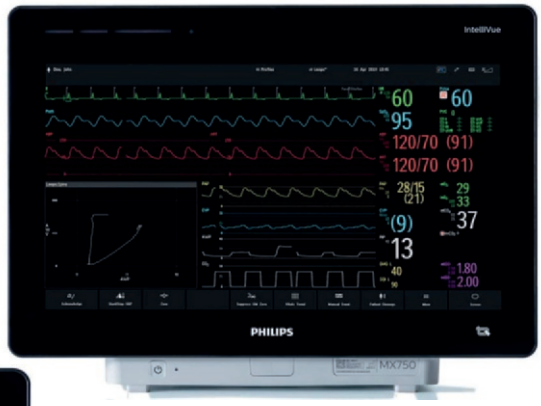
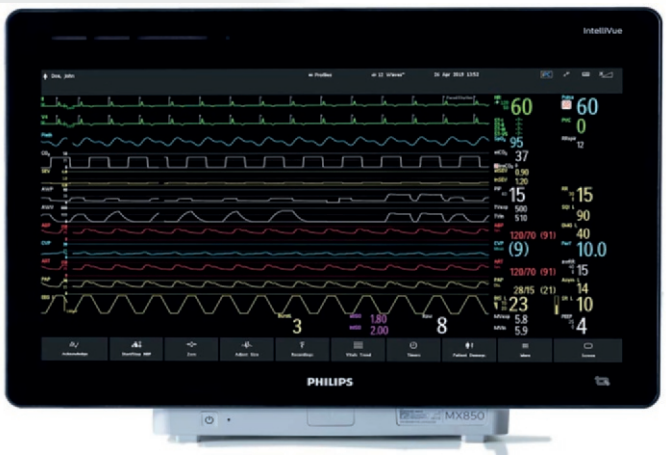
PHILIPS

IntelliVue

MX750 and MX850

Patient Monitors





IntelliVue MX750 and MX850 Patient Monitors

Philips 866471 & 866470, technical data sheet

Release N.01

The IntelliVue MX750 and MX850 Patient Monitors offer a flexible and modular monitoring solution, designed to suit a broad spectrum of needs. The monitor can be connected to the Philips Multi-Measurement Module family with its extensions, plug-in measurement modules, and the IntelliVue gas analyzers to extend its functionality with plug-and-play convenience. Dedicated configurations are available for the anesthesia, critical, cardiac, and neonatal care environments. The built-in Citrix (r) Xen (r) receiver and the HTML5 web applications platform, and the optional integrated PC (iPC) allows access to relevant patient information residing on the hospital's intranet.

Features

- Intuitive user interface.
- Easy-to-read, easy-to-use touchscreen.
- Simple menu hierarchy gives fast access to all basic monitoring tasks.
- Contactless identification and communication via RFID and NFC
- Screen layouts are easily adjustable, allowing flexible display of measurement information.
- The monitor can be configured to automatically vary the screen brightness to the ambient light conditions. The range within which this adaption is made is configurable.
- Previous/Next Screen function provides access to the 10 most recently used screens including the last three modified screens.
- Temperature, height, and weight can be configured either in metric or imperial units. Pressure measurements can be displayed in kPa or mmHg. Gases can be displayed in kPa or mmHg.
- Patient data management with tabular and graphic trends, and high-resolution trends to track changes with beat-to-beat resolution.
- Drug, ventilation, hemodynamic, and oxygenation calculations.
- User or case-specific profiles enable rapid case turnover.
- Patented automatic alarm limits help clinicians provide care more efficiently.
- Alarm Advisor provides feedback on recurring and continuous alarm limit violations, helping clinicians to adapt alarm limits more specifically for individual patients.

- Event Surveillance including neonatal event review (NER) for automatic detection of patient status deterioration.
- IntelliVue early warning scoring (EWS) calculates a score based on vital signs to help recognize early signs of deterioration in patients.
- Tympanic Temperature measurement [1,2]. In-Ear SpotCheck thermometer delivers accurate temperature readings in less than two seconds.
- Bed-to-bed overview provides clinicians with an overview of all the patient beds in their care.
- Choice of input devices: touchscreen, trackball, USB keyboard, mouse, or barcode scanner.
- Capable of functioning in a wireless infrastructure.
- Graphical measurement window shows which measurements are being measured by which device, making it easier to resolve measurement label conflicts.
- The Timers application enables notifications to be set when a specific time period has expired.
- Additional independent display capability using IntelliVue XDS Remote Display, IntelliVue AD75 and AD85 Active Displays[3], or the iPC.
  Note: The AD75/AD85 Active Display is not available in the USA and territories relying on FDA market clearance, and may also not be available in other geographies.
- The iPC can host Windows applications and safely share the display with the monitor's real-time system or drive a second display, independent of size and resolution. The content displayed on the second display can be different from the content on the main display of the monitor and can show either real-time vital signs information, PC applications, or both at the same time. A separate isolated LAN interface allows access to the hospital's network independent of the monitor. Six USB interfaces provide connectivity to external computer devices, for example, printers or input devices such as the touch interface of the selected display.
- Bedside information access using the iPC, Citrix (r) Xen (r) receiver, HTML5 web application functionality, and/or the IntelliVue XDS Clinical Workstation.
- XDS Database (option X40) enables the collection and storage of vital signs information (numeric data only - no waves), for example, heart rate, pressure on an external SQL database.

Indications for Use

The monitors are indicated for use by healthcare professionals whenever there is a need for monitoring the physiological parameters of patients.

The monitors are intended to be used for monitoring and recording of, and to generate alarms for, multiple physiological parameters of adults, pediatrics, and neonates. The monitors are intended for use by trained healthcare professionals in a hospital environment.

The monitors are only for use on one patient at a time. They are not intended for home use. Not therapeutic devices. The monitors are for prescription use only.

The ECG measurement is intended to be used for diagnostic recording of rhythm and detailed morphology of complex cardiac complexes (according to AAMI EC11).

ST segment monitoring is intended for use with adult patients only and is not clinically validated for use with neonatal and pediatric patients.

BIS is intended for use under the direct supervision of a licensed health care practitioner or by personnel trained in its proper use. It is intended for use on adult and pediatric patients within a hospital or medical facility providing patient care to monitor the state of the brain by data acquisition of EEG signals. The BIS may be used as an aid in monitoring the effects of certain anesthetic agents. Use of BIS monitoring to help guide anesthetic administration may be associated with the reduction of the incidence of awareness with recall in adults during general anesthesia and sedation.

The SSC Sepsis Protocol, in the ProtocolWatch clinical decision support tool, is intended for use with adult patients only.

The Integrated Pulmonary Index (IPI) is intended for use with adult and pediatric (1 to 12 years) patients only. The IPI is an adjunct to and not intended to replace vital sign monitoring.

The derived measurement Pulse Pressure Variation (PPV) is intended for use with sedated patients receiving controlled mechanical ventilation and mainly free from cardiac arrhythmia. The PPV measurement has been validated only for adult patients.

The IntelliVue NMT Module is intended to be used as an objective neuromuscular transmission monitor, using accelerometry for measuring the muscle contraction following an electrical stimulation of a peripheral nerve. The NMT Module is intended to be used with adult and pediatric patients.

The Masimo rainbow SET measurement is indicated for the noninvasive monitoring of functional oxygen saturation of arterial hemoglobin (SpO2), pulse rate, carboxyhemoglobin saturation (SpCO), methemoglobin saturation (SpMet), total hemoglobin concentration (SpHb), and/or respiratory rate (RRac). The Masimo rainbow SET measurement is indicated for use during both no motion and motion conditions, and for patients who are well or poorly perfused.

Modularity

The monitor's functionality can be extended by connecting the Philips Multi-Measurement Modules with extensions, Philips plug-in modules via the FMX-4, and gas analyzers - with plug-and-play convenience.

The monitor is available as standalone or networked solution.

The monitor's modular design allows new capabilities to be added in the future as monitoring requirements change. This upgradability provides the security of knowing the monitor can be enhanced and updated as practices and technologies advance, protecting long-term investments.

Main components

Display

The MX750 monitor has a 19 inch Full HD color LCD (TFT) display with a wide viewing angle, providing high-resolution waveform and data presentation.

The MX850 monitor has a 22 inch Full HD color LCD (TFT) display with a wide viewing angle, providing high-resolution waveform and data presentation.

1. Requires Option J13 - MIB/RS232 (2 ports) interface

2. See the IntelliVue Tympanic Temperature Module (Philips 866149) TDS for further details.

3. See the IntelliVue AD75 and AD85 Active Displays TDS for further details.

Remote display

IntelliVue XDS Remote Display allows the remote display of an IntelliVue Patient Monitor [1] on a PC connected to the same network. It can be configured to allow remote operation of the patient monitor. It is intended to be used as an additional independent display for viewing and operation by clinicians and nurses.

Integrated PC (iPC) [2]

The iPC is a fan-less, medical grade PC residing within the monitor and as such designed for continuous operation in the patient vicinity.

The iPC is shipped with Windows 7 as the operating system and can host applicable applications. These applications can be:

- Windows applications, such as Internet Explorer,
- Philips applications such as iSite clients or an application launch pad,
- Third party applications
- Hospital owned and developed software.

The iPC is designed as an "open" PC and can be serviced and maintained by the hospital's IT department as well as by Philips.

A separate isolated LAN interface allows access to the hospital's network independent of the monitor.

The iPC can safely share the main display with the monitor (single display setup) and/or be used with a standard or a medical grade display (dual display setup), either provided by Philips or another manufacturer.

The iPC supports displays with or without touch operation.

The iPC has six USB ports (five at the rear and one at the side of the monitor) supporting High-Speed mode for computer peripherals such as keyboard, mouse, barcode scanner, touch display, and so forth

User interface

The graphical user interface is designed for fast and intuitive operation, and ensures clinicians quickly feel at ease using the monitor.

- Configurable SmartKeys with intuitive icons allow monitoring tasks to be performed quickly and easily, directly on the monitor screen.
- Waves and numerics are color-coded, colors are customizable.
- The MX750 supports up to 12 waves simultaneously.
- The MX850 supports up to 16 waves simultaneously.
- For 12-lead ECG monitoring, the monitors can display 12 real-time ECG waves, with a rhythm strip and all ST values.
- Flexible screen layout allows optimal use of the available display space, for example, waves can be overlapped or wave size can adjust dynamically depending on the number of waves configured for the space.
- The Basic Help provides on-screen operating help, explaining INOP and alarm messages.

Touchscreen operation

The MX750 and MX850 patient monitors have screens that use capacitive touch technology. This technology supports multi-finger touch and swipe gestures. (similar to a smartphone).

Contactless identification and communication

Contactless identification via RFID (Radio Frequency Identification) and communication via NFC (Near Field Communication). User identification functionality that allows users to log in at the monitor and provides permissions for specific actions at the monitor.

Input devices

Supported input devices include the following USB-compatible off-the-shelf computer accessories:

- **Mouse:** Any specified USB mouse or trackball may be used for data entry.
- **Barcode scanner:** A USB barcode scanner in 'keyboard emulation mode' can be used via a USB connection.
- **Computer keyboard:** A USB-compatible off-the-shelf keyboard can be connected to the monitor for data entry.
- **Simulated keyboard:** If alpha or numeric data entry is required, for example to enter patient demographics, an on-screen keyboard is automatically displayed.

Input devices can be used individually or in combination.

IntelliVue AD75 and AD85 Active Displays

The AD75 and AD85 Active Displays can be used as additional independent displays for viewing screens generated by the (wired LAN) connected IntelliVue MX750 or MX850 patient monitor. The Active Displays provide encrypted audio and visual alarm signals for alarms generated by the connected patient monitor. The Active Displays can operate the connected patient monitor including start/stop of physiological measurements, change measurement modes, change alarm limits and acknowledge alarms.

Note: The AD75/AD85 Active Display is not available in the USA and territories relying on FDA market clearance, and may also not be available in other geographies.

X3 patient monitor/Multi-Measurement Module (867030)

The X3 can be used:

- As a stand-alone patient monitor.
- As a Multi-Measurement Module for the IntelliVue family of patient monitors.

The X3 can be connected to the monitor via an FMX-4 Module Rack.

It can also be placed in patient vicinity connecting it to the monitor via cable. It sends measurement waves and numerics to the monitor and generates alarms and INOPs.

The X3 can simultaneously monitor ECG (using 3-, 5-, 6-, or 10-lead sets, including arrhythmia and ST monitoring), respiration, oxygen saturation of arterial blood (SpO_2 [3]), noninvasive blood pressure (NBP), two invasive pressures, temperature, and CO_2. The X3 stores trend data, patient demographic information and measurement settings.

Combining its role as Multi-Measurement Module with that of stand-alone monitor, the X3 is particularly suited to transport situations. When the X3 is disconnected from the host monitor, it continues to monitor the patient as a stand-alone monitor running on battery power, eliminating the need for a separate transport monitor.

1. Requires a PC running the IntelliVue XDS Software

2. Optional

3. Choice of Philips FAST SpO_2, Masimo SET SpO_2, Nellcor OxiMax SpO_2 or Masimo rainbow SET SpO_2 (including certain Masimo rainbow parameters)

When the X3 is reconnected to a host monitor, it resumes its role as a Multi-Measurement Module, uploading trend data, patient demographic information and measurement settings, and allowing fully continuous monitoring.

The X3 can operate using battery power for over five hours with basic monitoring configuration to let you safely and easily monitor patients during in-hospital transfer. During in-hospital transport, the X3 can power the Measurement Extensions 867039, 867040, and 867041.

MMX Multi-Measurement Module (867036)

The MMX Multi-Measurement Module can be connected to the monitor via an FMX-4 Module Rack. It can also be placed in patient vicinity connecting it to the monitor via cable.

It sends measurement waves and numerics to the monitor and generates alarms and INOPs.

The MMX can simultaneously monitor ECG (using 3-, 5-, 6-, or 10-lead sets, including arrhythmia and ST monitoring), respiration, oxygen saturation of arrterial blood (SpO_2[1]), noninvasive blood pressure (NBP), two invasive pressures, temperature, and CO_2. Diagnostic 12-lead capability is optionally available.

The MMX stores trend data, patient demographic information and measurement settings and transfers it to a connected IntelliVue Patient Monitor.

X1 Multi-Measurement Module (M3001A/M3001AL)

The X1 Multi-Measurement Module can be connected to the monitor via an FMX-4 Module Rack. It can also be placed in patient vicinity connecting it to the monitor via cable.

It sends measurement waves and numerics to the monitor and generates alarms and INOPs.

The X1 can simultaneously monitor ECG (using 3-, 5-, 6-, or 10-lead sets, including arrhythmia and ST monitoring), respiration, oxygen saturation of arrterial blood (SpO_2[1]), noninvasive blood pressure (NBP), and either invasive pressure or temperature. Diagnostic 12-lead capability is optionally available. The X1 stores trend data, patient demographic information and measurement settings and transfers it to a connected IntelliVue Patient Monitor.

X2 Multi-Measurement Module (M3002A)

The X2 can be used:
- As a stand-alone patient monitor.
- As a Multi-Measurement Module for the IntelliVue family of patient monitors.

The X2 Multi-Measurement Module can be connected to the monitor via an FMX-4 Module Rack.

It can also be placed in patient vicinity connecting it to the monitor via cable. It sends measurement waves and numerics to the monitor and generates alarms and INOPs.

The X2 can simultaneously monitor ECG (using 3-, 5-, 6-, or 10-lead sets, including arrhythmia and ST monitoring), respiration, oxygen saturation of arrterial blood (SpO_2[2]), noninvasive blood pressure (NBP), and either invasive pressure and temperature, or CO_2. The X2 stores trend data, patient demographic information and measurement settings.

Combining its role as a Multi-Measurement Module with that of stand-alone monitor, the X2 is particularly suited to transport situations. When the X2 is disconnected from the host monitor, it continues to monitor the patient as a stand-alone monitor running on battery power, eliminating the need for a separate transport monitor.

When the X2 is reconnected to a host monitor, it resumes its role as a Multi-Measurement Module, uploading trend data, patient demographic information and measurement settings, and allowing fully continuous monitoring. The X2 can operate using battery power for over three hours with basic monitoring configuration to let you safely and easily monitor patients during in-hospital transfer.

Measurement extensions

The following Measurement Extensions can be slotted onto an X1, X2, X3, or MMX:
- The **867039 Hemodynamic Extension:** Adds temperature, two pressures, and optionally cardiac output/PiCCO.
- The **867040 Capnography Extension:** Adds mainstream or sidestream capnography, and optionally temperature, two pressures, and cardiac output/PiCCO [2].
- The **867041 Microstream® CO_2**[3] **Extension:** Adds Microstream capnography, and optionally temperature, two pressures, and cardiac output/PiCCO [4].
- The **M3012A Hemodynamic Extension:** Adds temperature, pressure, an additional pressure or a temperature and optionally cardiac output/PiCCO.
- The **M3014A Capnography Extension:** Adds mainstream or sidestream capnography, and optionally one pressure plus either a pressure or a temperature and cardiac output/PiCCO.
- The **M3015B Microstream CO_2 Extension:** Adds Microstream CO_2, two pressures and a temperature.

1. Choice of Philips FAST SpO_2, Masimo SET SpO_2, Nellcor OxiMax SpO_2 or Masimo rainbow SET SpO_2 (including certain Masimo rainbow parameters).

2. PiCCO is not available for the 867040 Capnography Extension in the United States and territories relying on FDA market clearance

3. Microstream is a registered trademark of Oridion Systems Ltd.

4. PiCCO is not available for the 867041 Microstream CO_2 extension in the United States and territories relying on FDA market clearance

Module Racks with plug-in modules

4-Slot Module Rack FMX-4 (866468) with Multi-Measurement Module Mount

The FMX-4 is available with four slots for plug-in measurement modules (with, or without a Multi-Measurement Module Mount on the side). The Patient Monitors can have up to two FMX-4 Module Racks, a maximum of eight plug-in modules are supported. The maximum number of specific module types that can be used simultaneously in an FMX-4 is: four pressure modules, four temperature modules, four IntelliBridge modules (any combination). The patient monitors support up to two pulse oximetry channels and four invasive pressure channels simultaneously (sourced either by plug-in modules or Multi-Measurement Modules).

Plug-in modules

Individual plug-in measurement modules are available:
- M1006B Invasive Blood Pressure
- M1011A Intravascular Oxygen Saturation Module (SO_2)
  M1012A Cardiac Output/Continuous Cardiac Output
- M1020B SpO_2
- M1027B Electroencephalograph (EEG/aEEG)
- M1029A Temperature
- M1034B Bispectral Index (BIS™) [1]
- 865383 Neuromuscular Transmission (NMT)
- 866173 G7m Gas Analyzer
- 867191 SpO2 (Masimo rainbow SET)
- 867192 SpO2 (Masimo SET)
- 867184 Masimo O3
- 867185 Masimo CO_2
- M1116B Thermal Array Recorder
- M1116C Thermal Array Recorder
- 865115 IntelliBridge EC10

IntelliVue gas analyzers

The G7m Gas Analyzer Module measures the five most commonly used anesthetic gases, as well as N_2O and CO_2. It also provides inspiration and expiration values for display on IntelliVue Patient Monitors and the values required for MAC calculation in the IntelliVue Patient Monitors.

The IntelliVue G7m Gas Analyzer features automatic agent identification and mixed-agent measurement capability.

Advanced O_2 technology based on paramagnetic measurements is included with the G7m.

Mounting

The standard mounting options enable flexible, space saving placement of the monitor for an ergonomic work space.

Applications for specific care settings

Anesthesia features

- The **IntelliVue G7m Gas Analyzer Module** measures the five most commonly used anesthetic gases, as well as N_2O and CO_2.
- The **BIS Module** assesses the level of consciousness in the OR, providing a measure of the effect of anesthetic agents.
- The **IntelliBridge EC10 Module** provides external-device interface capability to external devices at the bedside which have a serial RS232 and/or LAN interface.
- The **EEG module** determines coma prognosis and extent of cerebral insult. CSA information can be either permanently displayed on specially designed screens or viewed in a separate window. ***Burst Suppression Ratio (BSR)*** indicates the amount of time within an interval spent in the suppressed state.
- The **NMT Module** together with the NMT Patient Cable offers automatic measurements of muscle response to electrical stimuli delivered via electrodes placed over a peripheral nerve. This enables the evaluation of muscle relaxation of patients under neuromuscular block. The strength of the muscle response is measured with an acceleration sensor.
- **Screens** provide flexible viewing of patient information during different procedures or phases of an anesthesia case.
- **Respiratory Loops:** The IntelliVue Patient Monitor can generate three types of respiratory loops and display one realtime loop and up to six stored loops simultaneously. This helps early detection of patient airway problems (for example, atelectasis, bronchospasm) and ventilator problems (for example, leaks and kinked tubes).

Critical and cardiac care features

- The monitor performs multi-lead **arrhythmia analysis** on the patient's ECG waveform at the bedside. It analyzes ventricular arrhythmias, calculates heart rate, and generates alarms, including asystole, bradycardia, and ventricular fibrillation.
- Up to 12 leads of **ST segment analysis** can be performed on adult patients at the bedside, measuring ST segment elevation and depression, and generating alarms and events. The user can trend ST changes, set high and low alarm limits, and set both ST and isoelectric measurement points. ST points can be set either relative to the J-point or directly by selecting a numeric value. Using ST Snippets, one-second wave segments can be compared with a baseline segment for each measured ST lead.
- **QT/QTc interval monitoring** provides the measured QT interval, the calculated heart-rate corrected QTc value, and a ΔQTc value, which tracks variation in the QT interval in relation to a baseline value.
- **SvO_2** and **$ScvO_2$** measurements provide guidance for the treatment of sepsis treatment protocols.
- The **Parameter Histogram** View of the Vital Signs Trend allows the clinician to see, at a glance, the stability of the patient's condition for a selected time period.
- **ST Map** application shows ST changes over time in two multi-axis spider diagrams.
- **STE Map** adds gender-specific STE (ST Elevation) limits to ST Map. ST values violating these limits are indicated in red.

1. Bispectral Index and BIS are registered trademarks of Covidien AG and/or its affiliates

- **12-lead ECG** data can be measured in diagnostic quality using conventional electrode placement with 10 electrodes. Alternatively it can be measured using the EASI lead system with five electrodes in EASI placement, or the Hexad lead system with six electrodes [1].
- High-performance pulse oximetry technologies perform accurately even in cases with low perfusion.
- Choice of sidestream, or mainstream **CO_2 monitoring** for high-quality measurements with intubated and non-intubated patients.
- **Continuous cardiac output** and advanced hemodynamic assessment are provided using the PiCCO™ method without a pulmonary catheter [2].
- **Integrated Pulmonary Index (IPI)** [3] enables clinicians to assess a patient's ventilatory status and monitor changes in a patient's condition, facilitating more timely interventions.
- **Pulse Pressure Variation (PPV)** is calculated from beat-to-beat arterial pressure values. Pulse pressure is the difference between the systolic and diastolic pressure values for a single beat. Pulse pressure variation is defined as the maximal pressure less the minimum pressure divided by the average of these two pressures.
- **Clinical calculations** enable stored and manually entered data to be used to perform hemodynamic, ventilation and oxygenation calculations. Calculated data is displayed in both indexed and non-indexed format.
- **BIS** monitoring provides sedation assessment in critical and cardiac care environments.

Neonatal monitoring features

- The Oxygen CardioRespiroGram (***OxyCRG***) screens provide a simultaneous presentation of up to three high-resolution trends:
  - Beat-to-beat heart rate (btbHR)
  - An oxygenation measurement trend (SpO_2 or $tcpO_2$)
  - Compressed respiration wave (Resp)

  This customized display gives clinicians a convenient overview of the neonatal patient's most important vital signs, helping them identify significant events.
- Continuous oxyCRG recordings can be made at the bedside on the M1116C plug-in recorder and reports can be printed on a locally- or centrally-connected printer.
- Dual SpO_2 measurement provides clinical support through comparison and trending of the pulse oximetry values from two distinct patient sites, for example pre- and postductal saturations.
- Trended values can also be viewed in the form of a histogram. The SpO_2 histograms can be trend histograms or real-time histograms with one-second samples.
- Car Seat Assessment Record (CAR). This is a special period of event surveillance for neonates during a car seat test. During the CAR period, a real-time SpO_2 histogram is also generated with one-second samples.
- Neonatal event review (NER), for automatic detection of patient status deterioration. NER is optimized for monitoring neonatal patients. For each event, an episode of four minutes of data sampled four times a second is stored, to help you keep a record of rapid changes in the condition of neonatal patients. Combi-events correlate apnea events with bradycardia and/or desaturations.
- The aEEG [4] presentation is a trend display of the amplitude-integrated EEG (aEEG). It uses amplitude compression samples. A trend of the sum of the electrode impedances of the respective lead is shown below the aEEG presentation as a quality indicator that supports interpretation of the aEEG. The monitor stores 24 hours of aEEG and electrodes impedances for all four channels.

IntelliVue applications

Advanced clinical solutions

Clinicians are continuously drawing mental images from their observations of patients' vital signs. IntelliVue's Clinical Decision Support applications offer this dynamic "mind's eye view" directly on the monitoring screen display.

ProtocolWatch

ProtocolWatch allows clinicians to run clinical protocols that can monitor developments in the patient's condition. The SSC Sepsis Protocol runs on the ProtocolWatch application and is used in screening for severe sepsis, and monitoring its treatment.

IntelliVue early warning scoring (IntelliVue EWS)

The early warning scoring application provides fast, automated early warning scoring. IntelliVue EWS is fully customizable to match your hospital's clinical protocols:
- Configurable scoring parameters and thresholds
- Up to 20 parameters per EWS protocol
- Configurable MEWS thresholds
- Configurable Action List
- Up to 10 EWS protocols per monitor

IntelliVue EWS provides three basic types of scoring:
- Single Parameter Scoring (SPS)
- Multi-parameter scoring, for example:
  - Modified Early Warning Scoring (MEWS)
  - UK National Early Warning Scoring (NEWS)
- Body System Structural Scoring, for example:
  - Pediatric Early Warning Scores (Tucker Schema)
  - Adult Body System Scores

Vital signs and clinical observations can be configured for early warning scoring.
- Vital signs, for example: pulse, temperature
- Clinical observations, for example: AVPU, concern
- Using customized labels, clinical observations can be labeled and defined according to a hospital's particular requirements at the time of installation
- ADT data, for example: weight, age
- Lab data
- Documentation

1. EASI/Hexad-derived 12-lead ECGs and their measurements are approximations to conventional 12-lead ECGs. The 12-lead ECG derived with EASI/Hexad should not be used for diagnostic purposes as it is not identical to the 12-lead conventional ECG obtained from an electrocardiograph.

2. PiCCO™ is a trademark of Pulsion Medical Systems AG

3. Microstream CO_2 only

4. Patient monitor software option C60

ST Map

ST Map provides a graphical display that can help clinicians recognize ST changes and their location in the heart more easily. ST Map collects ST values created from the frontal (limb leads) and horizontal (chest leads) plane into an integrated display. The maps are multi-axis portraits of the patient's ST segments as measured with the ST/AR arrhythmia algorithm.

Advanced event surveillance

Events are electronic records of episodes in the patient's condition defined by customizable multi-parameter triggers. They can be used to drive alert notification to assist compliance to any protocol that is being used by the clinician.

Horizon view

Horizon trends provide clinicians with a graphical visualization tool that enables the patient's current clinical status to be detected at a glance. By combining parameters together on the display, the clinician is assisted in their cognitive process of pattern recognition.

Loops

Up to six loops of each type can be stored and compared to detect respiratory changes more easily.

Screen display flexibility

Up to 20 different screens can be created per monitor, meaning the clinician can have a screen created to match a specific clinical scenario on which the data that matter is displayed.

This streamlines the information that needs to be processed and interpreted to make the right decision at the right time.

Trends

- A **standard** trends database configuration is provided, designed to suit specific application areas. Depending on the configuration, patient data from up to 50 or 100 measurement numerics can be sampled every 12 seconds, 1 minute, or 5 minutes, and stored for a period ranging from 4 to 96 hours.
- **Tabular Trends** (Vital Signs) show data for all measurement numerics in tabular form. Tabular Trends can either be viewed in a separate window or permanently displayed on specially designed screens.
- Each NBP measurement generates a column in the Vital Signs trend table. The values for the other measurements are added to provide a complete vital signs set for the NBP measurement time.
- With **Graphic Trends**, up to three rows of measurement trends can be displayed in graphic form, each combining up to four measurements. Graphical Trends can either be viewed in a separate window or permanently displayed on specially designed screens.
- **Screen Trends** permanently display trend data for periodic and aperiodic parameters in graphical format on special screens. The displayed time period can be set to 30 minutes or 1, 2, or 4 hours.
- **High-Resolution Trends** allow the user to track fast-changing measurement trends with beat-to-beat resolution (four samples/second). The number of high-resolution trends available for display depends on the wave option purchased (for example eight for option A08).
- **Horizon Trends** show the deviation from a stored baseline.
- Trended values can be viewed in the form of a histogram. The SpO_2 histograms can be Trend Histograms with one-second samples.
- Navigation arrows provide easy access to the stored trends. Trend data can be documented on a locally- or centrally-connected printer.
- With **Event Surveillance**, changes in patients' condition are automatically detected according to user-defined multi-parameter triggers and an electronic record of data, called an Episode, is stored. The Episode can store:
  - 15 seconds of high-resolution wave trace
  - 4 minutes of data sampled 4 times a second, or
  - 20 minutes of data sampled every 12 seconds.

Event triggers can use the preset alarm limits or they can be user-defined. With user-defined triggers, event episodes are stored even when alarms are paused. A Manual-Event SmartKey enables manual episode storage.

Event Annotation allows immediate or retrospective annotation of events using a user-defined list of event markers such as 'ventilated'.

Events can be stored in a database for retrospective review, and episode data including graphic Event Reviews can be documented on a locally- or centrally-connected printer. In addition, episode data without graphic elements can be documented on the M1116C plug-in recorder. Events are also marked on the Event Line of an Information Center.

- The **basic event surveillance** package and the **neonatal event surveillance** package each include one Event Group. The basic event surveillance package can store 25 events over 24 hours.
- The **advanced event surveillance** offers increased storage capability, enabling the monitor to store up to:
  - 25 events for 8 hours
  - 25 events for 24 hours
  - 50 events for 8 hours
  - 50 events for 24 hours
  - 300 events over 7 days

Up to 10 user-defined Event Groups can be configured, each made up of up to four measurements. Up to six groups can be active at the same time. Advanced user-configurable trigger mechanisms allow the clinician to define event triggers combining information from up to four measurements. Either alarm limits or user-defined thresholds or deviations can be configured as event triggers. The user can set event notifications to be notified when an event is detected.

Patient management

- **Universal admission/discharge/transfer (ADT):** ADT information is shared between the networked monitor and the Philips Information Center. Information need only be entered once.
- **Stat Admit:** Allows you to admit a patient with a temporary patient identification. It can be used in cases when the patient ID is unknown or when the data is not yet available.
- **Quick Admit:** Allows you to quickly admit a patient using only a limited set of demographic data. You can enter the data with the keyboard or a barcode scanner.
- Patients can be transferred by disconnecting the Multi-Measurement Module from a monitor, and then reconnecting it at a new monitor. Patient demographics are stored in the Multi-Measurement Module so they do not have to be reentered at the new monitor.

Patient data documentation

An extensive range of patient reports can be printed:
- Event Review and Episode Reports
- 12-lead ECG Reports
- Vital Signs
- Graphic Trends
- Cardiac Output Reports
- Wedge Procedure Reports
- Calculations Reports
- EEG Reports
- Histogram Reports
- Loops Report
- ST Map Reports
- QT Reports
- Alarm Limit Reports
- Drug Calculator Reports
- Real-time Wave Reports
- OxyCRG Reports

Report templates can be defined in advance, enabling printouts tailored to each hospital's specific requirements to be started quickly. Reports can be printed on a locally- or centrally-connected printer, and can be initiated manually or automatically at user-defined intervals.

Recordings

The M1116C plug-in recorder records numerics for all active measurements and up to three waveforms. It can be used for local recording in the integrated module slots.

Alarms

The alarm system can be configured to present either the traditional HP/Agilent/Philips alarm sounds or sounds compliant with the IEC 60601-1-8 Standard.

Depending on the screen layout, alarm limits are permanently visible on the main screen. When an alarm limit is exceeded, it is signaled by the monitor as follows:
- An alarm tone sounds, graded according to severity.
- An alarm message is shown on the screen, color-coded according to severity.
- The numeric of the alarming measurement flashes on the screen.
- Alarm lamps flash for red and yellow alarms and are illuminated for technical INOPs.

The alarm-limit review page offers an overview of alarm limit settings and the possibility to modify these settings for all parameters.

A **Smart Alarm Delay** feature helps reduce the number of pulse oximetry nuisance alarms.

If the monitor is connected via a network to the Information Center, alarming is simultaneous at the monitor and at the Information Center.

The nurse call relay has active open and closed contacts and a user-definable delay time.

Alarms are graded and prioritized according to severity:
- **Red Alarms*** identify a potentially life-threatening situation for a patient.
- **Yellow Alarms**** indicate conditions violating preset vital signs limits.
- **Yellow Alarms*** indicate arrhythmia alarms.
- **Technical alarms (INOPs)** are triggered by signal quality problems, equipment malfunction, or equipment disconnect.

The Audio off/Pause Alarms function allows the user to switch off alarm tones with one touch or click while retaining visual alarm messages.

All alarms can be paused indefinitely or for one, two, three, five, or 10 minutes depending on their configuration.

Alarm strip recordings are available on the M1116C plug-in recorder or on a locally- or centrally-connected recorder.

Patented 'AutoLimits' help caregivers manage alarms more effectively, automatically adapting the alarm limits to the patient's currently measured vital signs within a safe margin defined individually for each patient.

Visual and/or audible latching and non-latching alarm handling is available.

Alarm Advisor

Alarm Advisor provides feedback on recurring and continuous alarm limit violations. The information provided helps the clinician in adapting alarm limits more specifically for individual patients.

Alarm Advisor can be enabled for:
- HR (low and high limit alarm, yellow and short yellow).
- PVCs/minute (high limit alarm).
- SpO_2 (low and high limit alarm).
- Pressure - ART, ABP, Ao, P (low and high limit alarm).
- RR (low and high limit alarm).
- awRR (low and high limit alarm).

Alarm Advisor can be switched on and off for each individual alarm (for example, for an SpO_2 low alarm, an HR low alarm, and so on).

Profiles

Profiles are predefined configuration settings for screens, measurement settings, and monitor properties. Each profile can be designed for a specific application area and patient category, for example OR adult, or ICU neonatal. Profiles enable a quick reaction to patient and care location changes: activating a profile with a particular patient category (adult, pediatric, or neonatal) automatically applies suitable alarm and safety limits and saves time usually spent carrying out a complete setup procedure.

A selection of profiles for common monitoring situations is provided with the monitor.

Profiles can also be created directly on the monitor or remotely on a PC and transferred to the monitor using the IntelliVue Support Tool. These created profiles can be changed, added to, renamed, or deleted.

A selection of profiles for common monitoring situations is provided with the monitor.

Networking capabilities

The monitor can operate as part of a networked system (wired/wireless) using the Philips IntelliVue Clinical Network interface. This includes:
- DHCP/BootP
- QoS Tagging
- 802.11 WLAN
- WMM on wireless networks

Other Bed Overview

The Other Bed window lets you view a subset of the waveform and numeric information from another bed in the same Care Group on the hospital network. Other Bed information can either be viewed in a separate window or permanently displayed on specially designed screens. The alarm status of a care group or unit can be displayed on the monitor's screen. The Other Bed window can be configured to pop up automatically when an alarm occurs at another bed. The Other Bed Overview can only be displayed on the main monitor.

Clinical calculation set

The clinical calculation set consists of Hemodynamic, Oxygenation, and Ventilation calculations.

Hemodynamic calculations:
- Cardiac Index (C.I.)
- Stroke Volume (SV)
- Stroke Index (SI)
- Systemic Vascular Resistance (SVR)
- Systemic Vascular Resistance Index (SVRI)
- Pulmonary Vascular Resistance (PVR)
- Pulmonary Vascular Resistance Index (PVRI)
- Left Cardiac Work (LCW)
- Left Cardiac Work Index (LCWI)
- Left Ventricular Stroke Work (LVSW)
- Left Ventricular Stroke Work Index (LVSWI)
- Right Cardiac Work (RCW)
- Right Cardiac Work Index (RCWI)
- Right Ventricular Stroke Work (RVSW)
- Right Ventricular Stroke Work Index (RVSWI)
- Extra Vascular Lung Water Index (EVLWI)
- Intrathoracic Blood Volume Index (ITBVI)
- Global End Diastolic Volume Index (GEDVI)

Oxygenation calculations:
- Arterial Oxygen Content (CaO_2)
- Venous Oxygen Content (CvO_2)
- Arteriovenous Oxygen Content ($CavO_2$)
- Oxygen Availability (DO_2)
- Oxygen Availability Index (DO_2I)
- Oxygen Consumption (VO_2)
- Oxygen Consumption Index (VO_2I)
- Oxygen Extraction Ratio (O_2ER)
- Alveolar-Arterial Oxygen Difference ($AaDO_2$)
- Percent Arteriovenous Shunt (Qs/Qt)

Ventilation calculations:
- Minute Volume (MINVOL)
- Compliance (COMP)
- Dead Space (Vd)
- Dead Space/Tidal Volume Ratio (Vd/TV)
- Alveolar Ventilation (ALVENT)

Drug Calculator

The Drug Calculator allows you to calculate the fourth value when three of the following values are entered: dose, amount, volume, rate of infusion.

A titration table and drip table can be displayed and printed.

Measurement units can be converted (for example, lbs to kgs). The Drug Calculator can also be configured to include a list of commonly used drugs using the IntelliVue Support Tool.

Service features

The IntelliVue Support Tool helps technical personnel to:
- Carry out configuration, upgrades, and troubleshooting via the network, or on an individual monitor.
- Share configuration settings between monitors.
- Back up the monitor settings.
- Document configuration settings.

A password-protected:
- **Service Mode** ensures that only trained staff can access service tests and tasks.
- **Configuration Mode** allows trained users to customize the monitor configuration.

Device connections

The monitor can be connected to the following Multi-Measurement Modules:
- X1 (M3001A/M3001AL)
- X2 (M3002A)
- X3 (867030)
- MMX (867036)

The following Measurement Extensions can be connected to the Multi-Measurement Modules:
- 867039 Hemodynamic Extension
- 867040 Capnography Extension
- 867041 Microstream CO_2 Extension
- M3012A Hemodynamic Extension
- M3014A Capnography Extension
- M3015A Microstream CO_2 Extension
- M3015B Microstream CO_2 Extension

The monitor can also be connected to:
- IntelliVue AD75 and AD85 Active Displays
  Note: The AD75/AD85 Active Display is not available in the USA and territories relying on FDA market clearance, and may also not be available in other geographies.
- A PC running the IntelliVue XDS Software [1]
- External devices via an IntelliBridge EC10 Module
- One or two FMX-4 Module Racks
- Plug-in measurement modules (in conjunction with FMX-4)
- Tympanic Temperature Module 866149
- A Philips Patient Information Center (for example, PIC iX)

Standard interface connections

Network interface

The network interface provides the system with networking capability via a wired network connection.

Device Interface (USB Interface)

This interface allows USB devices to be connected to the monitor, for example: mouse, keyboard, barcode scanner, PCL5-supported Printer.

RS232 interface (standard)

The standard RS232 port can be used to connect, for example, an IntelliVue G1/G5 gas analyzer.

1. Requires the relevant IntelliVue XDS options to be installed on either the patient monitor, or on a PC running the IntelliVue XDS Software with an activated license. See the IntelliVue XDS Software Technical Data Sheet for details

Further optional connection interfaces

MIB/RS232 (two port) interface board (option J13)

Additional dual MIB/RS232 I/O boards can be installed. The MIB ports can be independently configured to be used for:
- Numeric, wave, and alarm data export using a computer interface, to an automated anesthesia recordkeeper or a personal computer (not available in all countries).
- Data export can be configured for up to two MIB ports on the monitor. However only the first configured port provides wave export.
- Connection to a gas analyzer.
- Connection to iTemp (Philips tympanic thermometer).

Flexible nurse call interface (option J30)

The Flexible Nurse Call Interface provides a means for alarms generated on the monitor to be signaled on an external device such as a nurse call system, a beeper or a light. It provides three general alarm relays and one power fail alarm. The external device is connected to the alarm relay and alarms are triggered by criteria defined by the user. It has active open and closed contacts and a user-definable delay time.

Wireless infrastructure (option J35)

- Wireless Infrastructure enables the monitor to function within a WLAN. The WLAN infrastructure is an IEEE 802.11 a/b/g/n network in the 2.4 GHz or 5-GHz bands.

Additional components are required to complete the system. See the IntelliVue Clinical Network documentation for further information.

Monitor specifications

See the individual Technical Data Sheets for IntelliVue X1, IntelliVue X2, IntelliVue X3, and MMX Multi-Measurement Modules, Measurement Extensions, FMX-4 Module Rack, and plug-in module specifications.

Safety specifications

The monitors, together with the X3 Patient Monitor/Multi-Measurement Module (867030), MMX Multi-Measurement Module (867036), the current generation Measurement Extensions (867039, 867040, 867041), and all compatible plug-in modules comply with the Medical Device Directive 93/42/EEC and, among other standards, with:
- IEC 60601-1, Ed. 3.1:2012-08 (cons.)
- EN 60601-1:2006 + AC:2010 + A1:2013, Ed. 3
- ANSI/AAMI ES60601-1:2005/(R)2012, Ed. 3 (cons.)
- CAN/CSA-C22.2 No. 60601-1:14, Ed. 3 (cons.)
- IEC 60601-1-2:2014, Ed. 4
- EN 60601-1-2:2015, Ed. 4
- IEC 60601-1-6:2010 + A1:2013
- EN 60601-1-6:2010 + A1:2015
- IEC 60601-1-8:2006 + A1:2012
- EN 60601-1-8:2007 + A1:2013
- IEC 80601-2-49:2011
- EN 80601-2-49:2015

Classification (according to IEC 60601-1): Class 1, Type CF, Continuous Operation. The BIS, NMT, and tympanic temperature measurements, and the G7m Gas Analyzer use a Type BF applied part. They are protected against damage from defibrillation and electrosurgery.

The possibility of hazards arising from software errors was minimized in compliance with:
- ISO 14971:2007
- EN ISO 14971:2012
- ANSI/AAMI ISO 14971:2010
- IEC 62304:2006
- EN 62304:2006 + AC 2008

This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme à la norme NMB-001 du Canada.

Physical specifications

Product	Max. Weight	W x H x D
MX750 Monitor	10 kg (22. lb)	477 x 350 x 217 mm (18.8 x 13.8 x 8.5 in)
MX850 Monitor	11 kg (24.3 lb)	544 x 388 x 217 mm (21.4 x 15.3 x 8.5 in)

Environmental specifications

MX850 and MX750 Monitors

Item	Condition	Range
Temperature range	Operating	0-40°C (32-104°F) Or, with iPC installed: 0-35°C (32-95°F)
	Storage	-20-60°C (-4-140°F)
Humidity range	Operating	15-95% RH non-condensing
	Storage	5-95% RH non-condensing
Altitude range	Operating	-500-3000 m (-1640-9842 ft)
	Storage	-500-4600 m (-1640-15091 ft)
Ingress protection		IP21

Display specifications

MX850 Monitor 22 inch Full HD

Type	547 mm active matrix color LCD (TFT)
Resolution	1920 x 1080 (Full HD)
Useful Screen	476.6 mm x 268.1 mm
Pixel Size	0.248 mm x 0.248 mm

MX750 Monitor 19 inch Full HD

Type	469 mm active matrix color LCD (TFT)
Resolution	1920 x 1080 (Full HD)
Useful screen	409 mm x 230 mm
Pixel size	0.213 mm x 0.213 mm

Performance specifications

Power specifications

Power consumption	<200-W average
Line voltage	100 to 240 V
Current	1.9 to 0.9 A
Frequency	50/60 Hz

Indicators

Alarms off	Red or yellow LED (with crossed out alarms symbol)
Alarms	Red/yellow/light blue (cyan) LED
On/Standby/Error	Green/red LED integrated in power switch
External power	Green LED

Sounds

- Audible feedback for user input
- Prompt tone
- QRS tone, or SpO_2 modulation tone
- Four different alarm sounds
- Remote tone alarms on other beds in network
- Tone for timer expired

Display wave speeds

Available for standard waves	6.25 mm/s, 12.5 mm/s, 25 mm/s, 50 mm/s with ±5% accuracy (guaranteed only for integrated displays
Available for EEG and BIS waves	6.25 mm/s, 12.5 mm/s, 15 mm/s, 25 mm/s, 30 mm/s, 50 mm/s with ±5% accuracy (guaranteed only for integrated displays

Trends

Resolution	50 or 100 numerics @ 12 seconds, 1 minute, 5-minute resolution

Trends

Information	Multiple choices of number of numerics, resolution and duration depending on trend option and application area. Standard Database Configuration Options: **H02, H12, H22, H32, H42:** • **50 Parameters for:** 12 hours @ 12 secs, 48 hours @ 1 min, 96 hours @ 5 min • **50 Parameters for:** 24 hours @ 12 secs, 24 hours @ 1 min, 24 hours @ 5 min • **100 Parameters for:** 4 hours @ 12 secs, 24 hours @ 1 min, 96 hours @ 5 min

High Res trend waves

Measurements available	HR, SpO_2, Resp, Pulse, $tcpO_2$, Perf, $tcpCO_2$, CO_2, ABP, PAP, CVP, ICP, CPP, BIS, CCO, AWP, Anesthetic Agents, △ SpO_2, inO_2
Resolution	Measurement samples are taken at a resolution of 4 samples per second
Update speed	Waves are drawn at a speed of 3 cm/minute

Events

Information	Trigger condition and time, event classification and associated detailed view of episode data
Episode data	Configurable: • 4 minutes of high-resolution trend or • 20 minutes of numerics trend @ 12-sec resolution or • 15 seconds of 4 waves @ 125 samples/sec (Snapshot) including all current numerics, alarms and INOPs.
Capacity (max.)	30 events for 7 days

Alarm signal

System delay	<4 seconds
Pause duration	1, 2, 3 minutes or infinite, depending on configuration
Extended alarm pause	5 or 10 minutes

Review alarms

Information	All alarms/INOPs, main alarms on/off, alarm acknowledge, Alarm duration, and time of occurrence
Capacity	300 items

Real-Time clock

Range	From: January 1, 1997, 00:00 To: December 31, 2080, 23:59
Accuracy	Better than 4 seconds per day
Hold time	• If powered by AC: Infinite • Without power or battery: At least 48 hours

Buffered memory

Contents	Active settings, trends, patient data, real-time reports, events, review alarms
Hold time	• If powered by AC: Infinite • Without power: At least 8 hours

MX750/850 interface specifications

Network

Standard	IEEEc802.3 10Base-T and 100Base-TX, auto negotiation, full and half-duplex, IEE802.3af
Connector	RJ45 (8 pin)
Isolation	Basic insulation: • Reference voltage: 250 V • Test voltage: 1500 V

RS232 (standard)

Connector	RJ45 (8-pin)
Power	None
Isolation	Basic insulation: • Reference voltage: 250 V • Test voltage: 1500 V

USB interface

Standard	USB 2.0 high-speed (embedded host)
Connector	USB series 'Standard A' receptacle

USB interface

Power	Low-power port 4.4 V minimum, maximum load for all ports together 500 mA
Isolation	None

MIB/RS232 (optional I/O board)

Standard	ISO/IEC 11073-30200 compliant
Connector	RJ45 (8-pin)
Mode	Software-controllable: • BCC (RxD/TxD cross over) or • DCC (RxD/TxD straight through)
Power	5 V ±5%, 100 mA (max.)
Isolation	Basic Insulation: • Reference Voltage: 250 V • Test Voltage: 1500 V

Flexible nurse call interface (optional I/O Board)

Connector	20-pin MDR (Mini D-Ribbon), active open and closed contacts
Contact	≤100 mA, ≤24 V dc
Isolation	Basic Insulation: • Reference Voltage: 250 V • Test Voltage: 1500 V
Delay	< [Configured Latency +0.5] seconds

Basic nurse call relay[a]

Connector	Modular Jack 6P6C, active open and closed contact
Contact	≤100 mA, ≤24 V dc
Isolation	Basic insulation: • Reference Voltage: 250 V • Test Voltage: 1500 V
Delay	< [Configured Latency +0.5] seconds

a. With one general relay. The relay is configurable.

802.11 wireless interface (wireless network adapter) [a]

Type	Internal wireless adapter
Technology	IEEE 802.11a/b/g/n
Frequency band	2.4 GHz and 5-GHz band
United States	• 2.400-2.483 GHz • 5.15-5.35 GHz • 5.72-5.825 GHz
Europe	• 2.400-2.483 GHz • 5.15-5.35 GHz • 5.470-5.725 GHz
Japan	• 2.400-2.483 GHz • 5.150-5.250 GHz • 5.250-5.350 GHz • 5.470-5.725 GHz
China	• 2.400-2.483 GHz • 5.725-5.850 GHz
Modulation technique 802.11b/g/n	• DSSS (CCK, DQPSK, DBPSK) • OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
Modulation technique 802.11a/n	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
Effective isotropically radiated power (EIRP)	Below 20 dBm
WLAN infrastructure	For operation with full capacity, a WLAN infrastructure is recommended that provides: • A minimum RF signal (RSSI) level of -67 dBm (or higher) in all areas of monitor use. • A minimum signal-to-noise ratio (SNR) of 25 dB in all areas of monitor use. See the *IntelliVue Network Specification* document for details.

a. Optional: See ""Interface options" on page 15"

Near Field Communication interface (NFC)

Technology	• NFCIP-1, NFCIP-2 protocol • ISO/IEC 14443A, ISO/IEC 14443B • FeliCa PCD mode • MIFARE PCD encryption mechanism • NFC Forum tag 1 to 4 • ISO/IEC 15693/ICODE
Band	13.56 MHz
Modulation	ASK (active mode) or load modulation (passive mode)
Bandwidth	106 kbit/s, 212 kbit/s, 424 kbit/s, 848 kbit/s (depending on technology used)

Measurement server link (MSL)

Connectors	MSL out (Proprietary)
Voltage	56 V ±10% DC18
Power	45 W
Power synchronization	5 V CMOS Level; 78.125 kHz (typical)
LAN signals	10Base-T (IEEE802.3i) and 100Base-TX (IEEE 802.3u) compliant
Serial signals	RS-422 compliant

ECG sync output/analog ECG output

General	Connector	(1/4 inch stereo phone jack with tip, ring, sleeve)
	Isolation	None
Analog ECG output (ring, tip)	Gain error	<15%
	Baseline offset error	<150 mV
	Bandwidth	1-100 Hz
	Output voltage swing	±4 V (min.)
	Signal delay	<20 ms per AAMI EC13
	Signal delay with older versions of the M3001A Multi-Measurement Module	<30 ms per AAMI EC13
	Pacemaker pulse	filtered and included in ECG output signal
Digital pulse output (ring)	Output low-voltage level	<0.4 V @ I= -1 mA
	Output high-voltage level	>2.4 V @ I= 1 mA
	Pulse width	100 ms ±10 ms (active high)
	Pulse rise time	<1 ms (from 0.4 V to 2.4 V)
	Signal delay	<25 ms per AAMI EC13
	Signal delay with older versions of the M3001A Multi-Measurement Module	<35 ms per AAMI EC13

iPC specifications[1, 2]

iPC PC1 components	Specification
Processor	Intel Core i5-4300U
Graphics	Intel HD Graphics 4400
Hard drive	Solid-State Drive 100 GB or bigger
RAM	8 GB

iPC PC1 interfaces

Ethernet LAN

Connector	RJ45
LAN signals	IEEE 802.3 1000Base-T compliant, isolated according to IEC 60601-1

USB

Six external ports (five at the rear, one on the right-hand side) Type A connectors

Top connector on rear and connector on right side	USB 2.0 supporting Hi-Speed mode
Lower four connectors on rear (with blue inserts)	USB 3.0 supporting SuperSpeed mode

Audio

Microphone input stereo	3.5-mm audio jack
Headphone output stereo	3.5-mm audio jack

Two displayport outputs

DisplayPort 1.2	Supports resolutions up to 2560 x 1600 at 60 Hz

1. iPC PC1 may not be available in all countries

2. Optional, See """ on page 15

Ordering information

Ordering information for the 866470 (MX850) and 866471 (MX750) is given here. See the individual Technical Data Sheets for detailed ordering information for the Multi-Measurement Module family, Measurement Extensions, and plug-in modules.

Measurement capability options [1]

Care area options	Option
Intensive care software	H12
Neonatal care software	H22
Anesthesia software	H32
Cardiac care software	H42

Clinical packages	Option
Extended ECG capabilities	CP2
Extended alarm capabilities	CP4

Clinical features

Waveform capability	Option
6 Real-time wave segments (MX750 only)	A06
8 Real-time wave segments (MX750 only)	A08
12 Real-time wave segments (MX750 & MX850)	A12
16 Real-time wave segments (MX850 only)	A16

Clinical applications	Option
Advanced event surveillance	C07
Alarm Advisor	C46
HEXAD	C54
aEEG	C60

ProtocolWatch	Option
Severe Sepsis Screening	P01
SSC Sepsis Protocol	P02
IntelliVue EWS	P05

Hardware options - 866470 & 866471

Description	Option
Hardware add-ons	
866468 FMX-4 without Multi-Measurement Module mount	---
866468 FMX-4 with Multi-Measurement Module mount	E20
Integrated PC	
Integrated PC (iPC) 2G	PC1

Interface options

Wired interfaces [a]	Option
MIB/RS232 (2 ports) interface [b]	J13
Flexible nurse call interface	J30

a. Check availability in your country
b. Hardware supports multiple boards of this type

Wireless Interfaces [a]	Option
802.11 wireless Interface	J35

a. Check availability in your country

Care area software bundles - Hxx option dependent

Software	Option
Intensive Care Software: Intensive Care software consists of the standard set of clinical and operational patient monitoring functions plus Basic Event Surveillance, the extended ECG capabilities (Full Arrhythmia, ST Analysis, ST/STE Map and Qt/Qtc), the alarm visualization toolset (Alarm Review and Alarm Limits page, direct access to Auto Limits) as well as the data visualization tools (Horizon Trends, Pressure-Volume Loops, Parameter Histograms and Short graphical trends), together with the ability to customize screens. Smart Alarm Delay capability and connectivity to the Patient Information Center PIC iX are also a part of this software package. Two remote display connections are included for MX850, and one remote display connection is included for MX750, for use with the XDS Remote Display application on a PC. The XDS Clinical Workstation and XDS Database functionality are also included.	H12

1. One Hxx option and one Axx option must be chosen

Software	Option
Neonatal Care Software: Neonatal Care Software offers you the standard set of clinical and operational patient monitoring functionality. In addition, the package includes a neonatal event review with car seat testing and parameter histograms, the extended trends database and drug calculator. Other functions are the Smart Alarm Delay capability and the amplitude EEG (aEEG) presentation of EEG waveforms. The software package also allows you to customize your screens and to connect to the Philips Information Center PIIC iX. Two remote display connections are included for MX850, and one remote display connection is included for MX750, for use with the XDS Remote Display application on a PC. The XDS Clinical Workstation and XDS Database functionality are also included.	H22
Anesthesia Care Software: Anesthesia Software offers you the standard set of clinical and operational patient monitoring functionality. In addition, the package includes basic event surveillance, the extended trend database, ST-analysis and various data visualization tools: Horizon Trends, pressure-volume loops, Parameter Histograms and Short graphical trends. The software package also allows you to customize your screens and to connect to the Philips Information Center PIIC iX.Two remote display connections are included for MX850, and one remote display connection is included for MX750, for use with the XDS Remote Display application on a PC. The XDS Clinical Workstation and XDS Database functionality are also included.	H32
Cardiac Care Software: Cardiac Care Software offers you the standard set of clinical and operational patient monitoring functionality. In addition, the package includes basic event surveillance, the extended trends database, and the following cardiac options: full arrhythmia, ST-analysis, ST/STE-map, Qt/Qtc, and HEXAD (12-lead ECG derived from 6 leads). Also included are the alarm visualization toolset and the Smart Alarm Delay capability as well as the following data visualization tools: horizon trends, pressure-volume loops, parameter histograms, and short graphical trends. The software package also allows you to customize your screens and to connect to the Philips Information Center PIIC iX. Two remote display connections are included for MX850, and one remote display connection is included for MX750, for use with the XDS Remote Display application on a PC. The XDS Clinical Workstation and XDS Database functionality are also included.	H42

Measurement options

Measurements	Product No.	Option
Multi-Measurement Modules		
X1 Multi-Measurement Module Including Resp, ECG (inc. EASI/Hexad), NBP, and Pressure/Temperature See the IntelliVue X1 Technical Data Sheet for details	**M3001A**	
Philips FAST SpO_2		A01
Masimo SET SpO_2		A03 [a]
Nellcor OxiMax SpO_2		A04 [a]
Add Press/Temp		C06
Add Press/Temp and Conventional 12-Lead ECG		C12
X1 Multi-Measurement Module Including Resp, ECG (inc. EASI/Hexad), NBP, Masimo rainbow SET SpO_2, and Pressure/Temperature See the IntelliVue X1 Technical Data Sheet for details	**M3001AL**	A05
Add Press/Temp		C06
Add Press/Temp and Conventional 12-Lead ECG		C12
X2 Multi-Measurement Module Including Resp, ECG (inc. EASI/Hexad), NBP, and Pressure/Temperature See the IntelliVue X2 Technical Data Sheet for details	**M3002A**	
Philips FAST SpO_2		A01
Masimo SET SpO_2		A03 [a]
Nellcor OxiMax SpO_2		A04 [a]
Masimo rainbow SET SpO_2		A05
Add Press/Temp		C06
Add Respironics CO_2 ready [b]		C14
X3 Patient Monitor/Multi-Measurement Module See the IntelliVue X3 Technical Data Sheet for details	**867030**	
Three Wave Capability		A03
Four Wave Capability		A04
Five Wave Capability		A05
Dual SpO_2		B02
Respironics CO_2 Ready		B03

Measurements	Product No.	Option
Dual Pressure and Temperature		B06
Philips FAST SpO_2		SP1
Masimo rainbow SET SpO_2		SP5
Nellcor OxiMax SpO_2		SP6
MMX Multi-Measurement Module See the IntelliVue MMX Technical Data Sheet for details	**867036**	
Dual SpO_2		B02
Respironics CO_2 Ready		B03
Dual Pressure and Temperature		B06
Philips FAST SpO_2		SP1
Masimo rainbow SET SpO_2		SP5
Nellcor OxiMax SpO_2		SP6
Measurement extensions		
Hemodynamic Extension Including Press, Temp, Press/Temp	**M3012A**	
Add C.O.		C05
Add C.O./CCO		C10
Capnography Extension	**M3014A**	
Add Press, Press/Temp and C.O.		C05
Add Press and Press/Temp		C07
Add Press, Press/Temp and C.O./CCO		C10
Microstream CO_2 Extension Including dual invasive pressure and Temperature Measurements	**M3015B**	C08
Hemodynamic Extension	**867039**	
Dual Invasive Pressure, Temperature, and Cardiac Output		B05
Dual Invasive Pressure, Temperature		B06
Dual Invasive Pressure, Temperature, Cardiac Output, and PiCCO		B10
Capnography Extension Including Mainstream or Sidestream CO_2 Measurement	**867040**	
Dual Invasive Pressure, Temperature, and Cardiac Output		B05
Dual Invasive Pressure, Temperature		B06
Dual Invasive Pressure, Temperature, Cardiac Output, and PiCCO		B10 [c]
Microstream CO_2 Extension Including Microstream CO_2 Measurement	**867041**	
Dual Invasive Pressure, Temperature, and Cardiac Output		B05
Dual Invasive Pressure, Temperature		B06
Dual Invasive Pressure, Temperature, Cardiac Output, and PiCCO		B10 [d]

Module Rack (for plug-in measurement modules)		
FMX-4 Module Rack	**866468**	
Add Multi-Measurement Module mount		E20

Plug-in measurement modules		
See Module Technical Data Sheets for details		
Invasive Blood Pressure	M1006B [e]	
SO_2	M1011A	
Cardiac Output with Optional CCO	M1012A	
Philips FAST SpO_2	M1020B	A01
Nellcor OxiMax SpO_2	M1020B	A04 [a]
EEG/aEEG	M1027B	
Temperature	M1029A	
BIS Module	M1034B	
Thermal Array Recorder	M1116B/C	
IntelliBridge EC10	865115	
NMT	865383	
G7m Gas Analyzer	866173	
Masimo rainbow SET SpO_2	867191	SP5
Masimo SET SpO_2	867192	SP3

Measurements	Product No.	Option
Gas analyzers		
IntelliVue TcG10 [a]	865298	

a. Check availability in your country
b. Not available with option A05
c. Option B10 is not available for the 867040 Capnography Extension in the United States and territories relying on FDA market clearance
d. Option B10 is not available for the 867041 Microstream CO_2 Extension in the United States and territories relying on FDA market clearance
e. Option C01 provides an analog output signal

Related products

Product	Product/Option
IntelliVue Support Tool (DVD) orderable via: http://www.2.forms.healthcare.philips.com/LP=463	M3086A

Cables

Length	Description	Product/option
MSL cables		
0.75 m	Monitor to Multi-Measurement Module	M8022A SC1
2 m	Monitor to Multi-Measurement Module	M8022A SC2
4 m	Monitor to Multi-Measurement Module	M8022A SC4
10 m	Monitor to Multi-Measurement Module	M8022A SC6
15 m	Monitor to Multi-Measurement Module	M8022A SC7
25 m	Monitor to Multi-Measurement Module	M8022A SC9
MIB/RS232 cables		
1.5 m	Serial cable	M8022A SR2
3.0 m	Serial cable	M8022A SR3
10.0 m	Serial cable	M8022A SR6
15.0 m	Serial cable	M8022A SR7
25.0 m	Serial cable	M8022A SR9

Length	Description	Product/option
Basic nurse call relay cables		
3.0 m	Standard (backward compatible) Nurse Paging Relay Cable [a]	M8022A NS3
10.0 m	Cable	M8022A NS6
Advanced nurse call relay cables		
3.0 m	Cable	M8022A NC3
10.0 m	Cable	M8022A NC6
ECG out cables		
3.0 m	Standard ECG out cable [b]	M8022A SY3
25.0 m	ECG sync extension cable	M8022A SY9

a. Standard (backward compatible) connector. One end terminated with 6P6C connector; other end w/o connector
b. Both ends terminated with a 1/4 in phone plug

Software upgrade options

For: 866473 IntelliVue MX850 and 866474 IntelliVue MX750

Description	Option
SLCP (Software Licensed Controlled Product) waves	
Upgrade from 6 to 8 waves (MX750 only)	A68
Upgrade from 6 to 12 waves (MX750 only)	A6C
Upgrade from 8 to 12 waves (MX750 only)	A8C
Upgrade from 12 to 16 waves (MX850 only)	ACF
Clinical applications	
Neonatal CDS package	C04
Advanced event surveillance	C07
Alarm Advisor	C46
HEXAD	C54
aEEG	C60
Clinical packages	
Extended ECG capabilities	CP2
Extended alarm capabilities	CP4
Care areas	
Intensive care software	H12
Neonatal care software	H22
Anesthesia care software	H32
Cardiac care software	H42
ProtocolWatch	
Severe Sepsis Screening	P01
SSC Sepsis Protocol	P02
Early Warning Scoring	P05

Hardware upgrade options

For: 866473 IntelliVue MX850 and 866474 IntelliVue MX750

Description	Option
Wired interfaces	
MIB/RS232 interface	J13
Flexible nurse call interface	J30

a. Hardware supports multiple boards of this type

Wireless interfaces	
802.11 Wireless Interface [a]	J35

a. May not be available in all countries

Mounting information

For mounting hardware, contact your local Philips sales representative. For more information, see: https://www.usa.philips.com/healthcare/solutions/patient-monitoring/mounting-solutions

Documentation

All documentation is available in .pdf format on documentation DVD that is shipped with the product. Additionally, a predefined number of the Instructions for Use ships with each order.

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866471 & 866470 comply with the requirements of the Council Directive 93/42/EEC of 14 June 1993 (Medical Device Directive) as amended.