SUNTECH

Vet40

Portable Multiparameter Monitor

for Animals

User Manual

CAUTION: Read all warnings, cautions, and instructions provided prior to using the Vet40.

This manual is identified as part number: 80-0102-00. This manual is for use with Vet40 models 40A, 40B. 40AE, and 40BE. An updated version may be available for download from the SunTech Medical website. Should you notice errors or omissions in this manual, please notify us at:

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Copyright Information

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Welcome to the SunTech Vet40

Thank you for choosing the Vet40 vital signs monitor! For over 30 years, SunTech Medical has been the preeminent supplier of leading-edge technology and innovative products to obtain blood pressure (BP) measurements. Developed specifically for the veterinary care environment, the Vet40 can perform automatic BP, pulse oximetry (SpO2), body temperature, pulse rate, electrocardiogram (ECG), and capnography (ETCO2) measurements for veterinary professionals.

For measuring BP, a BP cuff is placed around the patient's forelimb or tail. The cuff is inflated automatically, and blood pressure is determined by the oscillometric method, which senses pressure waves in the artery when occluded by pressure in the cuff. Measurement of the frequency of the pressure waves enables the heart rate to also be measured.

The pulse oximetry function measures the patient's percent functional oxygen saturation of arterial hemoglobin using principles of plethysmography via a SpO2 sensor placed on the patient. Arterial oxyhemoglobin saturation is determined by measuring the absorption of red and infrared light passing through the tissue. Changes in absorption caused by pulsations of blood in the vascular bed are used to determine arterial saturation and pulse rate. The Vet40 provides two options for SpO2: AccuVetTM or MasimoTM SET®. The oximeters require no routine calibration or maintenance. The display features a waveform focus screen, which displays the SpO2 plethysmograph. The waveform is not normalized.

Temperature can be measured using a temperature probe. The temperature probe contains a thermistor that generates a voltage based on changes in temperature, and these voltages are recorded by the temperature circuitry.

The electrocardiogram measures the patient's electrical signals in the heart. The heart muscles receive electrical signals to contract, or beat, pushing blood out to other parts of the body. The ECG device uses electrodes attached to the patient to measure this electrical activity of the heart, in volts, with the changes in voltage corresponding to different aspects of the heart contraction. The waveform created can be used to determine the heart rate of the patient and if there are any irregularities or rhythm in the heartbeat.

The capnography function measures the amount of carbon dioxide (CO2) the patient is exhaling. Capnography uses infrared light passing through the airway tube to measure the amount of CO2 in the air. CO2 absorbs infrared light, preventing it from getting to the other side of the airway tube. This allows the capnography device to determine how much CO2 is in the air sample passing through the tube. The device will also provide a waveform of the amount of CO2 in the tube over time. By monitoring this waveform, the user may determine the patient's respiratory rate. Mainstream capnography is non-diverting, so it is giving real-time information on the air that is passing through the sensor on the airway tube. Sidestream capnography is diverting, so there is a small delay in displaying the result due to the length of the sampling tube.

The Vet40 is a portable device, weighing approximately 2.65 lb (1.2 kg). Control buttons allow the user to turn on or off the device and start/stop BP measurements. The touchscreen display shows the device status and measurement information and allows for selection of settings. The unit is powered by a single rechargeable lithium-ion battery at the bottom of the device. Bluetooth can be used to wirelessly connect and send data to a PC through software package VET40 Stream, which may be downloaded from the SunTech website at: https://www.suntechmed.com/vet40-VET40 STREAM. Patient data files can be transferred to a PC through software package Fetch, which may be downloaded from the SunTech website at: https://www.suntechmed.com/vet40-Fetch. A USB-C cable can be used to send data to the Fetch application through a wired connection. Upper and lower alarm limits can be set for all parameters.

Intended Use

The SunTech Vet40 is a clinical grade automated blood pressure measurement device that provides oscillometric non-invasive blood pressure readings. The Vet40 also provides pulse oximetry, temperature, ECG, and optional capnography measurement capabilities. It also provides a non-diagnostic ECG waveform display of cardiac electrical activity. This portable device is intended to be used in veterinary clinics and surgical theaters on companion animals (cats and dogs) with an optional version intended for use on equines. The device may be used for spot-checking vital signs or continuous measurement activities. This device is not intended for human use.

The devices are contraindicated for use on humans or any species other than those described above.

The Vet40 models are designed to measure, record, and display a patient's blood pressure, functional oxygen saturation, continuous temperature, ECG, and (optional) ETCO2.

Vet40 Essential Performance:

The Essential Performance of the Vet40 models are designed to measure, record, and display a patient's blood pressure within a blood pressure accuracy range of +/- 5 mmHg mean error & 8mm Hg standard deviation (max inflate 280 mmHg).

Additionally, these models are designed to measure, record, and display a patient's functional oxygen saturation over the range of 70% to 100% with an increment of 1% within an accuracy of +/- 3%. These models shall also measure, record, and display a patient's continuous temperature within an accuracy of no greater than 0.3^0C (+/- 3 digits) when used with a minimum temperature range of 26^0C to 46^0C.

ECG signal resolution is ≤ 5 µV/lsb RTI with a signal sample rate ≥ 120 Hz, and selectable gain setting of 10 mm/mV. CO2 accuracy of ≤ ±2 mmHg at 0-40 mmHg, ≤ ±5% of reading at 41-70 mmHg, ≤ ±8% of reading at 71-100 mmHg, and ≤ ±10% of reading at 101-150 mmHG. Heart rate accuracy of +/-2 BPM or 2%.

User Responsibility

This user manual is for use with all Vet40 models. The user of this monitor shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, improper repair, damage or alteration by anyone other than SunTech Medical or their authorized service personnel. The Vet40 is for use only by, or on the direction of, a licensed veterinarian.

To request a paper copy of current user manual at no additional cost, contact SunTech Customer Service at CustomerSupport@suntechmed.com or by calling 800.421.8626.Use of Vet40

Use only veterinary BP cuffs supplied by SunTech Medical. Observe the patient carefully during the measurement. Accuracy of any BP reading, oxygen saturation measurement, ECG reading, or ETCO2 reading may be affected by the position of the patient, sensor location, their physical condition and use outside of the operating instructions detailed in this guide. The interpretation of BP, oxygen saturation, ECG, or ETCO2 measurements should only be made by a qualified veterinarian.

AccuVet SpO2 Module: Use only AccuVet SpO2 sensors supplied by SunTech Medical.

Masimo SET SpO2 Module: Use only original Masimo SpO2 sensors and cables.

SunTech ECG leads, clips, and cables: Use only approved SunTech cables.

SunTech ETCO2 Module: Use only original SunTech ETCO2 sensors and cables.

Check the application site of the SpO2 sensor frequently to confirm proper positioning of the sensor and to check the circulation and skin sensitivity of the patient.

Frequently checking the application sites of the ECG leads to confirm proper positioning and adequate connection with the skin. Check the skin sensitivity of the patient as warranted.

Table of Contents

1. Contraindications, Warnings and Precautions

Contraindications

This device is contraindicated for use on humans or any species other than those described above.

This device is not for human use and should only be used by or under the direction of a licensed veterinarian.

General warnings and cautions are listed here and repeated where relevant throughout this guide. A WARNING indicates a situation which, if not avoided, could result in serious injury or death.

WARNING: The Vet40 is intended for use by a qualified clinician. The operator is required to have some basic knowledge of the measurement of vital signs.
WARNING: DO NOT connect patient hose or monitor to any other devices or connections, especially intravenous (IV) tubes as there is potential for air to be pumped into a blood vessel which could cause serious injury.
WARNING: DO NOT use accessories labeled for single-patient use on multiple patients as this may result in cross-contamination and serious infection. These accessories include but may not be limited to single patient use cuffs, airway adapters and airway tubing.
WARNING: This monitor may cause radio interference or disrupt the operation of nearby equipment. It may be necessary to take mitigation measures such as re-orienting, relocating, or shielding the location.
WARNING: The cuff should not be applied over a wound or non-intact skin as this could cause further injury.
WARNING: DO NOT use a defibrillator, full body irradiation, or ultrasonic device on the patient at the same time with the Vet40 as it may affect the operation and/or safety of the patient due to interactions.
WARNING: During application and removal of ECG electrodes, keep a safety distance of at least 2 meters from any electric devices, metallic objects, or other electric conductors. If the patient's lead cables (with electrodes) are applied to the patient, lead cables that are disconnected must not contact potential shock or electrical hazards. Such contact may serve as a pathway for potentially life-threatening electric shock.
WARNING: DO NOT immerse the monitor in any fluid or attempt to clean the unit with liquid detergents, cleaning agents, or solvents. This may cause an electrical hazard. Do not use the monitor if accidental wetting occurs. Refer to the cleaning section of this guide for instructions on proper cleaning. If any of these conditions apply, please contact SunTech Medical.
WARNING: If using a BP cuff, check the limb frequently to ensure that the operation of the monitor does not result in prolonged impairment of the circulation of the patient.
WARNING: DO NOT apply the BP cuff to a limb being used for IV infusions or any other intravascular access, therapy, or an arteriovenous (A-V) shunt. Cuffs inflation can temporarily block blood flow, potentially causing harm to the patient.
WARNING: Do not remove Vet40 covers. Doing so may cause electrical shock to the user or damage to the Vet40. The device does not contain serviceable components.
WARNING: Pressurization of the BP cuff can temporarily cause loss of functionality of SpO_2 if used on the same limb.
WARNING: DO NOT use if the device is dropped and/or is damaged. Have a qualified service representative check the unit before using Vet40 again. Repairs should only be conducted by an authorized SunTech Medical service representative.
WARNING: Before performing a procedure when a device is not plugged into the main power supply, ensure there is sufficient battery charge. If battery loses too much charge, the device must be plugged into the power supply to function.
WARNING: The USB port is a service and data port only. Before connecting a personal computer to the USB port, remove the Vet40 and all connected accessory parts from the patient. Otherwise, the personal computer must be hospital-grade and comply with the requirements of the IEC 60601-1 standard.
WARNING: As with all medical equipment, carefully route patient cabling to reduce the possibility of patient entanglement or strangulation.
WARNING: Do not place the monitor or accessories in any position that might cause it to fall on the patient.
WARNING: Do not start or operate the monitor unless the setup is verified to be correct.
WARNING: Do not use the monitor during magnetic resonance imaging (MRI) or in an MRI environment.
WARNING: Do not use the monitor if it appears or is suspected to be damaged.
WARNING: Explosion hazard: Do not use the monitor in the presence of flammable anesthetics or other flammable substances in combination with air, oxygen-enriched environments, or nitrous oxide.
WARNING: To ensure safety, avoid stacking multiple devices or placing anything on the device during operation.
WARNING: To protect against injury, follow the directions below:

- Avoid placing the device on surfaces with visible liquid.
- Do not soak or immerse the device in liquids.
- Do not attempt to sterilize the device.
- Use cleaning solutions only as instructed in this operator manual.
- Do not attempt to clean the device while monitoring a patient.

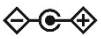
WARNING: To protect from electric shock, always remove any sensor(s) and completely disconnect the monitor before bathing the patient.
WARNING: If any measurement seems questionable, first check the patient's vital signs by alternate means and then check the monitor for proper functioning.
WARNING: The monitor should not be used as the sole basis for medical decisions. It must be used in conjunction with clinical signs and symptoms.
WARNING: The monitor is not an apnea monitor.
WARNING: The monitor may not be used during electrocautery or near other active HF surgical equipment.
WARNING: The monitor should not be used for arrhythmia analysis and will not alarm for arrythmias such as tachycardia.
WARNING: Do not adjust, repair, open, disassemble, or modify the monitor or accessories. Injury to personnel or equipment damage could occur. Return the monitor to SunTech Medical for servicing if necessary.
WARNING: Not designed for human use or any species other than those indicated.
WARNING: Do not rely on the clinical alarm functions of the veterinary monitor. The alarm limits may have been improperly set, or the alarm may have been disabled.
WARNING: Alarm functions of the veterinary monitor must be checked regularly.

CAUTION: This device contains a lithium-ion battery that contains materials which may be hazardous to human health. DO NOT dispose of battery in domestic waste! Instead, please dispose of it in an environmentally responsible way, or return the battery to SunTech Medical. A prepaid return label can be obtained. Please see our website for more information about our environmental policy at http://www.suntechmed.com/about-suntech/environmental-policy.
CAUTION: Accuracy of any blood pressure measurement may be affected by the position of the subject, the patient's physical condition, position of the cuff, and use outside of the operating instructions detailed in this manual. Interpretation of BP measurement should be made only by a veterinarian or trained medical staff. Minimize limb movement during the measurement.
CAUTION: A compressed or kinked connection hose may cause continuous cuff pressure resulting in blood flow interference and potentially harmful injury to the patient. If the cuff fails to deflate, the operator should be instructed on how to remove the cuff.
CAUTION: Accuracy of any $EtCO_2$ measurement may be affected by restrictions or leaks in the airway tubing or airway fittings, excessive condensation in the sensing window, or by rapid cyclical pressures
CAUTION: Performance can be affected if used or stored outside the specified temperature, humidity, or altitude ranges. In such instances, the device should not be used for a minimum of 20 minutes or until the device can adjust to the operating environment.
CAUTION: Replace replaceable parts that are broken, worn, missing, damaged, incomplete, or contaminated. Contact SunTech Medical for service on parts that are not replaceable and stop using device until repaired. Failure to repair a damaged product may cause injury to the user and/or the patient.
CAUTION: Do not place the monitor where the controls can be changed by the patient.
CAUTION: Electrical shock and flammability hazard: Before cleaning, always turn off the device and disconnect from any power source.
CAUTION: Do not place the monitor on electrical equipment that may affect the device, preventing it from working properly.
CAUTION: To ensure that alarm limits are appropriate for the patient being monitored, check the limits each time the monitor is used.
CAUTION: Electrical Shock Hazard: Carry out periodic tests to verify that leakage currents of patient-applied circuits and the system are within acceptable limits as specified by the applicable safety standards. The summation of leakage currents must be checked and in compliance with IEC 60601-1 and UL60601-1. The system leakage current must be checked when connecting external equipment to the system. When an event like a component drop of about 1 meter or greater or a spillage of blood or other liquids occurs, retest before further use. Injury to personnel could occur.
CAUTION: Disposal of product - Comply with local laws in the disposal of the device and/or its accessories.
CAUTION: To minimize radio interference, other electrical equipment that emits radio frequency transmissions should not be close to the pulse oximeter.
CAUTION: Use only SunTech branded cuffs approved for use on the device.
CAUTION: Comply with all warnings and cautions in any third-party instructions

2. Icons and Symbols

Some of the symbols listed in the table below refer to the following FDA SDO Consensus standards:

- Recognition #5-103, ISO 7000: 2014: Graphical symbols for use on equipment - Registered symbols
- Recognition #5-116, ISO 7010: 2011: Graphical symbols - Safety colors and safety signs - Registered safety signs
- Recognition #5-102, ISO 60417: 2002 DB: Graphical symbols for use on equipment
- Recognition #5-117, ISO 15223-1: 2016: Medical devices - Symbols to be used with medical device labels, labelling, and information to be supplied - Part 1: General requirements

Symbol	Description	Standard/Source
	General Warning Sign	ISO 7010-W001
	Batch Code	ISO 7000-2492
	Caution	ISO 7000-0434A
	Classification – Class II	IEC 60417-5172
	Refer to Instruction Manual	ISO 7010-M002
	Authorized representative in the European Community	SunTech Design
	USB	Industry
	Direct Current	IEC 60417-5031
	Alternating Current	IEC 60417-5032
	Polarity of DC power connector	IEC 60417-5926
	Rechargeable battery	IEC 60417-5639
	Consult Instructions for Use	ISO 7000-1641
	This product meets the requirements of the applicable Directives	EU Directive
	Disposal in compliance with WEEE Directive	WEEE Directive
	Manufacturer	ISO 7000-3082
	Date of Manufacture	ISO 7000-2497
	Serial Number	ISO 7000-2498
	Cuff index line must fall within range markings	SunTech Design
	Arrow should be placed over artery	SunTech Design
	Symbol indicating limb circumference	SunTech Design
	Index line	SunTech Design
	Not made with natural rubber latex	SunTech Design
	Reference Number	ISO 7000-2493
	Type BF Applied Part	IEC 60417-5333
	Fragile, handle with care	ISO 7000-0621

	Humidity Limits	ISO 7000-2620
	Temperature Limits	ISO 7000-0632
	Keep Dry	ISO 7000-0626
	Accesses Settings screen	SunTech Design
	Access Controls Reference Screen	SunTech Design
	Clock	SunTech Design
	Date	SunTech Design
	Return to Home Screen	SunTech Design
	Small animal mode	SunTech Design
	Large animal mode	SunTech Design
	Equine mode	SunTech Design
	Start New Patient in Small Animal Mode	SunTech Design
	Start New Patient in Large Animal Mode	SunTech Design
	Start New Patient in Equine Mode	SunTech Design
	Opens the Icon Menu	SunTech Design
	Day Mode / Night Mode	SunTech Design
	Begins Interval BP Mode	SunTech Design
	Adjusts volume	SunTech Design
	Silence Alarm	SunTech Design
	View Memory	SunTech Design
	Exits or closes a screen	SunTech Design
	Confirm Selection	SunTech Design
	Select or Deselect All	SunTech Design
	Delete all patient data	SunTech Design
	Averages selected BP readings	SunTech Design

	Begins STAT Mode	SunTech Design
	Bluetooth	Bluetooth
	Begins data transfer	SunTech Design
	Screen Capture Waveform Data	SunTech Design
	ECG Lead Number and Quick Access ECG Settings	SunTech Design
	Suspend Mode	SunTech Design
TIP:	Provides practical advice for using monitor	SunTech Design
	Patient Timer	SunTech Design
PT #:	Patient Number	SunTech Design
	Standby (Powers device on/off)	IEC 60417-5009
	Start/Stop a BP measurement	IEC 60417-5107B IEC 60417-5110B
	Battery Indicator	SunTech Design
IPX1	SpO_2 Sensors only: These items are protected against ingress of vertically dripping water only	IEC 60529

3. Getting to Know SunTech Vet40

3.1 Applied Parts and Patient Environment

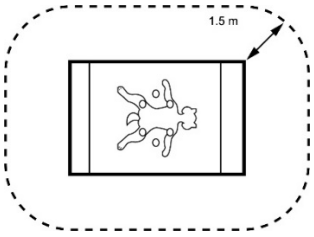
The applied parts are type BF. The following are the applied parts of the Vet40:

- BP Cuffs
- SpO_2 Sensors
- Temperature Probes
- ECG Leads
- $ETCO_2$ Sensors

The Vet40 has been tested with specific parts used within the patient environment. The parts of the system that can be used in the patient environment are:

- Vet40 monitor
- All applied parts as defined above
- All accessories as defined in Section 12.5, excluding the AC Adapter

The patient environment is defined in the following diagram:



3.2 Device Placement

WARNING: As with all medical equipment, carefully route patient cabling to reduce the possibility of patient entanglement or strangulation.

CAUTION: Do not position the monitor so that it is difficult to access and remove the AC adapter from the electrical supply mains. The power supply is the only means of connection or disconnection to the supply mains.

Place the Vet40 monitor in an appropriate location to ensure the user's ability to monitor the screen continuously. Ensure the monitor is placed away from tabletop edges and route the patient cables so that if pulled, the monitor will not fall.

3.3 Front Panel

Power button.
Press once to turn ON. The button is illuminated when power is on.
To turn OFF, press and hold the button until the screen turns off.

Start/Stop button.
Starts BP measurement. Stops a measurement in progress at any time.

3.4 Connect Power, Hose, and Sensors

Insert the AC adapter connector into the Vet40. Plug the other end of the AC adapter into a power supply to begin charging the battery. Only use the AC Adapter supplied by SunTech Medical.

WARNING: To completely disconnect the Vet40 from all power, the AC adapter must be unplugged, and the battery must be disconnected. *See Section 12.3 for information on battery disconnection.*

Connect the patient hose to the back of the monitor. Pull back the sliding collar of the metal connector on the hose and insert the connector piece on the back of the monitor as indicated below. Release the sliding collar of the metal connector, ensuring that a solid connection has been formed. *For additional information on how to take a BP measurement, see Section 5.*

Plug AccuVet temperature probe into the back of the monitor. Be sure to fully insert the connector into the monitor to avoid erroneous temperature values. *For additional information on how to take temperature measurements, see Section 6.*

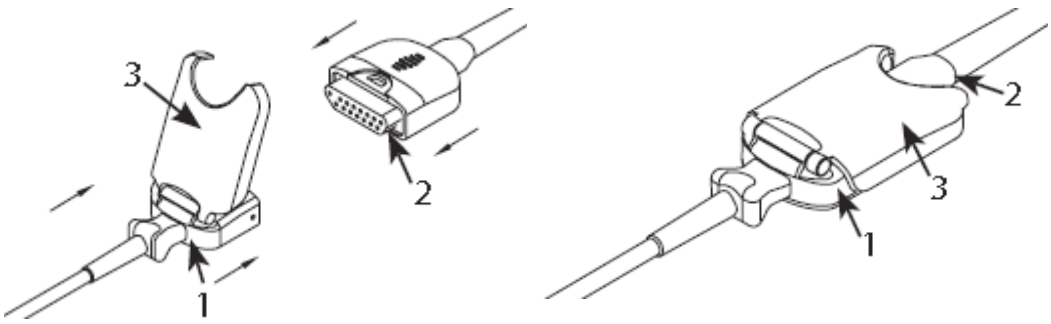
A) AccuVet SpO_2

To plug the AccuVet SpO_2 Y-lingual Sensor, Reflectance Sensor, or extension cable into the back of the monitor, first lift the retaining clip. Then insert the connector completely into the back of the Vet40. Ensure the retaining clip secures the connector. If applicable, firmly attach the sensor cable to the extension cable. *For additional information on how to take an SpO_2 measurement, see Section 7.*

B) Masimo SpO_2

Attach the LNC Patient Cable to the Masimo-labeled connector on the back of the Vet40.

Attach the LNC Patient Cable connector to a LNCS reusable sensor connector. Orient sensor connector (1) to patient cable connector (2) as shown. Insert sensor connector (1) completely into patient cable connector (2). Close sensor connector cover (3) over patient cable connector until it locks in place. *For additional information on how to take an SpO_2 measurement, see Section 7.*



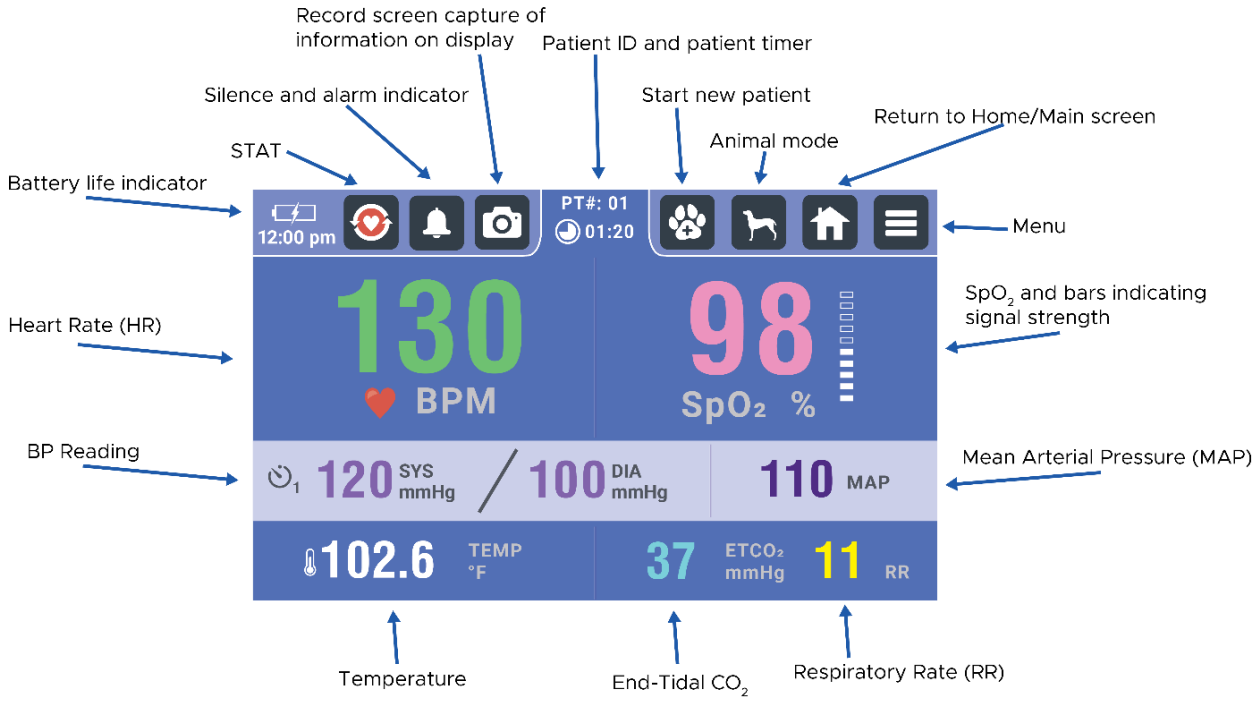
Connect the ECG cable to the back of the monitor. Ensure that all lead wires are connected to the main ECG cable. *For additional information on how to take an ECG measurement, See Section 8.*

Connect the $ETCO_2$ cable to the back of the monitor. Ensure that the patient tubing forms a secure and tight connection with the $ETCO_2$ adapter. *For additional information on how to take an $ETCO_2$ measurement, See Section 9.*

3.5 Display

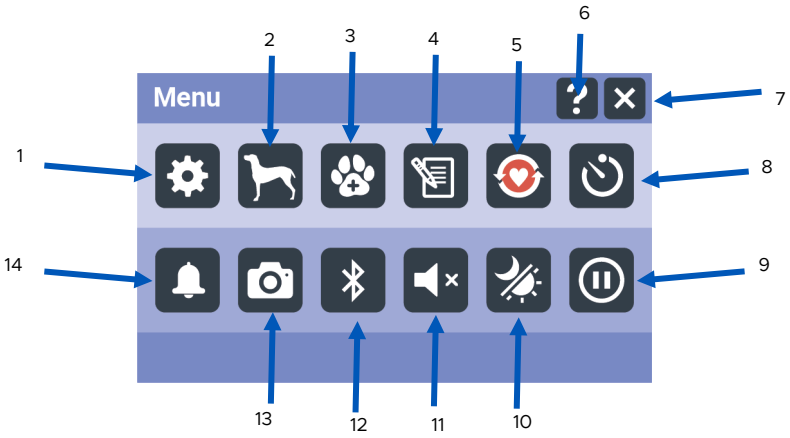
Main Screen

The main screen will display the most recent patient measurements. Here is a quick overview of the key symbols and numeric values displayed. Prior to the first reading, the screen will display dashes instead of values.



Menu

Press the Menu button on the main screen to open the Menu. The menu consists of all the functions and settings for the Vet40.



1. Settings
   For more information on selecting settings, see Section 4.3
2. Animal Mode Selection
3. Start New Patient
4. Memory
   For more information on reviewing and transferring data, see Section 10
5. STAT Mode
   For more information on STAT BP Mode, see Section 5.5
6. Controls Reference Screen
7. Exit Icon Menu
8. Interval Mode
   For more information on Interval BP Mode, see Section 5.4
9. Suspend Mode
   For more information on Suspend Mode, see Section 3.8
10. Light/Dark Mode
11. Speaker Volume
12. Bluetooth Connect
    For more information on Bluetooth connection, see Section 10.7
13. Screen Capture
    For more information on Screen Capture, see Section 3.9
14. Silence and Alarm Indicator

For more detailed information on temperature, BP, SpO_2, ECG, and $ETCO_2$ touch the section of the screen relating to the parameter you would like to focus on. This expanded view provides a more detailed look at the measurement. To exit the screen, touch a different parameter or the home button.

Temperature Focus Screen

- Larger view of the current temp reading

Blood Pressure Trending

- Focused view of the recent blood pressure reading in a graphical representation.

Waveform Focus Screen

- Provides the waveforms for the parameters selected.

The Vet40 blood pressure focus screen will show the recent NIBP readings. Example image shown above. Each BP reading will be represented as a vertical bar. The top of the bar represents the systolic reading. The bottom of the bar represents diastolic reading. Additionally, a dark dot represents the MAP reading. The readings are shown in consecutive order starting from the left of the screen and moving right. The most recent reading is shown on the far right. A reading from the trend may be selected, and the information from that reading will be displayed in the white box at the bottom of the screen.

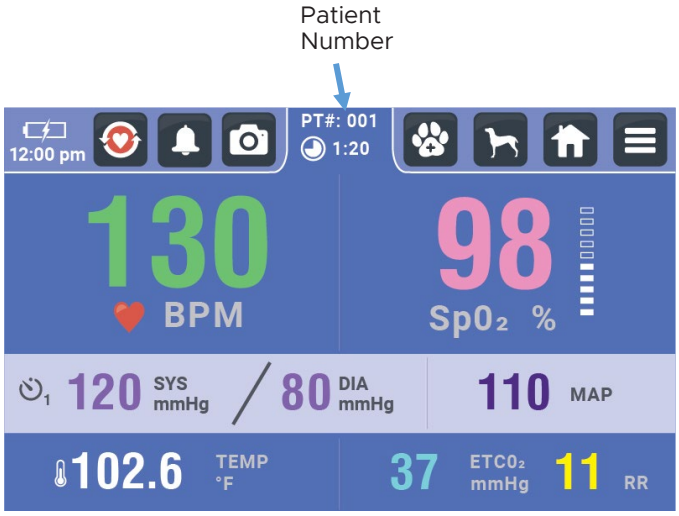
The Vet40 allows the user to view up to 3 waveforms on a single screen. The waveforms available for viewing are ECG, SpO_2, and $ETCO_2$. The waveform will be displayed when a sensor is connected, and the monitor detects a signal.

To start or stop displaying a waveform, tap on the numerical value associated with the parameter to be displayed or removed. (Example: touch the oxygen saturation value to display the plethysmograph for the SpO_2).

All 3 waveforms can be displayed at the same time. Any combination of the 3 can be displayed. If 2 of the parameters are selected for display, then there will be only 2 lines of waveforms displayed. If only one parameter is selected, then the monitor will show 2 lines of waveform data with the second line being a continuation of the first line.

The Vet40 allows the user to track each patient with a number. The Patient Number is displayed at the top of the main screen, along with the amount of time that patient has been actively monitored by Vet40. All data stored on the monitor will be saved with the date, time, and Patient Number for that day.. This may also be exported to a PC using the Fetch application https://www.suntechmed.com/vet40-fetch.

The user can start a new patient at any time by pressing the "New Patient" button at the top of the screen. It is important to note that the Patient Number will reset to #1 at the start of each day.



3.6 External Display

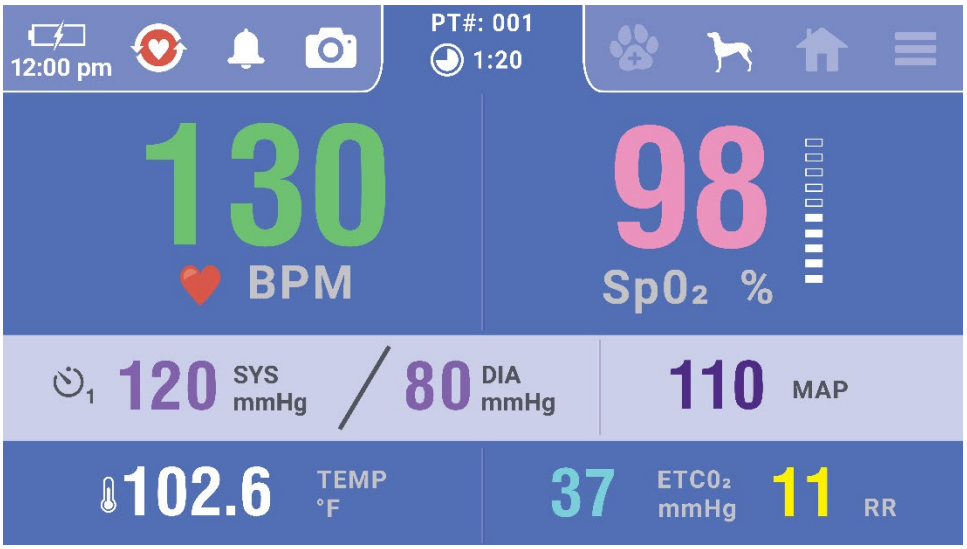
The SunTech Vet40 features a 5-inch touchscreen display. If a larger screen is needed or desired, the Vet40 may be connected to an external display via HDMI. The external display will not have any touchscreen responsiveness.

CAUTION: The external display must be a hospital-grade display complying with the requirements of the IEC 60601-1 standard.

To utilize an external display, connect an HDMI cable to the Vet40 and connect the other end of the cable to the external display. This will automatically show the information on the external display if the external display is on. The Vet40 MUST be plugged into an AC power supply to show information on an external display.

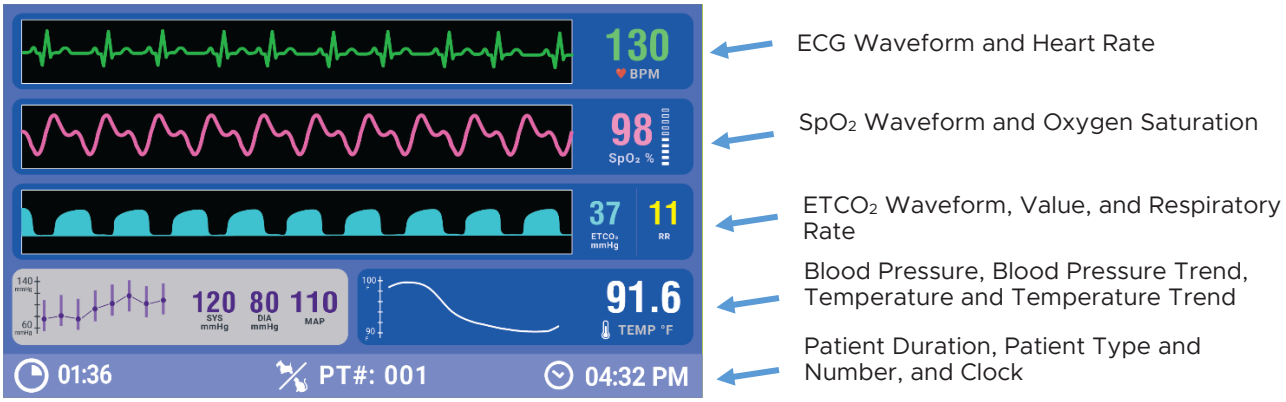
There are two options for an external display found in the Vet40 settings. They are described below:

- **Option 1 – Duplicate Display (Default)**. The external display will update as the screen on the Vet40 changes. Navigation to any menu screens on the Vet40 will not be visible on the external display.



- **Option 2 – Surgical Display**. The external display will show all values displayed on the Vet40 in a single view.

All Vet40 settings will also apply to the information being displayed on the external display. For example, if the setting for an ECG lead is changed on the Vet40, the new lead will be shown on the external display.



3.7 Start/Stop Button

The color of the LED ring around the START/STOP button  indicates the status of the Vet40.

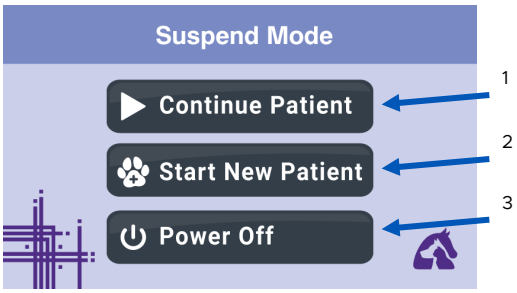
- START/STOP button is magenta during normal operation
- START/STOP button is blue during a BP reading
- START/STOP button is white when in service mode
- START/STOP button is red during an error, when a status message is displayed, or the device is unable to connect via Bluetooth

3.8 Suspend Mode

The monitor can enter Suspend Mode, which will pause all functions of the monitor to conserve battery life.

No measurements can be taken during this mode. First, if the monitor does not detect any signal from a patient or input from a user, for a defined interval (set in Power Management), then the Vet40 will automatically switch to Suspend Mode. Alternatively, the user can also switch the monitor to this mode manually at any time by pressing the suspend mode button  .

When in Suspend Mode, the monitor will always display the following screen:



There are 3 options to exit this mode:

1. **Continue Patient:** This will resume operation with the same Patient Number and timer.
2. **Start New Patient:** This will resume operation with a new Patient Number and timer.
3. **Power Off:** This will turn the Vet40 off completely.

3.9 Screen Capture

The monitor can record screen captures by saving high resolution waveforms and vitals data by pressing the screen capture button . The Vet40 will create a data file of all the waveforms and vitals from the previous one minute of operation and the next one minute of operation. During this time, the button will slowly fill green until the process is complete.

While a screen capture is in progress, the button may be pressed again to extend the recording time for one additional minute.

Any saved screen capture data may be exported from the Vet40 for further analysis and viewing.

4. Selecting Your Settings

TIP: Settings are saved even when the device is powered off.

4.1 Animal Mode

Small Animal Mode should be chosen when taking BP measurements on cats and dogs up to a #3 BP cuff size. This size typically applies to cats or dogs weighing less than 8kg (~17.5 lbs.).

Large Animal Mode has been designed for animals requiring a #4 BP cuff or larger. This size typically applies to cats or dogs weighing more than 8 kg (~17.5 lbs.).

(Optional) Equine Mode has been designed specifically for all horses.

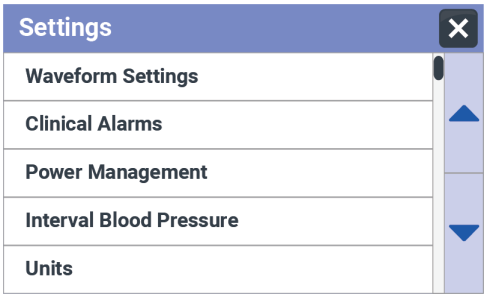
If blood pressure readings are questionable, verify that the correct animal mode is selected.

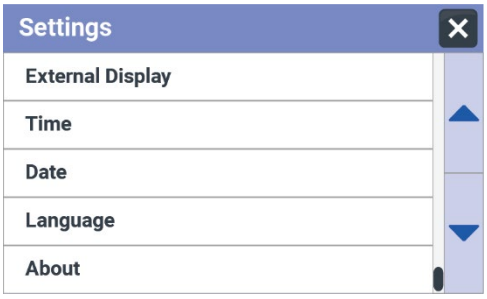
4.2 Volume

The SunTech Vet40 monitor's default volume setting is Off so that patients are not disturbed by sounds. To toggle between Off, Low, and High Volume, press the Speaker button. This setting will not affect alarms.

4.3 Settings

To access the settings screen, select the settings button in the menu.

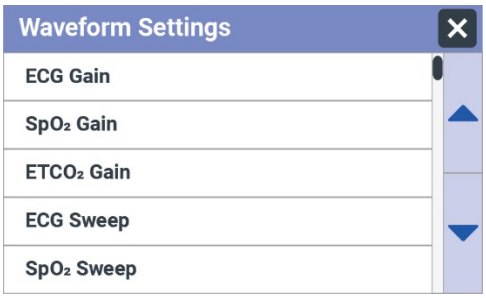


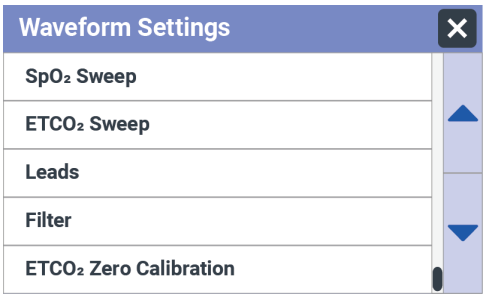


Waveform Settings	View settings for waveform.
Clinical Alarms	View and set all clinical alarms.
Power Management	Select how long monitor stays on before entering Suspend Mode.
Interval Blood Pressure	Select time between BP measurements in Interval BP Mode.
Units	Select the units for temperature, BP pressure, and $ETCO_2$.
External Display	Choose display mode.
Time	Set the time.
Date	Set the date.
Language	Select the desired language.
About	View monitor information and contact support.

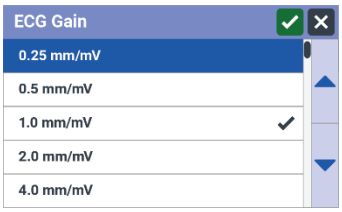
Waveform Settings

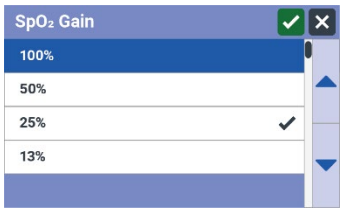
The SunTech Vet40 provides waveforms for ECG, SpO2, and $ETCO_2$. These settings are found in the Waveform Settings submenu (see below).

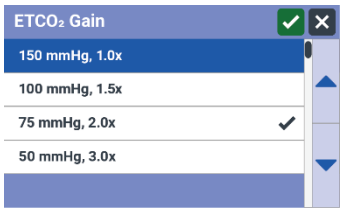




Gain
The gain may be adjusted independently for ECG, SpO_2, and $ETCO_2$ waveforms.



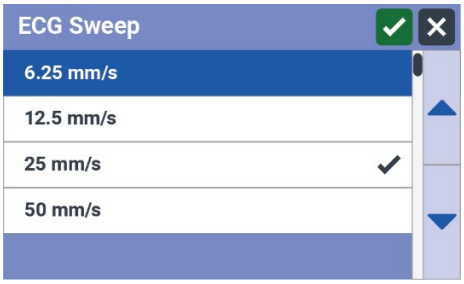





Press the green check to save the gain.


Press X to exit without changing the gain.

Sweep
Sweep speed may also be adjusted independently for ECG, SpO_2, and $ETCO_2$ waveforms.




Press the green check to save the sweep settings.

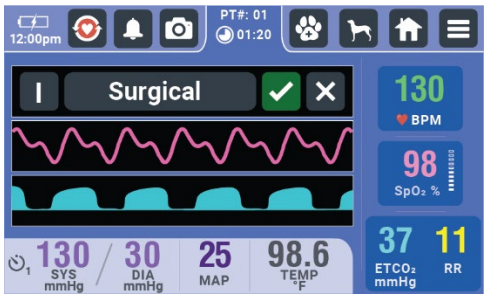

Press X to exit without changing the sweep setting.

Leads
The lead source may be adjusted between I, II, and III.

Press the green check to save the lead source.

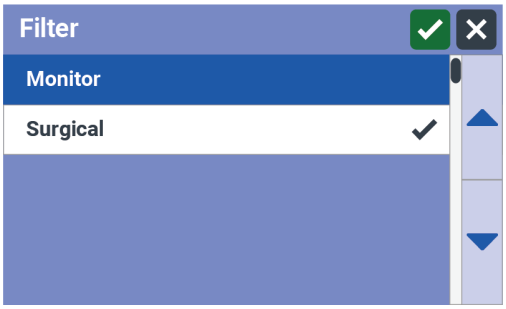
Press X to exit without changing the lead source.

NOTE: This setting may also be accessed directly from the Waveform Focus screen.



Filter

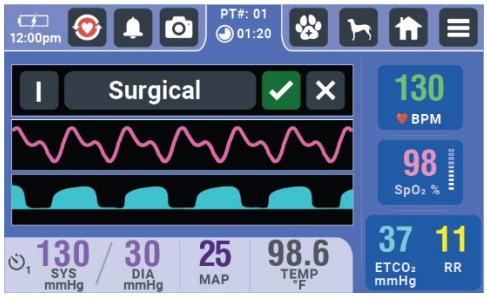
The waveforms may be adjusted to see more detail with the Surgical setting or a smoother waveform with the Monitor setting.



Press the green check to save the filter.

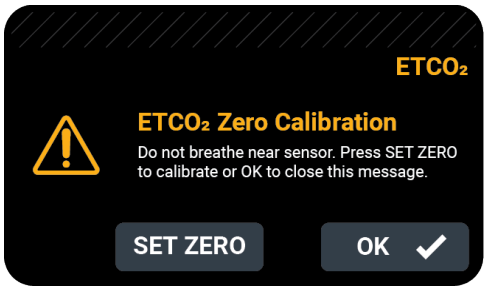
Press X to exit without changing the filter.

NOTE: This setting may also be accessed directly from the Waveform Focus screen.



$ETCO_2$ Zero Calibration

Selecting this option from the menu will cause a pop-up to appear. The $ETCO_2$ can be calibrated to read a zero value by pressing the SET ZERO button and will then return to the previous screen. Allow the system (sensor connected to powered Vet40 monitor) to warm up for a minimum of 2 minutes before starting the zero process. The sensor needs to be mounted to an airway adapter and in a typical room air environment, without concentration of CO_2 (not connected to a patient). It is important to not breathe near the sensor during the zeroing process. Pressing the OK button will close the pop-up which will then return to the previous screen.

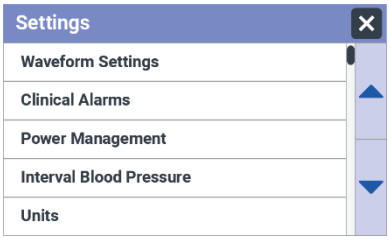


Clinical Alarms

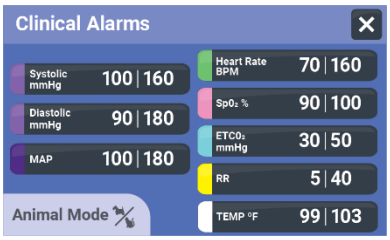
The SunTech Vet40 provides alarms for all clinical values (SYS, DIA, MAP, HR, $ETCO_2$, RR, Temp, and SpO_2). The default factory setting is OFF for all clinical alarms.

NOTE: Each set of clinical alarm limits will be specific to the active animal mode. The active animal mode is visible in the lower left corner of the clinical alarm screens.

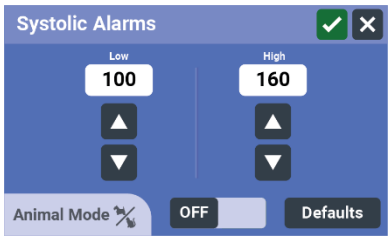
To change alarm values, select the Settings button in the Menu. Then choose Clinical Alarms from the Settings menu.



Select a parameter of interest.



Touch the OFF/ON button to ON, then set the desired alarm values.



Press the green check to save the alarm settings.

Press X to exit without changing the alarm settings.

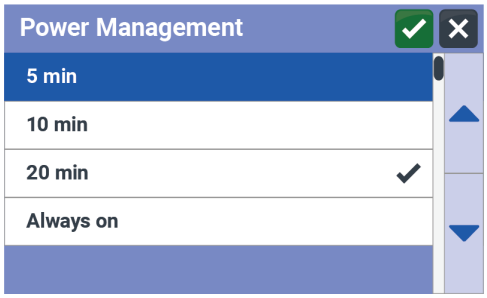
To reset to default clinical alarms, touch the Defaults button. For information on the default clinical alarm values, see Section 16.2.

When an alarm is triggered, displayed values that are outside of the set ranges will flash and the alarm indicator will turn yellow, and an alarm tone will sound. *For more information on alarms, see Section 11.*

Power Management
Power Management is a feature which puts the monitor into Suspend Mode after a defined period of inactivity while not on external power.

To access the Power Management options, select the Settings screen in the Menu, then choose Power Management. Options are 5, 10, 20 minutes or Always ON. Factory default setting is 10 minutes.

TIP: Battery charge may be rapidly depleted if set to Always ON.
NOTE: Only use the power cord provided (Part Number: 19-0020-00).

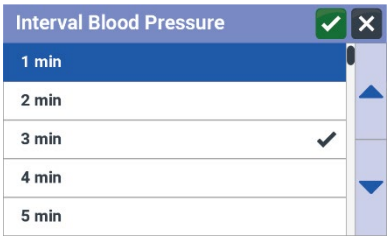


Press the green check to save the power management settings.

Press X to exit without changing the power management settings.

Interval BP
The Vet40 may be configured to automatically take BP readings at set intervals.

Select the interval desired for BP Interval Mode. To access the Interval BP options, select the Settings screen in the Menu, then choose Interval BP. Intervals include 1, 2, 3, 4, 5, 10, 15, 30, 60, and 90 minutes.



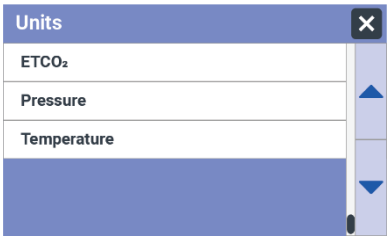
Press the green check to save the interval.

Press X to exit without changing the interval.

To begin Interval BP Mode, click the Interval BP button in the Menu. *For more information on Interval BP Mode, see Section 5.4.*

Units
The Vet40 is capable of showing values in a variety of units.

To access the Units options, select the Settings screen in the Menu, then choose Units to change $ETCO_2$, Pressure or Temperature units.



$ETCO_2$ Units
Select between kPa, mmHg, or % for $ETCO_2$ units.

Press the green check to save the units.

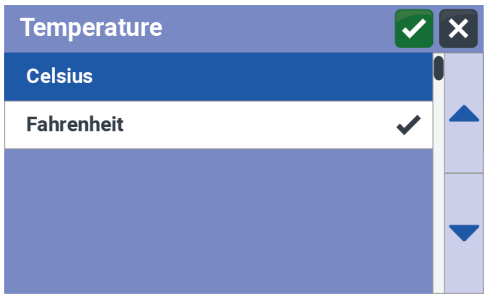
Press X to exit without changing the units.

Pressure Units
Select between kPa or mmHg for pressure units.

Press the green check to save the units.

Press X to exit without changing the units.

Temperature Units
Select between Fahrenheit or Celsius for temperature units.

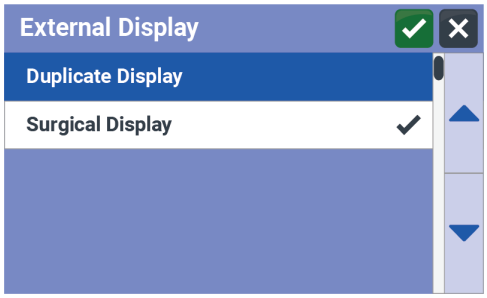


Press the green check to save the units.

Press X to exit without changing the units.

External Display
The Vet40 is capable of supporting an external display.

Choose the preferred display mode: Duplicate Display or Surgical Display. To access the external display options, select Settings in the Menu, then choose External Display.

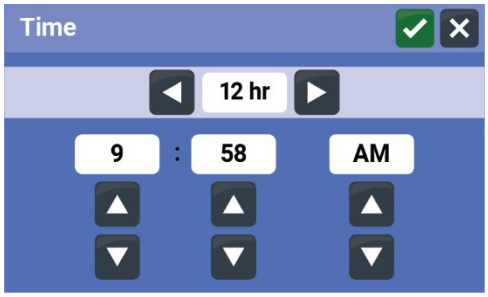


Press the green check to save the display mode.

Press X to exit without changing the display mode.

Time
To set the internal clock, select Settings in the Menu, then choose Time.

- Two time formats are available: 12 Hour and 24 Hour.
- Use the arrow buttons to set the hour and minute. In 12 Hour format, use the arrows to toggle between AM or PM.



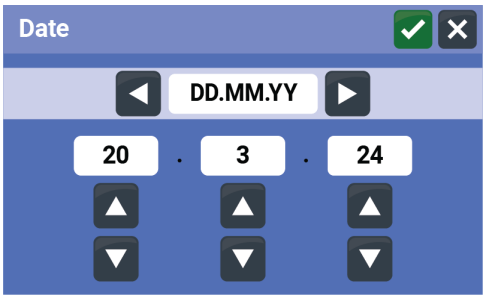
Press the green check to save the time.

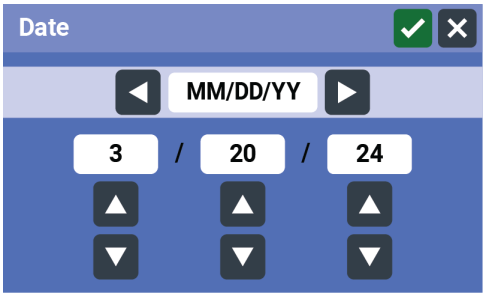
Press X to exit without changing the time.

Date

To set the date, select Settings in the Menu, then choose Date.

- Two date formats are available: MM/DD/YY or DD.MM.YY
- Use the arrow buttons to set the day, month, and year.



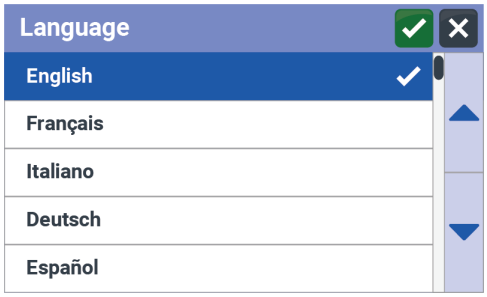


Press the green check to save the date.

Press X to exit without changing the date.

Language

Multiple languages are available including English, French, Italian, German, Spanish, and Portuguese. To access the language options, select Settings in the Menu, then choose Language. Touch the desired language to select it.

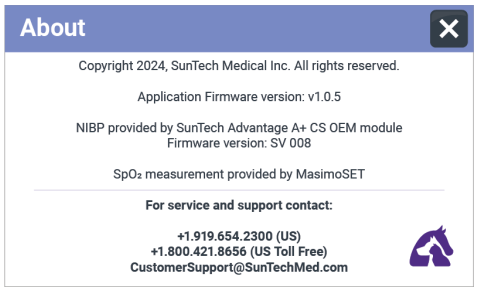


Press the green check to save the language.

Press X to exit without changing the language.

About

The About Screen contains Vet40 monitor and contact information. To access this information, select Settings in the Menu, then choose About. The About screen will look like this example:



5. Blood Pressure Measurement

5.1 Cuff Sizing

The SunTech Vet40 comes with a variety of different BP cuff sizes. Each cuff contains important markings that help with selecting the right cuff size. These are SunTech designed symbols.

Make sure this part of the cuff is placed over the patient's artery.

When the cuff is wrapped around the patient's limb, its Index Marker should fall within these lines.

When you wrap the cuff around the patient's limb, the Index Marker should fall within the Range Marker on the inside of the cuff.

Indicates limb circumference range of the cuff.

Not made with natural rubber latex.

TIP: When more than one cuff size fits the limb, always choose the larger size for more accurate measurements. When a cuff is too small, it can cause BP values to be overestimated.
An alternative sizing method is to measure the circumference of the limb or tail and choose a cuff whose width is 40% of the circumference for dogs and 30% for cats.

5.2 Where to Apply the Cuff

WARNING: The cuff should not be applied over a wound or non-intact skin as this could cause further injury.

SunTech recommends that the cuff be placed on a front limb while the patient is lying on the right or left side. This helps ensure that the cuff is at heart level, which is best for measurement accuracy. Also, the patient is less likely to retract the front limb when the cuff gently squeezes during measurement. The cuff should be placed so that its artery marker aligns with the limb artery.

Alternate Patient Positioning: If the patient seems more comfortable seated, position the cuff as described above and hold the limb level with the heart during the BP measurement. This will help keep the cuff at heart level and relax the patient's muscles. If the patient appears sufficiently agitated to bite or scratch, or is standing, the base of the tail is an acceptable alternate location.

5.3 Taking a BP Measurement

1. Position the patient so that they are lying down, seated, or if necessary, held. Then place the cuff on the limb, making sure not to place it over a joint. Connect the cuff to the monitor hose.

TIP: The success of the BP measurement is dependent on choosing the correct sized cuff and attaching it to the patient correctly. The cuff is the sensor, please make sure to fit the cuff snugly as this provides better signal for the monitor.

2. If the Vet40 is not on, press the Power Button to turn it on. Select Small or Large Animal Mode (or Equine if available). If this is a new patient, press the New Patient button before starting the procedure.

TIP: To change animal size after initial selection, touch the Animal Selection icon on Main Screen to toggle between Small and Large (or Equine if available). *For more information on selecting animal sizes, see Section 4.1.*

3. Allow the patient to acclimate for approximately 5 minutes prior to the exam. Press the START/STOP button to start a blood pressure measurement. The START/STOP button turns blue during measurement. The reading is complete when the START/STOP button returns to magenta. Main Screen will show systolic (SYS), diastolic (DIA), mean arterial pressure (MAP), and heart rate (HR).

TIP: During a BP reading, the Menu is not available. To access the Menu, either wait until the BP reading is complete or stop the reading by pressing the START/STOP button.
TIP: When a BP reading is in progress, pressing the START/STOP button will immediately stop the measurement and deflate the cuff.
TIP: For information on averaging BP measurements, see Section 10.2.

5.4 Interval BP Mode

In Interval BP Mode, the SunTech Vet40 automatically takes a BP reading at set time intervals. The time interval can be changed through the Interval BP settings (*see Section 4.3*) screen.

- To start taking BP measurements in Interval Measurement Mode, enter the Menu, then touch the Interval BP button
- The first BP measurement will immediately begin. Once the BP reading has finished, the device will wait for the selected time interval before automatically taking another BP reading.
- When the SunTech Vet40 is in Interval Measurement Mode, a clock icon will appear on the screen, indicating the time interval.
- An additional BP reading can be taken by manually pressing the START/STOP button between Interval BP readings. This will not change the next planned BP measurement.
- During a BP reading, the Menu is not available. If an Interval BP reading is scheduled to start and the Menu or a Settings screen is open, the scheduled BP reading will not begin until the display is returned to the Main Screen or a Focus Screen.
- To exit Interval BP Mode, touch the Interval BP button in the Menu or press the START/STOP button during a BP measurement.

Interval BP indicator →

TIP: For information on setting the interval measurements, see Section 4.3.

5.5 STAT Mode

WARNING: Check the limb frequently to ensure that the operation of the monitor does not result in prolonged impairment of the circulation of the patient.

WARNING: STAT mode is not intended for unsupervised continuous monitoring of patients undergoing anasethic procedures as well as emergency care where there can be a clinical need for frequent readings.

During STAT Mode, the SunTech Vet40 will automatically take consecutive BP measurements for 10 minutes.

- To enter STAT Mode, select the STAT button at the top of the Main or Focus Screens.
- Alternatively, enter the Menu, then touch the STAT button .
- When the device is in STAT Mode, the STAT icon is displayed on the main screen.
- During a BP reading, the Menu is not available.
- To exit STAT Mode, touch the STAT button again. If no action is taken, STAT Mode will automatically stop after 10 minutes.

STAT Mode Icon →

5.6 Interrupting/Stopping a Measurement

To abort a measurement while in progress, touch the START/STOP button. This will immediately stop the measurement and deflate the cuff. An abort message will appear on the screen, and a short beep will sound if volume is on. The START/STOP button returns to magenta, and monitor is ready to start a new reading.

5.7 Heart Rate Measurement

Heart rate will be sourced from one of the following three modalities: SpO_2, ECG, or BP.

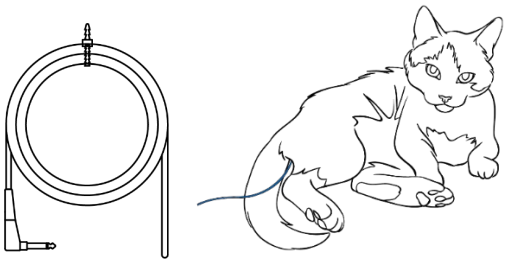
In order of priority, Vet40 will use the heart rate from SpO_2 first. If not available, then from ECG. If neither are available, then the BP measurement will provide the heart rate.

6. Temperature Measurement

6.1 Where to Apply the Temperature Probe

Clean the probe before use. *See Section 12 for cleaning instructions.* Disposable, non-rigid thermometer probe covers are recommended. Users should ensure the compatibility of the temperature probe and that probe covers are used in accordance with manufacturers' instructions.

The AccuVet temperature probe may be placed either in the esophagus or the rectum while the patient is lying down. Placement is not interchangeable, so proper probe labeling is encouraged to avoid cross-contamination.



CAUTION: Label usage of temperature probe to avoid cross-contamination.

6.2 Taking a Temperature Measurement

TIP: Clean and disinfect the probe before and after each use, making sure to remove all bioburden.

1. Position patient so that they are lying down. Optionally, apply a disposable, non-rigid probe cover. Place the temperature probe either in the esophagus or rectum and connect to the Vet40.

TIP: Placement is not interchangeable, so proper probe labeling is encouraged to avoid cross-contamination.

2. Power up the Vet40 and select the correct animal mode (See Section 4.1). Once the temperature probe obtains a reading from a patient, the values will display on the screen. Verify that the probe is properly positioned and correctly detecting the temperature by watching several seconds of data. While the device is obtaining a temperature measurement, dashes will appear on the screen.

TIP: See Section 4.3 to learn how to change the temperature units displayed.

7. SpO_2 Measurement

WARNING: Only use the AccuVet SpO_2 accessories with the models that support AccuVet SpO_2. Only use the Masimo SpO_2 accessories with the models that support Masimo SpO_2. Masimo units are labeled on the back of the Vet40, and connectors are not interchangeable with AccuVet models.

WARNING: Inaccurate SpO_2 readings may be caused by:

- Improper sensor application and placement
- Elevated levels of COHb or MetHb: High levels of COHb or MetHb may occur with a seemingly normal SpO2. When elevated levels of COHb or MetHb are suspected, laboratory analysis (CO-Oximetry) of a blood sample should be performed.
- Elevated levels of bilirubin
- Elevated levels of dyshemoglobin
- Vasospastic disease, such as Raynaud's, and peripheral vascular disease
- Hemoglobinopathies and synthesis disorders such as thalassemias, Hb s, Hb c, sickle cell, etc.
- Hypocapnic or hypercapnic conditions
- Severe anemia
- Very low arterial perfusion
- Extreme motion artifact
- Abnormal venous pulsation or venous constriction
- Severe vasoconstriction or hypothermia
- Arterial catheters and intra-aortic balloon
- Intravascular dyes, such as indocyanine green or methylene blue
- Externally applied coloring and texture, such as nail polish, acrylic nails, glitter, etc.
- Birthmark(s), tattoos, skin discolorations, moisture on skin, deformed or abnormal digits. etc.
- Skin color disorders

WARNING: Interfering Substances: Dyes or any substance containing dyes that change usual blood pigmentation may cause erroneous SpO_2 readings.

WARNING: Masimo SpO_2 is empirically calibrated in healthy adult volunteers with normal levels of carboxyhemoglobin (COHb) and methemoglobin (MetHb).

WARNING: Measuring SpO_2 in the presence of bright light may result in inaccurate measurements. In such cases, cover the sensor site with an opaque material.

WARNING: Do not apply tape to secure the sensor in place or to tape it shut. Venous pulsations may lead to inaccurate saturation measurements.

WARNING: Pressurization of the cuff can temporarily cause loss of functionality of SpO_2 if simultaneously using device on the same limb.

WARNING: Excessive pressure by a pulse oximeter probe for prolonged periods can induce pressure injury.

CAUTION: When patients are undergoing photodynamic therapy, they may be sensitive to light sources. Pulse oximetry may be used only under careful clinical supervision for short time periods to minimize interference with photodynamic therapy.

CAUTION: If SpO_2 values indicate hypoxemia, a laboratory blood sample should be taken to confirm the patient's condition.

CAUTION: Variation in measurements may be profound and may be affected by sampling technique as well as the patient's physiological conditions. Any results exhibiting inconsistency with the patient's clinical status should be repeated and/or supplemented with additional test data. Blood samples should be analyzed by laboratory instruments prior to clinical decision making to completely understand the patient's condition.

CAUTION: Do not submerge the pulse oximeter in any solution or attempt to sterilize by autoclave, irradiation, steam, gas, ethylene oxide or any other method. This will seriously damage the pulse oximeter.

7.1 Masimo Pulse Oximetry

Masimo Patents: www.masimo.com/patents.htm

Possession or purchase of this device does not convey any express or implied license to use the device with unauthorized sensors or cables which would, alone or in combination with this device, fall within the scope of one or more of the patents relating to this device.

NOTE: A functional tester cannot be used to assess the accuracy of the pulse oximetry function of the Vet40.
NOTE: High-intensity extreme lights (such as pulsating strobe lights) directed on the sensor, may not allow the Vet40 to obtain vital sign readings.
NOTE: Do not loop the patient cabling into a tight coil or wrap around the device, as this can damage the patient cabling.

NOTE: Additional information specific to the Masimo sensors compatible with the Vet40, including information about parameter/measurement performance during motion and low perfusion, may be found in the sensor's directions for use (DFU).

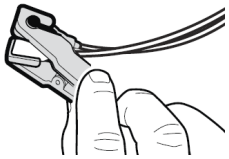
NOTE: Cables and sensors are provided with X-Cal™ technology to minimize the risk of inaccurate readings and unanticipated loss of patient monitoring. Refer to the Cable or Sensor DFU for the specified duration of the patient monitoring time.

WARNING: Exercise extreme caution with poorly perfused patients; skin erosion and/or pressure necrosis can be caused when the sensor is not frequently moved. Assess site as frequently as every hour with poorly perfused patients and move the sensor if there are signs of tissue ischemia.

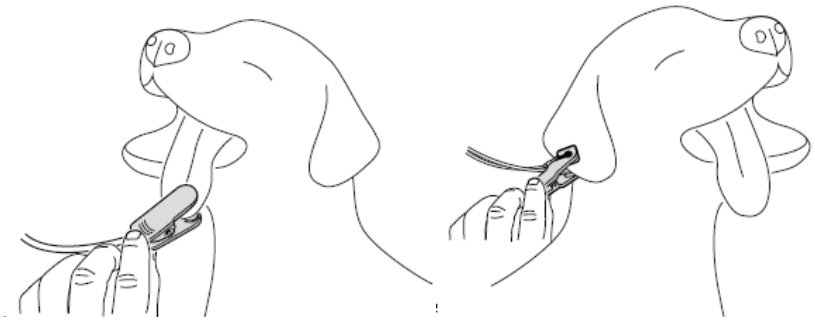
Where to Apply the Masimo LNCS YI AH Multisite Reusable Sensor

To attach the AH clip to the YI AH Sensor:

1. Grasp the pad of one of the sensor pads on the sensor, slide the end of the sensor head into the clip with the black side facing out.
2. Once the head of the sensor pad is engaged in the clip, push the pad down into the round end of the clip.
3. Repeat with the other sensor pad on the opposite window.



Application site should be cleaned of debris and dry prior to sensor placement. Dark pigmentation, thick fur, ambient light, low or poor perfusion, and movement of the sensor at the site may impact the accuracy of pulse oximetry. Possible application sites include tongue, lip, ear, prepuce or vulva, toe, paw, or nostril. *For instructions on connecting the Masimo sensor and patient cable, see Section 3.4.*



To disconnect the sensor:

1. Lift the protective cover to gain access to the sensor connector.
2. Pull firmly on the sensor connector to remove the patient cable. To avoid damage, pull on the sensor connector, not the cable.

To disconnect the sensor from the clip:

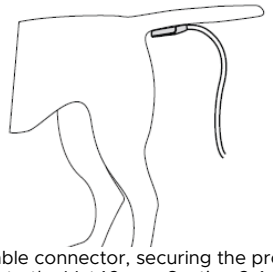
1. Gently lift each sensor pad up and out of the clip.

Where to Apply the Masimo LNCS TF-I AH Reusable Transflectance Sensor (if included)

CAUTION: Exercise extreme caution with poorly perfused patients; skin erosion and/or pressure necrosis can be caused when the sensor is not frequently moved. Assess site as frequently as every hour with poorly perfused patients and move the sensor if there are signs of tissue ischemia.

Application site should be cleaned of debris and dry prior to sensor placement. Dark pigmentation, thick fur, ambient light, low or poor perfusion, and movement of the sensor at the site may impact the accuracy of pulse oximetry. Recommended application site ventral tail base.

1. Apply the sensor to the patient at the selected monitoring site as shown below and gently press on the sensor so that the adhesive tab forms good contact with the patient's skin.



2. Connect the sensor connector and the patient cable connector, securing the protective cover. *For complete instructions on connecting the Masimo sensor and patient cable to the Vet40, see Section 3.4.*

To disconnect the sensor:

1. Lift the protective cover to gain access to the sensor connector.
2. Pull firmly on the sensor connector to remove the patient cable. To avoid damage, pull on the sensor connector, not the cable.

Taking a Masimo SpO_2 Measurement

1. Place SpO_2 sensor on patient and connect to Vet40 as described above.
2. Power up the Vet40 and select the correct animal mode (See Section 4.1). Once the SpO_2 sensor is connected and sensing a reading, the monitor will begin to beep at the pulse rate. The bars in the bar graph indicate the signal strength and pulse rate. When more bars are filled in, the signal strength is stronger. The monitor will not beep if the speaker is OFF. Verify that the sensor is properly positioned and correctly detecting the SpO2% by watching several seconds of data. When the monitor is searching for a signal, the dashes in the SpO_2 section of the screen will flash. If the monitor is having trouble obtaining SpO_2 %, re-position the sensor to another location. The measurement site must be changed every 4 hours to guarantee the integrity of the patient's skin.
If the SpO_2 sensor falls off or is removed from the patient, the pulse rate beep will stop, and dashes will appear on the screen in place of the SpO_2 reading. If the volume is on, an audible tone will be heard.

TIP: For systems using SpO_2, the SpO_2 heart rate takes precedence over the ECG and BP heart rate.

Troubleshooting a SpO_2 Measurement
Potential causes of difficulty in obtaining a reading can include:

- Improper sensor type or application
- Low perfusion
- Excessive motion artifact
- Excessive ambient or strobing light
- Low battery/not plugged into AC power supply

When troubleshooting a difficulty in obtaining a reading, ensure the following steps are taken:

- Allow time for reading to stabilize
- Verify sensor type and check connection to Vet40
- Check if blood flow to the sensor site is restricted
- Check the placement of the sensor and re-apply sensor if needed
- Replace sensor if defective
- Shield the sensor from excessive or strobing light
- Minimize motion at the monitoring site
- Connect the AC power supply

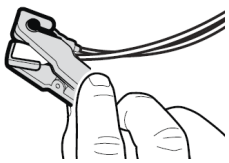
Refer to the Directions for Use included with the Masimo sensor for additional application information.

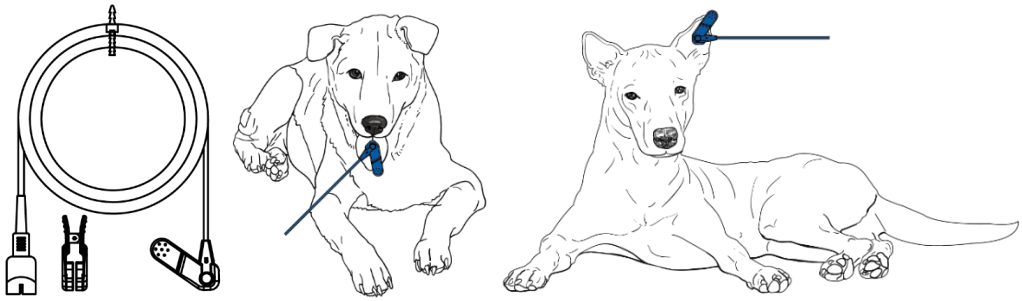
7.2 AccuVet Pulse Oximetry

NOTE: A functional tester cannot be used to assess the accuracy of the pulse oximetry function of the Vet40.

How to Apply the AccuVet Y-lingual SpO_2 Sensor

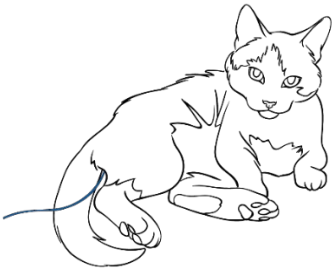
1. Clean the sensor before use.
2. Select the sensor clip that is appropriate for the patient.
3. Open the clip with thumb and finger. For each side of the clip, push the sensor alignment buttons into the clip slots until they are fully engaged. Verify that the sensor pads are properly aligned with each other.
4. Apply the sensor to the patient at the tongue or alternatively at the lip, ear, skin between toes, prepuce, or vulva while the patient is lying down.





How to Apply the AccuVet Reflectance SpO_2 Sensor

1. Clean the sensor before use.
2. Apply disposable, non-rigid covers as needed. Users should ensure sensor covers are used in accordance with manufacturers' instructions.
3. Place sensor in the rectum.



CAUTION: The reflectance sensor is not designed for long-term monitoring. It must be moved every 4 hours (or more often, if indicated by circulatory status and/or skin integrity) and reapplied to a different site.

TIP: If the sensor does not measure the pulse of the patient reliably, it may be incorrectly positioned, or skin may be pigmented. If any of these situations occur, reposition the sensor.

Taking an AccuVet SpO_2 Measurement

TIP: Clean the sensor before and after each use.

1. Place SpO_2 sensor on patient and connect to Vet40. *For information on connecting the SpO_2 sensor, see Section 3.* Position patient so that they are lying down. Apply the sensor to the patient at the tongue or alternatively at the lip, ear, skin between toes, prepuce, or vulva. If using rectal reflectance SpO_2 sensor, place in patient's rectum, using disposable, non-rigid covers as needed.

2. Power up the Vet40 and select the correct animal mode (See Section 4.1). Once the SpO_2 sensor is connected and sensing a reading, the monitor will begin to beep with the pulse rate. The bars in the bar graph will indicate signal strength. When more bars are filled in, the signal strength is stronger. The monitor will not beep if the speaker is OFF. Verify that the sensor is properly positioned and correctly detecting the SpO2% by watching several seconds of data. When the monitor is searching for a signal, the dashes in the SpO_2 section of the screen will flash. If the monitor is having trouble obtaining SpO_2 %, re-position the sensor to another location. The measurement site must be changed every 4 hours to guarantee the integrity of the patient's skin.
If the SpO_2 sensor falls off or is removed from the patient, the pulse rate beep will stop, and dashes will appear on the screen in place of the SpO_2 reading. If the volume is on, an audible tone will be heard.

TIP: For systems using SpO_2, the SpO_2 heart rate takes precedence over the ECG and BP heart rate.

If the SpO_2 sensor falls off or is removed from the patient, the pulse rate beep will stop, and dashes will appear on the screen in place of the SpO_2 reading. If the volume is on, an audible tone will be heard.

Troubleshooting a SpO_2 Measurement

If a sensor is connected to the Vet40 and to the patient, but not displaying a reading, observe the display for one minute to determine if the monitor is searching for a signal. When the monitor is searching for a signal, the dashes in the SpO_2 section of the screen will flash. Dashes indicate that the signal may be inadequate. If the monitor is having trouble obtaining SpO_2 %, re-position the sensor to another location. If the monitor does not appear to be searching for a reading, check the connection to the patient and to the Vet40. If no issues are found, disconnect, and then re-connect the sensor. If issues persist, the sensor may need to be replaced. Contact your sales representative to purchase a replacement sensor.

Potential causes of difficulty in obtaining a reading can include:

- Improper sensor type or application
- Low perfusion
- Excessive motion artifact
- Excessive ambient or strobing light
- Low battery/not plugged into AC power supply

When troubleshooting a difficulty in obtaining a reading, ensure the following steps are taken:

- Allow time for reading to stabilize
- Verify sensor type and check connection to Vet40
- Check if blood flow to the sensor site is restricted
- Check the placement of the sensor and re-apply sensor if needed
- Replace sensor if defective
- Shield the sensor from excessive or strobing light
- Minimize motion at the monitoring site
- Connect the AC power supply

7.3 Heart Rate Measurement

Heart rate can be measured either through the ECG, SpO_2 or through BP measurements. When the SpO_2 sensor is plugged in, the heart rate derived from that measurement will automatically take precedence over the heart rate derived from the ECG or BP measurement.

8. ECG Measurement

WARNING: Avoid using magnetic resonance equipment at the same time with ECG cables & lead wires, otherwise it may cause burns.

WARNING: When connected with defibrillator, the electrodes on the patient should be kept at the appropriate distance from the defibrillator electrodes, otherwise it may cause burns during the time of discharge at the connecting sites between electrodes and patients.

WARNING: As with other cables *from medical equipment, the cable should be placed so that it will not cause the patient to suffocate.*

CAUTION: All lead wires, if not connected properly, may cause reading errors, faults, high temperature, electromagnetic wave interference. Dangerous voltage sources also could affect the readings. Check the lead wires at least every two hours and ensure the locations of equipment are secured.

CAUTION: The wires should be properly installed and placed according to the instructions for the equipment's use.

CAUTION: Avoid stretching or bending the wires with the force of 5 KGF (11 lbs.) or more, otherwise it may cause internal damage to the cable and failed shielding performance or inaccurate readings.

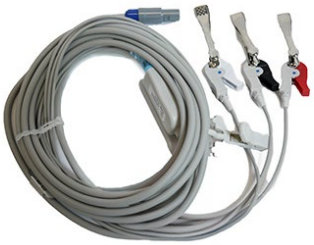
CAUTION: Keep the lead wire metal parts dry to avoid malfunction.

CAUTION: Disposal of the ECG cable set and its accessories should comply with national and/or local requirements.

8.1 How to apply the sensors

To attach the clips to the ECG lead wires

1. Squeeze the colored plastic lever to open the clamp, slide the nodule of the clip into the clamp so that the nodule is inserted into the opening.
2. Release the clamp so that it grips and holds the nodule of the clip.
3. Repeat for the other leads and clips so that each lead has a clip on the end.



To apply clips to the patient:

1. Clean any residue or debris from the metal clips
2. Open the metal clip by applying pressure to the back end (opposite from the patient's end).
3. Apply clip around the patient's hair or fur (if there is any), making sure the clip is in contact with patient skin.

TIP: It may be helpful to apply electrode gel or alcohol to help acquire a stronger signal.

Application sites should be cleaned of debris prior to clip placement. Ensure that the clips are attached to the skin, not just the end of the fur. Thick fur and movement of the sensor at the site may impact the accuracy of the ECG.

Leads should be placed according to the traditional 3-lead placement on the patient. White should be placed on the patient's right chest (or upper portion of the right Cubitus). Black should be placed on the patient's left chest (or upper portion of left Cubitus). Red should be placed on the patient's left lower abdomen (or upper portion of the left stifle joint).

When positioning the ECG Lead Wire electrodes on the patient, make sure the lead wires are separated to avoid twisting; otherwise, it may cause errors in heart rate, waveform fluctuations and other interference during operation.

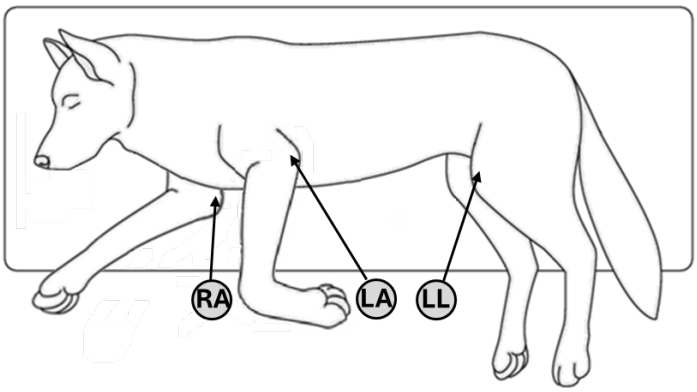


Image shown for reference purposes only.

To disconnect the clip from the patient

1. Squeeze the metal clips on the side away from the patient.
2. Make sure that the clip does not get stuck on any skin, as that may cause tissue damage to the patient.
3. Pull clip away from the patient.

To disconnect clip from the patient cable

1. Squeeze the colored lever to open the clamp and remove the clip's nodule from the clamp.

8.2 Taking an ECG reading

1. Place the ECG leads and clips on the patient and connect to the Vet40 as described above. *For information on connecting the ECG leads to the Vet40, see Section 3.4.*
2. Power up the Vet40 and select the correct animal mode (See Section 4.1). Once the ECG clips are connected and the system is sensing a reading, the monitor will begin to beep with each heartbeat. The signal can be seen on the waveform screen to determine the quality of the signal. The monitor will not beep if the speaker is OFF.
3. Verify that the clips are properly positioned and correctly detecting the ECG signal and heart rate by watching several seconds of data. When the monitor is initially acquiring the signal, the waveform may move up and down the display while the system establishes the center and range of waveform; this may take approximately 20 seconds. If the monitor is having trouble obtaining a signal, or the waveform continues to fluctuate in and out of the range of the display, re-position the clips to another location or apply more gel/alcohol to acquire a stronger signal.
4. The lead being displayed in the waveform trace can be changed in the settings between lead I, II, and III.
5. If an ECG clip falls off or is removed from the patient, the heart rate beep will stop, and the waveform may flatline.

TIP: If any of the three ECG leads have a poor connection, this can cause a complete loss of the ECG signal. Be sure to check all three leads when attempting to get the ECG connection or signal.

Troubleshooting an ECG reading

Potential causes of difficulty in obtaining a reading can include:

- Improper clip type or application
- Lead wires twisted
- Excessive motion artifact
- Low battery/not plugged into AC power supply
- Excessive electrical noise from other equipment
- Excess fur or hair blocking connection with the skin

When troubleshooting difficulty in obtaining a reading, ensure the following steps are taken:

- Allow time for reading to stabilize
- Verify clip type and connections, and check connection to Vet40
- Check the placement of all 3 clips and re-apply if needed
- Replace clip if defective or broken
- Minimize motion at the monitoring site
- Connect the AC power supply

8.3 Heart Rate Measurement

Heart rate can be measured either through the ECG, SpO_2 or through BP measurements. When the SpO_2 sensor is plugged in, the heart rate derived from that measurement will automatically take priority over the heart rate derived from the ECG or BP measurement.

9. $ETCO_2$ Measurement

WARNING: This sensor provides readings of exhaled CO_2 concentration and respiration rate and does not provide a final diagnosis. The final diagnosis is to be provided by a licensed veterinarian according to clinical practice.

WARNING: Disposable airway adapters shall not be reused. Used disposable airway adapters shall be disposed of in accordance with local regulations for medical waste.

WARNING: Disconnect the power from the module before cleaning.

CAUTION: This sensor shall be used by trained professionals or professional medical centers. The operator shall read and understand the contents of the user manual before they use it.

CAUTION: Usage of device near strong interference of electromagnetism such as electro surgical instruments, MRI, etc. will generate incorrect results.

CAUTION: Usage of device near CT will generate incorrect results.

CAUTION: Usage of device in an environment of heavily changing temperature may generate incorrect results.

CAUTION: Usage of device with unlisted anesthetic gases will generate incorrect results. Please calibrate according to the protocol or contact the manufacturer.

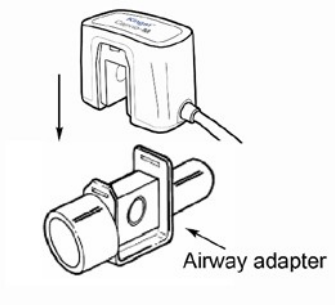
CAUTION: During the measurement, do not plug in or disconnect the adaptor, otherwise, data will not be available.

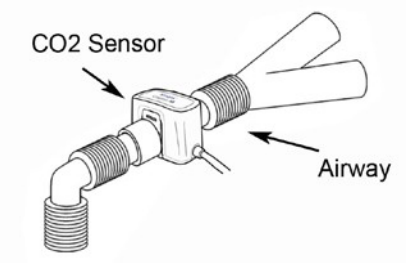
CAUTION: Do not let the liquid cleanser flow into the electrical connector jack or the FiLock™ connector of the module to avoid damage.

9.1 How to apply the Mainstream $ETCO_2$ sensor

1. Clean the sensor before use.
2. Select the airway adapter that is appropriate for the tubing and patient.
3. Insert the airway adapter noting the direction of flow into the breathing tube, ensuring that all connections are made properly.
4. Attach the sensor to the airway adapter so that the body of the sensor is on top of the airway adapter. The sensor can be installed on the adapter in only one orientation. Make sure that the sensor is fully seated in the adapter.
5. It is recommended to add an elbow in the breathing circuit between the endotracheal tube and the Mainstream adapter to allow for proper positioning of the sensor.

Refer to the Directions for Use included with the $ETCO_2$ sensor for additional application information.





9.2 Taking a Mainstream $ETCO_2$ measurement

1. Begin by setting the *$ETCO_2$* gas settings in the Service Menu – see Appendix A. The factory default settings are: O_2 : 21%, N_2O : 0%.
2. Before connecting the tubing to the patient, connect the sensor to the Vet40. *For information on connecting the $ETCO_2$ sensor, see Section 3.4.*
3. Power up and select animal mode. The sensor will need a brief warming period of 2 minutes. After the warming period, a zero calibration will be required. The zero-calibration procedure must be completed with an airway adapter in place, but prior to connecting the sensor to the patient (ensure no breath or CO_2 is flowing to the sensor at this time).
    a. Any time the airway adapter is changed, the system needs to go through a zero-calibration process.
    b. If the sensor is used for more than 4 hours, it is recommended to go through a zero-calibration process.
4. After the zero-calibration is complete, connect the patient to the tubing. Position the sensor at a level that is higher than the patient and orient the adapter's 'sensor window' to be vertical (to reduce moisture build up).

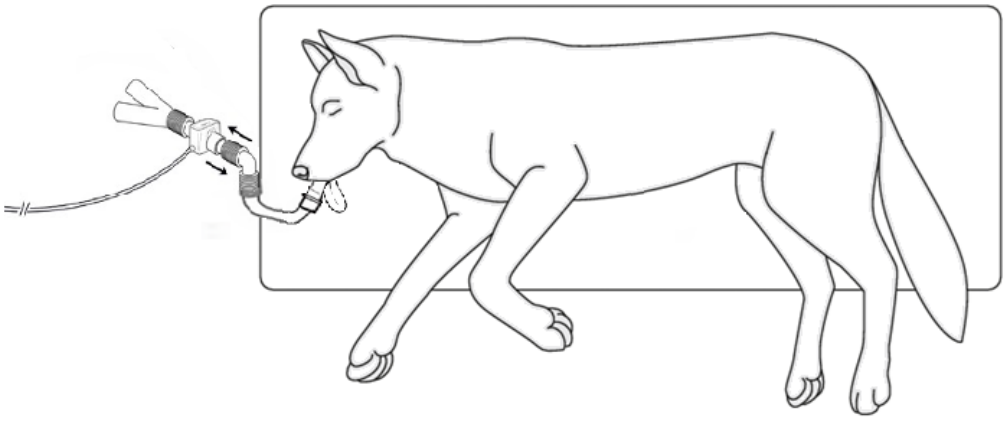


Image shown for reference purposes only.

5. With an $ETCO_2$ sensor connected, calibrated, and sensing a reading, the monitor will begin to display the reading. The signal is displayed in the capnography portion of the waveform screen. The partial pressure and respiratory rate will also appear once enough data has been collected to present those values. Verify that the sensor is properly positioned and correctly detecting the CO_2 by watching several seconds of data.
6. When the monitor is searching for a signal, the ETCO2 value will display dashes.
    a. The waveform may also display as a flat line across the screen.
    b. If the monitor is having trouble obtaining $ETCO_2$ values, check the connection between the sensor and the adapter, and the adapter and patient tubing.
7. If the $ETCO_2$ sensor falls off or is removed from the patient tubing, dashes will appear instead of the $ETCO_2$ and respiratory rate readings. If the volume is on, an audible tone will be heard.

Troubleshooting a Mainstream $ETCO_2$ measurement

Potential causes of difficulty in obtaining a reading can include:

- Improper ET Tube placement

    - Be sure ET Tube is placed properly and is providing sufficient airway.
- Contamination or moisture on the 'viewing window' of the airway adapter or sensor.
    - Use cotton swab or soft cloth wetted with clean water to lightly wipe and blot the window. Be sure it is dry before usage.
- Rapid changes in temperature of the surrounding environment.
    - Allow time for the temperature to stabilize.
- Use near electromagnetic or CT devices.
- Improper sensor type or application
- Excessive motion artifact
- Excessive ambient or strobing light
- Low battery/not plugged into AC power supply
- Poor air flow due to leak in tubing or poor connection

When troubleshooting a difficulty in obtaining a reading, ensure the following steps are taken:

- Allow time for reading to stabilize
- Verify sensor type and check connection to Vet40
- Check for any air leaks or blockages in the patient airway tubing
- Check the placement of the sensor and re-apply if needed
- Replace sensor if defective
- Shield sensor from excessive or strobing light
- Minimize motion at the monitoring site
- Connect the AC power supply

9.3 How to apply the Sidestream $ETCO_2$ sensor

1. Connect a filter to the FiLock connector on the base of the Sidestream module and connect the air sample line to the filter.
    a. The FiLock connector on the Sidestream module includes an indicator light that will begin to flash blue after power is on. If a filter is installed into the connector, the light will be a steady blue (not flashing). If the filter or air sample line is blocked or has a leak, the light will be orange.

2. For intubated patients select the airway adapter and sample air line that is appropriate for the patient. Insert the airway adapter noting the direction of flow into the breathing tube, ensuring that all connections are made properly
3. For non-intubated patients connect the sample air line to the breathing loop or mask of the ventilator, anesthetic machine, or nasal breathing tube.

Refer to the Directions for Use included with the $ETCO_2$ sensor for additional application information.

9.4 Taking a Sidestream $ETCO_2$ measurement

1. Before connecting the tubing to the patient, connect the sensor to the Vet40. *For information on connecting the $ETCO_2$ sensor, see Section 3.4.*
2. Power up and select animal mode. The sensor will need a brief warming period of 2 minutes, during which time the sensor will automatically complete a zero-calibration process. The zero-calibration process must be completed prior to connecting the sensor to the patient (ensure no breath or CO_2 is flowing to the sensor at this time).
3. After the zero-calibration is complete, connect the patient to the tubing.

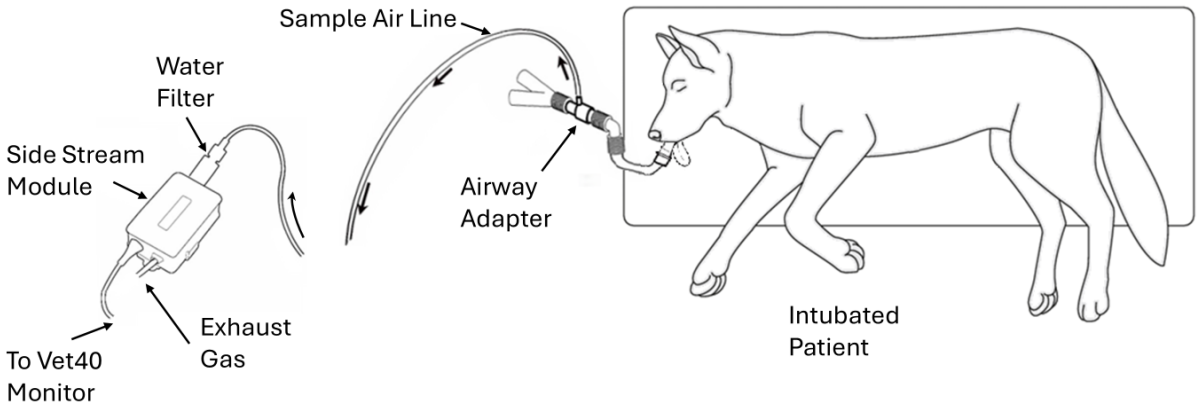


Image shown for reference purposes only.

Note: For non-Intubated Patient connect air line to breathing loop or mask of the ventilator, anesthetic machine, or nasal breathing tube.

4. Once the $ETCO_2$ sensor is connected and sensing a reading, the monitor will begin to display the reading. The signal is displayed in the capnography portion of the waveform screen. The partial pressure and respiratory rate will also appear once enough data has been collected to present those values. Verify that the sensor is properly positioned and correctly detecting the CO_2 by watching several seconds of data.
5. When the monitor is searching for a signal, the dashes in the $ETCO_2$ and respiratory rate sections will flash.
    a. The waveform may also display as a flat line across the screen.
    b. If the monitor is having trouble obtaining $ETCO_2$ values, check the connection between the sensor and the adapter, and the adapter and patient tubing.
6. If the $ETCO_2$ sensor falls off or is removed from the patient tubing, dashes will appear instead of the $ETCO_2$ and respiratory rate readings. If the volume is on, an audible tone will be heard.

Troubleshooting a Sidestream $ETCO_2$ measurement

Potential causes of difficulty in obtaining a reading can include:

- Mucus or moisture in the filter or air sample tubing.
    - Drain moisture from filter or tubing or replace with new.
- Poor air flow due to pinched air sample tubing.
    - Straighten tubing.
- Poor air flow due to leak in tubing or poor connection
    - Tighten or replace with new
- Rapid changes in the temperature of the surrounding environment.
    - Allow time for the temperature to stabilize.
- Use near electromagnetic or CT devices.
- Low battery/not plugged into AC power supply

When troubleshooting a difficulty in obtaining a reading, ensure the following steps are taken:

- Allow time for reading to stabilize
- Verify sensor type and check connection to Vet40
- Check for any air leaks or blockages in the patient airway tubing
- Replace sensor if defective
- Connect the AC power supply

9.5 Respiratory Rate

When connected to the monitor and a reading can be obtained, the $ETCO_2$ system will also calculate the respiratory rate (RR). The respiratory rate displayed is in breaths per minute.

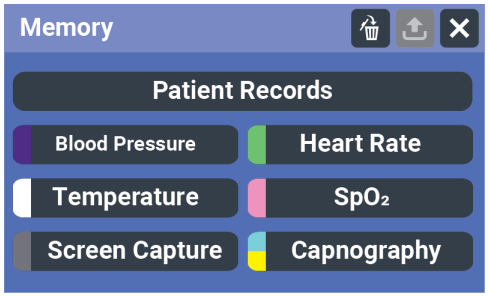
10. Viewing and Transferring Data

10.1 Viewing Stored Measurements

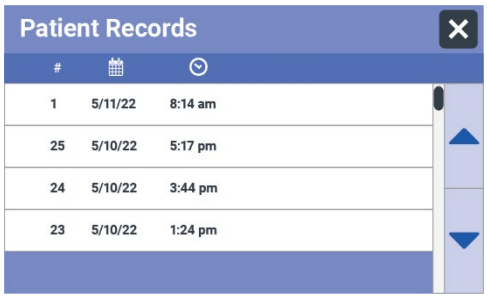
The Vet40 stores data of all readings.
BP readings are saved in every instance. SpO_2, heart rate, $ETCO_2$, respiratory rate, and temperature readings are saved every 60 seconds while a patient is connected.

Data is organized into multiple categories for easy viewing and management on the Vet40. To view previous readings, touch Menu, then select the Memory icon. Press the corresponding category button to view the desired data.

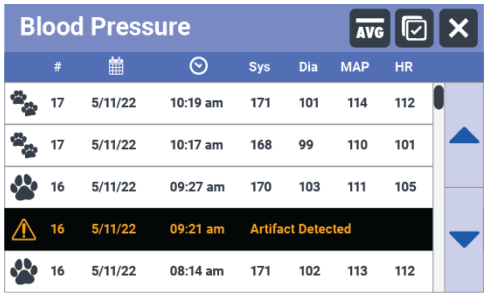
NOTE: Saved screen captures cannot be viewed on the Vet40 monitor. They must be exported to a PC through Fetch to be viewed.



Data is presented in a list format based on patient number, date, and time.



Each memory screen has buttons to manage the data (see table below for button descriptions).



Export: Vet40 will be placed in "Data Transfer Mode" to allow transferring all data to a connected computer. Note: This button will be enabled once the Vet40 is successfully connected to a computer.

Averaging: Selected data will be averaged, and the result will be shown on the display in a small pop-up. (See section 10.2)

Select All: Pressing this button will select/highlight all the data in the list. Pressing the button again will clear all data selections/highlights.

Close: Leave the screen and return to the previous screen.

10.2 Averaging Measurements

The data can be averaged on the memory screen. To average measurements, touch each row with the measurements you wish to average. Selected rows will be highlighted. To unselect a measurement, touch that row a second time.

Press the average button AVG to calculate the averages.

The calculated average of the selected measurements will appear as a small pop-up. Rows may be selected or deselected while the pop-up is visible, and the averages will be automatically updated. Touching the pop-up will close it.

10.3 USB Connection to PC with Fetch

The SunTech Vet40 can connect to a PC with a USB cable to transfer data. Insert the USB cable to the rear of the Vet40 and connect the other end to a USB port on the computer. The connection will be established as long as both the Vet40 and PC remain powered.

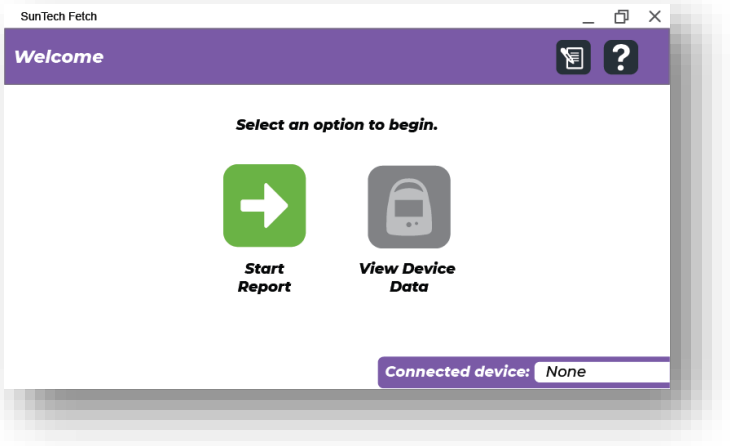
NOTE: To transfer data, Fetch is required. See Section 10.4.

10.4 Data Transfer

Once a USB connection is established with a PC, data can be transferred to Fetch. The Fetch application must first be installed on the PC. The application is available for download from the SunTech website at https://www.suntechmed.com/vet40-fetch. The PC application is supported on Windows 10 and higher.

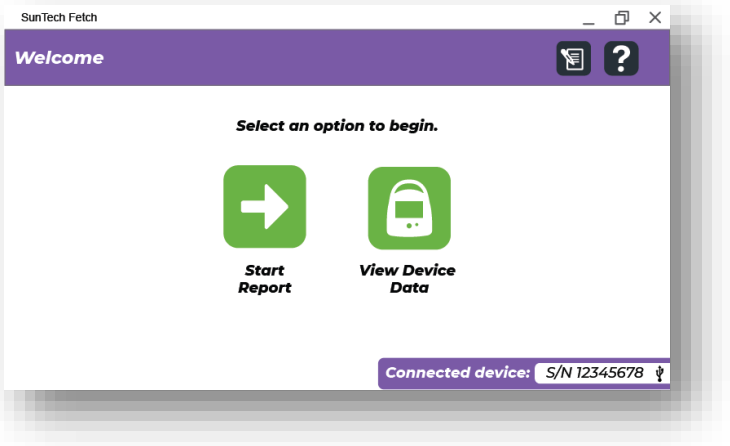
Transferring Data

1. Open the Fetch application.

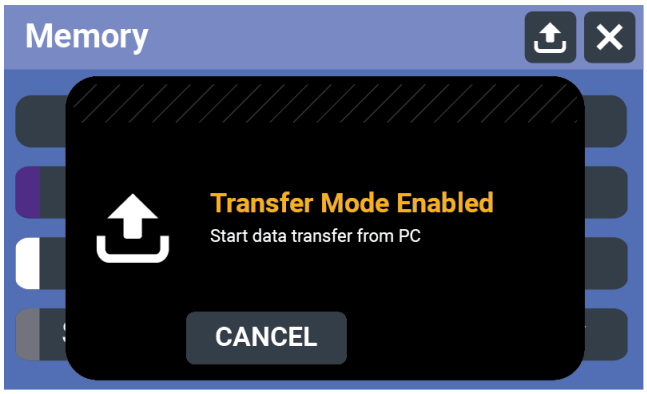


2. Connect the Vet40 to the PC by USB (See Section 10.3 or 10.4).

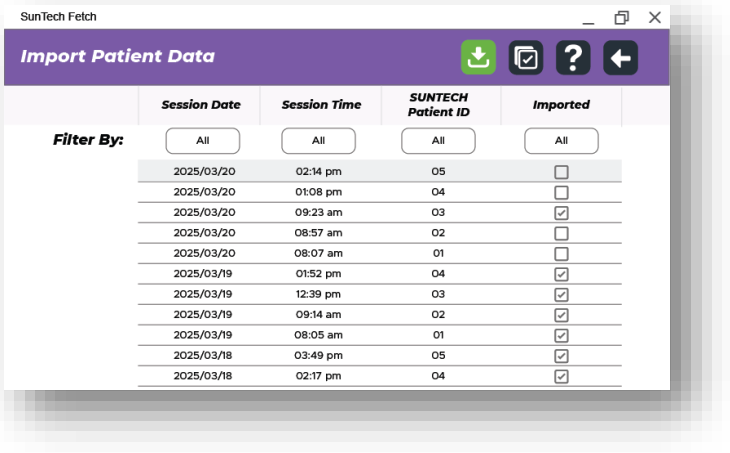
3. The Fetch application will show the serial number of the first connected Vet40 device.



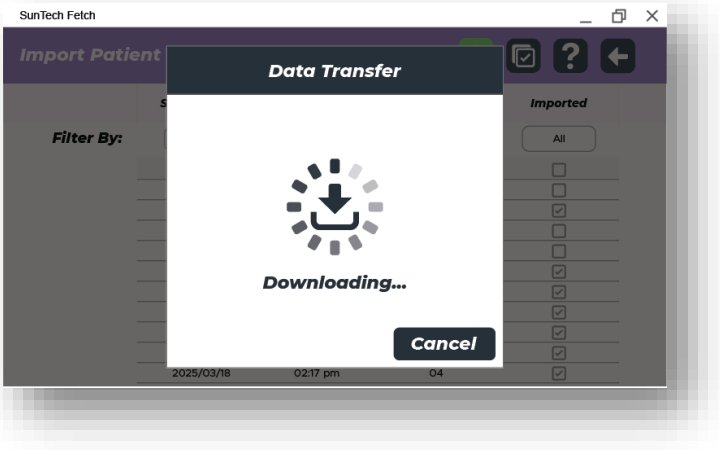
4. Touch the Data Transfer icon in the Memory screen of the Vet40. A status message will appear putting the Vet40 into Data Transfer mode. (Note: The button will be disabled if a successful connection has not been established to a PC)



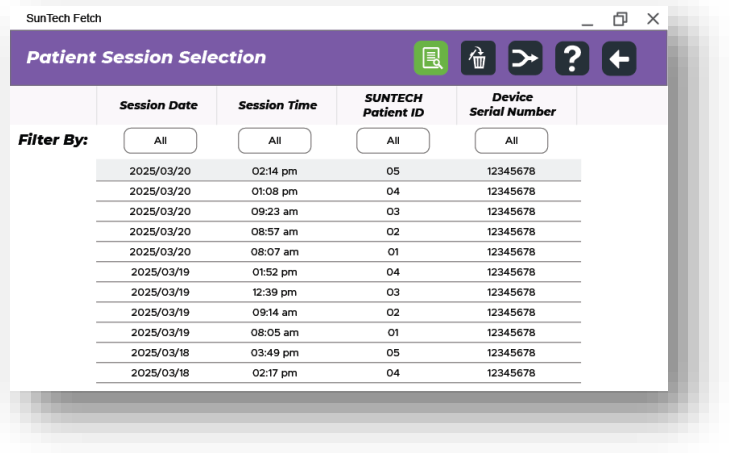
5. Touch the View Device Data button on the Fetch application to view the data on the connected Vet40. Select which patient data to download to the computer. Pressing the Import button will start the data transfer process. Note the Import button will be disabled until data is selected from the list.



6. An overlay will appear on both the Vet40 and Fetch during the transfer process. The data transfer may be cancelled through the Fetch application or the Vet40 unit.



7. Once complete, the Patient Session Selection screen will appear on Fetch and the new patient data will be added to the list.

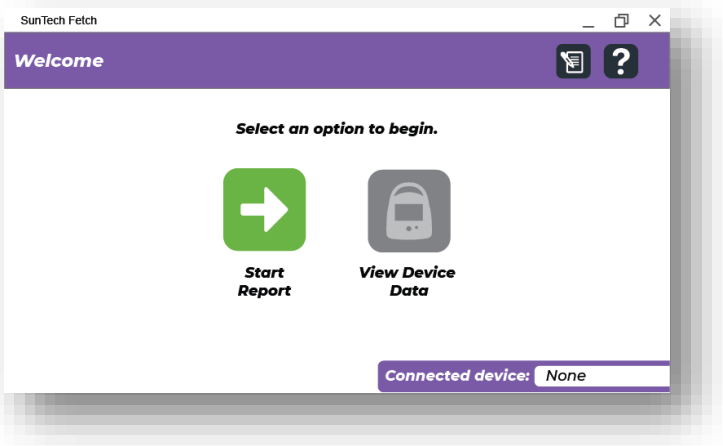


10.5 Reviewing Data and Creating Reports

The SunTech Fetch application allows the user to create reports from patient data. All data is downloaded from the Vet40 to the connected PC and displayed on the software main screen in tabular format with the latest data at the top of the screen.

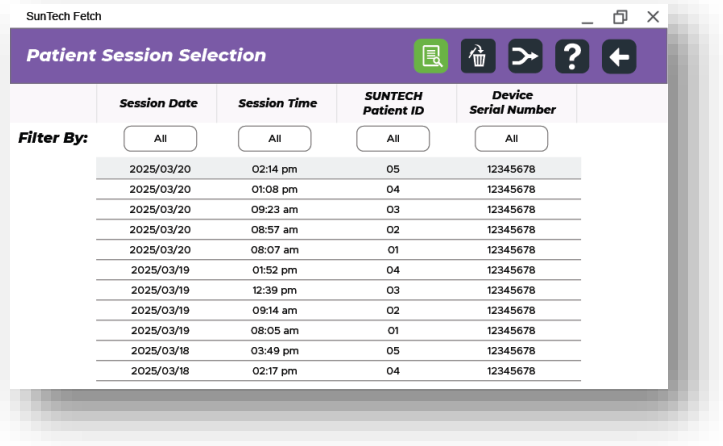
Review Data

1. Open the Fetch application.

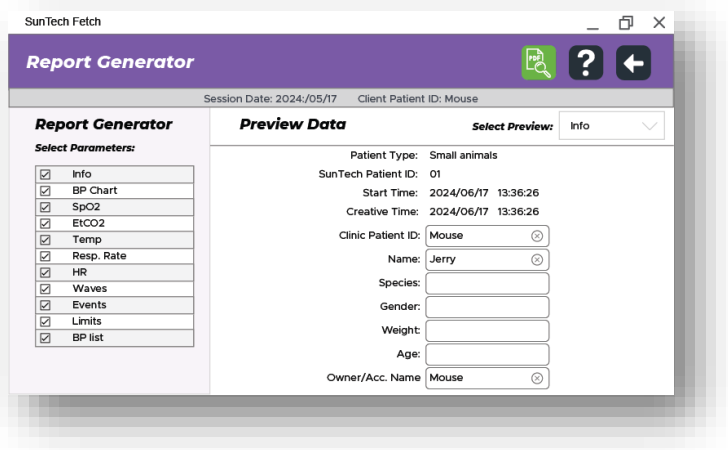


2. Press the Start Report button to view patient data that has already been downloaded to the PC. If you need to download data, see Section 10.4.

3. From the Patient Session Selection screen, select the patient session you want to view and press the preview data button .

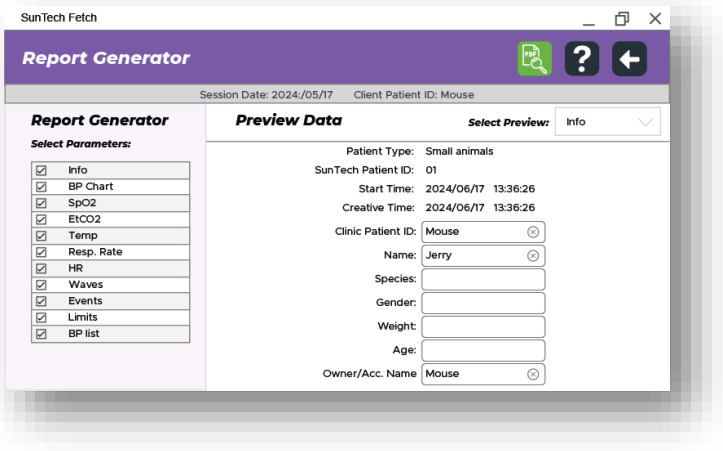


4. Data may be previewed by using the drop-down list on the Report Generator screen



Creating a Report

1. Select the parameters you wish to include in the report from the Report Generator screen of the Fetch app. See section Review Data above for more information.



2. Select the View PDF button  to preview the PDF of the report before saving or printing

10.6 Creating a Report Template

The SunTech Fetch application allows the report template to be customized with practice information. To view the template and edit the format, press the edit template button  on the welcome screen.

10.7 Bluetooth Connection to PC with VET40 Stream

The SunTech VET40 Stream application provides a way for the Vet40 to display real-time data on a Bluetooth connected PC. The application is available for download from the SunTech website at https://www.suntechmed.com/vet40-VET40 STREAM. The PC application is supported on Windows 10 and higher with Bluetooth 4.0 or above (Bluetooth Low Energy supported)

The SunTech Vet40 can pair with a Bluetooth enabled PC within a 30-foot radius. The Vet40 Stream will display the following data on the paired PC: Heart Rate (bpm), SpO_2 (%), Blood Pressure (Systolic, Diastolic, MAP), $EtCO_2$ (%), Respiratory Rate (RR).

Note: to prevent displaying old information, the Vet40 Stream BP values will revert to dashes after one minute.

To pair with a PC:

1. Go to https://www.suntechmed.com/vet40-VET40STREAM and download the application to your PC.
2. Open the Bluetooth settings on your PC and confirm that Bluetooth is turned ON.
3. Open the Vet40 Stream application on your PC. The connection status will be displayed during setup.
4. If you see the message "Possible PC Bluetooth Issue – Turn 'ON' computer Bluetooth and restart the program", ensure Bluetooth is enabled on your PC, then close and reopen the Vet40 Stream application.
5. To enable Bluetooth on the Vet40 press the Bluetooth icon  in the Menu. The Vet40 will become a discoverable device, and the Bluetooth icon will display 'rolling' dots.

6. On the VET40 Stream application on your PC, select the Vet40 that you want to connect to from the drop-down list, and press the 'Connect' button.
7. The VET40 Stream application will display the Vet40 serial number as the device ID in the top-left corner. To make identification easier, double-click the text field in the upper text block to enter a custom name.
8. The VET40 Stream application will now display "Is the Vet40 Transmitting?"
9. To start data transmission, on the Vet40 press and hold the Bluetooth icon for approximately one second. The icon will turn blue and the VET40 Stream application will begin to display live data.
10. You can view additional Vet40 monitors by opening a new instance of the Vet40 Stream application and repeat steps 3-9.
11. To stop transmission either press the Bluetooth icon on the Vet40 (the icon will be white when it is not transmitting), power off the Vet40, or close the VET40 Stream application on the PC.

    NOTE: Powering off the Vet40 will end the Bluetooth connection. When the device is turned back on, the pairing process must be repeated to re-establish the connection.

11. Alarms

11.1 Technical advisories

A technical advisory occurs in the following situations:

- Loss of connection to a sensor
- Sensor failure
- An error during a measurement

During a technical advisory, an audible tone will sound. Vital sign values outside published values will not be displayed, and dashes will be displayed instead.
A status message will be displayed to assist with troubleshooting the problem. *For a list of status messages, see Section 13.*

11.2 Clinical Alarms

Clinical alarms occur when a measured value exceeds the high or low limit set for that parameter. The default mode for clinical alarms is OFF. *See Section 4.3 for instructions on turning on clinical alarms and setting up clinical alarm values.* When a clinical alarm occurs, the measurement value and alarm icon will flash on the screen and a tone will sound.

NOTE: Alarms associated with vital signs that involve averaging, such as heart rate and SpO2, will be delayed by the averaging process, which may be approximately 8 seconds.

Alarms may be temporarily silenced for 2 minutes by pressing the alarm silence button  . The alarm silence button will turn grey and will slowly fill with color indicating the time remaining for the current period of silence. If any new alarms occur, any silence period will automatically end, and an audible alarm will occur. If it is appropriate for the patient, the alarms can be turned off.

Always ensure that appropriate resuscitation equipment and personnel are available during any procedure. Always select alarm ranges that are appropriate for the patient and procedure. All alarms indicate a potential increased risk of injury.

To test the clinical alarms, set the alarm at a value likely to be exceeded with the next reading. Perform the reading. When the value exceeds the limit set, the alarm should display and a beep should sound.

12. Taking Care of the SunTech Vet40

12.1 Battery

WARNING: The Vet40 must be plugged into a power source to maintain the battery to a full charge. Check the battery charge status monthly, especially before a procedure where the monitor is not connected to a power source.

The Vet40 has an internal battery that charges whenever the monitor is plugged into a power source. No segments will appear when battery charge is low, recharge immediately. During continuous monitoring of SpO_2 and temperature, with Interval BP set for every 5 minutes, a fully charged battery should last at least 4 hours before requiring recharging. If only taking manual BP measurements, a fully charged battery is estimated to last for at least 150 BP measurements before requiring recharging. Fully charging the battery should take about 6 hours.

The battery should be fully recharged every 2 months when the monitor is in storage.

Full battery

Low battery: Recharge Immediately

Battery charging

Fully charged

12.2 Cleaning

Cleaning the Vet40

WARNING: DO NOT immerse the monitor in any fluid or attempt to clean the unit with liquid detergents or solvents. This may cause an electrical hazard. Do not use the monitor if accidental wetting occurs.
As needed, clean the display using a soft, lint-free cloth sprayed with an alcohol-free glass cleaner. Dampen a soft cloth with mild medical grade disinfectant and wipe the monitor to remove surface dust and dirt.

Cleaning the Protective Armour

Remove the armour from the Vet40 and then wash the armour in warm, soapy water.

Due to the manufacturing process, minor molding blemishes may be present on the protective armour. These blemishes will not impact the functionality of the armour or the monitor and are not considered defects of the product.

Cleaning the Masimo SpO_2 Accessories

WARNING: Do not immerse the connector end of the SpO_2 sensor cable as this may damage the sensor.

NOTE: Cleaning instructions for the LNC Patient Cable, YI AH Sensor, and TFI AH Sensor may be found in the directions for use (DFU) of those items.

Cleaning the AccuVet Temperature Probe

Clean the probe before and after each use, making sure to remove all bioburden. Brief immersion of the probe in cleaning solution is acceptable except for the probe connector which must not be immersed. Disinfection of the probe and its connecting cable can be done with a soft cloth saturated with 70% isopropyl alcohol or 10% (1:10) solution of chlorine bleach and tap water. Afterwards, wipe the probe with a soft cloth saturated with clean water. Allow the probe and cable to dry thoroughly before use.

Cleaning the AccuVet SpO_2 Y Sensor

WARNING: Do not immerse the SpO_2 probe in any fluid or attempt to clean the unit with any liquid detergents or solvents. Do not sterilize. This may cause an electrical hazard.

Clean the sensor and clip before and after each use. Clean the clip, sensor, and connecting cable with warm soapy water or 70% isopropyl alcohol. Allow the sensor, clip, and cable to dry thoroughly before use.

Cleaning the AccuVet SpO_2 Reflectance Sensor

CAUTION: Do not sterilize by irradiation, steam, or ethylene oxide.

Clean the sensor before and after each use, making sure to remove all bioburden. The sensor may be surface cleaned by wiping it with a soft cloth saturated with a solution such as 70% isopropyl alcohol. If low level disinfection is required, use 10% (1:10) solution of chlorine bleach and tap water. Do not use undiluted bleach (5%-25% sodium hypochlorite) because permanent damage to the sensor could occur. To clean or disinfect the sensor:

1. Saturate a clean, dry gauze pad or soft cloth with the cleaning solution. Wipe all surfaces of the sensor with the gauze pad.
2. Saturate another clean, dry gauze pad or soft cloth with sterile or distilled water. Wipe all surfaces of the sensor with the gauze pad.
3. Allow the sensor and cable to dry thoroughly before using.

Cleaning the AccuVet SpO_2 Extension Cable

Clean the connecting cable with warm soapy water or 70% isopropyl alcohol. Allow the cable to dry thoroughly before use.

Cleaning the ECG cable and clips

1. Make sure the lead wire is disconnected from the monitor during the cleaning or disinfecting process.
2. Clean or disinfect before applying to a new patient.
3. 70% isopropyl alcohol or alcohol solution can be used as a cleaning solution to clean the surface of the ECG cable, clamps, and clips.
4. Disconnect the clips from the lead wire clamps to provide access to the clamping areas.
5. First apply the cleaning solution onto a clean and dry sponge pad. Use this sponge pad to wipe all the surfaces and cables, clamps, and clips.
6. Dip another clean and dry sponge pad in sterile or distilled water. Use this sponge pad to wipe all the surfaces and cables.
7. Finally, use a clean, dry sponge pad to wipe all the surfaces of the wires, clamps, and clips.
8. Note: the pins in the connector end shall not touch the cleaning solution; otherwise, it will cause permanent damage to the electric conduction line of the conductor and the monitoring device.

Allow the components to dry thoroughly before using. Do not immerse the ECG leads and clips in any fluid, or attempt to clean the components with any liquid detergents or solvents.

Cleaning a Mainstream $ETCO_2$ sensor

Disconnect the power before cleaning. Clean the outer shell of the module with only non-corrosive cleaners such as clear water. Use a lightly damp cloth with 70% isopropyl alcohol solution to wipe the surface of the module. Do not let fluid flow into the electrical or filter connector. Do not autoclave or sterilize. Do not immerse the $ETCO_2$ sensor in any fluid or attempt to clean the components with any liquid detergents or solvents. Be sure the sensor window is dry before using.

For the sensor:

1. Wipe with 70% ethyl alcohol or isopropanol, glutaraldehyde, chlorhexidine, or other aldehydes to disinfect the outside surface; do not dip in liquid.
2. Use 3% hydrogen peroxide or 70% isopropanol, or active reagent to clean cable but without dipping the joint in liquid.
3. Rinse the sensor with water.

The sensor's infrared window:

1. Use cotton swab or soft cloth wetted with clean water to lightly wipe and blot the window. Allow to air dry naturally.
2. Be sure it is dry before usage.

Cleaning a Sidestream $ETCO_2$ module

Keep the module from dust.

1. It is recommended to wipe clean the outer shell of the module using only a non-corrosive cleanser such as clear water.
2. Use a lightly damp cloth with a 70% alcohol solution to wipe the surface of the module and dry it with a clean cloth or simply air-dry.

Disconnect the power from the module before cleaning.

Do not let the liquid cleanser flow into the electrical connector jack or the FiLockTM connector of the module to avoid damage.

Clean the exterior of the connector only.

- Do not let any liquid flow into the shell or any parts of the module.
- Do not let the cleanser and disinfectant stay on its surface.
- Do not autoclave or sterilize the module.
- Do not put any parts of the module in the liquid.

The airway adapter and the sampling air line kit are intended for single patient use and are not to be reprocessed. Do not attempt to clean, disinfect, or reuse them.

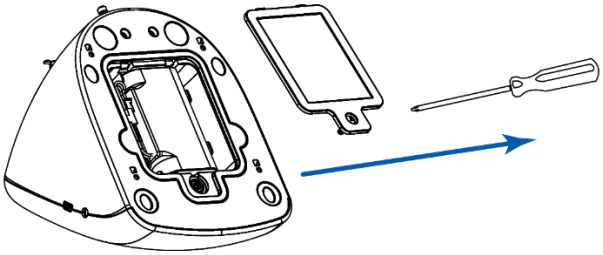
12.3 Preventative Maintenance

WARNING: Do not disassemble the unit. There are no user serviceable parts except for the user-replaceable battery. Refer to qualified service personnel.

System Self Checks
The Vet40 performs a range of system checks during normal operation. If the monitor detects a problem, it will display a status message recommending a troubleshooting action or contact SunTech Technical Support. techsupport@suntechmed.com

Replaceable Parts

CAUTION: Replace accessories that are broken, worn, missing, damaged, incomplete, or contaminated. Contact SunTech Medical for service on parts that are not user replaceable and stop using device until repaired. Failure to repair a damaged product may cause injury to the user and/or the patient.
On a routine basis, inspect the monitor, cuffs, sensors, and hoses for cracks, fraying, or kinks. Immediately replace any damaged parts. The device can function without a battery. However, if the battery fails to maintain a charge, replace the battery. Before replacing the battery, make sure the device is turned off and disconnected from the battery. Do not replace the battery without removing the power supply from the wall. To replace the battery, use a screwdriver to unscrew the screw and open the battery bay door on the bottom of the device. Remove battery by disconnecting the electrical connector. Replace the battery and reconnect the electrical connector. Replace battery bay door and secure with the screw. Before use, the battery must be fully charged.



CAUTION: Use only approved accessories. Fire, explosion and severe burn hazard. Replace battery only with SunTech part number 17-0026-00.

Expected Service Life
Monitor: 7 years

AccuVet SpO_2 sensor: 3 years

Masimo Patient Cable: 17,520 hours of patient monitoring time

AccuVet temperature probe: 3 years

Lithium-ion Battery: 250 cycles (before capacity falls below 80% of original capacity)

ECG Cables: 3 years

$ETCO_2$ Sensors: 2 years

12.4 System Components

Your Vet40 System should contain the following items:

Vet40 System	Standard Qty.
Vet40 System Monitor	1
Patient Hose, 6ft (1.8m)	1
Vet System Cuff Kit (6 cuffs) or (8 cuffs for equine systems)	1
Vet40 Quickstart Guide	1
AccuVet Y-lingual SpO_2 Sensor with 2 clips - OR - Masimo LNCS YI AH SpO_2 Sensor with 3 clips	1
AccuVet Temperature Probe	1
Set of 3 ECG leads with clips	1
(Optional) $ETCO_2$ sensor with 2 airway adapters	1
AC Adapter, Universal	1
Protective Armour	1

12.5 Accessories & Replacement Parts

CAUTION: Use of accessories and replacement parts other than those specified may result in poor or incorrect performance.

Contact your sales representative to purchase the following items:

Description	Part Number	Details
#1 Cuff	98-0400-80-VET	3 – 6 cm, white, non-locking, box of 20
#2 Cuff	98-0400-81-VET	4 – 8 cm, white, non-locking, box of 20
#3 Cuff	98-0400-82-VET	6 – 11 cm, white, non-locking, box of 20
#4 Cuff	98-0400-83-VET	7 – 13 cm, white, non-locking, box of 20
#5 Cuff	98-0400-84-VET	8 – 15 cm, white, non-locking, box of 20
#6 Cuff	98-0400-F1	12 – 19 cm, white, non-locking, box of 20
#7 Cuff	98-0400-F3	17 – 25 cm, white, non-locking, box of 20
#8 Cuff	98-0400-F4	23 - 33 cm, white, non-locking, box of 20
#9 Cuff	98-0400-F5	31 - 40 cm, white, non-locking, box of 20
Vet Cuff Pack, Slip Luer, Sizes #1-6	98-0240-00	Pack of 6 cuffs: 1 of each size 1 - 6
Patient Hose, 6 ft (1.8 m)	91-0028-77	6 ft (1.8 m), black, individual
Patient Hose, 10 ft (3 m)	91-0028-78	10 ft (3 m), black, individual
AC Adapter	19-0020-00	Power Supply, Universal
Vet40 Armour Protective Cover – Royal Purple	39-0376-00	Protective cover, purple, individual
Vet40 Armour Protective Cover – Flamingo Pink	39-0376-01	Protective cover, pink, individual
Vet40 Armour Protective Cover – Peacock Blue	39-0376-02	Protective cover, blue, individual
Vet40 Armour Protective Cover – Tree Frog Green	39-0376-03	Protective cover, green, individual
AccuVet Y-lingual SpO_2 Sensor w/ 2 clips	52-0019-00	Y-lingual sensor, 6.5 ft (2 m)
AccuVet SpO_2 Reflectance Sensor	52-0020-00	Rectal sensor, 5.9 ft (1.8 m)
AccuVet SpO_2 Extension Cable	52-0021-00	Extension cable, 6.5 ft (2 m)
AccuVet Temperature Probe, 2m	52-0022-00	Temperature probe, 6.5 ft (2 m) f
AccuVet Temperature Probe, 3m	52-0023-00	Temperature probe, 9.8 ft (3 m)
AccuVet Y-Lingual Replacement Clips	45-0009-00	2 sizes included
Masimo LNCS™ YI AH SpO_2 w/ 3 clips	52-0031-00	Y-lingual sensor, 3 ft (0.9 m)
Masimo LNCS TF-I AH Transflectance SpO_2 Sensor	52-0031-02	Reflectance sensor, 3 ft (0.9 m)
Masimo LNC Patient Cable	52-0031-01	Patient cable, 10 ft (3 m)
Masimo AH SpO_2 Replacement Clips (3)	52-0025-00	Pack of 3 sizes (small, medium, large)
ECG Cable & Lead Wires (Qty:1)	91-0153-00	ECG Leads w/ clips
ECG Replacement Electrode Clips (Qty:3)	98-0264-00	Pack of 3 clips (one size)
$ETCO_2$ Capnography Mainstream Sensor	52-0033-00	Mainstream sensor 9 ft (2.8 m)
$ETCO_2$ Capnography Mainstream Replacement Airway Adapters Large (Qty:5)	45-0013-00	Pack of 5 (large)
$ETCO_2$ Capnography Mainstream Replacement Airway Adapters Small (Qty:5)	45-0013-01	Pack of 5 (small)
$ETCO_2$ Capnography Sidestream Sensor	52-0033-01	Sidestream sensor 2.4 ft (0.7 m)

$ETCO_2$ Capnography Sidestream Replacement Airway Adapters (Qty:5)	45-0013-02	Pack of 5
$ETCO_2$ Capnography Sidestream Sampling Lines (Qty:5)	45-0015-00	Pack of 5
$ETCO_2$ Capnography Sidestream Filters (Qty:25)	45-0014-00	Pack of 25 filters
Rechargeable Lithium-Ion Battery	17-0026-00	7.2 V, 2.6 Ah, 18.72 Wh
Vet40 Carrying Case	45-0012-00	Nylon bag that fits monitor and accessories
Vet40 IV Pole Mount	98-0263-00	Vet40 IV pole and mobile stand mount kit
Deluxe Mobile Stand	46-0040-00	Requires 98-0263-00 to mount Vet40 to mobile stand

13. Information Signals and Alarms

13.1 General Status Messages

If the SunTech Vet40 has a problem performing a task, a short beep will occur, the START/STOP button will turn Red, and a Status Message will appear on the monitor screen. Take action as directed on the screen, or as suggested in the table below:

Status Message	Reason	Solution
Air Leak	There is a leak in the cuff, hose or monitor. Also, possible if the cuff or hose is not attached to the monitor.	Check that the hose is connected to the monitor and the cuff. Check that the cuff is properly tightened. Check that the cuff is in the correct position. Check that the cuff is not leaking air. Check that the hose connections are not damaged or loose.
Value out of Range	The blood pressure value is outside of SunTech Vet40's published ranges.	Make sure you are using the proper cuff size. Patient may have been moving too much. Check that the cuff is properly tightened and in the proper position.
Poor Signal Quality	Monitor is not receiving a strong signal from the patient. Also, possible if rapid deflation occurs during a measurement.	Check that the cuff is in the correct position. Check the patient. Check that the cuff is properly tightened. Check that the correct size cuff is used.
Artifact Detected	Monitor is picking up on unexpected noise or movements.	Check animal mode. It might be in the wrong setting. Check patient for motion, trembling. Too much movement. Check that the cuff is in the correct position. Check that the correct size cuff is used.
Measurement Too Long	The monitor is not detecting strong and consistent signals from the patient for an extended time period.	Check to ensure the cuff is fitting snugly on the patient and is positioned properly. Check that the cuff is in the correct position. Check patient for moving trembling.
Check Batteries!	Battery power is low.	See the battery life indicator on the Main Screen. Recharge or replace the battery as needed.
Air Blockage	Air is not able to pass through the hose or cuff properly.	Check that the hose has no sharp bends and is not pinched. Check that the patient is not lying or stepping on the cuff. Check that the cuff is in the correct position.
Cuff Overpressure	Pressure in the cuff briefly exceeded 300 mmHg due to patient movement, air blockage or using a cuff that is too small.	Check that the correct size cuff is being used. Check that the hose has no sharp bends and is not pinched. Check that the patient is not lying or stepping on the cuff. Ensure patient is not moving excessively.
Monitor Not Ready	The monitor is preparing for the next measurement or may need service.	Touch START/STOP to start a new measurement. For repeated errors, calibration or service may be required.
System Failure	A monitor system has failed.	Service is required.
Error	Connection with the Bluetooth pairing device failed.	Check to ensure that the device is within the range (30 feet) of the pairing device. Check that the pairing device has Bluetooth turned on and is advertising.
Transfer Error	Bluetooth paired device disconnected.	Check to ensure that the device is within the range (30 feet) of the pairing device. Check that the pairing device has Bluetooth turned on and is advertising.
Repeat BP Measurement	BP measurement failed	Ensure patient is still. Check the cuff position. Service may be required for repeated errors.
Sound Failure	The sound module has failed. No sound is available.	Contact SunTech.
Bluetooth Failure	The Bluetooth module has failed.	Contact SunTech.
Date and Time Suspect	Internal clock has failed.	Contact SunTech.

13.2 SpO_2 Status Messages

If the SunTech Vet40 encounters a problem related to the SpO_2 functionality, a warning sign will appear on the main screen. Touch the warning symbol to open another pop-up, where further information will be available. Take action as directed on the screen, or as suggested in the table below:

Status Message	Reason	Solution
No Sensor Connected	The SpO2 sensor is not fully inserted into the Vet40 or not fully connected to the cable. May be an incorrect sensor or a defective sensor or cable.	Disconnect and reconnect the sensor into the cable or into the Vet40. Check to see if the sensor LED is flashing. Disconnect and reconnect the sensor. If the LED fails to operate, replace the sensor
Replace Sensor	The SpO_2 sensor is either non-functional or defective.	Replace the SpO_2 sensor.
Low Perfusion Index	Signal strength is too weak.	Move the sensor to a better perfused site.
Pulse Search	The device is searching for a pulse.	If the device fails to display within 30 seconds, disconnect and reconnect. If pulse search continues, move the sensor to a better perfused site.
Interference Detected	High intensity light (pulsating strobe lights, excessive ambient light sources such as surgical lights or direct sunlight) or other monitor displays are interfering with the sensing.	Place a light shield over the sensor to block the interference.
Sensor Off Patient	The sensor is not connected to the patient properly. Also, it is possible the sensor is damaged.	Properly reapply the sensor to the patient and reconnect the sensor to the device or patient cable. If the sensor is damaged, replace the sensor.
Incompatible Sensor	The SpO2 sensor in use is not compatible with the device.	Use a compatible sensor.
Low SpO_2 Signal IQ	Indicates low signal confidence of the acquired SpO_2 signal.	Ensure proper sensor application. Minimize patient movement. Move sensor to a better perfused site.
Delayed Data	Indicates no SPO_2 data has been received.	Check the sensor or position.
No Cable Connected	The SpO_2 cable is not attached or not fully inserted into the Vet40.	Disconnect and reconnect the cable.
No Adhesive Sensor Connected	When a single-patient-use sensor is used, the adhesive portion of the sensor is not connected.	Ensure the adhesive portion is firmly connected to the sensor.
Loss of Communication	The sensor is disconnected during use or system communications failure.	Check that the SpO_2 sensor is fully plugged into the back of the Vet40. If error continues, service or sensor replacement may be required.

13.3 $ETCO_2$ Status Messages

If the SunTech Vet40 encounters a problem related to the $ETCO_2$ functionality, a warning sign will appear on the main screen. Touch the warning symbol to open another pop-up, where further information will be available. Take action as directed on the screen, or as suggested in the table below:

Status Message	Reason	Solution
$ETCO_2$ Zero Calibration	$ETCO_2$ sensor requires calibration before use	Do not breathe near the sensor. Press the SET ZERO button on the $ETCO_2$ Zero Calibration message to calibrate.
Air Blockage	There is a blockage in the sensor.	Remove airway adapter and check that the sensor connections are open and clear.

13.4 ECG Status Messages

If the SunTech Vet40 encounters a problem related to the ECG functionality, a warning sign will appear on the main screen. Touch the warning symbol to open another pop-up, where further information will be available. Take action as directed on the screen, or as suggested in the table below:

Status Message	Reason	Solution
LL Lead Fail	LL lead has lost connection.	Check or reapply LL lead.
LA Lead Fail	LA lead has lost connection.	Check or reapply LA lead.
RA Lead Fail	RA lead has lost connection.	Check or reapply RA lead.
Multiple Lead Fail	Multiple leads have lost connection.	Check or reapply all leads.
Lead Overload	Possible electrical interference	Check the environment for sources of electrical interference near all leads.

14. Frequently Asked Questions

How many measurements can I store in Memory?
You can store up to 960 of the most recent measurements.

How do I delete data from memory?
Select the data you wish to delete and touch the Delete button. Before the data is permanently deleted, you will be asked to confirm or cancel the deletion. See section 10.1 for more information.

For medium-sized dogs, which animal mode do I choose?
Use the cuff size as the determining factor. If a #3 cuff or smaller is the best fit, choose small animal mode. If #4 cuff or larger, choose large animal mode.

How do I choose the correct cuff size?
Wrap the cuff around the patient's limb and make sure the index line falls within the range marker. If two different cuff sizes fit the patient, choose the larger size. See section 5.1 for more information.

How long will the battery last?
During continuous monitoring of SpO_2 and temperature, with an Interval BP set for every 5 minutes, a fully charged battery should last at least 4 hours before requiring recharging. If only taking manual BP measurements, a fully charged battery should last for at least 150 BP measurements before requiring recharging. Fully charging the battery should take under 6 hours. Battery life is dependent on the screen display ON time. To maximize life, SunTech suggests changing the Power Management setting to 5 minutes.

Can I use this monitor on awake and anesthetized animals?
Yes. The Vet40 can be used on anesthetized animals as well as awake animals.

How do I keep the cuff from slipping down the limb or coming off?
First ensure the cuff has a snug fit. Extra attention will be needed on species with dense or thick fur. If the cuff does not stay attached, check and clean the hook & loop or replace the cuff.

Are there other power options?
Yes. The device is provided with a plug-in power supply that recharges the internal battery when connected. When the monitor is not connected to the power supply, the battery will allow the unit to be portable for use.

What are the minimum and maximum cat & dog weights when taking measurements with the Vet40?
There are none. Any cat or dog that has a limb that fits within the cuff ranges is acceptable.

15. Limited Warranty

SunTech Medical, Inc. provides to the original purchaser the following limited warranty from the date of invoice.

Monitors	24 months
Cuffs/Hoses	90 days
Masimo Accessories	6 months
AccuVet Accessories	1 year
ECG Accessories	1 year
ETCO$_2$ Accessories	1 year

SunTech Medical, Inc. warrants each device to be free from defects in material and workmanship. Liability under this warranty covers servicing of the device when returned from the customer's facility within the United States prepaid to the factory. SunTech Medical, Inc. will repair any component(s) or part(s) that it finds to be defective during the period of this limited warranty. Should a defect become apparent, the original purchaser should first notify SunTech Medical, Inc. of the suspected defect. The device should be carefully packaged and shipped prepaid to:

SunTech Medical, Inc.
Service Department
5827 S Miami Blvd, Suite 100
Morrisville, NC 27560 USA

Tel: 800.421.8626
919.654.2300
Fax: 919.654.2301

This limited warranty is void if the device has been damaged by accident, misuse, negligence, act of God or serviced by any person not authorized by SunTech Medical, Inc. This warranty contains the entire obligation of SunTech Medical, Inc. and no other warranties expressed, implied or statutory are given. No representative or employee of SunTech Medical, Inc. is authorized to assume any further liability or grant any further warranties except as herein.

16. Technical Information

16.1 Monitor Model Numbers

Part Number	Model Number	Model Description
99-0185-00	M40A	*Vet40* Monitor with BP, AccuVet SpO_2, Temp, ECG, Flamingo Pink Armour
99-0185-01	M40A	*Vet40* Monitor with BP, AccuVet SpO_2, Temp, ECG. Peacock Blue Armour
99-0185-02	M40A	*Vet40* Monitor with BP, AccuVet SpO_2, Temp, ECG, Tree Frog Green Armour
99-0185-04	M40A	*Vet40* Monitor with BP, AccuVet SpO_2, Temp, ECG, Purple Armour
99-0186-00	M40B	*Vet40* Monitor with BP, Masimo SpO_2, Temp, ECG, Flamingo Pink Armour
99-0186-01	M40B	*Vet40* Monitor with BP, Masimo SpO_2, Temp, ECG. Peacock Blue Armour
99-0186-02	M40B	*Vet40* Monitor with BP, Masimo SpO_2, Temp, ECG, Tree Frog Green Armour
99-0186-04	M40B	*Vet40* Monitor with BP, Masimo SpO_2, Temp, ECG, Purple Armour
99-0187-00	M40A	*Vet40* Monitor with BP, AccuVet SpO_2, Temp, ECG, Mainstream ETCO2, Flamingo Pink Armour
99-0187-01	M40A	*Vet40* Monitor with BP, AccuVet SpO_2, Temp, ECG, Mainstream ETCO2, Peacock Blue Armour
99-0187-02	M40A	*Vet40* Monitor with BP, AccuVet SpO_2, Temp, ECG, Mainstream ETCO2, Tree Frog Green Armour
99-0187-04	M40A	*Vet40* Monitor with BP, AccuVet SpO_2, Temp, ECG, Mainstream ETCO2, Purple Armour
99-0188-00	M40B	*Vet40* Monitor with BP, Masimo SpO_2, Temp, ECG, Mainstream ETCO2, Flamingo Pink Armour
99-0188-01	M40B	*Vet40* Monitor with BP, Masimo SpO_2, Temp, ECG, Mainstream ETCO2, Peacock Blue Armour
99-0189-02	M40B	*Vet40* Monitor with BP, Masimo SpO_2, Temp, ECG, Mainstream ETCO2, Tree Frog Green Armour
99-0188-04	M40B	*Vet40* Monitor with BP, Masimo SpO_2, Temp, ECG, Mainstream ETCO2, Purple Armour
99-0190-00	M40AE	*Vet40E* Monitor with BP, AccuVet SpO2, Temp, ECG, Flamingo Pink Armour
99-0190-01	M40AE	*Vet40E* Monitor with BP, AccuVet SpO2, Temp, ECG, Peacock Blue Armour
99-0190-02	M40AE	*Vet40E* Monitor with BP, AccuVet SpO2, Temp, ECG, Tree Frog Green Armour
99-0190-04	M40AE	*Vet40E* Monitor with BP, AccuVet SpO2, Temp, ECG, Purple Armour
99-0191-00	M40BE	*Vet40E* Monitor with BP, Masimo SpO2, Temp, ECG, Flamingo Pink Armour
99-0191-01	M40BE	*Vet40E* Monitor with BP, Masimo SpO2, Temp, ECG, Peacock Blue Armour
99-0191-02	M40BE	*Vet40E* Monitor with BP, Masimo SpO2, Temp, ECG, Tree Frog Green Armour
99-0191-04	M40BE	*Vet40E* Monitor with BP, Masimo SpO2, Temp, ECG, Purple Armour
99-0192-00	M40AE	*Vet40E* Monitor with BP, AccuVet SpO2, Temp, ECG, Mainstream ETCO2, Flamingo Pink Armour
99-0192-01	M40AE	*Vet40E* Monitor with BP, AccuVet SpO2, Temp, ECG, Mainstream ETCO2, Peacock Blue Armour
99-0192-02	M40AE	*Vet40E* Monitor with BP, AccuVet SpO2, Temp, ECG, Mainstream ETCO2, Tree Frog Green Armour
99-0192-04	M40AE	*Vet40E* Monitor with BP, AccuVet SpO2, Temp, ECG, Mainstream ETCO2, Purple Armour
99-0193-00	M40BE	*Vet40E* Monitor with BP, Masimo SpO2, Temp, ECG, Mainstream ETCO2, Flamingo Pink Armour
99-0193-01	M40BE	*Vet40E* Monitor with BP, Masimo SpO2, Temp, ECG, Mainstream ETCO2, Peacock Blue Armour
99-0193-02	M40BE	*Vet40E* Monitor with BP, Masimo SpO2, Temp, ECG, Mainstream ETCO2, Tree Frog Green Armour
99-0193-04	M40BE	*Vet40E* Monitor with BP, Masimo SpO2, Temp, ECG, Mainstream ETCO2, Purple Armour

16.2 Factory Default Settings

Monitor Default Settings

Parameter Name	Default Value	Parameter Name	Default Value
Animal Mode	Large	Pressure Units	mmHg
Clinical Alarms Status	OFF (All parameters)	$ETCO_2$ Units	mmHg
Speaker Status	OFF	Temperature Units	Fahrenheit
Power Management	10 minutes	ECG Gain	1 mm/mV
Interval BP Rate	3 minutes	SpO2 Gain	100%
Language	English	ETCO2 Gain	150 mmHg, 1.0x
External Display	Duplicate Display	ECG Sweep	25 mm/s
Date Format	MM/DD/YYYY	SpO2 Sweep	25 mm/s
Time Format	12-hour	ETCO2 Sweep	12.5 mm/s
Bluetooth Status	OFF	Leads	I
Light/Dark Mode	Light Mode	Filter	Monitor

Clinical Alarm Default Settings

Parameter Name	Small Animal (Cat)		Large Animal (Dog)		Equine	
	Low	High	Low	High	Low	High
NIBP SYS (mmHg)	70	160	70	160	70	160
NIBP DIA (mmHg)	40	100	40	100	40	100
NIBP MAP (mmHg)	70	140	70	140	70	140
HR (bpm)	90	180	50	180	25	50
SpO2 (%)	85	100	85	100	85	100
ETCO2 (mmHg)	20	60	20	60	20	60
Resp Rate (rpm)	5	55	5	55	5	55
Temp (F)	96.8	104	96.8	104	96.8	104

16.3 Performance Specifications

CAUTION: Performance can be affected if used or stored outside the specified temperature, humidity, or altitude ranges listed below. In such instances, the device should not be used for a minimum of 20 minutes or until the device can adjust to the operating environment.

Operating Conditions: 0°C to 40°C, 15% to 90% non-condensing humidity

Storage Conditions: -20°C to 65°C, 15% to 90% non-condensing humidity
Altitude: Measurement accuracy not affected by altitude
Power Source: Lithium-ion Battery and/or AC Adapter
Input Voltage Range: Universal (100 to 240 Vac)
Input Frequency Range: 50/60 Hz
Input Efficiency rating: DoE Level VI
Isolation Classification: Class II
Output Voltage: 12 Vdc
Output Current: 0 to 2.5 A
Protection from electrical shock:Class 2
Duty Cycle: Continuous use
Battery: 7.2 V, 2.6 Ah, 18.72 Wh
Dimensions: 6.25" x 5" x 5.25" (15.9cm x 12.7cm x 13.3cm)
Weight: M40A: 2.35 lbs (1.1 kg) with battery and sensors
M40B: 2.65 lbs (1.2 kg) with battery and sensors

BP Specifications

Method of Measurement:	Oscillometric
Blood Pressure Range:	Systolic: 40 – 265 mmHg MAP: 27 – 222 mmHg Diastolic: 20 – 200 mmHg
Pulse Rate Range:	25 to 300 BPM (Beats Per Minute)
Pulse Rate Units:	Beats per minute
Cuff Deflate Rate:	Deflation step size varies with heart rate, cuff pressure and cuff volume
Initial Inflation Pressure:	180 mmHg (default)
Subsequent initial inflation:	previous Systolic + 30 mmHg
Transducer Accuracy:	±3 mmHg between 0 mmHg and 300 mmHg
Transducer Calibration:	Calibration check recommended annually or if a calibration problem is suspected

Temperature Specifications

Temperature Range:	26ºC to 46ºC
Temperature Accuracy:	±0.3ºC plus the temperature sensor tolerance
Temperature Resolution:	0.1ºC
Sensor:	YSI 400 compatible
Display Update Rate:	1 Hz
Measurement Mode:	Direct measurement
Transient Measurement Time:	45 seconds

Masimo Pulse Oximetry Specifications

Accuracy specifications are statistically distributed, and only about two-thirds of the measurements fall within the 1 Std. Dev. specification.

	LNCS YI Multisite Sensor	LNCS TF-I Reflectance Sensor
SpO_2 Range	0-100%	0-100%
SpO_2 Accuracy	±2% at 70%-100%, for patients weighing >30 kg Undefined, for patients weighing <30 kg	±2% at 70%-100%, for patients weighing >30 kg Undefined, for patients weighing <30 kg
Pulse Rate Range	25-240 BPM	25-240 BPM
Pulse Rate Accuracy	±3 BPM, for patients weighing >30 kg Undefined, for patients weighing <30 kg	±3 BPM, for patients weighing >30 kg Undefined, for patients weighing <30 kg
SpO_2 Averaging Time:	8 second averaging	
TF-I Sensor Wavelength	Red 660nm Infrared 880nm	
Ingress Protection	IPX1	

AccuVet Pulse Oximetry Specifications

SpO_2 Range	0-99%
SpO_2 Accuracy	±2% at 70%-99% <70% unspecified
SpO_2 Resolution	1% increments
Pulse Oximetry Units	% SpO_2
Pulse Rate Range	18-400 BPM
Pulse Rate Accuracy	±2% or 2 BPM, whichever is greater
Pulse Rate Resolution	1 BPM
Pulse Rate Units	Beats per Minute
SpO_2 Averaging	8 pulse beat average
Display Update Rate	1 Hz (maximum age of SpO_2 and pulse rate data is 35 seconds)
Sensor Wavelength	Red 660nm, 2mW (typical) Infrared 905nm, 2-2.4mW (typical)
Ingress Protection	IPX1
Calibration	Factory calibrated over the range of 70% to 99% SpO_2 using human blood samples to functional saturation. Test methods are available upon request. No in-service calibration is required.

AccuVet Reflectance Pulse Oximetry Specifications

SpO_2 Range	70-100%
SpO_2 Accuracy	±3% at 70%-100%
SpO_2 Resolution	1% increments

Pulse Rate Range	25-300 BPM
Sensor Wavelength	Red 660nm, 2mW (typical) Infrared 905nm, 2.4mW (typical)
Ingress Protection	IPX1

ECG Specifications

Configuration	3-lead
Lead Selection	I, II, III, user selectable
Maximum number of simultaneous ECG Waveforms	One
Defibrillation Protection	Yes
Line Noise Filter	50Hz or 60Hz, user selectable
Input Range	-5mV to 5mV
QRS Detection Range	0.16mV to 5mV
Hear Rate Detect	Yes
Heart Rate Range:	12-420 bpm
Heart Rate Accuracy	±2% or 2 BPM, whichever is greater
Heart Rate Resolution	1 bpm
Waveform Update Rate	300Hz
Heart Rate Display Update Rate	1 Hz
Current applied to patient (for leads-off sensing)	75nA DC
Tall T-wave rejection	None
Heart Rate Averaging	Number of R-R intervals during 16 second period
Response time of heart rate meter to change in heart rate for: 1) step decrease from 8 increase from 80 to 20 bpm 2) step 0 to 40 bpm:	1) 4 sec to 37%, 7 sec to 63%, 16 sec to 100% 2) 5 sec to 37%, 8 sec to 63%, 18 sec to 100%
Heart Rate Response to alternating ECG complexes according to IEC 60601 2 27: 2011 Clause 201.7.9.2.9.101	For veterinary use only

Mainstream/Sidestream Capnography Specifications

Method	Mainstream Capnography	
Principle of Operation	Non-dispersive, multi-channel IR detector, no moving parts	
Initialization Time	To display: 8 sec; to specification: 2 min	
Rise Time	Less than 100 msec	
CO2 Measurement Range	0 to 150 mmHg	
CO2 Measurement Resolution	1 mmHg	
CO2 Accuracy	0 - 40 mmHg	≤ ±2 mmHg
	41 – 70 mmHg	≤ ±5% of reading
	71 – 100 mmHg	≤ ±8% of reading
	101 – 150 mmHg	≤ ±10% of reading
EtCO2 Calculation	Every breath, or 10 to 20 second averaging	
Respiration range	2 to 150 Breaths/min	
Respiration accuracy	1% ± 1 breath	
Barometric Pressure compensation	Automatic compensation for barometric pressure from 400 to 860mmHg.	
Calibration	Initial zero calibration only	

Method	Sidestream Capnography	
Principle of Operation	Non-dispersive, multi-channel IR detector, no moving parts	
Initialization Time	To display: 45 sec; to specification: 2 min	
Rise Time	Typical 200 msec	
CO2 Measurement Range	0 to 150 mmHg	
CO2 Measurement Resolution	1 mmHg	
CO2 Accuracy	0 - 40 mmHg	≤ ±2 mmHg
	41 – 70 mmHg	≤ ±5% of reading
	71 – 100 mmHg	≤ ±8% of reading
	101 – 150 mmHg	≤ ±10% of reading
EtCO2 Calculation	Every breath, or 10 to 20 second averaging	
Flow	50 – 150 ml/min, +/- 25%	
Respiration range	2 to 150 Breaths/min	
Respiration accuracy	1% ± 1 breath	
Barometric Pressure compensation	Automatic compensation for barometric pressure from 400 to 860mmHg.	
Calibration	Self-calibration	

16.4 Radio Frequency Compliance Requirements

This device contains a transmitter module identified by FCC ID: QOQBGM111 and Industry Canada: IC 5123A-BGM111. It has been tested and found to comply with the limits for a Class B device. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment. This device complies with Part 15 of the FCC Rules for the United States. Operation is subject to the following 2 conditions:

1) This device may not cause interference; and

2) This device must accept any interference, including interference that may cause undesired operation of the device.

Radio Equipment Directive (RED)

This is a Class I (RED directive) device that contains a wireless transmitter which can be used in at least one EU member state. There are no restrictions of use.

16.5 Electromagnetic Compatibility (EMC)

Changes or modifications to the SunTech Vet40 that are not approved by SunTech Medical may cause EMC interference problems with this or other equipment.

EMC Statement

This equipment needs special precautions regarding EMC and needs to be installed and put into service per the EMC information provided in this document. This equipment has been tested and found to comply with the limits for medical devices to IEC 60601-1-2: 2020. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving device.
- Increase the separation between the equipment.
- Connect the equipment into an outlet on a circuit different from which the other device(s) are connected.
- Consult with the manufacturer or field service technician for help.
- Portable and mobile RF communications equipment can affect Medical Electrical Equipment.

WARNING: Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the Vet40 system, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.
WARNING: Use of accessories, transducers, and cables other than those specified may result in increased emissions or decreased immunity of the Vet40.
WARNING: The Vet40 should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the Vet40 should be observed to verify normal operation in the configuration in which it will be used.

WARNING: This equipment/system is intended for use by healthcare professionals only. This equipment/system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the Vet40 or shielding the location.

Guidance and Manufacturer's Declaration – Electromagnetic Emissions		
The Vet40 Monitor is intended for use in a Professional Healthcare Facility within the electromagnetic environment specified below. The customer or the user of the Vet40 Monitor should be sure that it is used in such an environment. This equipment has been tested and found to comply with the limits for medical devices to IEC60601-1-2: 2020		
Emissions test	**Compliance**	**Electromagnetic Environment – Guidance**
RF emissions CISPR 11	Group 1	The Vet40 Monitor uses RF energy only for its internal functions. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
	Class B	The Vet40 Monitor is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Guidance and Manufacturer's Declaration – Electromagnetic Immunity			
The Vet40 Monitor is intended for use in a Professional Healthcare Facility within the electromagnetic environment specified below. It is not intended for helicopter transport, hospital ambulance, or home use. It is not intended for use near active HF SURGICAL EQUIPMENT and the RF shielded room of an ME SYSTEM for magnetic resonance imaging, where the intensity of EM DISTURBANCE is high. The customer or the user of the monitor should ensure that it is used in such an environment. This equipment has been tested and found to comply with the limits for medical devices to IEC 60601-1-2: 2020.			
Immunity Test	**Applies to**	**Compliance Level**	**Electromagnetic Environment-Guidance for Professional Healthcare Facility Environment**
Electrostatic discharge (ESD) IEC 61000-4-2	All device input and output connections and cables	± 2, 4, 6, 8kV contact ± 2, 4, 8, 15kV air discharge	Floors should be wood, concrete, or ceramic tile. If the floor is covered with synthetic material, the relative humidity should be at least 30%. Users must eliminate static in their hands before using it.
Radiated RF EM fields IEC 61000-4-3	All device input and output connections and cables	3V/m 80 MHz to 2700MHz 80% AM at 1kHz	Radiated electromagnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment
Radiated RF Wireless communication equipment IEC 61000-4-3	All device input and output connections and cables	See Table A below	This device has been subjected to RF wireless communication bands from cell phones, and other communication devices.
Electrical fast transient/burst IEC 61000-4-4	All device input and output connections and cables	± 2kV for power supply lines 100kHz repetition frequency	Mains power quality should be that of a typical commercial or hospital environment (Professional Healthcare Facility) DC power quality shall be provided by the supplied power adapter
Surge IEC 61000-4-5	AC Mains, Line to Ground	± 0.5, 1, 2kV	
	AC Mains, Line to Line	± 0.5, 1kV	
	DC Input (>3m), Line to Ground	± 0.5, 1, 2kV	
	DC Input (>3m), Line to Line	± 0.5, 1kV	
Conducted Disturbances induced by RF fields IEC 61000-4-6	All device input and output connections and cables	3V 0.15MHz – 80MHz 6V in ISM bands between 0,15 MHz and 80MHz 80% AM at 1kHz	Mains power quality should be that of a typical commercial or hospital environment. All handheld and patient coupled parts should be consistent with intended use.
Conducted RF IEC 61000-4-6	All device input and output connections and cables	3V 10V ISM bands 150kHz to 80MHz	Portable and mobile RF communications equipment should be used no closer to any part of the monitor, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. The minimum separation distance

Guidance and Manufacturer's Declaration – Electromagnetic Immunity			
			for higher IMMUNITY TEST LEVELS shall be calculated using the following equation. Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m) and E is the Immunity Test Level in V/m.
Power Frequency (50Hz) magnetic field IEC 61000-4-8	All device input and output connections and cables	3A/m	Power Frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	Device input (AC power)	<5% UT (>95% dip in UT) for 0.5 cycles 40% UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT for 25 cycles) <5% UT (>95% dip in UT for 5 sec	Mains power quality should be that of a typical commercial or hospital environment (Professional Healthcare Facility) If the user of the monitor requires continued operation during power mains interruption, it is recommended that the monitor be powered from an uninterruptible power supply or a battery.
NOTE: *UT is the a.c. mains voltage prior to application of the test level*			
In the event of an error, the device will auto-recover within 5 seconds.			
Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol. 			
NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			

Recommended separation distances between portable and mobile RF communications equipment and the Vet40			
The Vet40 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Vet40 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and Vet40 as recommended below, according to the maximum output power of the communications equipment. Wireless communications equipment such as wireless home network devices, mobile phones, cordless telephones and their base stations, walkie-talkies can affect this equipment and should be kept at least a distance d away from the equipment.			
Rated maximum output power of transmitter. Watts (W)	Separation distance according to frequency of transmitter. Meters (m)		
	150 kHz to 80 MHz $d = 1{,}2\sqrt{P}$	80 MHz to 800 MHz $d = 1{,}2\sqrt{P}$	800 MHz to 2,5 GHz $d = 2{,}3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer. NOTE 1: at 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			

a) Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the monitor is used exceeds the applicable RF compliance level above, the monitor should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the monitor.
b) Over the frequency range 150kHz to 80 MHz, field strengths should be less than 3V/m

Table A – Test specifications for the device's Signal Input Parts/Signal Output parts to RF wireless communication equipment.

Test Frequency (MHz)	Band a) (MHz)	Service b)	Modulation b)	Maximum Power (W)	Distance (m)	IMMUNITY TEST LEVEL (V/m)
358	380 – 390	TETRA 400	Pulse Modulation b) 18Hz	1,8	0.3	27
450	430 – 470	GMRS 460, FRS 460	FM c) 5 kHz deviation 1 kHz sine	2	0.3	28
710 745 780	704 - 787	LTE Band 13, 17	Pulse Modulation b) 217Hz	0,2	0.3	9
810 870 930	800 - 960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse Modulation b) 18Hz	2	0.3	28
1720 1845 1970	1700 - 1990	GSM 1800, CDMA 1900, GSM 1900, DECT, LTE-Band 1, 3, 4, 25, UMTS	Pulse Modulation b) 217Hz	2	0.3	28
2450	2400 - 2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse Modulation b) 217Hz	2	0.3	28
5240 5500 5785	5100 – 5800	WLAN 802.11 a/n	Pulse Modulation b) 217Hz	2	0.3	9

NOTE If necessary to achieve the IMMUNITY TEST LEVEL, the distance between the transmitting antenna and the ME EQUIPMENT or ME SYSTEM may be reduced to 1m. The 1m test distance is permitted by IEC 61000-4-3

a) For some services, only the uplink frequencies are included
b) The carrier shall be modulated using a 50% duty cycle square wave signal
c) As an alternative to FM modulation, 50% pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be the worst case.

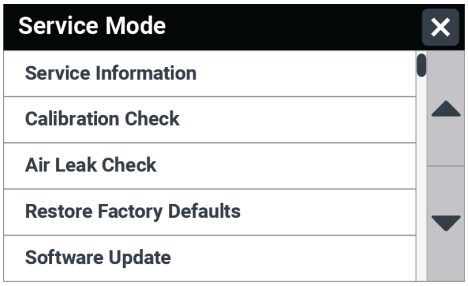
Appendix A: Service Screens

WARNING: Do not disassemble the unit. There are no user serviceable parts except for the battery. Refer to qualified service personnel.

WARNING: When updating the software or transferring data via the USB port, the monitor cannot be in use, and the accessories should not be contacting the patient.

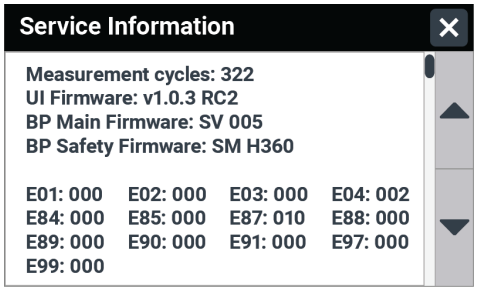
CAUTION: DO NOT remove unit covers. Doing so may increase the risk of electrical shock. This monitor does not contain any user serviceable parts. Substitution of a component or accessory different from that supplied may result in measurement error. Repairs should be undertaken only by personnel trained or authorized by SunTech Medical.

The SunTech Vet40 BP monitor includes a service mode where service information can be accessed, factory default settings can be restored, and hardware verification checks can be performed. The service screens are accessed by holding down the power button for approximately 6 seconds when turning the monitor ON. When viewing service screens, the Start/Stop button LED is white.
No parts of the monitor or its accessories are serviceable.



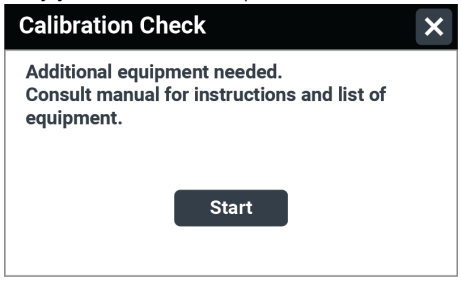
Service Information

Basic details are logged which includes the number of measurement cycles, user interface firmware version, both firmware versions for the BP algorithm as well as a count for each status message. Status codes are provided to assist in troubleshooting during a service call. The image below is provided for example only.



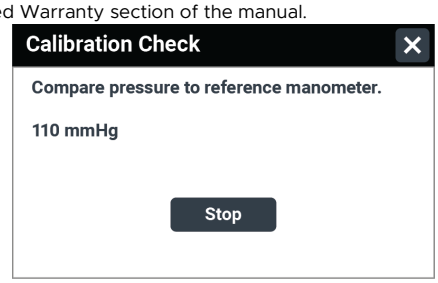
Calibration Check

The pressure transducer in the SunTech Vet40 BP monitor is designed to hold its calibration for many years. Human NIBP devices require that the maximum static pressure accuracy be ± 3mmHg or 2% of the reading, whichever is greater. This is a stringent requirement, and all test equipment must be in excellent working order to properly perform this test. If you do not have access to this equipment or prefer to have someone else verify the calibration, the monitor can be sent to SunTech following the procedure described in the Limited Warranty section of this manual. There may be a charge associated with the verification if the transducer is not out of calibration.
SunTech suggests this check be performed every year or if there is suspicion that the monitor may be out of calibration.

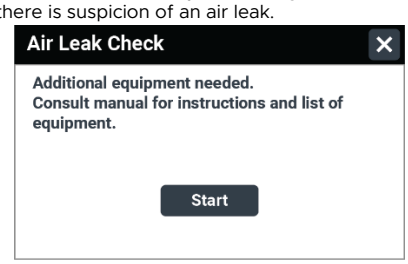


Equipment Needed
Calibrated Manometer
Pneumatic "T" Adapters
Volume (500mL bottle or #6 or #7 cuff wrapped tightly around a solid object)
Hand Bulb
Connection Tubing

Procedure
Connect a manometer, volume and the hand bulb to the end of the monitor hose using "T" adapters and connection tubing.
Touch the Start button which closes the valves and shows the pneumatic pressure.
Apply various pressures (between 0 mmHg and 250 mmHg) to the monitor with the hand bulb. INFLATE SLOWLY when adding pressure over 200 mmHg to avoid an overpressure. Verify that the module pressure is equal to the manometer pressure (±3 mmHg or 2% of the target value).
If the pressure is within limits, then touch the Stop button and the calibration check is complete.
If the pressure does not agree with the manometer, then the transducer needs to be re-calibrated. Send the monitor back to SunTech Medical following the procedure in the Limited Warranty section of the manual.

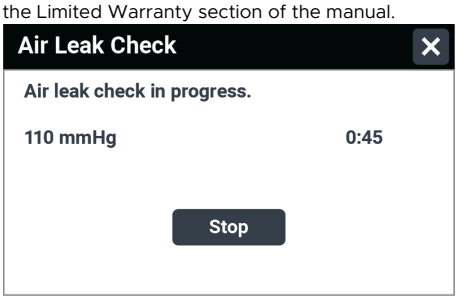


Air Leak Check
International standards for human NIBP devices require that air leakage within the pneumatic system must not exceed 6 mmHg/min. During manufacturing at SunTech Medical, acceptable air leakage is less than 3 mmHg/min. Both of these pass criteria will not affect the performance or accuracy of the NIBP module, so the SunTech Vet40 uses the 6 mmHg/min pass criteria. If you do not have access to this equipment or prefer to have someone else perform the air leak check, the monitor can be sent to SunTech following the procedure described in the Limited Warranty section of this manual. There may be a charge associated with performing an air leak check.
SunTech suggests this check be performed if there is suspicion of an air leak.

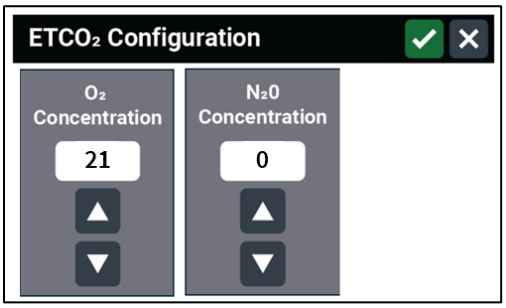


Equipment Needed
Volume (500mL bottle or #6 or #7 cuff wrapped tightly around a solid object)
Standard patient hose
TIP: A reduction in cuff pressure is expected during the first 60 seconds due to pneumatic expansion of the cuff, patient hose, and internal tubing. Make sure the cuff is wrapped tightly around a solid object. Do not perform with a cuff on a patient, lying flat or wrapped loosely.

Procedure
Connect the volume to the monitor patient hose. Touch the Start button which begins the air leak check and shows the pneumatic pressure and a timer. This check will take approximately 2 minutes. When the check is complete, the monitor will indicate a pass or fail result.
If pass, then touch the Pass button and the air leak check is complete. If fail, then there is an air leak within the pneumatic system. Try repeating the check with a different cuff to make sure all connections are sealed. If it still fails, you may send the monitor and cuffs back to SunTech Medical following the procedure in the Limited Warranty section of the manual.

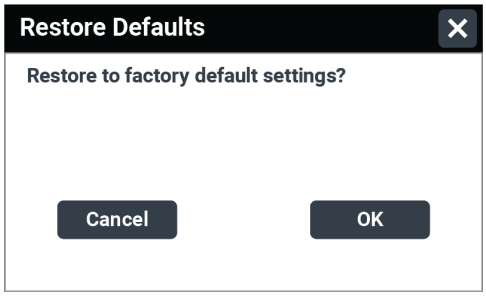


$ETCO_2$ Configuration
ETCO2 may be reconfigured by accessing this screen. The O2 and N2O concentrations may be adjusted to their desired settings.



Restore Factory Defaults

Factory defaults are restored by accessing this screen. A list of factory default settings is in the Technical Information section of this manual.



Software Update

If a software update is required, the software can be updated by contacting SunTech for technical support. SunTech may provide a USB drive.

Procedure

WARNING: When updating the software, the monitor cannot be in use, and the accessories should not be contacting the patient.

With the USB drive inserted into the device, touch Software Update from the Service Mode screen. A status bar will indicate the progress of the update. Do not turn off the device during the update. The device will restart when X is pressed after the update is complete.