transferred to the M-Series (M3/M4)³ and Philips IntelliVue (MP60/MP70/MP90) patient monitors.
- EASI™-derived 12-lead ECG⁴ using a 5-electrode cable set.
- Multi-lead Arrhythmia.
- Up to 3 channels of ECG with basic Arrhythmia and ST Analysis capability.
- FAST-SpO₂ measurement, using Fourier Artifact Suppression Technology, for accurate performance even with low perfusion.
- Respiration, Non-invasive and Invasive Blood Pressure, and Temperature measurements.
- Mainstream or Sidestream CO₂, a second Invasive Blood Pressure and Temperature measurements, and enhanced Arrhythmia capability, available optionally.

1. This data sheet describes monitors with Software Revision E. The M3046A is also available with Software Revision D (M3046A option #C90) and there is a separate data sheet for this (publication number: 4522 981 83061).

2. Not compatible with M3000A.

3. Software Revision E only.

4. EASI™-derived 12-lead ECGs and their measurements are approximations to conventional 12-lead ECGs. As the 12-lead ECG derived with EASI™ is not exactly identical to the 12-lead conventional ECG obtained from an electrocardiograph, it should not be used for diagnostic interpretations.

Usability Features

- Choice of serial interface for a dedicated external strip chart recorder (as default), or IrDA interface for connecting to a local printer.
- 3-wave or 4-wave displays are available.
- Trend data, with manual and automatic event storage, together with a range of report styles help you track and document your patient's progress.
- Color display with a wide viewing angle.
- Optional battery informs you of remaining capacity, and allows longer transport times. It can be easily exchanged during transport with no loss of settings.
- TouchBar human interface — quick to learn and easy to use.
- Rubber bezel protector, available in four colors, gives additional protection in transport scenarios.

Patient Transfers

Patient demographics, measurement data and trends (for up to the last eight hours at one minute resolution for all numerics), are stored in the MMS, and can be uploaded to other Philips patient monitors - up to the last four hours to the M-Series (M3/M4)⁵, and the full eight hours to the IntelliVue family.



Patients can be transferred by disconnecting the MMS from the monitor, and then reconnecting it at a new monitor.

Local Recorder

You can connect a dedicated, standalone strip chart recorder (GSI Lumonics XE-50p, order number M3080A #H20) to your monitor via the optional serial recorder interface (see Ordering Information).

The following recordings are supported:

- Real-time local strips
- Delayed local strips
- Alarms
- Vital signs
- Trends and stored events



⁵.Software Revision E only.

Display

The color display has a wide viewing angle, and excellent visibility from a distance, so you can easily recognize and see the data you need for decision making.

For applications where a larger display is required, an additional display can be connected to the monitor via the standard VGA output (consult your Philips representative for further information).

Networked Systems

In larger installations, several of these monitors can be networked and connected to a Philips Information Center — with or without wires, for ultimate flexibility. Such a networked system not only allows central monitoring, but also bed-to-bed overview on any connected monitor. A permanent indication at the top of the screen conveniently shows the alarm status for beds assigned to the caregiver's group at all times.

Intended Use

The M3 and M4 patient monitors are designed for use by clinicians for adult, pediatric and neonatal patients in Critical and Intermediate Care areas, in Operating Rooms and General Wards, and for transport inside and outside the hospital.

U.S. Federal Law restricts this device to sale by or on the order of a physician.

M3001A/M3046A Monitor and Measurement Server Safety Specifications

The M3046A monitor together with the M3001A Measurement Server and the M3015A/M3016A Measurement Server Extensions comply with the Medical Device Directive 93/42/EEC (CE₀₃₆₆).

In addition, the product complies with

- IEC 601-1:1988 + A1:1991 + A2:1995
EN60601-1:1990 + A1:1993 + A2:1995
- UL 2601-1
- CAN/CSA C22.2#601.1-M90
- JIS T 1001-1992

Monitor Physical Specifications

Size (W×D×H)

Without Handle:

210mm × 135mm × 210mm
(8.27" × 5.31" × 8.27")

Weight

Without battery:

3200 g (7.05 lb.)

Monitor Environmental Specifications

Temperature Range (without wireless network interface)

Operating:

0 to 45°C (32 to 113°F).

Storage:

-20 to 60°C (-4 to 140°F).

Temperature Range (with wireless network interface)

Operating:

0 to 35°C (32 to 95°F).

Storage:

-20 to 60°C (-4 to 140°F).

Humidity Range

Operating:

95% RH max. @ 40°C (104°F)

Storage:

85% RH max. @ 50°C (122°F)

Altitude Range

Operating:

-500m to 4,600m
(-1,600' to 15,000')

Storage:

-500m to 13,100m
(-1,600' to 43,000')

Electrical Specifications

100 to 240VAC, 50/60Hz,
0.4 to 0.7A

Power Fail Protection.

Monitor Performance Specifications

Display

6.5" (diagonal) active color LCD (TFT)

Resolution:

640 × 480 pixels

Indicators

- Up to 4 waves (depending on monitor option)
- Alarms Off (red crossed-bell LED).
- Alarms (red/yellow LED, 3 different alarm tones).
- On/Standby (green LED).
- AC Power (green LED)
- Battery Status (green/yellow/red LED).
- QRS tone or tick, or SpO₂ modulation tone.

Interfaces

- Server link between monitor and measurement server
- Network (RJ45)
- Infrared Interface to local printer
- Serial Interface to local recorder (supported recorder: GSI Lumonics XE-50p)
- Nurse Call relay (1/8" phone jack, ≤60W, ≤2A, ≤36VDC, ≤25VAC, active=closed)
- ECG Output/Marker Input (1/4" stereo phone jack with tip, ring, sleeve)

ECG Output:

Signal Gain: 320 to 3200 (depending upon ECG display gain)

Full Scale on Display: 3.2V_{pp}

Gain Error: <20%

Baseline Offset: <150mV

Noise:<20mV_{RMS} at signal gain 1000

Bandwidth: 1 to 80Hz in ECG Diagnostic mode

Output Impedance:

<2.2KΩ ±20% ECG Output (ring)

<2.5kΩ ±20% ECG Output/Marker Input (tip)

Signal delay: <30ms

Marker Input Requirements:

Signal Type: 0 to -12V, negative edge pulse.

Pulse Source Impedance: <7kΩ

Pulse Fall Time: <100μs

Pulse Duration: >4ms

VGA Interface

Refresh rate: 60 Hz.

Horizontal frequency: 31.5 kHz

Resolution: 640 x 480 pixels

Video Signal: 0.7 V_{pp} @ 75 Ohm

HSYNC/VSYNC signal type: TTL

Connector: 15-pin D-SUB

Wireless Network Interface (optional)

Antenna: integrated into handle.

Technology: Frequency Hopping Spread Spectrum (FHSS)

Frequency band: 2.4 GHz Industrial Scientific Medical (ISM) band

Output Power: 100mW (max.)

Weight: < 200g

Battery (optional)

Moltech NJ1020 Smart Battery, 3500mAh (typical), Nickel-Metal-Hydrate (removable). *Also possible:* Toshiba TR36, Duracell DR36

Discharge Time:

2.5h minimum [new and fully charged battery, with NBP every 15 minutes, ECG, SpO₂, and automatic reduction of display brightness.]
With a CO₂ measurement in use, typically 15 minutes shorter.

Charge Time (after connection to AC power):

- typically 24h with monitor on and functioning.
- typically 4.5h with monitor off.

Weight:

600 g (1.3 lb.)

Real-time Clock

Accuracy:

<2 seconds per day.

Operating Time:

6h without battery or AC power, otherwise unlimited.

Active Settings and Stored Data

Operating Time:

6h without battery or AC power, otherwise unlimited.

Trends

Short trend:

10 hours with 1 minute resolution.

Long trend:

48 hours with 5 minutes resolution.
Both trends are stored.

Ordering Information

Monitor Options

M3046A #A03

M3 with 3 wave channels.
Supports CO₂ from M3015/M3016A Measurement Server Extensions.

M3046A #A04

M4 with 4 wave channels.
Supports M3015/M3016A Measurement Server Extensions, and the Pressure/Temperature channel from M3012A Measurement Server Extension.

M3046A #C01

Add enhanced arrhythmia capability

M3046A #C15

Add basic network capability

M3046A #C16

Add full network capability
(requires #C15)

M3046A #C40

Add battery.

M3046A #C90

Software Revision D (works with M3000A, not with M3001A). No local recorder support.

M3046A #C91

Software Revision E (works with M3001A, not with M3000A). Support for local recorder M3080A #H20.

M3046A #J14




Add IrDA Interface to connect to local printer
(you cannot also order M3046A #J16)

M3046A #J16

Add Serial Interface to connect to local recorder
(you cannot also order M3046A #J14; not compatible with M3046A #C90)

M3046A #J20

Add Wireless Network Interface
(requires #C15).

Complies with the requirements of the Council Directive 1999/5/EEC of 9 March 1999 (Radio and Telecommunications Terminal Equipment Directive)   

Monitor Mounting Options

M3080A #A10

Table Top Mount

M3080A #A11

Universal Hanger (including Table Top Mount)

M3080A #A13

Wall Rail

M3080A #A14

Tilt/Swivel Wall Mount
(includes wall rail)

M3080A #A15

GCX Wall Channel

M3080A #A21

Transport Bed Hanger

M3080A #A22

Roller Top Stand

M3080A #C05

Universal Pole Mount Clamp

M3080A #C06

Mounting Clamp for transport of Measurement Server and Measurement Server Extension

M3080A #C10

Monitor Rail Mount

Measurement Server Mounting Options

M3080A #A01

Measurement Server Mounting Plate
(pack of five plates)

M3080A #A02

Rotating Clamp Mount

Monitor Accessory Options

M3080A #C12

Monitor carrying case

M3080A #C30

Battery Charger for use with PowerSmart-compatible batteries.
[Original Equipment Manufacturer Product Number: DR36-SMB-TNT]

M3080A #C32

12V Adapter for use with a vehicle 12V power supply (for CE countries only)
[Original Equipment Manufacturer Product Number: NotePower 75/NotePower 75i]

M3080A #C40

Spare battery

Upgrade Options

M3060A #A01

Upgrade software to the latest revision (E)

M3060A #A03

Upgrade M2 to M3

M3060A #A04

Upgrade M3 to M4

M3060A #C01

Upgrade to full Arrhythmia

M3060A #C15

Upgrade to basic network

M3060A #C16

Upgrade to full network

M3060A #J14

Upgrade to IrDA Interface for connection to external printer (exchanging the Serial Interface for the external recorder)

M3060A #J16

Upgrade to Serial Interface for connection to external recorder (exchanging the IrDA Interface for the external printer). Revision E software is required.

M3060A #K01

Rubber Bezel Protector - Gray

M3060A #K02

Rubber Bezel Protector - Blue

M3060A #K03

Rubber Bezel Protector - Aqua

M3060A #K04

Rubber Bezel Protector - Yellow

Local Printer Options

M3080A #H05

Wireless Infrared Printer Connector

Local Recorder Options

For GSI Lumonics XE-50p:

M3080A #H20

GSI Lumonics XE-50p Strip Chart Recorder
(Software Revision E and Serial Interface connector required)

M3080A #A30

Roller Stand Mount

M3080A #A31

Wall Mount

M4816A

Paper, 10 Rolls

M4817A

Paper, 80 Rolls

M3081A #A70

1.0m serial recorder cable

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This device complies with the requirements of the Council Directives 93/42/EEC (Medical Device Directive) of 14 June 1993.

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