Medical device certification number: 305AFBZX00029000

January 31, 2024 (Edition 1.2)

Actocardiograph MT-830

Operation Manual

Classification: Machinery device 21, visceral function inspection device

Controlled medical device: Medical device requiring specific maintenance and management

Generic name: Fetal monitor JMDN 37796000

⚠ CAUTION

- Read this operation manual carefully before use.
- Keep these instructions for future reference.

Manufacturer

TOITU CO., LTD.
1-5-10, Ebisu-Nishi, Shibuya-Ku,
Tokyo, 150-0021 Japan
TEL: +81-3-3463-6381
FAX: +81-3-3463-6380
E-mail:international@toitu.co.jp
URL:https://en.toitu.co.jp/

Distributor

Introduction

- This operation manual describes the required method of handling and safety precautions to follow when using the Actocardiograph MT-830 (hereafter called "the device").

  Read this operation manual carefully before use for safe operation of the device. All users must read “For Safe and Proper Use” even if they are already familiar with the device. Any carelessness may result in a serious accident.

  Deviation from this manual may impair the safety of patients or operators, or cause device performance to decline or damage to the device.

- The device’s intended use is to monitor the fetal heart rate, uterine contractions, the maternal heart rate, the maternal non-invasive blood pressure, and the maternal arterial blood oxygen saturation (ranging from mid-pregnancy to delivery).

- This device is only to be used by doctors and health care workers (such as midwives and nurses) being supervised by doctors.

- To use this device in its optimum condition, proper operation and periodic maintenance are required.
  Only qualified personnel can repair the device.

  If this device is used in a way not specified in this operation manual or repaired by unqualified personnel, TOITU and our distributors will accept no responsibility for the performance of the device or the safety of patients or operators.

  If this manual is lost or damaged, contact TOITU or our distributor to request a new operation manual.

Understanding this manual

In this manual, to avoid injury to the operator using this device, injury to other people, or damage to property, precautions that must be followed are categorized under "Warning", "Contraindication", and "Caution" as follows. In addition, supplementary information is provided as "Important" and "Note".

WARNING	Indicates that failure to follow this instruction may result in death or severe personal injury.
Contraindication	Indicates that the use of this device beyond the performance range, inappropriate handling, or operation by unqualified or unintended personnel may result in death or severe personal injury.
CAUTION	Indicates that failure to follow this instruction may result in personal injury or damage to property.
Important	Indicates contents that should be followed when using this device.
Note	Indicates useful information.

The following symbols are used to indicate different hazards.

	Indicates an electrical hazard that may cause electric shock or fire.
	Indicates an action that must be performed.
	Indicates an action that must NOT be performed.

Table of Contents

1. For Safe and Proper Use

1-1. Safety Precautions

The table below explains safety precautions that must be followed to use this device safely.

WARNING

	When using this device in combination with other ME devices, ground them equipotentially so that there is no potential difference between the devices. Patients or operators may receive an electric shock if there is even a small potential difference between chassis.
	Follow the instructions in this operation manual. In case of any abnormality, stop using the device immediately.
	Be sure to inspect the device before use. If you cannot confirm the proper condition during the inspection, turn off the power, and remove the power plug from the outlet. Stop using the device, attach a “Failure” indication, and contact us or our distributor to repair the device immediately.
	If you are unsure of the accuracy of monitoring values, first use an alternative method to check a patient's vital signs, and then check if the device is working correctly.
	Do not use the device alone to reach a medical decision. It should be used in combination with clinical signs and symptoms.
	Do not disassemble or modify the device. Failure to follow this instruction may result in failure or malfunction.
	Do not apply a single device to multiple patients. Failure to follow this instruction may result in failure or malfunction.
	For safety, perform electrical safety testing of other medical devices such as cardiac pacemakers, electrical stimulators, and others applied to the patient before using the fetal monitor.
	If there is a concern of intrauterine fetal death when using this method, perform an additional examination using another method. It may cause a misdiagnosis.
	To use identical or similar devices in the same facility, make the Alarm Settings consistent among the devices. If the Alarm Settings are not consistent, a proper alarm may not be issued.
	During monitoring, doctors and health care workers (such as midwives and nurses) being supervised by doctors should remain within hearing distance of the device so that alarms can be heard.
	In the event of a fetal heart rate alarm, initiate the appropriate measures under the direction of a physician. Failure to follow this instruction may result in an accident or other deterioration of the fetus.

	In the event of a Maternal Heart Rate / Maternal Pulse Rate alarm, initiate the appropriate measures under the direction of a physician. Failure to follow this instruction may result in an accident or other deterioration of the fetus.
	In the event of an SpO_2 alarm, initiate the appropriate measures under the direction of a physician. Failure to follow this instruction may result in an accident or other deterioration of the fetus.
	In the event of a NIBP alarm, initiate the appropriate measures under the direction of a physician. Failure to follow this instruction may result in an accident or other deterioration of the fetus.
	Be sure to connect to a grounded wall outlet using the provided three-pin plug power cord. Failure to follow this instruction may result in fire or electric shock.
	The accessories connected to the analog or digital interfaces of this device must meet the related IEC or JIS standards (ex: IEC 62368-1 for digital processing devices or IEC60601-1 for medical devices). In addition, all configurations must conform to IEC 60601-1. Therefore, every person who connects additional devices to this device is responsible for ensuring that the system conforms to the requirements in IEC 60601-1. If you have any questions, contact us or our distributor.
	Do not insert or remove the plugs with wet hands. Failure to follow this instruction may result in electric shock.
	Use an isolation transfomer to supply power to non-medical electronic devices used close to expectant and nursing mothers. Failure to follow this instruction may result in electric shock.
	Do not use USB devices with their own power source unless used with an appropriate isolation device. Failure to follow this instruction may result in electric shock.
	The device may cause radio interference with other devices in the vicinity resulting in poor transmission. Such cases require measures to reduce the interference by using a shield or changing the direction or installation location of the device.
	Do not use this device close to, or stacked on top of, another device. If the device must be used in such a way, confirm the correct operation in the arrangement to be used.
	Do not use a microwave oven, microwave therapy device, or a device that uses microwaves near this device. Failure to follow this instruction may result in a malfunction.
	Supervise and issue instructions not to bring mobile phones, transceivers, radio controlled toys, and other similar devices into the room where the device is installed or around the antenna installed in the hospital for medical devices.
	Do not use this device in an X-ray room, MRI room, image processing room, or within a strong high-frequency electromagnetic field such as from an electric scalpel. Failure to follow this instruction may result in a malfunction.

	Do not block the heat vent of the device. Failure to follow this instruction may result in a fire or a device failure.
	Do not place sensors or accessories which may fall onto patients.
	Do not start up or operate the device unless it is confirmed to be ready for operation.
	To prevent a potential breakage of cables, refrain from bundling the cables extremely tight or wrapping them around the device.
	Do not contact conductive parts of cables connected to the patient with other conductive objects including an earth wire. Failure to follow this instruction may result in a misdiagnosis by inaccurate recording of monitoring results.
	Carefully wire cables when installing a sensor on a patient so that the cables will not be tangled or tightened.
	Be sure to use the specified accessories or options. Failure to follow this instruction may increase electromagnetic radiation wave (emission) and degrade immunity for disturbances.
	Do not use this device close to, or stacked on top of, unspecified other devices.
	If a noise-like sound is heard from the fetal monitor's speaker and monitoring values of biological information parameters are found to be affected by electromagnetic interferences, a doctor or a qualified staff certified by a doctor should be responsible for determining if they may have an adverse effect on diagnosis or treatment of expectant and nursing mothers.
	Do not use a power cord and an AC adapter other than the provided ones. Failure to follow this instruction may result in fire or electric shock.

Contraindication

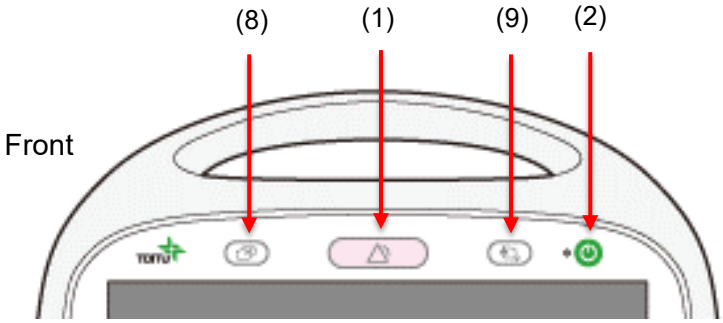
	Do not use in the following places. Failure to follow this instruction may cause an explosion or fire. This device is not explosion-proof. ・Using the device in a hyperbaric oxygen therapy device ・Using the device in a flammable anesthetic gas or high concentration oxygen atmosphere ・Using a defibrillator
	This device is not intended to be used with high frequency surgical instruments (electrical scalpels) or used during defibrillation or MRI. Remove transducers, sensors, and accessories from patients before using the high frequency surgical instrument (electrical scalpel) or working on defibrillation or MRI. Otherwise, a device failure or injuries to the patient or operator may be caused.

⚠ CAUTION

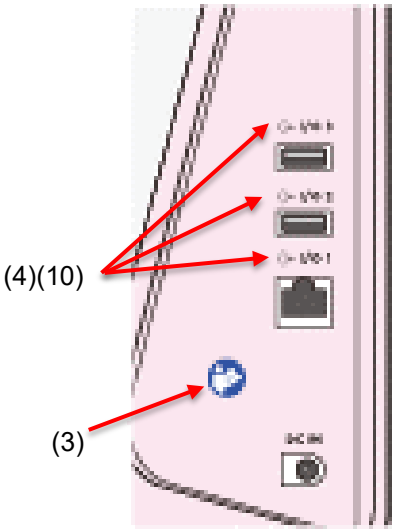
	When a solution is spilled on the device, stop using the device and contact us or our distributor.
	Do not install the device at a location or environment where the patient can manipulate.
	Be sure to use the specified transducer. Failure to follow this instruction may result in monitoring errors or failure.
	Do not drop, hit, or subject the transducer to excessive impacts.
	Do not hit the head of the Doppler transducer with too much force. Failure to follow this instruction may result in monitoring errors or failure.
	Do not exert excessive force on the pressure sensitive part of the External UC transducer. Failure to follow this instruction may result in monitoring errors or failure.
	Use our specified parts or consumables used for the maternal heart rate monitoring. Failure to follow this instruction may cause defective monitoring, including increased artifacts.
	Carefully apply the maternal heart rate monitoring to pacemaker users.
	Be sure not to touch metallic parts of the M.ECG electrode to other conductive objects. Failure to follow this instruction may cause a device failure or an electric shock to the patient.
	Use our specified cuffs or relay air hose used for the maternal non-invasive blood pressure (NIBP) monitoring. Failure to follow this instruction may cause defective monitoring, including increased artifacts.
	Use our specified cuffs for the maternal non-invasive blood pressure (NIBP) monitoring. Failure to follow this instruction may cause irritated skin or allergy.
	Do not use the device to monitor a neonatal non-invasive blood pressure (NIBP). The device is intended for an adult's non-invasive blood pressure (NIBP) monitoring.
	Use our specified parts or consumables for SpO_2 monitoring. Failure to follow this instruction may cause defective monitoring, including increased artifacts. In addition, a legacy SpO_2 patient cable or legacy SpO_2 sensor which lacks mock prevention measures cannot be used.
	Use our specified remote marker switch. Failure to follow this instruction may result in monitoring errors or failure.
	Use our recommended USB memory. Failure to follow this instruction may result in an unstable operation. Contact us or our distributor for recommendations.

	When operating the LCD screen (touch panel), touch the screen using the tip of your finger. Do not operate it using your nails or hard objects such as a ballpoint pen or metal, and do not rub or push with excessive force. Failure to follow these instructions may cause a failure.
	Do not use the device after its service life or count has expired.
	The device body is not waterproof. Do not allow water to get inside the device.
	Do not use any ultrasound gel other than our specified gel. Failure to follow this instruction may result in damage such as failure. In addition, using gel other than that specified by us may cause irritated skin or allergy.
	Turn OFF mobile phones or compact radios (excluding PHS terminals authorized to be used by the facility administrator) around patients. Failure to follow this instruction may result in an erroneous monitoring value displayed due to radio waves from the mobile phone or compact radio misread as a pulse wave.
	The wireless LAN on the device can use bands of 2.4GHz and 5GHz. Regulations do not allow 5.15 - 5.35GHz bands (W52, W53) to be used outside.
	To use the device safely, keep it at least 20 cm away from people.
	Use our specified recorder. Failure to follow this instruction may result in monitoring errors or failure.

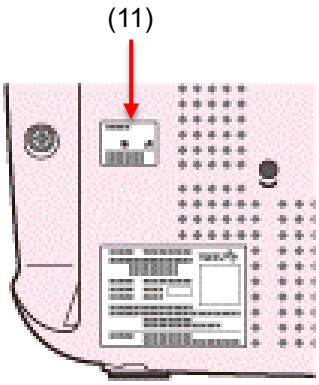
1-2. Meaning of the symbols on the device



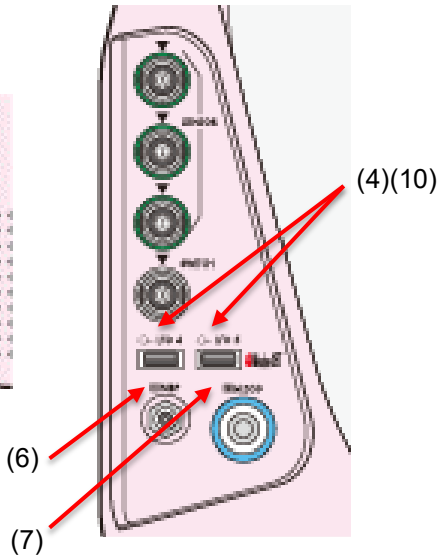
Right-side



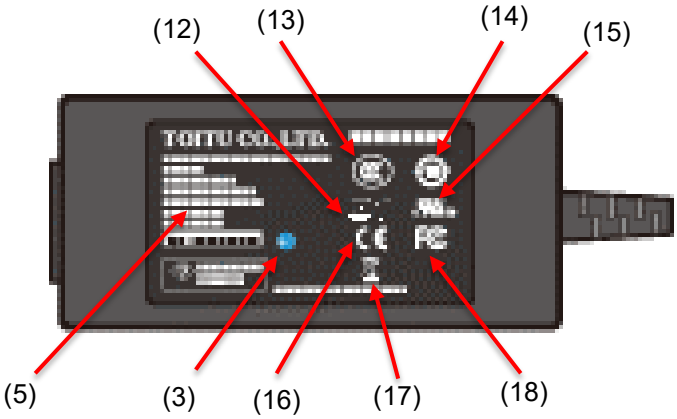
Back



Left-side



AC adapter



■ Symbols based on IEC International Standards and Japanese Industrial Standards

No.	Symbol	Name	No.	Symbol	Name
(1)		Alarm	(5)		DC power source
(2)		Stand-by	(6)		Type BF applied part
(3)		See the operation manual	(7)		Type CF applied part
(4)		INPUT/OUTPUT			

■ Other Symbols

No.	Symbol	Name	No.	Symbol	Name
(8)		Mode selection	(14)		EFUP
(9)		Home	(15)		UL
(10)	I/O	Input/output	(16)		CE marking
(11)	-	Battery replacement YYMM	(17)		WEEE
(12)		TÜV Rheinland	(18)		FCC
(13)		China Compulsory Certification marking			

1-3. Meaning of the screen symbols on the device

■ Symbols based on IEC International Standards and Japanese Industrial Standards

No.	Symbol	Name	No.	Symbol	Name
1		Heart mark (heart rate)	7		Start action
2		Alarm sound off	8		Graphic recorder
3		Alarm function off	9		Timer
4		Alarm suspension	10		Speaker
5		Alarm	11		Time
6		ZeroSet			

■ Our own Symbols

No.	Symbol	Name	No.	Symbol	Name
1		Right fetal movement marker	5		Timestamp
2		Left fetal movement marker	6		Low battery
3		Heart beat monitoring error	7		UC ZeroSet
4		Recording speed			

1-4. EMC Compliance

The device is compliant with the Electro-medical Apparatus EMC Standards Edition 4 (IEC60601-1-2: 2014).
Remark: CISPR11: Group 1, Class B

For details, refer to P.197 "11-1-6 Electromagnetic Compatibility (EMC) Information".

1-5. Directive 2014/53/EU Declaration of Conformity

Hereby, TOITU CO., Ltd. declares that the radio equipment type MT-830 is in compliance with Directive 2014/53/EU.
The full text of the EU declaration of conformity is available at the following internet address:
https://en.toitu.co.jp/Declaration_of_Conformity/

1-6. Using Wireless LAN or Bluetooth®

This product meets the following standards:

Type	Supported Standard
Wireless LAN	■ IEEE802.11-2012 (a/b/g/n) ■ IEEE802.11ac-2013
Bluetooth	Bluetooth standard Ver. 5.1

As wireless LAN or Bluetooth uses a radio wave to send/receive data, a malicious third-party may steal data or gain unauthorized access to internal data.
It is the customer's judgment and responsibility to use the device with security settings in place.

The wireless LAN on the device can use bands of 2.4GHz and 5GHz. Regulations do not allow 5.15 - 5.35GHz bands (W52, W53) to be used outside.

1-7. Licensing the Device

The MT-832-L and MT-832-P come with A&D's integrated NIBP module TM-2917.

Masimo Corporation's pulse oximeter can be connected to the MT-832-L and MT-832-P during use.
Ownership or purchase of the device (when the device is used solely or combined with other devices) should not be transferred, whether the license is clarified or not, as far as one or more patents related to the device exist (including use of unauthorized spare parts).

The device is protected by one or more of the following US patents:
5,758,644, 5,823,950, 6,011,986, 6,157,850, 6,263,222, 6,501,975

In addition, patents applied other than those listed above can be found in www.masimo.com/patents/.

The device is certified and authorized to be compliant with the Bluetooth standard as defined by Bluetooth SIG.
Bluetooth® is a registered trademark of Bluetooth SIG, Inc. in the U.S.

2. Product Overview

2-1. Feature

The device is a fetal monitor intended to detect the fetal heart rate (single, twin, triplet fetus/es) and uterine contractions, as well as to monitor the maternal conditions, including the maternal heart rate, NIBP (Non-Invasive Blood Pressure), and SpO_2 (arterial blood oxygen saturation) etc.
This device can be used from mid-pregnancy to delivery.
The main features are as follows.

- **Clear display**
  10-inch color TFT LCD displays large texts and images of the recording paper.

- **Touch panel operation**
  Touch and hold operation is realized by utilizing a resistive touchscreen.

- **CTG (CardioTocoGram) data storage**
  Saves the latest 72-hours of CTG data in the built-in memory. The stored data can be viewed/played as well as copied to a USB memory.

- **Battery-driven operation**
  The device can operate for 120 minutes when it is disconnected from the power source (with the battery fully charged).
  The recorder unit (MP-130) (sold separately) can also print without connecting to the power supply.

- **Maternal NIBP monitoring**
  The MT-832-L and MT-832-P use A&D's integrated NIBP module TM-2917 to measure the maternal BP and PR. A cuff is used to press the artery externally to determine the max. min. and average BP values from the fluctuation of air vibration observed under changes in pressure.

- **Maternal SpO_2 monitoring**
  A pulse oximeter (manufactured by Masimo Corporation) can be connected to the MT-832-L and MT-832-P to monitor SpO_2. Favorable SpO_2 monitoring can be expected even under conditions where monitoring is difficult due to patient's body movement or low perfusion.

- **Maternal Heart Rate monitoring**
  Monitors the MHR from M.ECG using ECG electrodes. A pulse as well as M.ECG waveform can be checked and the leads can be switched.

- **Data printing**
  A recorder (sold separately) can be used to print out CTG data being monitored and logged.

● **A range of model offerings**

The device line up offers a range of accessories and options for different applications, and provides four different models, each of which has different functions available.
In this manual, the model name is clarified for functions available limited to that model.

MT-832-L / P : Function available only for the MT-832-L and MT-832-P models

MT-831-S / MT-832-P : Function available only for the MT-831-S and MT-832-P models

	Function	MT-831-L	MT-831-S	MT-832-L	MT-832-P
Fetal Measurement	External method • FHR: Ultrasound Doppler method • External UC	○	○	○	○
Maternal Measurement	Non-invasive blood pressure (NIBP)	–	–	○	○
	Arterial blood oxygen saturation (SpO_2)	–	–	Optional	Optional
	PR (from NIBP or SpO_2)	–	–	○	○
	Pulse (from M.ECG)	–	–	○	○
Print		Optional	Optional	Optional	Optional
Wireless LAN		–	○	–	○

○: As standard Optional: Available as an option

2-2. Supplementary Functions

Function Name	Explanation of the Function
Fetal movement monitoring	Monitors and records the fetal movement for up to three fetuses (there are two monitoring methods: automatic monitoring using ultrasound and manual monitoring when the mother recognizes the fetal movement).
Contraction cycle monitoring	Automatically monitors/displays/prints the contraction cycle.
External output	Provides CTG data output to the central monitor.
Timer function	Stops monitoring automatically after a specified time and automatically starts monitoring when the specified conditions are met.
Monitoring data storage function	Stores and displays the monitoring data to the main unit or a removable media.
Recording/system function	Stores/reads the monitoring data to/from the storage media via systems such as external devices or communication devices (including wireless devices).
Display function	Shows information such as CTG patterns as an image.

2-3. Principle

2-3-1. Fetal heart rate

Fetal heart rate is detected by using the ultrasound Doppler method. When high-frequency voltage is applied to the Doppler transducer, the element in it vibrates and emits ultrasound. When this ultrasound is delivered to the heart of the fetus through the maternal abdominal wall, it is reflected by the movement of the heart valve and wall, bloodstream (heartbeat signal), the roll of the fetus, movement of the fetus limbs (fetal movement signal), and then returned to the transducer. The received ultrasound undergoes signal processing and is separated using the difference in heartbeat and fetal movement signals. The heartbeat signal can be heard from the speaker since it is within the range of human audibility.

2-3-2. Uterine Contraction

A contraction (uterine contraction) signal is detected by using the strain gauge. When the External UC transducer containing the strain gauge is fixed to the abdominal wall at the uterine fundus, the resistance value changes when a strain is applied to the strain gauge due to the uterine contractions. A contraction (uterine contraction) signal is detected by detecting changes in this resistance.

2-3-3. Maternal Heart Rate

The maternal heart rate is detected by using the M.ECG method. A bipolar induction method is used to monitor M.ECG and detect MHR from between M.ECG R waves' interval. A pulse as well as M.ECG waveform can be checked and the leads can be switched.

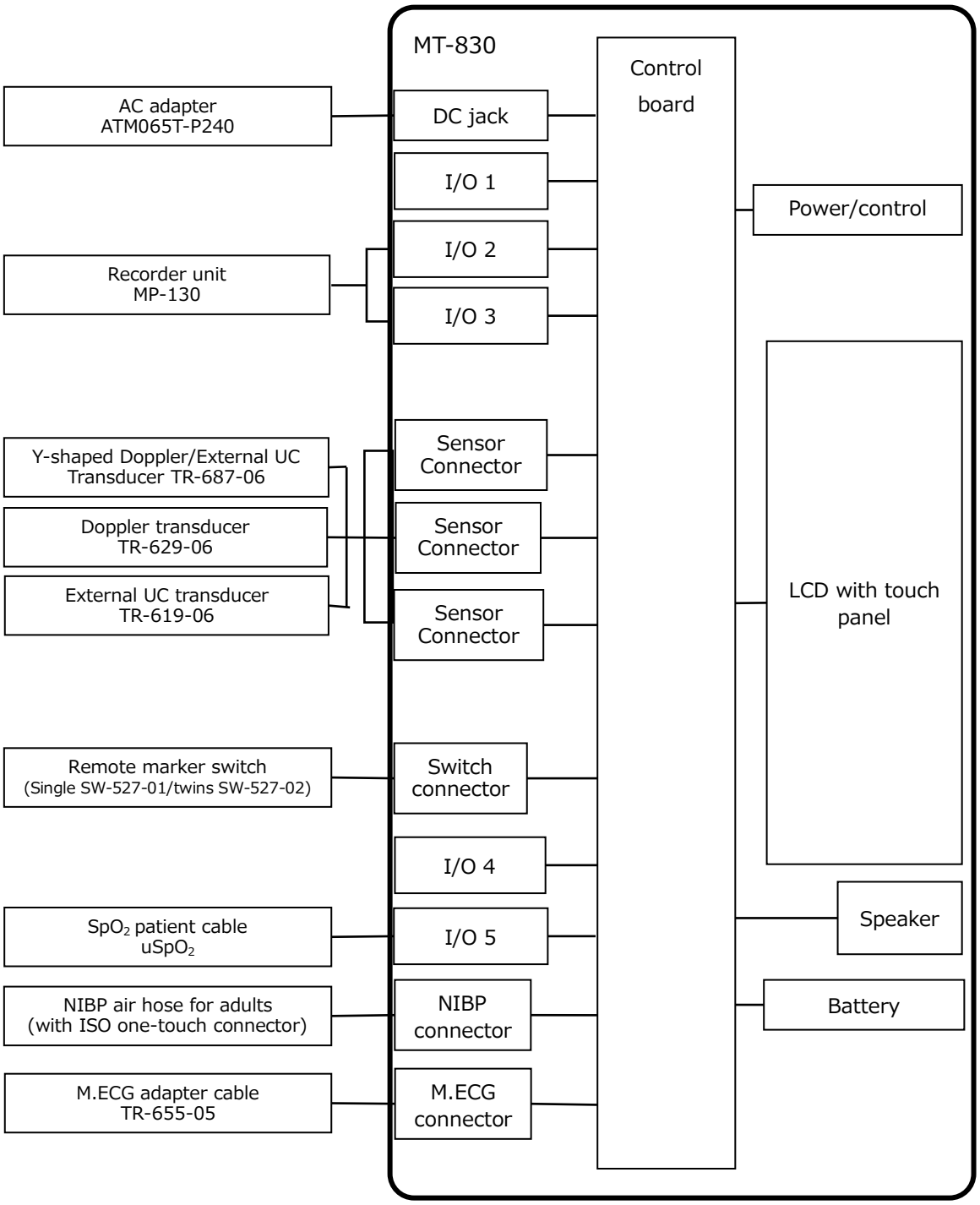
2-3-4. Maternal non-invasive blood pressure (NIBP)

An oscillometric method is used to monitor artery BP non-invasively.
A gradual pressurization or depressurization of cuffs wrapped around limbs superimposes vibration from artery pulsation on the cuff pressure. The vibration shows a chevron shape where it gradually becomes larger as the cuff pressure changes and smaller accordingly after reaching the peak amplitude.
The oscillometric method calculates the BP value non-invasively, looking at the relationship between the amplitude of the vibration and the associated cuff pressure.

2-3-5. Maternal arterial blood oxygen saturation (SpO_2)

An arterial blood oxygen saturation and PR(Pulse rate) are monitored by monitoring the absorbance of a specific beam's wavelength. The probe has a light-emitting element and an element which detects a beam passing through the organization. This is capable of averaging the artery's functional oxygen saturation (saturation percentage obtained from oxidized hemoglobin divided by total hemoglobin) and PR.
As well as arterial blood oxygen saturation monitoring, the original waveform of a pulse wave can be identified with the fetal monitor operation.

2-3-6. Block Diagram

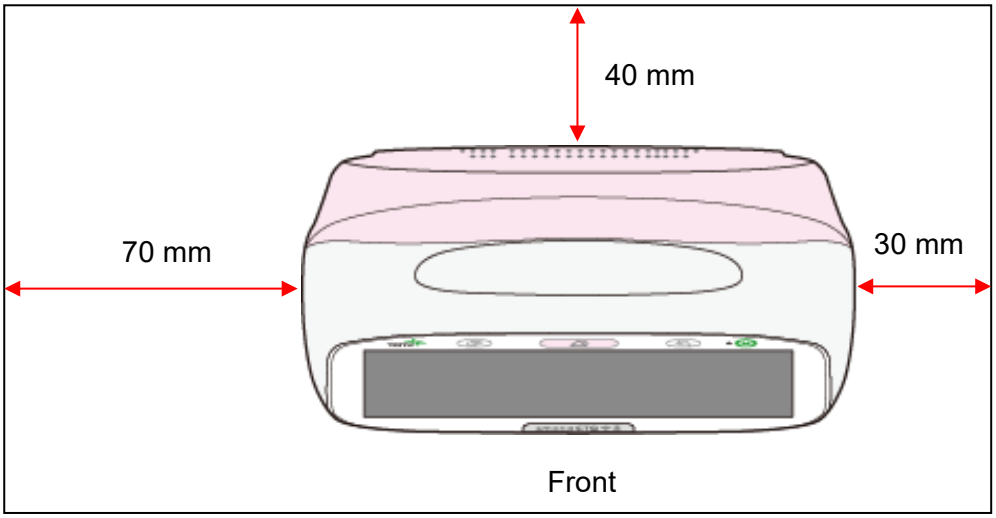


* The remote marker switch for either single or twins can be connected to the switch connector.

2-4. Usage Environment

Use the device under the following conditions.

Field	Condition
Ambient temperature	10 to 40°C
Relative humidity	30 to 70% (no condensation)
Atmospheric Pressure	700 to 1060 hPa
Other conditions	• A room without the risk of explosion • A place where the provided power cord can be connected to an AC commercial power outlet in the hospital or clinic building • A stable, flat surface with a space of more than 40 mm at the rear, 30 mm on the right, and 70 mm on the left when viewed from the front (as shown below)

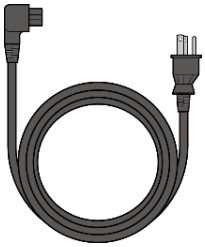


3. Package Contents

This device consists of the main unit, accessories, and options. Check the package contents before use. In addition, standard accessories depend on the model, and the accessories may be included with the main unit or sold separately due to failures, replenishment, and so on.

3-1. Accessories

(1)



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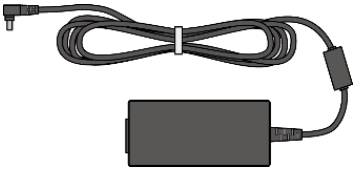

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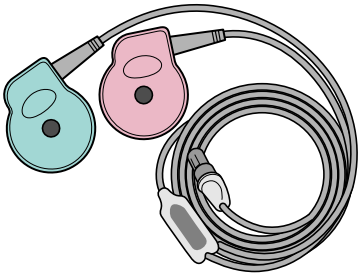

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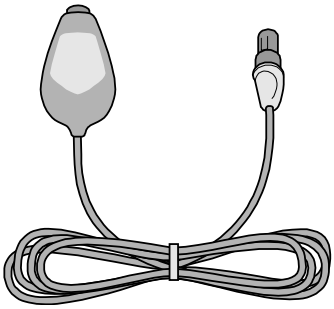

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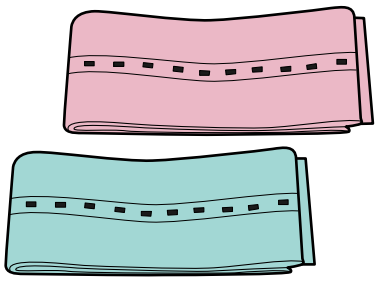

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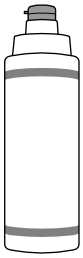
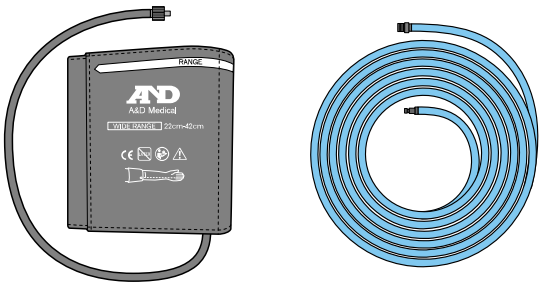


(7)

MT-832-L / P



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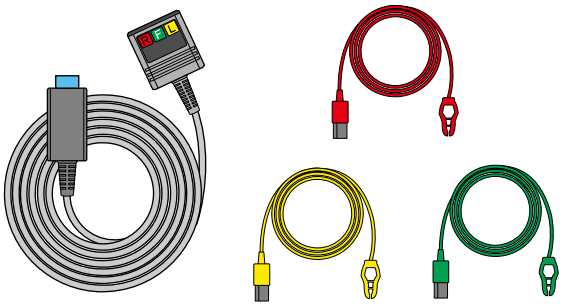
MT-832-L / P



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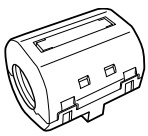
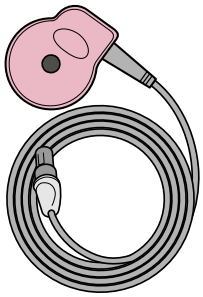


No.	Name	Function and Operation
(1)	Power cord	Used to connect to a commercial power supply.
(2)	AC adapter	Used to connect the main unit with the power cord.
(3)	Y-shaped Doppler/ External UC transducer	Used for monitoring Fetal heart rate by ultrasound and External UC.
(4)	Remote marker switch (single)	A hand-held switch used to record maternal perception of fetal movement.
(5)	Transducer belt x 2 (Pink, green)	Used to affix the transducer onto the abdominal wall.
(6)	Ultrasound gel	Used to reduce ultrasonic attenuation between the Doppler transducer and the abdominal wall.
(7)	BP monitor set • NIBP wide-range cuff • NIBP air hose for adults	Used for monitoring maternal BP.
(8)	M.ECG set • M.ECG adapter cable • Clip electrode lead (R: Red) (F: Green) (L: Yellow)	Used for monitoring MHR by using the M.ECG method.
(9)	Ferrite core	Connect this part to the LAN cable used for communication with the central monitor when using the MT-831-S and MT-832-P. For details on connecting this part, see Step 1 of P.46 "(8) Connect the accessories" . * This ferrite core is attached only to the export versions MT-831-S and MT-832-P. It is not attached to MT-831-L and MT-832-L.
–	Operation Manual (This document)	

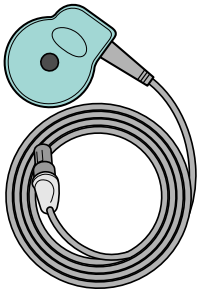
* For product codes, refer to P.204 "11-2-1 Accessories supplied".

3-2. Major Options

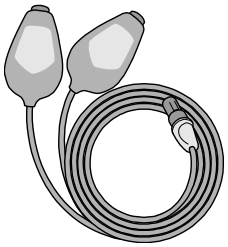
(1)



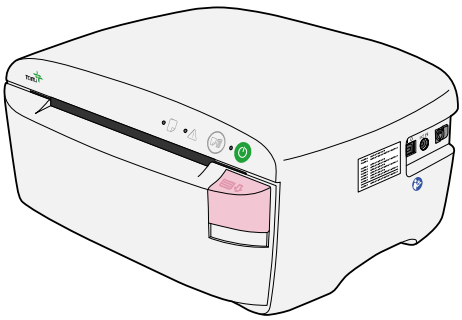
(2)



(3)

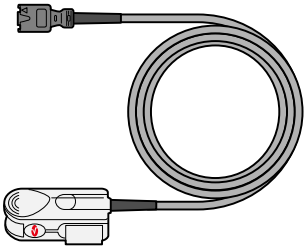


(4)



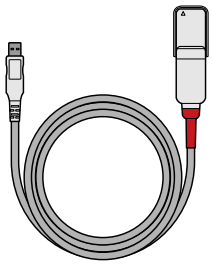
(5)

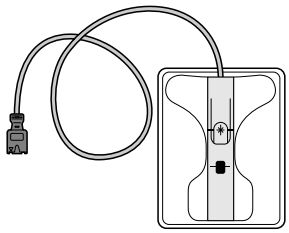
MT-832-L / P



(6)

MT-832-L / P





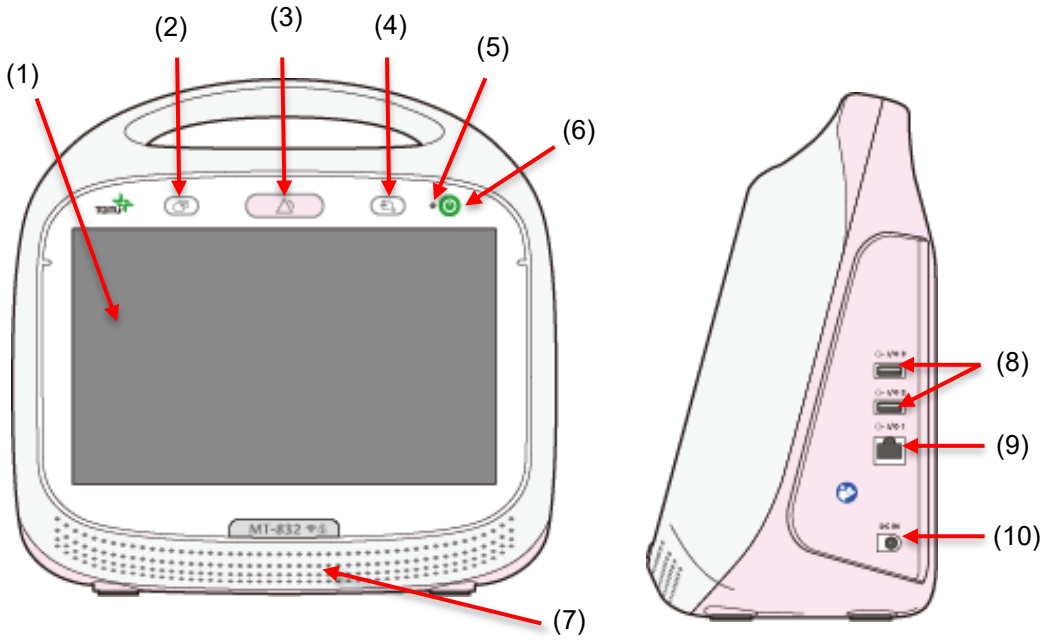
No.	Name	Function and Operation
(1)	Doppler transducer	Used for monitoring Fetal heart rate by ultrasound in the case of multi-fetuses.
(2)	External UC transducer	A transducer used to monitor uterine contraction.
(3)	Remote marker switch (for twins)	A hand-held switch for twin fetuses used to record maternal perception of fetal movement.
(4)	Recorder unit MP-130	Prints the monitoring data and parameters.
(5)	SpO_2 reusable sensor for adults LNCS DCI	A reusable sensor for SpO_2.
(6)	SpO_2 monitor set • SpO_2 patient cable • SpO_2 disposable sensor for adults (20 sheets/box)	Used for monitoring maternal arterial blood oxygen saturation and a pulse wave.

* Available options vary depending on the model. For details, refer to P.10 "2-1 Features".
* For product codes and other options, refer to P.204 "11-2-2 Options List".

4. Part Names and Functions

4-1. Main Unit

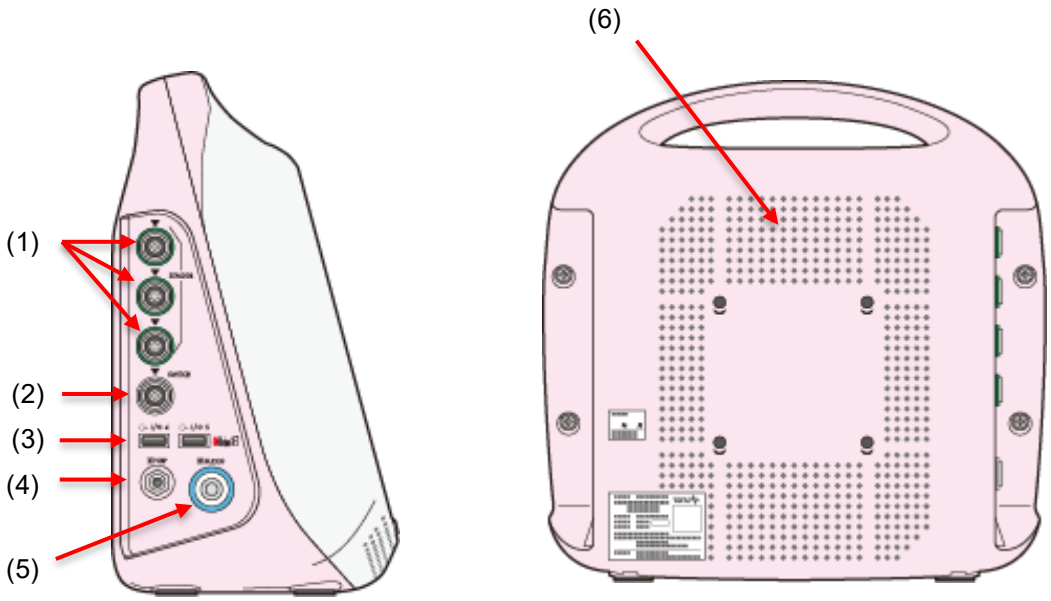
4-1-1. Front and Right Side



No.	Name	Function and Operation
(1)	LCD screen	Displays the fetal heart rate and can be operated by the touch panel.
(2)	Mode selection button	Switches the Measure Mode (Delivery/NST/Maternal). Delivery screen is used for monitoring the fetus and maternal status during delivery, NST screen (None-Stress Test) is used for checking the fetal status for a certain period when delivery has not yet started, and Maternal screen is used for monitoring the maternal status after delivery. You can configure the measurement time, waveform size, printing, and NIBP measurement method for each mode in Admin Settings (see P.151 "8-5-3-2 Measure Mode").
(3)	Alarm button	Pauses/resumes an alarm.
(4)	Home button	Returns to the Home screen when a screen other than Home is displayed. When Home is displayed, the button works the same way as the information display on the bottom (see (15) on P.22 “4-2-1 Home".
(5)	Power indicator	● (On) Power-on ● (Flashing) Charging (during power-off) ● (On) Battery full (during power-off) ● (Off) Power-off (AC adapter not connected)

No.	Name	Function and Operation
(6)	Power button	Turns the device ON or OFF. * Press and hold the button for more than 5 seconds when the power is ON to turn off the device completely.
(7)	Speaker	Outputs Doppler sounds, alarms, and other operating sounds.
(8)	I/O 2 connector I/O 3 connector	Used to connect options (e.g. a recorder specified, or a USB memory).
(9)	I/O 1 connector	Used to connect TOITU central monitor (LAN). A wired LAN is used for communication when a LAN cable is connected, and a wireless LAN is used when it is not. When switching between wired and wireless LAN when OBIS central is used, OBIS CTG data will be split.
(10)	Power jack	Used to connect the AC adapter.

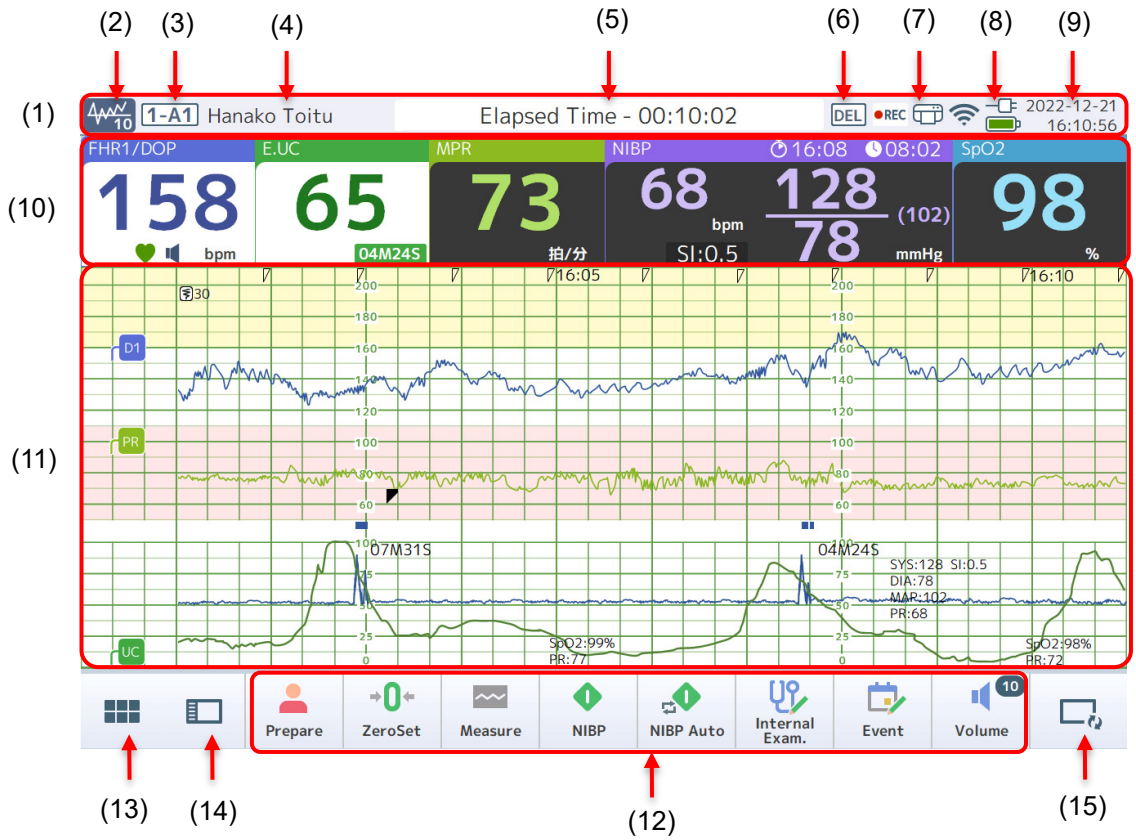
4-1-2. Rear and Left Side



No.	Name	Function and Operation
(1)	Sensor connector	Used to connect the Y-shaped Doppler/External UC transducer, Doppler transducer, External UC transducer.
(2)	Switch connector	Used to connect the remote marker switch.
(3)	I/O 4 connector I/O 5 connector	Used to connect options (e.g. a recorder specified, or a USB memory, and SpO_2 patient cables.
(4)	NIBP connector	Used to connect an air hose for adults to monitor the maternal non-invasive blood pressure.
(5)	M.ECG connector	Used to connect the M.ECG adapter cable for the maternal heart rate monitoring.
(6)	Heat vent	Exhausts heat from inside the device.

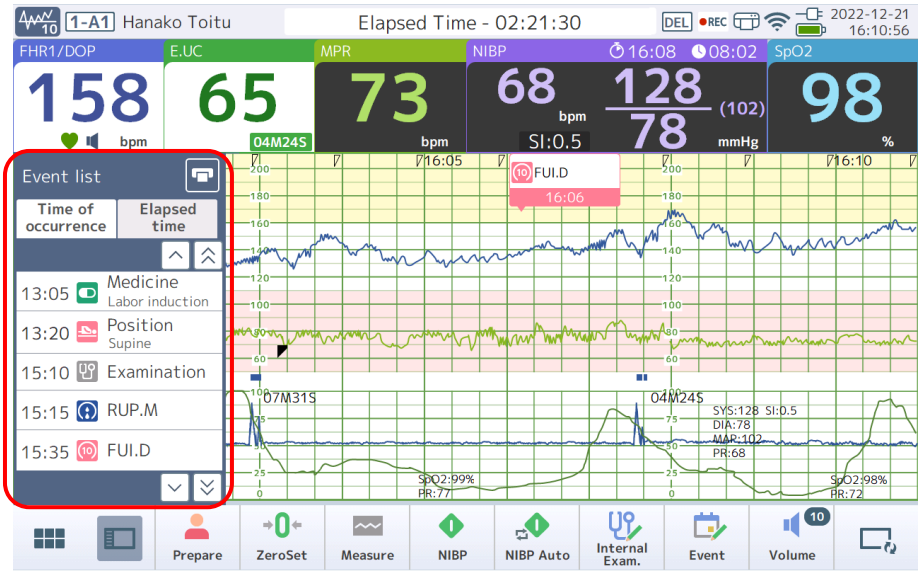
4-2. Display

4-2-1. Home

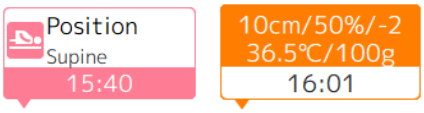


With the side window displayed

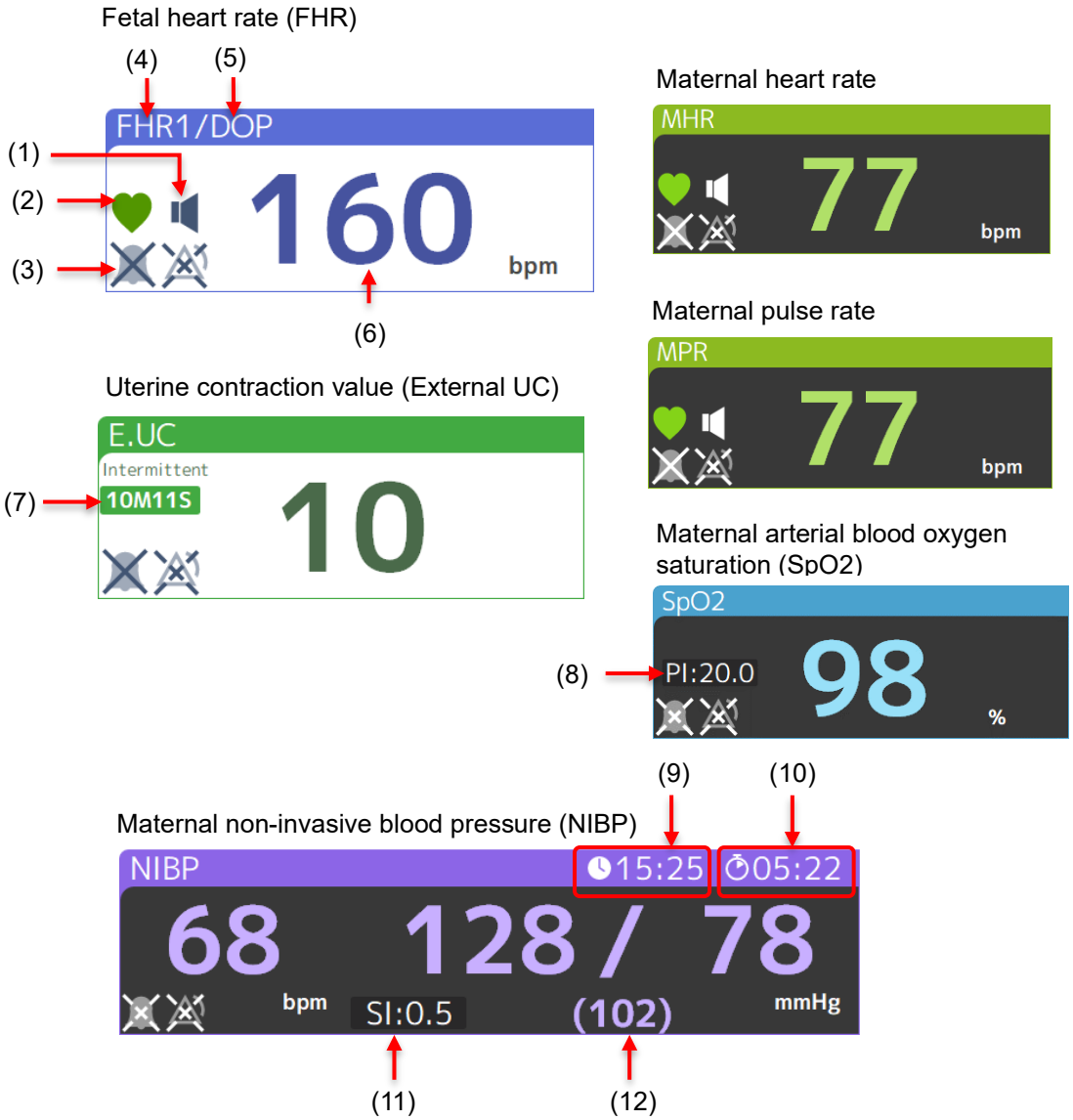
(16)



No.	Settings Item	Function and Operation
(1)	Status bar	Displays the product, patient data, elapsed time, device status, and the current time, etc. For details, refer to (2) to (9) below.
(2)	Waveform display time selection	Sets and displays the current CTG waveform display time (10min/15min/40min/FULL SIZE/Number) (Refer to P.28 “4-2-3 Waveform Area").
(3)	Product information display (ID)	Displays the monitor ID. Touch this to show the serial number and battery charge of the device.
(4)	Patient information	Displays the patient information.
(5)	Free space	Displays the monitoring information and alarm information, etc.
(6)	Measure Mode display	Displays the current Measure Mode (NST Mode/Delivery Mode/Maternal monitoring mode).
(7)	Status display	Displays the following icons depending on the state of the device.
		<Measurement state> REC: Measuring : Suspending measurement
		<Central monitor connection status> : Connected to wired LAN : Connected to wireless LAN : Out of Hospital : Not connected * The signal strength is also shown along with the icon "Connected to wireless LAN".
		<Printing> : Printing
		<Recorder paper level> : No recorder paper left : Low recorder paper level
		<Recorder battery level> : No battery left : Low battery level
(8)	Battery/ drive state	: Using the battery. The battery level is also shown. : Using AC power. The battery level is also shown.
(9)	Date	Displays the current date in YYYYMMDD and time in HH:MM:SS.
(10)	Monitoring value area	Displays the monitoring values and alarm status (refer to P.25 "4-2-2 Monitoring area").

No.	Settings Item	Function and Operation
(11)	Waveform area	Displays the waveform elapsed for the selected CTG waveform duration starting from the latest (rightmost) monitoring value. In addition, for 40 min. waveform mode, the latest information is shown on the lower right while the oldest information is on the upper left. Press and hold the waveform to shows the elapsed waveform (refer to P.97 "6-16-1 History Screen").
(12)	Bottom button	Displays a range of setting screens and side windows, and performs actions. Buttons shown vary depending on the Measure Mode and the device status. For the buttons, refer to P.31 "4-2-4 Menu Screen", P.33 "4-2-5 Side Window". * You can select the bottom buttons to locate from menus and the side window from the Admin Settings (refer to P.158 "8-5-5 Operation / display").
(13)	Menu display	Displays the Menu screen (refer to P.31 "4-2-4 Menu Screen").
(14)	Side window display	Select items to display on the side window panel on the left of the Home screen (refer to P.33 "4-2-5 Side Window"). While the side window panel is active, the button changes to  , you can touch the button to exit the side window.
(15)	Information display	Displays information on the sensor status, events, and internal examination on the screen. With every single touch of the button, the icon changes from "Show only icon" → "Show details" → "Nothing shown" in this sequence. • Show only icon (ex.):  • Show details (ex.):  • Sensor status (ex.):  * You can configure the display method from the Admin Settings (refer to P.152 "8-5-3-3 Info display").
(16)	Side window	Displays desired information on the left of the Home screen (refer to P.33 "4-2-5 Side Window"). Turning the device OFF hides the side window.

4-2-2. Monitoring area



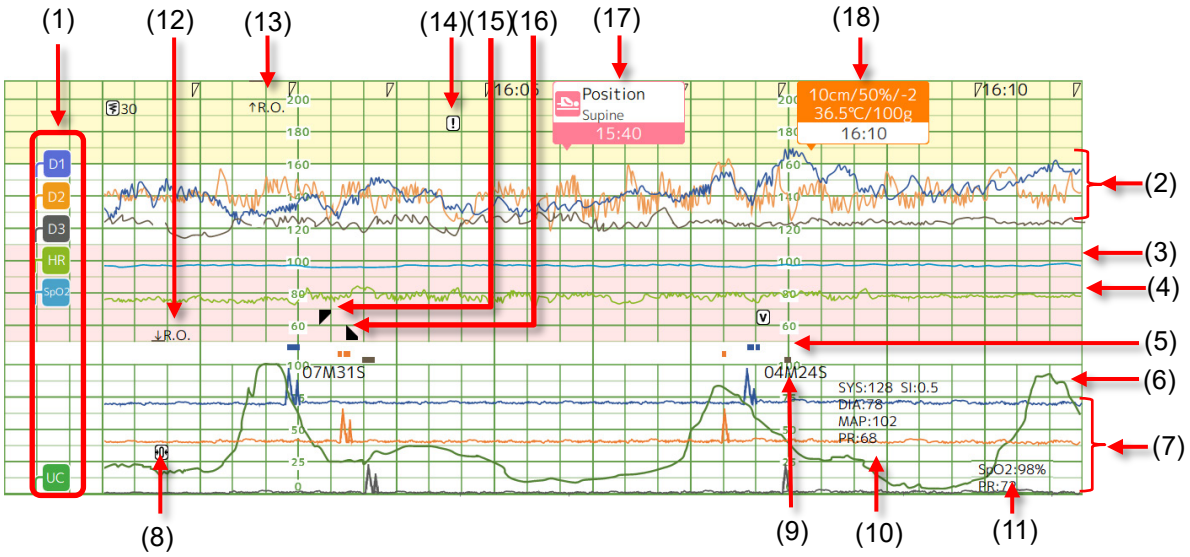
No.	Settings Item	Function and Operation
(1)	Select Heartbeat sound symbol	Displayed in the monitoring area of the sensor emitting a heartbeat sound (refer to P.133 "8-3-1-1 Common").
(2)	Heartbeat synchronization symbol	Flashes in synchronization with the heartbeat. The color changes to “green > yellow > red” depending on the state of the heart rate input signal (refer to P.59 "(2) Decide on the position").
(3)	Status of alarm setting	Displays the Alarm Settings status and an alarm state (refer to P121 "7-3 Alarm Settings").  The alarm is muted  One or more conditions in the Alarm Settings are disabled  The alarm is suspended

No.	Settings Item	Function and Operation
(4)	Type of monitoring value	Displays the type of monitoring value displayed: FHR1: Fetus 1 heart rate FHR2: Fetus 2 heart rate FHR3: Fetus 3 heart rate E.UC: Uterine contraction value MHR: Maternal heart rate MPR: Maternal pulse rate NIBP: Maternal non-invasive blood pressure SpO2: Maternal arterial blood oxygen saturation
(5)	Sensor type	Displays the type of sensor used for monitoring: Doppler: Doppler transducer * The Doppler SH is monitoring in Single Heart mode (Refer to P.134"8-3-1-2 F.HR / FM"). E.UC: External UC transducer * For E.UC[Hi], Uterine contraction value is monitored with UC Sensitivity as High (Refer to P.136 "8-3-1-3 UC").
(6)	Monitoring value	Displays monitored values (Fetal heart rate/Uterine contraction value/Maternal heart rate/Maternal pulse rate/Maternal non-invasive blood pressure (NIBP)/Maternal arterial blood oxygen saturation (SpO_2)).
(7)	UC calculation value	Displays the duration of an intermittent UC (or UC cycle) or UC onset, or UC count per 10 minutes. Only a single item is shown when the display area is small, however, touching the area shows all items. You can configure items to display from the Admin Settings (refer to P.152 "8-5-3-3 Info display").
(8)	PI value	Displays a PI value (PERFUSION INDEX). The PI value is a perfusion index which indicates a ratio of pulsatile blood volume against non-pulsatile blood volume in a peripheral tissue. The value ranges from 0 to 20%, and the larger the value is, the more accurate the monitoring value. You can hide this from the Admin Settings (refer to P.152 "8-5-3-3 Info display").
(9)	BP measurement start time	Displays the BP measurement start time.
(10)	Time-to-the next BP measurement	Displays the time remaining before the next BP measurement starts.
(11)	SI value	Displays an SI value (shock index). The SI value is calculated with Maternal heart rate / Maternal pulse rate (bpm) devided by Systolic BP (mmHg), and the Maternal heart rate/Maternal pulse rate is calculated using the Maternal ECG pulse rate when the M.ECG adapter cable is connected and using the NIBP pulse rate when it is not connected. You can hide this from the Admin Settings (refer to P.152 “8-5-3-3 Info display”).
(12)	Mean BP /Cuff’s pressure value	Displays the pressure value of the cuff during monitoring and the Mean BP value of the monitoring result after monitoring is complete.

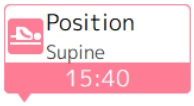
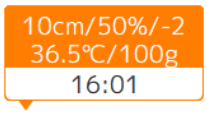
* Press and hold the Monitoring area on each sensor to go to the Measure Settings screen of the sensor.
* Touch the Monitoring area of FHR, MHR, and MPR to change the monitor and synchronous sound played back.
  However, touching the area when an alarm has occurred switches the device to alarm suspension status. Touch it again during this alarm suspension status to change the monitor and synchronous sound played back.

4-2-3. Waveform Area

Touching  at the top left of the screen allows you to switch the display mode of the waveform (10min/15min/40min/FULL SIZE/Number). In FULL SIZE waveform, the waveform is displayed at the same size as the recording paper for printout.



No.	Settings Item	Function and Operation
(1)	Icon of a sensor showing waveforms	Displays the type of sensor showing waveforms * 1 
(2)	Fetus 1 to 3 heart rate waveform	Displays the heart rate of fetus 1 to 3 (FHR1-3) as a waveform.* 1
(3)	Maternal SpO_2 waveform	Displays the maternal SpO_2 value as a waveform.* 1 Displayed as a waveform when waveform display mode is selected in the Admin Settings (Refer to P.153 “8-5-3-4 Waveform”). However, SpO_2 is not displayed as a waveform but displayed numerically when the MHR/MPR is displayed as a waveform for 3 fetuses.
(4)	Maternal Heart Rate (Maternal Pulse Rate) waveform	Displays the maternal heart rate (MHR) or pulse rate (MPR) as a waveform.* 1 MPR is displayed as a waveform when waveform display mode is selected in the Admin Settings (Refer to P.153 “8-5-3-4 Waveform”).
(5)	Fetus 1 to 3 ACT marking	Displayed when the fetal movement of each fetus 1 to 3 exceeds the threshold of FM dot specified in P.134 “8-3-1-2 F.HR / FM”.* 1 This can be set to hidden referring to P.152 “8-5-3-3 Info display”.
(6)	UC value waveform	Displays the UC value (UC) as a waveform.* 1
(7)	Fetus 1 to 3ACT	Displays the fetal movement of fetus 1 to 3 as a waveform.* 1 This can be set to hidden referring to P.152 “8-5-3-3 Info display”.
(8)	ZeroSet marking	Displays when ZeroSet is executed.

No.	Settings Item	Function and Operation
(9)	Uterine contraction cycle	Displays the UC cycle.
(10)	Maternal BP (Max. Min. Ave.), SI	Displays the results of NIBP measurement and SI value.
(11)	Maternal SpO_2 value, Maternal Pulse Rate value	Displayed every five minutes when Number mode is selected in the Admin Settings when the SpO_2 sensor is connected (refer to P.153 “8-5-3-4 Waveform”).
(12)	↓ R.O. marking	Displayed when the heart rate goes beyond the bottom of the waveform display area.
(13)	↑ R.O. marking	Displayed when the heart rate goes beyond the top of the waveform display area.
(14)	Signal Error marking	Displayed when a signal error alarm is issued.
(15)	Remote marker right	Displayed when the remote marker switch (single) or the right remote marker switch (twins) is operated.
(16)	Remote marker left	Displayed when the left remote marker switch (twins) is operated.
(17)	Event	Displayed when an event is registered. Select to display or hide this on P.152 “8-5-3-3 Info display”. • Show only icon (ex.):  • Show details (ex.): 
(18)	Internal Examination	Displayed when an internal examination is registered. Select to display or hide this on P.152 “8-5-3-3 Info display”. • Show only icon (ex.):  • Show details (ex.): 

*1 Displayed in the same color as the monitoring value area.

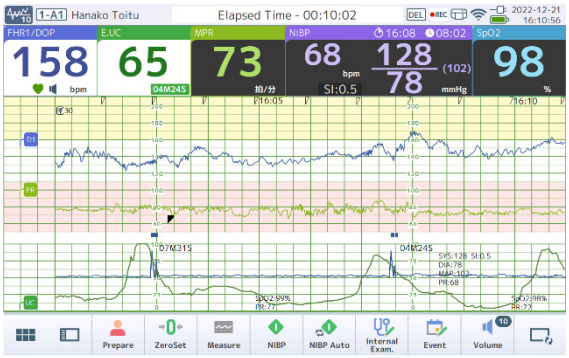
Note

The waveform is displayed on the actual screen for the following duration:

- 10min waveform → 11 minutes
- 15min waveform → 15 minutes
- 40min waveform → 46 minutes

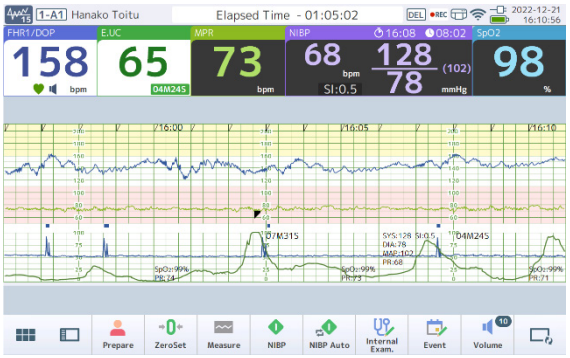
In addition, the duration above is when the track speed is 30mm/min. The duration is 3 times longer when the track speed is 10mm/min. The duration is 1.5 times longer when the track speed is 20mm/min.

10min waveform



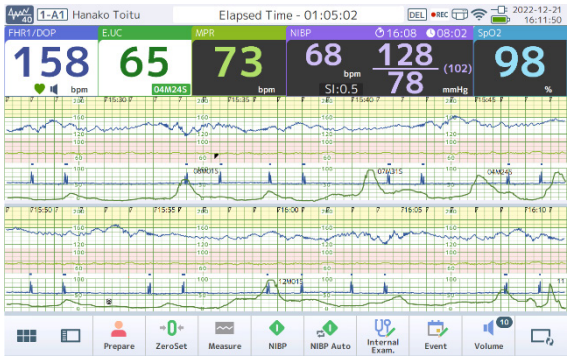
The monitoring value is shown above while the CTG waveform for 10 minutes is shown below

15min waveform



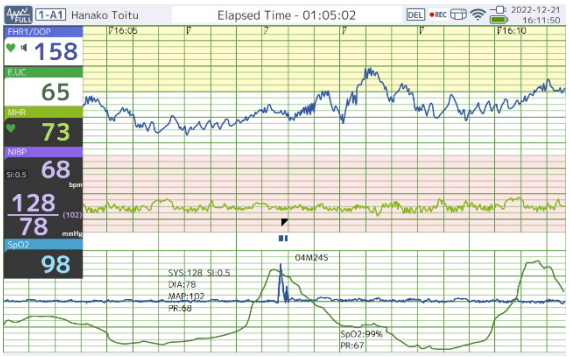
The monitoring value is shown above while the CTG waveform for 15 minutes is shown below

40min waveform



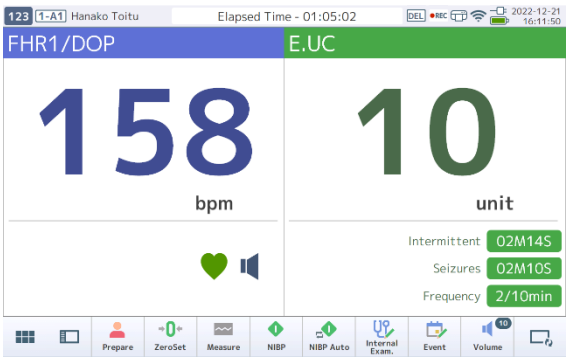
The monitoring value is shown above while the CTG waveform for 40 minutes is shown below in two tiers

FULL SIZE waveform



The monitoring value is overlaid on the CTG waveform and shown on the left
(The Bottom button will be hidden)

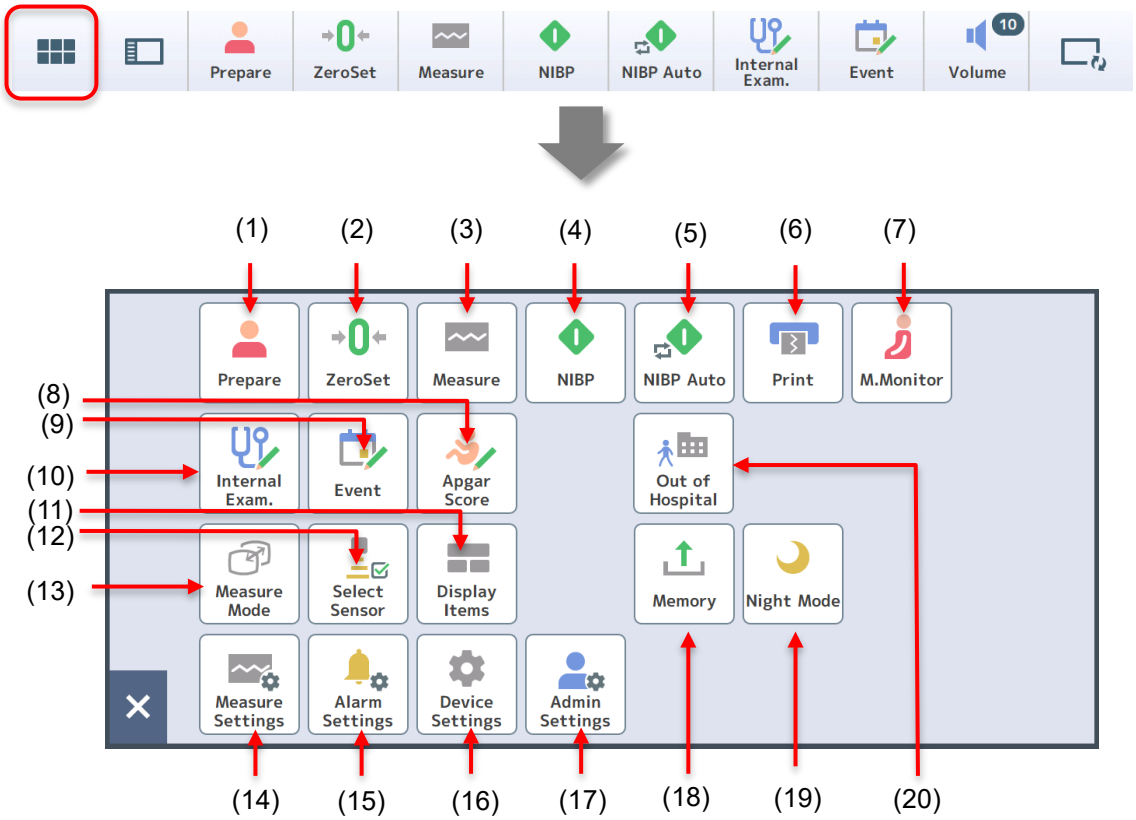
Only Number



Only the monitoring value is shown without the CTG waveform

4-2-4. Menu Screen

The Menu screen is displayed when you touch the (Menu) Bottom button. Some of the menus are shown on the Bottom button.

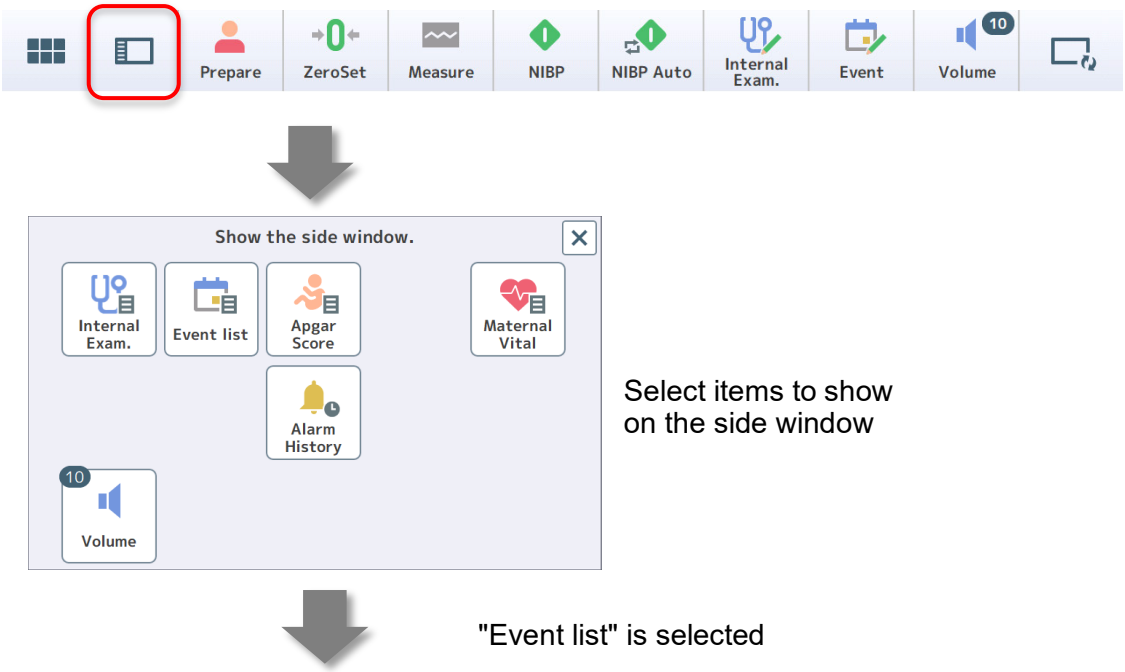


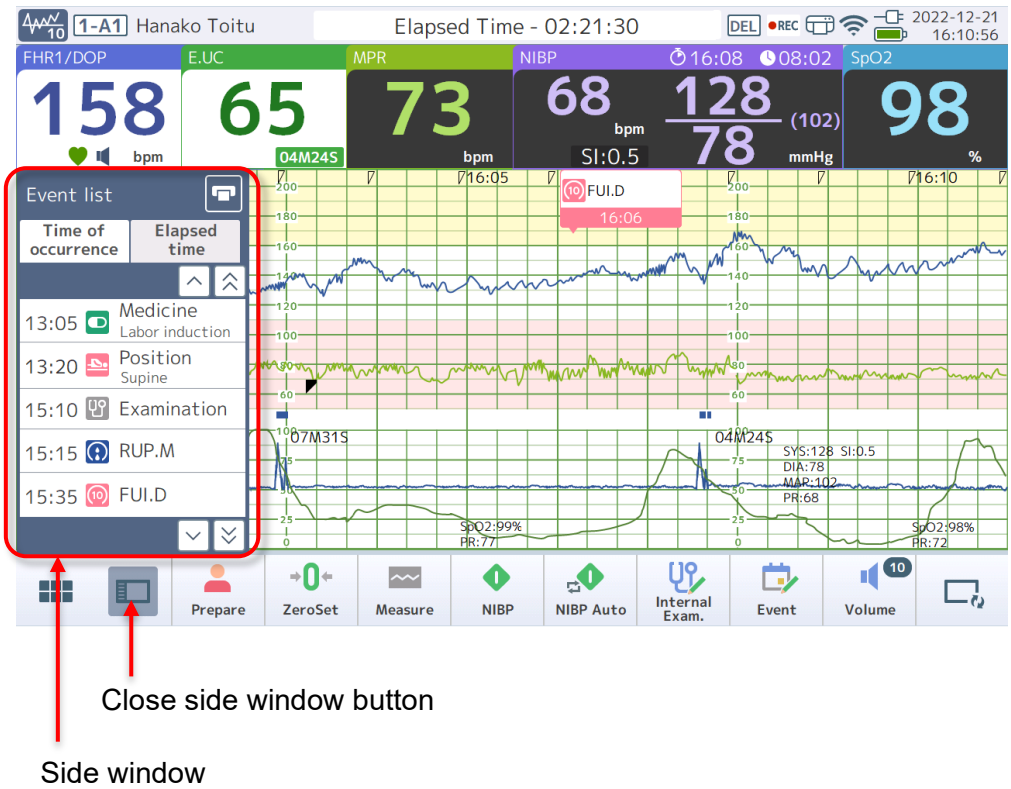
No.	Settings Item	Function and Operation
(1)	Prepare	Allows you to enter patient information or select a preset before starting monitoring (refer to P.55 “6-1 Registering Patient Information”).
(2)	ZeroSet	Sets the UC value to "12" units. Set to "0" by holding this button (refer to P.62 “(3) Set UC ZeroSet”).
(3)	Measure	Allows you to start monitoring, store monitoring data, and send the monitoring data to the central monitor (refer to P.75 “6-7 Start monitoring”). Set to start monitoring without showing the Start screen in the Admin Settings (refer to P.150 “8-5-3-1 Power-on/off”).
(4)	NIBP	Starts one NIBP measurement (refer to P.63 “6-4 Measuring maternal Non-Invasive Blood Pressure (NIBP)”).
(5)	NIBP Auto	Performs continuous NIBP measurements (refer to P.63 “6-4 Measuring maternal Non-Invasive Blood Pressure (NIBP)”).
(6)	Print	Starts CTG printing on recording paper when a recorder (sold separately) is connected (refer to P.90 “6-13 Printing the Monitoring Data”).

No.	Settings Item	Function and Operation
(7)	M.Monitor	Starts maternal monitoring. This is also lined up on the Bottom button in Delivery mode.
(8)	Apgar Score	Input Apgar score (refer to P.84 “6-10 Inputting the Apgar Score”).
(9)	Event	Input an event (refer to P.82 “6-9 Recording an Event”).
(10)	Internal Exam.	Input an internal examination (refer to P.80 “6-8 Registering an Internal Examination”).
(11)	Display Items	Select items to display on the screen (refer to P.143 “8-3-3 Display Items”).
(12)	Select Sensor	Select a sensor used respectively for Doppler, External UC, Maternal ECG, NIBP and SpO_2 (refer to P.140 “8-3-2 Select Sensor”).
(13)	Measure Mode	Select a Measure Mode (NST Mode/Delivery Mode/Maternal monitoring mode) (refer to P.89 “6-12 Changing the Measure Mode”).
(14)	Measure Settings	Make settings for measurement (refer to P.133 “8-3 Settings Related to Measurement”).
(15)	Alarm Settings	Make settings for On/Off and the threshold, etc. of an alarm (refer to P.121 “7-3 Alarm Settings”).
(16)	Device Settings	Make device settings, including the time and installation (refer to P.144 “8-4 Device Settings Which Can be Changed by the User”).
(17)	Admin Settings	Make settings on measurement, devices, and the system that can be accessed by the administrator (refer to P.147 “8-5 Admin Settings Which Can be Changed by the Administrator”). You can set a password used to open the Settings screen.
(18)	Memory	Plays and prints past monitoring data in the internal memory or USB memory. Data in the internal memory can also be copied to the USB memory (refer to P.97 “6-16 Display the Stored Data”).
(19)	Night Mode	Select a mode suitable for night time by adjusting the screen brightness (refer to P.104 “6-17 Switching to Night Mode”).
(20)	Out of Hospital	Select Out of Hospital mode (refer to P.105 “6-18 Using Out of Hospital”).

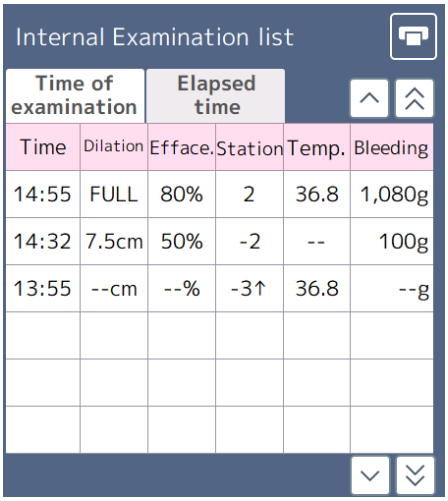
4-2-5. Side Window

When (Side Window) is touched on the Bottom button to select an item, the side window panel can be displayed on the left.
Turning the device OFF hides the side window.

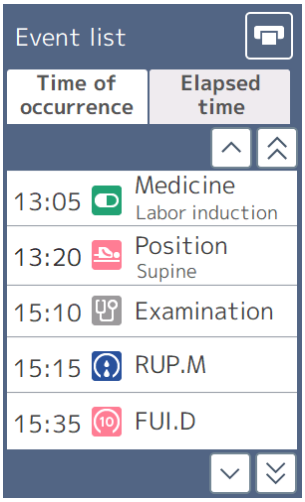




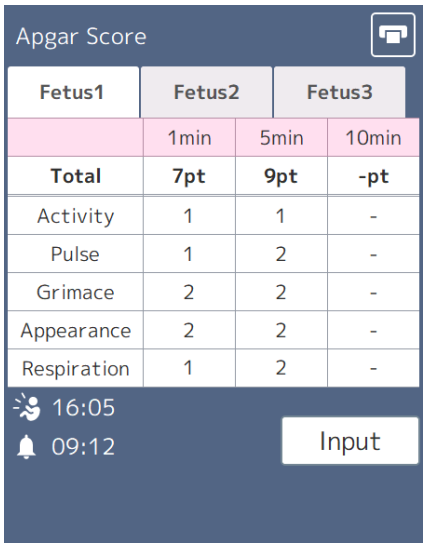
(1) Internal Examination list



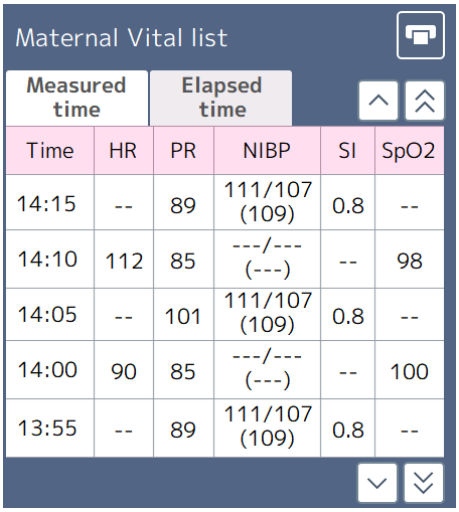
(2) Event list



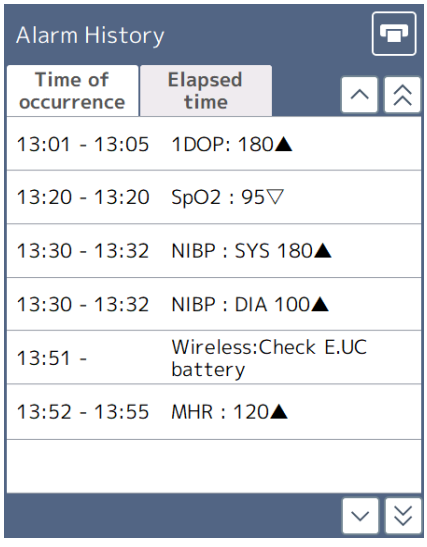
(3) Apgar Score



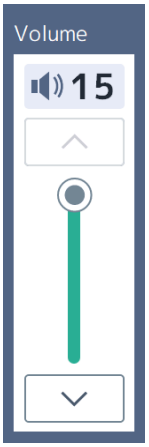
(4) Maternal Vital list



(5) Alarm History



(6) Volume



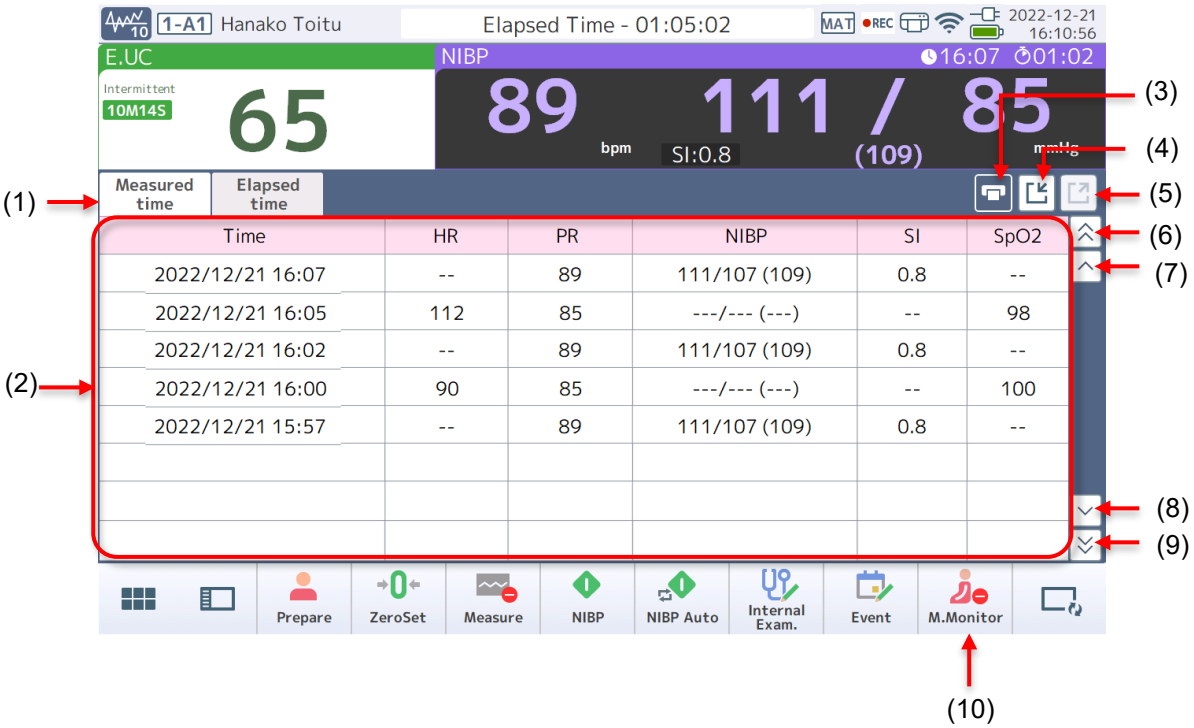
No.	Settings Item	Function and Operation
(1)	Internal Examination list	Displays the entries of internal examinations by “Time of examination” and “Elapsed time” (refer to P.80 “6-8 Registering an Internal Examination”).
(2)	Event list	Displays the entries of events by “Time of occurrence” and “Elapsed time”. Touch an event to show more details of the event (refer to P.82 “6-9 Recording an Event”).
(3)	Apgar Score	Displays the Apgar Score entered for each fetus. Touch [Input] to enter a score or record a fetal delivery (refer to P.84 “6-10 Inputting the Apgar Score”).
(4)	Maternal Vital list	Displays the maternal vital information by “Measurement time” and “Elapsed time”. In maternal monitoring mode, the window can be resized with (Minimized) and (Maximized).
(5)	Alarm History	Displays the alarms issued by “Time of occurrence” and “Elapsed time”.
(6)	Volume	Displays the Doppler sound volume and MHR/MPR synchronization volume. The current volume is shown in numbers (0-15). Touch the up/down button or move the slider directly to adjust the volume. To mute, touch the number. Touch the number again to unmute.

Note

- To print a list, touch (Print) at the top right of the window when a recorder (sold separately) is connected.
- Touch or to switch to the previous or next page.
- Touch or to switch to the first or last page.

4-2-6. Maternal monitoring Mode Screen

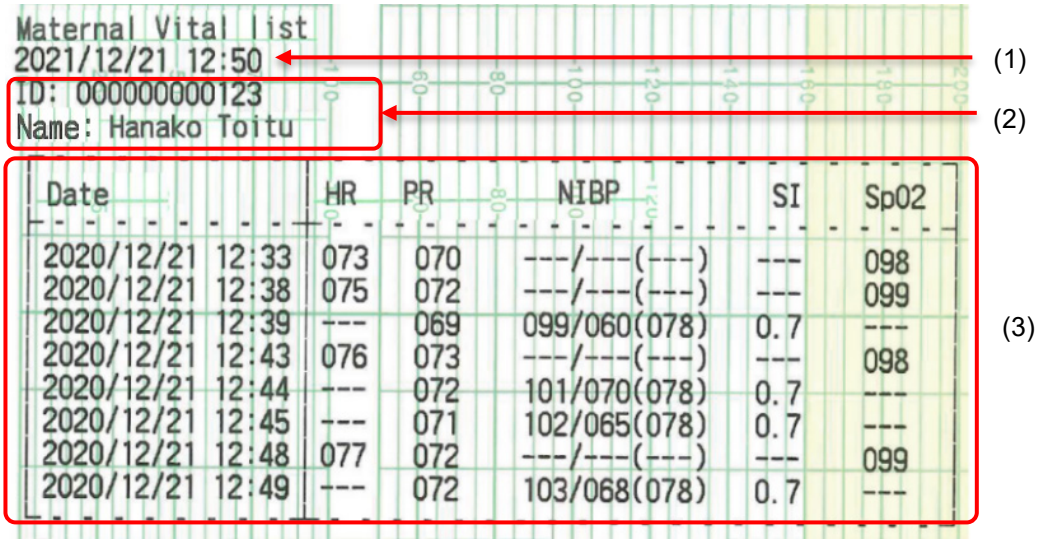
Maternal vitals are displayed on a screen in Maternal monitoring Mode.
Touch | | (Minimized) to move the vitals list to the side window and display the waveform.



No.	Settings Item	Function and Operation
(1)	Tab	Select “Measured time” or “Elapsed time”.
(2)	Maternal Vital list	Displays the value of MHR, PR, BP, SI, and SpO_2 by time unit.
(3)	(Print)	Prints the Maternal Vitals list when a recorder (sold separately) is connected.
(4)	(Minimized)	Moves the Maternal Vitals list to the side window and displays the waveform.
(5)	(Maximum)	Returns the Maternal Vitals list to its full size.
(6)	(first page)	Displays the first page.
(7)	(previous page)	Displays the previous page.
(8)	(next page)	Displays the next page.
(9)	(last page)	Displays the last page.
(10)	Apgar Score	Displayed when a delivery event is entered. Input an Apgar score.

■ Printing the Maternal Vitals list

Touch (Print) to print a list of measurement times and details of the maternal vitals when a recorder is connected. Up to 1000 entries of maternal vitals will be printed.

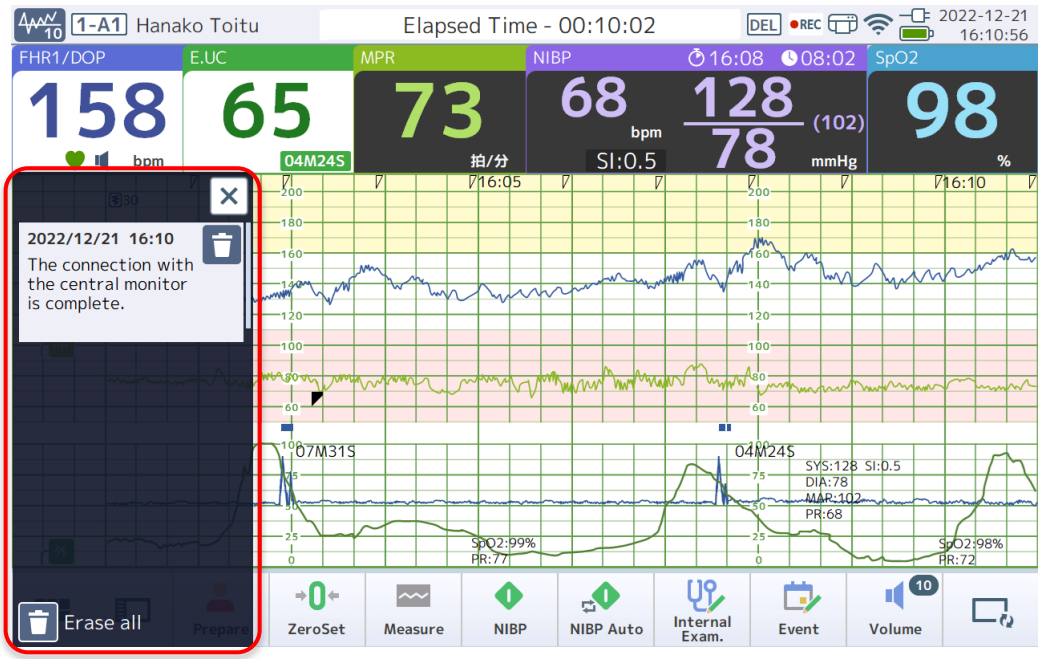


No.	Settings Item	Function
(1)	Printout date/time	Prints out the date and time on which the list was printed.
(2)	Patient information	Prints out the patient ID and the patient's name.
(3)	Maternal Vitals	Prints out the measured date and time and details.

4-2-7. Alert Screen

An alert is shown when:

- the connection with the central monitor is complete,
- the device failed to connect to the central monitor, or
- connection with central monitor has been lost.



Press the ✕ button on the upper right to exit the Alert screen, but the screen will automatically disappear after 10 seconds of no operation.

5. Preparations Before Use

Place the device in a location that meets requirements (refer to P.15 “2-4 Usage Environment”).
The unit is not sterilized before shipment. Be sure to sterilize and clean before use (refer to P.173 “9-1 Cleaning and Sterilization”).

Contraindication

	Do not use in the following places. Failure to follow this instruction may cause an explosion or fire. This device is not explosion-proof. • Using the device in a hyperbaric oxygen therapy device • Using the device in a flammable anesthetic gas or high concentration oxygen atmosphere • Using a defibrillator
	This device is not intended to be used with high frequency surgical instruments (electrical scalpels) or used during defibrillation or MRI. Remove transducers, sensors, and accessories from the patient before using the high frequency surgical instrument (electrical scalpel) or working on defibrillation or MRI. Otherwise, a device failure or injuries to the patient or operator may be caused.

5-1. Checking the Main Unit

Make sure that the main unit is correctly installed without the risk of a falling hazard.
Make sure that the main unit is not damaged or deformed.

5-2. Loading Recording Paper

Load recording paper before measurement when a recorder (sold separately) is connected.

Note

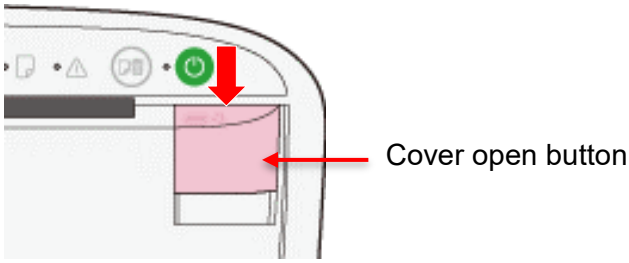
For details on the recorder, refer to “Recorder Unit MP-130 Operation Manual”.

⚠ CAUTION

	Do not use any recording paper other than the paper specified. Unspecified recording paper may cause a misdiagnosis by incorrectly recording monitoring results.
	If a recorder that was used with another fetal monitor is used, be sure to cut off the recording paper. Failure to follow this instruction may result in a mix-up of patients.

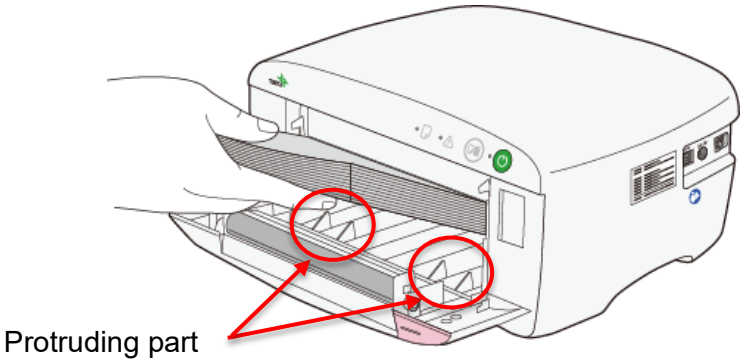
(1) Open the cover

1. **Press the cover open button of the recorder down.**
   The cover is unlocked and opens towards you.

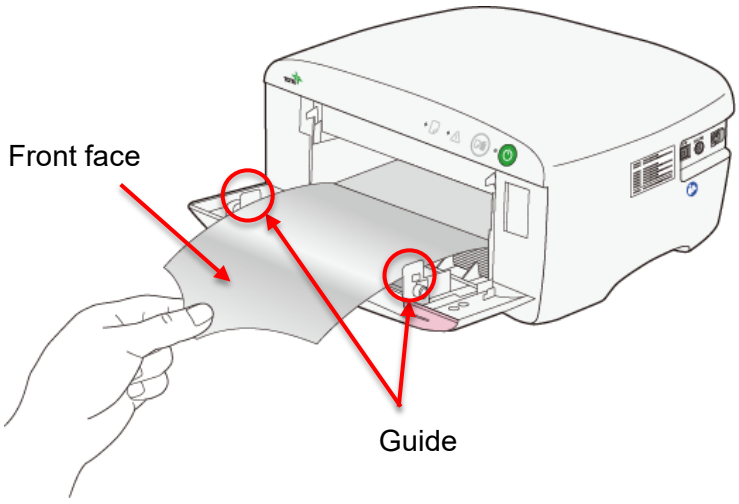


(2) Load the recording paper

1. **Remove the recording paper from the bag and loosen them lightly.**
2. **Hold the paper with the cut edges facing up and insert them into the tray over the protruding parts inside the recorder.**

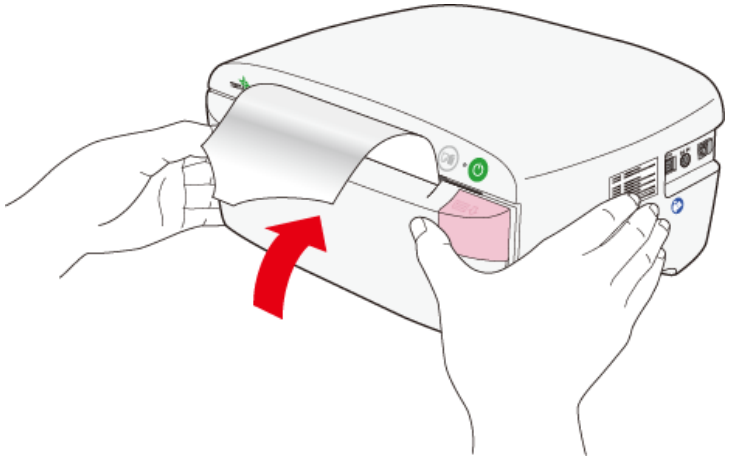


3. **Set the top paper within the guide and pull it out of the cover.**



(3) Close the cover

1. **Push the cover back while holding the recording paper.**
   You will hear a click when it locks into place.



5-3. Connecting Plugs

Make sure that the power cord and cables are not damaged or deformed before connecting the plugs.

(1) Connect the power cord

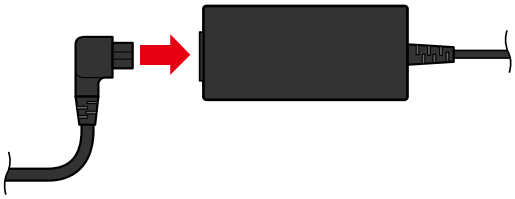
WARNING

	Do not place heavy objects on the power cord in such a way that the power cord is crushed under the object. Do not damage, forcibly bend, twist, pull, or expose the power cord to heat sources. In case of any damage to the power cord (exposure of core or breakage), contact us or our distributor for replacement. Failure to follow this instruction may result in fire or electric shock.

CAUTION

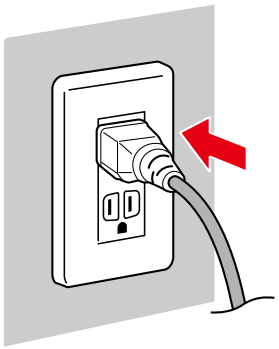
	Use an outlet which you can easily disconnect the power cord and do not place any obstacles around the power outlet.

1. **Connect the power cord to the AC adapter.**



2. **Connect the DC connector of the AC adapter to the power jack on the right side of the main unit.**

3. **Insert the power plug into a commercial power outlet AC.**



(2) Check the battery charge status

Charging automatically starts when the power cord is connected.
Make sure that the power indicator is flashing green.
The power indicator turns orange when the battery is fully charged.

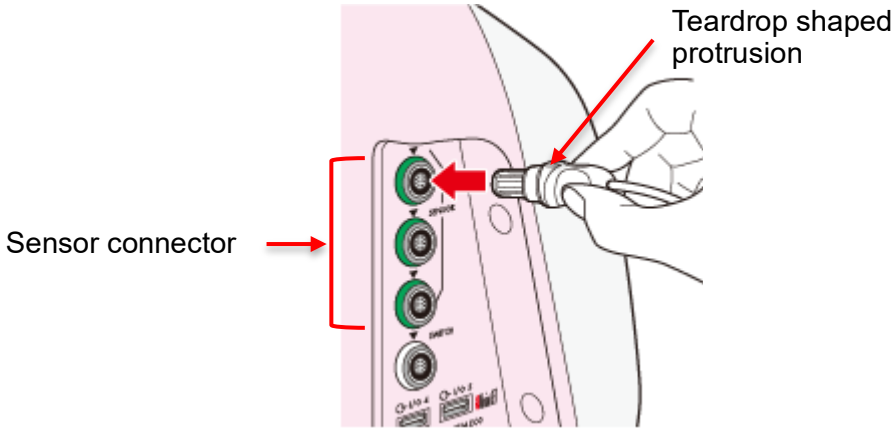
Charging: Flashes green Fully charged: Lit orange

If the commercial power supply is cut off, the power automatically switches to the internal battery. When the power source supply is restored, the power reverts back to the normal commercial power supply and continues the operation before it was cut off.
When the commercial power source is cut off and there is no power left in the built-in battery, all settings are restored based on each setting stored in the memory when the power source is restored.

(3) Connect the transducer

Connect the plug to the sensor (SENSOR) connector (green) on the left side of the main unit. Select whichever connector.
Align the plug's teardrop shaped protrusion with the ▼ symbol on the main unit and fully insert the plug until it clicks in to place.

- For single: Y-shaped Doppler/External UC transducer supplied with the device
- For twin/triplet fetuses: Y-shaped Doppler/External UC transducer supplied with the device, and optional Doppler transducer

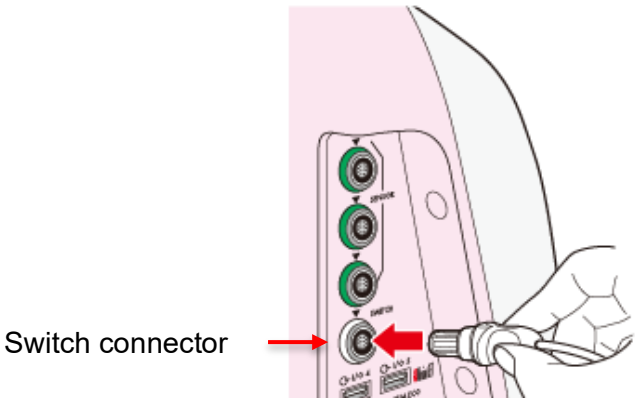


Note

The added Doppler transducer can be used for a single fetus. Using two Doppler transducers (double Doppler) for a single fetus provides a wider range of monitoring since the two signals detected are compared, and the one with better quality is automatically selected for display and printing (single heart).
The monitor requires a change of setting mode (refer to P.134 "8-3-1-2 F.HR / FM").

(4) Connect the remote marker switch

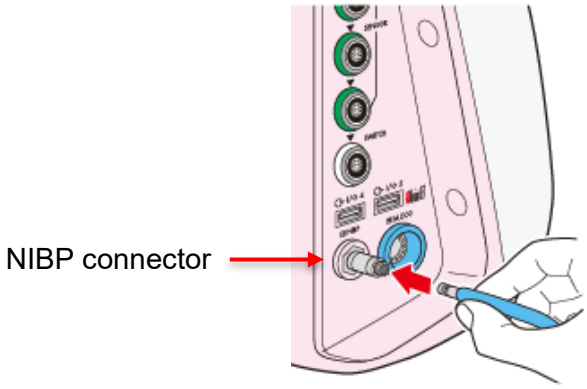
Connect the plug to the switch (SWITCH) connector (white) on the left side of the main unit.
Align the plug's teardrop shaped protrusion with the ▼ symbol on the main unit and fully insert the plug until it clicks.



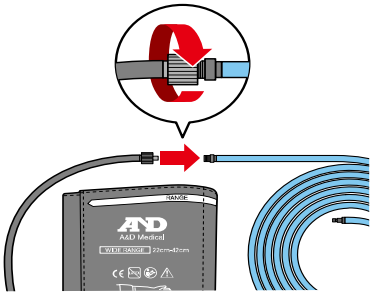
(5) Connect Non-Invasive Blood Pressure Gage (NIBP)

MT-832-L/ P

1. **Connect the NIBP air hose for adults to the NIBP connector on the left side of the main unit.**
   Fully insert the plug until it clicks in to place.



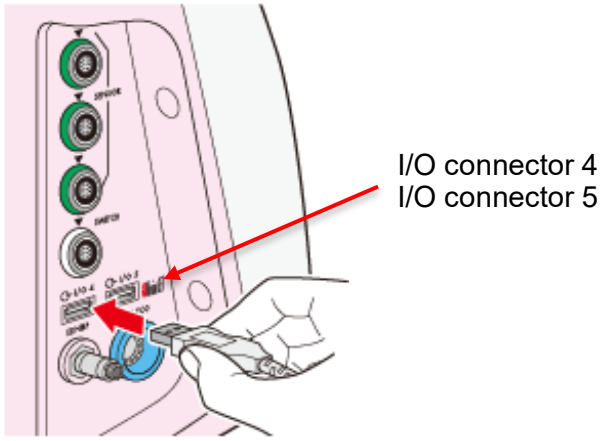
2. **Connect the NIBP cuff to the air hose.**
   Insert the cuff's connector to the joint of the air hose. Rotate the connector clockwise until it stops.



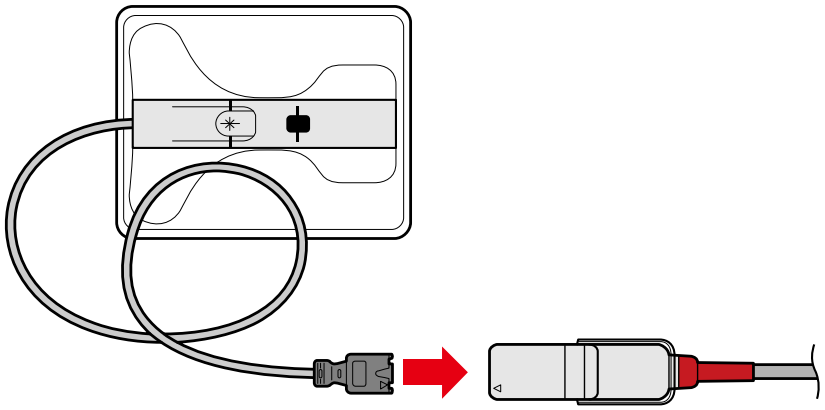
(6) Connect the pulse oximeter (SpO_2)

MT-832-L/ P

1. **Connect the SpO_2 patient cable to I/O connector 4 or 5 on the left side of the main unit.**



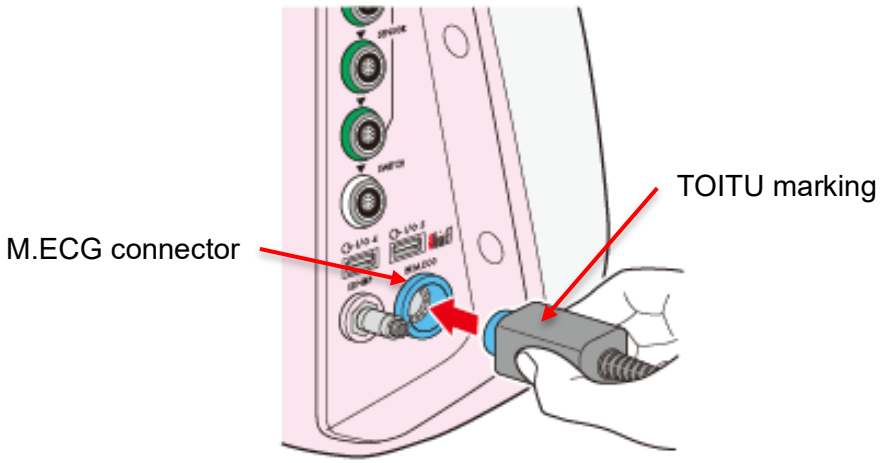
2. **Connect the SpO_2 adult sensor to the SpO_2 patient cable.**



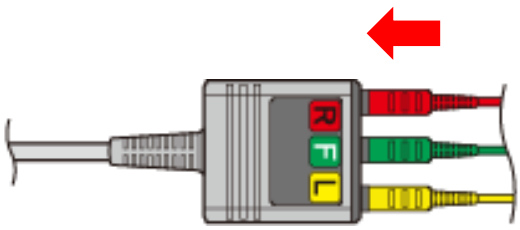
(7) Connect the M.ECG adapter cable

MT-832-L / P

1. **Connect the M.ECG adapter cable to the M.ECG connector on the left side of the main unit.**
   Push the plug in fully with the TOITU marking facing upward.



2. **Match the color when inserting color-coded clip electrode leads (R: red, F: green, L: yellow) to the tip of the ECG adapter cable.**

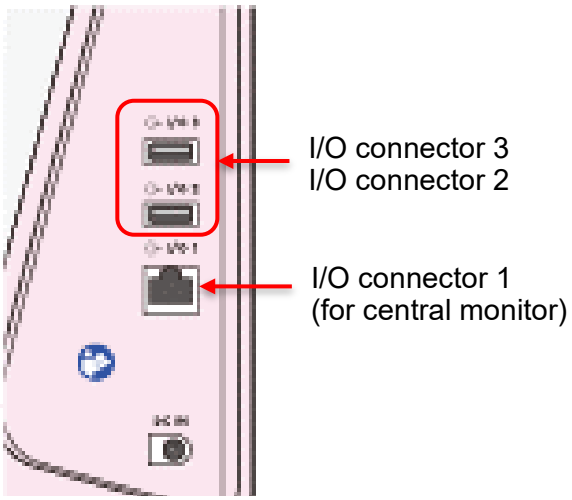


(8) Connect the accessories

Information monitored with the device can be monitored remotely, data can be printed, and the patient information can be read.

- Central monitor
- Recorder unit
- Bar code reader
- Card reader

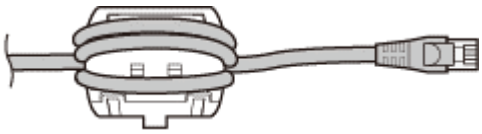
1. Connect the central monitor to I/O connector 1, and other accessories to I/O connector 2 or 3.



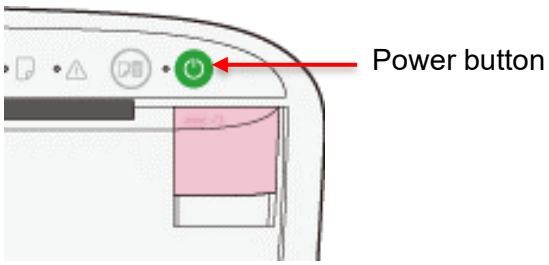
Right-side

Note

For the MT-831-S and MT-832-P, wrap the provided ferrite core with the LAN cable between the fetal monitor (I/O 1) and the central monitor, as shown in the figure, and attach it to the main unit.



2. Push the power button to turn ON the device when the recorder is connected.



Make sure that the error indicator and the paper indicator are not flashing.

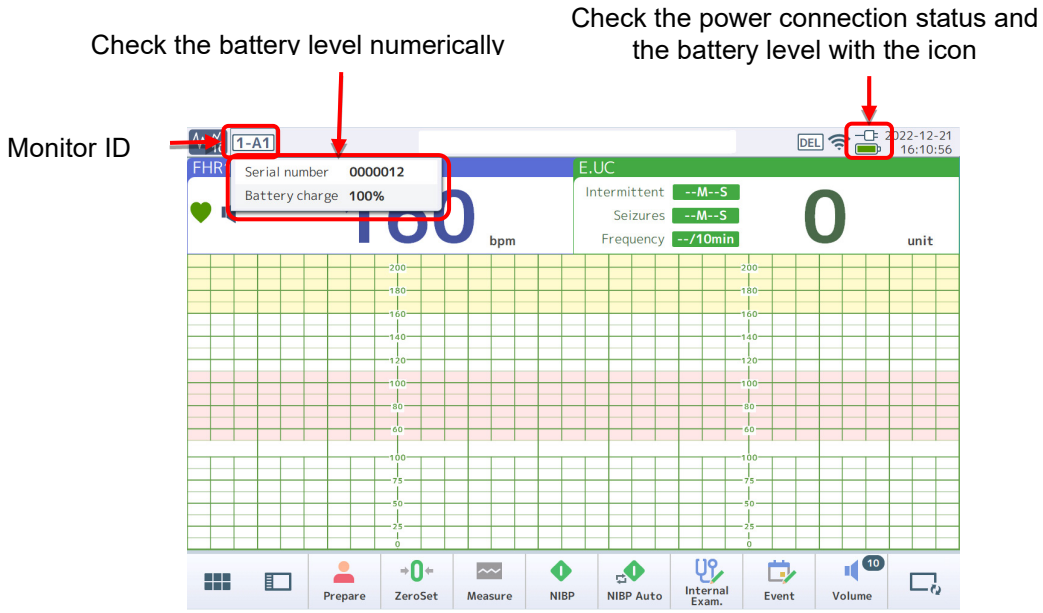
Note

If the recorder's "Linked with power on/off" setting in the Admin Settings is set to "Enable", the recorder will be powered ON/OFF when the main unit is powered ON/OFF (refer to P.167 "8-5-9-1 Print1") respectively.

5-4. Inspections before Use

(1) Confirm startup

1. **Press the (Power) button on top of the main unit.**
   The power indicator turns green.
2. **Confirm that there are no defective areas on the LCD screen.**
3. **Check the battery level using the battery icon on the status bar.**
   Touch the Monitor ID to check the battery level numerically.



(2) Check the date/time

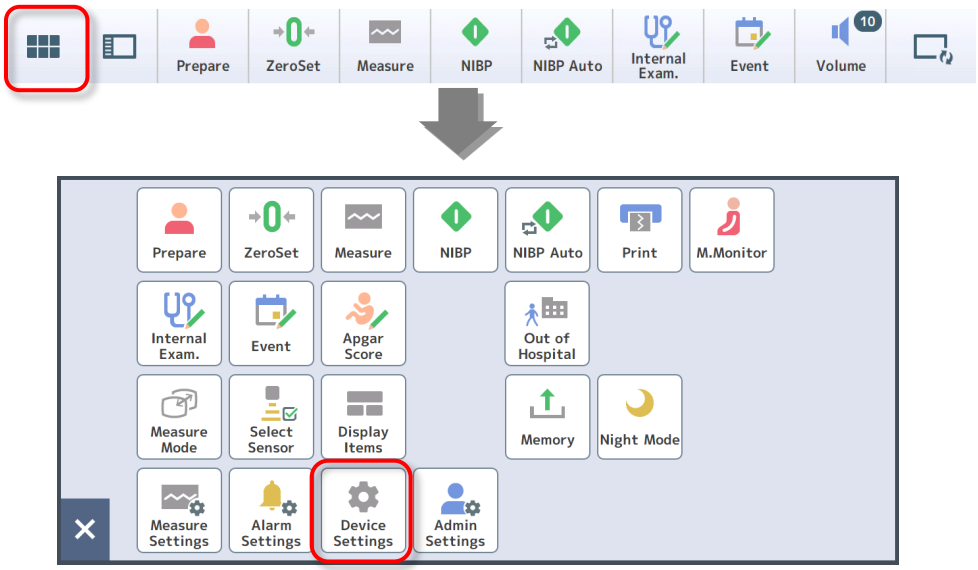
Make sure that the date/time is correct on the right of the status bar by comparing it with the correct date/time.
If there are no errors, proceed to Step (4). If there are any errors, proceed to Step (3) and be sure to correct the time.

(3) Correct the time (or date)

Note

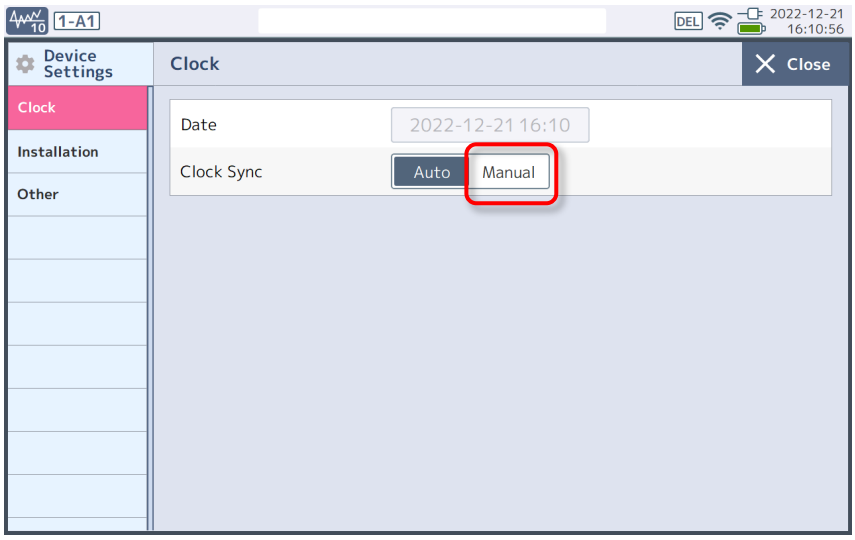
You can also make settings to automatically show the time setting screen at startup from the Admin Settings (refer to P.150 "8-5-3-1 Power-on/off").

1. **Touch (Menu) on the Bottom button, then touch [Device Settings].**

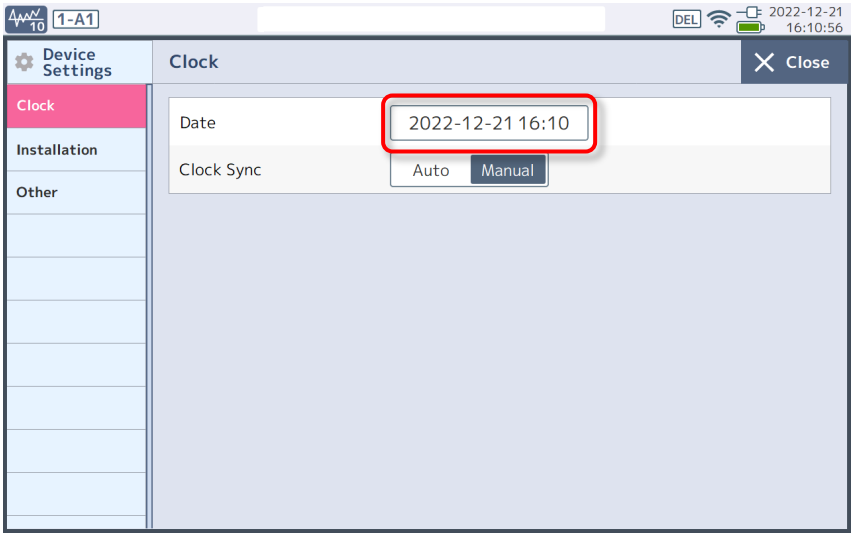


The Clock setting screen is displayed.

2. **If the time synchronization is set to <Auto>, touch <Manual>.**



3. **Touch the Date display area.**

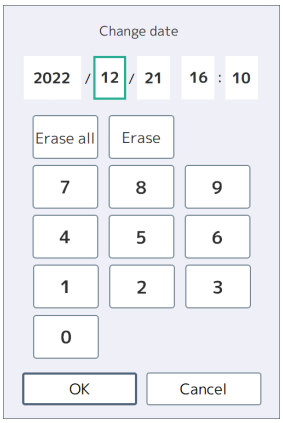


The Change date pad appears.

4. **Touch the date/time you want to change and enter the correct date/time.**
Touch [Erase all] or [Erase] to erase the date/time.

Note

You cannot modify the seconds manually. In order to modify the seconds, enter the time a minute or two minutes ahead and touch [OK] when it reaches 00 seconds of the correct minute.



5. **Touch [OK] to confirm the date/time.**

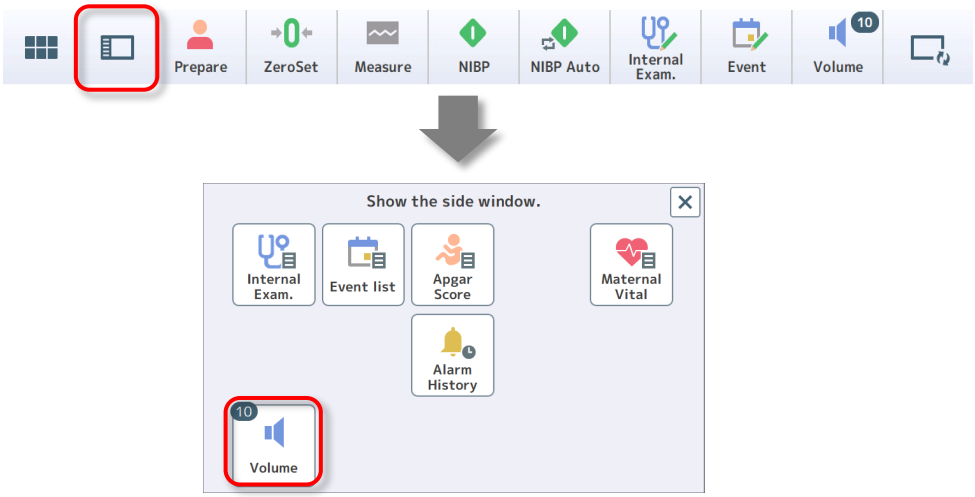
Note

Touch [Cancel] to close the Change date pad without making date and time settings.

(4) Adjust the Doppler sound volume

When more than one Y-shaped Doppler/External UC transducer and Doppler transducer are connected, the Doppler sound of one of those can be heard.
You can hear the Doppler sound of the Doppler for which is displayed on the monitoring area.

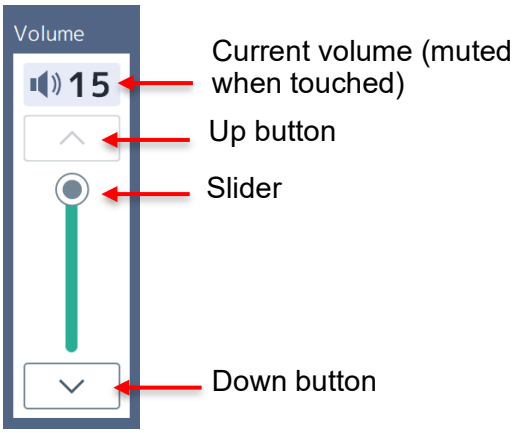
1. **Touch (Side Window) on the Bottom button, and then touch [Volume].**
   When the [Volume] button is listed on the Bottom button, touch the button to show the volume.



   The volume meter is displayed and the current volume is shown as a number (0-15).

2. **Touching the monitoring area of each Doppler switches the Doppler sound that can be heard.**

3. **Adjust the volume.**
   Touch the up/down button on the volume meter or move the slider directly to adjust the volume.
   Touch 15 to set the volume to zero. No Doppler sound can be heard. Touch the number again to return to the volume before it was muted.



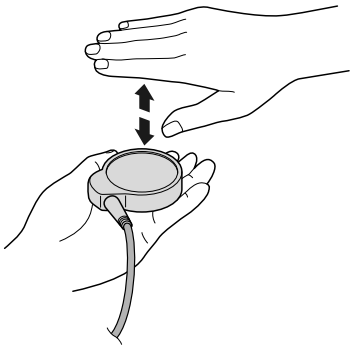
4. **Touch (Close side window) on the Bottom button to hide the volume meter.**

Note

- A Doppler sound and Maternal heart rate/Maternal pulse rate synchronous sound can be adjusted or muted using the volume meter. For the alarm volume, refer to P.122 "7-3-1 Common".
- For the key sound settings, refer to P.146 "8-4-3 Other".

(5) Confirm the Doppler sound

1. **Hold the Doppler transducer in your hand so that the transmitting and receiving surface faces out.**
2. **Move the palm of the other hand towards or away from the transmitting and receiving surface.**



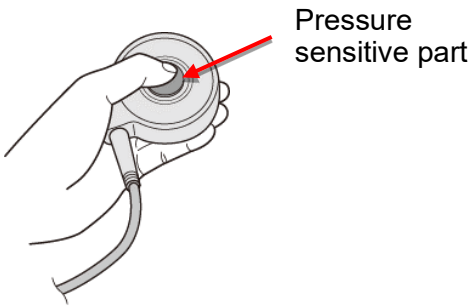
3. **Confirm that the Doppler sound can be heard when the hand is close to the transducer. If it cannot be heard, increase the volume and try again.**
4. **After confirmation, gently place the transducer avoiding putting pressure on the transmitting and receiving surface.**
5. **If you cannot confirm the sound, connect a different Doppler transducer and try again.**

Important

If there is no Doppler transducer with which you can confirm the Doppler sound, do not use this device.

(6) Confirm the contraction level

1. **Lightly press the center of the pressure sensitive part of the External UC transducer.**



2. **Confirm that the UC level increases in proportion to the extent of the pressure applied.**

3. **Once complete, gently place the transducer while avoiding putting pressure on the pressure sensitive part.**
4. **If you cannot confirm the UC level change, connect a different the External UC transducer and try again.**

Important

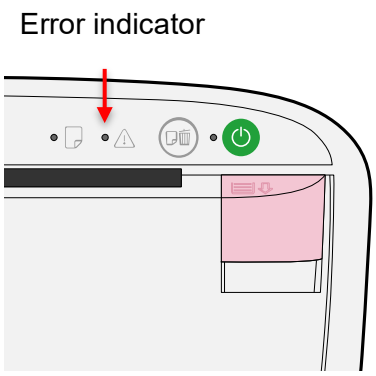
If there is no the External UC transducer with which you can confirm the UC level, do not use this device.

(7) Check the M.ECG adapter cable

1. **Confirm that a device alarm "M.ECG:Check Electrode" is issued when the electrode of the M.ECG adapter cable is not applied to the patient.**

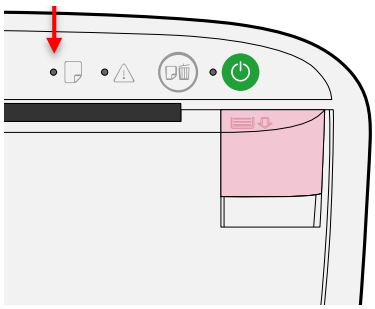
(8) Check the recorder

1. **Make sure that the error indicator of the recorder is not flashing.**



2. **Make sure that the paper indicator is not flashing.**

Paper indicator



Note

- For actions you should take when the error indicator is flashing, refer to "Recorder Unit MP-130 Operation Manual".
- When the paper indicator is flashing, check if the recording paper is loaded correctly or the cover is not open.

6. Using This Device

6-1. Registering Patient Information

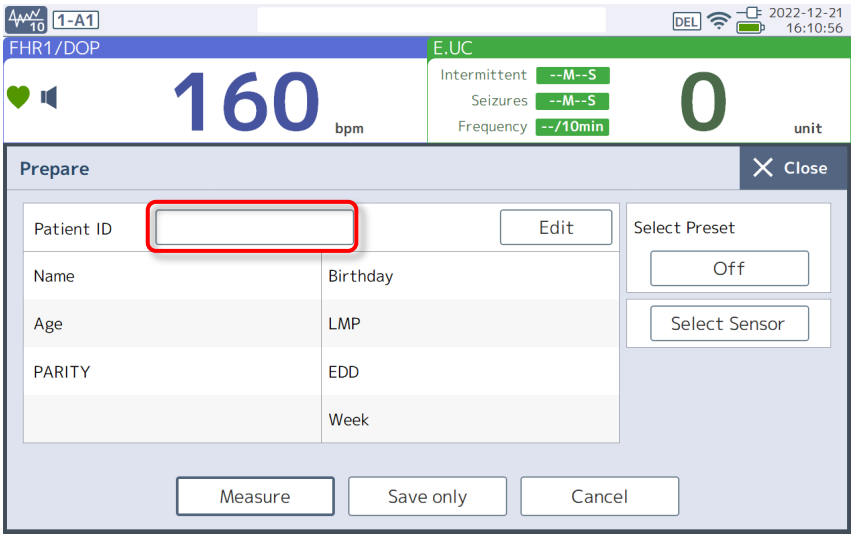
Patient information can be registered/displayed/recorded if the device is associated with our central monitor. Patient ID can be entered on a screen.

6-1-1. Entering on a screen

1. **Touch [Prepare] on the Bottom button or Menu screen.**

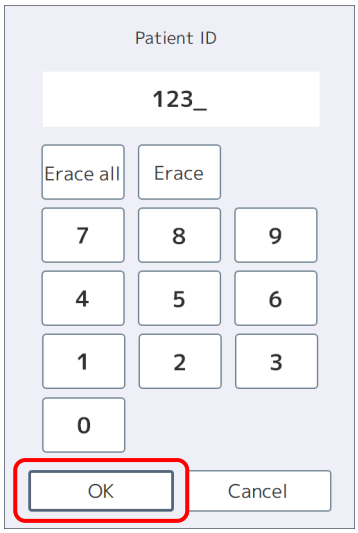
The Prepare screen is displayed.

2. **Touch the [Patient ID] field.**



The Patient ID entry pad appears.

3. **Enter the patient ID registered with our central monitor and touch [OK].**



The patient information is read and the Prepare screen is displayed.

4. **Select a Preset**

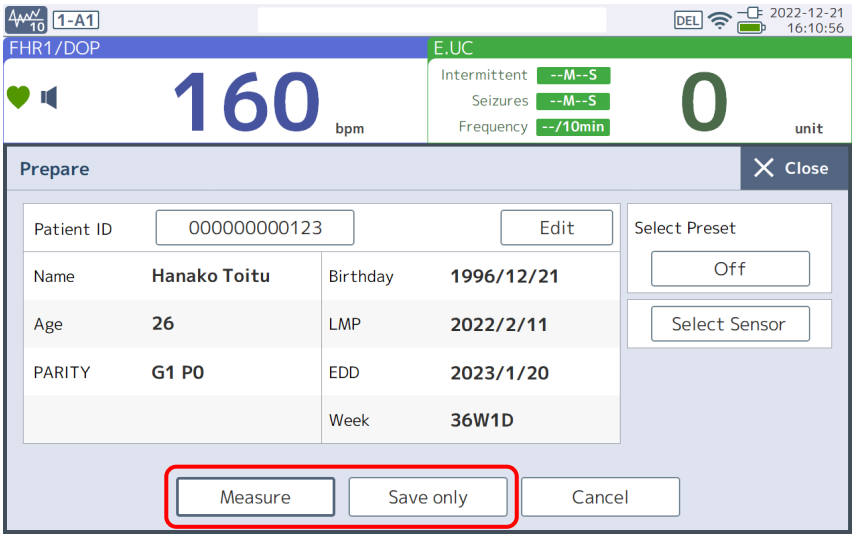
When a Preset is registered in the Admin Settings (refer to P.154 "8-5-3-5 Preset"), select Preset to change the following settings collectively:
- Alarm Settings (refer to P.121 "7-3 Alarm Settings")
- NIBP measurement settings (Interval, End Sound) (refer to P.138 "8-3-1-5 NIBP")
- Sensor to use (refer to P.140 "8-3-2-1 Common")

Make sure that the selected Preset is suitable for the patient before using the Preset.

The selected Preset will be deselected after measurement is complete, and any settings that were changed when the Preset was selected are restored to the original settings.

The Preset values registered in the Admin Settings do not change even if associated settings are changed on the Settings screen while the Preset is selected. The changes are temporary until the measurement is complete.

5. **Confirm that the data shown is consistent with the patient information you want to register, and then touch [Measure] or [Save only].**
   Touch [Save only] when you do not want to start measurement immediately.



When [Measure] is touched, a confirmation screen is displayed. For subsequent operations, refer to P.75 "6-7-1 Select Measure Mode to start monitoring".
When [Save only] is touched, the screen returns to the monitoring screen.

Note

- You can hide the patient information on the monitoring screen from the Admin Settings (refer to P.155 "8-5-3-6 Other").
- If our central monitor is not used, touch [Edit] on the Prepare screen to edit the patient information.
- Select the Preset registered in "Select Preset" on the Prepare screen to change the settings collectively based on the patient (refer to P.154 "8-5-3-5 Preset").

6-2. Monitor the Doppler Fetal Heart Rate

⚠ WARNING

❗	Carefully monitor for any surges in heart rate images due to any artifacts. The heart rate can be converted to incorrect signals because of the change of uterine contractions. In some cases, the displayed and recorded heart rate may be twice as much as the actual heart rate even when it is decreasing, or half as much even when it is increasing. This may cause a misdiagnosis.
❗	Move the Doppler transducer to a position (optimal position) that provides clear, rhythmic sounds (sounds of the heart wall and valves) in response to the fetal movement. Failure to do so may cause a misdiagnosis.

⚠ CAUTION

❗	When monitoring the fetal heart rate of twins or three fetuses, check each fetus using the heart rate sound. The identical fetus could be detected depending on the position of the Doppler transducer.
❗	Confirm that the fetal heart beat is different from the maternal pulse rate. When it is suspected the maternal pulse rate is being recorded, take the maternal pulse and compare with the displayed heart rate.

(1) Apply ultrasound gel

Apply the ultrasound gel to the surface of the maternal abdomen and the transmitting and receiving side of the Doppler transducer.

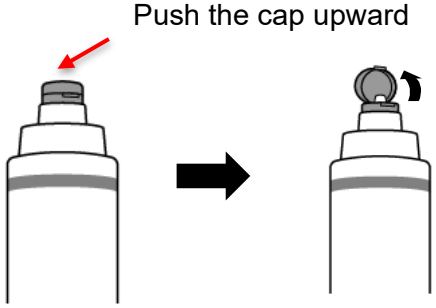
Important

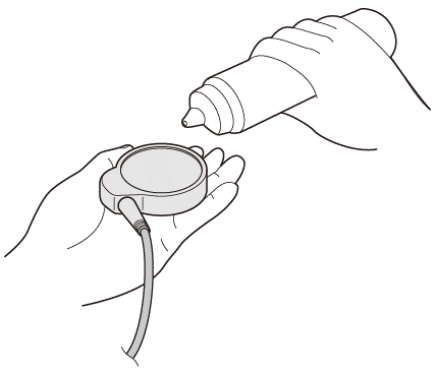
The amount of ultrasound gel should be applied evenly so that it creates a thin layer. It should not be too much or too little.

In addition, ultrasound gel left for a prolonged time may harden. Do not use hardened gel as it prevents the correct measurement from being attained.

Opening/closing the gel cap

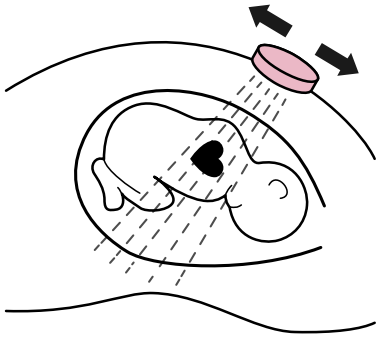
Push the cap upward



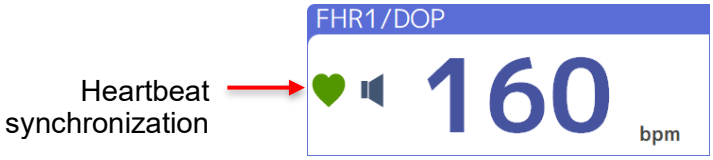


(2) Decide on the position

1. **Place the transmitting and receiving side of the Doppler transducer so that it is closely applied to the maternal abdominal wall.**
2. **Slowly move the Doppler transducer to detect a position that provides clear, rhythmic sounds (sounds of the heart wall and valves).**



3. **Check the icon for heartbeat synchronization ♡ on the screen and hold the transducer in a position where the green light is continuously on.**



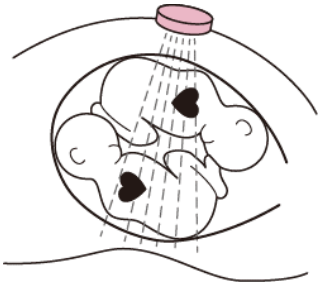
The color of the icon is defined as follows depending on the status of the heart rate signals.

♡ Color	♥ Green	♥ Yellow	♥ Red
Signal quality	The signal is stable.	There is some noise but the signal can be detected.	The signal is unstable.

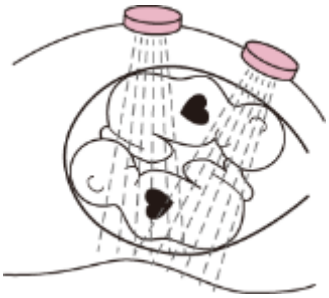
4. **In the case of multiple fetuses, find the position for each fetus.**

Important

- In the case of multiple fetuses, position the transducer so that each fetus is measured by the Doppler sound.
  One Doppler transducer may monitor two fetuses, or two transducers may monitor one fetus.



One transducer is monitoring two fetuses



Two transducers are monitoring one fetus

- The Doppler sound switches between the selected Doppler each time you touch the monitoring area, and is displayed on the monitoring area for the active one. Regularly check the fetus with the Doppler sound and adjust the position of the Doppler transducer as required.

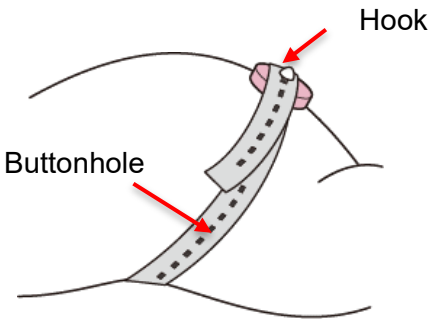
5. **When using Single Heart Mode, find a position where two transducers can monitor one fetus.**

Note

If Single Heart Mode is set to "On" on the Measure Settings screen, [Doppler SH] is displayed in the FHR mode field (refer to P.134 "8-3-1-2 F.HR / FM").

(3) Affix the transducer

1. **Affix the appropriate buttonhole on one end of the transducer belt applied to the back to the hook of the Doppler transducer while being careful not to move the transducer.**



2. **Affix the other buttonhole on the other end of the transducer belt to the hook to tighten the transducer belt.**
   Drop the end of the transducer belt down to the side.
3. **Thoroughly wipe away any excessive ultrasound gel on the abdominal wall.**

(4) Start monitoring

Refer to P.75 "6-7 Start monitoring" to start monitoring.

6-3. Monitoring the External UC

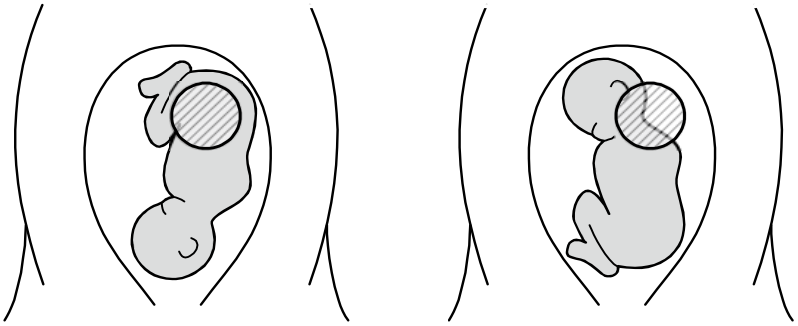
CAUTION

	Do not apply ultrasound gel to the External UC transducer.
	Do not fasten the transducer belt too tightly. Failure to follow this instruction may result in excessive pressure on the abdominal wall or cause a monitoring error.
	Confirm there is no redness on the skin when the External UC monitoring transducer is used for a long time. If there is redness, slightly displace the contraction transducer or stop using the monitoring device. Failure to follow this instruction may result in contact dermatitis in rare cases.

(1) Decide on the position

Place the External UC transducer slightly above the navel, the center of the abdominal wall that provides the maximum abdominal circumference.

Positioning of the External UC transducer



Around the bottom on the back side of the fetus for a cephalic presentation

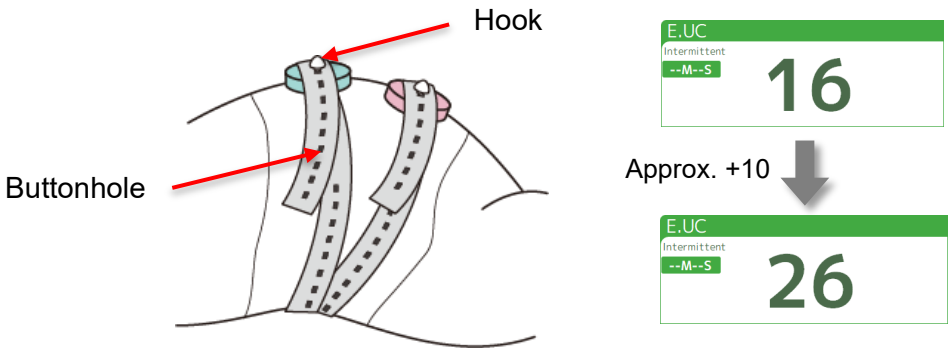
Around the head of the fetus for a breech presentation

Important

- If the transducer is placed below the navel, it cannot monitor correctly due to the mother's breathing.
- The device has a filter to eliminate the effect of breathing.
  To record a waveform which does not use the filter, change the settings (refer to P.136 "8-3-1-3 UC").

(2) Affix the transducer

1. **Affix the appropriate buttonhole on one end of the transducer belt applied to the back hook of the External UC transducer while being careful not to move the transducer.**
   Fasten the transducer belt so that the UC level is incremented by approximately 10.

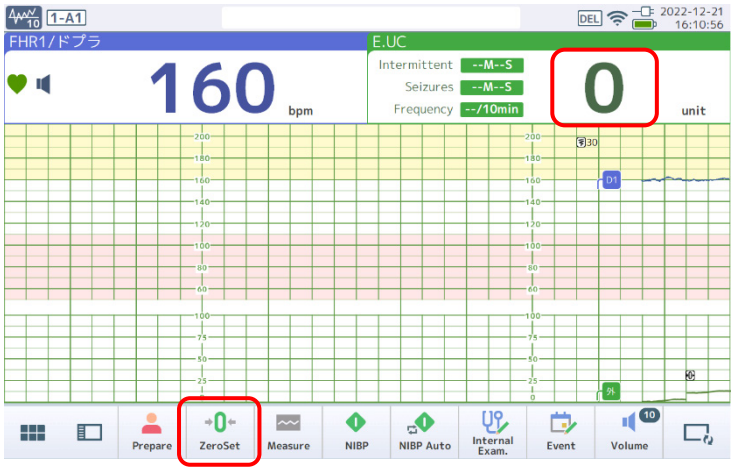


2. **Drop the end of the transducer belt down to the side.**

(3) Set UC ZeroSet

After fixing the transducer, touch [ZeroSet] on the Bottom button or Menu screen.
The starting points for the display and record are set to "12" on the scale.

Zero set and sample screen



Important

- [ZeroSet] can be set to "0" with a long press, however, a negative value may be measured for the reference value set to zero in the External UC monitoring, therefore, use a short press to set to "12".
- Without performing a zero set, the UC cycle may not be calculated correctly.

(4) Start monitoring

Refer to P.75 "6-7 Start monitoring" to start monitoring.

6-4. Measuring maternal Non-Invasive Blood Pressure (NIBP)

MT-832-L / P

⚠ WARNING

	Take extreme care when measuring the non-invasive blood pressure of a patient who is likely to bleed or in hypercoagulable status. Punctate bleeding or blood clot may cause a circulatory disorder after the arm is tightened with a cuff.
	Refrain from a continuous measurement for a prolonged period. Failure to follow this instruction may cause blood stasis on the measured area.
	Be sure to use the device while checking the status of the patient when measuring at an interval of 2.5 minutes or less is required. Failure to follow this instruction may cause blood stasis on the measured area. Periodically check the blood circulation when a periodical measurement is made for a prolonged time of period.
	Non-invasive BP may not be measured correctly when: • an electrical scalpel is used, • a body movement is detected, • a pulse wave is weak, • an irregular heartbeat is frequent, • an external vibration is detected, • an acute BP fluctuation is detected, • a measurement is made during CPR, • PR is slow, • BP is low, • pulse pressure is low, • the cuff is wrapped incorrectly (too tight or too loose) • a cuff not suitable for the thickness of the patient's arm is used, • the cuff is wrapped on thick clothing, or • a worn-out cuff is used.
	Stop measurement immediately if the patient's physical condition gets worse due to blood pressure measurement.
	Consult the doctor for advice before using the device as the patient who has a severe circulatory deficit on his or her arm may cause a poor health condition.

⚠ CAUTION

	Make sure that the cuff and air hose fitted to the patient are securely connected to the device. Failure to follow this instruction may cause a misdiagnosis due to inaccurate display of monitoring results.
	Do not connect the air hose to something other than the cuff (e.g. transfusion line).

	Do not connect a neonatal cuff to the device. The device is intended for an adult's non-invasive blood pressure (NIBP) monitoring.
	Normally, the cuff should be worn on a bare arm to monitor the arterial pulsation accurately.
	Do not wrap the cuff too tightly when wearing the cuff. Failure to follow this instruction may inhibit the bloodstream, causing blood stasis. In addition, if the cuff is wrapped loosely, the BP value could be relatively high.
	Do not monitor a non-invasive blood pressure (NIBP) on the same side as SpO_2. Failure to follow this instruction may inhibit the bloodstream and suspend the SpO_2 monitoring.
	Do not wear the cuff on the upper arm or thigh on which a venous path is secured. Failure to follow this instruction may cause a back-flow of blood and stop a chemical injection.
	Do not try to smash or bend the air hose during monitoring. Failure to follow this instruction may apply pressure on the cuff continuously, resulting in a bloodstream failure and causing serious injury to the patient.
	Refrain from NIBP monitoring for patients for whom a balloon pumping (IABP) is applied. Failure to follow this instruction may cause an incorrect measurement as the pulse wave emitted by IABP and the patient's pulse wave coexist.
	Refrain from measuring BP in the following states as it may cause an accident: • Wrapping the cuff over external injuries Failure to follow this instruction can cause additional injury as well as cause infection. • Wrapping the cuff around limbs where blood vessel cannulation, treatment, or shunt Failure to follow this instruction may cause harm due to inhibited bloodstream. • A state where blood clots may occur because the patient is confined to bed for a prolonged time. • Warpping the cuff around the arm on the mastectomy side. Failure to follow this instruction may cause interference with the mastectomy due to cuff pressure. • Starting monitoring without wrapping the cuff • Wrapping the cuff around areas other than the limbs • The air hose is bent Air remains in the cuff, causing a periphery function disorder due to homeostasis in the arm. • Using a contaminated cuff Failure to follow this instruction may cause infection.

	The measurement fails and re-measurement may take place when: • a body movement is detected, • a pulse wave is weak, • an irregular heartbeat is frequent, • an external vibration is detected, • PR is slow, • BP is low, • pulse pressure is low, • periphery low perfusion is detected, • the body temp is low, • the cuff is wrapped incorrectly (too tight or too loose) • a cuff other than that for compression measurement is used, • a cuff not suitable for the thickness of the patient's arm is used, or • the cuff is wrapped on thick clothing, As the factory default, pressurization measurement is set but can also be changed to decompression measurement.
	The cuff may be degraded if measurement is not disabled during continuous pressurization and decompression measurement is set. Replace with a new cuff. Using the degraded cuff, a noise from the cuff is mixed during pressurization, and the pressurization measurement is not possible.
	BP may not be measured correctly when measured under the conditions or with procedures not listed in “Recommendations for BP measurement”. If you are concerned about the accuracy of monitoring results, check if the recommended conditions or procedures are being followed.
	If a measurement error occur or you are concerned about the accuracy of monitoring results even when recommended conditions or procedures are being followed, check using other methods (auscultation, palpation, etc.).
	Do not use a measured PR to judge infrequent pulse or irregular heartbeat.

The device has A&D's integrated NIBP module TM-2917.
Recognize a pulse wave as being pressurized and release the pressure to complete the measurement once the max BP (SYS) is measured. To change to decompression mode, change “Wired NIBP Measure Mode” on P.138 “8-3-1-5 NIBP“.

■ Recommendations for BP measurement

Patients under BP monitoring are recommended to be in the following status:

- Resting quietly in bed prior to the initial measurement
  It is recommended to rest for more than 5 minutes.
- Fold the sleeve or wear a thin material of clothing
  Make sure that the folded sleeve does not tighten the area to be measured.
- Sit back and relax comfortably
- Do not cross legs, but instead place them on the floor to make your back and arms stable
- Keep the center of the wrapped cuff as high as the right atrium
- Keep quiet in bed during monitoring and do not make conversation.

Follow the procedure below to measure correctly. During monitoring, the patient should maintain the following recommended status as much as possible.

- Make sure that the patient is relaxed.
- Use a cuff compatible with the boundary length of the arm.
- Adjust the height of the chair and posture to make sure the center of the wrapped cuff is as high as the right atrium.
- Make sure that the patient remains relaxed even after the measurement has started.

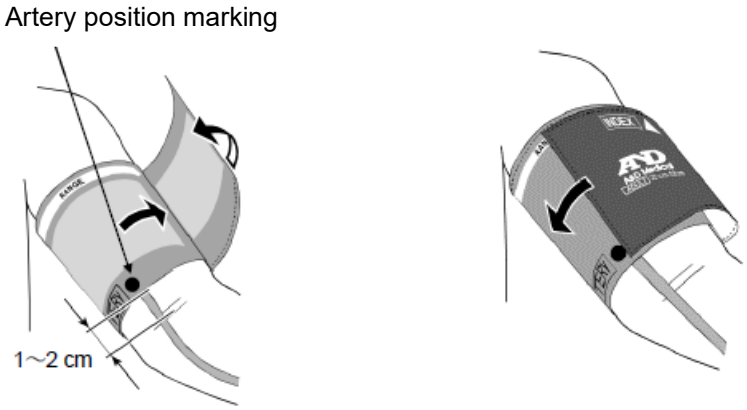
(1) Make settings

Make NIBP measurement settings. They include measurement settings and Alarm Settings.

- For the measurement settings, refer to P.138 “8-3-1-5 NIBP“.
- For Alarm Settings, refer to P.116 “7-1-4 Non-Invasive Blood Pressure (NIBP) Alarm“.

(2) Wear a cuff

1. **With the palm of the patient’s hand facing up, align the cuff 1 to 2 cm above the inner elbow joint of the upper arm.**
   The cuff’s range where the INDEX marking overlaps the RANGE marking is proper.
2. **Apply the cuff so that the artery position marking ● overlaps the artery.**



3. **Wrap the cuff around the arm.**
   Wrap the cuff tightly without any space so that the cuff is not misaligned or does not move. However, try not to tighten excessively and allow for about one or two-fingers of space.

(3) Start monitoring

Refer to P.75 "6-7 Start monitoring" to start monitoring.

Important

You cannot make an NIBP measurement unless the BP is being monitored.

(4) Measure NIBP

Place the cuff as high as the heart. Relax in a correct posture and measure the BP. The button for a single measurement is different from that of continuous measurement.

● **For a single measurement**

1. **Touch [NIBP] on the Bottom button or Menu screen.**

NIBP measurement starts and the cuff is pressurized with the pump.
Once the measurement is complete, Systolic BP, Diastolic BP, Mean BP, and Pulse rate are displayed on the NIBP monitoring value area. Once the BP value is determined, air in the cuff will be released rapidly.

Note

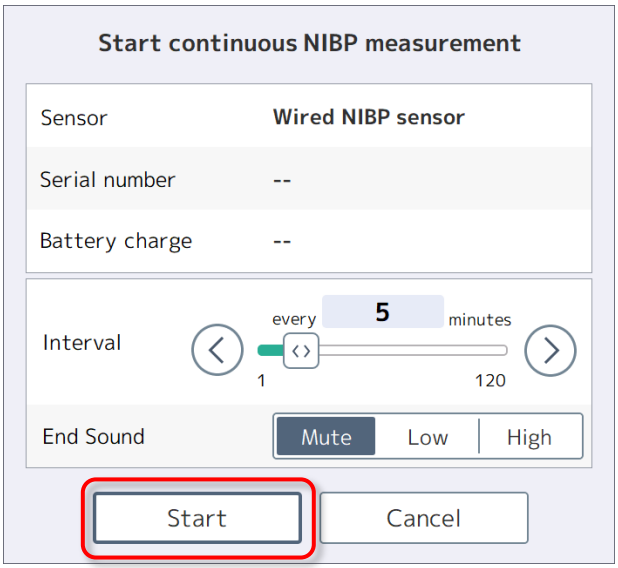
- To abort during monitoring, touch [NIBP] on the Bottom button or Menu screen again .
- When the measurement failed, an automatic re-measurement (up to 3 times) may take place depending on the cause.

● **For continuous measurement**

1. **Touch [NIBP Auto] on the Bottom button or Menu screen.**

The Start continuous NIBP screen is displayed.

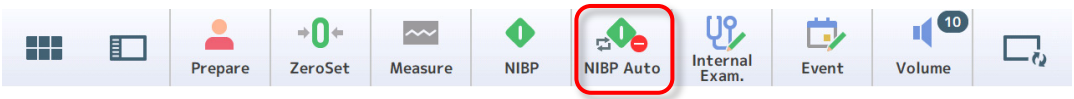
2. Change the Interval and End Sound as necessary and touch [Start].



Once NIBP Auto measurement starts, the cuff is pressurized with the pump.
Once the measurement is complete, Systolic BP, Diastolic BP, Mean BP, and Pulse rate are displayed on the NIBP monitoring value area. Once the BP value is determined, air in the cuff will be released rapidly.
Measurement starts again after a specified time has passed.

Note

Touch [NIBP Auto] on the Bottom button or Menu screen again when you want to exit continuous measurement.



6-5. Measuring maternal Arterial blood oxygen saturation (SpO_2)

MT-832-L / P

WARNING

	A SpO_2 disposable sensor is for single-use only. Do not reuse it. Failure to follow this instruction may cause infection due to contamination.
	Do not use an expired SpO_2 disposable sensor. Failure to follow this instruction may cause infection due to contamination.
	Be sure to refer to the Operation Manual to apply the SpO_2 sensor correctly. Incorrect application may cause damage to the skin.
	Do not use the SpO_2 sensor on the same area for a long time, and reposition the sensor at least every 8 hours. For patients whose bloodstream on the applied area of the SpO_2 sensor is poor, reposition the sensor at least every 2 hours. Failure to follow this instruction may cause damage to the skin, pressure necrosis of tissue, blood stasis, rash, or burn.
	Do not connect the SpO_2 sensor to anything other than the SpO_2 patient cable.
	Do not use the pulse oximeter to issue an alarm when a breathing abnormality is detected, such as arrested respiration during sleep. The pulse oximeter is a device to measure SpO_2 and PR.
	Do not use the pulse oximeter to detect an irregular heartbeat alternatively using M. ECG. The irregular heartbeat may not be detected as the PR measurement using the pulse oximeter is done with an optical detection of periphery bloodstream.
	Use the pulse oximeter as a device for early warning of oxygen saturation. Use a blood gas analyzer to check when SpO_2 is likely to be exposed to hypoxic conditions.
	Do not connect the SpO_2 sensor and the SpO_2 patient cable in wet locations.
	Do not immerse in liquid or wet the SpO_2 sensor and the SpO_2 patient cable.
	The SpO_2 value is experientially adjusted by a healthy adult volunteer's check.
	The SpO_2 disposable sensor for adults and reusable sensor for adults are intended for measuring adults of 30kg or more.
	Do not apply the SpO_2 sensor to a finger of the arm with the cuff of NIBP gauge or the catheter for invasive blood pressure monitoring applied. Failure to follow this instruction may cause an inaccurate monitoring value.
	Remove the SpO_2 sensor completely before the patient takes a bath.

	Note that a correct measurement of SpO_2 may be prevented when: • Excessive amounts of abnormal hemoglobin such as carboxyhemoglobin (COHb) and methemoglobin (MetHb), • the bilirubin level is high, • the CO2 level in the blood is extraordinary low, • the angiography agent is being administered, • chemicals with vasodilating effects are being administered, • a pigment is injected to blood, • CPR (cardiopulmonary resuscitation technique) treatment is in progress, • a cardiac arrest or shock is being experienced, • hypotonia, significant luminal narrowing, severe anemia, or hypothermia is being experienced, • measurement is made on limbs using an artery catheter and intra-aortic balloon • measurement is made on an area where venous pulsation is detected, • PR is slow, • low perfusion is identified, • blood circulation on the measured area is poor (hands or fingers are cold), • a body movement is detected, • a fingernail to monitor is manicured, • hand cream is applied or have dirty hand, or • measurement is made under strong light, including sunlight, surgical operation lamp, etc.

⚠ CAUTION

	A patient undergoing photodynamic therapy may be sensitive to light sources. The pulse oximeter can be used for a short time under clinical supervision as long as disturbances by the photodynamic therapy are minimized.
	When a faint pulse message is frequently displayed, find a more suitable monitoring position.
	Additional information unique to the Masimo sensor, including artery and low pulsation parameters/monitoring performance information is described in the sensor's User's Manual (DFU).
	The SpO_2 sensor and the SpO_2 patient cable should not be closer to other non-specified devices or stacked in use. If the device must be used in such a way, confirm the correct operation in the arrangement to be used.

The device has Masimo Corporation's pulse oximeter integrated. The device can monitor a reliable SpO_2 value and PR under such clinical conditions as patient's body movement or low pulsation. In addition, as the cable and the sensor have X-Cal™ technology, incorrect reading or unexpected patient's monitoring loss can be minimized.

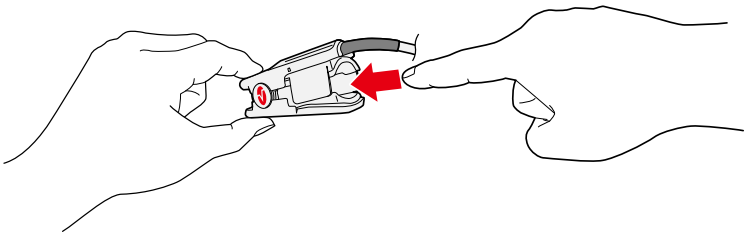
(1) Make settings

Make SpO_2 measurement settings. They include measurement settings and Alarm Settings.

- For the measurement settings, refer to P.139 “8-3-1-6 SpO2“.
- For Alarm Settings, refer to P.126 “7-3-5 SpO2“.

(2) Apply the SpO_2 sensor

Apply the SpO_2 sensor to a patient’s finger.
For the SpO_2 disposable sensor, refer to the Operation Manual provided with the device.
To use the SpO_2 reusable sensor (sold separately), apply the sensor to a finger as shown below. An alarm is triggered when the finger is removed from the SpO_2 sensor after the measurement has started. In that case, remove the sensor to stop the alarm.

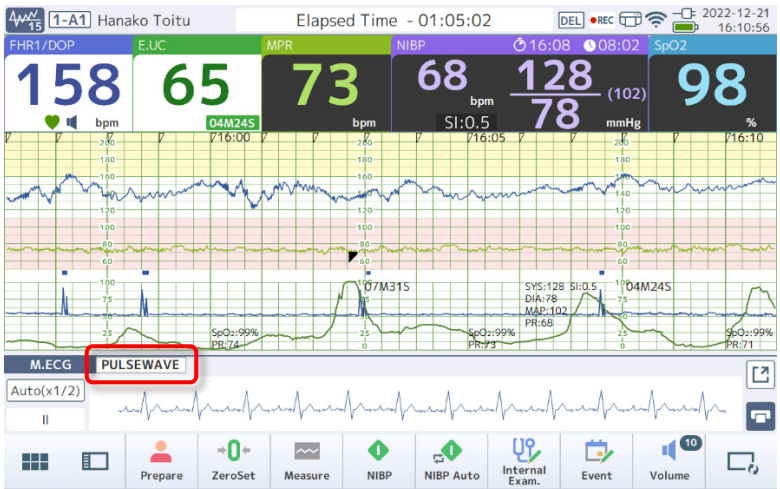


(3) Start monitoring

For stable monitoring, observe the signal strength of PULSEWAVE and the shape of the waveform to make sure that the waveform is good.
Refer to P.75 "6-7 Start monitoring" to start monitoring.

● Original waveform display of PULSEWAVE

1. **Touch on the status bar and select [15min (Original waveform)].**
   The original waveform of Maternal ECG is displayed.
2. **Touch [PULSEWAVE].**



The original waveform of PULSEWAVE is displayed.

Note

- Touch (Maximize) to maximize the original waveform.
- To print the original waveform, touch (Print) when a recorder (sold separately) is connected.

6-6. Monitoring the MHR with M.ECG Diagram Method

MT-832-L / P

⚠ WARNING

	The M.ECG electrode is for single-use only. Do not reuse it. Failure to follow this instruction may cause infection due to contamination.
	Do not use an expired M.ECG electrode. Failure to follow this instruction may cause infection due to contamination.
	Do not connect the clip electrode lead to anything other than the M.ECG adapter cable.

⚠ CAUTION

	Use an M.ECG electrode with a generic name that corresponds to "Single-use M.ECG electrode". Example: Product name "RED DOT Monitoring electrode" Registered No. "13B1X10109000192" Using parts other than those indicated may cause irritated skin or allergy due to prolonged exposure to the part.
	Do not use the M.ECG electrode on the same area for a prolonged time. Failure to follow this instruction may cause such abnormalities as a rash on the area.
	Do not use the M.ECG electrode on cut or irritated skin. Failure to follow this instruction may worsen the condition.

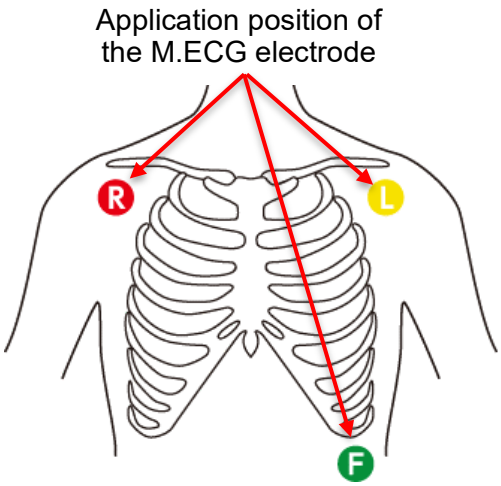
(1) Make settings

Make the maternal heart rate measurement settings. They include measurement settings and Alarm Settings.

- For the measurement settings, refer to P.137 “8-3-1-4 M.ECG“.
- For Alarm Settings, refer to P.124 “7-3-3 M.HR / M.PR“.

(2) Decide on the position

1. **Clean the area on which the M.ECG electrode is applied with alcohol or mild soap water.**
2. **Affix the M.ECG electrode on the chest as shown in the figure.**
3. **Connect the clip of the clip electrode lead (R: Red) (F: Green) (L: Yellow) to the M.ECG electrode respectively according to the letters shown on the M.ECG adapter cable.**



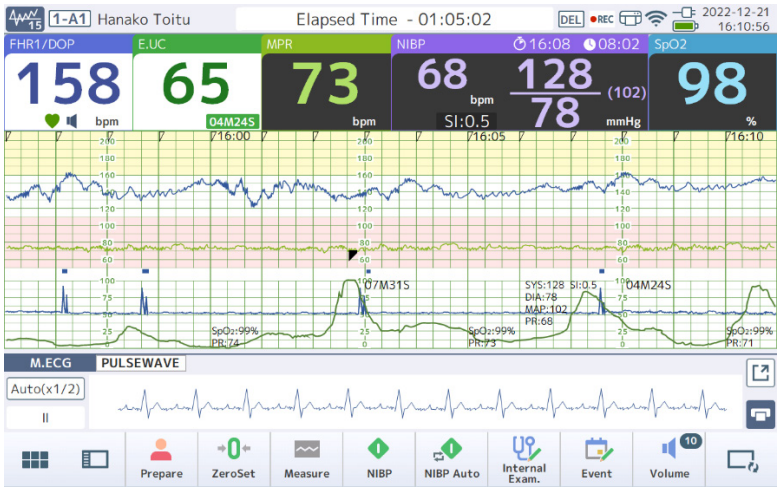
4. **When the MHR is displayed on the monitoring area, check if the MHR is shown correctly.**

(3) Start monitoring

Refer to P.75 "6-7 Start monitoring" to start monitoring.

● **Original waveform display of the Maternal ECG**

1. **Touch 15 on the status bar and select [15min (Original waveform)].**
   The original waveform of the Maternal ECG is displayed.



Note

- Touch (Maximize) to maximize the original waveform.
- To print the original waveform, touch (Print) when a recorder (sold separately) is connected.

6-7. Start monitoring

Once each sensor has been applied corretly, select Measure Mode to start monitoring.
If you set to start monitoring once the device has been turned ON in the Admin Settings, monitoring starts without having to perform Start operations (refer to P.150 “8-5-3-1 Power-on/off“).
The device has three Measure Modes; NST, Delivery, and Maternal and the differences between the modes is shown below:
The Measure Mode currently selected is shown on the status bar.

Function	NST Mode	Delivery Mode	Maternal Monitoring Mode
Fetal monitoring	Yes	Yes	No
Fetal alarm	On	On	Off
Display	Waveform	Waveform	Maternal Vital list *

* Waveform can be displayed even in Maternal monitoring Mode.

Important

The monitoring data will be sent to the central monitor and saved in the internal memory only during the period from the start to the end of monitoring.
To start monitoring of a new patient, be sure to check if the Alarm Settings are appropriate.
In addition, adjust the Alarm Settings to appropriate values based on the patient’s status during monitoring.

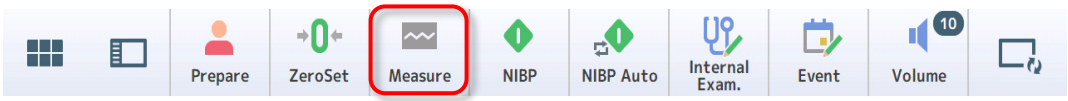
Note

- To start the NIBP measurement, refer to P.63 “6-4 Measuring maternal Non-Invasive Blood Pressure (NIBP)“.
- If you set to start monitoring automatically once HR has been detected in the Admin Settings, monitoring starts automatically once a stable fetal heart rate has been measured (refer to P.150 “8-5-3-1 Power-on/off“).

6-7-1. Select Measure Mode to start monitoring

Check Measure Mode and measurement conditions to start monitoring. Printing and monitoring are available at the same time if NIBP Auto measurement is enabled, or a recorder (sold separately) is connected.
Once the Measurement time has been set, the measurement will end automatically after the specified time has elapsed.
As well as the method shown below, you can also touch [Measure] on the Prepare screen to start monitoring.

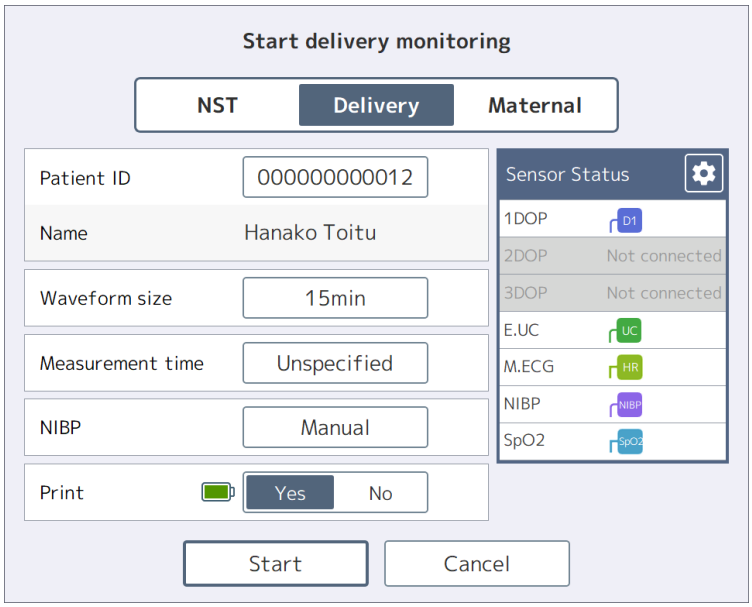
1. **Touch [Measure] on the Bottom button or Menu screen.**



The Start confirmation screen is displayed and the current measurement conditions are shown.
The displayed screen differs depending on the Measure Mode.

2. Change the Measure Mode and measurement conditions as necessary and check the sensor status.

Delivery Mode



Note

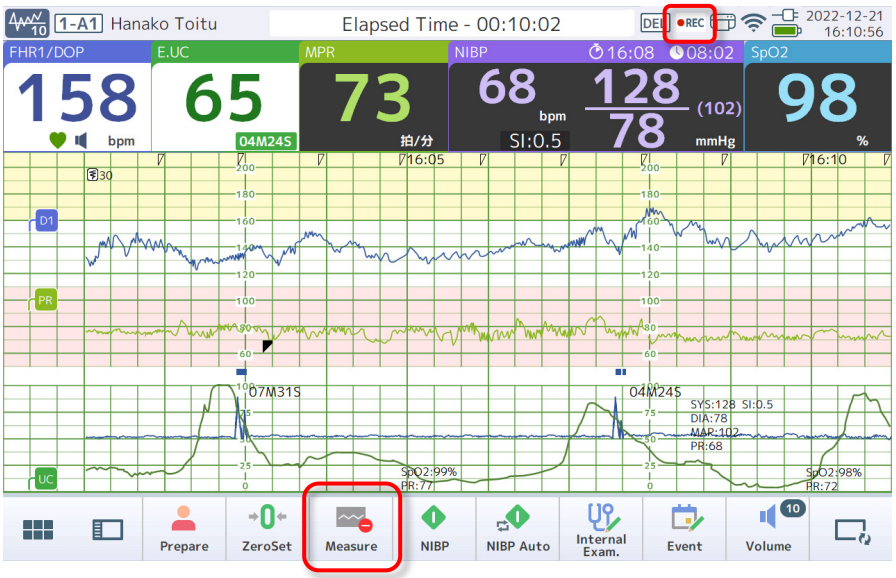
- Switch the Measure Mode using the above tab ([NST]/[Delivery]/[Maternal]).
- It is possible to start the monitoring without showing the confirmation screen by configuring the Admin Settings.
- You can change the initial value for each Measure Mode from the Admin Settings (refer to P.151 "8-5-3-2 Measure Mode").

Settings Item	Function	Default Value
Measure Mode	Switches the Measure Mode (NST/Delivery/Maternal). * You can change the initial value for Measure Mode from the Admin Settings (refer to P.150 "8-5-3-1 Power-on/off").	Delivery
Patient ID	Displays the patient ID (refer to P.55 "6-1 Registering Patient Information").	–
Name	Displays the name of the patient.	–
Waveform size	Displays and switches the waveform size to display (10min/15min/40min/FULL SIZE/Number) (Refer to P.28 “4-2-3 Waveform Area").	• NST: 10min • DEL: 15min • MAT: 15min
Measurement time	Displays and changes the measurement time (refer to “■Specify the measurement time” below).	• NST: 20min • DEL: Unspecified • MAT: Unspecified
NIBP	Displays and changes the NIBP measurement mode (Manual/Auto) and Interval and End Sound.	• NST: Manual • DEL: Manual

Settings Item	Function	Default Value
	∗ Not displayed when NIBP is set to “Off” in the Admin Settings (refer to P.164 “8-5-7 Sensor“).	• MAT: Auto
Print	Displays and changes whether printing is required when a recorder (sold separately) is connected. If Print is set to "On", the CTG data from the start of monitoring will be printed at high speed even if a recorder is connected later. However, the limit is 2 hours; if it exceeds 2 hours, only the CTG data for the last 2 hours will be printed at high speed. ∗ Not displayed when Print is set to “Off” in the Admin Settings (refer to P.167 “8-5-9-1 Print1“).	• NST: Yes • DEL: Yes • MAT: No
Sensor Status	Displays the connected sensors along with their connection status, battery level, and communication status. Touch  to select a sensor independently. ∗ Selecting a sensor is also available on the Menu screen (refer to P.140 "8-3-2 Select Sensor").	
Start	Starts monitoring.	
Cancel	Cancels monitoring.	

3. Touch [Measure].

Monitoring starts and the Monitoring screen is displayed.
The Measuring icon is displayed on the status bar.
If Print is set to “On” in the condition settings, printing starts when the measurement started.



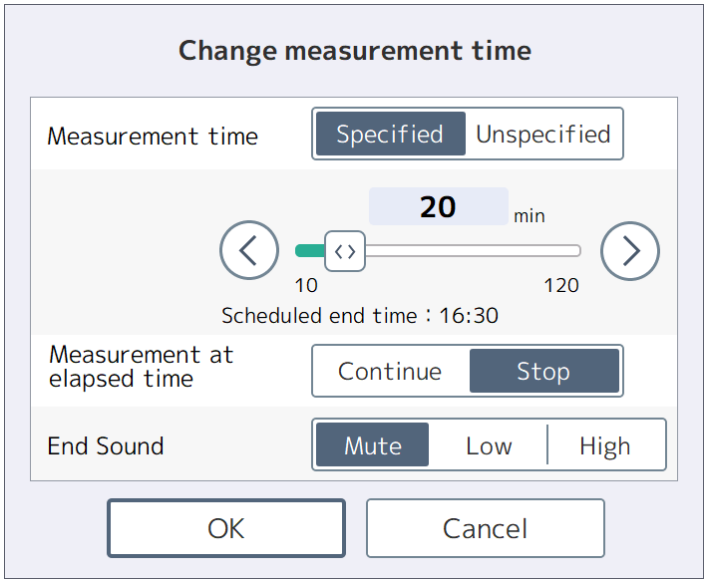
Note

- Pressing and holding the waveform area allows you to view the historical data being measured (refer to P.97 “6-16 Display the Stored Data“).
- When a recorder (sold separately) is connected, even if Print is set to “No” on the Start screen, touching [Print] on the Menu screen allows you to start printing when you want.

■ Specify the measurement time

Once the Measurement time has been specified, you can end the measurement automatically or emit an End Sound after the specified time has elapsed.

1. **Touch the “Measurement time” area on the Start screen.**
   The Change measurement time screen is displayed.
2. **Touch [Specified] to specify after how many minutes the measurement should end.**
   Touch ‹ › or slide ‹› to specify a value.



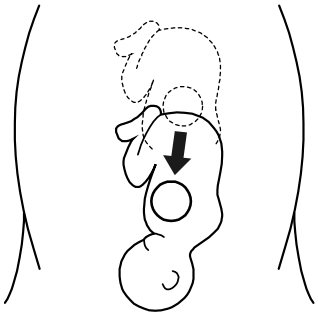
3. **Set the operation after the specified time has elapsed.**
   If “Measurement at elapsed time” is set to “Stop”, the measurement ends automatically after the specified time has elapsed. If it is set to “Continue”, you can emit an End Sound without terminating the measurement.
4. **Touch [OK].**
   The measurement time is changed and displayed on the Start screen.

6-7-2. Move the position of the Doppler transducer

WARNING

	Move the Doppler transducer to the position (optimal position) that provides clear, rhythmic sounds (sounds of heart wall and valves) in response to the fetal movement. Failure to do so may cause a misdiagnosis.

Adjust the Doppler transducer in response to the fetal movement.
Especially, when measuring multiple fetuses, periodically check the Home screen and printed recording paper, and if [!] is displayed (printed), be sure to reposition the Doppler transducer.



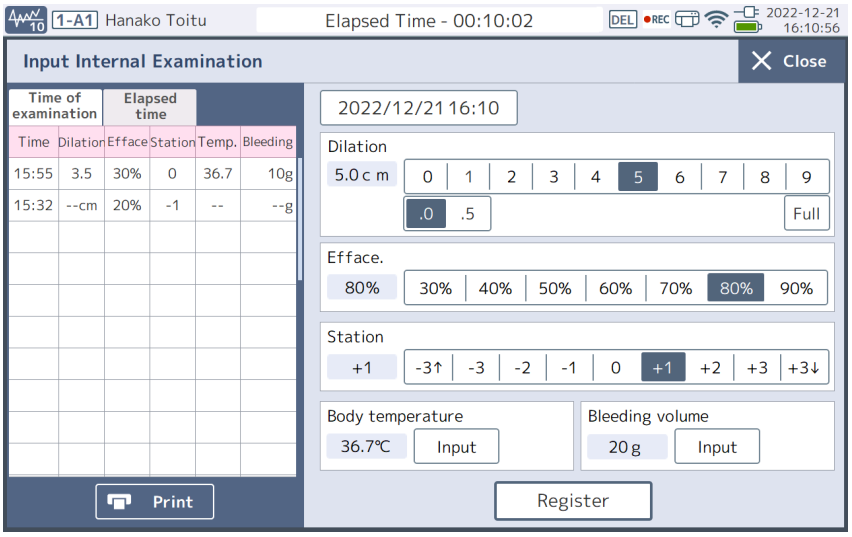
6-8. Registering an Internal Examination

You can register the level of internal examination for each item.

1. **Touch [Internal Exam.] on the Bottom button or Menu screen.**

The Internal Exam. screen is displayed. The registration history for this measurement is displayed on the left pane.

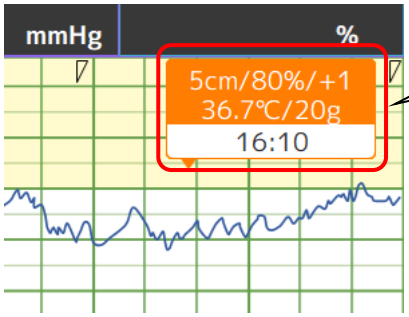
2. **Select a single level for each item.**
Select a single level for “Dilation”, “Effacement”, and “Station”.
For “Body temperature” and “Bleeding volume”, touch [Input], enter a number with the keypad, and then touch [OK].
You do not have to enter all items to complete the registration.

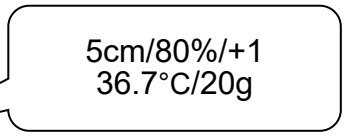


Note

- To change the date and time, touch the date/time area at the top of the screen.
- The internal examination registration history for this measurement is listed in the left pane. To print the list, touch [Print] when a recorder (sold separately) is connected (refer to “■Print the internal examination list”).
  However, printing is not available during CTG printing. End CTG printing before printing.
- The registration history list can also be displayed as a side window along with the waveform (refer to P.33 “4-2-5 Side Window“).
- Touching each history in the registration history list allows you to change the date of the internal examination or delete the history.

3. **Touch [Internal Exam.].**
   The internal examination will be registered and displayed on the Home screen.





Displayed in the form of “A cm/B %/C/D °C/E g”.
A: Dilation
B: Effacement C: Station
D: Body temp. E: Bleeding

Important

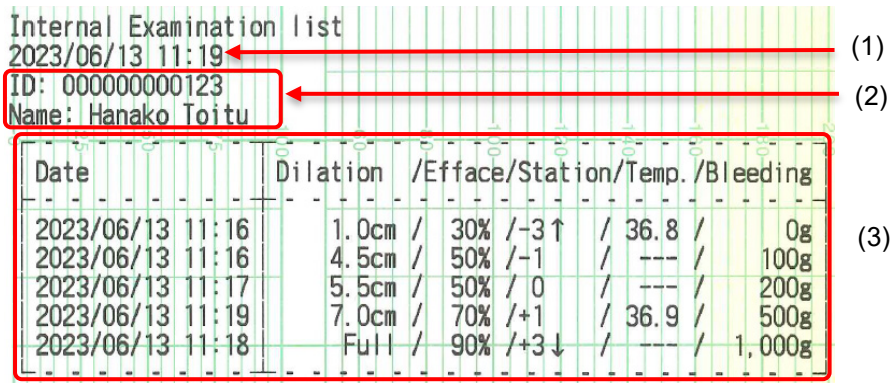
Internal examinations are not sent to the Central monitor (OBIS).

Note

Touch [Close] to cancel the Internal Exam.

■ Print the internal examination list

Touch [Print] to print a list of input times and details of each internal examination when a recorder (sold separately) is connected. Up to 500 entries of the internal examination will be printed.



No.	Settings Item	Function
(1)	Printout date/time	Prints out the date and time on which the list was printed.
(2)	Patient information	Prints out the patient ID and the patient name.
(3)	Internal Examination	Prints out the date of occurrence and details of the internal examination.

6-9. Recording an Event

Record the time at which an event such as FUI.D, RUP.M, or F.DEL occurred and activate the Apgar Timer when the F.DEL event occurred.

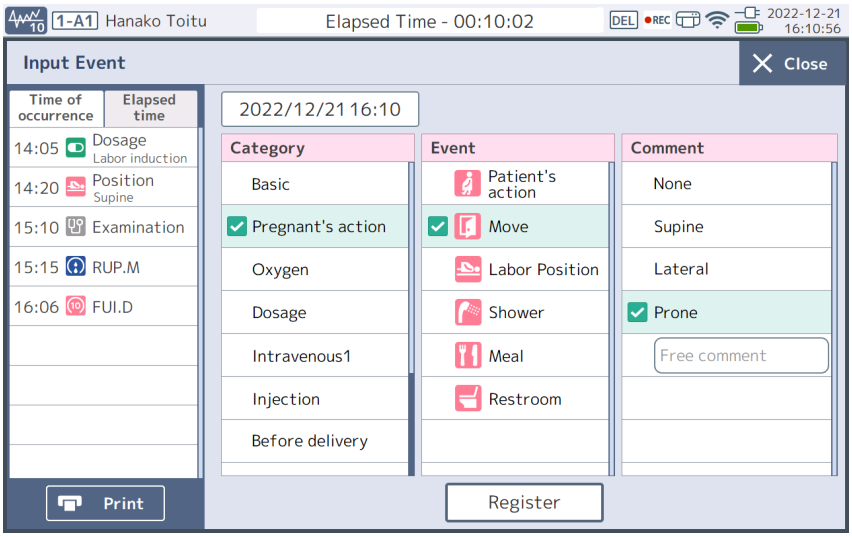
Note

You can show or hide an event for each category from the Admin Settings (refer to P.156 "8-5-4 Clinical Set").

1. **Touch [Event] on the Bottom button or Menu screen.**

The Event screen is displayed. The registration history for this measurement is displayed in the left pane.

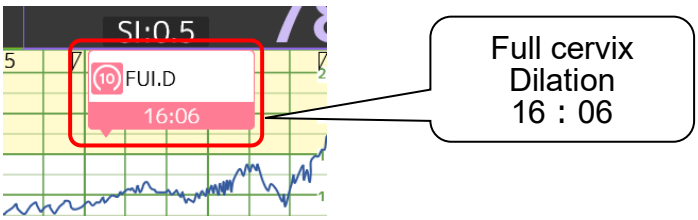
2. **Select an event in the order of "Category", "Event", and "Comment".**
Touch Free comment area under "Comment" to show the keypad. Enter comments and touch [↵] (Enter) key.



Note

- To change the date and time, touch the date/time area at the top of the screen.
- The event registration history for this measurement is listed in the left pane. To print the list, touch [Print] when a recorder (sold separately) is connected (refer to "■Print the event list"). However, printing is not available during CTG printing. End CTG printing before printing.
- The registration history list can also be displayed as a side window along with the waveform (refer to P.33 "4-2-5 Side Window").
- Touching each history in the registration history list allows you to change the date and time or delete the history.

3. **Touch [Event].**
   The event will be registered and displayed on the Home screen.



Important

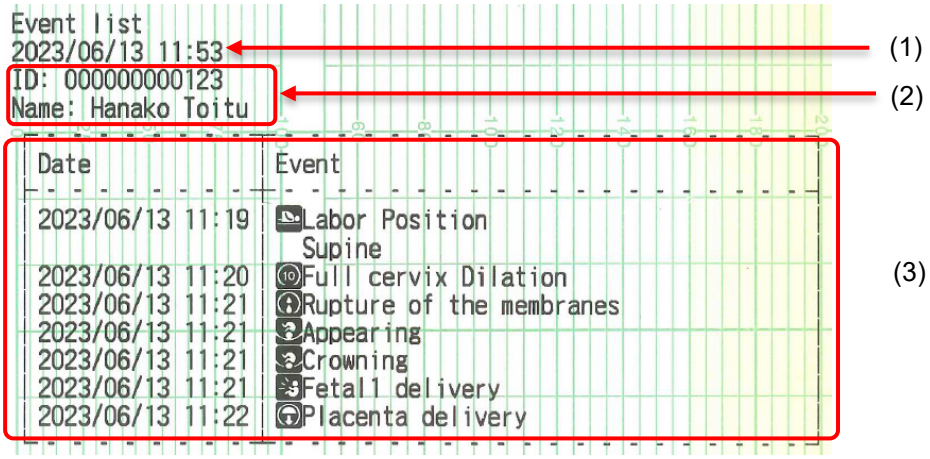
Events are not sent to the Central monitor (OBIS).

Note

- Touch [Close] to cancel the Event.
- If “F.DEL” is selected, when the Apgar Timer is set to “On”, a timer tone rings after the time preset on the timer is reached (refer to P.84 “6-10 Inputting the Apgar Score“).
- You can allocate “F.DEL1”, “F.DEL2”, “F.DEL3”, or “Placenta DEL.” on the Bottom button to input an event from the Bottom button from the Admin Settings (refer to P.159 “8-5-5-2 Bottom Button“).

■ Print the event list

Touch [Print] to print a list of input time and details of each event when a recorder (sold separately) is connected. Up to 500 entries will be printed.



No.	Settings Item	Function
(1)	Printout date/time	Prints out the date and time on which the list was printed.
(2)	Patient information	Prints out the patient ID and the patient’s name.
(3)	Event	Prints out the date of occurrence of the event and the event name.

6-10. Inputting the Apgar Score

When the Apgar Timer is set to “On”, select [F.DEL] on the Event screen to activate the Apgar Timer and record the fetal delivery time. Once the timer tone rings at the preset time, enter the Apgar Score.

Important

Data in the Apgar Score will not be sent to the Central monitor (OBIS).

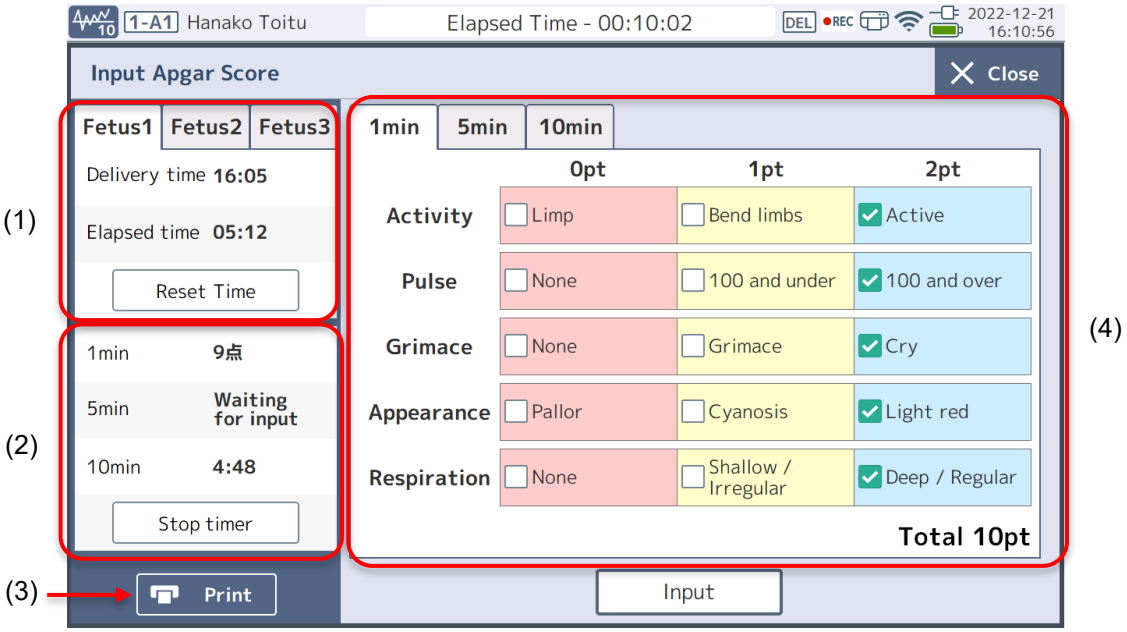
Note

You can set On/Off of the Apgar Timer as well as the timer time and timer tone from the Admin Settings (refer to P.157 “8-5-4-2 Apgar Timer“).

1. **Touch [Apgar Score] on the Bottom button or Menu screen.**

The Input Apgar Score screen is displayed.

2. **Touch and check the relevant items for each elapsed time.**



No.	Settings Item	Function
(1)	Delivery information	Displays the fetal delivery time and elapsed time for each fetus (1st./2nd./3rd.) ("-" is displayed before delivery). The timer tone rings after a preset time has passed. The [F.DEL] button is displayed before delivery and the [Reset Time] button is displayed after delivery. • [FetalX delivery]: Records the fetal delivery time and starts the timer. • [Reset Time]: Resets the delivery time.
(2)	Apgar Score	Displays the Apgar Score registered for each timer. Displays "Waiting for input" and "x:xx remaining (time)" before the time preset on the timer is reached. To stop the Apgar Timer from counting, touch [Stop timer].
(3)	Print	Prints a list of delivery information and the Apgar Score when a recorder (sold separately) is connected. However, printing is not available during CTG printing. End CTG printing before printing.
(4)	Input	Check neonatal information for each timer. The score is totalized at the bottom right depending on the selected items.

Note

The delivery information and each Apgar Score can also be displayed as a side window along with the waveform (refer to P.33 "4-2-5 Side Window").

3. Touch [Input].

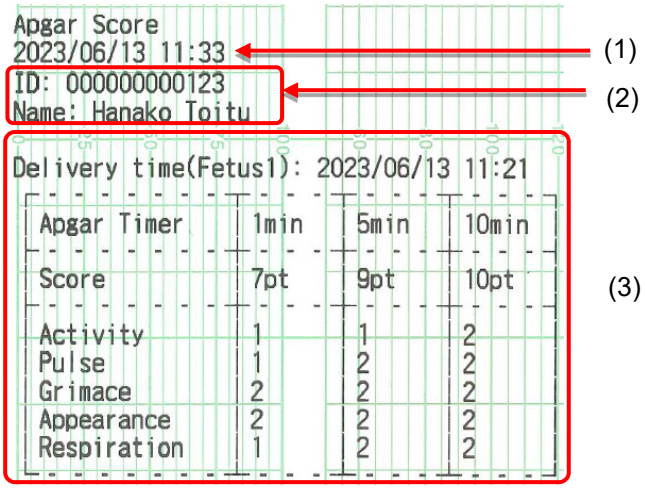
The Apgar Score is registered.

Note

Touch [Close] to cancel the Apgar Timer input.

■ Print the Apgar Score list

Touching [Print] prints out a list of delivery information and the Apgar Score when a recorder (sold separately) is connected. The score for the number of fetuses will be printed.



No.	Settings Item	Function
(1)	Printout date/time	Prints out the date and time on which the list was printed.
(2)	Patient information	Prints out the patient ID and the patient's name.
(3)	Score	Prints out the score for each time.

6-11. Switch to Maternal Monitoring Mode

After all fetuses have been delivered, switching to Maternal monitoring Mode suppresses an alarm or navigates to a screen specialized for Maternal Vitals. To switch to Maternal monitoring Mode during monitoring, touch (mode selection) button on top of the main unit or [M.Monitor] on the Bottom button or Menu screen.

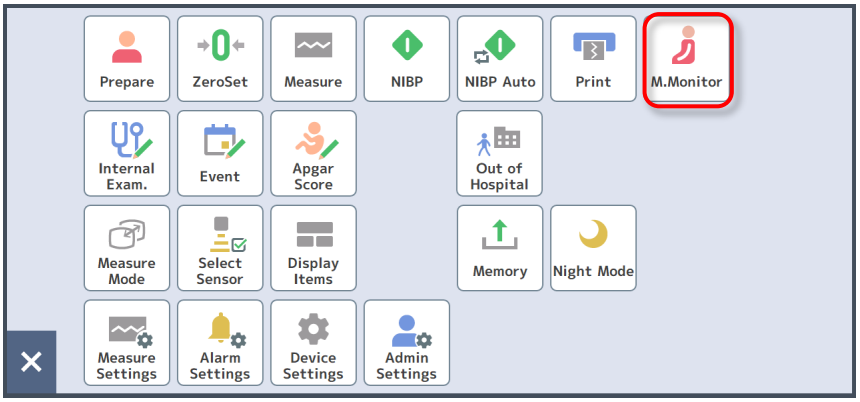
Important

In Maternal monitoring Mode Switch, the alarm of the relevant fetus will stop.

Note

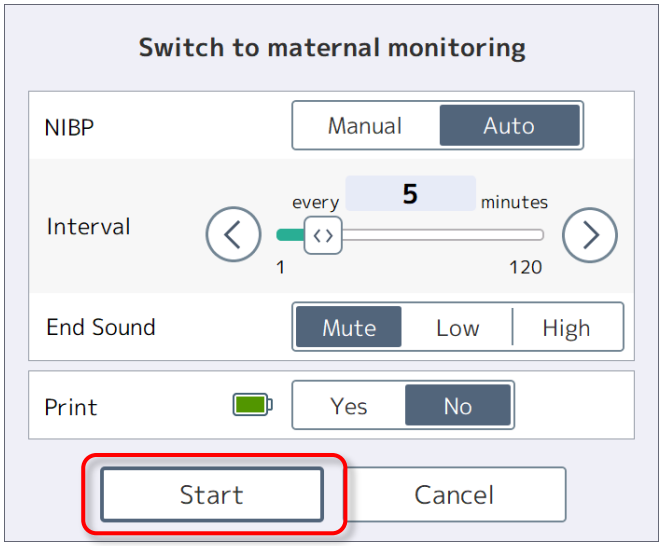
After F.DEL events for all fetuses are registered, the Maternal monitoring Mode entry confirmation screen is displayed.

1. **Touch (mode selection) button on top of the main unit or [M.Monitor] on the Bottom button or Menu screen.**

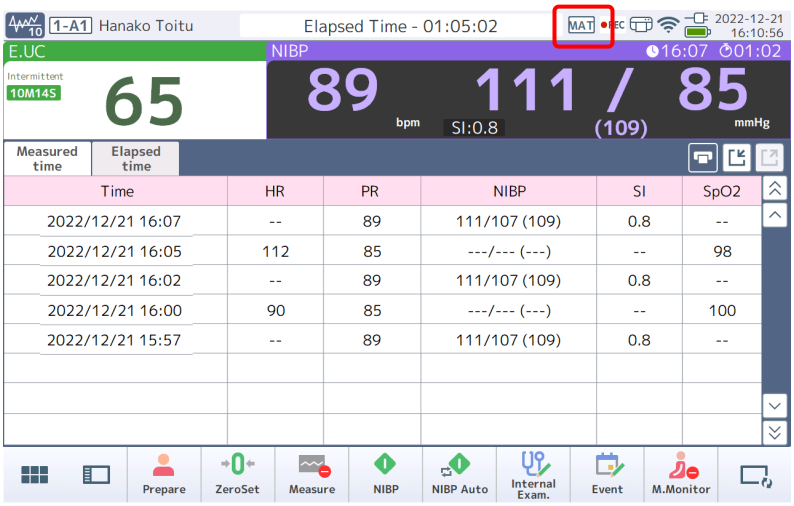


The M.Monitor confirmation screen is displayed.

2. **Specify measurement conditions and touch [Start].**
For the measurement conditions, refer to P.75 “6-7-1 Select Measure Mode to start monitoring“.



The screen switches to Maternal monitoring Mode, the Maternal Vitals list is shown on the Home screen, and “MAT” is shown on the status bar.



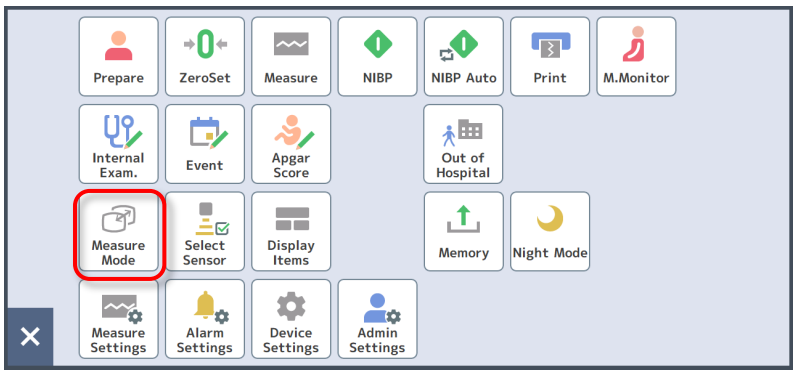
Note

When CTG printing is active, starting Maternal monitoring Mode stops printing automatically. You can also set not to stop printing automatically (refer to P.167 “8-5-9 Print“).

6-12. Changing the Measure Mode

The measurement mode and measurement conditions can be changed or set using the menu or (mode selection) at the top of the main body in addition to the measurement start screen.

1. **Touch [Measure Mode] on the Menu screen.**
   Press (mode selection) button on top of the main unit to change the mode after measurement started.

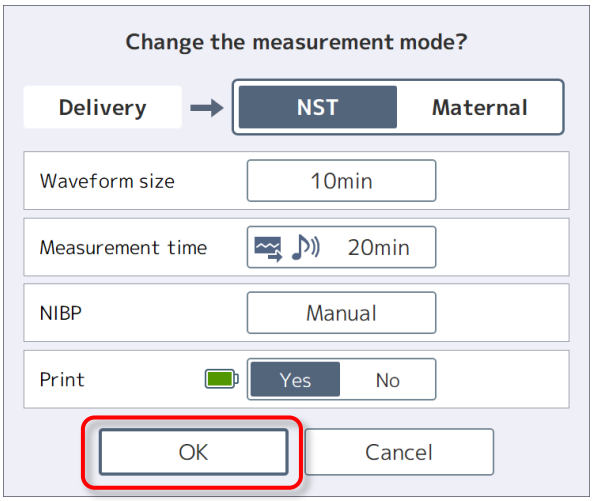


The Measure Mode selection screen is displayed.

Note

Touching (mode selection) button or [M.Monitor] in Delivery mode displays the Maternal monitoring Mode entry screen (refer to Step 2 in P.87 “6-11 Switch to Maternal Monitoring Mode“).

2. **Touch the Measure Mode you want to change, select Waveform size, Measurement time, NIBP sensor, and set Print, and then touch [OK].**



For each measurement condition, refer to P.75 “6-7-1 Select Measure Mode to start monitoring“.

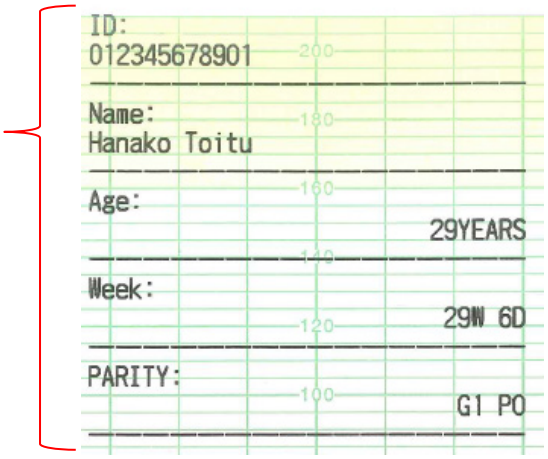
6-13. Printing the Monitoring Data

You can print data being measured when a recorder (sold separately) is connected.
For the details of the recorder, refer to "Recorder Unit MP-130 Operation Manual".

6-13-1. Print a Top Sheet

The information shown below is printed as a top sheet when printing starts.
You can also change the settings to skip the top sheet from the Admin Settings (refer to P.167 ”8-5-9 Print“).

Patient information
Patient data is printed by entering the ID when the device is connected to our Central monitor.



6-13-2. Print item name

For a single/twins

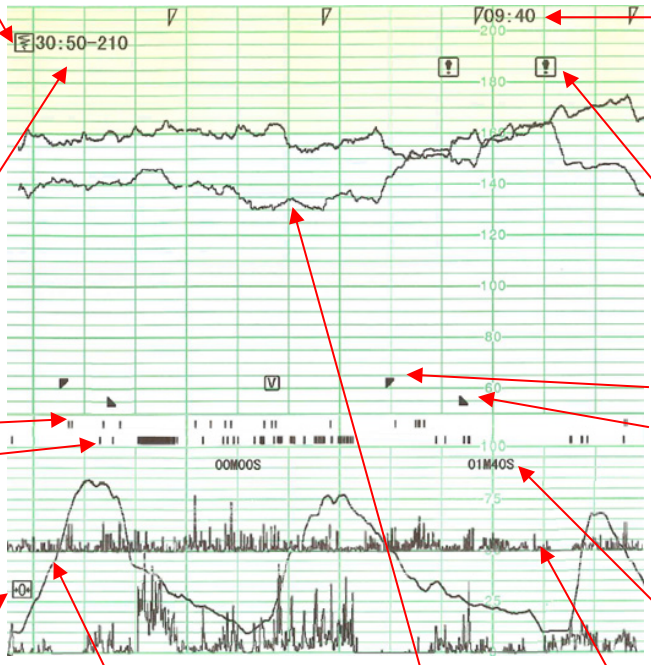
Date and time
Prints the start time of printing.
The date is not printed during monitoring.

Print mode
Print items are printed depending on the accessories used or the selected settings. These are also printed when the print conditions are changed during monitoring.

For three fetuses

Print Item Name	Description
FHR1	Printed when Doppler transducer for Fetus 1 HR monitoring is connected. In the case of double Doppler single heart, [FHR[SH]] is printed.
FHR2 -20	Printed when Doppler transducer for Fetus 2 HR monitoring is connected. (Printing example when offset “-20” is selected in the settings) * You can select the offset (-20/±0/+20) from the Admin Settings (refer to P.153 "8-5-3-4 Waveform").
FHR3 +20	Printed when Doppler transducer for Fetus 3 HR monitoring is connected. (Printing example when offset “+20” is selected in the settings) * You can select the offset (-20/±0/+20) from the Admin Settings (refer to P.153 "8-5-3-4 Waveform").
MHR	Printed when the M.ECG adapter cable is connected.
MPR	Printed when the SpO_2 sensor is connected and Maternal pulse rate is shown as a waveform.
SpO2	Printed when the SpO_2 sensor is connected and SpO_2 is shown as a waveform.
Right marker	Prints the right marker in “6-13-3 Sample CTG Print“ when the right remote marker switch (twins) was operated.
Left marker	Prints the left marker in “6-13-3 Sample CTG Print“ when the left remote marker switch (twins) was operated.
ACT	Prints the fetal movement dot of Fetus 1/Fetus 2/Fetus 3 (FHR1/FHR2/FHR3).
FM Spike	Prints the fetal movement spike waveform of Fetus 1/Fetus 2/Fetus 3 (FHR1/FHR2/FHR3).
UC	Prints when the Y-shaped Doppler/External UC transducer is connected or the External UC transducer is connected. Prints [UC[Hi]] when UC is set to High.

6-13-3. Sample CTG Print



Paper feed speed
Printed at the start of printing and when the setting is changed.

Recording Range
Printed at the start of the printing.

Time
Prints hours/minutes every 5 minutes and ▼ for every minute

Heart beat monitoring error
Printed when the two fetal heart rates are close to each other.

Right marker
Left marker
Printed when the remote marker switch was pressed.

1 dot
2 dots
Printed when the fetal movement exceeds the preset fetal movement

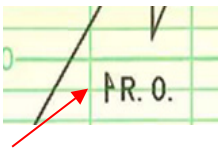
Contraction cycle
Prints minute (M) and second (S) for each cycle

ZeroSet
Printed when the contraction is set to zero while monitoring.

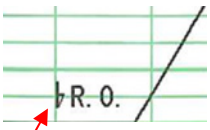
UC waveform

Heart rate waveform

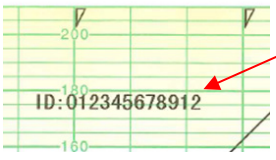
Fetal movement spike waveform
Printed when enabled in the settings.



↑ R.O. symbol
Printed when the heart rate is higher than the range of the recording paper

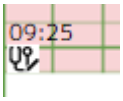


↓ R.O. symbol
Printed when the heart rate is lower than the range of the recording paper

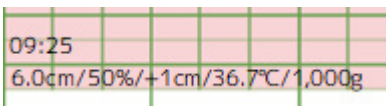


Patient ID
Printed when the patient ID was changed while printing

Internal Examination
Printed when an internal examination was entered

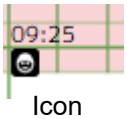


Icon

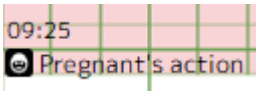


Detail

Event
Printed when an event was entered



Icon



Detail

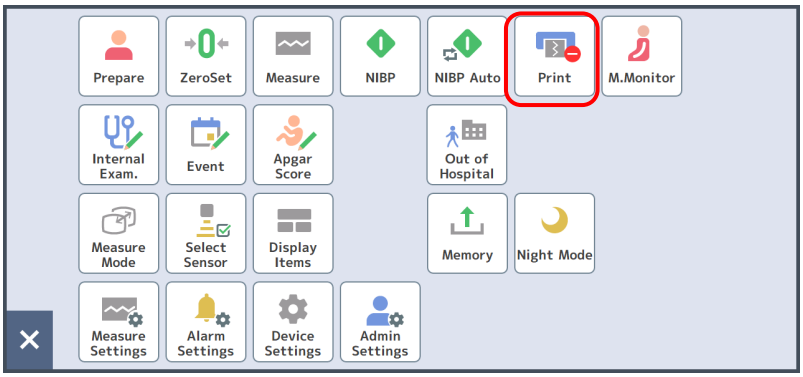
6-13-4. Print the fetal movement mark

Ask the patient wearing this device to press the remote marker switch when she recognizes a fetal movement. A mark is printed when the switch is pressed. Use the left and right switches when using a switch for twins.

6-13-5. Stop printing

Once measurement is complete, printing ends; however, you can perform the operation shown below to end printing when you want.

1. **Touch [Print] on the Menu screen.**



When “Auto Feed” is set to “On” in the Admin Settings, paper will be fed to the start of the next page, and then printing stops (refer to P.167 “8-5-9-1 Print1“).

2. **Lightly hold the top of the folding line of the recording paper, and then cut the paper downward.**

6-14. Suspending/Resuming Measurement

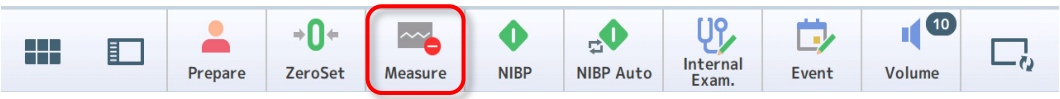
You can suspend or resume measuring during monitoring.

6-14-1. Suspend Measurement

Follow the operation below to suspend measurement. Saving CTG data also stops while measuring is suspended.
The following list shows functions that stop and do not stop during suspension:

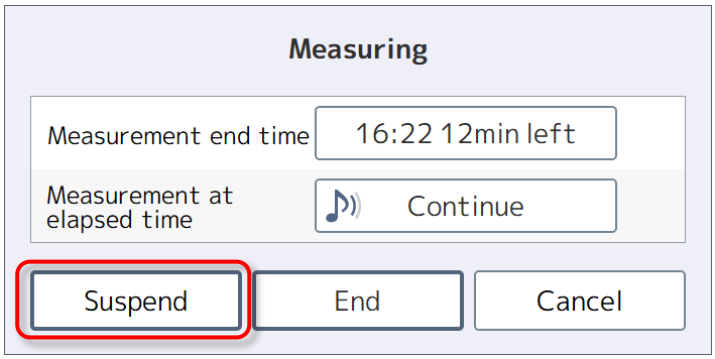
Functions that stop during suspension	Functions that do not stop during suspension
• CTG recording • Counting measurement time • Judging an alarm resulting from a sensor • NIBP measurement • Input Internal Examination • Event	• Monitor sound • Updating a monitoring value from a sensor • Judging an alarm not resulting from a sensor • Apgar Timer/Input * Other functions not listed do not stop

1. **Touch [Measure] on the Bottom button or Menu screen.**



The Measuring screen is displayed.

2. **Touch [Suspend].**



The measurement is suspended.

Note

Touch [End] to end the measurement completely.

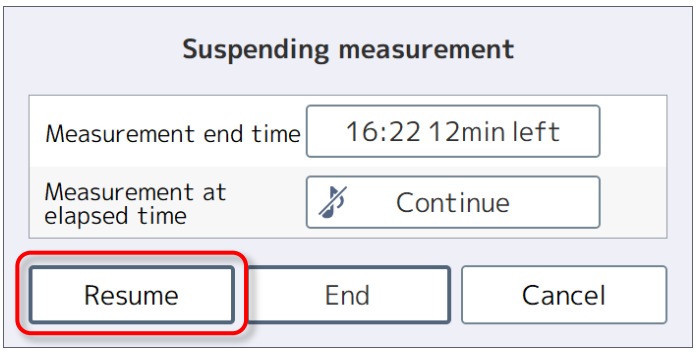
6-14-2. Resume Measurement

Follow the operation below to resume suspended measurement. Once the measurement has resumed, saving CTG data will also resume.

1. **Touch [Measure] on the Bottom button or Menu screen.**

The Suspending measurement screen is displayed.

2. **Touch [Resume].**



The measurement will resume.

Note

Touch [End] to end the measurement completely.

6-15. Stopping Monitoring

Follow the operation below to stop measurement. Saving CTG data stops after the measurement is complete, and no data will be sent to our Central monitor.
In addition, you can stop measuring automatically after the specified time has elapsed by setting the measurement time (refer to P.75 “6-7-1 Select Measure Mode to start monitoring").

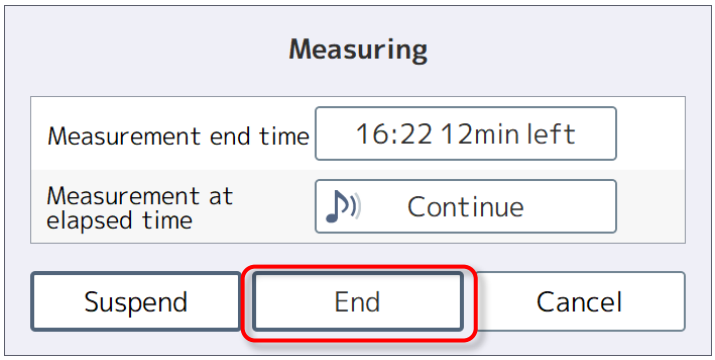
(1) Stop Monitoring

Stop measuring if it is currently active.

1. **Touch [Measure] on the Bottom button or Menu screen.**

The Measuring screen is displayed.

2. **Touch [End].**



The measurement will end.

Note

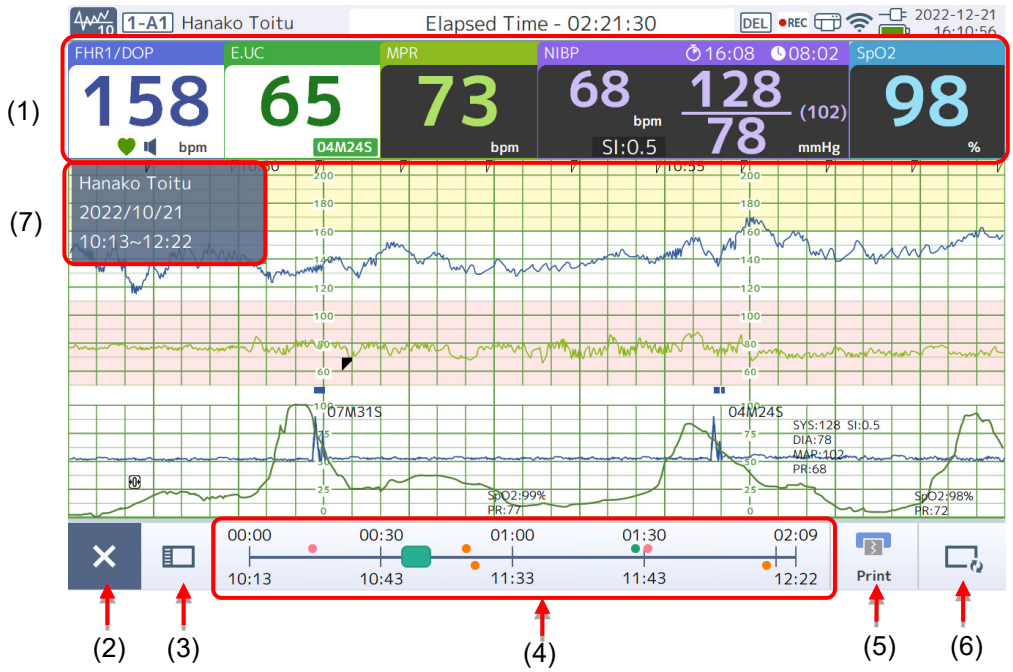
Touch [Suspend] to stop the measurement temporarily.

6-16. Display the Stored Data

The monitoring data for the last 72 hours is stored in the built-in memory and can be displayed or printed out on the recording paper and backed up to a USB memory.
Old data exceeding 72 hours is automatically deleted in chronological order. Back up necessary data before going over 72 hours.

6-16-1. History Screen

Press and hold the waveform area to display stored data during monitoring. To display the stored data for which measurement has been completed, refer to P.98 “6-16-2 View the Stored Data“.
If you want to see the waveforms hidden by the reference data information window (see (7) below), touch the window to move it to the upper right. Touch the window again to return it to its original position (upper left).



No.	Settings Item	Function
(1)	Monitoring value	Displays the value currently acquired from the sensor, not the stored data.
(2)	Close	Exits the stored data display and returns to the current Home screen.
(3)	Side window	Displays information on stored data in the side window. The following information is available for display on the History screen: • Internal Examination list • Event list • Maternal Vitals list • Apgar Score

No.	Settings Item	Function
(4)	Slider	Displays the elapsed time above the bar and time under the bar. The green knob shows the time zone being referenced. Touch on the slide bar or slide the knob to change the time zone. A dot above the bar indicates the time of occurrence of an event while a dot under the bar indicates the time when an internal examination was made.
(5)	Print	Starts printing CTG data from the time displayed on the screen when a recorder (sold separately) is connected.
(6)	Information display	Displays information on the sensor status, events, and internal examination on the screen. With every single touch of the button, the icon changes from "Show only icon" → "Show details" → "Nothing shown" in this sequence.
(7)	Reference data information	Displays the patient's name and time of stored data being referenced.

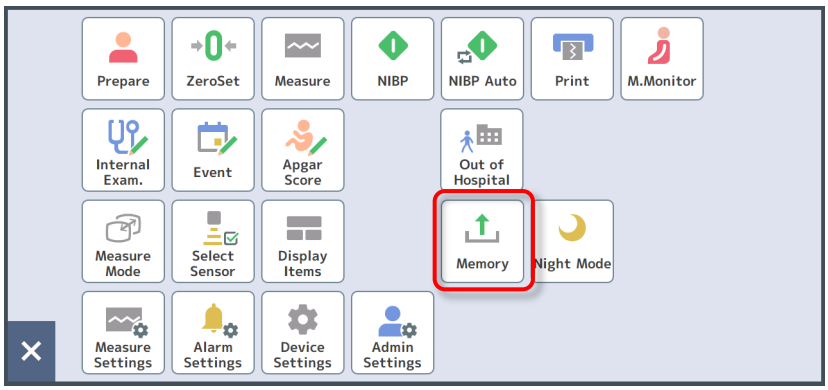
6-16-2. View the Stored Data

Stored data for which measurement has been completed is shown on the Home screen.

Note

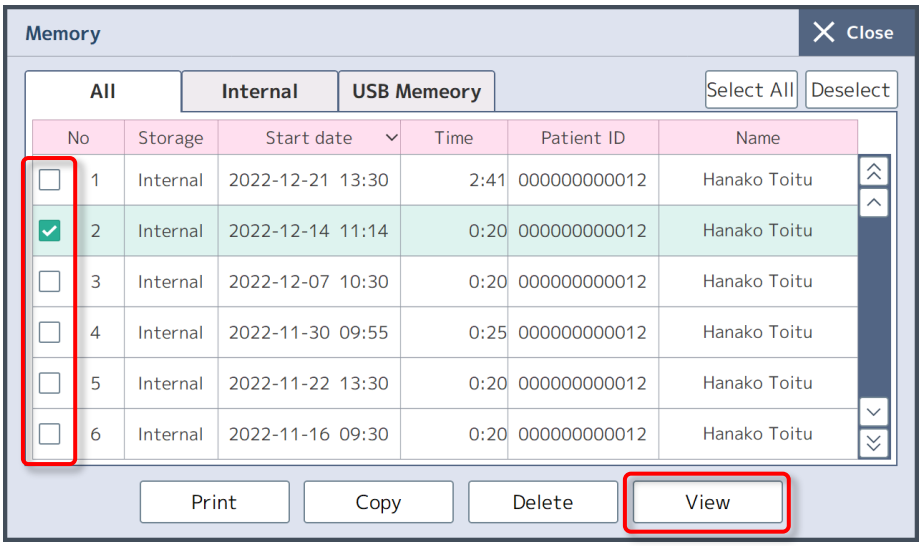
Press and hold the waveform area to display stored data being measured.

1. **Touch [Memory] on the Menu screen.**



Previous measurement data will be displayed.

2. **Select the measurement data you want to display and touch [View].**

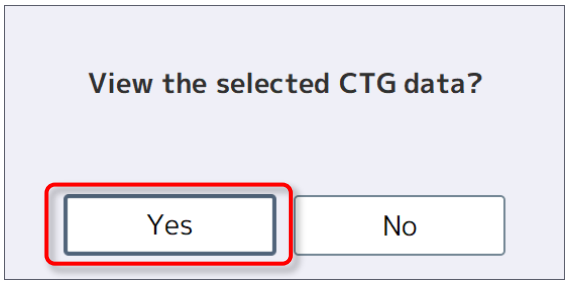


Note

- Use the top tab to switch between [Internal] and [USB Memory] to show data in the respective storage.
- Touch ^ or v to switch to the previous or next page.
- Touch ^^ or vv to switch to the first or last page.

A confirmation screen is displayed.

3. **Touch [Yes].**



The selected stored data is shown on the Home screen.

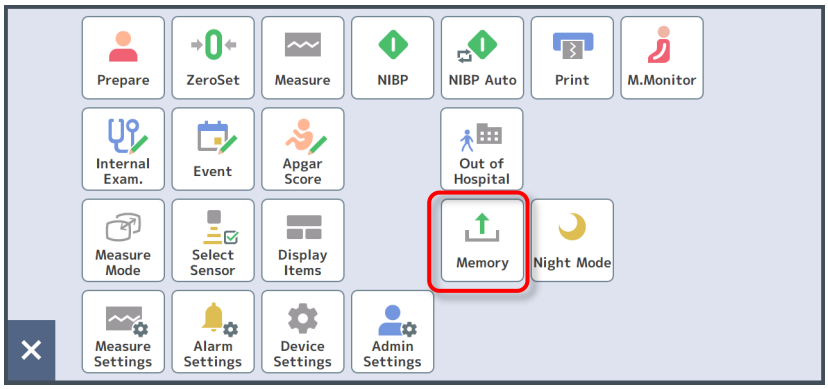
6-16-3. Print the Stored Data

You can print stored data for which measurement is complete when a recorder (sold separately) is connected.

Note

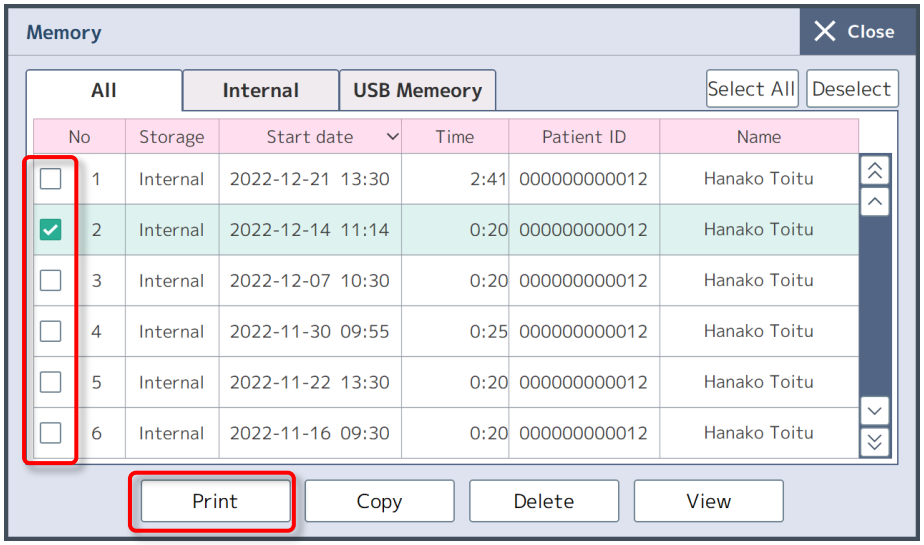
You can touch [Print] on the Bottom button to print while the History Screen is displayed.

1. **Touch [Memory] on the Menu screen.**



Previous measurement data will be displayed.

2. **Select the measurement data you want to display and touch [Print].**

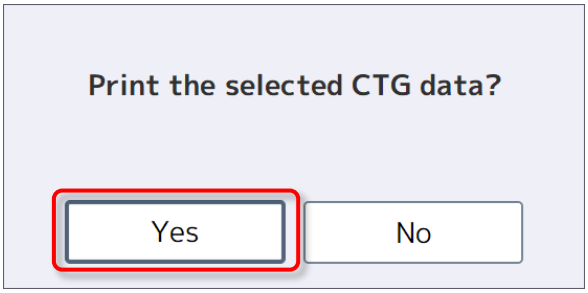


Note

- Use the top tab to switch between [Internal] and [USB Memory] to show data in the respective storage.
- Touch ^ or v to switch to the previous or next page.
- Touch ^^ or vv to switch to the first or last page.

A confirmation screen is displayed.

3. **Touch [Yes].**

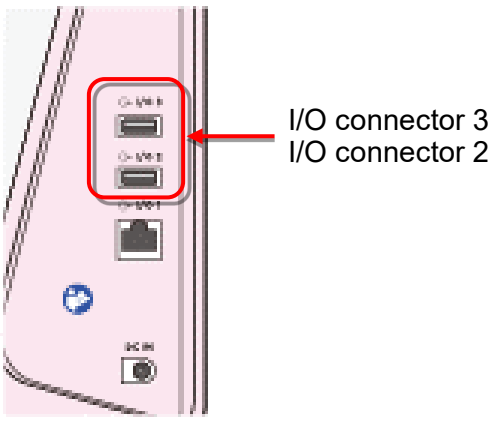


Printing starts.

6-16-4. Save (Copy) the Stored Data

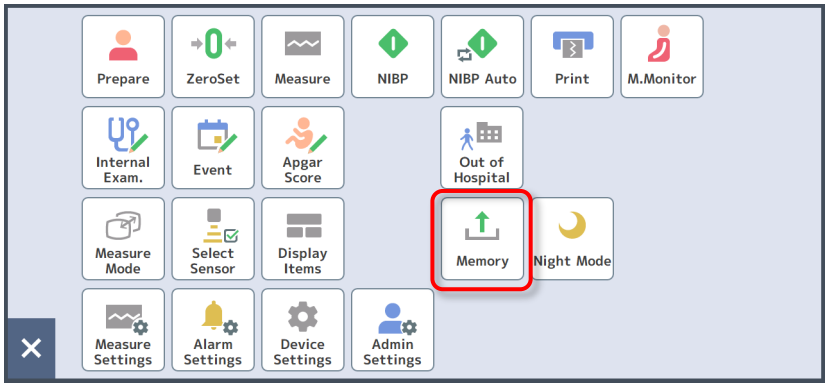
Use a USB memory to save the stored data to an external medium.

1. **Insert a USB memory into I/O connector 2 or 3 on the right side of the main unit.**



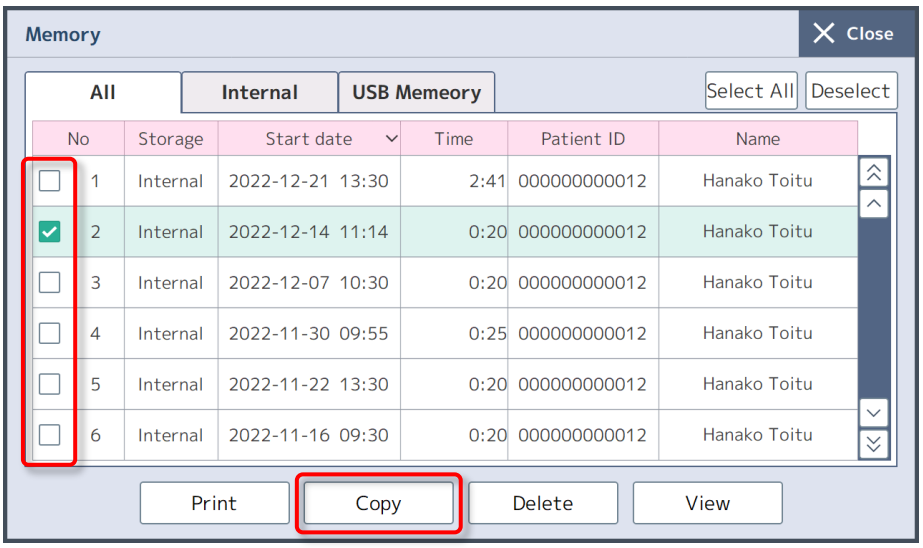
Right-side

2. **Touch [Memory] on the Menu screen.**



Previous measurement data will be displayed.

3. **Select the measurement data you want to save and touch [Copy].**

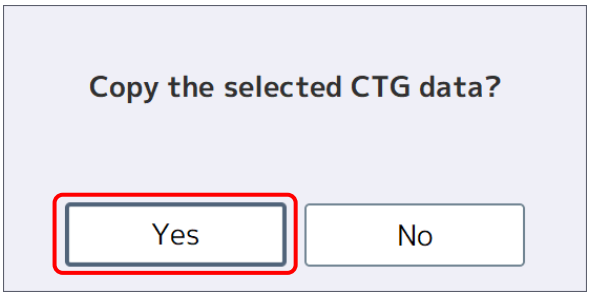


Note

- Use the top tab to switch between [Internal] and [USB Memory] to show data in the respective storage.
- Touch ^ or v to switch to the previous or next page.
- Touch ^^ or vv to switch to the first or last page.
- To select all data, touch [Select All].

A confirmation screen is displayed.

4. **Touch [Yes].**



The data is copied to the USB memory.

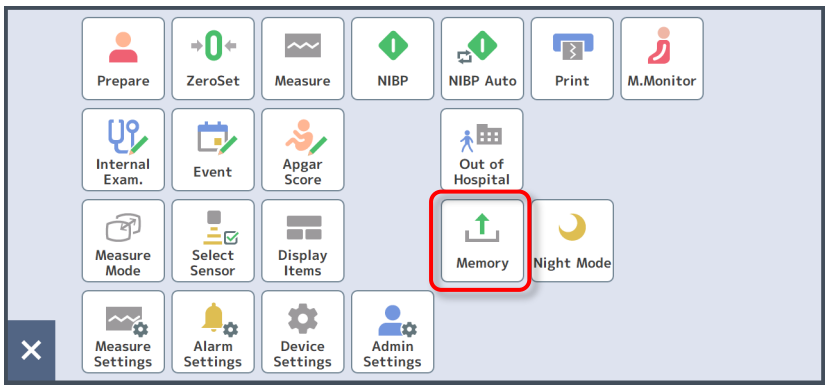
Important

Do not remove the USB memory until copying is complete.

6-16-5. Delete the Stored Data

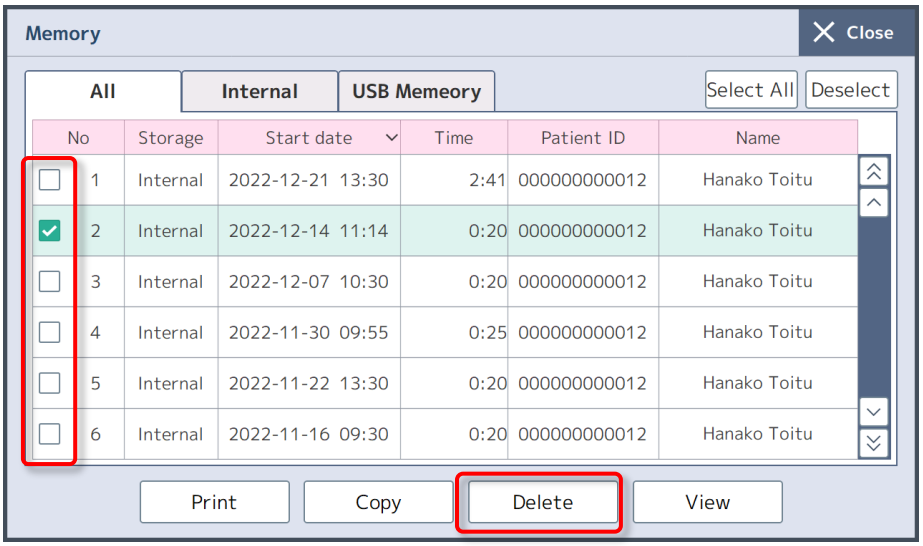
You can delete the stored data. To delete data saved in the internal memory or USB memory, connect before operation.

1. **Touch [Memory] on the Menu screen.**



Previous measurement data will be displayed.

2. Select the measurement data you want to delete and touch [Delete].

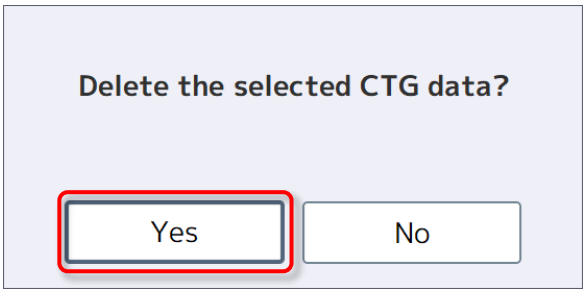


Note

- Use the top tab to switch between [Internal] and [USB Memory] to show data in the respective storage.
- Touch ^ or v to switch to the previous or next page.
- Touch ^^ or vv to switch to the first or last page.
- To select all data, touch [Select All].

A confirmation screen is displayed.

3. Touch [Yes].



Deleting starts.

Important

To remove the data in the USB memory, do not remove the USB memory until deleting is complete.

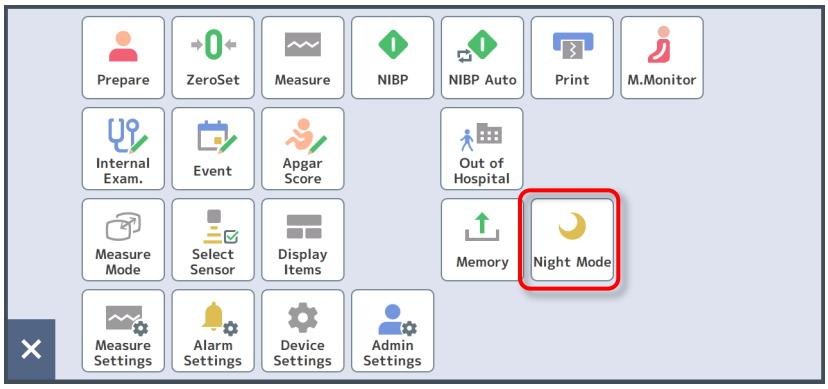
6-17. Switching to Night Mode

You can use screen and key sound settings that are suitable for nighttime by entering Night Mode when the screen is too bright or you do not want to make sounds when touching the keys.

Note

From the Device Settings, the screen brightness and key sound On/Off can be set for Night Mode (refer to P.146 “8-4-3 Other“).

1. **Touch [Night Mode] on the Menu screen.**



The screen and key sound are set to Night Mode.
Night Mode will be reset if you perform the same operation again.

6-18. Using Out of Hospital

Switch to Out of Hospital mode when you send CTG data to our Central monitor outside the hospital. Return the mode to In-hospital mode to use inside the hospital.
The out-of-hospital mode is intended for communication via smartphone tethering and cannot be started while a wired LAN cable is connected. Also, if a wired LAN cable is plugged in during the out-of-hospital mode, the system automatically switches to the in-hospital mode.
You can determine if you are in the out-of-hospital mode by looking at the central monitor connection status icon on the status bar.

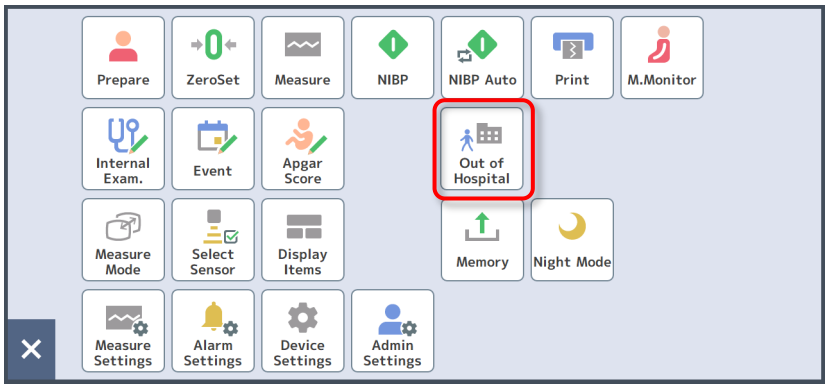
The following settings must be made in advance for out-of-hospital use.

- Wireless LAN setting for out-of-hospital use (see P.162 "8-5-6-2 Wireless LAN")
- Bed ID setting for out-of-hospital use (see P.169 "8-5-10 Installation")

Important

Use Out of Hospital mode after making sure that the mode is shown on the Central monitor.

1. **Touch [Out of Hospital] on the Menu screen.**



Out of Hospital mode will be reset if you perform the same operation again.

Note

If "Out of Hospital" is not shown on the menu screen, check whether the button is hidden in [Operation / display] - [Menu] in Admin Settings (see P.158 "8-5-5-1 Menu").

6-19. Displaying the Side Window

You can show items that you always want to check during measurement in the side window. In addition, turning the device OFF hides the side window.

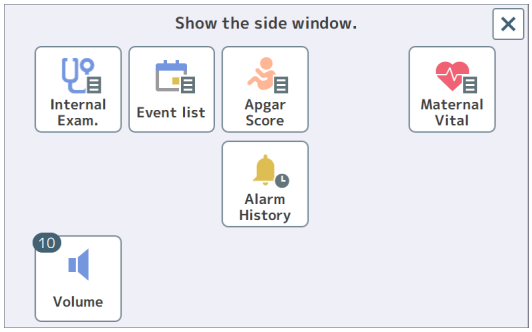
Note

For details on each side window, refer to P.33 "4-2-5 Side Window".

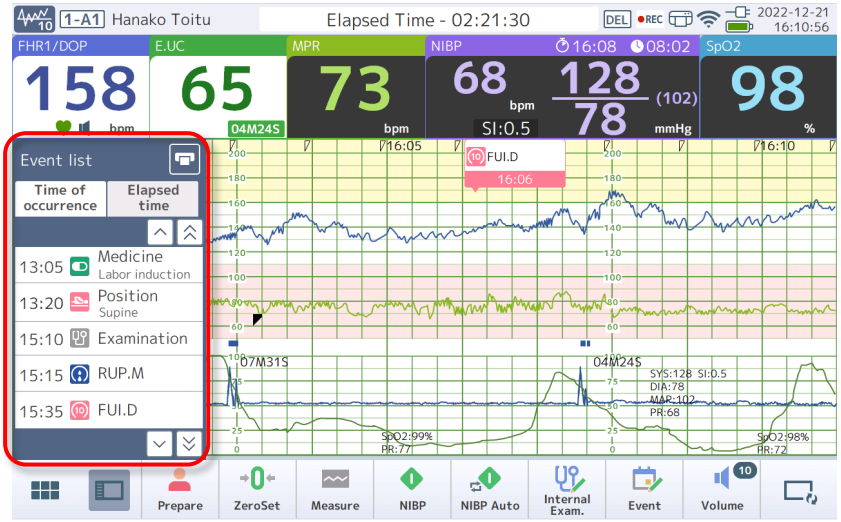
1. **Touch (Side window) on the Bottom button.**

The side window selection screen is displayed.

2. **Select items you want to show in the side window.**



The selected items will be displayed in the side window (“Event list” selected below as an example).



3. **To close the side window, touch (Close) on the Bottom button or Menu screen.**

The side window closes.

6-20. Finishing Using the Device

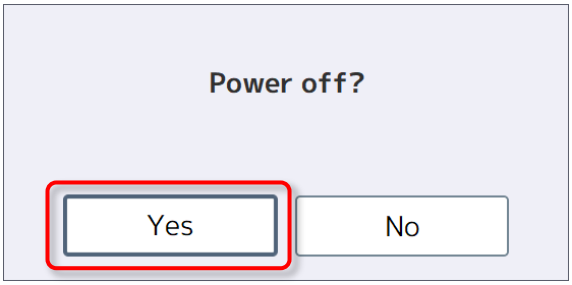
(1) Turn off the device

1. **Press (Power) button on top of the main unit.**
   The device will be turned off.

Follow the procedure below to shut down the device completely.

The battery power in standby mode will be saved if the device is shut down completely, however, it takes a while to start up the device next time.

1. **Press and hold the (Power) button (for 5 seconds or more).**
   A confirmation message is displayed.
2. **Touch [Yes].**



The device LCD turns off.

Note

- As long as the AC adapter is connected, the power indicator flashes or is lit even if the device is turned off.
- The device shuts down automatically when the battery level is running low even if the power is turned off with a short press of the power button. In that case, it takes a while to start up the device next time.

(2) Remove the transducer from the patient

1. **Detach the transducer belt.**
2. **Remove the transducer from the abdominal wall.**
3. **Wipe the ultrasound gel on the abdominal wall with tissues or a paper towel.**

(3) Remove the cuff from the patient's arm in the case of NIBP measurement

(4) Remove the sensor from the patient's finger in the case of SpO_2 measurement

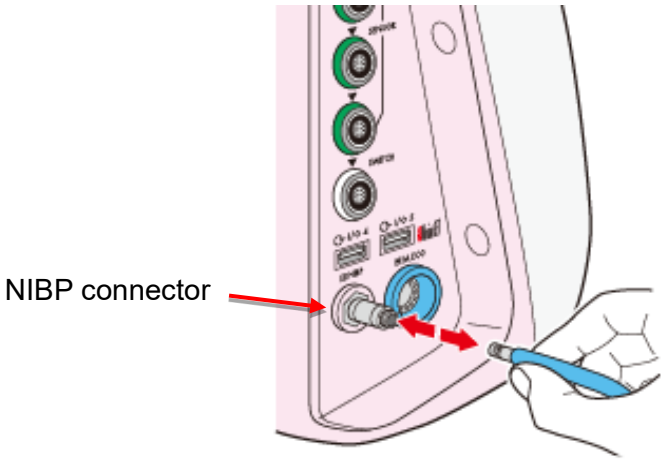
(5) Sterilize the parts that have touched the surface of the skin

Sterilize the transducer/remote marker switch.
Be sure to sterilize after every use (refer to P.173 "9-1 Cleaning and Sterilization").

(6) Disconnect the plugs from the main unit

- **NIBP air hose for adults**

Push the connector into the main unit to disconnect the plug.

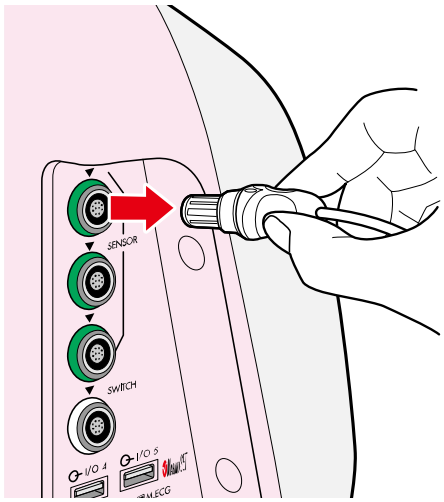


- **Other plugs**

Hold and pull the plug straight out to disconnect.

Important

To disconnect the plug, do not twist the plug or pull the cord. Failure to follow this instruction may damage the connector, plug, or cord.



(7) Make sure there is no damage or deformation found on the main unit, transducers, patient cables, etc.

(8) Make sure there is no dirt or foreign matter found on the main unit, transducers, patient cables, etc.

7. Actions for Alarms and Settings

7-1. Actions for Alarms

There are two different alarms; biological alarms, including Fetal Heart Rate, Maternal Pulse Rate, Maternal BP, Maternal SpO_2 and device alarms related to the device. When an alarm is issued during monitoring, the user is notified as shown below. Perform the necessary actions.
For Alarm Settings, refer to P.121 “7-3 Alarm Settings“ and P.166 “8-5-8 Alarm“.

- An alarm tone rings (it does not ring when the alarm tone is set to [Mute]).
- (alarm) in the monitoring area blinks (see below).
- A corresponding alarm message is displayed in free space on top of the screen (status bar).
- The volume can be set separately for the biological alarm and the device alarm.

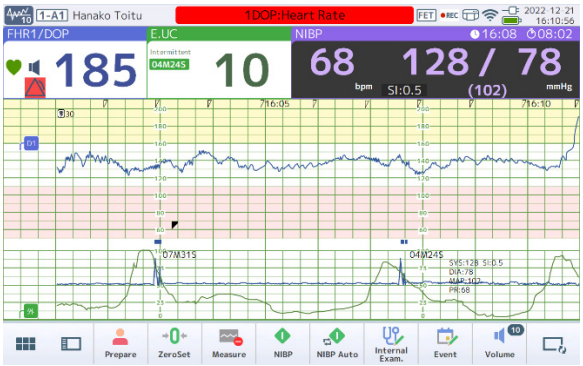
Important

The device alarm stops automatically once the cause of the alarm is removed, however, the biological alarm does not stop unless the clear alarm operation is performed.

CAUTION

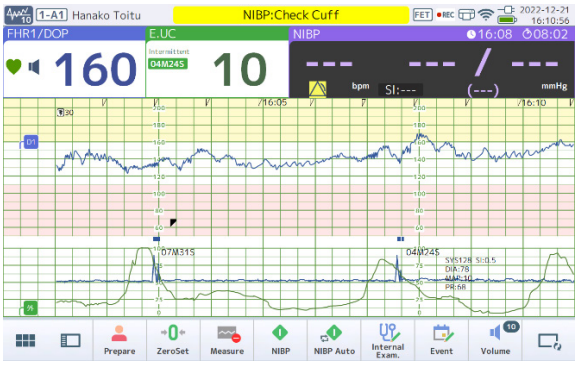
	Pay attention to changes on the LCD screen and recording when monitoring with the alarm tone set to [Mute]. Failure to follow this instruction may result in the alarm being missed.
	Check the settings of the alarm periodically. The alarm may not be raised depending on the setting.

Example of a biological alarm



An alarm icon appears in the monitoring area where the biological alarm is issued and blinks in red every 0.5 seconds.

Example of an alarm other than a biological alarm



When an alarm other than the biological alarm is issued, an alarm icon appears in the monitoring area and blinks in yellow every two seconds.

* Sometimes a biological alarm with the monitoring value "---" (unmonitoring state) is issued.

7-1-1. List of Alarms

■ Biological alarm

Message	Reason for the Alarm	Action
1DOP: Heart Rate	The heart rate was higher than the upper limit or lower than the lower limit for more than the delay time.	Refer to P.114 "7-1-2 Fetal Heart Rate Alarm"
2DOP: Heart Rate		
3DOP: Heart Rate		
DOP[SH]:Heart Rate		
M.ECG: Heart Rate	The heart rate exceeded the upper limit or the lower limit and this state continued.	Refer to P.115 "7-1-3 Maternal Heart Rate / Maternal Pulse Rate Alarm"
SpO2: Pulse Rate		
SpO2: Oxygen Saturation	The SpO_2 value exceeded the preset upper limit or the lower limit and this state continued.	Refer to P.117 "7-1-5 Arterial Blood Oxygen Saturation (SpO2) Alarm"
NIBP: Systolic BP	The BP value exceeded the preset upper limit or lower limit and this state continued.	Refer to P.116 "7-1-4 Non-Invasive Blood Pressure (NIBP) Alarm"
NIBP: Mean BP		
NIBP: Diastolic BP		

■ Device alarm

Message	Reason for the Alarm	Action
Signal Error	The following signal error alarm is issued. ・Two Doppler transducers may be monitoring the heart rate of a single fetus. ・The same heartbeat may be detected for the fetal heartbeat and the maternal heartbeat.	Reposition the Doppler transducer.
No Multiple transducers	Multiple transducers were connected in combination which is prohibited. Ex.: Two External UC transducers were connected.	Disconnect either transducer.
Transducer unidentifiable	A transducer other than those specified by us is connected.	Connect our specified product.
	A transducer which is not supported by the device software is connected.	Update the device software.
1DOP transducer: Check	Doppler transducer for Fetus 1 HR monitoring is not correctly connected.	Reconnect the Doppler transducer for Fetus 1 HR monitoring.
2DOP transducer: Check	Doppler transducer for Fetus 2 HR monitoring is not correctly connected,	Reconnect the Doppler transducer for Fetus 2 HR monitoring.

Message	Reason for the Alarm	Action
3DOP transducer: Check	Doppler transducer for Fetus 3 HR monitoring is not correctly connected.	Reconnect the Doppler transducer for Fetus 3 HR monitoring.
Check E.UC sensor	The External UC transducer is not correctly connected.	Reconnect the External UC transducer.
UC: Check UC Transducer	The External UC transducer is not correctly positioned.	Change the application position of the External UC transducer. Change the tightness of the transducer belt.
M.ECG: Check Electrode	The electrode is disconnected in M.ECG.	Check the electrode and connect it again.
M.ECG: Check F Electrode		
M.ECG: Check L Electrode		
M.ECG: Check R Electrode		
M.ECG: Check etc1 Electrode		
M.ECG: Check etc2 Electrode		
M.ECG: Over Voltage	The device failed.	Contact us or our distributor to request repairs.
M.ECG: Low Voltage		
NIBP: Check Cuff	Could not confirm the cuff pressure though the pump was activated.	Check if the cuff and the connector are connected correctly.
	Could not pressurize the cuff properly. Air leakage could be possible.	Check the connected cuff and the connector.
	Blood pressure/pulse rate cannot be judged correctly.	Check if the cuff is wrapped correctly, there is no body movement, the measurement posture is appropriate, ask the patient to stay still in bed, and then measure again.
	Too many detected pulses.	It may be caused by the body movement or vibration. Check if the cuff is wrapped correctly, there is no body movement, the measurement posture is appropriate, ask the patient to stay still in bed, and then measure again.
	Could not detect a pulse with BP monitoring.	Check if the cuff is wrapped correctly, there is no body movement, the measurement posture is appropriate, ask the patient to stay still in bed, and then measure again.

Message	Reason for the Alarm	Action
NIBP: Leak	Could not measure correctly because insufficient pressure for the blood pressure measurement.	Adjust First Pressure on “Measure Settings” → ”NIBP” and measure again.
NIBP: Artifact	Could not pressurize or depressurize the cuff properly due to body movement.	Ask the patient to stay still in bed, and then measure again.
NIBP: Out of Range	The measured BP value is out of range.	It may be caused by a weak pulse signal, body movement, or an irregular heartbeat. If the error persists, use palpation or invasive blood pressure method to measure the BP.
NIBP: Check Interval	Measure the BP continuously for more than 30 minutes.	Check the patient’s status, and determine if you should continue to measure.
NIBP: Over Cuff Pressure	Pressure exceeded the upper limit value.	It may be caused even by body movement. Check if the cuff is wrapped correctly, there is no body movement, the measurement posture is appropriate, ask the patient to stay still in bed, and then measure again.
	Too fast to pressurize the cuff.	It may be caused by a bent air hose or use of an inappropriate cuff. Check the connected cuff and air piping, and settings for what to measure.
NIBP: Time Over	BP measurement time including remeasurement exceeded the threshold.	Check for an error at remeasurement and check the relevant phenomenon.
NIBP: Unit Failure	The manometer failed.	Contact us or our distributor to request repairs.
SpO2: Check Sensor	The sensor is not applied appropriately.	Check that the sensor is not applied too tight. Reposition the sensor.
SpO2: Pulse Search	Detected a pulse.	This is not a failure. The error disappears once the detection is complete.
SpO2: Low Pulse	Cannot measure because the signal is not strong enough.	Check the patient’s status. For patients whose bloodstream on the applied area is poor, reposition the application position at least every 2 hours. Do not apply to the arm with the BP cuff applied.
SpO2: Unit Failure	The SpO_2 unit failed.	Contact us or our distributor to request repairs.

Message	Reason for the Alarm	Action
Low Battery	Battery voltage of the main unit is low.	Connect the power cord and charge the battery.
Clock Low Battery	The voltage of the clock battery is low.	Contact us or our distributor to replace the battery. * Be sure to correct the time when you continue monitoring.
System Error	The device failed.	Contact us or our distributor to request repairs.

■ Alarms issued when the recorder (MP-130) is connected

Message	Reason for the Alarm	Action
Recorder: Paper Out	The recorder cover is open or recording papers are used up.	Refer to P.118 "7-1-6 Paper Out Alarm".
Recorder: Temperature	The internal temperature of the recorder is rising.	Stop using the recorder and wait until the recorder's temperature has lowered before you try to print again.
Recorder: Unit Error	An error has occurred with the recorder.	Stop using the recorder and contact us or our distributor to request repairs.
Recorder: Low Battery	Battery voltage of the recorder is low.	Connect the power cord and charge the battery.
Recorder: Element	An error occurred with the head.	Contact us or our distributor.

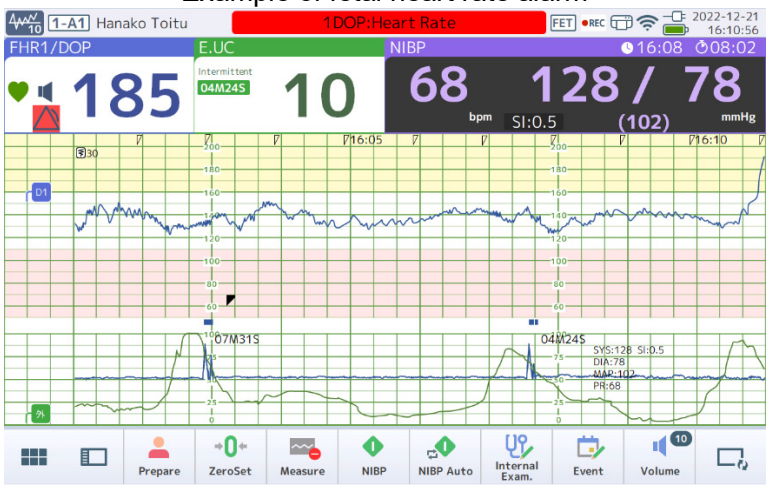
7-1-2. Fetal Heart Rate Alarm

Important

From the Admin Settings, if the Alarm Restraint feature is set to [ON] when the power is on, the Fetal Heart Rate Alarm feature is not activated until five minutes have passed after turning on the power, or from when the Doppler transducer was connected, or when a good heartbeat signal was monitored for more than ten seconds. This is to avoid the frequent occurrence of the fetal heart rate alarm. Pay close attention to the condition of the heart rate recorded during the selected preset time (refer to P.166 “8-5-8 Alarm").

(1) Fetal Heart Rate Alarm triggered

Example of fetal heart rate alarm



- An alarm tone sounds (It does not sound when [Mute] is set in Alarm Settings).
- (alarm) in the monitoring area blinks red every 0.5 seconds.
- “1DOP:Heart Rate”, “2DOP:Heart Rate”, or “3DOP:Heart Rate” is displayed in the free space.

(2) Confirm the fetal heart rate alarm

1. **Touch the monitoring area where the alarm is issued or press (Alarm) button on top of the main unit.**
   The heart rate alarm is suspended.
   The alarm sound stops and the alarm suspension icon blinks.

2. **Check the fetal and maternal condition and take appropriate measures under the direction of a physician.**

(3) Clear the Fetal Heart Rate Alarm

The alarm will be cleared if the monitored value returns to the specified range while the alarm suspended icon is blinking.

Important

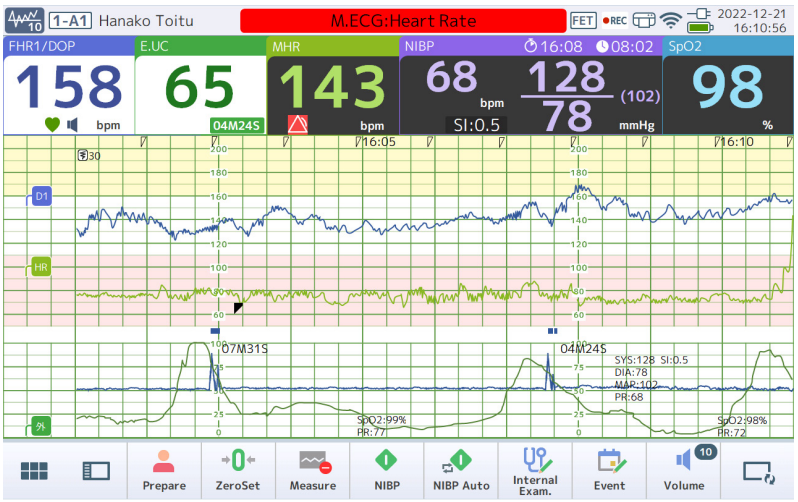
The Fetal Heart Rate Alarm is not automatically cleared even if the monitored value returns to the normal range. the user must press (Alarm) button on top of the main unit or the monitoring area blinking in red when this alarm has been triggered.

7-1-3. Maternal Heart Rate / Maternal Pulse Rate Alarm

MT-832-L / P

(1) Maternal Heart Rate / Maternal Pulse Rate Alarm triggered

Example of Maternal Heart Rate / Maternal Pulse Rate Alarm



- An alarm tone sounds (It does not sound when [Mute] is set in Alarm Settings).
- (alarm) in the monitoring area blinks red every 0.5 seconds.
- “M.ECG:Heart Rate” or “SpO2:Pulse Rate” is displayed in the free space.

(2) Check the Maternal Heart Rate / Maternal Pulse Rate Alarm

1. **Touch the monitoring area where the alarm is issued or press (Alarm) button on top of the main unit.**
   The Maternal Heart Rate / Maternal Pulse Rate alarm is suspended.
   The alarm sound stops and the alarm suspension icon blinks.

2. **Check the fetal and maternal condition and take appropriate measures under the direction of a physician.**

(3) Clear the Maternal Heart Rate / Maternal Pulse Rate Alarm

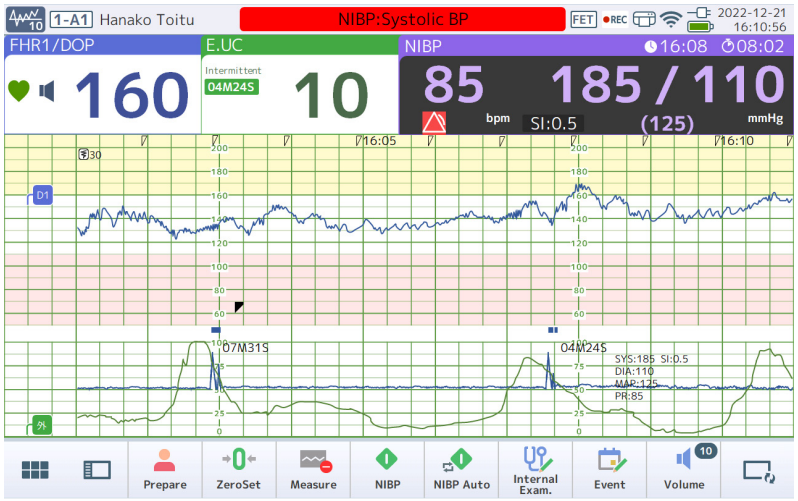
The alarm will be cleared if the monitored value returns to the specified range while the alarm suspended icon is blinking.

7-1-4. Non-Invasive Blood Pressure (NIBP) Alarm

MT-832-L / P

(1) NIBP Alarm triggered

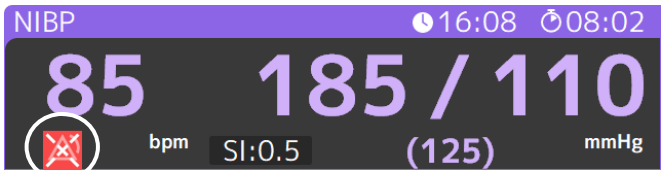
Example of NIBP Alarm



- An alarm tone sounds (It does not sound when [Mute] is set in Alarm Settings).
- (alarm) in the monitoring area blinks red every 0.5 seconds.
- “NIBP:Systolic BP”, “NIBP:Mean BP” or “NIBP:Diastolic BP” is displayed in the free space.

(2) Confirm the NIBP Alarm

1. **Touch the monitoring area where the alarm is issued or press (Alarm) button on top of the main unit.**
   The NIBP Alarm is suspended.
   The alarm sound stops and the alarm suspension icon blinks.



2. **Check the fetal and maternal condition and take appropriate measures under the direction of a physician.**

(3) Clear the NIBP Alarm

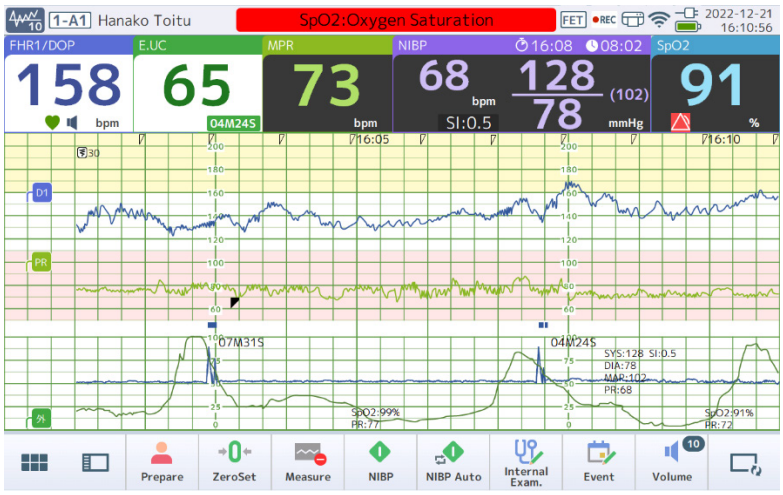
The alarm will be cleared if the monitored value returns to the specified range while the alarm suspended icon is blinking.

7-1-5. Arterial Blood Oxygen Saturation (SpO_2) Alarm

MT-832-L / P

(1) SpO_2 Alarm triggered

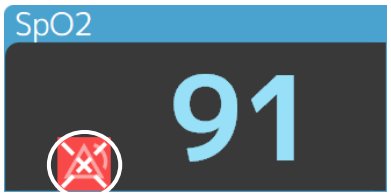
Example of SpO_2 Alarm



- An alarm tone sounds (It does not sound when [Mute] is set in Alarm Settings).
- (alarm) in the monitoring area blinks red every 0.5 seconds.
- “SpO2:Oxygen Saturation” is displayed in the free space.

(2) Confirm the SpO_2 alarm

1. **Touch the monitoring area where the alarm is issued or press (Alarm) button on top of the main unit.**
   The SpO_2 Alarm is suspended.
   The alarm sound stops and the alarm suspension icon blinks.



2. **Check the fetal and maternal condition and take appropriate measures under the direction of a physician.**

(3) Clear the SpO_2 Alarm

The alarm will be cleared if the monitored value returns to the specified range while the alarm suspended icon is blinking.

7-1-6. Paper Out Alarm

(1) Paper Out Alarm triggered

- An alarm tone sounds (It does not sound when [Mute] is set in Alarm Settings).
- (alarm) in the monitoring area blinks yellow every two seconds.
- “Recorder:Paper Out” is displayed in the free space.

(2) Confirm the alarm

1. **Touch the monitoring area where the alarm is issued or press (Alarm) button on top of the main unit.**
   The Paper out alarm is suspended.
   The alarm sound stops and the alarm suspension icon blinks.

2. **Check the recorder and load new recording paper if it is empty.**
   Close the cover completely (refer to P.39 “5-2 Loading Recording Paper“).
   The alarm is automatically cleared when recording paper is loaded and the cover is closed.

(3) Print the recording while printing was suspended

When recording paper is used up during printing, loading new recording paper enables automatic follow-up print (high-speed print) of CTG indicating the paper was used up until new paper was loaded.

7-1-7. Other Alarms

As well as the alarms described above, there are other device alarms listed on P.110 “7-1-1 List of Alarms”.

(1) When an alarm occurs

- An alarm tone sounds (It does not sound when [Mute] is set in Alarm Settings).
- (alarm) in the monitoring area blinks yellow every two seconds.
- A corresponding alarm message is displayed in the free space.

(2) Confirm the alarm

1. **Touch the monitoring area where the alarm is issued or press (Alarm) button on top of the main unit.**
   The alarm is suspended.
   The alarm sound stops and the alarm suspension icon blinks.
2. **Perform the necessary action in response to the alarm message.**
   The alarm is automatically cleared when the condition is remedied.

7-2. Alarm Specifications

(1) Alarm triggered

Device alarms related to biological alarms and sensors are triggered only in Measure status.
If Alarm Restraint settings are set to “Yes” on P.166 “8-5-8 Alarm“, device alarms related to biological alarms and sensors are restrained until correct signals are input at least for 5 minutes after the power is turned On or a sensor is connected.
Time is counted down until the restraint is cleared in the free space on the status bar during Alarm Restraint.
If a biological alarm and a device alarm are issued concurrently, the display and the alarm tone of the biological alarm are prioritized.
If more than one alarm is triggered concurrently, a message showing details of the alarm is displayed on the status bar one by one.

(2) Intended position of the user

The alarms for this device are intended to notify personnel in the area that an issue has occurred and they should be able to see the monitor or the recording paper.

(3) Suspension (reset) of an alarm

Touch the monitoring area for alarm conditions or press  (Alarm) button on top of the main unit to suspend all triggered alarms. Blinking in the monitoring area changes to lit, and the alarm stops. The alarm message on the status bar remains displayed.
The alarm will be unsuspended automatically according to “Alarm suspend Time” and “SpO2 Alarm suspend Time” on P.166 “8-5-8 Alarm“.
If a new alarm is triggered during alarm suspension, the suspended alarm will be unsuspended.
It will be unsuspended when connection with the Central monitor failed or was disconnected.
Touch the Alarm suspension icon on the monitoring area or press  (Alarm) button on top of the main unit during alarm suspension to unsuspend all triggered alarms.

Biological alarms are not reset automatically until the alarm is reset by the operator even if the symptom resulting in the alarm disappeared.
Press  (Alarm) button on top of the main unit to reset the alarm as the alarm will be reset along with the alarm suspension or reset operation.
Device alarms will be reset automatically once the symptom resulting in the alarm disappeared.

(4) Information delay

There are delays to the alarm signal for this device caused by the following processes.

- Delay caused by the heart rate detection algorithm
- Delay caused by internal communication
- Delay caused by network

Delay Time for each alarm

- Fetal Heart Rate : 15 sec. or less * Alarm Delay Time: 10 sec.
- Maternal Heart Rate : 10 sec. or less
- Maternal Pulse Rate : 24 sec. or less
- Maternal SpO_2: 24 sec. or less
- Maternal NIBP: 1 sec. or less after completion of measurement
- Alarm notification delay time to the Central monitor: 4 sec. or less

(5) Alarm history

Alarms triggered during monitoring are saved in the alarm history along with CTG data. Therefore, alarms triggered before or after Measure will not remain in the history.
72-hours of CTG data are saved in the Fetal monitor, therefore, if you continue to monitor, the alarm history is also erased along with old CTG data.
The alarm history which contains alarms issued so far is retained when the power is forcibly turned OFF due to a low battery of the Fetal monitor.

(6) Presets for an alarm

Presets that can be selected on the Prepare screen include alarm setting values.
To read out the preset, refer to P.55 “6-1 Registering Patient Information“.
To create a preset, refer to P.154 “8-5-3-5 Preset“.
If the power is turned OFF during monitoring due to a low battery, the preset is restored to an unselected state after restarting. Therefore, you need to change the alarm settings so that they will be optimized for the patient to resume monitoring.

(7) Distributed alarm system

The device can also show triggered alarms on the network-connected Central monitor.
If there is a problem in communication with the Central monitor during monitoring, the message “Failed to connect with Central” is displayed. In this case, note that alarms cannot be shown on the Central monitor.
To meet requirements for the distributed alarm system standards, the device should be used with a Central monitor compliant with the same standards.
Requirements for some distributed alarm system standards may not be met if the device is used with a non-compliant Central monitor.
Setting a proper bed ID on the Fetal monitor allows you to determine on which Fetal monitor an alarm is triggered on the Central monitor.

(8) Method and timing for verifying alarm system function

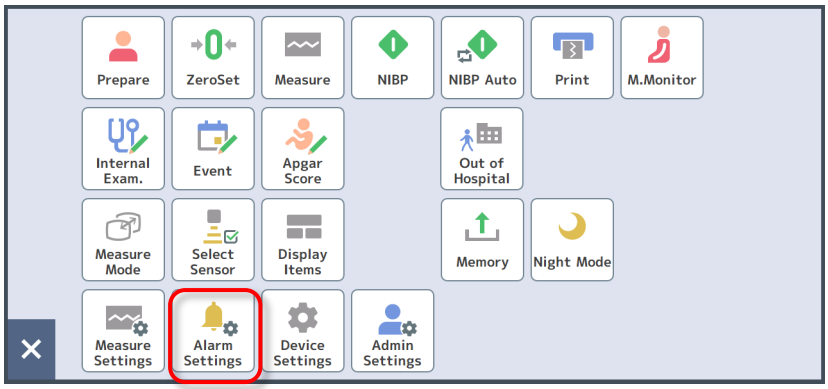
Check periodically that the alarm function for this device is operating normally.

- Verification timing: every six months
- Verification method: Refer to P.177 “9-2.Inspections to be Conducted by Users”

7-3. Alarm Settings

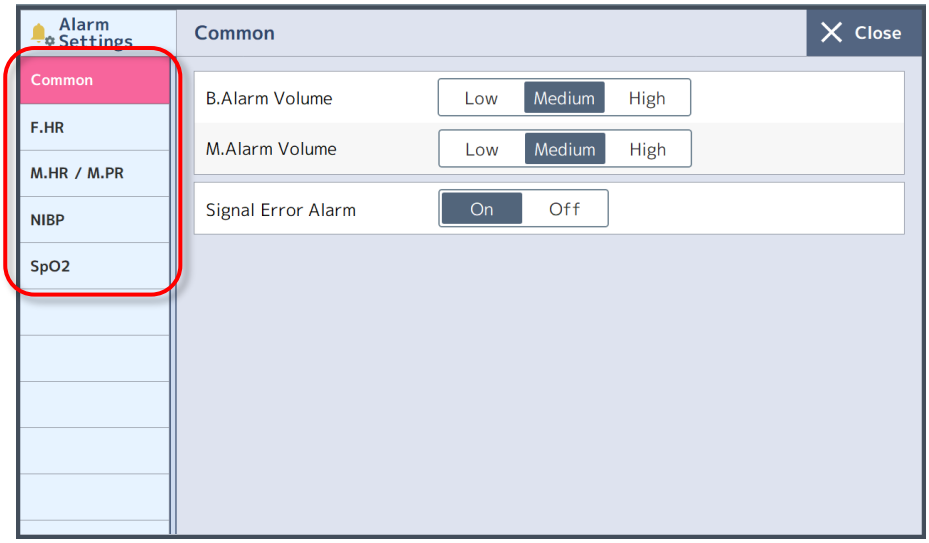
In Alarm Settings the volume of an alarm and the upper/lower value of a triggered alarm can be set. Use setting values suitable for a patient for monitoring.
In addition, if the Fetal monitor is replaced with another device during monitoring, check if set values for the alarm are suitable for the patient being monitored.
Setting items include “Common”, “F.HR”, “M.HR / M.PR”, “NIBP”, and “SpO2”.
Follow the steps below to display the Alarm Settings screen.

1. **Touch [Alarm Settings] on the Menu screen.**



The Alarm Settings screen is displayed.

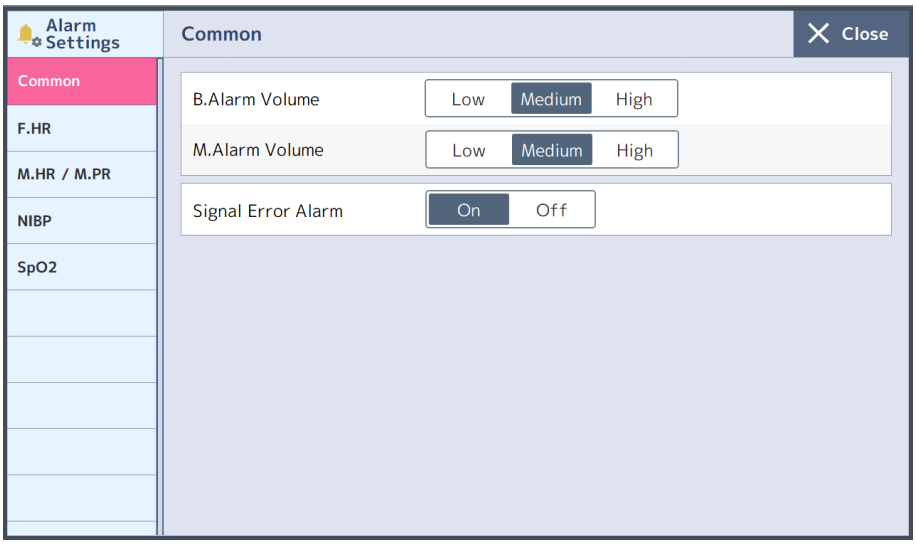
2. **Select a setting item.**



The right pane shows a window for setting each item.
Touch [× Close] to exit the Alarm screen.

7-3-1. Common

Touch (Menu) - [Alarm Settings] on the Bottom button to display the Common settings screen. In Common settings, set B.Alarm Volume, M.Alarm Volume, and Signal Error Alarm respectively.



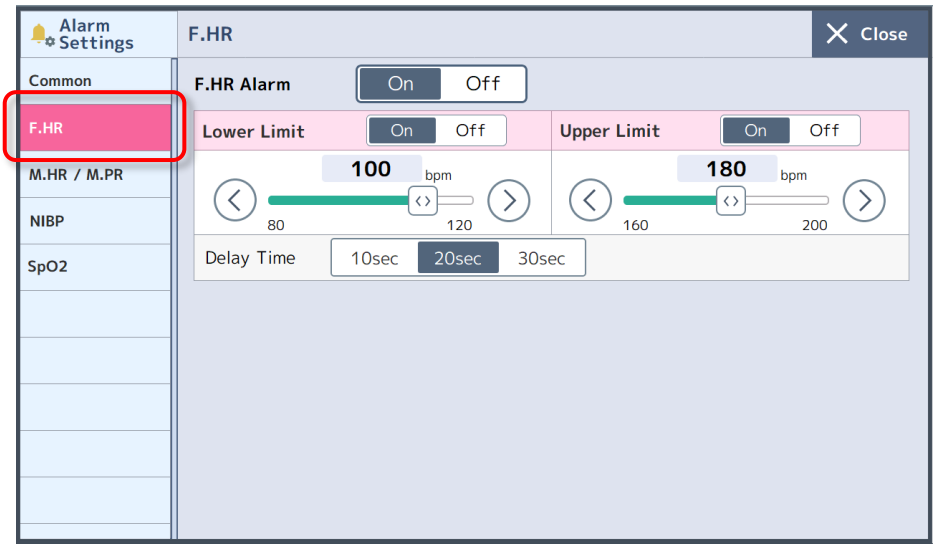
Settings Item	Function	Default Value
B.Alarm Volume	Set the volume of the biological alarm.	Medium
M.Alarm Volume	Set the volume of the device alarm.	Medium
Signal Error Alarm	Set the signal error alarm to On or Off.	On

Note

- The value in “M.Alarm Volume” cannot be larger than the value in “B.Alarm Volume”.
- A “Signal Error Alarm” is issued when two Doppler transducers may be monitoring the heart rate of a single fetus or a heart rate which is identical between the fetus and the mother.

7-3-2. F.HR

Touch (Menu) - [Alarm Settings] - [F.HR] on the Bottom button to display the F.HR settings screen. In F.HR settings, set Fetal Heart Rate Alarm On/Off, the upper/lower value, and Delay Time.



Note

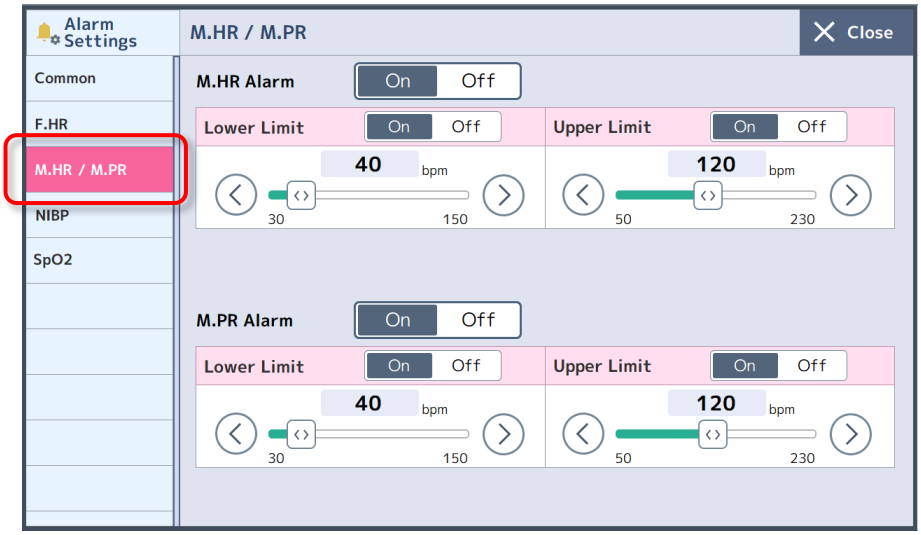
Touch or slide to specify a value.

Settings Item	Function	Default Value
F.HR Alarm	Set the Fetal Heart Rate Alarm to On or Off.	On
Lower Limit	Select whether or not (On or Off) the alarm is triggered when the lower limit is exceeded, and specify a pulse (80-120) (in increments of 10 bpm) when On is selected.	On 100 bpm
Upper Limit	Select whether or not (On or Off) the alarm is triggered when the upper limit is exceeded, and specify a pulse (160-200) (in increments of 10 bpm) when On is selected.	On 180 bpm
Delay Time	Set the time to trigger an alarm.	20sec

7-3-3. M.HR / M.PR

MT-832-L / P

Touch (Menu) - [Alarm Settings] - [M.HR / M.PR] on the Bottom button to display the M.HR / M.PR settings screen. In M.HR / M.PR settings, set Maternal Heart Rate Alarm and Maternal Pulse Rate Alarm On/Off, and the upper/lower value.



Note

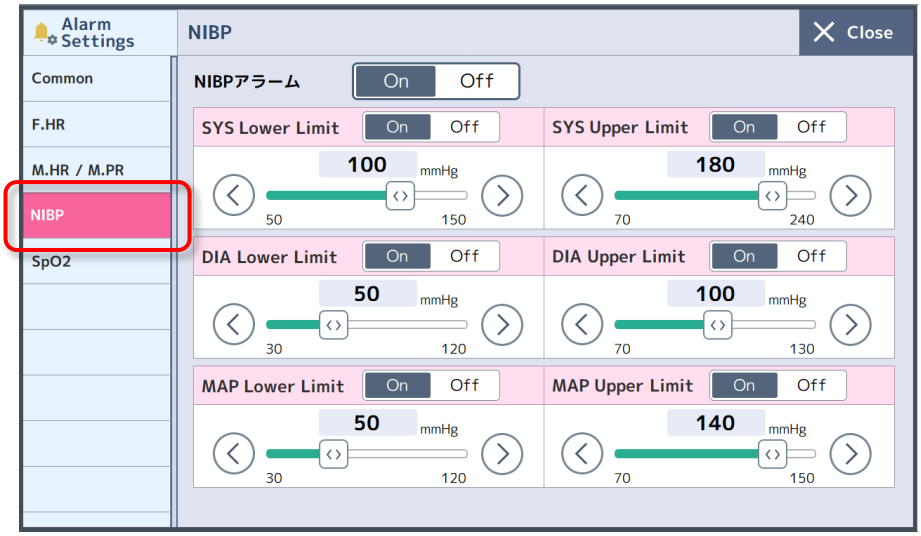
Touch or slide to specify a value.

Settings Item	Function	Default Value
M.HR Alarm	Set the Maternal Heart Rate Alarm to On or Off.	On
Lower Limit	Select whether or not (On or Off) the alarm is triggered when the lower limit is exceeded, and specify a heart rate (30-150) (in increments of 5 bpm) when On is selected.	On 40 bpm
Upper Limit	Select whether or not (On or Off) the alarm is triggered when the upper limit is exceeded, and specify a heart rate (50-230) (in increments of 5 bpm) when On is selected.	On 120 bpm
M.PR Alarm	Set the Maternal Pulse Rate Alarm to On or Off.	On
Lower Limit	Select whether or not (On or Off) the alarm is triggered when the lower limit is exceeded, and specify a pulse rate (30-150) (in increments of 5 bpm) when On is selected.	On 40 bpm
Upper Limit	Select whether or not (On or Off) the alarm is triggered when the upper limit is exceeded, and specify a pulse rate (50-230) (in increments of 5 bpm) when On is selected.	On 120 bpm

7-3-4. NIBP

MT-832-L / P

Touch (Menu) - [Alarm Settings] - [NIBP] on the Bottom button to display the NIBP settings screen. In NIBP settings, set NIBP alarm On/Off, and the upper/lower value of Systolic BP, Diastolic BP, Mean BP.



Note

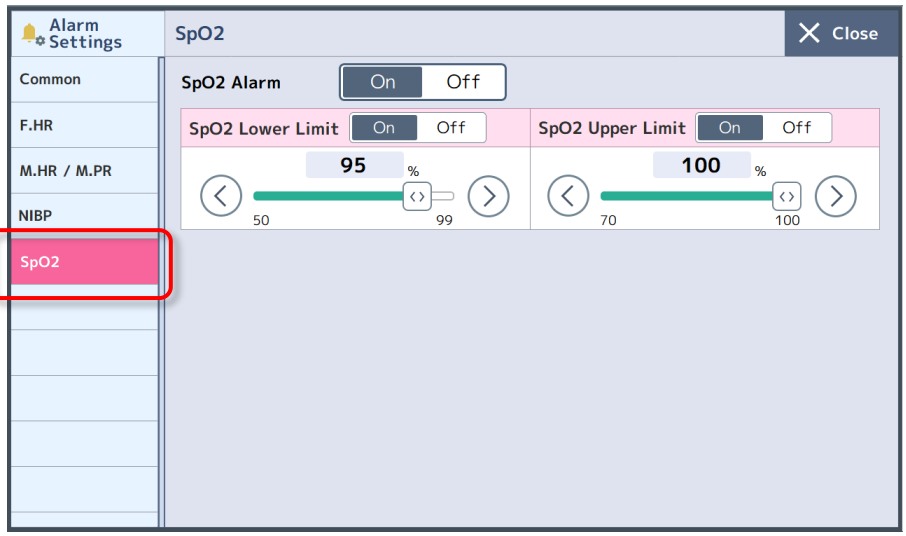
Touch ‹ › or slide ‹› to specify a value.

Settings Item	Function	Default Value
NIBP Alarm	Set the NIBP Alarm to On or Off.	On
SYS Lower Limit	Select whether or not (On or Off) the alarm is triggered when the lower limit is exceeded and specify a blood pressure (50-150) (in increments of 10mmHg) when On is selected.	On 100mmHg
SYS Upper Limit	Select whether or not (On or Off) the alarm is triggered when the upper limit is exceeded and specify a blood pressure (70-240) (in increments of 10mmHg) when On is selected.	On 180mmHg
DIA Lower Limit	Select whether or not (On or Off) the alarm is triggered when the lower limit is exceeded and specify a blood pressure (30-120) (in increments of 10mmHg) when On is selected.	On 50mmHg
DIA Upper Limit	Select whether or not (On or Off) the alarm is triggered when the upper limit is exceeded and specify a blood pressure (70-130) (in increments of 10mmHg) when On is selected.	On 100mmHg
MAP Lower Limit	Select whether or not (On or Off) the alarm is triggered when the lower limit is exceeded and specify a blood pressure (30-120) (in increments of 10mmHg) when On is selected.	On 50mmHg
MAP Upper Limit	Select whether or not (On or Off) the alarm is triggered when the upper limit is exceeded and specify a blood pressure (70-150) (in increments of 10mmHg) when On is selected.	On 140mmHg

7-3-5. SpO2

MT-832-L / P

Touch (Menu) - [Alarm Settings] - [SpO2] on the Bottom button to display the SpO2 settings screen. In SpO_2 settings, set SpO_2 Alarm On/Off, and the upper/lower value.



Note

Touch ‹ › or slide ‹› to specify a value.

Settings Item	Function	Default Value
SpO2 Alarm	Set the SpO_2 Alarm to On or Off.	On
SpO2 Lower Limit	Select whether or not (On or Off) the alarm is triggered when the lower limit is exceeded and specify an SpO_2 value (50-99) (in increments of 1%) when On is selected.	On 95%
SpO2 Upper Limit	Select whether or not (On or Off) the alarm is triggered when the upper limit is exceeded and specify an SpO_2 value (70-100) (in increments of 1%) when On is selected.	On 100%

8. Various Settings

The settings are grouped into those which vary depending on the patient's status during monitoring and the basic settings for the device.
The basic settings for the device are divided into Device Settings which can be changed by the user and Admin Settings which can only be changed by the administrator. A password setting is available in Admin Settings.
For alarm settings, refer to P.121 "7-3 Alarm Settings".

8-1. Setting Items List

8-1-1. Settings Which Vary Depending on the Patient's Status During Monitoring

Menu		Setting Items	Default Value	Refer to
Measure Settings	Common	Select Heartbeat sound	–	P.133
	F.HR / FM	Dop Focus Range	Shallow	P.134
		Single Heart Mode	Off	
		Threshold of FM dot	25	
	UC	UC Sensitivity	Normal	P.136
		UC Filter	On	
	M.ECG	M.ECG Lead	Ⅱ Lead	P.137
		Pacemaker Pulse	Off	
		High Cut Filter	On	
	NIBP	Wired NIBP Measure Mode	Compress	P.138
		First Pressure	Auto	
		Continuous measurement Interval	Every 5 min	
		Continuous measurement End Sound	High	
	SpO2	SpO2 Average Time	Medium	P.139
Select Sensor	Common	1DOP/2DOP/3DOP/E.UC/M.ECG/NIBP/SpO2	Use	P.140
	DOP	–	–	
	External UC	–	–	
	M.ECG	–	–	
	NIBP	–	–	
	SpO2	–	–	
Display Items		M.ECG	On	P.143
		M.ECG Sensitivity	Auto	
		PULSEWAVE	On	

8-1-2. Device Settings Which Can be Changed by the User

Menu	Setting Items	Default Value	Refer to
Clock	Date	–	P.144
	Clock Sync	Auto	
Installation	Facility ID	–	P.145
	Ward ID	–	
	Bed ID (Wired LAN)	–	
	Bed ID (Wireless/in-hospital)	–	
	Bed ID (Wireless/out-of -hospital)	–	
	Monitor ID	–	
Other	Normal Screen brightness	100	P.146
	Normal Key Sound	On	
	Night Mode Screen brightness	20	
	Night Mode Key Sound	Off	

8-1-3. Admin Settings Which Can be Changed by the Administrator

Menu		Setting Items	Default Value	Refer to
Function		Operation Mode	Expert	P.148
		Internal Examination	On	
		Event	On	
		NST Mode	On	
		Maternal monitoring Mode	On	
		Apgar Score	On	
		Suspension/restart of measurement	On	
		Preset	On	
		Recorder	On	
Measurement	Power-on/off	Power-on Show screen	Prepare	P.150
		Power-on Start measurement automatically	Off	
		Power-on Measure Mode	Delivery	
	Measure Mode （NST）	Confirmation message	On	
		Waveform size	10min	
		Measurement time	20min	
		Measurement at elapsed time	Continue	
		End Sound	High	
		NIBP measurement	Manual	
		Print	Yes	

Menu		Setting Items	Default Value	Refer to
	Measure Mode (Delivery)	Confirmation message	On	
		Waveform size	15min	
		Measurement time	Unspecified	
		Measurement at elapsed time	Continue	
		End Sound	High	
		NIBP measurement	Manual	
		Print	Yes	
	Measure Mode (Maternal)	Confirmation message	On	
		Waveform size	15min	
		Measurement time	Unspecified	
		Measurement at elapsed time	Continue	
		End Sound	High	
		NIBP measurement	Auto	
		Print	No	
	Info display	UC information	Cycle/INT.	
		SI Display	On	
		PI Display	On	
		Internal Exam.	Details	
		Event	Details	
		Sensor connection status	On	
		FM Spike	On	
		Dot of FM	On	
	Waveform	REC Speed	30mm/min	
		FHR2 Waveform Offset	0	
		FHR3 Waveform Offset	0	
		M.PR display	Waveform	
		SpO2 display	Number	
		Noise cut (F.HR/M.HR)	On 25	
	Preset	Create New Preset	–	
	Other	Pressure Unit	mmHg	
		Temperature unit	°C	
		Priority of MHR, MPR	MHR	
Clinical Set	Event	Enable/Disable Each Event	–	P.156
	Apgar Timer	Timer1	1min	
		Timer2	Use 5min	
		Timer3	Use 10min	
		Timer volume	High	

Menu		Setting Items	Default Value	Refer to
Operation / display	Menu	Menu/Side window On/Off setting	–	P.158
	Bottom button	NST/Delivery/Maternal	–	
	Color	FHR1/FHR2/FHR3/UC/MHR/NIBP/SpO2	FHR1:2 FHR2:9 FHR3:16 UC:11 MHR:10 NIBP:3 SpO2:14	
	Other	Display of patient information	On	
Network	Fetal monitor	Monitor (Wired)	Manual	P.161
		Monitor (Wireless/in-hospital)	Manual	
		Monitor (Wireless/out-of-hospital)	Fixed to auto	
	Wireless LAN	Wireless LAN AP (in-hospital)	–	
		Wireless LAN AP (out-of-hospital)	–	
	Server	Central monitor (in-hospital)	–	
		Central monitor (out-of-hospital)	–	
Sensor	Common	2DOP	On	P.164
		3DOP	On	
		M.ECG	On	
		NIBP	On	
		SpO2	On	
	DOP	Wired DOP No Assignment	Fix	
Alarm		B.Alarm Volume	Medium	P.166
		M.Alarm Volume	Medium	
		Alarm Restraint at Power-on	Off	
		Alarm suspend Time	5min	
		SpO2 Alarm suspend Time	2min	
Print	Print1	Top Sheet	On	P.167
		Auto Feed	On	
		Printing during measurement suspension	Off	
		Automatic printing of the mother vitals list at the end of print	Off	
		Linked with power on/off	On	
		FHR2 Waveform Offset	0	
		FHR3 Waveform Offset	0	
		Internal Examination	Details	

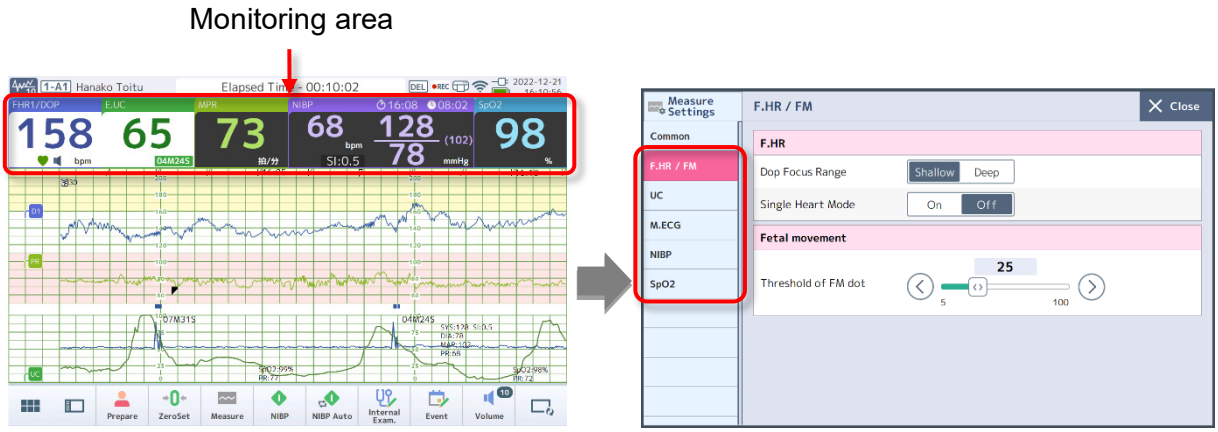
Menu		Setting Items	Default Value	Refer to
		Event	Details	
	Print2	Waveform line ・FHR1 ・FHR2 ・FHR3 ・UC ・MHR ・SpO2	 2dot 2dot 2dot 2dot 1dot 1dot	
Installation		Facility ID	–	P.169
		Ward ID User changes	– Prohibit	
		Bed ID (Wired) Bed ID (Wireless/in-hospital) Bed ID (Wireless/out-of-hospital) User changes	– – – Permit	
		Monitor ID User changes	– Prohibit	
System		Admin Setup Password	Not available	P.170
		Setting list	–	
		Return all settings to their initial status	–	

8-2. Display Settings Screen

You can display the settings screen from the monitoring area on the Home screen or on the Menu screen.

8-2-1. Opening the settings screen from the Home screen

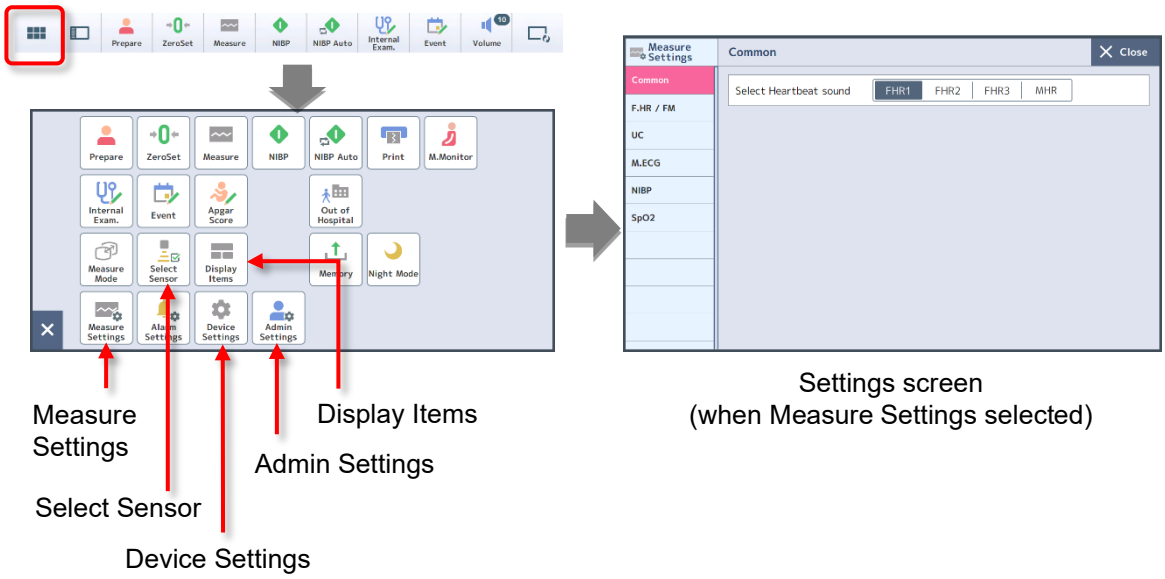
Press and hold the monitoring area to show the settings screen for those settings related to each measurement method.



Measure Settings screen
(with Doppler area pressed)

8-2-2. Display the Settings Screen from the Menu Screen

Touch (Menu) on the Bottom button, then touch [Measure Settings], [Select Sensor], [Display Items], [Device Settings], or [Admin Settings] on the Menu screen to display the settings screen. You can display the settings screen for all items.



Settings screen
(when Measure Settings selected)

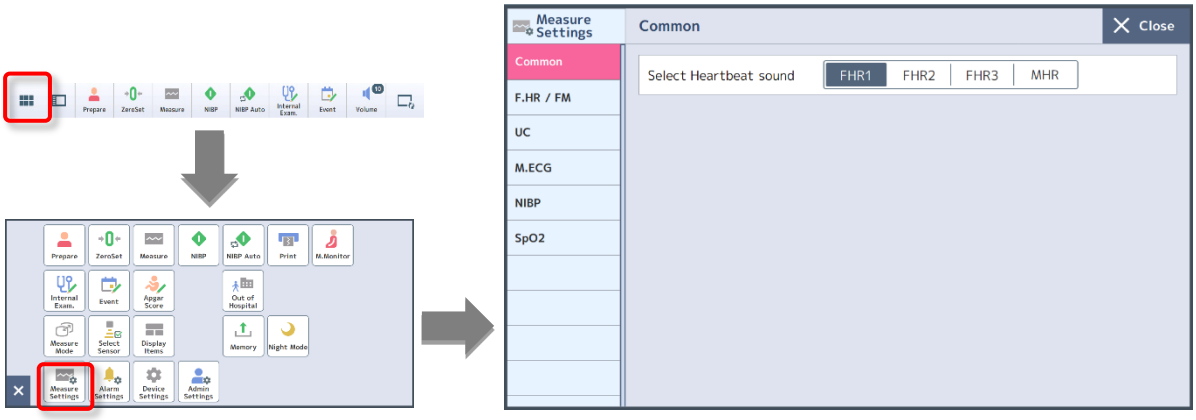
8-3. Settings Related to Measurement

8-3-1. Measure Settings

You can make settings for each Measurement method. You can configure six items, “Common”, “F.HR / FM", “UC”, “M.ECG”, “NIBP” and “SpO2”.

8-3-1-1. Common

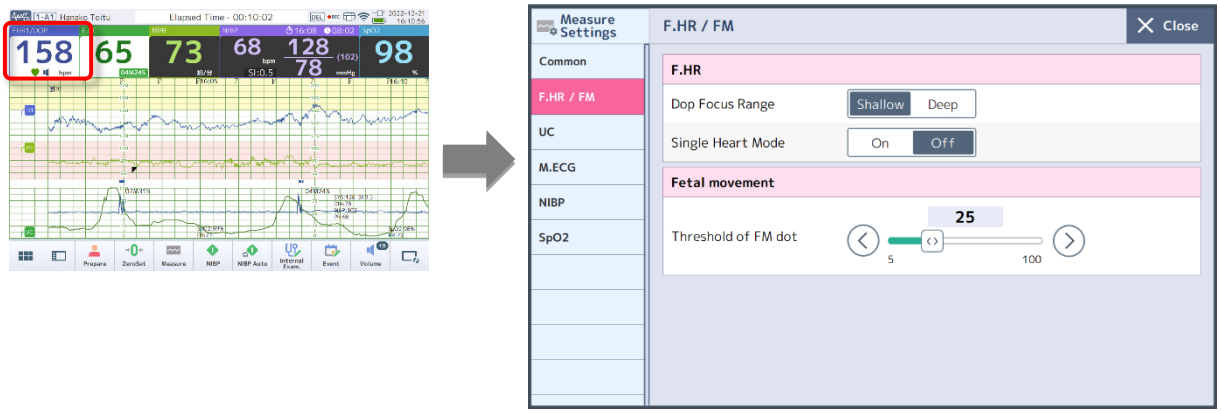
Touch (Menu) - [Measure Settings] on the Bottom button to display the Common settings screen for Measure Settings.



Settings Item	Function	Default Value
Select Heartbeat sound	Set which HR or synchronous sound should be output from the speaker. With this setting, only the current status is changed but the setting is not saved. Sensors connected subsequently are selected automatically.	–

8-3-1-2. F.HR / FM

Press and hold the Doppler area to display the F.HR / FM settings screen (when the Doppler transducer is connected).



Note

- Alternatively, touch [Measure Settings] - [F.HR / FM] on the Menu screen to display the F.HR / FM settings screen.
- Touch ‹ › or slide ‹› to specify a value.

Settings Item	Function	Default Value
Dop Focus Range	Set the range of depth monitored by ultrasound.	Shallow
Single Heart Mode	Set to perform a wide range of monitoring using two Doppler transducers for one fetus.	Off
Threshold of FM dots	Set the threshold for recording FM dots.	25

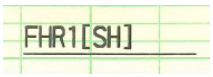
● Single Heart Mode setting

Important

- In order to use the Single Heart Mode setting, you must connect the optional Doppler transducer (refer to P.18 "3-2 Major Options").
- The Single Heart Mode works only when two Doppler transducers are connected. An ordinary measurement is made when one or three Doppler transducers are connected.

1. **Connect two Doppler transducers.**
2. **Set Single Heart Mode to “On”.**
3. **Touch [× Close].**
   You are returned to the Home screen. [DOP [SH]] is displayed on the F.HR mode field.

Example of displaying and printing Single Heart Mode

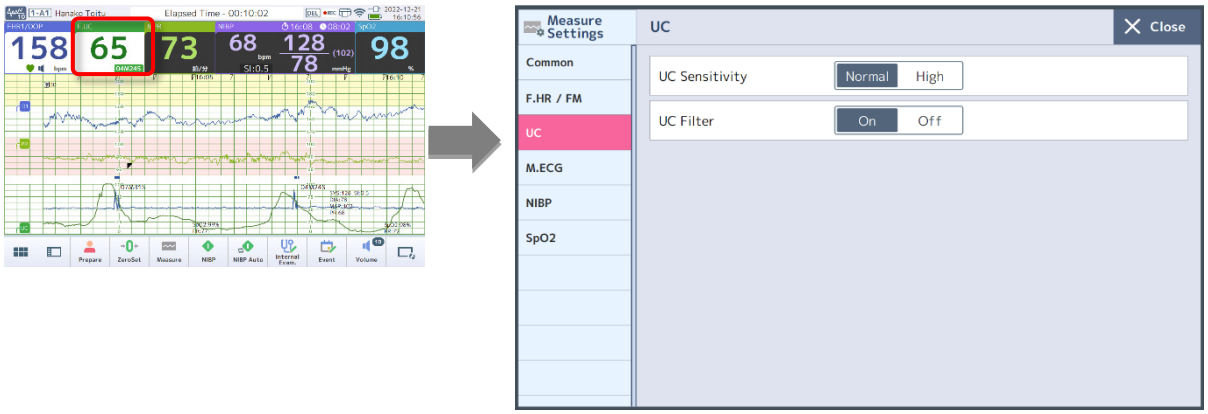


Note

You can start printing when a recorder (sold separately) is connected. [FHR1 [SH]] is printed on the header of the recording paper. During monitoring, the Doppler transducer with the best signal is automatically selected for recording.

8-3-1-3. UC

Press and hold the External Uterine Contraction (E.UC) monitoring area to display the UC settings screen.



Note

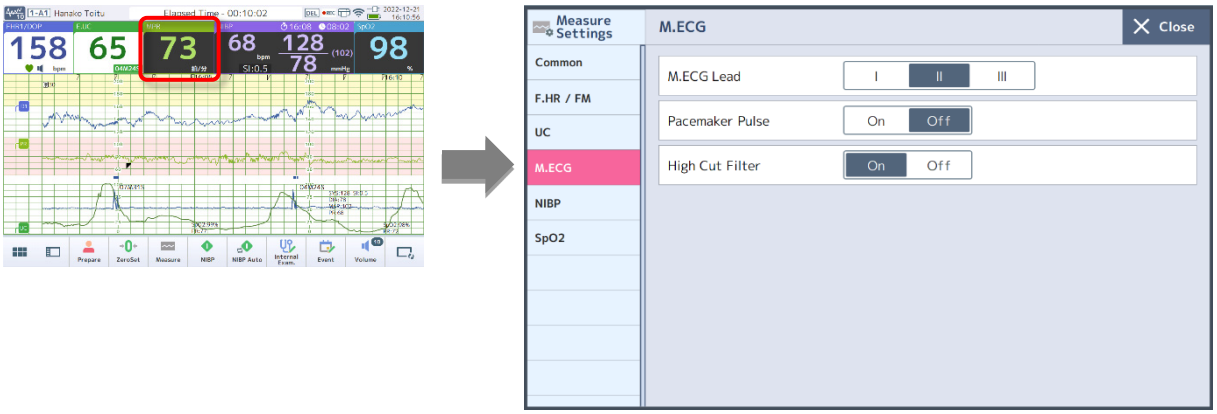
You can also display the UC settings screen by touching [Measure Settings] - [UC] on the Menu screen.

Settings Item	Function	Default Value
UC Sensitivity	Set the sensitivity level of UC.	Normal
UC Filter	Set the filter function to eliminate the breathing components.	On

8-3-1-4. M.ECG

MT-832-L / P

Press and hold the MHR monitoring area to display the M.ECG settings screen.



Note

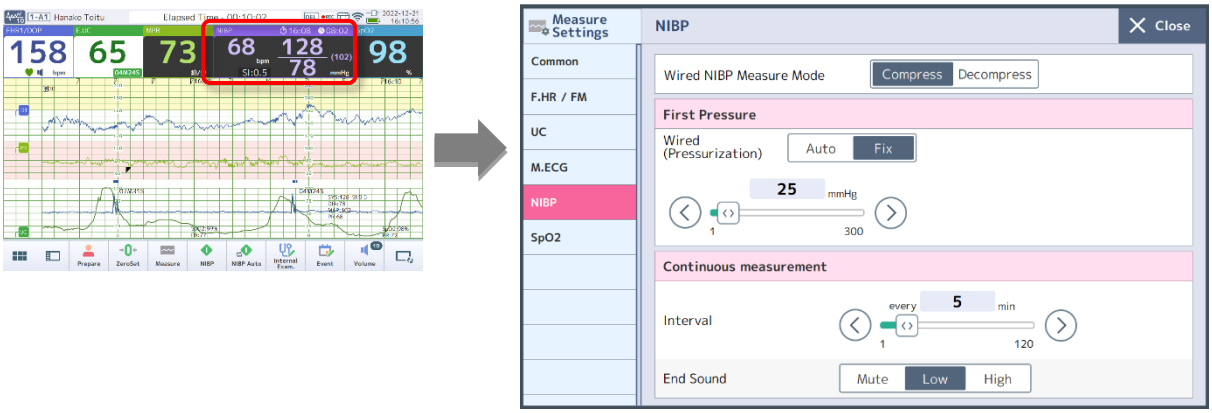
You can also display the M.ECG settings screen by touching [Measure Settings] - [M.ECG] on the Menu screen.

Settings Item	Function	Default Value
M.ECG Lead	Switches between induction combination.	II Lead
Pacemaker Pulse	Detects a pacemaker pulse and overwrites a pseudo-pacemaker pulse over an M.ECG waveform.	Off
High Cut Filter	Sets a wide-range noise cut filter for the M.ECG.	On

8-3-1-5. NIBP

MT-832-L / P

Press and hold the NIBP monitoring area to display the NIBP settings screen.



Note

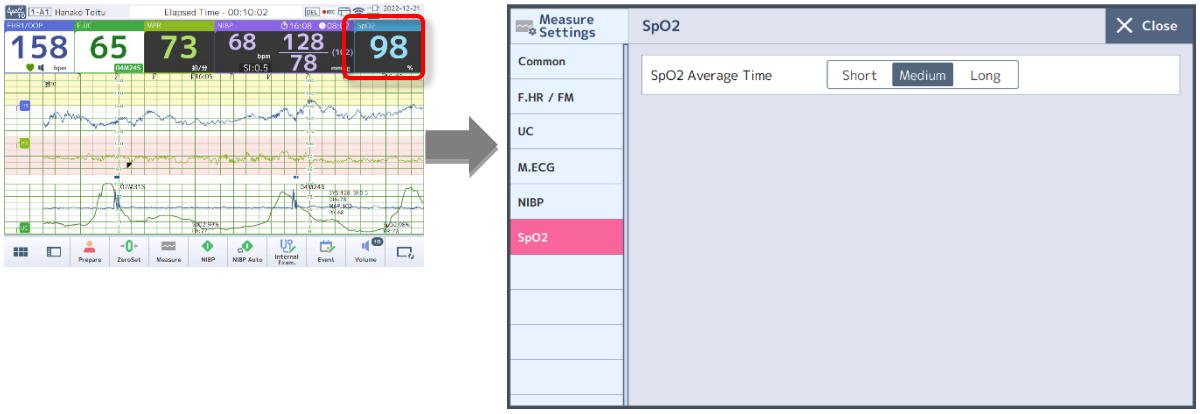
- You can also display the NIBP settings screen by touching [Measure Settings] - [NIBP] on the Menu screen.
- Touch ‹ › or slide ‹› to specify a value.

Settings Item		Function	Default Value
Wired NIBP Measure Mode		Select a measurement method (Compress/Decompress).	Compress
First Pressure		Set whether to determine that BP cannot be calculated automatically during pressurization at the first measurement or to fix the BP value. For “Fix”, set the target pressure value (1-300). From the second measurement onwards, the previous Systolic BP value＋30mmHg will be set (in increments of 1mmHg).	Auto
Continuous measurement	Interval	Set Interval (1-120) for a continuous measurement. Selection unit: 1/2/2.5/3/4/5/.../120 * If the interval is 5 minutes or more, measure every x minutes (x:5 min., x:10 min...on the device clock).	Every 5 min
	End Sound	Set the end sound after the preset interval has elapsed.	High

8-3-1-6. SpO2

MT-832-L / P

Press and hold the SpO_2 monitoring area to display the SpO_2 settings screen.



Note

You can also display the SpO_2 settings screen by touching [Measure Settings] - [SpO2] on the Menu screen.

Settings Item	Function	Default Value
SpO2 Average Time	Set to acquire a more accurate SpO_2 value that matches the patient's status. • Short: For a status where there is no body movement, including during sleep. • Medium: For a status where there is less body movement. • Long: For a status where there is frequent body movement.	Medium

8-3-2. Select Sensor

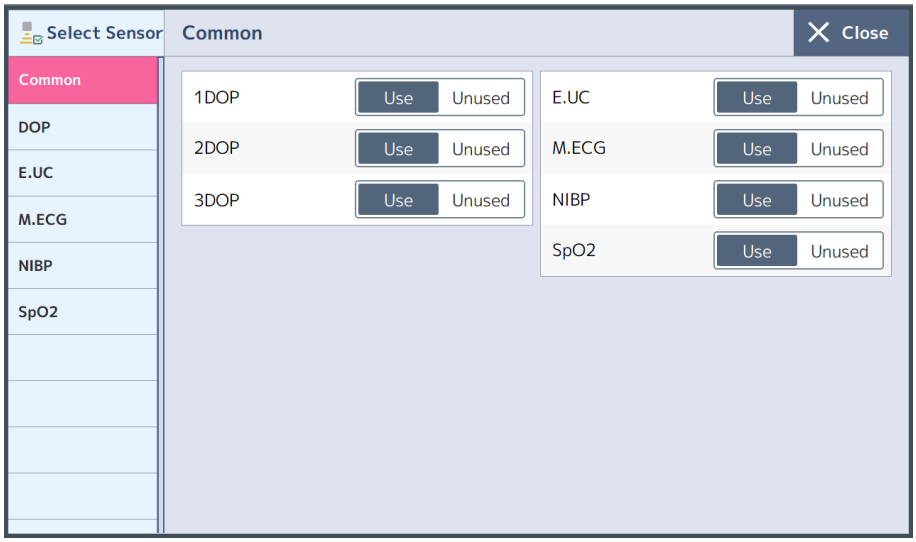
The device automatically detects a connected sensor, but you can specify the sensor you want to use manually.
You can configure six items, “Common”, “DOP", “E.UC”, “M.ECG”, “NIBP” and “SpO2”.

Note

In addition, touch  in “Sensor Status” on the Measure screen to display the Select Sensor screen.

8-3-2-1. Common

Touch  (Menu) - [Select Sensor] on the Bottom button to display the Common settings screen for Select Sensor.



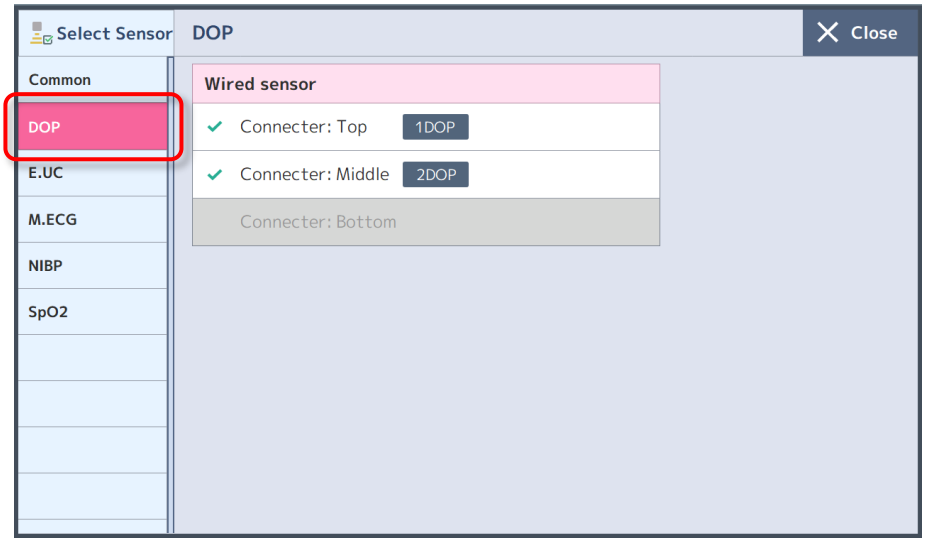
Important

Monitoring does not start even if a sensor is connected when this is set to “Unused”.

Settings Item	Function	Default Value
1DOP	Select whether or not to use the sensor.	Use
2DOP	Select whether or not to use the sensor.	Use
3DOP	Select whether or not to use the sensor.	Use
E.UC	Select whether or not to use the sensor.	Use
M.ECG	Select whether or not to use the sensor.	Use
NIBP	Select whether or not to use the sensor.	Use
SpO2	Select whether or not to use the sensor.	Use

8-3-2-2. DOP

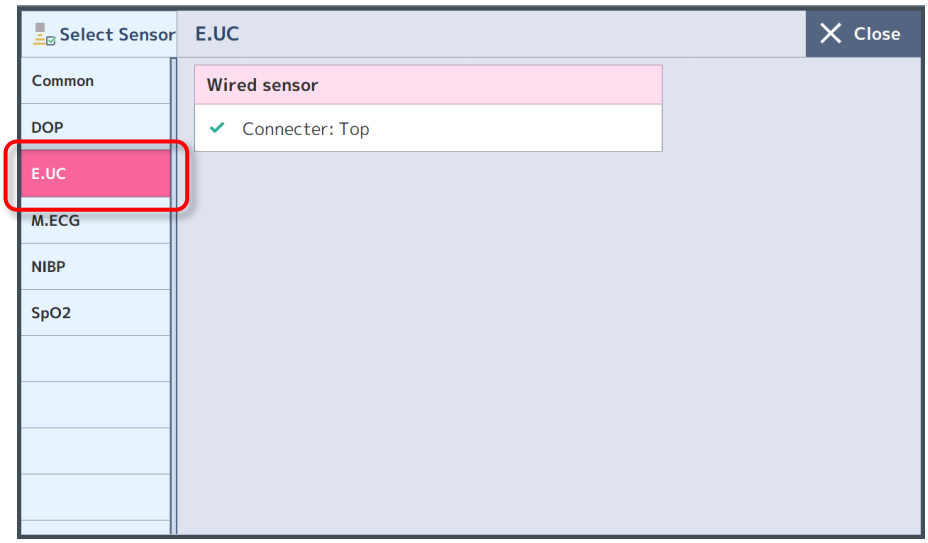
Touch (Menu) - [Select Sensor] - [DOP] on the Bottom button to display the DOP settings screen for Select Sensor.



Settings Item	Function	Default Value
Sensor connection status	Displays the status of the sensor currently connected.	–

8-3-2-3. E.UC

Touch (Menu) - [Select Sensor] - [E.UC] on the Bottom button to display the E.UC settings screen for Select Sensor.



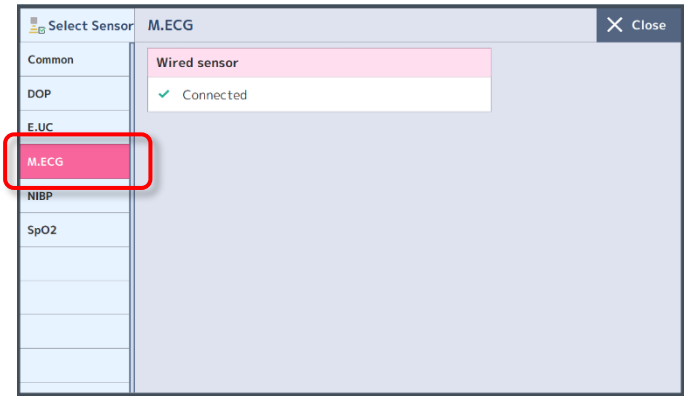
Settings Item	Function	Default Value
Sensor connection status	Displays the status of the sensor currently connected.	–

8-3-2-4. M.ECG/NIBP/SpO2

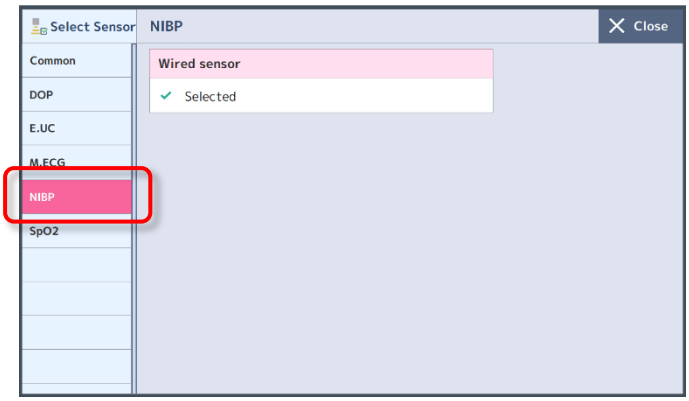
MT-832-L / P

Touch (Menu) - [Select Sensor] - [M.ECG]/[NIBP]/[SpO2] on the Bottom button to display the connection status for Select Sensor.

M.ECG



NIBP



SpO2

.

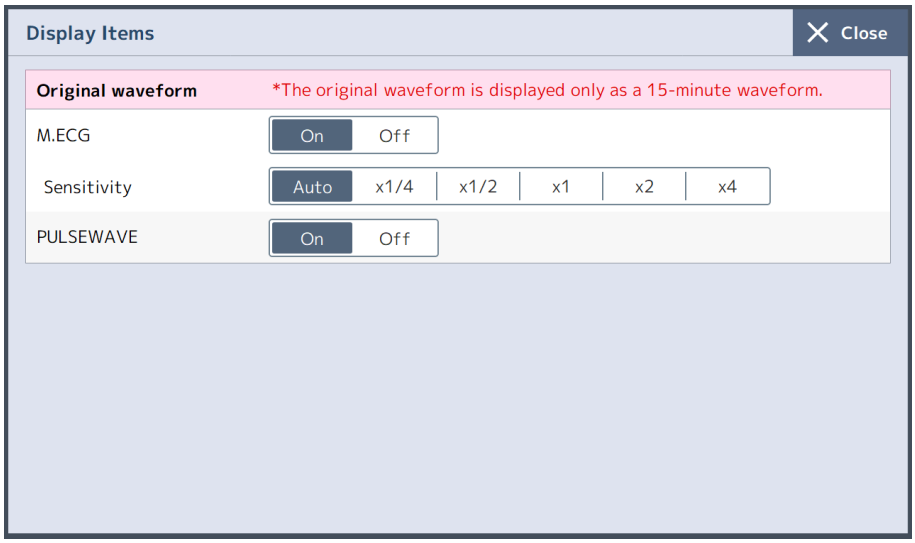
Settings Item	Function	Default Value
Sensor connection status	Displays the status of the sensor currently connected.	–

8-3-3. Display Items MT-832-L / P

Set the original waveform to display on the Home screen.
Touch (Menu) - [Display Items] on the Bottom button to display the Display Items settings screen.

Note

The original waveform is displayed only for “15min waveform”.

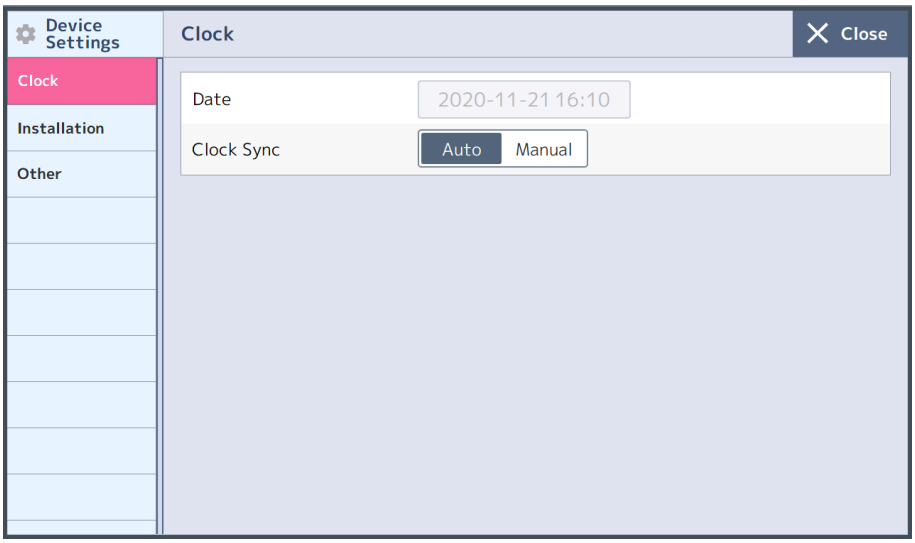


Settings Item	Function	Default Value
M.ECG	Sets to show or hide the item.	On
Sensitivity	Sets the sensitivity to Auto or scale factor (×1/4, ×1/2, ×1, ×2, ×4).	Auto
PULSEWAVE	Sets to show or hide the item.	On

8-4. Device Settings Which Can be Changed by the User

8-4-1. Clock

Make Date and Clock Sync settings.
Touch (Menu) - [Device Settings] on the Bottom button to display the Clock settings screen.



Important

The device does not support automatic time shift due to daylight-savings time. You need to adjust the clock manually when the time changes due to daylight-savings time.

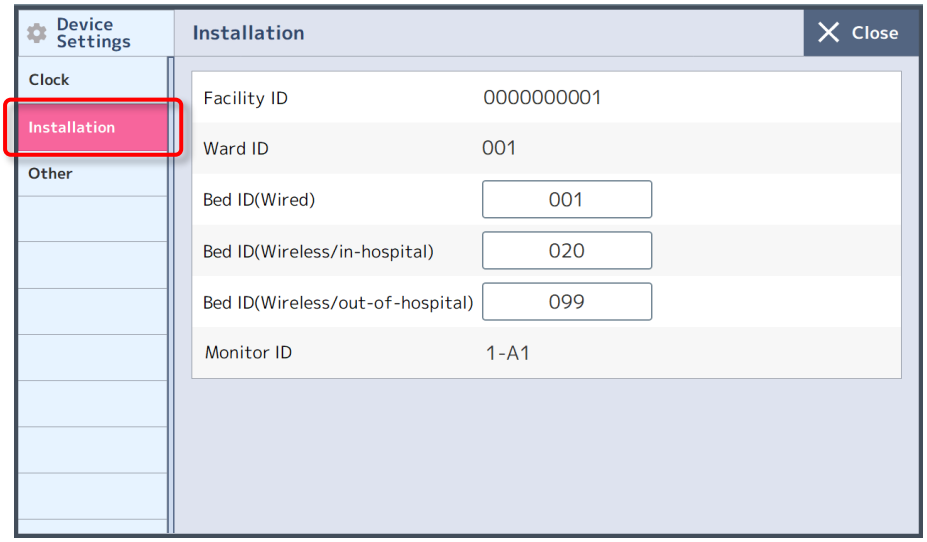
Note

For adjusting the clock, refer to P.49 “(3) Correct the time (or date)“.

Settings Item	Function	Default Value
Date	If Clock Sync is set to “Manual”, touch to display the Change date pad. Set a year (western calendar), month, day, and time (in 24-hour format).	–
Clock Sync	When set to [Manual] the date and time can be manually entered from the LCD screen of the device. When set to [Auto], time will be synchronized automatically with our Central monitor.	Auto

8-4-2. Installation

Make settings for the device ID, ward ID, and bed ID.
Touch (Menu) - [Device Settings] - [Installation] on the Bottom button to display the Installation settings screen.

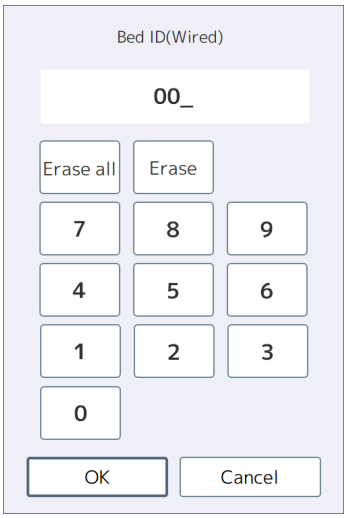


Note

You can allow or deny changes in Device Settings, except for “Facility ID”, from the Admin Settings (refer to P.169 "8-5-10 Installation").

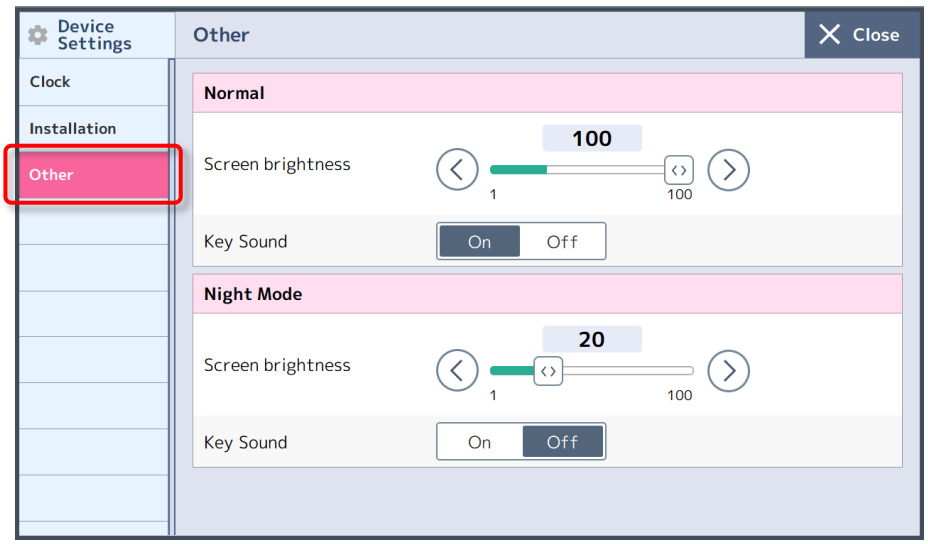
Settings Item	Function	Default Value
Facility ID	Displays the facility ID (cannot be changed).	–
Ward ID	Displays the ward ID.	–
Bed ID (Wired)	Displays the registered ID (in three digits) respectively. To change the ID, touch to show the bed ID entry pad (see below), enter a number, and then touch [OK].	–
Bed ID (Wireless/in -hospital)		–
Bed ID (Wireless/out-of -hospital)		–
Monitor ID	Displays the ID of the device.	–

■ **Bed ID entry pad**



8-4-3. Other

Make settings for Screen brightness and Key Sound for Normal mode and Night Mode.
Touch (Menu) - [Device Settings] - [Other] on the Bottom button to display the Other settings screen.



Note

Touch or slide to specify a value.

Settings Item		Function	Default Value
Normal	Screen brightness	Set the brightness of the LCD screen (1-100) in Normal mode.	100
	Key Sound	Set whether or not keys make a sound in Normal mode.	On
Night Mode	Screen brightness	Set the brightness of the LCD screen (1-100) in Night Mode.	20
	Key Sound	Set whether or not keys make a sound in Night Mode.	Off

8-5. Admin Settings Which Can be Changed by the Administrator

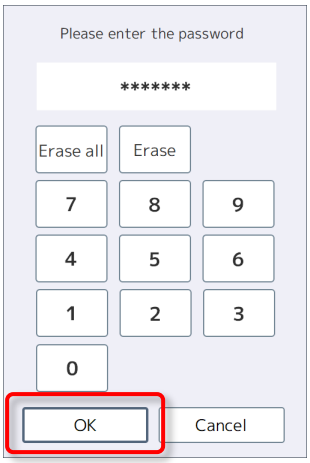
The Admin Settings can be changed only by the administrator.

Note

You can make settings on the presence of a password and change the password from the Admin Settings (refer to P.170 "8-5-11 System").

8-5-1. Enter a Password

1. **Touch [Admin Settings] on the Menu screen.**
   The password entry pad appears.
2. **Enter a 7-digit password and touch [OK].**
   The password entered is shown as "*".



If the password is correct, the Admin Settings screen is displayed.

Note

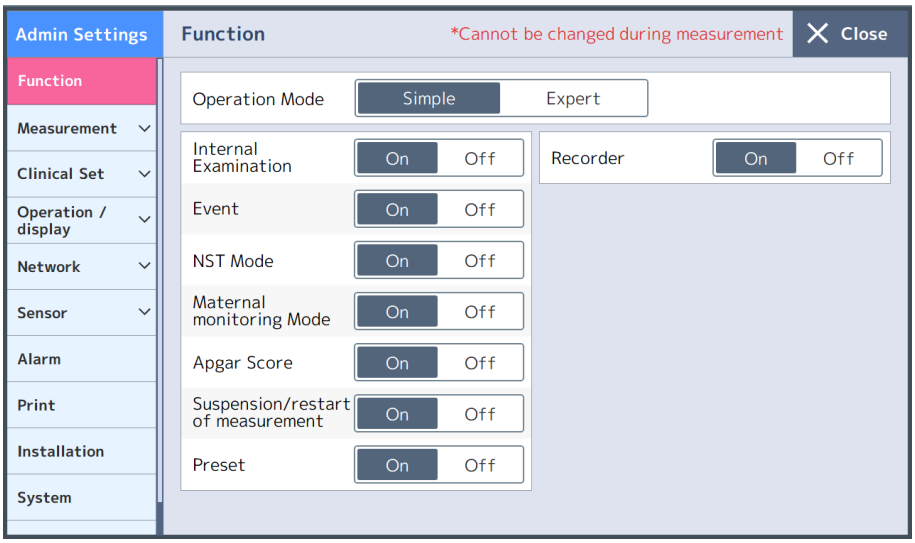
Contact us or our distributor if you forgot your password.

8-5-2. Function

Make settings on the operation mode and functions.
Touch (Menu) - [Admin Settings] on the Bottom button to display the Function settings screen.

Important

Changing the settings is not available during monitoring.



Settings Item	Function	Default Value
Operation Mode	Switch between Simple and Expert. Available functions vary depending on the mode being used. For details, refer to "■ Differences in Simple mode and Expert mode" below.	Expert
Internal Examination	Set the Internal Exam. function to On or Off.	On
Event	Set the Input Event function to On or Off.	On
NST Mode	Set the NST Mode to On or Off.	On
Maternal monitoring Mode	Set the Maternal monitoring Mode to On or Off.	On
Apgar Score	Set the Apgar Score function to On or Off.	On
Suspension/restart of measurement	Set the Suspension/restart of measurement function to On or Off.	On
Preset	Set the Preset function to On or Off.	On
Recorder	Set the Recorder function to On or Off.	On

■ Differences in Simple mode and Expert mode

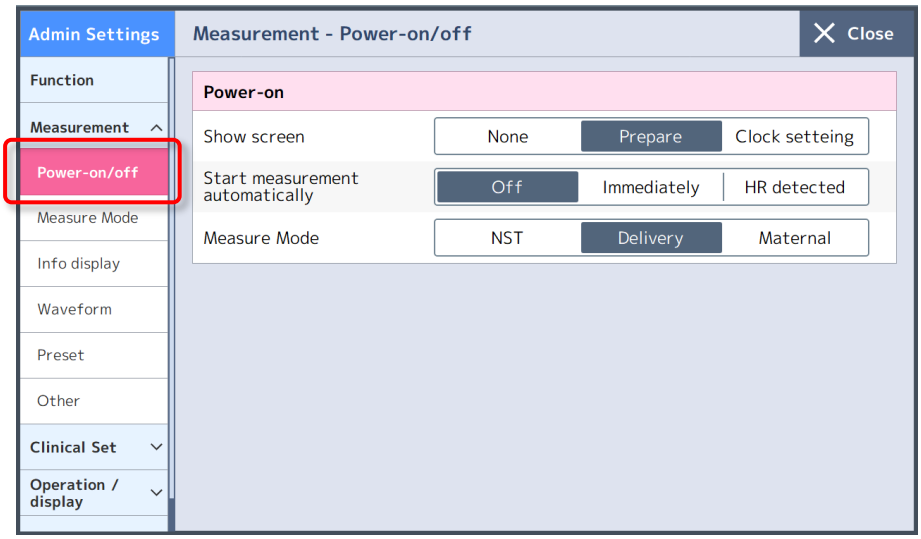
Settings Item	Expert mode	Simple mode
Select Sensor-Common	Settings available	All sensors are set to [Use] and cannot be changed. The settings screen is also hidden.
Admin Settings-Function * Only the default value is different	All set to On	All set to Off
Admin Settings-Measurement-Operation-Power-on * Only the default value is different	・Menu display: Prepare ・Start Auto measurement: Off	・Menu display: None ・Start Auto measurement: Immediately
Admin Settings-Sensor-DOP assignment setting	“Auto” or “Fix” selection available	Set to [Fix] and cannot be changed.

* Competing settings are stored for each mode, and the settings are retained after switching the mode.
* The default values in Expert mode are described for each setting item in this document.

8-5-3. Measurement

Make measurement settings.
Touch (Menu) - [Admin Settings] - [Measurement] on the Bottom button to display the Measure Settings screen.
You can configure six items, “Power-on/off”, “Measure Mode", “Info display”, “Waveform”, “Preset” and “Other”.

8-5-3-1. Power-on/off



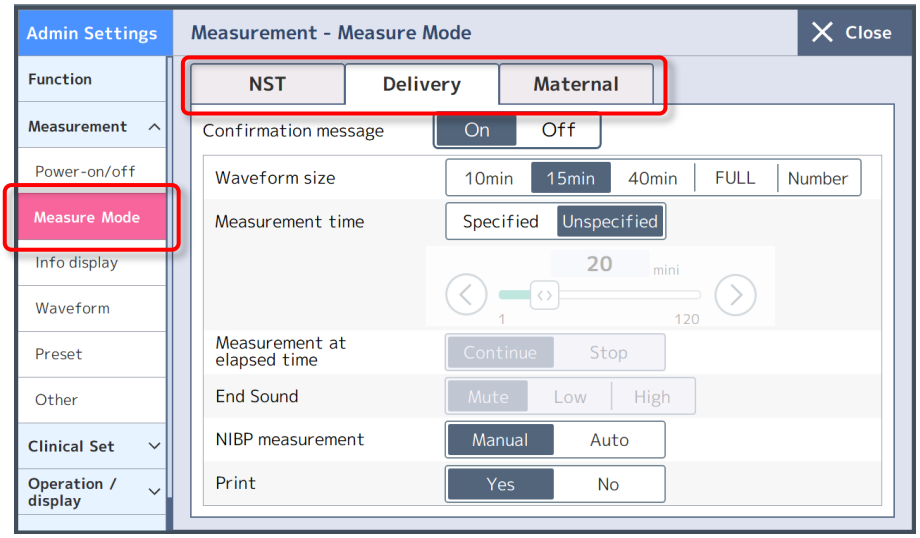
Settings Item		Function	Default Value
Power-on	Show screen	Set the screen display when the power is turned ON.	Prepare
	Start measurement automatically	Set the timing when automatic measurement will start.	Off
	Measure Mode	Set the Measure Mode when the power is turned ON.	Delivery

Important

If Start automatically is set to [Off] when the power is turned ON, you need to perform the Start operations to store the CTG data and send data to the Central monitor after the power is turned ON.

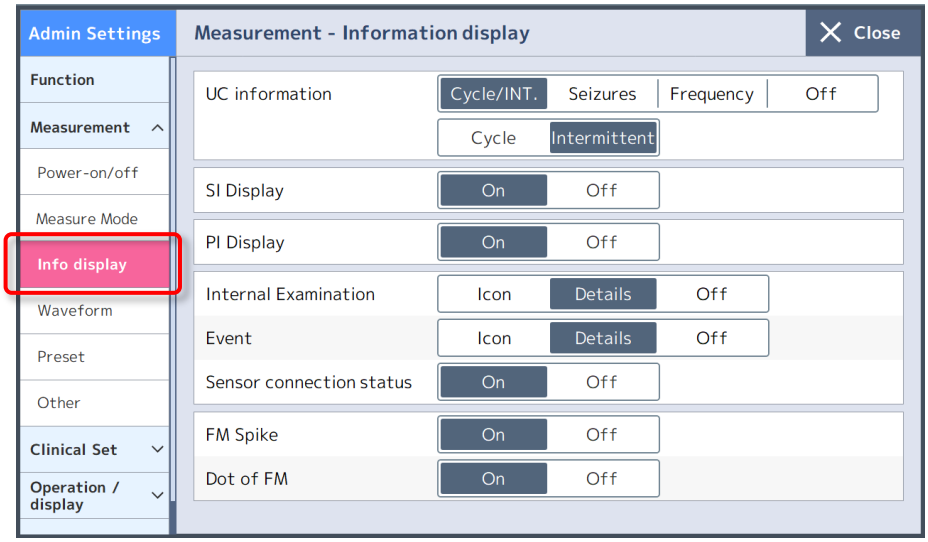
8-5-3-2. Measure Mode

You can switch the Measure Mode between the “NST”, “Delivery”, and “Maternal” tabs to make respective settings.



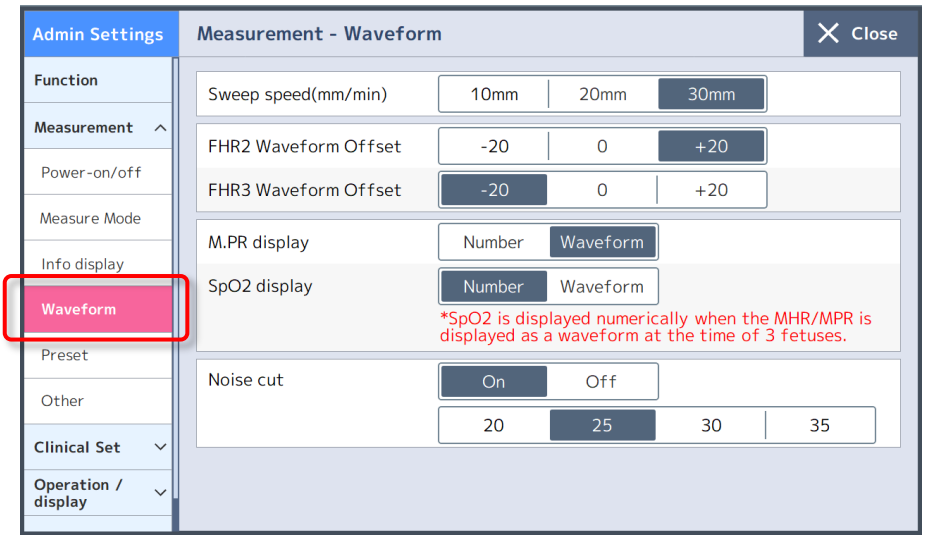
Settings Item	Function	Default Value		
		NST	Delivery	Maternal
Confirmation message	Set Confirmation message when a mode is selected.	On	On	On
Waveform size	Set the waveform size (10min/15min/40min/FULL SIZE/Number).	10min	15min	15min
Measurement time	Set whether or not to specify the measurement time. When “Specified” is selected touch ‹ › or slide ‹› to specify time.	Specified 20min	Unspecified	Unspecified
Measurement at elapsed time	Set whether or not to continue the measurement at elapsed time of monitoring.	Continue	Continue	Continue
End Sound	Set the sound emitted at the end of monitoring.	High	High	High
NIBP measurement	Set whether or not NIBP is measured in Manual or Auto mode.	Manual	Manual	Auto
Print	Set whether or not to print.	Yes	Yes	No

8-5-3-3. Info display



Settings Item	Function	Default Value
UC information	Set information to display in the UC monitoring area.	Cycle/INT.
SI Display	Set whether or not to display an SI value in the BP monitoring area.	On
PI Display	Set whether or not to display a PI value in the SpO_2 monitoring area.	On
Internal Examination	Set how to display internal examination registration information in the waveform area.	Details
Event	Set how to display event registration information in the waveform area.	Details
Sensor connection status	Set whether or not to display sensor connection/disconnection information in the waveform area.	On
FM Spike	Set whether or not to display FM spike waveforms.	On
Dot of FM	Set whether or not to display a dot for FM.	On

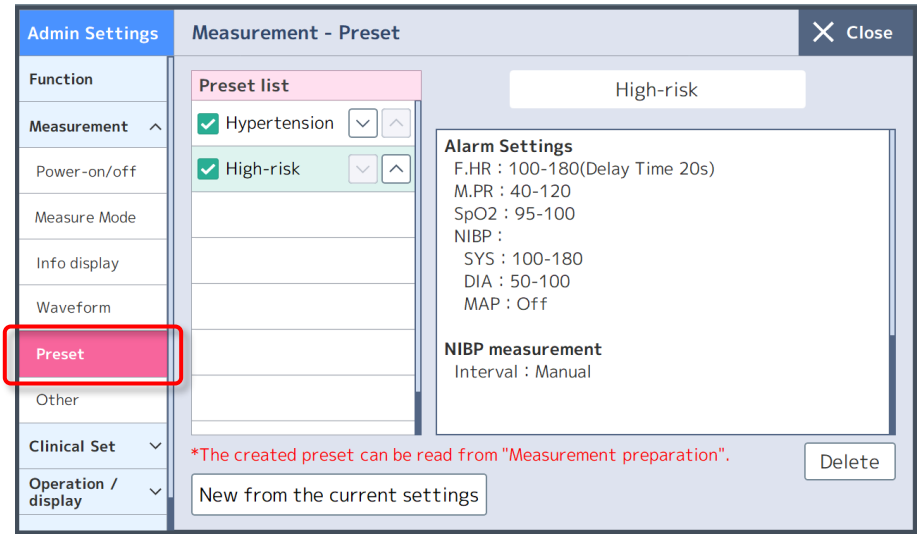
8-5-3-4. Waveform



Settings Item	Function	Default Value
Sweep speed (mm/min)	Set the speed of display and printing.	30mm/min
FHR2 Waveform Offset	Set the offset value of FHR2 waveforms on the LCD screen.	0
FHR3 Waveform Offset	Set the offset value of FHR3 waveforms on the LCD screen.	0
M.PR display	Set whether to use Number or Waveform to display the monitoring results in the waveform area.	Waveform
SpO2 display	Set whether to use Number or Waveform to display the monitoring results in the waveform area. * Number is used for display when MHR is shown as a waveform even if “Waveform” is selected.	Number
Noise cut (FHR/MHR)	Prevents the HR waveform from being concatenated continuously when differences between two continuous fetal heart rates exceed the set value. For “On”, set the HR difference (20/25/30/35).	On 25

8-5-3-5. Preset

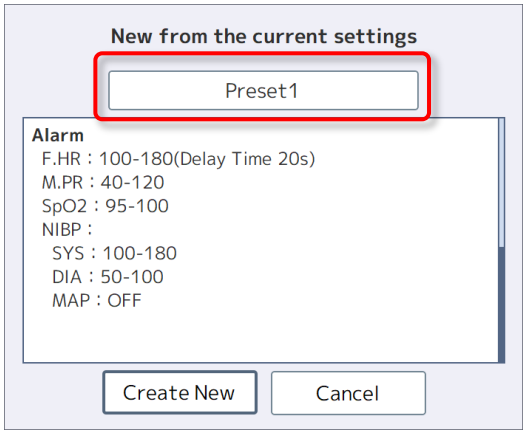
Set presets that can be selected on the Prepare screen.



Settings Item	Function	Default Value
Preset list	Displays the registered presets. Details for the selected presets (in green) are shown in the right pane. Unselected items will disappear in the Preset List on the Prepare screen. Select a preset and touch ⌃ ⌄ to change the order of the preset in the list.	
New from the current settings	Creates a new preset. Three items, “Alarm Settings”, “NIBP measurement settings (Interval and End Sound), and “Sensor to use” will be used to create a preset out of the current settings. You can register up to 10 presets.	
Delete	Deletes selected presets.	

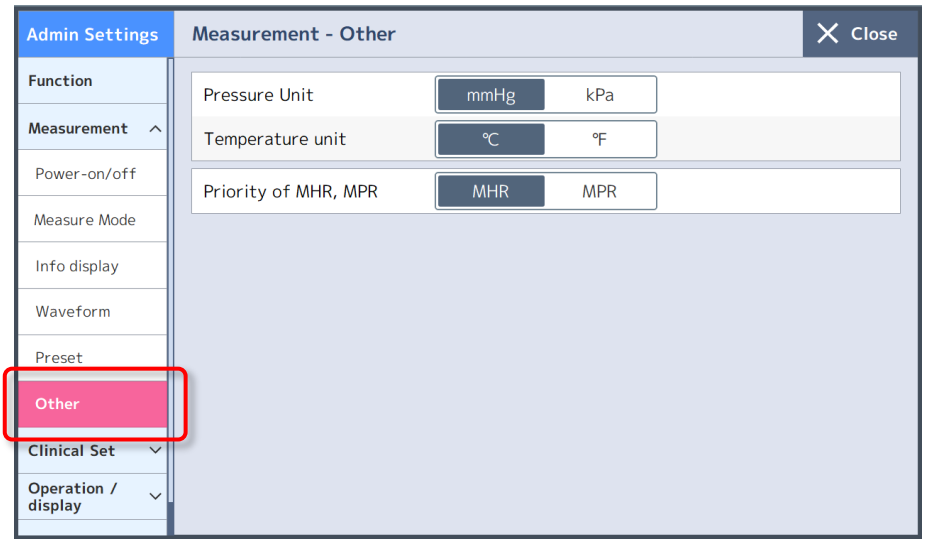
■ Create a new preset

1. **Touch [New from the current settings]**
   The Create New screen is displayed.
2. **Touch a preset name.**



   The Preset name entry screen and the keypad appear.
3. **Enter a preset name and touch [↵] (Enter) key.**
   The Create New screen is displayed.
4. **Touch [Create New].**
   The created preset will be added to the Preset list.

8-5-3-6. Other

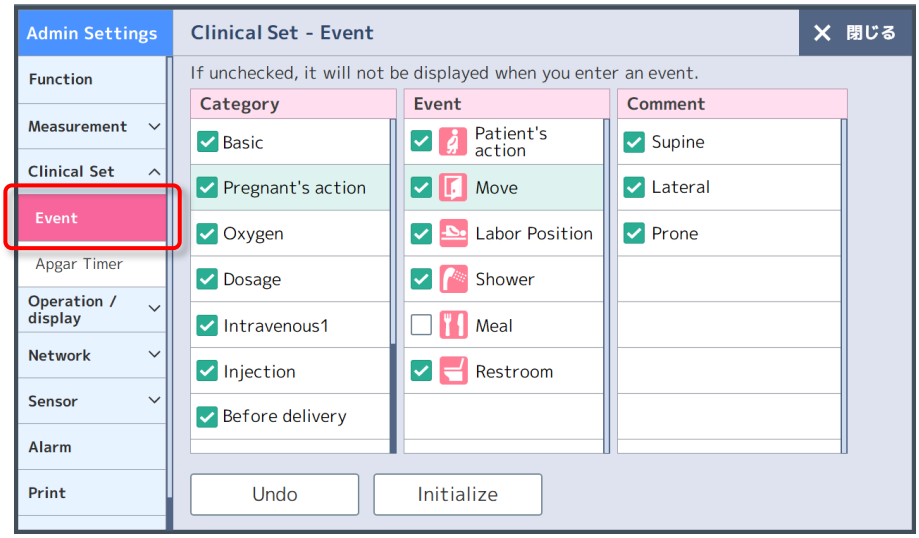


Settings Item	Function	Default Value
Pressure Unit	Set the pressure unit.	mmHg
Temperature unit	Set the temperature unit.	°C
Priority of MHR, MPR	Set which monitoring results should be selected when the M.ECG sensor and the SpO_2 sensor are connected at the same time.	MHR

8-5-4. Clinical Set

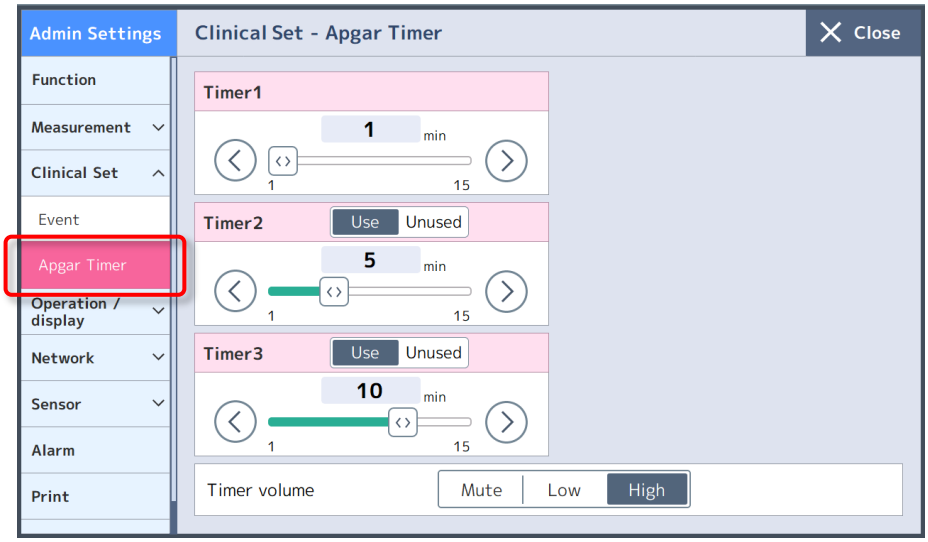
Make settings for the Clinical Set function.
Touch (Menu) - [Admin Settings] - [Clinical Set] on the Bottom button to display the Clinical Set settings screen.
You can configure two items, “Event” and “Apgar Timer”.

8-5-4-1. Event



Settings Item	Function	Default Value
Category/Event/Comment	Displays events that can be used for event entry by Category, Event, and Comment. If these are not selected, they will not be displayed when you enter an event.	
Undo	Returns to the previous state before you made a change.	
Initialize	Returns to the initial values.	

8-5-4-2. Apgar Timer



Note

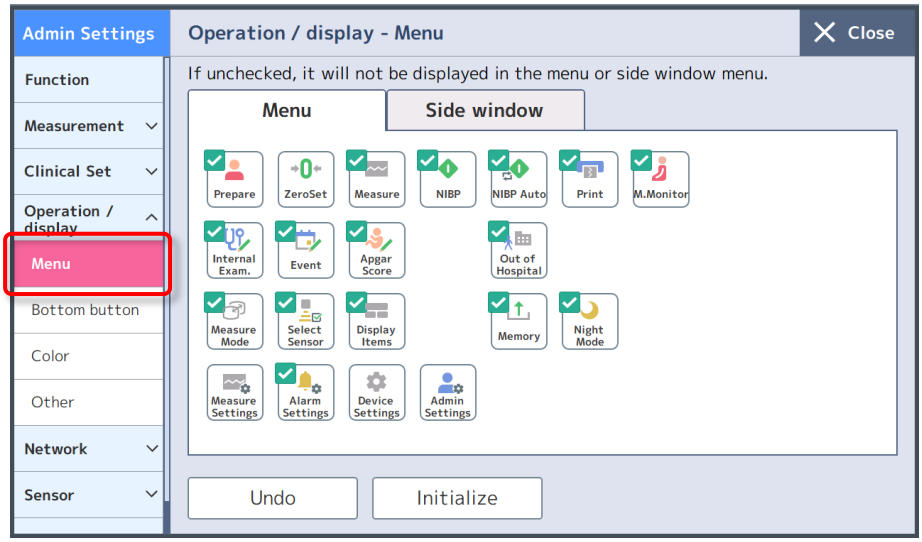
Touch ◁ ▷ or slide ‹› to specify a value.

Settings Item	Function	Default Value
Timer1	Set the time for Apgar Timer 1 (1 to 15min).	1min
Timer2	Set whether or not to use Apgar Timer 2. If “Use” is selected, set the time (1-15min).	Use 5min
Timer3	Set whether or not to use Apgar Timer 3. If “Use” is selected, set the time (1-15min).	Use 10min
Timer volume	Set the volume for the Apgar Timer.	High

8-5-5. Operation / display

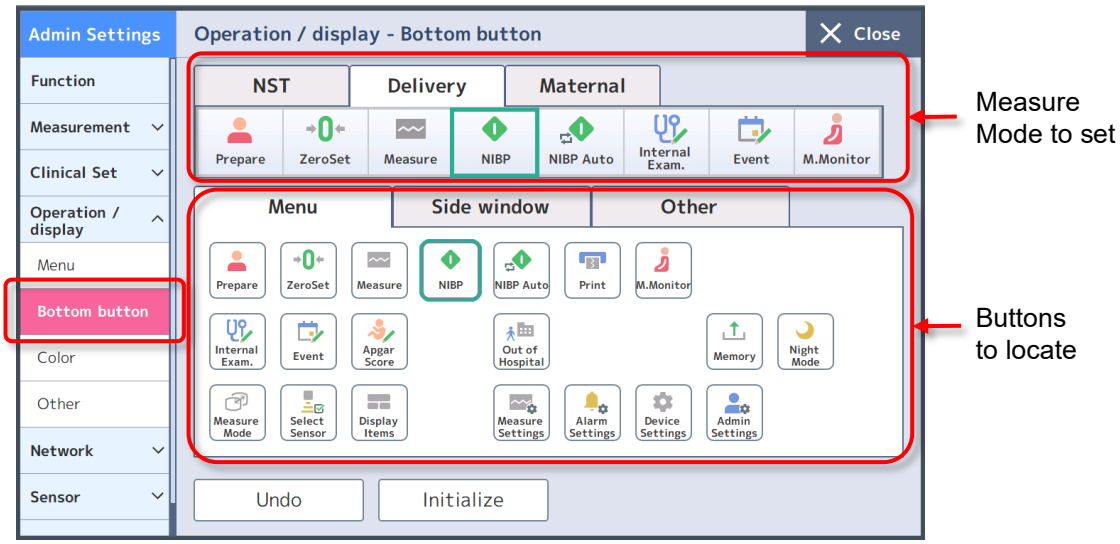
Make settings for items and buttons you want to display on the screen.
Touch (Menu) - [Admin Settings] - [Operation / display] on the Bottom button to display the Operation / display settings screen.
You can configure four items, “Menu”, “Bottom button”, “Color”, and “Other”.

8-5-5-1. Menu



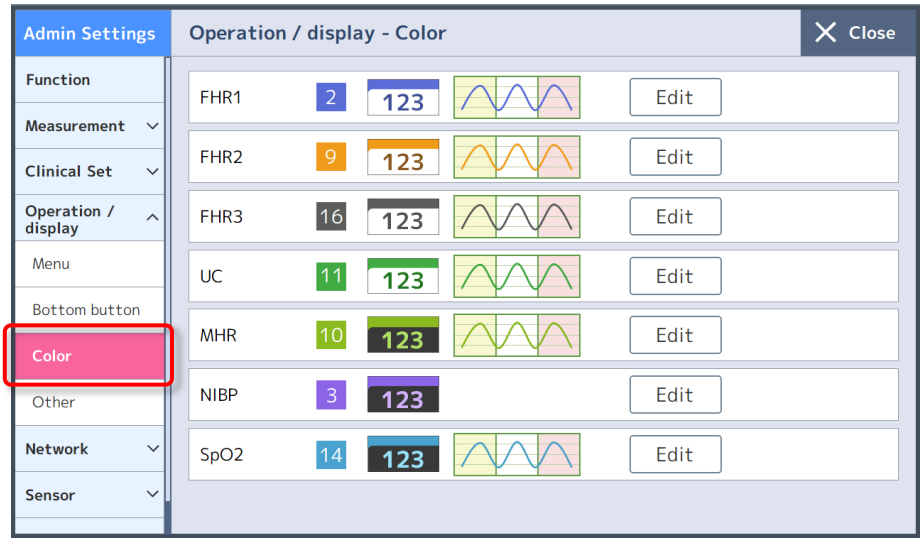
Settings Item	Function	Default Value
Menu/Side window On/Off setting	Set items you want to display on the Menu or Side window. If these are not selected, they will not be displayed.	–
Undo	Returns to the previous state before you made a change.	–
Initialize	Returns to the initial values.	–

8-5-5-2. Bottom Button



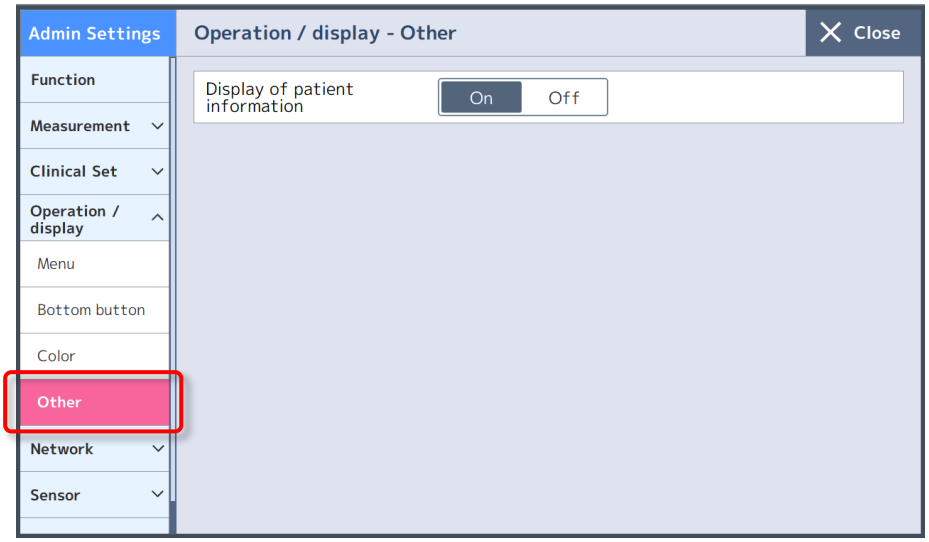
Settings Item	Function	Default Value
Measure Mode to set	Use the “NST”/“Delivery”/“Maternal” tabs to select measurement modes to configure the Bottom buttons, and then select which mode will be assigned to which Bottom button.	–
Buttons to locate	Select buttons you want to locate from the buttons on the “Menu”/“Side window”/“Other” tab. You can configure buttons that perform specific events from the “Other” tab.	–
Undo	Returns to the previous state before you made a change.	–
Initialize	Returns to the initial values.	–

8-5-5-3. Colors



Settings Item	Function	Default Value
FHR1/FHR2/FHR3/UC/MHR/NIBP/SpO2	Set the color of each monitoring value (including the color of numbers, the color of waveform lines, etc.) To change, touch [Edit] to display a candidate color, select the color and thickness of the line, and then touch [OK].	FHR1:2 FHR2:9 FHR3:16 UC:11 MHR:10 NIBP:3 SpO2:14

8-5-5-4. Other

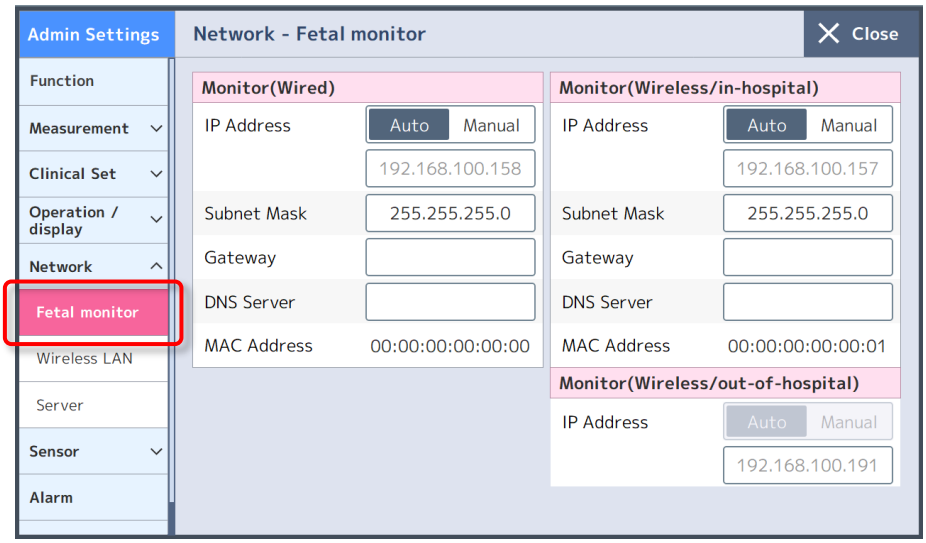


Settings Item	Function	Default Value
Display of patient information	Set whether to display the patient information on the Home screen or the top sheet when printing.	On

8-5-6. Network

Make network and server settings.
Touch (Menu) - [Admin Settings] - [Network] on the Bottom button to display the Network settings screen.
You can configure three items, “Fetal monitor”, “Wireless LAN”, and “Server”.

8-5-6-1. Fetal monitor



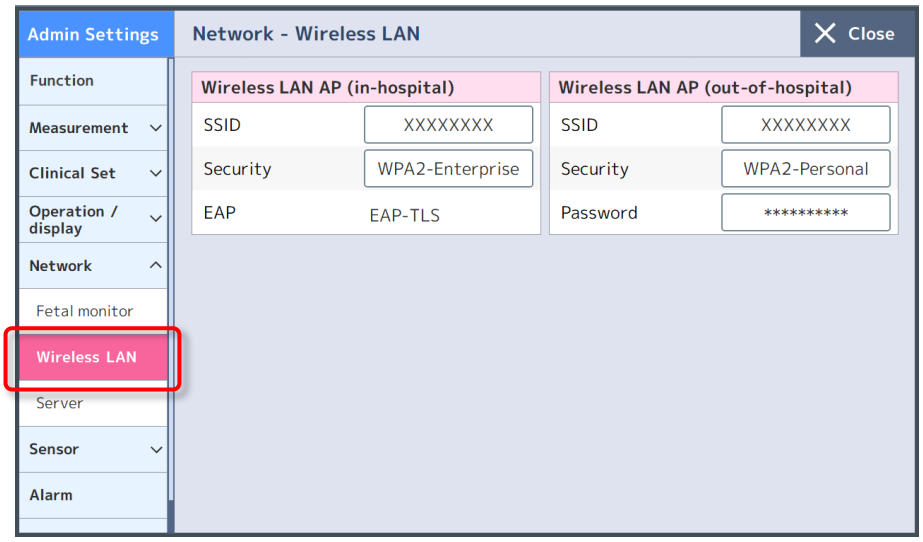
Note

To enter characters or numbers, touch the field to show the entry pad, enter a number and then touch [OK].

Settings Item	Function	Default Value
Monitor (Wired)	For a wired network connection of the device, configure the IP Address (Auto/Manual), Subnet Mask, Gateway, DNS Server, and MAC Address.	Manual
Monitor (Wireless/ in-hospital)	For a wireless (in-hospital use) network connection of the device, configure the IP Address (Auto/Manual), Subnet Mask, Gateway, DNS Server, and MAC Address.	Manual
Monitor (Wireless/ out-of-hospital)	When the device is used outside the hospital, the IP address assigned by the connected smartphone is displayed.	Fixed to auto

8-5-6-2. Wireless LAN MT-831-S / MT-832-P

Configure the in-hospital and out-of-hospital wireless LAN connection.



Note

To enter characters or numbers, touch the field to show the entry pad, enter a number, and then touch [OK].

In addition, touch the Enter Key to close the entry pad.

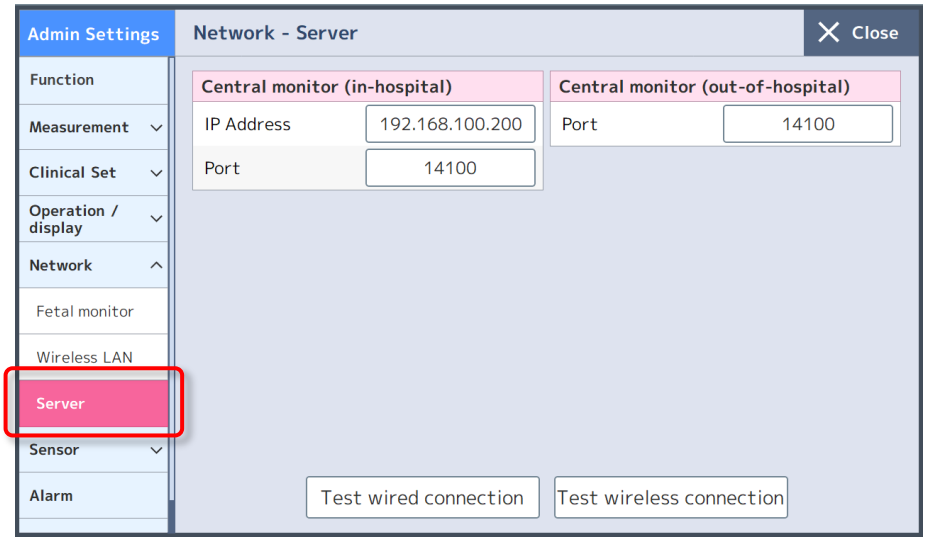
- Use ⌫ to delete the last entered character.
- Use ← → to confirm the position you want to enter a character.

Settings Item	Function	Default Value
SSID	Set the SSID of the wireless LAN access point to be connected to or the smartphone to be tethered.	–
Security	Set the security (WPA-Personal/WPA2-Personal/WPA-Enterprise/WPA2-Enterprise) of the wireless LAN access point to be connected to or the smartphone to be tethered.	WPA2-Personal
Password	Set the password if the security is "WPA-Personal"/"WPA2-Personal".	–
EAP	If the security is set to "WPA-Enterprise"/"WPA2-Enterprise", the selected authentication method is displayed.	–

Important

- The password for the wireless LAN access point to be connected to must be 8 to 64 characters long.
- When connecting to a wireless LAN access point with "WPA-Enterprise"/"WPA2-Enterprise, a separate configuration is required. Please contact TOITU distributor.
- When connecting using "WPA-Enterprise"/"WPA2-Enterprise", the connection will no longer be possible if the certificate expires.

8-5-6-3.Server



Note

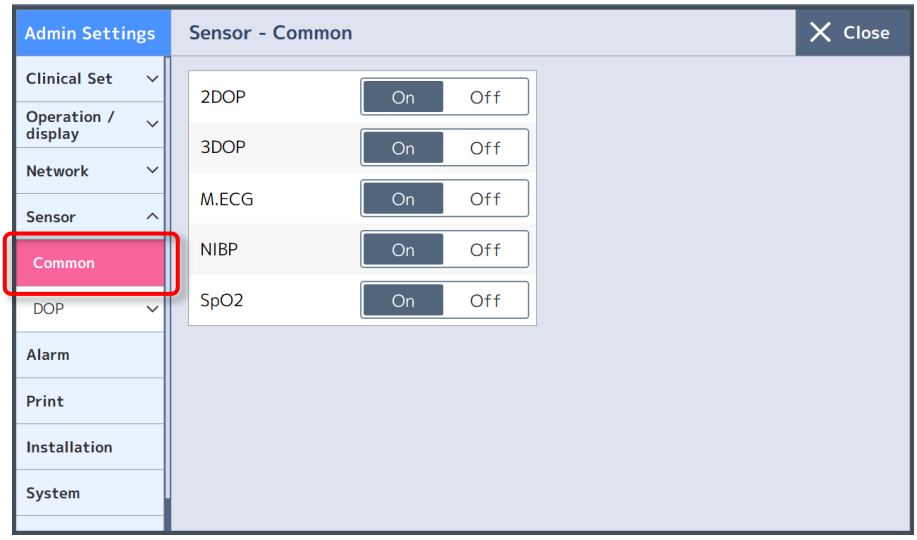
To enter characters or numbers, touch the field to show the entry pad, enter a number, and then touch [OK].

Settings Item	Function	Default Value
Central monitor (in-hospital)	Set whether or not to use the in-hospital Central monitor. To connect with the in-hospital Central monitor, configure the IP Address and Port.	–
Central monitor (out-of-hospital)	To connect with the Central monitor (MF-7700 only) out-of-hospital, configure the Port.	–
Test wired connection	Execute a wired connection test after configuration.	–
Test wireless connection	Execute a wireless connection test after configuration.	–

8-5-7. Sensor

Make settings for the sensors you want to use.
Touch (Menu) - [Admin Settings] - [Sensor] on the Bottom button to display the Sensor settings screen.
You can configure two items, “Common” and “DOP".

8-5-7-1. Common

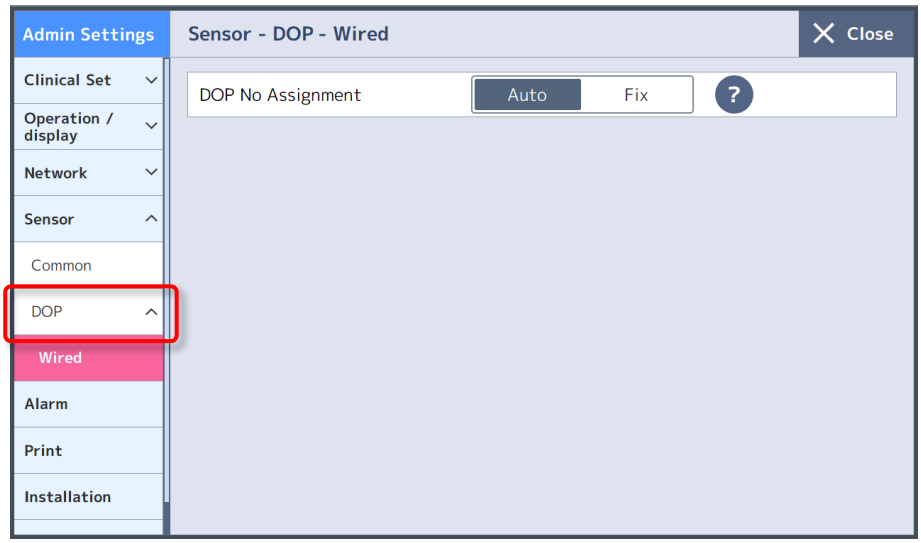


Important

Items that are set to “Off” are not displayed on the Measure Settings screen or User Device Settings screen. Setting sensors which are not in use to “Off” helps when using the device as unnecessary settings are not displayed.

Settings Item	Function	Default Value
2DOP	Set the 2DOP sensor to On or Off.	On
3DOP	Set the 3DOP sensor to On or Off.	On
M.ECG	Set the M.ECG sensor to On or Off.	On
NIBP	Set the NIBP sensor to On or Off.	On
SpO2	Set the SpO_2 sensor to On or Off.	On

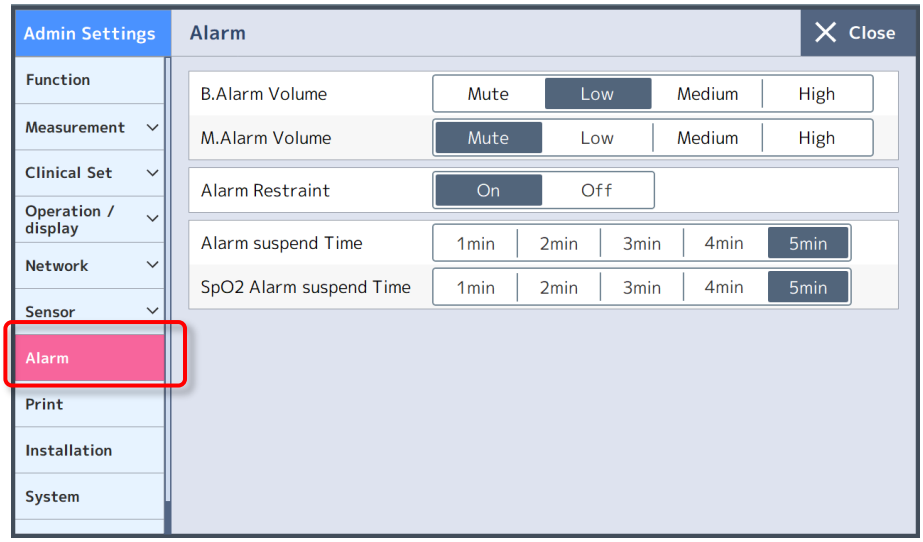
8-5-7-2. DOP



Settings Item	Function	Default Value
DOP No Assignment	Set the DOP No. assignment to Auto or Fix. • “Auto”: The number is assigned in the order DOPs are connected. • “Fix”: The Y-shaped Doppler/External UC transducer is assigned from 1DOP while the Doppler transducer is assigned from 2DOP in the order they are connected.	Fix

8-5-8. Alarm

Make settings on the volume and suspended time of an alarm.
Touch (Menu) - [Admin Settings] - [Alarm] on the Bottom button to display the Alarm settings screen.



Settings Item	Function	Default Value
B.Alarm Volume	Set the volume of a biological alarm.	Medium
M.Alarm Volume	Set the volume of a device alarm.	Medium
Alarm Restraint	Set whether or not to restrain the alarm when the power is turned ON.	Off
Alarm suspend Time	Set the time until the alarm will be released automatically when alarm suspension is active.	5min
SpO2 Alarm suspend Time	Set the time until the alarm will be released automatically when SpO_2 alarm suspension is active.	2min

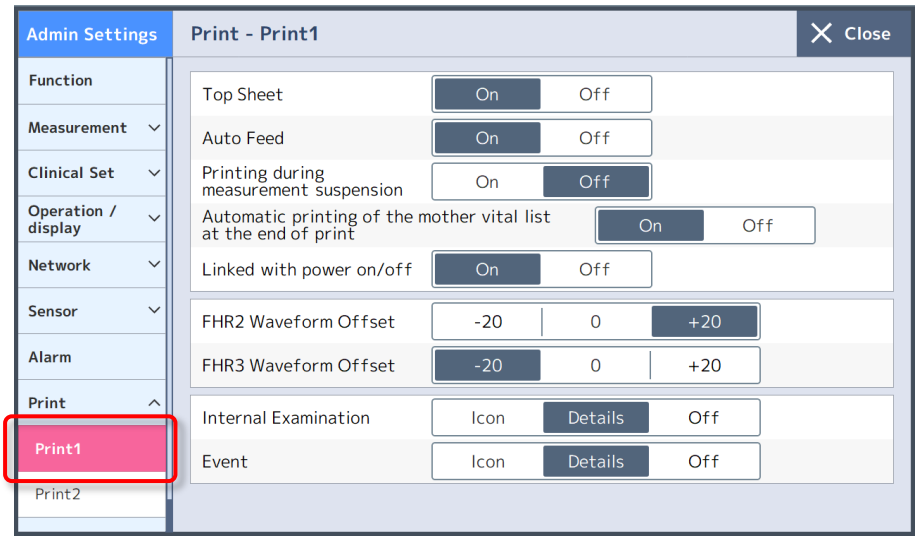
Note

- The value in “M.Alarm Volume” cannot be larger than the value in “B.Alarm Volume”.
- Contact us or our distributor when you want to set the alarm volume to [Mute].

8-5-9. Print

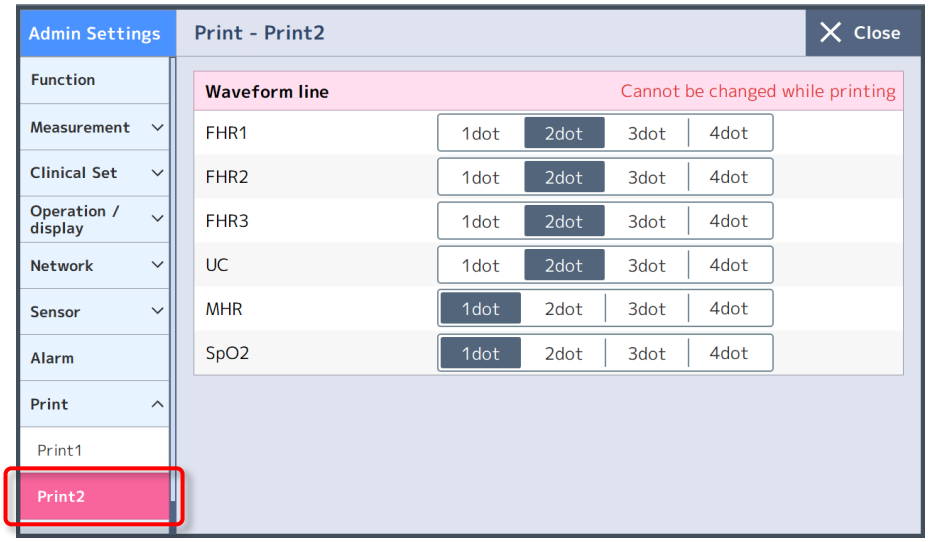
Make print settings when a recorder (sold separately) is connected.
Touch (Menu) - [Admin Settings] - [Print] on the Bottom button to display the Print settings screen. This is enabled only when a recorder is connected.
You can configure two items, “Print1” and “Print2".

8-5-9-1. Print1



Settings Item	Function	Default Value
Top Sheet	Set whether or not to print the top sheet.	On
Auto Feed	Set whether or not to feed the recording paper to its fold line at the end of printing.	On
Printing during measurement suspension	Set whether or not to print during measurement suspension. *Cannot be changed during measurement suspension.	Off
Automatic printing of the mother vital list at the end of print	Set whether or not to print a mother vitals list at the end of CTG print.	Off
Linked with power on/off	Set whether or not to power ON/OFF the recorder when the device is powered ON/OFF.	On
FHR2 Waveform Offset	Set the offset of a FHR2 waveform print position.	0
FHR3 Waveform Offset	Set the offset of a FHR3 waveform print position.	0
Internal Examination	Set how to print internal examinations. When "Icon" is selected, only icons are printed; when "Details" is selected, descriptions of diagnosis and diagnosis times are printed.	Details
Event	Set how to print an event. When "Icon" is selected, only icons are printed; when "Details" is selected, the icon, event name, and registration time are printed.	Details

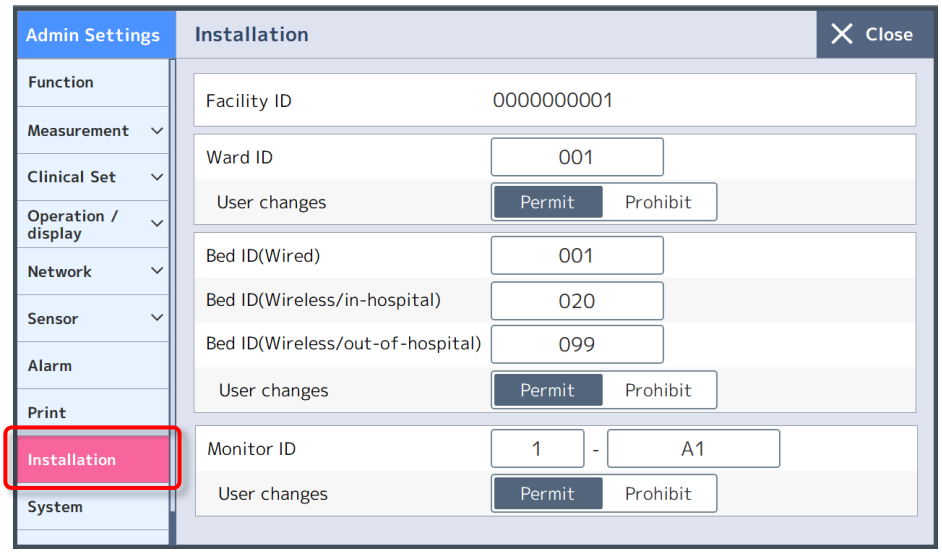
8-5-9-2. Print2



Settings Item	Function	Default Value
Waveform line	Set the line thickness of each waveform on the Home screen. ・FHR1 ・FHR2 ・FHR3 ・UC ・MHR ・SpO2 *Cannot be changed while printing.	 2dot 2dot 2dot 2dot 1dot 1dot

8-5-10. Installation

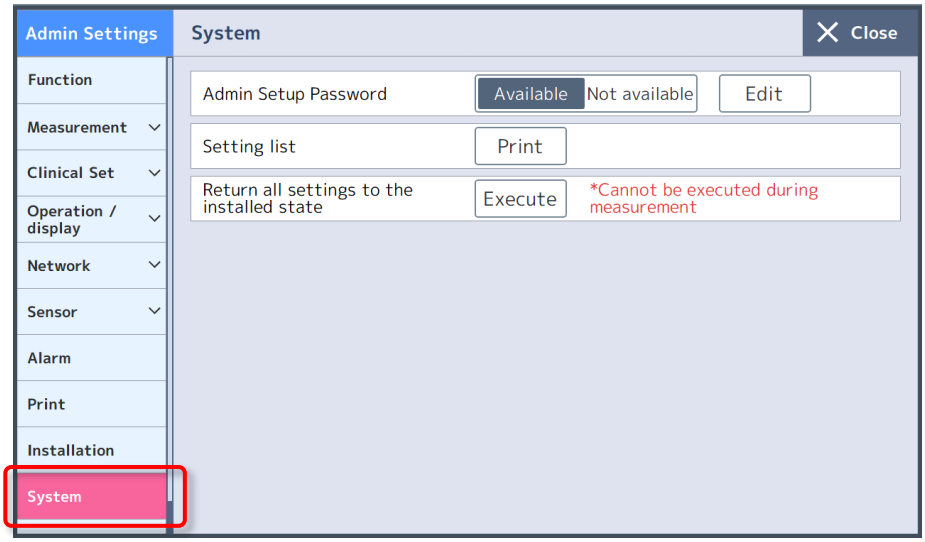
Make settings for the device ID, ward ID, and bed ID.
Touch (Menu) - [Admin Settings] - [Installation] on the Bottom button to display the Installation settings screen.



Settings Item	Function	Default Value
Facility ID	Displays the facility ID (cannot be changed).	–
Ward ID User changes	Set the ward ID (in 3 digits). To change the ID, touch to show the ward ID entry pad, enter a number, and then touch [OK]. Set whether or not to allow the user to change the ID.	– Prohibit
Bed ID (Wired) Bed ID (Wireless/in-hospital) Bed ID (Wireless/out-of-hospital) User changes	Set the wired, wireless (in-hospital), and wireless (out-of-hospital) bed IDs (in 3 digits). To change the ID, touch to show the bed ID entry pad, enter a number, and then touch [OK]. Set whether or not to allow the user to change the ID.	– – – Permit
Monitor ID User changes	Set the device ID (number-alphabet＋number). To change the ID, touch to show the Monitor ID entry pad, enter a number, and then touch [OK]. Set whether or not to allow the user to change the ID.	– Prohibit

8-5-11. System

Make system settings including the admin password.
Touch (Menu) - [Admin Settings] - [System] on the Bottom button to display the System settings screen.

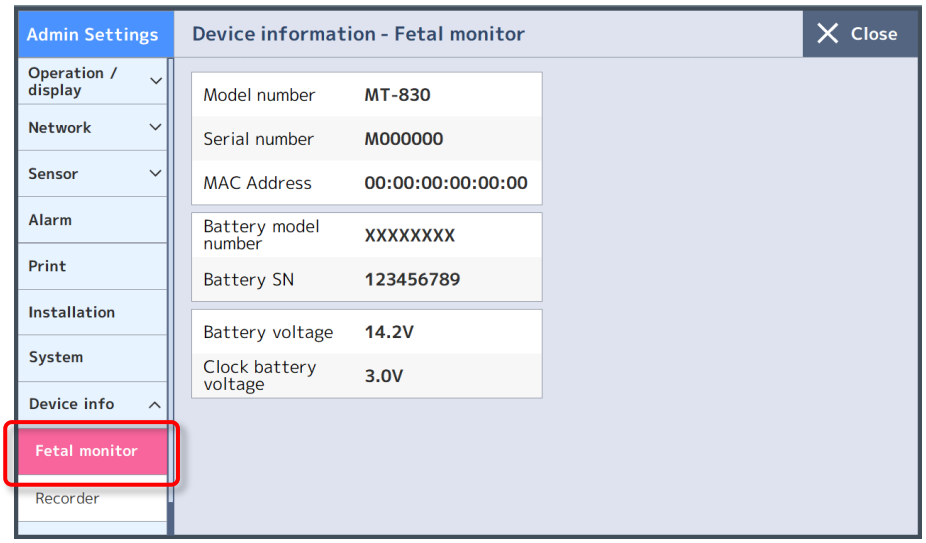


Settings Item	Function	Default Value
Admin Setup Password	Set whether or not (Available or Not available) to use an admin password. You can also change the password. When set to “Available”, you need to enter the password to access Admin Settings. To change the password, touch [Edit] to show the password change pad, enter the current password and a new password (twice), and then touch [OK].	Not available
Setting list	Prints (when a recorder is connected) the settings list. Touch [Yes] on the confirmation screen.	–
Return all settings to the installed state	Returns all settings to their default values at the time of installation. Touch [Yes] on the confirmation screen. Pressing "Execute" restarts automatically.	–

8-5-12. Device info

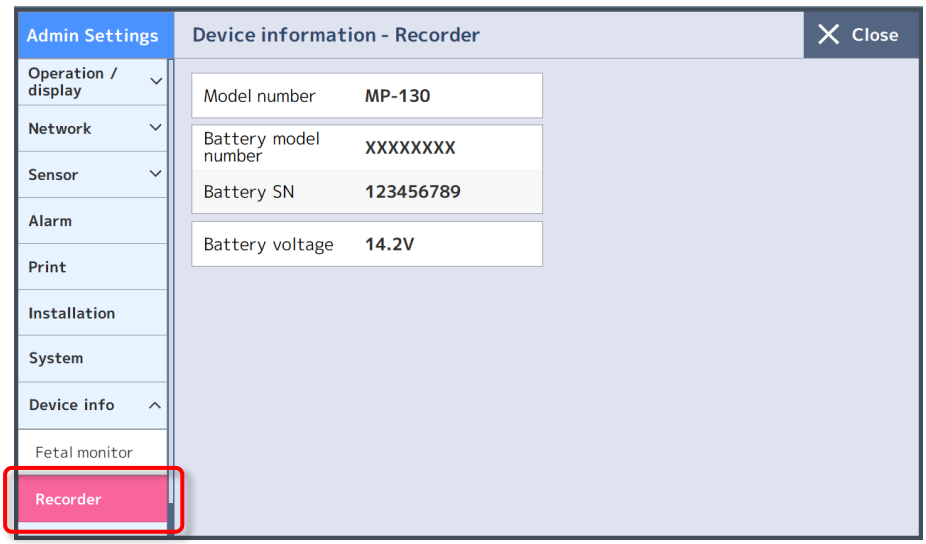
Displays the Model number of the device and each device.
Touch (Menu) - [Admin Settings] - [Device info] on the Bottom button to display the Device info screen.
You can configure two items, “Fetal monitor” and “Recorder”.

8-5-12-1. Fetal monitor



Settings Item	Function	Default Value
Model number	Displays the Model number of the device.	–
Serial number	Displays the Serial number of the device.	–
MAC Address	Displays the MAC address of the device.	–
Battery model number	Displays the Model number of the built-in battery.	–
Battery SN	Displays the Serial number of the built-in battery.	–
Battery voltage	Displays the voltage of the built-in battery.	–
Clock battery voltage	Displays the voltage of the clock battery for the device.	–

8-5-12-2. Recorder



Settings Item	Function	Default Value
Model number	Displays the Model number of the recorder.	–
Battery model number	Displays the Model number of the built-in battery.	–
Battery SN	Displays the Serial number of the built-in battery.	–
Battery voltage	Displays the voltage of the built-in battery.	–

9. Maintenance and Inspection

9-1. Cleaning and Sterilization

⚠WARNING

	Sterilize all equipment that touches the surface of the skin before every use. Failure to follow this instruction may cause infection.

⚠CAUTION

	The device is not sterilized before shipment. Be sure to sterilize and clean before use.
	For safety reasons, remove the power cord before wiping.
	Do not clean with chemicals such as sodium hypochlorite, alcohol that uses a larger amount than specified by us (ethanol, methanol, isopropyl alcohol), and do not use chemicals such as thinner, benzine, peracetic acid formulation (Acecide), sodium hydroxide, volatile solvents, or cleanser. Failure to follow these instructions may degrade the material.
	Do not use chemicals other than those specified by us for disinfection or sterilization.
	Do not excessively wipe the head of the transducer. Failure to follow this instruction may damage the sensor or remove the surface coating preventing smooth movement on the abdominal wall, resulting in redness on the skin.
	Do not use water to clean, wipe, or disinfect the power plug. Failure to follow this instruction may result in corrosion.
	Do not apply or spray disinfectant on to the electrical parts. Some disinfectants are conductive. Residual liquid may become more conductive by absorbing dust or dirt.
	Refer to P.178 "9-2-2 Inspection Checklist" for inspections after cleaning.
	Do not use the following methods of disinfection or sterilization. • Disinfection or sterilization at more than 70°C, such as autoclave • Sterilization by EOG (ethylene oxide gas) or ultraviolet light
	Although the Doppler transducer and the External UC transducer are IPX7 waterproof, their waterproof performance may decrease if they are immersed into chemicals. Immerse only the applying surface into disinfectants.
	Periodically clean the device to keep it clean. Failure to follow this instruction may spread bacteria that can cause a rash.
	Follow the instructions in this document to use the cleaning agent.
	Refrain from cleaning while the patient is being monitored.

9-1-1. Cleaning and Sterilization of Doppler/External UC Transducers

To prevent infection, periodically clean and sterilize the application surface that touches the surface of the patient's skin.

■ Cleaning

Before sterilization, wipe away the ultrasound gel or contamination from the Doppler transducer carefully with tissues or a soft cloth.

■ Sterilization

The following disinfectant is available: Bacterial sensitivity differs depending on the chemicals being used. Follow the instructions in the documents supplied with each chemical such as the indications, usage, and precautions.

- Immersed in Benzalconium Chloride (Osvan) 0.1% solution for 10 minutes
- Wiping with a cloth immersed in disinfectant isopropanol 80 vol% or less
- Wiping with a cloth immersed in disinfectant ethanol 76.9 to 81.4 vol% or less
- Immersed in Glutaral (STERIHYDE L) 2W/V % solution for 30 minutes
- Immersed in Amphoteric surfactant (TEGO 51) 0.05 to 0.2% solution for 10 to 15 minutes

Important

- Immerse only the applying surface into disinfectants.
- Do not immerse the connectors and cables.
- Do not scratch with a brush.
- Be sure to use the correct concentration of disinfectant. For details, refer to the instructions supplied with the disinfectant.
- Clean and sterilize according to "9-1-2 Cleaning and Sterilizing the Main Unit and AC Adapter" for sterilization of areas other the patient's application surface.

9-1-2. Cleaning and Sterilizing the Main Unit and AC Adapter

To prevent infection, periodically clean and sterilize the main unit and AC Adapter.

■ Cleaning

Wipe the device and AC Adapter with a soft cloth on a regular basis.

Clean tough stains in the following manner.

1. **Soak a soft cloth in a neutral detergent diluted with lukewarm water (or water).** Wring out the cloth before wiping so that the water does not drip.
2. **Wipe the device with the damp cloth.**
3. **Finally, wipe with a soft dry cloth.**

■ Sterilizing

The following disinfectant is available: Bacterial sensitivity differs depending on the chemicals being used. Follow the instructions in the documents supplied with each chemical such as the indications, usage, and precautions.

- Wiping with a Super Sani-Cloth wet wipe (isopropanol 55% Class 4, ammonium salt 0.5%)
- Wiping with a cloth immersed in disinfectant isopropanol 80 vol% or less
- Wiping with a cloth immersed in disinfectant ethanol 76.9 to 81.4 vol% or less

Important

- Do not allow liquid to enter the casing of the main unit.
- Do not immerse the main unit. Protect the main unit from water drops or splashes.
- Be sure to use the correct concentration or disinfectant. For details, refer to the instructions supplied with the disinfectant.

9-1-3. Cleaning and Sterilizing the NIBP Cuff and Air Hose

MT-832-L / P

To prevent infection, periodically clean and sterilize the cuff.

■ Cleaning

Use an unmoistened dry cloth to wipe it off to clean.

■ Sterilizing

Lightly wipe the cuff with a gauze containing disinfectant or a cloth immersed in designated disinfectant, and remove moisture with a dry cloth.

The following disinfectant is available:

- Ethanol for disinfection
- Isopropanol 70 %
- Chlorhexidine gluconate solution 0.5 %
- Benzalkonium chloride solution 0.05 %

Important

- Do not wet the connectors and the connection of the cuff connector.
- Do not knead the cuff or scratch it with a brush.
- Be sure to use the correct concentration or disinfectant. For details, refer to the instructions supplied with the disinfectant.

9-1-4. Cleaning and Sterilizing the Remote Marker Switch, M.ECG Adapter Cable, Clip Electrode Lead, and Ultrasound Gel Bottle

Periodically clean and sterilize the application surface that touches the surface of the patient's skin.

■ Cleaning

Before sterilizing, wipe off adhered ultrasound gel or contamination carefully with tissues or a soft cloth. Clean tough stains in the following manner:

1. **Soak a soft cloth in a neutral detergent diluted with lukewarm water (or water).** Wring out the cloth before wiping so that the water does not drip.
2. **Wipe the device with the damp cloth.**
3. **Finally, wipe with a soft dry cloth.**

■ Sterilizing

The following disinfectant is available: Bacterial sensitivity differs depending on the chemicals being used. Follow the instructions in the documents supplied with each chemical such as the indications, usage, and precautions.

- Wiping with a Super Sani-Cloth wet wipe (isopropanol 55%　Class 4, ammonium salt 0.5%)
- Wiping with a cloth immersed in disinfectant isopropanol　80 vol% or less
- Wiping with a cloth immersed in disinfectant ethanol 76.9 to 81.4 vol% or less

9-1-5. Cleaning and Sterilizing the Transducer belt

To prevent infection, use a Transducer belt.

■ Cleaning

Wash the product clean according to the instructions on the package.

■ Sterilizing

We do not recommend sterilizing the product.

9-1-6. Cleaning and Sterilizing Other Optional Items

Follow the manual supplied with the respective product.

9-2. Inspections to be Conducted by Users

WARNING

	Do not perform maintenance in situations where the patient is present. Failure to follow this instruction may cause electric shock.

9-2-1. About inspections

Inspections are required to keep this device in optimum condition. Some inspections should be performed by the user and some inspections should be performed by our service personnel. The hospital or clinic is responsible for these inspections.
Users should conduct the following inspections.

Inspection		Refer to
Inspections before Use	Be sure to conduct before every use.	P.178
Inspection after use	Be sure to conduct after every use.	P.178
Six-month inspection	Conduct a functional inspection every six months.	P.179
Annual inspection	Conduct an inspection every year.	P.180

If you cannot confirm the proper action during the inspection, the device has failed.
Turn off the power, unplug the power cord, and attach a label stating “Failure”, and contact us or our distributor to request repairs.

9-2-2. Inspection Checklist

Perform the inspection using the checklist below. You can make copies of the checklist for your convenience.

■ Inspection before use

Inspect the device before use.

Body No.	Date of inspection YYMMDD	Inspected by

No.	Details of inspection	Results
1	The main unit is correctly installed without the risk of a falling hazard.	Y / N
2	No damage or deformation found on the main unit and power cords.	Y / N
3	No defective areas on the LCD screen.	Y / N
4	Battery level is sufficient.	Y / N
5	The date and time are correct.	Y / N
6	The volume is appropriate.	Y / N
7	The Doppler transducer is operating correctly and the Doppler sound can be heard.	Y / N
8	The display of contraction level changes by pressing the pressure sensitive part of the External UC transducer.	Y / N
9	A device alarm "Check Electrode" is issued when the M.ECG adapter cable is connected.	Y / N
10	[When using the recorder] The error indicator of the recorder is not flashing.	Y / N
11	[When using the recorder] The paper indicator of the recorder is not flashing.	Y / N

■ Inspection after use

Turn off the power before inspection.

Body No.	Date of inspection YYMMDD	Inspected by

No.	Details of inspection	Results
1	Accessories that touch the surface of the skin are sterilized.	Y / N
2	No damage or deformation found on the main unit, the transducers, or the patient's cables, etc.	Y / N
3	No dirt or foreign matter found on the main unit, the transducers, or the patient's cables, etc.	Y / N

■ Six-month inspection

Connect the transducers to the device before inspection.

Body No.	Date of inspection YYMMDD	Inspected by

No.	Details of inspection	Results
1	No loose or missing screws in the body and the stand.	Y / N
2	No damage or deformation found on the main unit and power cords.	Y / N
3	The touch panel can be operated.	Y / N
4	No missing accessories.	Y / N
5	No defective areas on the LCD screen.	Y / N
6	The date and time are correct.	Y / N
7	The volume is appropriate.	Y / N
8	The Doppler transducer is operating correctly and the Doppler sound can be heard.	Y / N
9	The display of contraction level changes by pressing the pressure sensitive part of the External UC transducer.	Y / N
10	A device alarm "Check Electrode" is issued when the M.ECG adapter cable is connected.	Y / N
11	The remote marker switch operates correctly.	Y / N
12	The fetal heart rate alarm can be correctly activated.	Y / N
13	The pulse rate alarm can be correctly activated.	Y / N
14	The NIBP alarm can be correctly activated.	Y / N
15	The SpO_2 alarm can be correctly activated.	Y / N

■ Periodic inspection

Conduct the six-month inspection at the same time.

Body No.	Date of inspection YYMMDD	Inspected by

No.	Details of inspection	Results
1	No abnormalities found in the six-month inspection.	Y / N
2	[When using the recorder] No abnormalities in the recorder. No dirt on the thermal head.	Y / N
3	Check for air leaks from the BP gauge.	Y / N
4	Check for pressure accuracy of the BP gauge.	Y / N
5	Check for operation and accuracy of the pulse oximeter.	Y / N
6	Check for operation and accuracy of the M.ECG diagram.	Y / N

9-2-3. Inspecting the fetal heart rate alarm

1. **Press the (Power) button to turn on the device, and connect the Doppler transducer.**
2. **Set Alarm Restraint to [OFF], set the Lower limit of heart rate to "120", and set the Delay time to "10sec" in the Alarm Settings so that the fetal heart rate alarm can be triggered easily.**
   For the alarm restraint setting, refer to P.166 "8-5-8 Alarm".
   For settings for the Lower limit of heart rate and Delay time, refer to P.123 "7-3-2 F.HR".
3. **Touch [Measure] on the Bottom button or Menu screen to start monitoring.**
4. **Turn the transmitting and receiving surface up to prevent signal input ("---" is displayed on the screen).**
5. **Confirm that the alarm is issued after the set delay time.**
6. **Restore the settings after confirming the alarm.**

9-2-4. Inspecting the Maternal Heart Rate / Maternal Pulse Rate Alarm

MT-832-L / P

1. **Press the (Power) button to turn on the device, and apply the M.ECG electrode to the chest (apply the SpO2 sensor to a finger for an the Maternal Pulse Rate alarm).**
2. **Set Alarm Restraint to [OFF] and set the Lower limit of heart rate to "120" in the Alarm Settings so that the Maternal Heart Rate / Maternal Pulse Rate alarm can be triggered easily.**
   For the alarm restraint setting, refer to P.166 "8-5-8 Alarm".
   For the Lower limit of heart setting, refer to P.115 "7-1-3 Maternal Heart Rate / Maternal Pulse Rate Alarm".
3. **Touch [Measure] on the Bottom button or Menu screen to start monitoring.**
4. **Confirm that the M.HR/M.PR is less than "120" and that the Maternal Heart Rate / Maternal Pulse Rate alarm has been triggered.**
5. **Restore the settings after confirming the alarm.**

9-2-5. Inspecting the NIBP Alarm

MT-832-L / P

1. **Press the (Power) button to turn on the device, and connect the NIBP cuff.**
2. **Set SYS Upper Limit to "100mmHg" and SYS Lower Limit to "50mmHg" in the Alarm Settings so that the NIBP alarm can be triggered easily.**
   For the settings, refer to P.125 "7-3-4 NIBP".
3. **Touch [Measure] on the Bottom button or Menu screen to start monitoring.**
4. **Wrap the cuff around the arm, and press the NIBP start switch to measure the BP.**
   Make sure that the alarm is triggered with its sound.
5. **Press the (Alarm) button to check that the alarm is suspended.**
6. **Restore the settings after confirming the alarm.**

9-2-6. Inspecting the SpO_2 Alarm

MT-832-L / P

1. **Press the (Power) button to turn on the device, and connect the SpO2 sensor.**
2. **Set Alarm Restraint to [OFF] and the SpO_2 Upper Limit to "90%" in the Alarm Settings so that the SpO2 alarm can be triggered easily.**
   For the alarm restraint setting, refer to P.166 "8-5-8 Alarm".
   For the SpO2 upper limit setting, refer to P.126 "7-3-5 SpO2".
3. **Touch [Measure] on the Bottom button or Menu screen to start monitoring.**
4. **Apply the SpO_2 sensor to a finger to start measuring SpO_2.**
5. **Make sure that the alarm is triggered with its sound.**
6. **Press the (Alarm) button to check that the alarm is suspended.**
7. **Restore the settings after confirming the alarm.**

9-3. Inspection by Service Personnel

Contact the service personnel of TOITU distributor to request inspection once a year (in general).

The service personnel will check that the electronic parts inside the device are operating correctly by using various measurement devices. They will visit your site based on the periodic inspection contract.

Failure to conduct a periodic inspection may degrade the function of the device, delay the detection of loss, or prevent correct monitoring.

Record the results of these periodic inspections. If you have any questions, contact TOITU or our distributor.

9-4. Notes on Storage Precautions

⚠ CAUTION

	Do not store the device in the following conditions. Failure to follow this instruction may result in failure. • A place subject to direct sunlight • A place subject to humidity (95% or above) or dust • A place subject to extreme heat (60°C or above) or cold (-10°C or below) • A place subject to vibrations or other unstable places

9-4-1. Storage and transport conditions

- Ambient temperature: -10 to +60°C (excluding freezers)
- Relative humidity: 30 to 95% (no condensation)
- Atmospheric Pressure: 700 to 1060 hPa

9-4-2. If the device is not going to be used for a long time

1. **Disconnect the power cord from the power outlet.**
2. **Remove the AC adapter from the main unit.**
3. **Do not store in a location in which the device could come into contact with water.**

Important

- Avoid direct sunlight, high temperatures and humidity, slopes, vibrations, and shocks.
- The battery in the device runs out even if the device is not being used. Charge the battery at least once a month.

9-4-3. Storing the transducer

Avoid subjecting the transmitting and receiving surface of the Doppler transducer and the pressure receiving surface of the External UC transducer to shocks.

9-4-4. Storage of the NIBP Cuff and Air Hose MT-832-L / P

Storing the cuff folded or the air hose tightly bent for a long time may shorten the service life of those parts.

10. Troubleshooting

This section describes the procedures for users to address problems. If there is no improvement after completing the procedures, contact us or our distributor to request repairs since the problem may be caused by a failure or a bad electrical contact. Also, contact us or our distributor if it is necessary to replace the battery for the clock or the lithium-ion battery.

10-1. General Problems

Examples of Failure	Possible Causes	Action
In the free space "Clock Low Battery" is displayed	The voltage of the battery for clock memory is low	Contact us or our distributor to replace the battery.
In the free space "Check UC Sensor" is displayed	The input signal deviates due to a sensor abnormality or for other reasons	Check the External UC transducer.
On the Alert screen "Failed to connect with Central" is displayed	The LAN cable is not connected properly	Connect the LAN cable properly.
	Out of wireless LAN communication range	Move to a position within the communication range.
	Wireless settings are not correct	Make proper communication settings (refer to P.161 "8-5-6 Network").
The power indicator will not turn on even though the power cord and the AC adapter are connected	The power cord or the AC adapter is unplugged	Plug in the power cord or the AC adapter securely.
No screens are shown even though the power button has been pressed	The battery has run out	Connect the power cord to the AC adapter and charge the battery for a while.
The date and time is not correct	The time setting is incorrect	Set the date and time again on the Settings screen (refer to P.49"(3) Correct the time (or date)").
The clock is not correct even after setting the time	The battery for the clock memory has run out	Contact us or our distributor to replace the battery.

Examples of Failure	Possible Causes	Action
The alarm tone does not sound	The following icon is displayed on the monitoring area. 	Display the Alarm Settings screen and make sure that the alarms for "F.HR", "M.HR / M.PR", "NIBP", and "SpO2" are set to "On" respectively. Otherwise, make sure that the upper or lower limit of each item is not set to "Off" (refer to P.121 "7-3 Alarm Settings").
	The following icon is displayed on the monitoring area. 	Display the Alarm settings screen in [Admin Settings] - [Alarm] and make sure that the alarm volume is not set to [Mute] (refer to P.166 "8-5-8 Alarm").
The key sound does not work	The key sound is set to [Mute]	Display the Other settings screen in [Device Settings] and set the key sound to "On" (refer to P.146 "8-4-3 Other").
The timer tone does not sound	The timer tone is set to [Mute]	For the measurement end sound, display [Admin Settings] - [Measure] - [Measure Mode] and set the end sound for each Measure Mode to anything other than [Mute] (refer to P.151 "8-5-3-2 Measure Mode" - [Measure Mode]).
		For the NIBP measurement end sound, display [Measure Settings] - [NIBP] and set the end sound to anything other than [Mute] (refer to P.138 "8-3-1-5 NIBP").
		For the Apgar Timer sound, display the Apgar Timer screen in [Admin Settings] - [Clinical Set] - [Apgar Timer] and set the timer volume to anything other than [Mute] (refer to P.157 "8-5-4-2 Apgar Timer").
Entering Apgar Score is disabled	Apgar Timer has not started counting	Register the "F.DEL" event and wait until the Apgar Timer you want to use starts counting.
No Doppler sound is heard	The volume setting is too low	Adjust the volume.
	The Doppler transducer is not connected to the main unit correctly	Connect the Doppler transducer to the main unit securely.

Examples of Failure	Possible Causes	Action
The Doppler does not work normally	The Doppler transducer is not connected to the main unit correctly	Connect the Doppler transducer to the main unit securely.
	The Doppler transducer is applied at an inappropriate position	Adjust the Doppler transducer to a position that provides clear, rhythmic sounds.
	Too small amount of ultrasound gel was applied to the Doppler transducer	Apply the gel evenly so that it creates a thin layer.
	The fetus has an irregular heartbeat or hiccups	Carefully continue to monitor. Use another method of monitoring which does not use this device.
	The Doppler transducer failed	Replace it with another Doppler transducer.
	The fetus or mother frequently moves	Use another method of monitoring which does not use this device.
	The mother is severely obese	Use another method of monitoring which does not use this device.
	No signals	Auscultate the fetal heartbeat.
Static noise in the Doppler	The fetus frequently moves	Reposition the Doppler transducer.
	Affected by environmental noise	Keep the sheet and gown away from the Doppler transducer.
		Do not hold the Doppler transducer with your hand.
	The mother frequently moves	Try to stop the mother's movement.
	The Doppler transducer failed	Replace it with another Doppler transducer.
[!] is displayed or printed	Two Doppler transducers may be monitoring the heart rate of a single fetus	Check the fetal position and reapply the Doppler transducer.
	The same heartbeat may be detected for fetal heartbeat and maternal heartbeat	
The External UC transducer records no contraction	The External UC transducer is inappropriately applied	Apply the transducer to the uterine fundus of the mother.
	ZeroSet at an occurrence of UC	Touch [ZeroSet] at UC INT.
	The External UC transducer is not connected to the main unit correctly	Connect the External UC transducer to the main unit securely.
	The External UC transducer failed	Replace it with another External UC transducer.
	No uterine contraction	Wait for a contraction and monitor for a while.
	The contraction exceeds the reference range	Loosen the belt. Remove the External UC transducer and fix it again making sure it is not too tight.

10-2. NIBP Measurement Problems

MT-832-L / P

Examples of Failure	Possible Causes	Action
In the free space "NIBP: Check Cuff" is displayed	Could not confirm the cuff pressure though the pump was activated.	Check if the cuff and the connector are connected correctly.
	Could not pressurize the cuff properly.	Check the connected cuff and the connector as there may be air leakage, etc.
	Blood pressure/pulse rate could not be judged correctly.	Check if the cuff is wrapped correctly, there is no body movement, the measurement posture is appropriate, ask the patient to stay still in bed, and then measure again.
	Too many detected pulses or failed to detect appropriately	Check if the cuff is wrapped correctly, there is no body movement, the measurement posture is appropriate, ask the patient to stay still in bed, and then measure again.
In the free space "NIBP: Leak" is displayed	Could not measure correctly because insufficient pressure for the blood pressure measurement.	Adjust First Pressure on “Measure Settings” and measure again.
In the free space "NIBP: Artifact" is displayed	Could not measure properly due to body movement	Ask the patient to stay still in bed, and then measure again.
In the free space "NIBP: Out of Range" is displayed	Blood pressure exceeds the measurement range	It may be caused by a weak pulse signal, body movement, or an irregular heartbeat. If the error persists, use palpation or invasive blood pressure method to measure the BP.
In the free space "NIBP: Check Interval" is displayed	Measure the BP continuously for more than 30 minutes every minute	Check the patient’s status, and determine if you should continue to measure.
In the free space "NIBP: Over Cuff Pressure" is displayed	Pressure exceeded the upper limit value	Check if the cuff is wrapped correctly, there is no body movement, the measurement posture is appropriate, ask the patient to stay still in bed, and then measure again.
	Too fast to pressurize the cuff.	Check for a bent air hose and measure again.
In the free space "NIBP: Time Over" is displayed	BP measurement time exceeded the threshold	Read the error indication and take an appropriate action as a measurement error occurred.
In the free space "NIBP: Unit Failure" is displayed	A unit failure	Contact us or our distributor to request repairs.

10-3. SpO2 Measurement Problems

MT-832-L / P

Examples of Failure	Possible Causes	Action
No numbers are displayed	The sensor is not applied appropriately	Connect the SpO2 patient cable to the main unit and the sensor securely.
		Reposition the sensor.
	Mother is moving	Ask the patient to stop moving.
	The sensor is exposed to a strong light	Do not expose the sensor to the light.
	Malfunction of the sensor	Replace the sensor.
In the free space "SpO2: Check Sensor" is displayed	The sensor is not applied appropriately	Check that the sensor is not applied to the finger too tightly.
		Reposition the sensor.
In the free space "SpO2: Pulse Search" is displayed	Detected a pulse	This is not a failure. The error disappears once the detection is complete.
In the free space "SpO2: Low Pulse" is displayed	Cannot measure because the signal is not strong enough	Check the patient's status. For patients whose bloodstream on the applied area is poor, reposition the application position at least every 2 hours. Do not apply to the arm with the BP cuff applied.
In the free space "SpO2: Unit Failure" is displayed	The SpO_2 unit is failed	Contact us or our distributor to request repairs.

10-4. Maternal Heart Rate Measurement Problems

MT-832-L / P

Examples of Failure	Possible Causes	Action
Maternal Heart Rate is not monitored correctly	The M.ECG adapter cable is not connected to the main unit	Connect the cable to the main unit securely.
	The electrode is not applied appropriately	Reapply the electrode appropriately.
	The clip of the clip electrode lead is not applied to the electrode appropriately	Check for the application status of the clip.
	An electrode with dried gel is used	Check the electrode and replace it with a new one if necessary.
	Signal is full of noise	Wipe the electrode application area with alcohol.
	M.ECG adapter cable is broken	Replace the cable.
	A sufficient signal amplitude is not acquired with the selected lead	Select another lead.
In the free space "Check Electrode" is displayed	The electrode is disconnected	Check the electrode and connect it again.
In the free space "M.ECG: Over Voltage" is displayed	The device is failed	Contact us or our distributor to request repairs.
In the free space "M.ECG: Low Voltage" is displayed	The device is failed.	Contact us or our distributor to request repairs.

10-5. Recorder Problems

Examples of Failure	Possible Causes	Action
CTG is not printed. The [Print] button color is gray	The main unit is not connected to the recorder	Connect the main unit to the recorder. (Refer to “MP-130 Operation Manual”)
	The recorder is not on	Connect the power cable of the recorder and turn on the power. (Refer to “MP-130 Operation Manual”)
	The recorder's battery has run out	Connect the power cable of the recorder. (Refer to “MP-130 Operation Manual”)
In the free space "Recorder: Low paper level" is displayed	Recording paper is running low	Load a new batch of recording paper. (Refer to “MP-130 Operation Manual”)
In the free space “Recorder: Paper Out” is displayed	No recording paper	Load recording paper. (Refer to “MP-130 Operation Manual”)
	The recorder cover is open	Close the recorder cover. (Refer to “MP-130 Operation Manual”)
In the free space “Recorder: Temperature” is displayed	The internal temperature of the recorder is rising	Leave the recorder to cool down without printing.
In the free space "Recorder: Low Battery" is displayed	The recorder's battery level is running low	Connect the power cable of the recorder. (Refer to “MP-130 Operation Manual”)
In the free space “Recorder: Head” is displayed	An error occurred with the head	Contact us or our distributor to request repairs.
In the free space "Recorder: Unit Failure" is displayed	The recorder is failed.	Contact us or our distributor to request repairs.

11. Specifications/Parts List

11-1. Product Specifications

11-1-1. Material of the parts which touch the surface of the skin

Name	Material
Y-shaped Doppler/External UC transducer	PC/ABS resin, silicone rubber
Transducer belt	Polyurethane rubber, polyester
Remote marker switch (single)	PC/ABS resin, elastomer material
Remote marker switch (for twins)	PC/ABS resin, elastomer material
Doppler transducer	PC/ABS resin
Ultrasound gel	Propylene glycol/carboxypolymethylene sodium/cellulose derivative/purified water
External UC transducer	PC/ABS resin, silicone rubber
NIBP wide-range cuff	No.302AHBZX00029000
NIBP M size cuff 22 to 32cm	No.302AHBZX00029000
NIBP LA size cuff 31 to 45cm	No.302AHBZX00029000
SpO_2 disposable sensor for adults	No.13B1X10223000001
SpO_2 reusable sensor for adults	No.13B1X10223000003
SpO_2 forehead disposable sensor	No.13B1X10223000036
SpO_2 forehead reusable sensor	No.13B1X10223000003

11-1-2. Device category

Category	Description
Classification by protection type to electric shock	Class I and internal power supply devices
Classification of applied part by protection level to electric shock	Y-shaped Doppler/External UC transducer, Doppler transducer, External UC transducer, NIBP wide-range cuff, SpO_2 disposable sensor for adults, SpO_2 reusable sensor for adults, SpO_2 forehead disposable sensor, SpO_2 forehead reusable sensor, remote marker switch: Type BF applied part
	M.ECG adapter cable: Type C applied part
Classification by protection level to hazardous entry of water	Main unit: IPX0 Transducer, remote marker switch: IPX7 (excluding the connector to the main unit)
Classification by actuation (operation) mode	Continuous actuation (operation) device

11-1-3. Electrical rating

Category of power supply	External	Internal	
		MT-831-L / MT-831-S	MT-832-L / MT-832-P
Alternating current/direct current	Alternating current	Direct current	Direct current
Rated voltage	100 - 240 V	14.4 V	14.4 V
Power input/capacity	1.6 - 0.7 A	3.45 Ah	6.90 Ah
Frequency	50 - 60 Hz	-	-

11-1-4. Dimension/weight

Category	Description
Main Unit	278 mm (W) × 264 mm (H) × 145 mm (D) (excluding protrusions, tolerance ±10%) MT-831-L / MT-831-S：2.2 kg MT-832-L / MT-832-P：2.9 kg (excluding accessories, tolerance ±10%)
Y-shaped Doppler/External UC transducer	66 ±7 mm (W) × 18 ±2 mm (H) × 80±9 mm (D)／ 240 ±24 g Length 2.85 ±0.1 m
Doppler transducer	66 ±7 mm (W) × 18 ±2 mm (H) × 80±9 mm (D)／170±17 g Length 2.85 ±0.1 m
Remote marker switch	73 ±7 mm (W) × 45 ±5 mm (H) × 28 ±3 mm(D)／ 100 ±10 g Length 2.5 ±0.3 m

11-1-5. Technical specifications

Category	Details	Description
Fetal heart rate measurement by ultrasound doppler	Ultrasound driving method	Pulse Doppler with autocorrelation processing
	Oscillating frequency	1.108 MHz ±10%
	Ultrasound power	Not more than 10 mW/cm2 TI, MI<1.0
	Heart rate measuring range	50-240 bpm
	Heart rate measuring accuracy	Within ±3 bpm
External UC	UC input	Strain gauge
	Measuring range	0-100 UNIT
	Contraction sensitivity mode	1.33 times the normal mode
	Recording sensitivity	30 mm on the recording paper for 100 g load
Measurement function	Double Doppler Single Heart	Two Doppler transducers are used for a single pregnancy to monitor across a wide range.
	Contraction cycle monitoring	The intervals of contraction peaks are monitored, displayed, and printed.

Category	Details	Description
Maternal non-invasive blood pressure (NIBP)	Measurement method	Oscillometric method
	Pressure measuring range	0 to 299 mmHg
	Pressure measuring accuracy	±3 mmHg（0 to 299 mmHg）
	MAX. Compress	299 mmHg
	BP measuring range	[Compress measurement] ・MAX. BP: 60 to 280 mmHg ・MIN. BP: 40 to 200 mmHg [Decompress] ・MAX. BP: 40 to 280 mmHg ・MIN. BP: 20 to 200 mmHg
	BP measuring accuracy	±3 mmHg
	PR measuring range	30 to 240 bpm
	PR measuring accuracy	±2 % or ±2 bpm whichever is larger
Maternal arterial blood oxygen saturation (SpO_2)	Measurement method	2 wavelength pulse oximetry
	LED wavelength	660 nm、905 nm *1)
	Optical output power	15 mW or less
	SpO_2 measuring range	1 ～100 %
	SpO_2 measurement error *2)	±2 % (70 to 100 %, without body movement, running low pulsation included) ±3 % (70 to 100 %, with body movement)
	PR measuring range	30-240 bpm
	PR measuring accuracy	±3 bpm (without body movement, running low pulsation included) ±5 bpm (with body movement)
	SpO2 Alarm delay	24 seconds or less
MHR (M.ECG method)	Measurement method	Peak trigger method
	Lead	I, II, III
	Heart rate measuring range	30-240 bpm
	Heart rate measuring accuracy	±1 bpm
	How to calculate the average HR	Judged pulse is 100bpm or more: 8 pulses of moving average Judged pulse is less than 100bpm: 4 pulses of moving average
	Time it takes to respond for the HR change	Change from pulse 80bpm to 120bpm: 10 seconds or less Change from pulse 80bpm to 40bpm: 10 seconds or less
	M.ECG REC speed	25mm/sec.

Category	Details	Description		
	Disconnected electrode detection	On		
	Frequency characteristics	0.3 to 40Hz(-3dB)		
	Removal capability of high T wave	0 to 1.3mV		
	Accuracy of HR detection portion and response to irregular rhythms	A1: Ventricular bigeminy: 80bpm A2: Slow alternating ventricular bigeminy: 60bpm A3: Rapid alternating ventricular bigeminy: 120bpm A4: Bidirectional systoles: 80-96bpm		
Print function (with recorder unit connected)	Method	Thermal head		
	Feeding speed	10, 20, 30 mm/min		
	Range of recording	HR 50-210 bpm/80 mm or 30-240 bpm/70 mm UC 0-100[UNIT]/40 mm		
	Simultaneous recordings	HR area 4 channels, UC area 4 areas, remote marker switch area 2 channels		
	Applicable recording paper	0030-026, 0030-027		
Alarm function	Heart rate and pulse rate alarm	Alarm settings with user-selectable high and low fetal heart rate and delay time.		
	Wrong heart rate measurement alarm	Alarm of two sensors measuring the same heart rate		
	Device alarm	Alarm regarding the state of the device such as out of paper and low battery.		
	Alarm sound pressure level	45 dBA to 85 dBA		
LAN interface	Supported standard	Compliant to 100BASE-TX		
Wireless LAN	Supported standard	▪ IEEE802.11-2012 (a/b/g/n) ▪ IEEE802.11ac-2013		
	Security	WPA-Personal	TKIP	PSK
		WPA2-Personal	AES	PSK
		WPA-Enterprise	TKIP	EAP-TLS/PEAP
		WPA2-Enterprise	AES	EAP-TLS/PEAP
Bluetooth	Supported standard	Bluetooth standard Ver. 5.1		
	Visibility distance	10 m		
Fetal movement	Auto measurement of fetal movement spike waveform by Doppler ultrasound system.			
	Fetal movement spike waveforms and dot recording by thresholds.			
	Monitoring of maternal perception by the Remote marker.			
Fetal heart rate sound monitor	Doppler original sound/MHR/switch synchronized PR sound			
Display function	10.1-inch TFT LCD panel, resolution: 1280 x 800 (WXGA)			
External I/O	IO-1: For connecting our Central monitor			

Category	Details	Description
	IO-2: For connecting options IO-3: For connecting options IO-4: For connecting options IO-5: For connecting options	
Battery operation	Working hours	120 min
	Charging time (0% to 90%)	MT-831-L / MT-831-S : 5 hours and 30 min. MT-832-L / MT-832-P : 6 hours and 30 min.

*1) Information on the wavelength range may be helpful for a photodynamic therapy.

*2) For the SpO_2 degree of certainty, as monitoring values of the pulse oximeter are statistically distributed, only 2/3 of the values monitored using the pulse oximeter are included in ±Arms of the monitoring values of ±Arms using the CO oximeter.

*3) A clinical test report in which SpO_2 accuracy is evaluated is provided by Masimo.
The relevant information is as follows:
The Masimo SET technology with Masimo sensors has been validated for no motion accuracy in human blood studies on healthy adult male and female volunteers with light to dark skin pigmentation in induced hypoxia studies in the range of 70-100% SpO_2 against a laboratory CO-Oximeter and ECG monitor. This variation equals ±1 standard deviation. Plus or minus one standard deviation encompasses 68% of the population.
The Masimo SET technology with Masimo sensors has been validated for motion accuracy in human blood studies on healthy adult male and female volunteers with light to dark skin pigmentation in induced hypoxia studies while performing rubbing and tapping motions, at 2 to 4 Hz at an amplitude of 1 to 2 cm and a non-repetitive motion between 1 to 5 Hz at an amplitude of 2 to 3 cm in induced hypoxia studies in the range of 70-100% SpO_2 against a laboratory CO-Oximeter and ECG monitor. This variation equals ±1 standard deviation, which encompasses 68% of the population.
The Masimo SET technology has been validated for low perfusion accuracy in bench top testing against a Biotek Index 2™ simulator and Masimo's simulator with signal strengths of greater than 0.02% and transmission of greater than 5% for saturations ranging from 70 to 100%. This variation equals ±1 standard deviation. Plus or minus one standard deviation encompasses 68% of the population.
The Masimo SET Technology with Masimo Neo sensors has been validated for neonatal motion accuracy in human blood studies on healthy adult male and female volunteers with light to dark skin pigmentation in induced hypoxia studies while performing rubbing and tapping motions, at 2 to 4 Hz at an amplitude of 1 to 2 cm and a non-repetitive motion between 1 to 5 Hz at an amplitude of 2 to 3 cm in induced hypoxia studies in the range of 70-100% SpO_2 against a laboratory CO-Oximeter and ECG monitor. This variation equals ±1 standard deviation. Plus or minus one standard deviation encompasses 68% of the population. 1% has been added to the results to account for the effects of fetal hemoglobin present in neonates.
The Masimo SET technology with Masimo sensors has been validated for pulse rate accuracy for the range of 25 to 240 bpm in bench top testing against a Biotek Index 2™ simulator. This variation equals ±1 standard deviation. Plus or minus one standard deviation encompasses 68% of the population.
See sensor directions for use (DFU) for complete application information. Unless otherwise indicated, reposition reusable sensors at least every 4 hours and adhesive sensors at least every 8 hours.
Sensor accuracy specified when used with Masimo technology using a Masimo patient cable for LNOP sensors, RD SET sensors, the LNCS sensors, or the M-LNCS sensors. Numbers represent Arms (RMS error compared to the reference). Because pulse oximeter measurements are statistically distributed, only about two-thirds of the measurements can be

expected to fall within a range of ± Arms compared to the reference value. Unless otherwise noted, SpO_2 accuracy is specified from 70% to 100%. Pulse Rate accuracy is specified from 25 to 240 bpm.

*4) A functional test machine (test device with which a predictable ratio value can be input to the pulse oximeter as a signal) is not available for evaluating the accuracy of the device and the SpO_2 sensor.

11-1-6. Electromagnetic Compatibility (EMC) Information

The device is compliant with the Electro-medical Apparatus EMC Standards Edition 4 (IEC60601-1-2: 2014).
This device has been confirmed to meet the standards when configured as shown below.
Using accessories or cables other than those specified may increase emissions from the device or not meet the performance of the device.

Devices Used for Evaluation

No	Device	Model number
1	Fetal monitor	MT-832-P-H
2	Recorder unit	MP-130-H
3	Y-shaped Doppler/External UC transducer	TR-687-06
4	Doppler transducer	TR-629-06
5	Doppler transducer	TR-629-06
6	Remote marker switch (for twins)	SW-527-02
7	SpO_2 sensor	uSpO_2 Masimo SET Oximetry Cable with USB Connector
8	NIBP wide-range cuff	UM-WRRS2M1KJC
9	M.ECG adapter cable	TR-655-05
10	Bar code reader	PDC-019-060-UP
11	USB memory	RUF2-KR-16GA-WH
12	Laptop PC	CF-W7DW3AAS
13	Wireless LAN access point	WLX313
14	PoE HUB	EIB-UG01-PL2
15	AC Adapter (for the main unit)	ATM065T-P240
16	AC Adapter (for the recorder)	ATM065T-P240
17	AC Adapter (for the PC)	CF-AA6372b

Cables Used for Evaluation

No	Cable Name	Length (m)	Shield
1	USB cable	1.6	With
2	Y-shaped Doppler/External UC transducer	2.9	With
3	Doppler transducer	2.9	With
4	Doppler transducer	2.9	With
5	Remote marker switch (for twins)	2.9	With
6	SpO_2 cable	1.8	With
7	SpO_2 reusable sensor	0.9	Without
8	NIBP air hose for adults	2.5	Without
9	M.ECG adapter cable	1.85	With
10	Clip electrode lead (R red)	1.0	With
11	Clip electrode lead (L yellow)	1.0	With
12	Clip electrode lead (F green)	1.0	With
13	DOP signal output cable	1.0	Without
14	Bar code reader cable	1.9	With
15	LAN cable	10	Without
16	Wireless LAN access point connection LAN cable	1.0	Without

No	Cable Name	Length (m)	Shield
17	AC cable (for the fetal monitor)	2.0	Without
18	AC cable (for the recorder)	2.0	Without
19	AC cable (for the PC)	2.0	Without
20	AC cable (for PoE HUB)	2.0	Without
21	DC cable (for the fetal monitor)	1.5	Without
22	DC cable (for the recorder)	1.5	Without
23	DC cable (for the PC)	1.5	Without
24	Twins link cable	0.5	With

Pay special attention to electromagnetic compatibility (EMC) when using the device. Follow the cautions on EMC described in this manual to install and work with the device. Medical electronic devices are prone to be affected by mobile phones and mobile harmonic (RF) communication devices.

The device has a very high signal amplifier integrated to measure fatal signals including fetus parameters with a high degree of sensitivity. Therefore, an immunity level for conducted disturbance inducted by a radiation wireless frequency electromagnetic field and a wireless frequency field has a technical limit.

The immunity test defines that the device's performance should not degrade when the product is placed in an environment where electromagnetic disturbances are simulated. However, a phenomenon has been noted in some frequencies in which the display and recorder output of ultrasonic wave parameters are not normal.

The above phenomenon is not unique to the device but often can be seen on a general biological information monitor, rarely causing problems due to clinical electromagnetic waves.

11-1-6-1. Electromagnetic Emission

Policies and declaration by manufacturer – Electromagnetic radiation –		
The device is intended to be used in the electromagnetic environment shown below. We recommended using the device under the following environment:		
Emission Test	Suitability	Electromagnetic Environment – Policy –
RF emission CISPR11	Group 1	The device uses RF energy only for internal functions. Therefore, the RF emission is very low and less likely to cause any interference with adjacent electronic devices.
RF emission CISPR11	Class B	The device is suitable for use in a facility directly connected to a commercial low voltage distribution network which supplies power to all facilities, including buildings used for domestic and household circumstances.
Harmonic emission IEC61000-3-2	Not applicable	
Voltage fluctuation/ flicker emission IEC61000-3-3	Not applicable	

11-1-6-2. Electromagnetic Immunity

Policies and declaration by manufacturer – Immunity –			
The device is intended to be used in the electromagnetic environment shown below. We recommend using the device under the following environment:			
Immunity Test	IEC 60601 Test Level	Suitability Level	Electromagnetic Environment – Policy –
Static discharge (ESD) IEC61000-4-2	Contact discharge: ±8.0kV Aerial discharge: ±2.0kV, ±4.0kV, ±8.0kV, ±15.0kV	Contact discharge: ±8.0kV Aerial discharge: ±2.0kV, ±4.0kV, ±8.0kV, ±15.0kV	We recommend that floor materials are made of wood, cement, or ceramic tiles. When floor materials are covered with synthetic resin, keep the relative humidity to 30% or more.
Electric fast transient burst IEC61000-4-4	±2.0kV power wire ±1.0kV signal wire	±2.0kV power wire ±1.0kV signal wire	We recommend using power quality that is equivalent to that of a standard commercial or hospital environment.
Surge IEC61000-4-5	±1kV line-line ±2kV line-ground	±1kV line-line ±2kV line-ground	We recommend using power quality that is equivalent to that of a standard commercial or hospital environment.
Voltage dip, momentary stop, and voltage fluctuation IEC61000-4-11	0% Ut 0.5 cycle 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315° 0% Ut 1 cycle and 70% Ut 25/30 cycle Single phase: 0°	0% Ut 0.5 cycle 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315° 0% Ut 1 cycle and 70% Ut 25/30 cycle Single phase: 0°	We recommend using power quality that is equivalent to that of a standard commercial or hospital environment. If continuous operation is required during electric outage, the operator should supply power from a UPS.
	0% Ut 250/300 cycle	0% Ut 250/300 cycle	
Power frequency magnetic field IEC 61000-4-8	30 A/m	30 A/m	We recommend using power quality that is equivalent to that of a standard commercial or hospital environment.
Remarks: Ut denotes an AC voltage prior to addition of the test level.			

Policies and declaration by manufacturer – Immunity –			
The device is intended to be used in the electromagnetic environment shown below. We recommend using the device under the following environment:			
Immunity Test	IEC 60601 Test Level	Suitability Level	Electromagnetic Environment – Guidance
Conducted RF IEC61000-4-6 Radiated RF IEC61000-4-3	3Vrms 150kHz to 80MHz Within ISM band[a] 3V/m 80MHz to 2.7GHz	3V rms 6Vrms 3V/m	We recommend using frequency ranges from 150kHz to 80MHz and that the electromagnetic strength is less than 3V/m. Interference may be detected near devices with the symbol shown below. 
Remarks 1. A higher frequency range is applied for 80MHz and 800MHz. Remarks 2. These policies do not always apply under all conditions. Propagation of electromagnetic waves is affected by absorption from and reflection against buildings, objects, and human bodies.			
a: ISM (industrial, scientific, and medical) band between 150kHz and 80MHz is equal to 6.765MHz to 6.795MHz, 13.553MHz to 13.567MHz, 26.957MHz to 27.283MHz, and 40.66MHz to 40.70MHz. b: Theoretically, the electromagnetic field strength from fixed transmitters, for example, a wireless phone base station (mobile/cordless) and a land mobile radio, an amateur radio, AM/FM radio and TV broadcasting cannot be predicted accurately. To evaluate an electromagnetic environment resulting from fixed RF transmitters, we advise considering a field investigation of electromagnetic waves. If the accurate electromagnetic field strength at a location in which the device is used exceeds the above levels, observe that the device is working correctly. Once an abnormal behavior has been detected, additional measures, including changing the orientation and installation position of the device are required.			

Specifications of the immunity test of an enclosure port for an RF wireless communication device						
We recommend that any mobile RF communication devices (including such peripheral equipment as an antenna cable and external antenna) are more than 30cm away from any parts of the device including cables. Otherwise, the performance of the device may degrade.						
Test frequency (MHz)	Band (MHz)	Service	Modulation	Maximum Power (W)	Distance (m)	Immunity Test Level (V/m)
385	380 to 390	TETRA 400	Pulse modulation 18Hz	1.8	0.3	27
450	430 to 470	GMRS 460, FRS 460	FM ±5kHz deviation 1kHz sine	2	0.3	28
710	704 to 787	LTE band 13, 17	Pulse modulation 217Hz	0.2	0.3	9
745						
780						
810	800 to 960	GSM800/900, TETRA 800, iDEN 820, CDMA 850, LTE band 5	Pulse modulation 18Hz	2	0.3	28
870						
930						
1720	1700 to 1990	GSM 1800, CDMA 1900, GSM 1900, LTE band 1, 3, 4, 25 UMTS	Pulse modulation 217Hz	2	0.3	28
1845						
1970						
2450	2400 to 2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE band 7	Pulse modulation 217Hz	2	0.3	28
5240	5100 to 5800	WLAN 802.11 a/n	Pulse modulation 217Hz	0.2	0.3	9
5500						
5785						

11-1-7. Classification by sterilization methods

Dipping method. The following chemicals are used for the IEC 60601-1 test:

Name of Chemicals	Dosage and Administration	Dipping Time
STERIHYDE L 20 W/V% solution	Carefully measure 100 mL, add it to 900 mL of purified water to make 1 L of 2 W/V% solution, add 30 mL of buffer agent to this to make a greenish yellow (L: greenish yellow to light yellow) solution.	30 minutes
Osvan disinfectant 10%	Used by diluting with purified water. 100 times solution (0.1% solution)	10 minutes
TEGO 51 disinfectant 10%	Used by diluting with purified water. 50 times solution (0.2% solution)	15 minutes

11-1-8. Wiping test

Undiluted natural detergent was used for the IEC 60601-1 test.

11-1-9. Classification by safety level in use in the presence of air and flammable anesthetic gas, or oxygen or nitrogen monoxide and flammable anesthetic gas

The device must not be used in the presence of air and flammable anesthetic gas, or oxygen or nitrogen monoxide and flammable anesthetic gas.

11-1-10. Network

The device can send monitoring data to the Central monitor over an IT network in real time and check for the patient's status remotely.

Some Central monitors work on the in-hospital server, providing different paths for data communication respectively.
The former Central monitors communicate over a connected LAN cable network.
Central monitors may communicate over an in-hospital Internet-connected environment while they may communicate over out-of-hospital mobile data communication.
Security risks to the IT network are reduced by using a VPN.

Be sure to confirm with the IT administrator in the hospital about the connections in advance.
The following risks may arise if a failure is detected in the IT network:

- The patient's status cannot be identified on the Central monitor.
- An alarm issued by the device cannot be identified.
- Transmission of the monitoring data is delayed.
- The monitoring data is intercepted and falsified.

When the device is added to the Central monitor or the network environment has changed, new risks may arise for the patient, operator, or third-party.
Identify, evaluate these risks, and then take appropriate measures.
Example of network environment change:

- Changing network configurations
- Adding new Fetal monitor or device to the network
- Removing the Fetal monitor or device from the network
- Updating the Fetal monitor or device connected to the network
- Upgrading the device connected to the network

11-2. Accessories/Options List

11-2-1. Accessories supplied

Name	Product Code	Standard or Model Name	Cable Length (m)	Quantity
Power cord **Note 1**	YA0075		2.0	1
	YA0074		2.0	1
AC adapter	RI0131	ATM065T-P240	1.5	1
Y-shaped Doppler/External UC transducer	GA0128	TR-687-06	2.9	1
Remote marker switch (single)	GA1264	SW-527-01	2.9	1
Transducer belt	GA0115	Personal belt, 2 pcs/set (each 1 pc for Doppler&UC)	-	1
Ultrasound gel **Note 2**	GA0132	Aquasonic 100 gel, 250 ml/bottle	-	1
NIBP air hose for adults 1.5m one-touch ISO	GA1277	TM-9232BL-150	2.5	1
NIBP wide-range cuff 22 to 42cm	GA1278	UM-WRRS2M1KJC	-	1
M.ECG adapter cable	GA1259	TR-655-05	1.85	1
Clip electrode lead (R red)	YC0082	TR-653-91R	1.0	1
Clip electrode lead (L yellow)	YC0080	TR-653-91L	1.0	1
Clip electrode lead (F green)	YC0091	TR-653-91F	1.0	1
Ferrite core	RC0074		-	1
Operation Manual (This document)	GZ1292		-	1

Note1: Either Cord YA0075, YA0074, or no cord is included depending on the country.
Note2: Whether it is included or not depends on the country.

11-2-2. Options List

Name	Product Code	Standard or Model Name	Cable Length (m)
Doppler transducer	GA0129	TR-629-06	2.9
External UC transducer	GA0130	TR-619-06	2.9
Remote marker switch (twins)	GA1265	SW-527-02	2.9
Twins set	GA1770		-
Triplets (three fetuses) set	GA1771		-
Recorder unit	GA1286	MP-130	-
NIBP M size cuff 22 to 32cm	GA1287	UM-AURS2M1KJC	-
NIBP LA size cuff 31 to 45cm	GA1288	UM-LARS2M1KJC	-
NIBP monitor set（MT-830）	GA1276		-
SpO_2 patient cable	JA2193	uSpO_2 Masimo SET Oximetry Cable with USB Connector	1.8
SpO_2 disposable sensor for adults (20 pcs./box)	GA1281	LNCS Adtx	0.9
SpO_2 reusable sensor for adults	GA0163	LNCS DCI	0.9
SpO_2 forehead disposable sensor	GA0164	LNCS Red TFA-1	0.9
SpO_2 forehead reusable sensor	GA0165	LNCS TF-I	0.9
SpO_2 monitor set（disposable）（MT-830）	GA1279		-
SpO_2 monitor set（reusable）（MT-830）	GA1282		-
Analog converter unit	AA1267	MF-7450	-

11-3. Service Parts

The service life of this device is six years after its purchase. However, the following components are supplied for maintenance since they have shorter service lives than that of the device.
We will store the parts necessary for repairs for six years after the device is sold. The timing of the replacement will depend on the frequency of use and the environment in which the device is used.
Replace components that fail inspections.
If you have any questions, contact us or our distributor.

Names of Major Components	Service Life	Reasons for Service Life
Power cord	4 years	Consumable, degradation of the cable jacket
AC adapter	3 - 4 years	Aging degradation, deformed or damaged plugs, degraded cable jacket
Doppler transducer	5 years	Degradation with use
External UC transducer	4 years	Degradation with use
NIBP air hose for adults	3 - 4 years	Degradation with use
NIBP cuff	1 year	Degradation with use
SpO_2 patient cable	3 - 4 years	Degradation with use
M.ECG adapter cable	3 - 4 years	Degradation with use
Clip electrode lead	2 - 3 years	Degradation with use
Battery for clock	3 years	Consumption
Lithium ion battery	2 years	Degradation by charge and discharge
Remote marker switch (single/twins)	3 - 4 years	Degradation with use

* The table does not show components that can normally function after the service life of the device.

12. About Disposal and Warranty

12-1. Service Life/Disposal

12-1-1. Service life

The service life of this device is six years after sale. (Based on our self-certification using in-house data. This applies only when the designated maintenance and inspection was performed).

Some components may degrade with age within the service life. It is necessary to regularly replace components to maintain the performance of the device during its service life. Conduct repairs or overhauls depending on the results of inspections as needed.

12-1-2. Disposal

The device is classified as industrial waste. Contact your local authority for disposal. The device has a built-in battery. For disposal of the main unit, recycle or dispose in accordance with your local authority rules and regulations.
Not complying with regulations may cause environmental pollution.

Contact us or our distributor if disassembly (such as removing the battery) or other support is necessary.

12-2. Warranty

We will repair the device free of charge within the warranty period.

For repairs after the warranty period, we will repair the devices that have been used normally only. After the warranty period, the cost of the repair will be charged only if the product is used normally. We will store the parts necessary for repairs for six years after the device is sold.

Notification to Users

Pursuant to the provisions of the Pharmaceuticals and Medical Devices Etc. Act, we must provide users with information related to the effectiveness and safety of the device and information necessary for proper use of the device. Also, it is required by law that users must cooperate in the collection of information necessary for proper use.
If you encounter any problems, contact us and provide the following information.

(Inform) Toitu Co., Ltd. International Department
1-5-10, Ebisu-Nishi, Shibuya-Ku, Tokyo, 150-0021 Japan
Tel: +81-3-3463-6381
Fax: +81-3-3463-6380

- Address
- Facility name
- Contact person

Device name: Actocardiograph MT-830 Serial number:

Problem

For the purpose of improvements, the contents of this document are subject to change without notice.

Index

O

P

R

S

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W

Y

Z

Manufacturer **TOITU CO., LTD.**

1-5-10, Ebisu-Nishi, Shibuya-Ku, Tokyo, 150-0021 Japan
TEL: +81-3-3463-6381 FAX: +81-3-3463-6380
E-mail:international@toitu.co.jp
URL:https://en.toitu.co.jp