SenTec Digital Monitoring System

Digital vital-sign monitoring
1 Trend Display Area
2 Numerical Display Area
3 Select Button
4 Alarm Mute Button
5 Alarm Mute Indicator (yellow LED)
6 Door Lock
7 Docking Station Door
8 Enter Button
9 Display Button
10 AC Power/Battery Indicator (green/yellow LED)
11 UP/DOWN Buttons
12 ON/OFF Indicator (green LED)
13 Status Bar
14 Speaker (on the side)

15 Sensor Connection Port
16 Multipurpose I/O-Port (Nurse Call & Analog Output)
17 Serial Data Port (RS-232)
18 Network Port (LAN)*
19 Gas Bottle Slot
20 Fan
21 Equipotential Terminal Connector (ground)
22 Fuse Holder
23 AC Power Connector
24 ON/OFF Switch

*feature not currently available
Warranty
The manufacturer warrants to the initial purchaser that each new component of the SenTec Digital Monitoring System (see list of components) will be free from defects in workmanship and materials. The manufacturer’s sole obligation under this warranty is to replace any component - for which the manufacturer acknowledges the warranty cover - with a replacement component.

Warranty Exclusions and System Performance
SenTec AG can neither guarantee or verify instrument performance characteristics nor accept warranty claims or product liability claims if the recommended procedures are not carried out, if the product has been subject to misuse, neglect or accident, if the product has been damaged by extraneous causes, if accessories other than those recommended by SenTec AG are used, or if instrument repairs are not carried out by SenTec authorized service personnel.

CAUTION:  Federal law (U.S.) restricts this device to sale by or on the order of a physician.

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Intended use and limitations

Intended use of the SenTec Digital Monitoring System (SDMS)

- The SenTec Digital Monitoring System - consisting of the SenTec Digital Monitor, the V-Sign™ Sensor and accessories - is indicated for continuous, noninvasive patient monitoring.

- The V-Sign™ Sensor is indicated for use with the SenTec Digital Monitor when continuous noninvasive monitoring of carbon dioxide tension (PCO$_2$), oxygen saturation (SpO$_2$), and pulse rate (PR) are required for adult and pediatric patients. In neonatal patients the use of the V-Sign™ Sensor is indicated for carbon dioxide tension monitoring only.

- SenTec’s Ear Clip is intended for use with the V-Sign™ Sensor when continuous, noninvasive carbon dioxide tension, oxygen saturation and pulse rate monitoring are required. The Ear Clip is for single-patient use and is indicated to attach the V-Sign™ Sensor to the earlobe of the patient. The use of the Ear Clip is contraindicated for patients whose earlobes are too small to ensure adequate sensor application.

- SenTec’s Multi-Site Attachment Ring, model MAR-A/P/N, is intended for use with the V-Sign™ Sensor when continuous, noninvasive carbon dioxide tension monitoring is required for adult, pediatric, and neonatal patients. The Multi-Site Attachment Ring, model MAR-A/P/N, is for single use and is indicated to attach the V-Sign™ Sensor to conventional measurement sites for carbon dioxide tension monitoring.

- SenTec’s Multi-Site Attachment Ring, model MAR-A/P, is intended for use with the V-Sign™ Sensor when continuous, noninvasive carbon dioxide tension monitoring is required for adult and pediatric patients. The Multi-Site Attachment Ring, model MAR-A/P, is for single use and is indicated to attach the V-Sign™ Sensor to conventional measurement sites for carbon dioxide tension monitoring.

- The SenTec Digital Monitoring System is indicated for use in hospitals, hospital-type facilities, intra-hospital transport environments, and - if under clinical supervision - home environments.

- The SenTec Digital Monitoring System is for prescription use only.

Note: Hospital use typically covers areas such as general care floors, operating rooms, special procedure areas, intensive and critical care areas. Hospital-type facilities typically cover facilities such as surgical centers, special nursing facilities, and sleep labs outside of the hospital. Intra-hospital transport includes transport of a patient within the hospital or hospital-type facilities.
Limitations of cutaneous blood gas measurements

The SDMS monitors cutaneous PCO₂. The following clinical situations or factors may affect the correlation between cutaneous and arterial PCO₂ values:
· arterio-venous shunts
· hypoperfused measurement site, e.g. because of low cardiac index, shock, hypothermia, or vasoactive drugs
· condition of patient’s skin and subcutaneous tissue
· interference with anesthetic gases

**Note:** The SDMS is not a blood gas device. Keep the above mentioned limitations in mind when interpreting cutaneous PCO₂ values.

**Note:** When comparing PCO₂ values displayed by the SDM against PCO₂ values obtained from arterial blood gas (ABG) analysis, pay attention to the following points:
· Carefully draw and handle blood samples.
· Blood sampling should be performed in steady state conditions.
· The PCO₂ value obtained from ABG analysis has to be compared to the SDM’s PCO₂ at the time of blood sampling.
· The PCO₂ values displayed by the SDM are automatically corrected to 37°C (regardless of the patient’s core temperature). When performing the ABG analysis make sure to properly enter the patient’s core temperature into the blood gas analyzer. Use the blood gas analyzer’s “37°C-PCO₂” value to compare with the SDM’s PCO₂ values.
· Verify proper operation of the blood gas analyzer. Periodically compare the blood gas analyzer’s barometric pressure against a known calibrated reference barometer.

Limitations of pulse oximetry

The SDMS monitors functional oxygen saturation (SpO₂). The following clinical situations or factors may limit the correlation between SpO₂ and arterial oxygen saturation (SaO₂) values:
· dysfunctional hemoglobins (COHb, MetHb)
· intravascular dyes
· low perfusion at the measuring site
· skin pigmentation
· venous pulsations (e.g. due to use of the earlobe as a measurement site on a patient in steep Trendelenburg position)
· anemia

**Note:** Oxygen saturation measurement techniques – including pulse oximetry – are not able to detect hyperoxemia.

**Note:** Due to the S-shape of the oxyhemoglobin dissociation curve (ODC) pulse oximetry cannot reliably detect respiratory problems in patients Inspiring supplemental oxygen.
Setting up the SenTec Digital Monitoring System (SDMS)

List of components

The SenTec Digital Monitoring System (SDMS) comprises the following components:

- SenTec Digital Monitor (SDM)
- Power cord (applicable to country of sale)
- SDMS instruction manual (applicable to country of sale)
- SDMS Manual CD (providing detailed information, SDM Technical Manual in English only)
- V-Sign™ Sensor
- Digital Monitor Extension Cable
- V-Sign™ Disposable Set (sensor remembraning tool)
- Ear Clip/Multi-Site Attachment Ring (for sensor application)
- Sensor Gel (contact liquid)
- Service Gas (for sensor calibration)
- V-STATS™ Installation CD (current version)

Additional instructions for the V-Sign™ Sensor, the V-Sign™ Disposable Set, the Ear Clip and the Multi-Site Attachment Rings are provided in the respective directions for use. To ensure proper operation of the SDMS, precisely follow the instructions provided in this instruction manual step by step.
Installation of the Service Gas bottle

**WARNING:** Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50°C (122°F). Do not pierce or burn, even after use. Do not spray on a naked flame or any incandescent material.

**WARNING:** Do not use gas bottles from manufacturers other than SenTec. The use of non-SenTec gas bottles may damage the Docking Station. Wrong calibration gas mixtures will result in wrong sensor calibrations, and subsequently result in wrong PCO₂ data.

The gas bottle slot is located on the rear of the SDM 19.

Remove the gas bottle by turning it in counter-clockwise direction.

Insert the gas bottle by turning it in clockwise direction and tighten it without applying undue force (see picture).

**Note:** The status icon “Gas” (8h) is displayed only if the sensor is in the Docking Station and if the parameter “PCO₂” is enabled. Replace the gas bottle if the message “Gas bottle empty” (8h) is displayed in the status bar.

**Note:** Dispose of empty gas bottles according to local waste regulations for aluminum containers.

Connect the Extension Cable

Connect the Digital Monitor Extension Cable to the SDM. The connection is properly established when both clamps of the plug snap in. To disconnect the cable from the SDM release the clamps by pressing the two buttons on the black plug (see picture) and pull to remove the cable.

Connect to AC power

Plug the female connector of the power cord into the AC power connector on the rear of the monitor 23.

Plug the male connector of the power cord into a properly grounded AC power outlet.

The SDM will automatically adapt to the applicable local voltage: 100 - 240V~ (50/60Hz). Verify that the AC power/battery indicator 10 is lit. If the AC power/battery indicator is not lit, check the power cord, accessible fuses, and the AC power outlet.
Battery operation

The SDM is equipped with a rechargeable internal LiIon battery that can be used to power the monitor during transport or when AC power is not available. A new, fully charged battery will provide 6 hours of monitoring time. The battery icon (10%) informs about the remaining battery charge (%).

The AC power/battery indicator informs about the charging status of the battery:
AC power/battery indicator green: battery fully charged
AC power/battery indicator yellow: battery charging

It takes approximately 7 hours to fully charge an empty battery.

Connect a sensor

Connect the V-Sign™ Sensor to the Digital Monitor Extension Cable.

Turning on the SenTec Digital Monitor (SDM)

Turn on the SDM by pushing the ON/OFF switch at the rear of the SDM (24). The SDM performs a power-on self-test. Check the date/time settings of the SDM and adjust if necessary.

Check the sensor

Make sure the sensor is not affected by loose fit of the membrane, trapped air under the membrane, or dried-up electrolyte (white appearance of the membrane). If needed change the membrane. In case of any staining on the sensor membrane clean it with 70% isopropanol. In case of any visible damage of the sensor housing or cable contact SenTec authorized service personnel or your local SenTec representative.
Sensor calibration and storage

If a calibration of the sensor is needed, the SDM will automatically prompt the message “Calibrate sensor” in the status bar.

1. Open the Docking Station door \( \text{\textcircled{7}} \) on the front side of the monitor by pressing the door lock \( \text{\textcircled{6}} \).

2. Check the gasket in the Docking Station. If necessary clean Docking Station and gasket by using a cotton swab (Q-Tip) with 70% isopropanol.

   **WARNING:** Always clean the sensor before putting it into the Docking Station.

3. Hang the sensor into the holder at the inside of the door (red light visible).

   **CAUTION:** Wrong orientation of the sensor in the Docking Station might cause damage to the sensor, the Docking Station, or parts of them.

4. The sensor has to be placed properly into the holder to ensure that the Docking Station door can be closed without force.

   **WARNING:** For a correct calibration it is necessary that the sensor is always positioned correctly in the Docking Station door and that the Docking Station door is properly closed.

5. Close the Docking Station door. The SDM now checks the sensor and automatically starts to calibrate the sensor. After a successful calibration the message “Ready for use” is displayed. If a sensor membrane change is required follow the instructions provided on the following pages and confirm the membrane change as requested by the monitor.

   **Note:** For best PCO\(_2\) results it is recommended to store the sensor in the Docking Station the first four hours after switching-on the monitor or after membrane change. If you want to measure immediately, we recommend additional calibrations.

   **WARNING:** To maintain monitor readiness always keep the monitor switched on and always store the sensor in the Docking Station.
Sensor membrane change

Under normal use, the membrane of the V-Sign™ Sensor has to be changed every 28 days. The monitor requests a membrane change if required. Additionally the membrane of the sensor must be changed if air bubbles are visible underneath the membrane or if the membrane is damaged.

Note: The membrane timer only resets to 28 days if you confirm the membrane change on the monitor.

Inserting sensor into tool

a. Place the membrane changer (V-Sign™ Disposable Set, short: tool) on a solid flat surface (e.g. table top).

b. Insert the sensor head (membrane up) into the tool.

Change sensor membrane in 4 steps

The membrane change procedure consists of the following 4 steps: step 1 removes old sensor membrane, step 2 cleans sensor surface, step 3 applies new electrolyte on sensor surface and step 4 sets new membrane on sensor.

Repeat the following Press and Turn procedure 4 times:

a. Press down slowly but firmly with palm of hand and hold for 3 seconds.

b. Keep tool horizontally. Grab base of tool with one hand, turn top clockwise with other hand to next stop.

Important: Pay attention to repeat the Press and Turn procedure 4 times!
Removing sensor from tool

a. Lift the sensor and remove it from the tool.

Inspecting sensor membrane

a. Verify that the membrane ring is securely seated on the sensor.

b. Verify that there are no air bubbles between membrane and sensor surface.

In case of loose fit or trapped air, you must repeat the membrane change procedure as described above.

To perform an unrequested membrane change (e.g. if the membrane is damaged), activate the menu item “Membrane Change” (see page 19).
Use of the SDMS - patient application

Patient population/Measurement Site

The choice of the type of sensor application depends on the skin condition, the patient’s age, and the parameters to be measured:

### Adults/pediatrics (i.e. more than one month of age)

<table>
<thead>
<tr>
<th>Type of sensor application</th>
<th>Skin condition</th>
<th>Measurement site</th>
<th>Parameters</th>
</tr>
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<tbody>
<tr>
<td>Ear Clip</td>
<td>All skin conditions, but intact</td>
<td>Earlobe</td>
<td>SpO$_2$, PR and PCO$_2$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SpO$_2$, PR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PCO$_2$</td>
</tr>
<tr>
<td>MAR-A/P</td>
<td>Normal intact</td>
<td>Cheek, forehead (close to the eye brow), thorax under clavicle, upper arm, skin area behind earlobe</td>
<td>PCO$_2$</td>
</tr>
<tr>
<td>MAR-A/P/N</td>
<td>Sensitive, fragile, but intact</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Warning:** The measurement of SpO$_2$ and PR are not defined on sites other than the earlobe. In order to avoid erroneous readings and false alarms of SpO$_2$ and PR, ensure that the appropriate patient mode (Adult or Neonatal) is selected.

### Neonates (i.e. up to one month of age)

<table>
<thead>
<tr>
<th>Type of sensor application</th>
<th>Skin condition</th>
<th>Measurement site</th>
<th>Parameters</th>
</tr>
</thead>
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<tr>
<td>MAR-A/P/N</td>
<td>All skin conditions, but intact</td>
<td>Thorax, back, thigh</td>
<td>PCO$_2$</td>
</tr>
</tbody>
</table>

**Warning:** The sensor SET temperature of 42°C shall not be used on neonates/infants (up to one year of age). In order to avoid potential burns as well as erroneous readings and false alarms of SpO$_2$ and PR, activate the neonatal mode in the menu of the SDM. SpO$_2$ and PR are disabled in the neonatal mode and the sensor SET temperature is automatically adjusted to 41°C.

**Note:** If the SDM is operated in the neonatal mode, a yellow “NEO” indicator is displayed on the measurement, calibration and “Ready for use” screen.
Attachment with the Ear Clip

To attach the Ear Clip, the earlobe needs to be big enough to cover the whole dark surface of the sensor. If the earlobe is too small, you may use a Multi-Site Attachment Rings (model MAR-A/P or MAR-A/P/N) to attach the sensor on an alternate site for PCO₂ only monitoring (see page 15).

1. Verify that the appropriate patient mode (Adult or Neonatal) is selected and that the SDM is “Ready for use”. Check the available monitoring time.

2. Clean the earlobe with a swab wetted with 70% isopropanol and let it dry.

**Note:** If the SDM is in the sleep mode, the display is inactive (black). Press any of the control-buttons of the SDM to activate the display.

3. Open the Docking Station door and take out the sensor. Check the sensor Temperature (°C).

4. Close the Docking Station door.

5. Press the sensor into the Ear Clip until it snaps in. **Use a new Ear Clip for every new patient!**

6. Pull off the liner protecting the adhesive tape of the Ear Clip.

**WARNING:** Do not swallow sensor gel. Keep away from children. Avoid contact with eyes and injured skin. Use only approved SenTec Sensor Gel.
7. Place one small drop of Sensor Gel in the middle of the membrane surface. Make sure to keep the Ear Clip open and to handle the sensor such as the gel does not run off the membrane. Avoid wetting the adhesive pad of the Ear Clip!

**Note:** Instead of using Sensor Gel, you may also use clean tap water to wet the inside of the earlobe.

8. Attach the sensor with the Ear Clip at the back of the earlobe. If possible, pull the earlobe in a horizontal position to attach the sensor. Close the clip from above, then guide the earlobe back in vertical position. The sensor is applied correctly if the whole dark surface is covered by the earlobe. Make sure that the sensor has good contact to the skin (no air gaps between membrane and earlobe).

9. Wrap the sensor cable around the ear twice, tape the cable to the cheek as shown in the picture, and secure the cable with Clothing Clip on shirt or bed linen. Due to the slightly increased sensor temperature the maximal site time is automatically controlled by the SDM. Remove the sensor when the site time has elapsed (status message “site time elapsed”).

### Detachment of the sensor from the ear

1. Remove the adhesive tape and the Ear Clip carefully from the patient. Detach the sensor carefully from the Ear Clip.

2. After use, remove gel residues from the sensor and the patient’s earlobe with a swab wetted with 70% isopropanol.

3. Open the Docking Station door.
4. Hang the sensor (red light visible) into the holder at the inside of the Docking Station door. Close the Docking Station door. Sensor calibration starts automatically. Note the messages displayed by the SDM.

**Note:** After successful calibration the display of the SDM changes to the “Ready for use” screen.

**Use of Multi-Site Attachment Rings**

**Preparation**

1. Verify that the appropriate patient mode (Adult or Neonatal) is selected and that for adult/pediatric patients the parameters SpO₂/PR are disabled in the menu of the SDM.

**Note:** Verify that the SDM is “Ready for use” and check the available Monitoring time.

2. Select an appropriate measurement site (see page 12 and illustrations below).

3. Select the appropriate attachment ring depending on the patient’s age and skin condition at the measurement site (MAR-A/P/N or MAR-A/P, see page 12).

4. Remove hair if necessary.

5. Clean the skin at the measuring site with a swab wetted with 70% isopropanol and let it dry.

**Application of the sensor**

There are two alternative methods applying the sensor to the skin:

**Method A:** First the Multi-Site Attachment Ring is attached to the skin then the sensor is inserted.

**Note:** For forehead/cheek placement please wrap the sensor cable twice around the ear, tape it to the skin and secure it with a clothing clip on shirt or bed linen.
1. Pull off the liner protecting the adhesive tape of the attachment ring.

2. Hold the snap ring and attach the ring to the measurement site, press gently on snap ring. Move your finger around the ring circumference to ensure a good seal, i.e. good adhesion of the entire adhesive to the skin.

**Warning:** Do not swallow sensor gel. Keep away from children. Avoid contact with eyes and injured skin. Use only approved SenTec Sensor Gel.

3. Apply one small drop of Sensor Gel to the skin area in the center of the attachment ring.

**Note:** Instead of Sensor Gel you may use one small drop of clean tap water.

4. Open the docking station door and take out the sensor. Check the sensor temperature (adults/pediatrics; infants/neonates).

5. Close the Docking Station door.

6. Gently press the sensor into the attachment ring until it snaps in. Slightly twist the sensor in the ring and press the sensor gently against the skin to spread the Sensor Gel.

**Note:** Care must be taken to ensure air gaps and bubbles are eliminated when placing the sensor onto the skin.

7. Twist the sensor into the best position. Tape the cable at a distance of 5 to 10 cm from the sensor head to skin and secure it with a clothing clip on shirt or bed linen. For forehead/cheek placement first wrap the sensor cable twice around the ear.

**Note:** Alternatively you may first take out the sensor from the docking station, apply one small drop of gel to the center of the sensor membrane surface, and finally snap in the sensor into the attachment ring (make sure to hand-
Method B: First the sensor is clicked into the Multi-Site Attachment Ring then the assembly is attached to the skin.

1. Open the Docking Station door and take out the sensor. Check the sensor temperature (adults/pediatrics; infants/neonates).

2. Close the Docking Station door.

3. Press the sensor into the attachment ring until it snaps in.

4. Pull off the liner protecting the adhesive tape of the attachment ring.

Warning: Do not swallow sensor gel. Keep away from children. Avoid contact with eyes and injured skin. Use only approved SenTec Sensor Gel.

5. Apply one small drop of Sensor Gel to the center of the sensor membrane surface (avoid gel running off the membrane, thereby potentially wetting the adhesive tape).

6. Attach the sensor-ring assembly to the measurement site, press gently on sensor. Move your finger around the ring circumference to ensure a good seal, i.e. good adhesion of the entire adhesive to the skin.

Note: Care must be taken to ensure air gaps and bubbles are eliminated when placing the sensor onto the skin.

7. Twist the sensor into the best position. Tape the cable at a distance of 5 to 10 cm from the sensor head to skin and secure it with a clothing clip on shirt or bed linen. For forehead/cheek placement first wrap the sensor cable twice around the ear.
**Note:** Two or more Multi-Site Attachment Rings may be attached to the skin simultaneously to alternate the sensor application site.

**Detachment of the Attachment Ring**

**Note:** For inspection of the measuring site or calibration of the sensor do not remove the Attachment Ring from the skin.

1. Hold the outer part of the attachment ring with two fingers while carefully detaching the sensor from the snap ring.

2. Remove the attachment ring from the skin by carefully pulling at the little tab.

**Note:** Careful removal of the adhesive tape on premature or micro-preemies is important.

3. After use, remove gel residues from the sensor and the patient’s skin with a swab wetted with 70% isopropanol.

4. Open the docking station door.

5. Hang the sensor (red light visible) into the holder at the inside of the Docking Station door. Close the Docking Station door. Sensor calibration starts automatically. Note the messages displayed by the SDM.

**Note:** After successful calibration the display of the SDM changes to the “Ready for use” screen.
Controls of the SenTec Digital Monitor (SDM)

The SDM can be controlled with 6 buttons:

- **Select Button**
  - to access the menu
  - to scroll through the menu

**Note:** A grey, underlying bar highlights the selected sub-menu, menu parameter, or function.

- **Enter Button**
  - to activate a selected submenu or function

- **UP & DOWN Button**
  - to change the value of the selected menu parameter
  - to adjust brightness of the display (if in Measurement Mode)

- **Display Button**
  - to switch between the available measurement displays
  - to return to the measurement display from any menu level

- **Alarm Mute Button**
  - to mute alarms for 1 or 2 minutes (depending on menu setting)
  - to mute alarms permanently (if pressing > 3 seconds)

**Example: “Membrane Change”**

Operate the menu of the SDM as follows:

**Note:** The menu “Membrane Change” can only be accessed if the sensor is neither in the Docking Station nor on the patient.

1. Select the menu “Membrane Change”, by pressing three times.
2. Activate the selection by pressing .
3. Select the menu item “Membrane Change Done” by pressing once.
4. Press to confirm that you have changed the sensor membrane.

**Note:** The membrane timer only resets to 28 days, if you confirm the membrane change.

**Note:** The ON/OFF switch is located on the rear of the SDM 24.
Measurements

The SDM displays the plethysmographic waveform, current values and trend graphs for SpO₂, PCO₂ and PR (see page 6). Furthermore it displays high and low alarm limits, alarms, alarm/status messages and status icons. Additionally the pulse can be monitored by a mutable audio-signal. Its automatic pitch modulation reflects changing SpO₂ levels.

Alarms

The SDM uses audible and visual alarm signals, to alert the user when a measurement value violates its alarm limits or to indicate conditions of the equipment that require user awareness. The following alarms can be distinguished:

High priority alarm:
2 sequences of 5 pulses of high pitch, repeated every 10 seconds. An immediate action of the personnel is necessary: SpO₂, PCO₂ or PR values violate the alarm limits.

Low priority alarm:
1 single pulse of low pitch, repeated every 10 seconds. Verify the monitor and/or the application of the sensor at the earlobe.

Note: During the PCO₂ stabilization phase, both visual and audible PCO₂ alarm signals are inhibited and the numeric PCO₂ value is displayed in gray (status message: “PCO₂ stabilizing”).

By pressing the alarm mute button, audible alarm signals can be muted for 1 or 2 minutes (depending on menu setting) or permanently (if pressing > 3 seconds).

WARNING: The function “Nurse Call” is inactive when alarms are muted.

Visual Indicators

Alarm Mute Indicator
- yellow: audible alarms muted for 1 or 2 minutes
- flashes yellow: audible alarms permanently muted
- LED off: audible alarms active

ON/OFF Indicator
- green: SDM turned on
- LED off: SDM turned off

AC Power/Battery Indicator
- green: connected to AC power, battery fully charged
- yellow: connected to AC power, battery charging
- LED off: not connected to AC power

Status icons in the status bar provide information on (from left to right): remaining site time, battery charge, sensor temperature, barometric pressure, gas bottle level.
Maintenance of the SDM

To guarantee continuous performance and reliability, basic maintenance procedures and checks have to be performed regularly.

⚠️ **WARNING:** Before cleaning the monitor, always switch it off and disconnect it from AC power.

⚠️ **CAUTION:** Plugs and connectors have to be kept clean and dry at all times. Do not expose the SDM to heavy moisture and do not allow any fluids to enter the SDM.

⚠️ **CAUTION:** Do not use other cleaning agents than those recommended here. Otherwise the SDM could be damaged permanently.

⚠️ **CAUTION:** Do not sterilize any parts of the SDM by irradiation, steam or ethylene oxide.

### Routine checks

The following checks should be performed regularly:

- Monthly check the SDM for mechanical and functional damages.
- Monthly check the power cord and the Digital Monitor Extension Cable for mechanical or functional damages. Defective cables must be replaced by original replacement parts.
- Monthly check the barometer (8.0 h 6.4 h 3.2 h 4.8 h 1.6 h 0.0 h 1.0 h 7.5 h 10.0 h 5.0 h 2.5 h 4.2 h) of the SDM against a known calibrated barometer.
- Weekly clean the Docking Station gasket using a cotton swab (Q-Tip) with 70% isopropanol.
- Monthly inspect the Docking Station door and gasket for mechanical damages.

Refer to the technical manual of the monitor and the directions for use of the sensor for additional/complete check lists and maintenance procedures.

**Note:** Please check the disposables monthly. Replace expired products!

### Cleaning and disinfection

The directions for cleaning and disinfection vary from hospital to hospital. In case of doubt consult your hygiene department. SenTec recommends the following agents:

- **surface cleaning:** water, mild non-abrasive cleaning agent or if needed KLENZYME (Steris)
- **disinfection:** 70% isopropanol e.g. WEBCOL Pads (Kendall) or CIDEX OPA (Johnson and Johnson)

Refer to the instructions for use of the respective manufacturer for preparation, application and disposal of the cleaning agents.

### Service

The SDM must be controlled annually by SenTec authorized service personnel. If service is necessary contact SenTec authorized service personnel or your local SenTec representative.

⚠️ **WARNING:** The cover should be removed only by SenTec authorized service personnel. There are no user-serviceable parts inside the SDM.