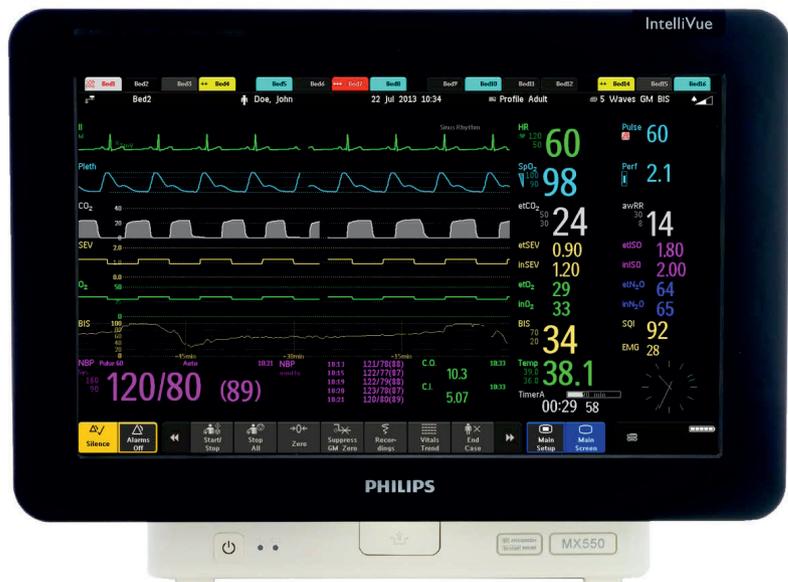


PHILIPS

IntelliVue

MX550

Patient Monitor



IntelliVue MX550 Patient Monitor

Philips 866066 Technical Data Sheet

Release N.0

The IntelliVue MX550 Patient Monitor offers 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, intensive, cardiac, neonatal and general care environments.

Features

- Intuitive user interface.
- Easy-to-read, easy-to-use touchscreen.
- Simple menu hierarchy gives fast access to all basic monitoring tasks.
- Screen layouts are easily adjustable, allowing flexible display of measurement information.
- Previous/Next Screen function provides access to the 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.
- Guardian Early Warning Scoring (EWS) calculates a score based on vital signs to help recognize early signs of deterioration in patients.
- Tympanic Temperature measurement¹. 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, remote control, trackball, mouse, keyboard, or barcode reader.
- Capable of functioning in a wireless infrastructure.
- Electronic Strip Recording.
- 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.
- Bedside information access using 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, etc. on an external SQL database.
- The monitor can be configured to automatically vary the screen brightness to the ambient light conditions. The range within which this adaptation is made is configurable.

1. Requires Option J13 - MIB/RS232 (2 ports) interface, or J40 - Advanced System Interface

Monitorius skirtas suaugusiųjų, vaikų ir naujagimių fiziologiniams parametrams stebėti, registruoti ir signalizuoti apie įvairius fiziologinius parametrus.

- Support for pre-configured remote applications hosted on Citrix®¹ XenApp® or standard IT web servers.
- Integrated carrying handle.

Indications for Use

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

1.1.1.

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

The monitor is additionally intended for use in transport situations within hospital environments, and is only for use on one patient at a time. It is not intended for home use. Not a therapeutic device. The monitor is for prescription use only.

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

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. The transcutaneous gas measurement (tcGas) with the M1018A plug-in module is restricted to neonatal patients only.

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.

BIS is intended for use under the direct supervision of a licensed healthcare 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 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.

Monitoriaus funkcionalumas gali būti išplėstas prijungiant Philips Multi-Matavimo modulius (su plėtiniais), ir dujų analizatorius, su patogia plug-and-play sistema

Monitoriaus modulinis dizainas leidžia pridėti naujas funkcijas ateityje, pasikeitus monitoravimo reikalavimams.

Modularity

The monitor's functionality can be extended by connecting Philips Multi-Measurement Modules (with extensions), and gas analyzers, with plug-and-play convenience.

The monitor is available as a standalone or networked solution.

1.1.1.

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 that the monitor can be enhanced and updated as practices and technologies advance, protecting long-term investments.

Main Components

Monitor

The monitor has a color 15-inch LCD TFT display with a wide viewing angle, providing high-resolution waveform and data presentation. The monitor integrates the display and the processing unit into one device. One external display² - providing an adaptive duplicate image of the primary display - can be connected to a built-in DVI-I port.

Remote Display

IntelliVue XDS Remote Display allows the remote display of an IntelliVue Patient Monitor³ 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.

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. Monitorius atvaizduoja iki šešių kreivių vienu metu
- The monitor displays up to six waves simultaneously. For 1.1.3.4. 12-lead ECG monitoring, it 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 monitor is supplied with a resistive touchscreen display.

1. Citrix®, Citrix Receiver™, XenApp®, and ICA® (Independent Computing Architecture) are trademarks of Citrix Systems, Inc. and/or one or more of its subsidiaries, and may be registered in the United States Patent and Trademark Office and in other countries

2. Requires Option J15 - Adaptive Secondary Display

3. Requires Option X00 - XDS Connectivity to be installed on either the patient monitor, or on a PC running the IntelliVue XDS Software with an activated license

Remote Control (865244)

The IntelliVue Remote Control 865244 provides direct access to five hardkeys, a navigation knob, and a numeric keypad which can also be used for alphanumeric entry. The hardkeys include “Acknowledge”, “Alarms Off / Pause Alarms”, “Back Key”, “MainScreen”, and a “SmartKeys” key that displays a block of configurable smart keys. The remote control is connected to the monitor via USB interface or SRR interface (wireless) and used for remote operation of the monitor.



Remote Alarm Device¹ (866406)

When connected to a patient monitor, the Remote Alarm Device 866406 provides audible and visual indicators of alarms, in addition to the indicators 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.
- **Computer Keyboard:** A USB-compatible off-the-shelf keyboard can be connected to the monitor for data entry.
- **Barcode Reader:** A USB barcode reader in 'keyboard emulation mode' can be used via a USB connection.
- **Simulated Keyboard:** If alpha or numeric data entry is required, for example to enter patient demographics, an on-screen keyboard is automatically displayed on the screen.

Input devices can be used individually or in combination.

X1 Multi-Measurement Module (M3001A/M3001AL)

The X1 Multi-Measurement Module can be connected directly to the rear of the monitor. 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 arterial blood (SpO₂²), 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 directly to the rear of the monitor.

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 arterial blood (SpO₂²), noninvasive blood pressure (NBP), and either invasive pressure and temperature, or CO₂. 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.

1. Requires Option J23 – Remote Device Interface

2. Choice of Philips FAST SpO₂, Masimo SET SpO₂, Nellcor Oximax SpO₂ or Masimo rainbow SET SpO₂ (including certain Masimo rainbow parameters).

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 also be connected directly to the rear of the monitor.

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 (SpO₂¹), noninvasive blood pressure (NBP), two invasive pressures, temperature, and CO₂. 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.

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) without requiring the use of the IntelliVue Battery Extension (865297).

MMX Multi-Measurement Module (867036)

The MMX Multi-Measurement Module can be connected directly to the rear of the monitor. 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 arterial blood (SpO₂¹), noninvasive blood pressure (NBP), two invasive pressures, temperature, and CO₂. 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 Monitor.

1. Choice of Philips FAST SpO₂, Masimo SET SpO₂, Nellcor OxiMax SpO₂ or Masimo rainbow SET SpO₂ (including certain Masimo rainbow parameters)

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/PiCCO².
- The **867041 Microstream® CO₂³ Extension**: Adds Microstream capnography, and optionally temperature, two pressures, and cardiac output/PiCCO⁴.
- 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 **M3015A Microstream CO₂ Extension**: Adds Microstream CO₂, and optionally either pressure or temperature.
- The **M3015B Microstream CO₂ Extension**: Adds Microstream CO₂, two pressures and a temperature.

Integrated Module Slots

The MX550 has three integrated module slots for use with plug-in modules.

Plug-in modules

The following individual plug-in measurement modules are available:

- M1006B Invasive Blood Pressure
- M1011A Intravascular Oxygen Saturation (SO₂)
- M1012A Cardiac Output/Continuous Cardiac Output
- M1014A Spirometry
- M1020B SpO₂
- M1027B Electroencephalograph (EEG/aEEG)
- M1029A Temperature
- M1034B Bispectral Index (BIS™)⁵
- 865383 Neuromuscular Transmission (NMT)
- 866173 G7m Gas Analyzer
- 867184 Masimo O3
- 867185 Masimo CO₂
- 867191 SpO₂ (Masimo rainbow SET)
- 867192 SpO₂ (Masimo SET)

Additional plug-in modules available are:

- M1116C Thermal Array Recorder
- 865115 IntelliBridge EC10

Supported Device Interfaces

Supported Device Interfaces are:

- IntelliBridge EC10 Module/EC10 Interface Board
- RS232 Data Export

2. PiCCO is not available for the 867040 Capnography extension in the USA 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 CO₂ extension in the USA and territories relying on FDA market clearance

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

IntelliVue Gas Analyzers

The G7m Gas Analyzer module measures the five most commonly used anesthetic gases, as well as N₂O and CO₂. 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 features automatic agent identification and mixed-agent measurement capability.

Advanced O₂ technology based on paramagnetic measurements is included with the G7m.

The TcG10¹ measures the transcutaneous O₂ and CO₂ partial pressure in neonates, pediatrics and adults.

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 N₂O and CO₂.
- The **BIS Module** assesses the level of consciousness in the OR, providing a measure of the effect of anesthetic agents.
- The **IntelliBridge EC10 Module / EC10 Interface Board** provides external-device interface capability to external devices at the bedside which have a serial RS232 and/or LAN output.
- 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 **Spirometry Module** provides airway pressure, volume, and flow measurements to monitor changes in respiratory status.
- 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 real-time 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 MX550 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.
- **SO₂ and ScvO₂** 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.
- **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 electrodes².
- High-performance pulse oximetry technologies perform accurately even in cases with low perfusion.
- Choice of mainstream or sidestream **CO₂ 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 catheter³.
- **Integrated Pulmonary Index (IPI)**⁴ enables clinicians to quickly and easily 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.

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

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

4. Microstream CO₂ only

1. May not be available in all countries

- **Spirometry** measurements help to manage ventilator settings and weaning.

Neonatal Monitoring Features

- Transcutaneous gas (TcGas) monitoring helps to optimize respiratory therapy in neonates.
- 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 (SpO₂)
 - Compressed respiration wave (Resp)
 - This customized display gives clinicians a convenient overview of the neonatal patient's most important vital signs, helping them to identify significant events.
- Continuous oxyCRG recordings can be made at the bedside on the integrated recorder, and reports can be printed on a locally- or centrally-connected printer.
- Dual SpO₂ measurement provides clinical support through comparison and trending of the pulse oximetry values from two distinct patient sites.
- Trended values can also be viewed in the form of a histogram. The SpO₂ histograms can be trend histograms or real-time histograms with 1-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 SpO₂ histogram is also generated with 1-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 aEEG¹ 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.

Guardian Early Warning Scoring (Guardian EWS)

The Early Warning Scoring application provides fast, automated early warning scoring. Guardian 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 ten EWS protocols per monitor

Guardian EWS provides three basic types of scoring:

- Single Parameter Scoring (SPS)
- Multiple 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

Escalating Monitoring: If a patient's condition is deteriorating or a closer observation is indicated in a particular situation, the monitor can be left with the patient and switched to a monitor profile that allows the vital signs to be checked with increased frequency.

Frequent Vitals: The monitor comes with the Frequent Vitals additional profile that can be used if some vital signs must be checked more frequently.

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. They can be used to drive alert notification to assist compliance to any protocol that is being used by the clinician.

Horizon Display

Horizon trends provide clinicians with a graphical visualization tool that enables the patients' 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.

1. Patient monitor software option C60

Screen Display Flexibility

Up to 20 different screens can be created per monitor, which means the clinician has the ability to have a screen created to match a specific clinical scenario on which the data that matters 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. Patient data from up to 100 measurement numerics can be sampled every 12 seconds, 1 minute, or 5 minutes, and stored for a period ranging from 4 to 48 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. Graphic 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 SpO₂ histograms can be Trend Histograms with 1-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 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 integrated recorder¹. 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** package 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

Up to six user-defined Event Groups can be configured, each made up of up to four measurements. All 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 in order to be notified when an event is detected.

Transport Features

- The monitor's portable design with integrated ergonomic handle and (optional) compact bedhanger means it can be used for in-hospital transport.
- The monitor can operate using battery² power for 2-2.5 hours, depending on the monitor configuration, to let you safely and easily monitor patients during procedures or in-hospital transfer.
- The transition from bedside monitoring to transport is smooth and easy, with no need to disconnect patient cables or adjust any measurement or monitor settings.
- The monitor's network capability means it is ready for use as an integrated part of the hospital system.
- Specially-designed mounting solutions let you quickly disconnect the monitor for transport and reconnect to the mount after transport.

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, X2, or X3 from a monitor, and then reconnecting it at a new monitor. Patient demographics are stored in the Multi-Measurement Module, X2, or X3, so they do not have to be re-entered at the new monitor.

1. Integrated recorder is optional: See "Hardware Options" on page 16

2. Battery required: See "Hardware Options" on page 16

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
- 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 print-outs 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 wave forms. It can be used for local recording in the integrated module slots.

Electronic strip recording (option C10) allows alarm-triggered and manually started electronic strips to be captured in the monitor print database. They can then be reviewed on the monitor, and printed in the form of reports when a printer is available.

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 alarms¹.

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 ten minutes depending on their configuration.

Alarm strip recordings are available on the integrated recorder or on a 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).
- SpO₂ (low and high limit alarm).
- Pressure - ART, ABP, Ao, P (low and high limit alarm).
- RR (low and high limit alarm).
- awRRR (low and high limit alarm).

Alarm Advisor can be switched on and off for each individual alarm (for example, for an SpO₂ 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.

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 or Smart-hopping Interface (1.4 or 2.4 GHz)

1. Not available in the USA and territories relying on FDA Market clearance. The Smart Alarm Delay functionality is currently not available in China or in clinical environments under CFDA control

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.

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 (CaO₂)
- Venous Oxygen Content (CvO₂)
- Arteriovenous Oxygen Content (CavO₂)
- Oxygen Availability (DO₂)
- Oxygen Availability Index (DO₂I)
- Oxygen Consumption (VO₂)
- Oxygen Consumption Index (VO₂I)
- Oxygen Extraction Ratio (O₂ER)
- Alveolar-Arterial Oxygen Difference (AaDO₂)
- 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 kg). 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 only trained staff can access service tests and tasks.
- **Configuration Mode** allows trained users to customize the monitor configuration.

Device Connections Prie monitoriaus galima prijungti šiuos multi matavimo modulius: X3

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 CO₂ Extension
- M3012A Hemodynamic Extension
- M3014A Capnography Extension
- M3015A Microstream CO₂ Extension
- M3015B Microstream CO₂ Extension

The monitor can also be connected to:

- A PC running the IntelliVue XDS Software¹
- External devices via an IntelliBridge EC10 Interface Board
- Gas Analyzers
- A Philips or Patient Information Center (for example, PIC iX)
- An Adaptive Secondary Display (an off-the-shelf VESA-compliant display (non-touch))

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 connection of USB devices to the monitor, for example: mouse, keyboard, barcode scanner, Remote Control 865244, PCL5-supported printer.

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)

The Additional dual MIB/RS232 I/O boards can be installed. The MIB ports can be independently configured to be used for:

- Input for connection to a touchscreen.
- Numeric, wave, and alarm data export using a computer interface, to an automated anesthesia record keeper 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 Temperature Thermometer).

Adaptive Secondary Display (Option J15)

The Adaptive Secondary Display activates the DVI video interface. The output of this interface mirrors the content of the monitor display. The output supports VESA display timings allowing off-the-shelf displays to be used with the DVI output.

Remote Device Interface (Option J23)

Remote Device Interface provides a connector on the patient monitor for connection to the Remote Alarm Device.

Device (USB) Interface (Option J25)

The USB Interface adds a USB port on the right-hand side of the monitor.

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.

IntelliBridge EC10 Interface Board (Option J32)

The IntelliBridge External Device Connection implements the physical layer of the ISO/IEEE 11073-30200 standard.

Driver software is available to support connectivity with a wide range of external medical devices.

In case the IntelliBridge EC5 ID Module is used to provide device identification, it also acts as a hardware adapter to the device-specific connector.

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.
- Smart-hopping Interface options, J45 (1.4 GHz [USA only]) and J47 (2.4 GHz) enable communication with a Philips IntelliVue Information Center (PIIC) or a Patient Information Center iX (PIC iX), using the Philips Cellular Telemetry System (CTS), cellular infrastructure.
- The Short-Range Radio option (J46) provides wireless connectivity to the IntelliVue Remote Control.

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

Advanced System Interface (Option J40)

The Advanced System Interface supports:

- An isolated RS232/5 V interface
- A Basic Nurse Call connector and two additional USB Connectors
- Input for connection to a touchscreen
- Numeric, wave, and alarm data export using a computer interface, to an automated anesthesia record keeper or a personal computer¹
- Connection to a gas analyzer

Remote Applications

With the appropriate connections you can access pre-configured applications made available by your hospital. The applications are hosted remotely on either a Citrix® XenApp® server or a standard IT Web server and can be displayed and operated on the bedside monitor screen.

Monitor Specifications

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

Safety Specifications

The monitor, 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. 3:2012-08 (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 60601-1-2:2007, Ed. 3
- EN 60601-1-2:2007 + AC:2010, Ed. 3
- 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
- IEC 60601-1-8:2006 + A1:2012
- EN 60601-1-8:2007 + A1:2013
- IEC 60601-2-49:2011
- EN 60601-2-49:2015

All applied parts are Type CF unless otherwise specified. 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

¹. May not be available in all countries

Physical Specifications

Product	Max. Weight	W x H x D
MX550 Monitor	7.5 kg (16.6 lb)	404 x 308 x 191 mm (15.9 x 12.1 x 7.5 in)
865244 Remote Control	0.4 kg (0.9 lb)	53 x 172 x 40 mm (2.1 x 6.8 x 1.6 in)
866406 Remote Alarm Device	0.4 kg (0.9 lb)	261 x 32 x 81 mm (10.3 x 1.3 x 3.2 in)

Environmental Specifications

MX550 Monitors

Item	Condition	Range
Temperature Range	Operating	0–40°C (32–104°F) Or, 0–35°C (32–95°F): • When charging the battery • M3002A is mounted on back, or • With Smart-hopping Interface
	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

Remote Control 865244

Item	Condition	Range
Temperature Range	Operating	0–40°C (32–104°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)

Performance Specifications

MX550 Power Specifications

Power Consumption	<70 W average
Line Voltage	100–240 V
Current	1.2–0.5 A
Frequency	50/60 Hz

WXGA (15:9) Display 15-inch 390 mm aktyvios matricos spalvotas LCD (TFT)

Type	1.1.3.1. 390 mm active matrix color LCD (TFT)
Resolution	1280 x 768
Refresh Rate	59.9 Hz
Useful Screen	334.1 x 200.5 mm (13.15 x 7.89 in)
Pixel Pitch	0.261 x 0.261

Indicators

Alarms Off	Red (crossed out alarms symbol) LED
Alarms	Red/yellow/light blue (cyan) LED
On/Standby/Error	Green/red LED integrated in power switch
External Power	Green LED
Battery	Red-Green-Yellow LED

Sounds

- Audible feedback for user input
- Prompt tone
- QRS tone, or SpO₂ 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)
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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)
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Trends

Resolution	100 numerics with: <ul style="list-style-type: none">• 4 h @ 12 sec• 24 h @ 1 min• 48 h @ 5 min
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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, ΔSpO ₂ , inO ₂
------------------------	--

Resolution	Measurement samples are taken at a resolution of 4 samples per second
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Update Speed	Waves are drawn at a speed of 3 cm/minute
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Events

Information	Trigger condition and time, event classification and associated detailed view of episode data.
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Episode Data	Configurable: <ul style="list-style-type: none">• 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.)	25 or 50 events for either 8 or 24 hours
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Alarm Signal

System Delay	<4 seconds
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Pause Duration	1, 2, 3 minutes or infinite, depending on configuration
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Extended Alarm Pause	5 or 10 minutes
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Review Alarms

Information	All alarms/INOPs, main alarms on/off, alarm acknowledge, and time of occurrence
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Capacity	300 items
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Real-Time Clock

Range	From: January 1, 1997, 00:00 To: December 31, 2080, 23:59
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Accuracy	Better than 4 seconds per day
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Hold Time	<ul style="list-style-type: none">• If powered by AC: Infinite• Without power or battery: At least 48 hours (typical: > 72 hours)
-----------	---

Buffered Memory

Contents	Active settings, trends, patient data, real-time reports, events, review alarms
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Hold Time	<ul style="list-style-type: none">• If powered by AC: Infinite• Without power: At least 8 hours
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865244 Remote Control Performance Specifications

Power (when not connected to the USB interface of the monitor)	Two AA primary cells
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Interface Specifications

Network

Standard	10Base-T and 100Base-TX (IEEE 802.3), auto-negotiation, full- and half-duplex
Connector	RJ45 (8 pin)
Isolation	Basic Insulation: • Reference Voltage: 250 V • Test Voltage: 1500 V

USB Interface

Standard	USB 2.0 high-speed
Connector	USB series 'Standard A' receptacle
Power	Low power port 4.4 V minimum, maximum load for all ports together 500 mA
Isolation	None

USB Interface (Two Ports)

Standard	USB 2.0 full-speed (embedded host)
Connector	USB series 'Standard A' receptacle
Power	Low power port 4.4 V min., max. load for all ports together 500 mA
Isolation	None

Video Interface^a

Connector	DVI-I (Digital and Analog Single Link)
Digital Video Signals	Single Link TMDS
HSYNC/VSYNC Signals	TTL
Vertical Frequency	59.9 Hz
Horizontal Frequency	47.8 Hz
Pixel Clock	79.5 MHz ±0.5%
Resolution	VESA 1280 x 768 at 60 Hz

a. Requires option J15 to enable video output

Dual MIB/RS232 Interface^a

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

a. Optional: See "Interface Options" on page 16

Flexible Nurse Call Interface^a

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 sec)

a. Optional: See "Interface Options" on page 16 and "Hardware Upgrade Options (866376)" on page 20

Basic Nurse Call Relay

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 sec

IntelliBridge EC10 Interface Board^a

Connector	Modular Jack 8P8C
Connectivity	RS232/LAN
Power	5 V ±5% @ 0-100 mA ^b
Isolation	Double Insulation: • Reference Voltage: 250 V • Test Voltage: 4000 V

a. Optional: See "Interface Options" on page 16 and "Hardware Upgrade Options (866376)" on page 20

b. Used to supply the IntelliBridge EC5 Module

Smart-hopping Interface^a 1.4 GHz (USA Only)

Type	Internal WMTS Adapter
Technology	Compatible with Philips Cellular Telemetry System (CTS), cellular infrastructure
Frequency Band	WMTS, 1395-1400 MHz and 1427-1432 MHz
Modulation Technique	GFSK
Effective Radiated Power	Max. 10 dBm ERP (9 mW)

a. Optional: See "Interface Options" on page 16 and "Hardware Upgrade Options (866376)" on page 20

Smart-hopping Interface^a 2.4 GHz

Type	Internal ISM Adapter
Technology	Compatible with Philips Cellular Telemetry System (CTS), cellular infrastructure
Frequency Band	2.4 GHz ISM
Modulation Technique	GFSK
Effective Radiated Power	Max. 18 dBm ERP (64 mW)

a. Optional: See "Interface Options" on page 16 and "Hardware Upgrade Options (866376)" on page 20

Advanced System Interface^a RS232/5 V

Standard	IEEE 11073 30200
Connector	RJ45 (8 pin)
Mode	BCC (Rx/D/TxD cross over)
Power	5 V \pm 5%, 100 mA (max.)
Isolation	Basic Insulation • Reference Voltage: 250 V • Test Voltage: 1500 V

a. Optional: See "Interface Options" on page 16 and "Hardware Upgrade Options (866376)" on page 20

Remote Device Interface^a

Connectors	14 pin MDR (Mini D Ribbon)
Input Voltage	18 V \pm 5%
Input Power	1.8 W
Serial Signals	RS-422 compliant
Alarm Tones	Generated by Monitor

a. Optional: See "Interface Options" on page 16

802.11 Wireless Interface^a (Wireless Network Adapter)

Type	Internal Wireless Adapter
Technology	IEEE 802.11a/b/g/n
Frequency Band	2.4 GHz and 5 GHz Band
USA	• 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 • 5.15-5.25 GHz • 5.25-5.35 GHz • 5.470-5.725 GHz
China	• 2.400-2.483 GHz • 5.725-5.85 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)
Bandwidth	20/40 MHz (nominal)
Effective Radiated Power (ERP) Max.	• 2.400-2.483 GHz: 16 dBm (40 mW) • 5.150-5.725 GHz: 15 dBm (32 mW) • 5.745-5.825 GHz: 13 dBm (20 mW)

a. Optional: See "Interface Options" on page 16

Short-Range Radio Interface^a

Type	Internal SRR Interface
Technology	IEEE 802.15.4
Frequency Band	2.4 GHz ISM (2.400-2.483 GHz)
Modulation Technique	DSSS (O -QPSK)
Effective Radiated Power	Max. 0 dBm (1 mW)

a. Optional: See "Interface Options" on page 16

Measurement Server Link (MSL)	
Connectors	MSL Out (proprietary)
Voltage	48 V ±10%
Power	12 W
Power Synchronization	5 V CMOS Level, 78.125 kHz (typical)
LAN Signals	IEEE 802.3 10Base-T compliant
Serial Signals	RS-422 compliant

ECG Sync Output/Analog ECG Output

General	Connector	(1/4 in stereo phone jack with tip, ring, sleeve)
	Isolation	None
	Short Circuit Current	<13 mA
Analog ECG Output (ring, tip) (Ring/Channel 2 is configurable to either Analog ECG Output or Digital Pulse Output)	Gain Error	<15%
	Baseline Offset Error	<150 mV
	Bandwidth	1-100 Hz
	Output Voltage Swing	±4 V (min.)
	Signal Delay	<20 ms
	Signal delay with older versions of the M3001A Multi-Measurement Module ^a	<30 ms
Digital Pulse Output (ring) (Ring/Channel 2 is configurable to either Analog ECG Output or Digital Pulse Output)	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
	Signal Delay	<25 ms
	Signal delay with older versions of the M3001A Multi-Measurement Module ^a	<35 ms

a. Identifiable with serial number prefix DE227 or DE441 and option string A01

Battery Specifications

Philips high-power lithium ion battery M4605A, 10.8 V 6000 mAh:

- Weight: 490 g per battery.
- Status LEDs indicate charge status of batteries.
- Safety: Complies with UL1642 (UL recognized).
- Electromagnetic Compatibility: Complies with the requirements for FCC Type B Computing Device, and EN 61000-4-2 and EN 61000-4-3.
- Communication Standard: Complies with the SMBus specification v1.1.

Battery Operating Time

New and fully charged battery:

- Basic Monitoring Configuration: 2.5 hours (brightness set to optimum, Multi-Measurement Module connected, NBP measurement every 15 minutes).
- Extended Monitoring Configuration: 2 hours (brightness set to optimum, Multi-Measurement Module and Measurement Extension connected, NBP every 15 minutes, Recorder, Pressure, Temperature Modules connected).

Battery Charge Time

- Monitor switched off: 3 hours.
- Monitor in use: Up to 5 hours, depending on monitor configuration.

Ordering Information

Ordering information for the 866066 (MX550) is given here. See the individual Technical Data Sheets for detailed ordering information for the Philips Multi-Measurement Modules, Measurement Extensions, and plug-in modules.

Monitor Capability Options

Basic Functionality	866066	Option
General Care Software (Default) ^a		H02
Intensive Care Software		H12
Neonatal Care Software		H22
Anesthesia Software		H32
Cardiac Care Software		H42

a. Check availability in your country

Application Options¹

Measurement Capability	866066	Option
Support Two Additional Pressures		M06
Support One Additional SpO ₂		M20
Clinical Applications	866066	Option
Drug Calculator		C05
Basic Event Surveillance		C06
Advanced Event Surveillance		C07
Parameter Histograms		C09
eDocumentation		C10
Alarm Advisor		C46
aEEG		C60

XDS Connectivity

Options	866066	Option
XDS Connectivity		X00
XDS Clinical Workstation		X30
XDS Database		X40

ProtocolWatch

ProtocolWatch	866066	Option
Severe Sepsis Screening		P01
SSC Sepsis Protocol		P02
IntelliVue Guardian EWS		P05

Hardware Options

Hardware	866406	Option
Remote Alarm Device		A01
Hardware Add-Ons	866066	Option
Remote Control		E00
Bed Hanger Mount		E21
Quick Release Mount		E22
One Li-ion Battery		E24

Interface Options

Wired Interfaces ^a	866066	Option
MIB/RS232 (2 ports) Interface ^b		J13
Adaptive Secondary Display		J15 ^c
Remote Device Interface		J23
USB Interface		J25
Flexible Nurse Call Interface		J30
IntelliBridge EC10 Interface Board		J32
Advanced System Interface		J40

- a. Check availability in your country
- b. Hardware supports multiple boards of this type
- c. Option J15 enables digital (DVI-D) and analog (DVI-A) video capability

Wireless Interfaces ^a	866066	Option
802.11 Wireless Interface		J35
Smart-hopping Interface 1.4 GHz ^b		J45
Short-Range Radio		J46
Smart-hopping Interface 2.4 GHz		J47

- a. Check availability in your country
- b. USA only

¹. Availability may depend on choice of Hxx option

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

Measurements	Product No.	Option
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
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	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 CO₂ 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
Hemodynamic Extension Including Press, Temp, Press/Temp	M3012A	

Measurements	Product No.	Option
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 CO₂ Extension	M3015A	
Add Press/Temp		C06
Microstream CO₂ Extension Including Dual Invasive Pressure and Temperature Measurements	M3015B	C08

Measurement Modules

See Module Technical Data Sheets for details

Invasive Blood Pressure	M1006B ^e	
SO ₂	M1011A	
Cardiac Output with Optional CCO	M1012A	
Spirometry	M1014A	
Philips FAST SpO ₂	M1020B	A01
Nellcor OxiMax SpO ₂	M1020B	A04 ^a
EEG	M1027B	
Temperature	M1029A	
BIS	M1034B	
Thermal Array Recorder	M1116C	
IntelliBridge EC10	865115	
NMT	865383	
G7m Gas Analyzer	866173	
Masimo O3 Plug-in Module	867184	
Masimo CO ₂ Plug-in Module	867185	
Masimo rainbow SET SpO ₂	867191	SP5
Masimo SET SpO ₂	867192	SP3

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 USA and territories relying on FDA market clearance

d. Option B10 is not available for the 867041 Microstream CO₂ Extension in the USA and territories relying on FDA market clearance

e. Option C01 provides an analog output signal

Gas Analyzers

IntelliVue TcG10^a 865298

a. Check availability in your country

Related Products

Product	Product No.	Option
Input Devices		
Slimline Keyboard with Protective Cover	M8024A	A01
Mouse; Wired	M8024A	B01
Trackball; Wired	M8024A	C01
Trackball; Wireless	M8024A	C02
Tabletop Wired Trackball	M8024A	C03
Remote Control	865244	
IntelliVue Support Tool (DVD) orderable via: http://www.2.forms.healthcare.philips.com/LP=463	M3086A	

Accessories

External Battery Charger 865432

IntelliVue Battery Extension (provides additional power to a combination of Measurement Extension and M3002A IntelliVue X2 Multi-Measurement Module for situations when no mains power is available, for example, during transport). 865297

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

Length	Description	Product/Option
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
Touch Cables		
1.5 m	Touch Cable	M8022A TC2
3.0 m	Touch Cable	M8022A TC3
10.0 m	Touch Cable	M8022A TC6
15.0 m	Touch Cable	M8022A TC7
25.0 m	Touch Cable	M8022A TC9
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		
10.0 m	Cable	M8022A NC6
ECG Out Cable		
3.0 m	Standard ECG Out Cable ^b	M8022A SY3
25.0 m	ECG Sync Extension Cable	M8022A SY9
Remote Alarm Device Cables		
1.5 m	Connect Cable	M8022A HF2
3.0 m	Connect Cable	M8022A HF3
10.0 m	Connect Cable	M8022A HF6
15.0 m	Connect Cable	M8022A HF7
25.0 m	Connect Cable	M8022A HF9

a. 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 (866366)

Description	Option
Waves	
Upgrade from 4 to 6 waves	A06
Upgrade from 6 to 8 waves ^a	A08
Clinical Applications	
Drug Calculator	C05
Basic Event Surveillance	C06
Advanced Event Surveillance	C07
Parameter Histograms	C09
eDocumentation	C10
Alarm Advisor	C46
aEEG	C60
Interfaces	
Adaptive Secondary Display	J15
ProtocolWatch	
Severe Sepsis Screening	P01
SSC Sepsis Protocol	P02
Measurement Capability Options	
Support One Additional SpO ₂	M20
XDS Connectivity Options	
XDS Connectivity	X00
XDS Clinical Workstation	X30
XDS Database	X40
Software	
Upgrade to Current Software Revision	SUN

a. Check availability in your country

Hardware Upgrade Options (866376)

Description	Option
Interfaces	
MIB/RS232 Interface (2 ports)	J13
Remote Device Interface	J23
USB Interface	J25
Flexible Nurse Call Interface	J30
IntelliBridge EC10 Interface Board	J32
802.11 Wireless Interface	J35
Advanced System Interface	J40
Smart-hopping Interface 1.4 GHz ^a	J45
Short-Range Radio	J46
Smart-hopping Interface 2.4 GHz	J47

a. USA only

Mounting Information

For mounting hardware, contact your local Philips sales representative. For more information, see: <http://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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4522 991 45641 * AUG 2019



How to reach us:

www.healthcare.philips.com

healthcare@philips.com



866066 complies with the requirements of the Council Directive 93/42/EEC of 14 June 1993 (Medical Device Directive) as amended.