BodyCap

ANIPILL® SYSTEM
USER GUIDE

Telemetry System for measuring and storing intracorporeal temperature

Aniview® Monitor

Activator

Anipill® Capsules

Read carefully the following instructions before use

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To our customers, thank you for purchasing the ANIPILL® system comprising an Activator and Aniview® monitor manufactured by BodyCap and used for the activation and reception of data from Anipill® capsule capsules. This guide is designed to introduce you to the features and operation of your system, to assist you in installing and using this product. The use of this device does not require any training or any special skills (see § 8); however, please read carefully this manual and keep it handy for reference whenever you need it.

Use and destination:
The ANIPILL® system is provided for ongoing measurement of the intracorporeal temperature of 1-16 animals in parallel. The Anipill® capsule is either ingested or injected (subcutaneous, intraperitoneal ...). The capsule is supplied sterile in its original packaging and for a single use. Then it is set up with the Activator associated with the Aniview® monitor that records and delivers data to a PC via a system interface delivered with the ANIPILL® system.

1   Precautions of use

The following safety precautions will ensure the proper functioning and increase the autonomy of ANIPILL® system. Follow them carefully. If you have, questions and you have not found the answers in this manual, request assistance from BodyCap via:
- FAQ http://www.animals-monitoring.com/;
- +33 (0)2.61.53.08.14
- support@animals-monitoring.com

Do not place or drop objects on the device, do not introduce foreign objects.

Do not expose the ANIPILL® system to dust or dirt.

Do not use during a gas leak.

Do not expose the device to strong magnetic or electrical fields.

Do not touch or press the screen of the Aniview® monitor.

Do not place the Aniview® monitor or the Activator amid small items that may scratch or penetrate the devices.

Do not expose Aniview® monitor or Activator to rain or moisture, keep them away from liquids.

To reduce the risk of fire, electric shock, and interference, use only micro-USB-USB cables and the adapter supplied with the device.

Do not use a damaged micro-USB-USB cable or a damaged AC adapter.

It is highly recommended to pay attention to the location of the cables, so they do not block the way and do not represent a risk of falling.

Do not shake or cause impact to the Aniview® monitor and the Activator. This may affect their normal operation.

Do not use the capsule if the packaging is damaged

Do not use the device if it is damaged

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Safety warnings:

DO NOT DISPOSE IN FIRE
DO NOT BYPASS
DO NOT DISSAMBLE

Do not dispose of the device with domestic waste. The Aniview® monitor and Activator have been designed to enable the reuse and recycling of their parts. The symbol of the crossed-out dustbin indicates that the product (electricals, electronics and batteries) should not be disposed of with unsorted household waste. Check local regulations for disposal of electronics.

Temperature, humidity and atmospheric pressure during operation

- The Aniview® monitor should be used in an environment where the humidity is between 30 and 80% of relative humidity, in an environment where the atmospheric pressure is between 800hPa and 1060hPa and under conditions of ambient temperature between 0 and 40 ° C. It is also recommended to avoid spraying water.

- The Activator should be used in an environment where the humidity is between 30 and 80% of relative humidity, in an environment where the atmospheric pressure is between 800hPa and 1060hPa and under conditions of ambient temperature between 0 and 40 ° C. It is also recommended to avoid spraying water.

- The cables should be used in an environment where the humidity is between 30 and 80% of relative humidity, in an environment where the atmospheric pressure is between 800hPa and 1060hPa and under conditions of ambient temperature between 0 and 40 ° C. It is also recommended to avoid spraying water.

- The Anipill® capsule should not be exposed to temperatures outside of the 0 - 50 ° C range.

Storage lenght and conditions

- The Aniview® monitor should be used in an environment where the humidity is between 30 and 80% of relative humidity, in an environment where the atmospheric pressure is between 800hPa and 1060hPa and under conditions of ambient temperature between 0 and 40 ° C. It is also recommended to avoid spraying water and sulight exposure.

- The Activator should be used in an environment where the humidity is between 30 and 80% of relative humidity, in an environment where the atmospheric pressure is between 800hPa and 1060hPa and under conditions of ambient temperature between 0 and 40 ° C. It is also recommended to avoid spraying water and sulight exposure.

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- The cables monitor should be used in an environment where the humidity is between 30 and 80% of relative humidity, in an environment where the atmospheric pressure is between 800hPa and 1060hPa and under conditions of ambient temperature between 0 and 40 ° C. It is also recommended to avoid spraying water and sunlight exposure.

- During the whole period preceding the use of the Anipill® capsule, it should be used in an environment where the humidity is between 30 and 80% of relative humidity, in an environment where the atmospheric pressure is between 800hPa and 1060hPa and under conditions of ambient temperature between 0 and 40 ° C. It is also recommended to avoid spraying water and sunlight exposure.
Storage at lower or higher temperatures may alter the performances and the autonomy (on operating time) of the capsules.
- The duration of storage on shelves of the Anipill® capsule capsule is indicated by an expiration date printed on its blister. Beyond that date, the device performance and autonomy are no longer guaranteed

Table 1 Operating principle

No.	Operating principle
1.	The Anipill® capsule is activated by an electromagnetic pulse emitted by the Activator
2.	The Anipill® capsule measures the temperature with a thermistor
3.	The Anipill® capsule stores the 2000 last collected data
4.	The communication between the Anipill® capsule and the Aniview® monitor is via a proprietary protocol with a radiofrequency in the 433MHz band
5.	The Aniview® monitor receives and stores data
6.	Downloading data from the monitor to the PC software
7.	Visualizing data on the PC software and data preprocessing

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2   First use

2.1   PC software Installation

Installation on the PC

Minimum System Requirements: 1GHz processor. 500MB of RAM. 200MB of disk space required for installation. Windows® 7 or higher Microsoft® operating systems. Compatible (32 or 64 bit). The screen resolution must be at least 1024x768.

To install the ANIPILL® PC software and the monitor drivers, please run the installer "Anipill_setup" present on the USB memory stick supplied with your ANIPILL® system and follow the instructions step by step. When installing the software, you should read and accept the license agreement.

Figure 1: Bodycap's USB memory stick

Create the Administrator Account

For the first use, it is necessary to create an administrator account. The latter will create and manage the user's accounts.

When starting the ANIPILL® PC software, please enter the administrator name and password.

Figure 2 : Window of the creation of the administrator account

The administrator name cannot be the same as the user name. (Avoid your name if you intend to use the ANIPILL® PC software)

The administrator name and password must be stored because it is necessary to manage the user accounts.

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The unique function of the administrator account is to manage the different user's accounts.

Create a user account

In order to have access to different functions of the ANIPILL® PC software, each user must create a user account. This operation can be achieved only by using the administrator account.

Figure 3 : Create a user account window

Visit the startup window of the ANIPILL® PC software, enter the name of the administrator in the "Account Name" field and the password of the administrator in the "Password" field and click on "Create account". A window opens; you just have to complete the common fields to create a user account.

Then, to log in with your user account when you start the ANIPILL® PC software enter the "Username" and the "Password" in the fields on the startup window and then click on the "Submit" button.

The user account allows visualizing and working on your own data. It is protected by a password specific to each user. If a user loses his password, the administrator has the ability to change the lost password.

2.2   Device set up

Switch on the monitor

To switch on the monitor, simply plug it into the mains socket or into a PC turned on with the cable and AC adapter provided by the manufacturer. To use the Aniview® monitor with the PC software, you must install the PC software and the Bodycap drivers (provided on the Bodycap USB memory stick). Once the installation is completed, the monitor and the PC software can communicate via a mode called "remote mode" on the monitor. To enable the passage of the monitor to the "Remote Mode", connect the monitor to a USB port on the PC (turned on), and press the OK button on the monitor when the "remote mode" is proposed.

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Charging the batteries

If you want to use the Aniview® monitor using its battery power, make sure that you have fully recharged the battery pack. The micro USB-USB cable allows to charge the battery pack of the Aniview® monitor when it is connected to a power source (mains power supply or via the turned on PC).

⚠ **To charge the system make sure that the monitor screen is turned off.**

Synchronize date and time of the monitor

During the first use or when the Aniview® monitor is discharged, it is necessary to set time. Please refer to § 6.2.1 of this manual.

Choose a channel

During the first use or when the Aniview® monitor is completely discharged, it is necessary, after recharging the battery pack, to set desired operating channel of the Aniview® monitor. Please refer to § 5.9.9 of this manual.

⚠ The channel must not be the same as those of the other monitors in the testing environment.

Monitor default configuration:

Chosen channel: 3
Sampling frequency of capsules communication: 30 s
Number of associated capsules: 0
Time and Date: 13-02-2014

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3   The Anipill® capsule

Figure 4 : Anipill® capsule

Figure 5 : Anipill® capsule label

The Anipill® capsule is designed to be ingested or implanted in order to measure the temperature.

3.1   Important information and safety instructions

The capsule is an applied part of the BF type.

The battery
The Anipill® capsule capsule contains 4 cells (zinc oxide - silver). In fact, the capsules should not be disposed of with household waste.

Cleaning
The capsule is supplied sterile (sterilization with ethylene oxide) and must be activated through the blister to maintain its sterile condition. It is not designed to be cleaned with a hydroalcoholic solution or re-sterilized.
The system shall, in no case be introduced in an autoclave, at the risk of permanent damage of the concerned capsules.

The label
The label contains the following symbols of the standard NF EN 980: 2008:

   « Do not re-use »

   « Use until »

   « Code of the batch »

   « Ethylene oxide method of sterilization »

   « Reference of the catalogue »

   « Manufacturer »

   « Limit of storage temperature »

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« Store in a dry place»

« Do not resterilize»

« Do not use if the packaging is damaged»

The label contains a symbol of the IEC 60601-1 Ed.3 :

« Follow the instructions of use »

« BF type applied part »

In addition, the label contains the following:

« Do not open until ready to use»
« This is not a medicinal product»

« Silver-zinc battery in the capsule »

Do not dispose of the ANIPILL® device with household waste; see § 1.

$C\mkern-2mu\epsilon$ CE Marking

3.2 Features

Dimensions:
Length: 17.7 mm
Diameter: 8.9 mm
Weight: 1.7 g ≈
Temperature range when operating: 0 ° C - 50 ° C
Accuracy: ± 0.1 ° C for XX-XX.1 lots or ± 0.2 ° C for XX-XX.2 lots in the 25-45 ° C range**;**
Sampling frequency : 30 s, 2 min, 5 min or 15 min.

Data storage in the capsule:
The last 2000 temperature values are stored in the capsule unless the temperature is below 25 ° C.

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Maximum distance transmission with Monitor:
3 m (depending on environment: metal cage, humidity ...)

Power: autonomous system containing rechargeable zinc oxide-silver

Battery Life:
Depends on the sampling frequency (1 to 12 months) (see Figure 6: Autonomy of the capsule depends on the sampling frequency. This estimated range is valid only when the RF communication is continuous.)

Monitoring frequency: ISM 433MHz - 434MHz

Figure 6 : Battery life of the capsule depends on the sampling frequency. This estimated range is valid only when the RF communication is continuous.

Plastic: Biocompatible PVC

Storage life: Refer to expiry date on the blister

Warning: eletromedical modification of the device are forbidden

For temperatures below 25 ° C, the capsule sends the measurement values by RF but does not save them. In case there is no direct communication with the Aniview® monitor the information will be lost.

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4   The Activator

Figure 8 : Activator

Figure 7 : Activator (label)

The activator is designed to activate a capsule before a measurement cycle.

4.1   Important information and safety instructions

Battery
The system does not include a battery. Each time you use the Activator the power supply unit carries power from the mains outlet or from a turned on PC. The connection between the Acrivator and the sector and / or the computer should be done using only the cables and the power supply unit provided by the manufacturer.

Cleaning
To function, some applications need the Activator to be clean. This is possible but by following some instructions. It is possible to clean your Activator with a damp cloth or a wipe to control the humidity. Nevertheless, it is important to pay attention to the external connectors because they are most sensitive to moisture. The system must not be introduced in an autoclave, at the risk of permanent damage

Maintenance
It is strictly forbidden to open the Activator. If a failure or a malfunction is noticed, please contact the manufacturer (Information detailed at the end of the user guide).

The label
The label contains the following symbols of the standard NF EN 980: 2008:

LOT   « Code of the batch »

REF   « Reference of the catalogue »

                « Manufacturer »

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	« Limit of storage temperature »
	« Store in a dry place»
	«Protect from exposure to strong light or heat »
	« Date of manufacture »

The label contains a symbol of the IEC 60601-1 Ed.3:

     « Follow the instructions of use »

In addition, the label contains the following:

     Do not dispose of the ANIPILL$^{®}$ device with household waste; see § 1.

     CE Marking

4.2   Features

Figure 9 : Description of the Activator

Dimensions:
Length: 690 mm
Width: 590 mm
Height: 310 mm
Weight: 62 g ≈

Power supply: AC power (100 ~ 240 V) or PC via USB (5V)
Electricity consumption: 115 mW ~ only connected (Non operating) and 500mW during activation (during 2s)
Electromagnetic transmission: no transmission - issuing a series of electromagnetic pulses
Lifespan: 2 years
Warning: eletromedical modification of the device are forbidden

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4.3 Button

OK button

The OK button is used to start the activation process.
The activation procedure is detailed in the § 5.9.1

4.4 LED

A green signal LED is positioned on the upper face of the Activator. This LED is continuously lit when the Activator is powered and flashes throughout the activation process. When the signal lamp flashes, the activation process is ongoing during this period, do not move the capsule placed in the Activator's hole.

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5 The Aniview® monitor

Figure 11 : Aniview® monitor

Figure 10 : Label of the Aniview® monitor

The monitor is designed to communicate with capsule by RF to collect temperature data.

5.1 Important information and safety instructions

Battery

The Aniview® monitor includes a Lithium-ion battery.
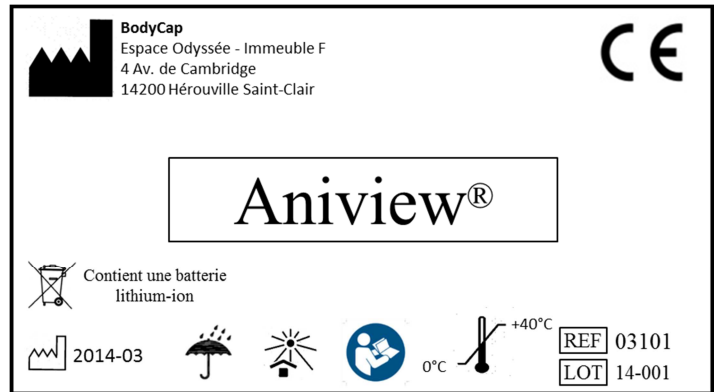The monitor shall in no case be disassembled; the battery must not be disconnected or thrown into fire. To recharge the monitor, please use the cable and the AC adapter provided by the manufacturer.

Cleaning

To function, some applications need the Aniview® to be clean. This is possible but by following some instructions. It is possible to clean your Aniview® with a damp cloth or a wipe to control the humidity. Nevertheless, it is important to pay attention to the external connectors because they are most sensitive to moisture. The system must not be introduced in an autoclave, at the risk of permanent damage

Maintenance

It is strictly forbidden to open the Aniview®. If a failure or a malfunction is noticed, please contact the manufacturer (Information detailed at the end of the user guide).

RF communication

It is certainly not advisable to place the monitor on a table or any other metal surface that would have the effect of reducing the performance of the RF emission. It is also recommended to be vigilant in environments with high metal composition (cages, reinforced concrete walls ...) and regularly check on the monitor screen if the communication with the capsule is not hindered. In the viewing menu (View Data), the date of the last collected data (Last data) must not exceed 2000 times the sampling frequency. However, it is recommended not to approach the limit of 2000 database at the risk of losing definitely a part of the collected data (the automatic synchronization capsule / monitor can take time, from several minutes to several hours depending on the number of data to recover and on the

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sampling frequency). Indeed, all metal parts generate reflections and reduce the scope of RF communication.

The label
The label contains the following symbols of the standard NF EN 980: 2008:

| LOT | « Code of the batch » |

| REF | « Reference of the catalogue » |

« Manufacturer »

« Limit of storage temperature »

« Store in a dry place»

«Protect from exposure to strong light or heat »

« Date of manufacture »

The label contains a symbol of the IEC 60601-1 Ed.3:

« Follow the instructions of use »

In addition, the label contains the following:

«Contains a lithium-ion battery»

Do not dispose of the ANIPILL® device with household waste; see § 1.

$C\epsilon$ CE Marking

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5.2   Description of the hardware

Signal lamps - LEDs

1

4

5

USB
Connector

TFT screen

3

6

5.3   Features

Dimensions:
  Length: 120 mm
  Width: 70 mm
  Thickness: 15 mm
  Weight: ≈ 120 g

TFT Screen: 320 x 240 pixels

Temperature of use: 0 to +40 ° C

Data storage : 43,690 measurements per activated capsule

IT interface : micro-USB B female port

Power supply : Lithium-ion rechargeable battery via an AC adapter (100 ~ 240 V) and a micro-USB - USB cable provided with the system. To recharge the system via USB to a PC, install the ANIPILL® PC Software following the procedure described in this manual.

Charging time: 3 hours

Autonomy: 24 hours, beyond which the association with the capsules could be lost

Frequency of communication: ISM 433MHz ~ 434MHz

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Lifespan: 2 years (or about 1000 charge cycles)

Warning: eletromedical modification of the device are forbidden

5.4 Buttons

The monitor has 6 buttons, their functions are described below; 5 are placed around the screen and the last one on the right side:

The OK button (ref. 1 Figure 12: Description of the Aniview® monitor)

The OK button is used to validate the information and to enter the menus.

The MENU button (ref. 2 Figure 12: Description of the Aniview® monitor)

The MENU button is used to return to the Main Menu.

The BACK button (ref. 3 Figure 12: Description Aniview® monitor)

The BACK button is used to return to the previous submenu.

The up arrow button (ref. 4 Figure 12: Description Aniview® monitor)

This button allows you to browse the menus.

The down arrow button (ref. 5 Figure 12: Description Aniview® monitor)

This button is used to browse the menus.

The Off button - is used to reactivate the screen (ref. 6 Figure 12: Description Aniview® monitor)

The Display button is used to turn on or to turn off the screen.

5.5 Signal lamps - LEDs

A yellow LED light and a red LED light are positioned on the front of the monitor; in the upper right corner.
When the red LED light flashes, it indicates that the battery level of the monitor is low; the monitor must be connected to a power source. When the yellow LED light is lit, it means that the monitor is plugged into a power source.

5.6 The battery of the Aniview® monitor

Information
When not connected to AC power, the monitor operates from a rechargeable Lithium-ion battery.
It is categorically prohibited to disassemble the monitor or to replace the battery at the risk of irreparable damages to the system and security failures.

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Charging Cycle

To recharge the battery, simply connect the power supply of the monitor to mains outlet and **turn off the screen**. Only few hours are necessary to charge the battery. The autonomy of the monitor when operting on a battery is about 24h without recharging.

⚠️ **Please do not forget to charge the monitor before the end of the 24 hours otherwise; you will lose the association with all the operating capsules. In this case, only the procedure of data recovery capsules described in § 6.2.9 will allow you to recover the data from the disassociated capsules and to re-associate the capsules again.**

In order to limit the risk of disassociation between the capsules and the monitor, the latter goes automatically into a power saving configuration (display off and cut the RF communication with the capsules) before the total loss of battery. The management of the LED lights and the functions change depending on the battery level (see table below).

Tableau 2 : Battery level

Battery level	LED light	Functions
Normal	X	Normal operating mode
Low	LED light flashes orange	Normal operating mode
Critical	LED flashes orange	The screen is not available The RF communication is cut

It is highly recommended, especially in case of an extended use of the material, to leave the monitor plugged into an external power source for the entire duration of the operation.

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5.7 Connections

Female Micro USB B port

This port is located on the left side of the monitor. It is possible to use the micro-USB port to connect the monitor to the mains outlet via the cable and adapter provided by the manufacturer or directly to a PC. This connection to a computer allows :

(i)   (i) to visualize in real time the results of measurements or

(ii)   (ii) to download the stored data on the ANIPILL® software and charge the battery of the monitor.

5.8 Aniview® monitor menus

Generic screen

Figure 13 : Aniview® monitor's screen with information

Whatever the level of the menu where the user is located, the screen of the monitor allows you to view the following information:

- The date (ex: 02/13/2014)
- Time (ex: 15:07)
- The monitor's battery level(eg top right of the screen)
- The channel on which the monitor works (eg Channel 3)
- The software version of the monitor (eg Version 1.0)
- The number of capsules that are associated with the monitor (eg 3 Asso)

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Monitor's main menu structure

Figure 14 : Aniview® monitor main menu

To validate a menu and go to a sub-menu, press "OK" (§ 5.4).
To go back, press "Back" (§ 5.4).
To return to the main menu, press "Menu" (§ 5.4).
To navigate between the items of the use the up-down buttons (§ 5.4).

The CAPSULE menu

The CAPSULE menu (Fig. 15) includes the various control functions of the capsules.

Figure 15 : CAPSULE menu of the Aniview® monitor

Activate capsule: start the activation process of the capsule.
Measurement parameters: changes the sampling rate of the capsule
Shutdown capsule: Turns off an operating capsule.

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The MONITOR menu

The MONITOR menu is used to manage the configuration of the monitor (Fig. 16).
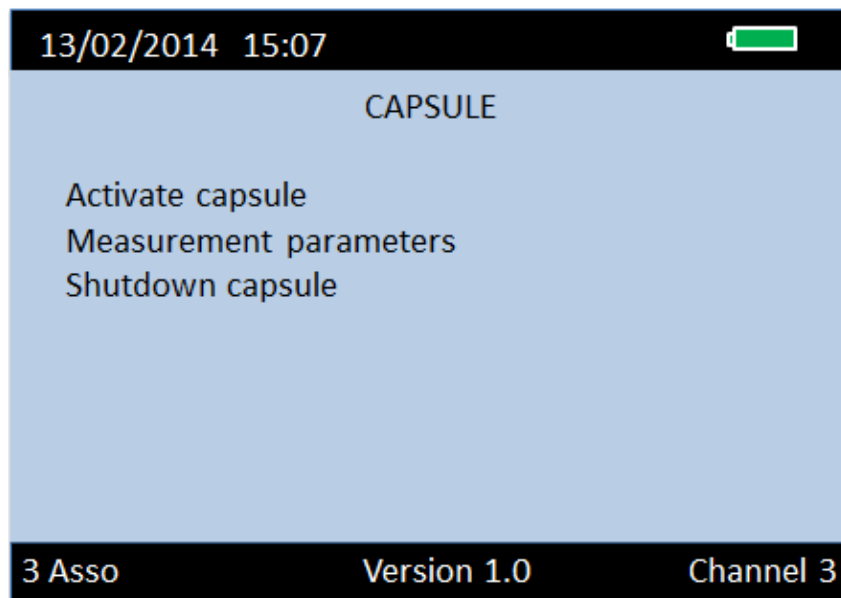

13/02/2014 15:07

MONITOR

Channel use

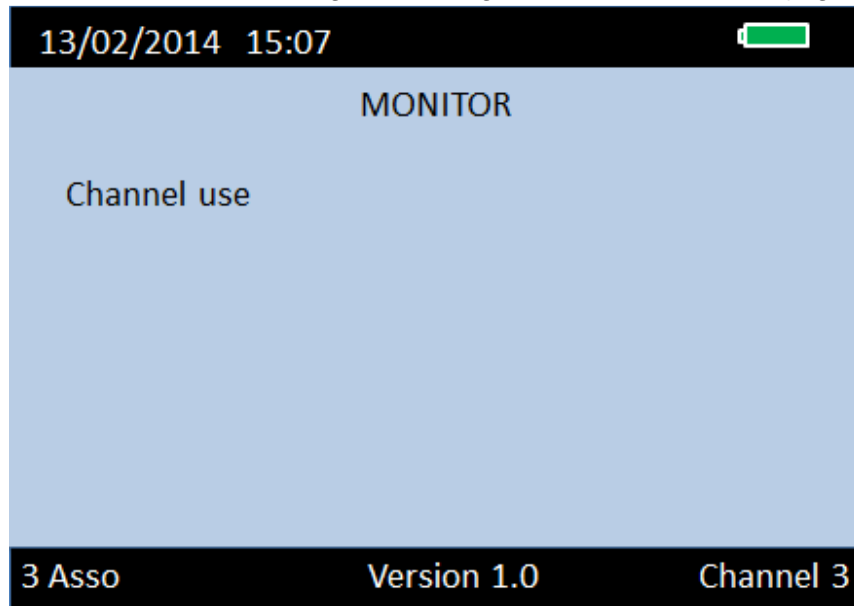3 Asso   Version 1.0   Channel 3

Figure 16 : MONITOR menu of the Aniview® monitor

<u>Channel use</u>: Allows you to set the channel on which the monitor works.

The DATA menu

The DATA menu is used to view or delete temperature data recorded on the monitor, this menu allows also to update the display of the minima and of the maxima (Fig. 17).

13/02/2014 15:07

DATA

View data
Erase data
Reset Min/Max

3 Asso   Version 1.0   Channel 3

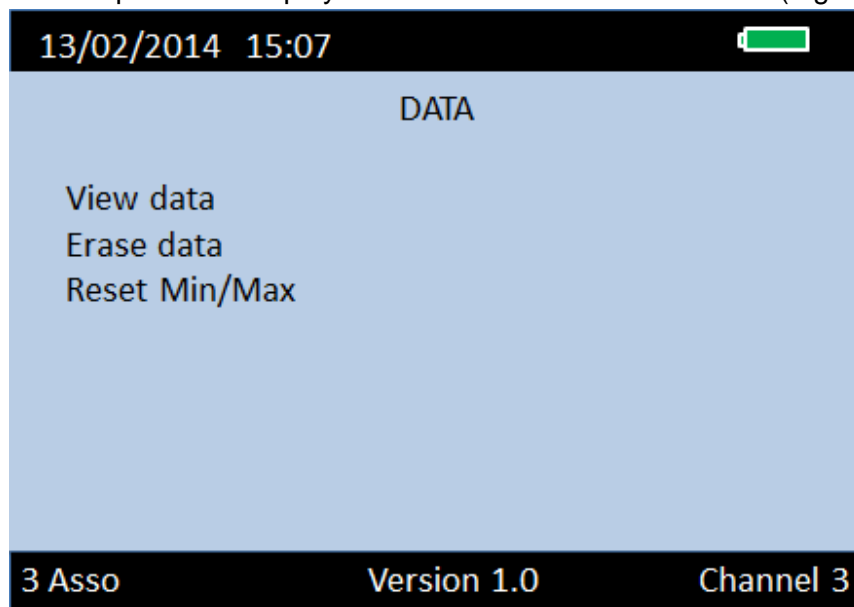**Figure 17 : DATA menu of the Aniview® monitor**

<u>View Data</u>: You can see the latest data collected as well as the minimum and maximum values collected by each associated capsule. It also allows you to view the battery status of the associated sensors (OK - Low battery). Refer to § 5.9.5 of this guide.

<u>Erase Data</u>: Deletes the data of one or of all the capsules stored in the monitor.

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This operation is not reversible; deleted data from the monitor that are not downloaded to the ANIPILL® Software are permanently lost. If a capsule is "In use" this function will erase all information about the association of the capsules. The "Erase Data" function should only be used in cases of:

• removing from the monitor base data a turned off capsule or,

• removing the data of a capsule which does no more communicate with the monitor after the capsule full discharge. Indeed, it is not possible to turn off this capsule, its allocated location in the monitor remains blocked as long as capsule remains associated. Refer to § 5.9.8 of this guide.

Reset Min/Max: allows you to reset the minimum and maximum viewable data in View Data table. Refer to § 5.9.6 of this guide.

5.9   Main functions

5.9.1 Activate a capsule

Note:

Before activating an Anipill® capsule capsule, check the operating channel of the monitor, the date and the time. (Refer to § 5.9.9 and § 6.2.1). **You cannot modify these two parameters after the activation of the capsule.**

To activate an Anipill® capsule capsule, please go to "CAPSULE" menu and then go to "Activate Capsule" submenu of the Aniview® monitor (Fig. 18).
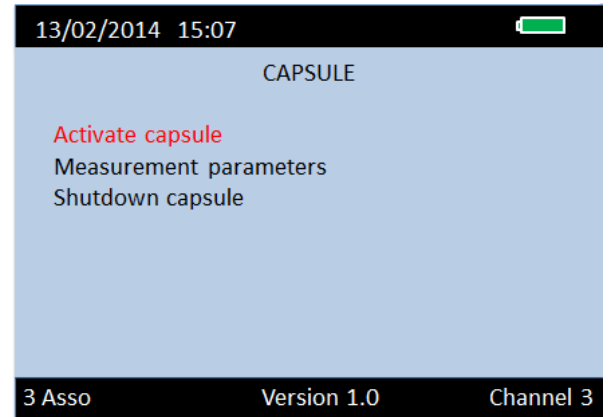

Figure 18 : Activate Capsule Menu

After validating the "Activate Capsule" command, dialog boxes will guide you throughout the activation process. First, the message "Supply activator" appears on the monitor screen; after connecting the activator and placing it in close to the monitor (<1m) , press the OK button. Then the message "Put capsule into the hole of the activator, colored part down" appears. The capsule to activate must be placed in the dedicated hole of the activator, white end facing up. In order to preserve the sterility of the capsule, this must be done preserving the blister pack. To activate a capsule through the blister, keep pressing the capsule while activating. Then press OK on the monitor.

Finally, the message «Processing… press the button on the activator» appears. Then you have to press briefly on the OK button of the Activator (§4.3).

Once the Activator button is powered, a green LED light located on the Activator will flash; then leave the capsule in place and wait until you see the message "Complete! Index: XX ID: XX.XX.XX.XX "on the monitor screen. It is recommended to **note these numbers**; they can be useful for data exploitation.

Then, the capsule is activated and associated with the monitor. Press OK to confirm the message and to return to the CAPSULE MENU.

The monitor then gives a capsule number between 1 and 16. It will allow you to view the data on the monitor while recording. By default, the assigned number will always be the smallest available between 1 and 16 (available means that there is no associated capsule or remained data stored on this number by the monitor).

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⚠ If the LED light of the Activator stops flashing and the message "Complete - Index: XX ID: XX.XX.XX.XX" does not appear on the monitor screen, please check the correct positioning of the Anipill® capsule in the Activator and / or move slightly the Anipill® capsule and re-press on the Activator button.

To activate another capsule, repeat the procedure. It is possible to associate up to 16 capsules in parallel with a single monitor.

⚠ In order to maintain the sterile condition of the capsule, the latter should be activated and released of its blister before ingestion or implantation as late as possible. The capsule should be handled with clean hands or gloved hands.

5.9.2 Change the parameters of an operating capsule

It is possible to change the sampling frequency of the capsules associated with the monitor during recording. To do so, go to the "CAPSULE" menu and then to the "Measurement parameters" submenu (Fig. 19).
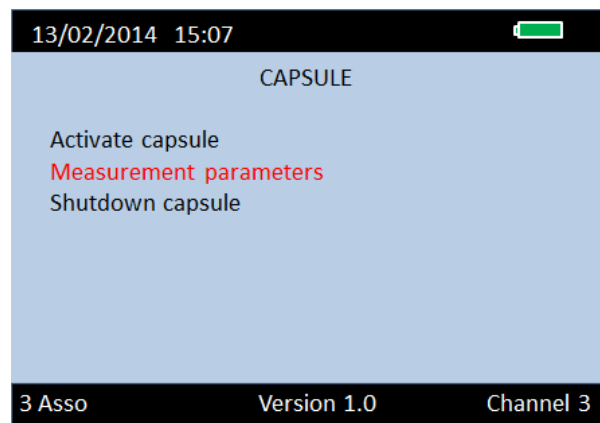

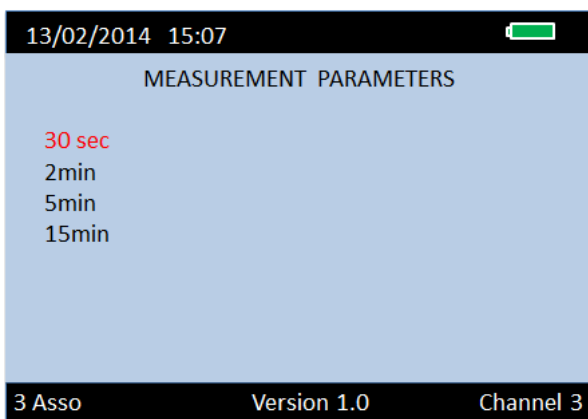Figure 19 : Aniview® monitor CAPSULE menu

Figure 20 : Menu to change the sampling and communication frequency of the capsules

Then select the sampling rate and press OK (Fig.20).

This procedure changes the setting of all the capsules associated with the monitor. To be effective this procedure needs to be done while Anipill® capsules are close to the monitor.

The management of these parameters will allow you to use operating modes of lesser consumption and to increase the lifespan of the capsules. (Fig 6, § 3.2)

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5.9.3 View the temperature data in real-time

In order to see the collected temperature data, go to the DATA menu and then to «View data" submenu. A table will then allow you to view the latest collected temperature data for each operating capsule as well as the minimum and maximum values recorded for each capsule.
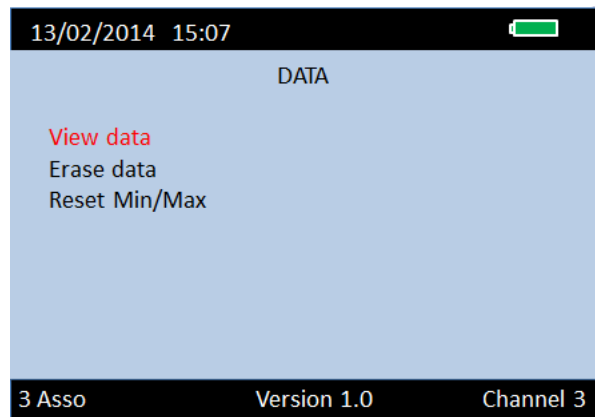

Figure 21 :View data menu

The last collected temperature data is as follows:

data (°C)
DD-MM-YY HH:MIN

Figure 22 : Visualization table of the temperature data

5.9.4 Synchronizing the data stored in the memory of the capsule

The capsule has an internal memory that automatically stores the last 2000 collected values. When the communication between a monitor and a capsule is broken, the monitor does not receive data. However, there is a feature in the monitor that allows you to recover all the missing data when communication is re-established. The monitor automatically synchronizes its data with the 2000 data in the memory of the capsule. A star indicating that the synchronization is in progress is displayed in the table (see Fig.22, the star is at the top left of

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the "last data" box). This synchronization can take a long time; it depends on the number of data to be recovered, the number of capsules associated with the monitor and the sampling frequency. It is preferable not to take away the monitor when capsules are being synchronized (the duration time can vary from several minutes to several hours).

⚠ During data synchronization, some values can be missing because the monitor prevails taking temperature on data recovery.
This functionality is automatic; it requires no action from the user and cannot be disabled. This operating mode can affect the lifespan of the capsule if it is used too often (make sure that the monitor remains close to the capsules).

⚠ Any data below 25 ° C cannot be recovered afterwards. Below 25 ° C the values are measured and sent by RF, but are not stored in the memory of the capsule and so cannot be synchronized with a monitor afterwards.

5.9.5 View the end of capsule's lifespan

When a capsule reaches the end of its lifespan, the message "Low" appears in the column Batt (Figure 22, column 5) of the data's visualization table (§ 5.9.3).
The capsule will stop about 500 steps after the appearance of the first "Low" message, regardless of the sampling frequency (if the monitor and the capsule are in continuous RF communication).

5.9.6 Min/Max values reset

In order to reset the Min / Max values shown in the visualization table data , go to the "DATA" menu (Fig. 23) and select the "Reset Min / Max" function.
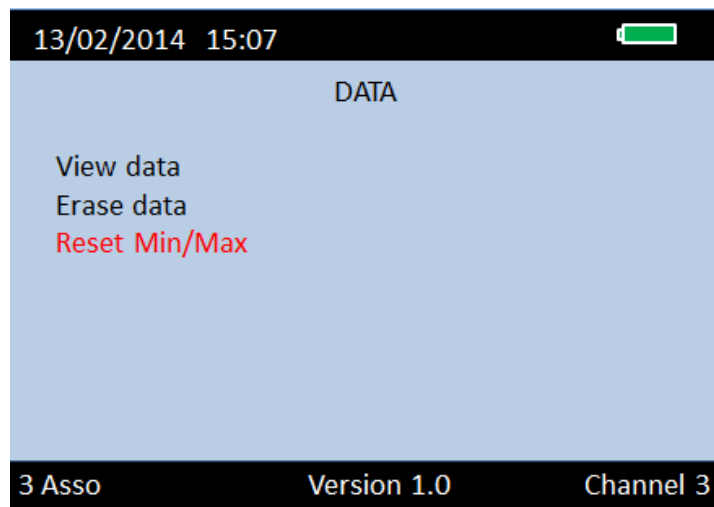This procedure involves all the capsules associated with the monitor.

Figure 23 : Min/Max reset menu of the Aniview® monitor

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5.9.7 Capsule shutdown

When you finished to use your capsule and you want to stop it, go to the "Capsule" menu (Fig. 24) of the monitor and then go to the "Shutdown capsule" submenu, select the capsule you want to stop and press OK.

To ensure the success of the procedure, the capsule must be connected to the monitor.
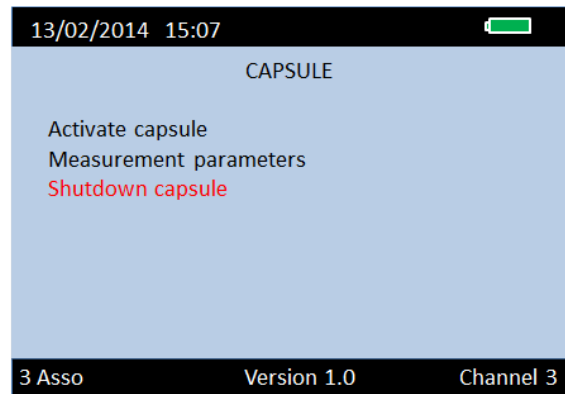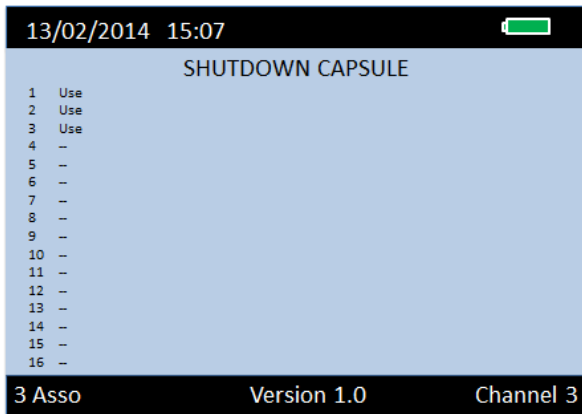

Figure 24 : Shutdown menu of the Aniview® monitor

This action is definitive, the capsule disappears from the monitor database; only an activation via the Activator according to the procedure described in § 5.9.1 may reactivate the capsule. The data file corresponding to the capsule is stored; the procedure to erase it, is described in § 5.9.8.

Figure 25: Shutdown a capsule

5.9.8 Erase the data stored on the monitor

To release a capsule Id number for the activation of a new capsule, it is necessary to delete the data stored on one of the memory locations. To do so, go to the «DATA" menu, then go to the "Erase Data" submenu. Then select the number of the capsules that you want to delete the data or select the "Delete all data" command, and press OK.
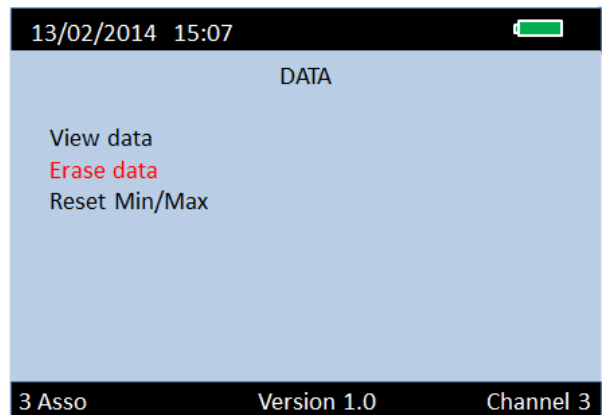

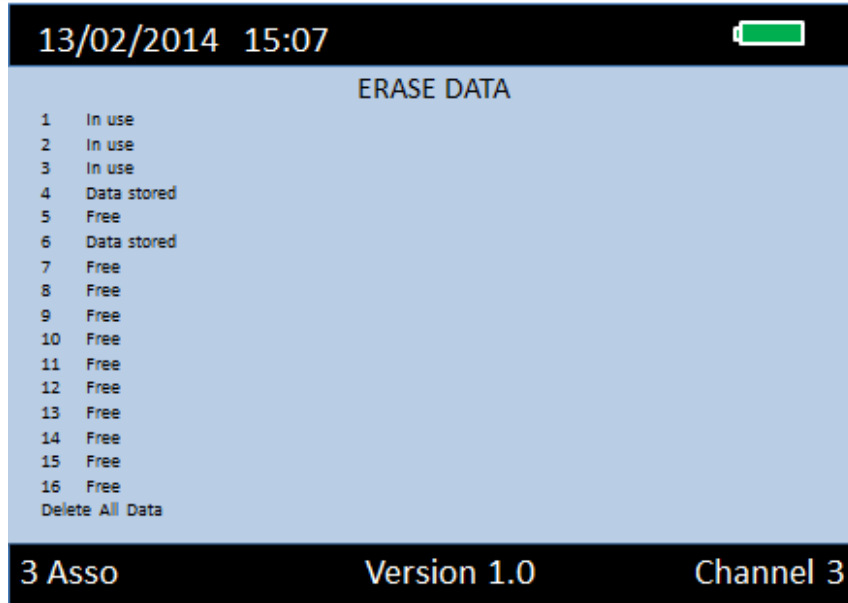**Figure 26: Aniview® monitor erase data menu**

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Figure 27 : Menu which allows you to erase the data stored on the Aniview® monitor

The 3 following steps are possible:

« Data stored » : The capsule data are stored on the monitor but the capsule is no longer associated with the monitor

« In use » : The capsule is associated with the monitor

« Free » : This capsule Id number is no longer used

⚠ This action is definitive; it will not be possible to recover the data anymore

⚠ The command « Delete all data » is available only if the capsule is " in use "

⚠ To delete the data of an "in use" capsule is not advisable. it causes a disassociation of the capsule with the monitor without shutting down the capsule. This mode should only be used to release the memory location of a capsule due to natural shutdown of the battery (low battery).

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5.9.9 Change the channel used by the monitor

7 monitors can operate in parallel in the same environment. This configuration is made possible by setting the operating RF channel of the monitor; setting the channel allows monitors not to interfere with each other.

To set the operating channel of the monitor, go to the "MONITOR" menu and then go to "Channel uses" submenu. Then select a channel different from those used by the monitors present in the same environment.

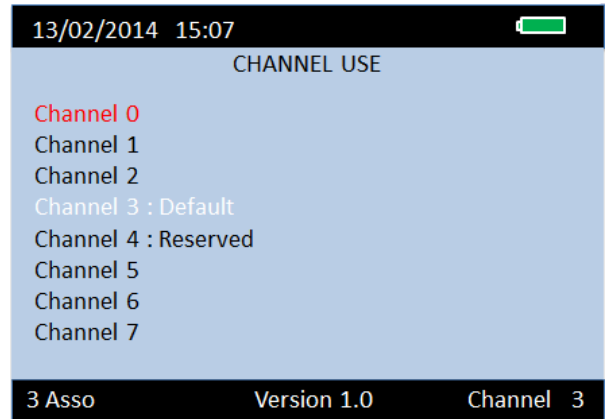Note: The channel 4 is already reserved. It is impossible to select it.

Figure 28 : Aniview® monitor menu to parameter the operating channels

This command is not possible when the capsules are still associated with the monitor. The following message appears on the monitor:
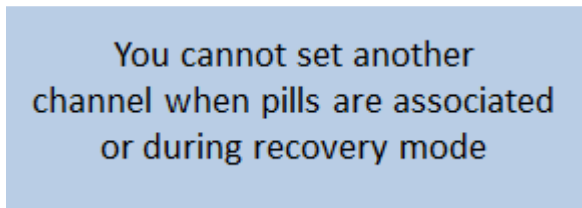

Figure 29 : Error message of the Aniview® monitor

Remember to write down the operating channel of each monitors; in case of breakage or failure, you will need this information for capsule's recovery process (§ 6.2.9).

5.10 Displayed messages of the Aniview® monitor

The following table presents the messages displayed by the monitor.

Table 3 : Monitor's messages

Displayed Messages	Cause/What happens
Switch to remote mode?	Monitor connected to a PC Process initiated by the PC software
USB control	Monitor interacting with the PC software
Supply activator	Step to associate a capsule
Put capsule into the hole of the activator, Colored part down.	Step to associate a capsule
Press the button on activator.	Step to associate a capsule
Activation failed Do you want to restart an activation?	Activation failed

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Complete! index : yy ID : xx.xx.xx.xx	Activation completed with the index number and with the capsule's serial number Note : Please retain those numbers
Activation impossible No free slot or free memory.	Activation impossible, there is no free slot (16 activated capsules or data still stored on the monitor) or no free memory available
Delete data from associated capsule. Warning: this action will remove the association between capsule and monitor without shutting down capsule. Do you really want to delete this association and to erase definitively the data?	Asks you to delete a capsule (otherwise the shutdown won't occur) Frees a memory location that was blocked by a capsule with a low batt (impossible to perform a normal shutdown)
Data deletion Do you really want to delete data?	Data deletion
Shutdown a capsule Do you really want to shutdown capsule?	Capsule shutdown request
Capsule will shut down.	Confirmation of the order of shutting down the capsule
You cannot set another channel when pills are associated or during recuperation mode.	Channel change request with operating pills or during recovery mode

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6 ANIPILL® Software

This software is designed for viewing the temperature data of a measurement cycle

6.1 Main screen

Figure 30 : Main screen of ANIPILL® software

Once the authentication procedure is done, the window that displays your data appears. It consists of :

- A graphics area (Fig. 30 a),
- A list of the displayed capsules on the graphics area (Fig 30 b),
- A list of all your saved experiments (Fig. 30 c)
- Buttons which display or hide the curves of the selected capsules (Fig. 30 d)
- The menu bar (Fig. 30 e).

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To use the Aniview® monitor with the ANIPILL® Software, you must install the software and the BodyCap drivers (provided in the BodyCap USB memory stick). Once the installation completed, the monitor and the software can be connected to each other via a method called "Remote Mode". To activate the "Remote Mode", connect the monitor to a USB port on a turned on PC, and press the OK button on the monitor when the remote mode is proposed.

6.2.1 Set up the time and the date of the monitor

If the date and the time displayed when switching on the monitor are not correct, you are asked to configure them.

These settings are configurable via the ANIPILL® software, when the monitor is connected via USB, to do so, go to the "Navigation" menu and then to the "Monitor" submenu - "Settings" - "Date-Time Synchronization." confirm the remote mode on the monitor by pressing the OK button on the monitor.
The date and the time of the monitor will synchronize with those of the PC.

⚠ **You cannot set time when Anipill® capsules are associated with the monitor**

6.2.2 Consult temperature data in real-time

It is possible to view the collected data temperature in real time via the ANIPILL® PC software.

To do so, first, check if the monitor is turned on and if it is already associated with the capsules. Connect the monitor with the USB cable to a PC. Then go to the "Browse" menu and then go to the "Monitor" submenu. Select the "Real Time" function. Confirm the remote mode on the monitor by pressing the OK button on the monitor.
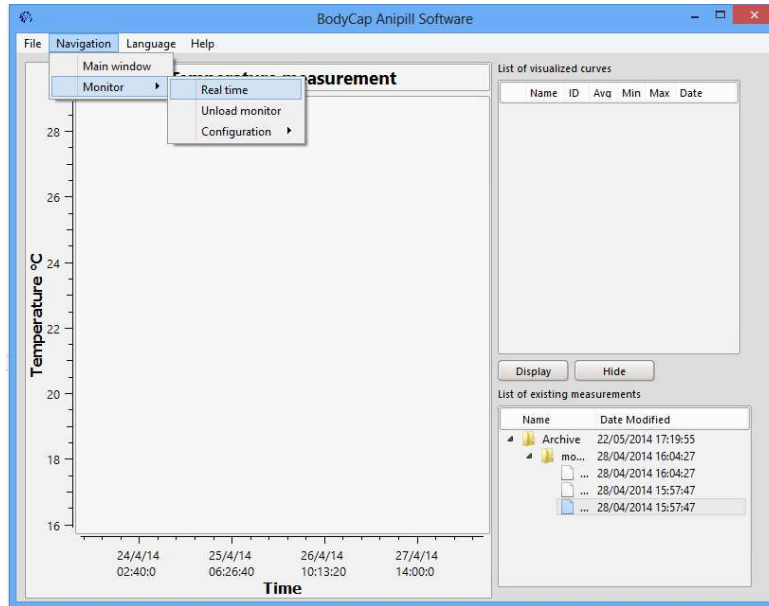
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Figure 31 : sofware to consult data in real-time

After putting the monitor in remote mode, press the "Start" button on the screen dedicated to real-time ANIPILL® PC software.

The transfer and the display of data are automatically done; you can then Hide and Show the data area of your choice on the chart.
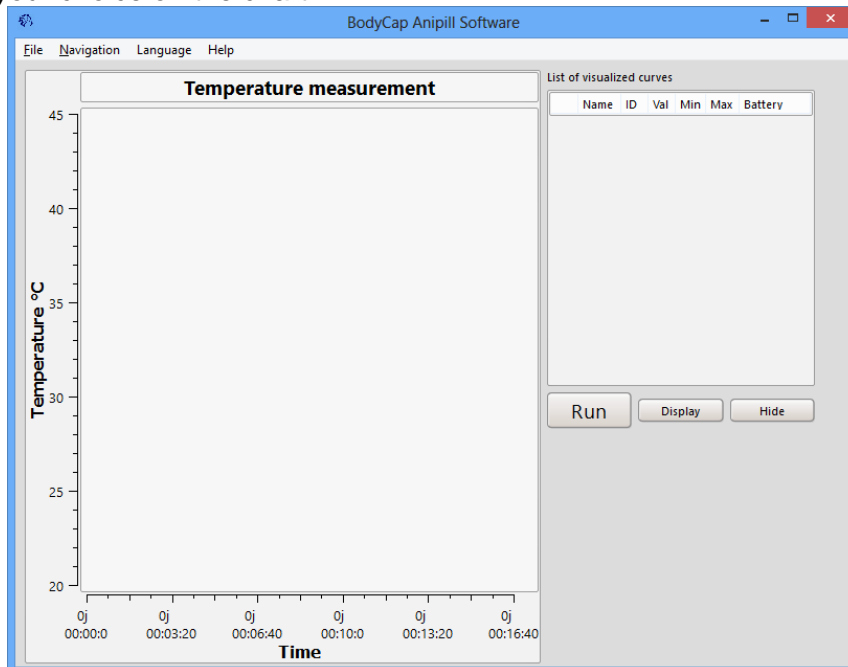

Figure 32 : Interface for real-time data visualization

When you no longer want to see a curve ("Hide" button) the data transfer of this capsule to the ANIPILL® PC software is stopped. If you re-display the hidden curve on the graphics area, the viewing will begin at the moment you restarted it (all previous data will disappear from the graphics area)

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Just to be clear concerning the graphics area, the simultaneous visualization in real-time of the collected data is limited to 8 capsules. The choice of curves to visualize, is done in the window in the upper right corner, entitled "List of added measures."

WARNING: The real-time visualization of data is not a data recording process (in the database of the PC software). It is therefore necessary to regularly download the data as described in § 6.2.3 otherwise you will lose the data stored in the monitor.
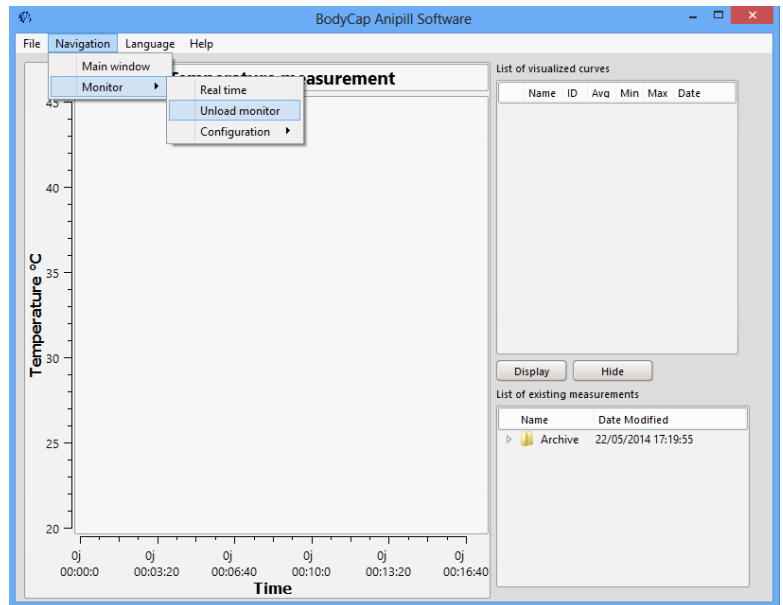
The Marker function described in § 6.2.7 is unavailable while using the real-time visualization.

6.2.3 Transferring and saving data

Data can be transfered during or after the saving proceedure.

To transfer and save the data on the monitor, please connect the activated monitor to a PC via the micro-USB-USB cable provided by the manufacturer. While on the ANIPILL® PC software, go to the "Navigation" menu and then to "Monitor". Go to the "Download Monitor" submenu and activate the "Remote Mode" on the monitor by pressing the OK button on it. A window opens (see Figure 34). All capsules whose indices are on the left are kept. Select the desired capsules.

Figure 33 : PC software data downloading menu

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Figure 34 : Select the capsules to download (menu)

Select the folder in which the data will be downloaded. All the downloaded capsules are put in the same folder. It must therefore be considered as an experimentation folder. Only alphanumeric characters, the sign "-" and uppercase and lowercase characters are accepted. Spaces are not accepted. Then the following dialog box should appear to allow you to create a new folder or select an existing folder by double clicking on the desired folder:

Figure 35 : Window to choose the folder for downloading and saving the data

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Figure 36 :Window that shows the progress of the downloading and the saving process

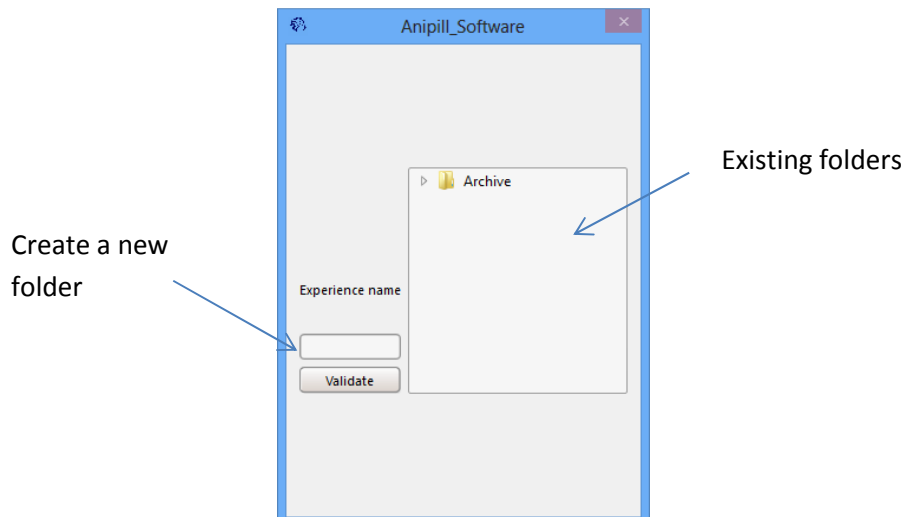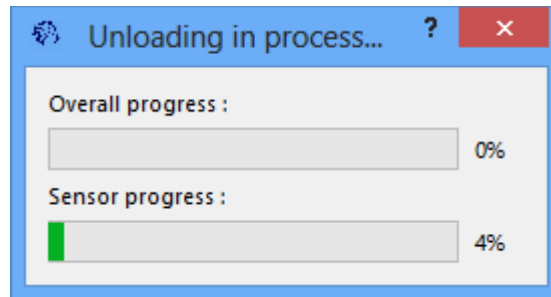A window indicates the progress of data downloading (Fig 36). The following message must appear at the end of the downloading process to tell you that the operation was successfully achieved.
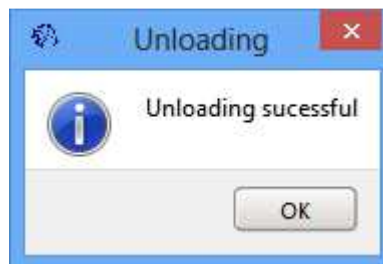

Figure 37 : Message that indicates that the data downloading has been achieved successfully

Regardless of the number of associated capsules with a monitor, it is recommended to download the monitor data every week when the sampling frequency is of 30 s and once a month when the sampling frequencies are slower.

Failure to respect this recommendation, will lead to a saturation of the monitor's memory. The latest one will automatically and circularly replace the earliest measurements. **The « erase data » must not be used on the monitor see §5.9.8**

When you download for several times the data of the same capsule, the corresponding file in the ANIPILL® PC software will be completed. To update this file, remember to select the same folder for each downloading process.

The number of data for each capsule associated at the same time may be different because of the variability of the internal clock, which may differ between the capsules.

The monitor continues to store data even after finishing downloading the data to the PC software. It is imperative not to delete the monitor's data, as the capsules remain activated. This can cause the loss of the association data between the monitor and the capsules.

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6.2.4 Consult temperature data imported into the ANIPILL® PC software

On the main screen of the ANIPILL® PC software, a list of all the downloaded data is visible in the lower right corner (Fig. 30 c). Select a file in the list and click on the "Show" button or double click on the desired file (Figure 30 c).

To no longer view the data displayed on the chart, select it in the list with a left click (Fig 30 a) then click on the "Hide" button (Fig. 30 d).

6.2.5 Export the temperature data imported to the ANIPILL® PC software

• As a spreadsheet

First, display the curve of the desired data (Fig. 30 a). Once displayed, you can export the data by clicking on "File" in the menu bar (Fig. 30 e), then click on "Graphics" then click on "Export to spreadsheet format." Then select the destination folder of the file to save. Export to a spreadsheet file is in CSV format.

Note: To ensure traceability, it is possible to export a file to a text format that shows all the actions that have been performed on the source data with the ANIPILL® PC software(add / remove a marker and ignore / restore value). To do so, please select first the data you want to export (Fig. 30 b), then click on the menu bar (Fig. 30 e) "File," then "Graphics" and then "Export record of changes". Then select the destination of the file to save.

⚠ **WARNING: The data are exported in UTC time, but it is in local time on the ANIPILL® PC software and on the monitor**.

⚠ As a reminder, the data are not recovered at strictly equal intervals, the lists of the data collected from several capsules with a single monitor can present lags in the spreadsheet.

• As a chart

To export data in a graphical form, display the curves of the desired data (Fig. 30a), click on the menu bar (Fig. 30 e) "File" then click on "Graphics" and finaly on "Export as a PDF document". Select the destination of the file to save.

6.2.6 Changes on the folders of the ANIPILL® PC software

It is possible to export / import folders from a PC software to another, in ".bce" format. To manage the folders, it is possible to archive it.

To introduce these changes, you must go to the File menu (Figure 30 e) then to "Folder".
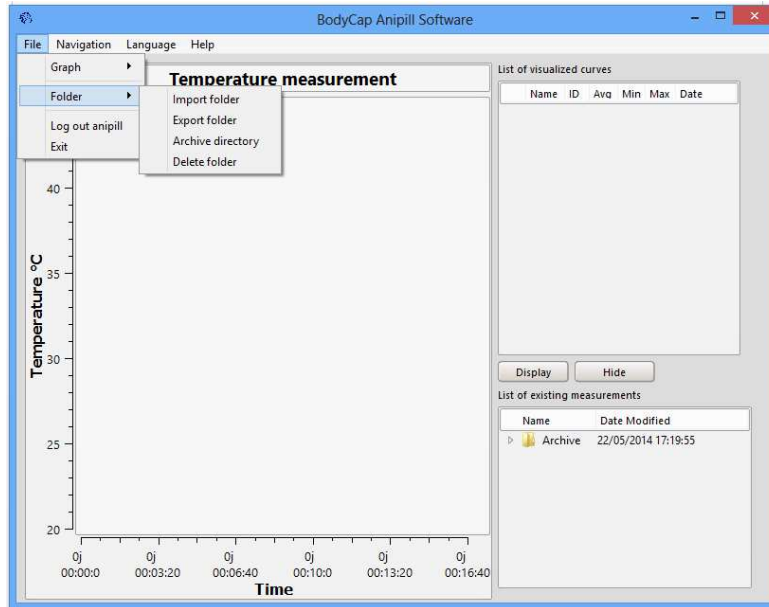
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Figure 38 : Path to follow to change the folders

- Export a measurement data file

In order to save the source data in multiple locations, it is possible to export measurement data files. This new exported file can be read only with an ANIPILL® PC software. To do so, select a folder in the "list of existing measurements" (Fig. 30 c), click on the menu bar (Fig. 30 e) "File" then click on "Folder" and click on "Export file". Select the destination of the folder to save. The folder name will be the same as the original one with a .bce extension that is specific to the ANIPILL® PC software.
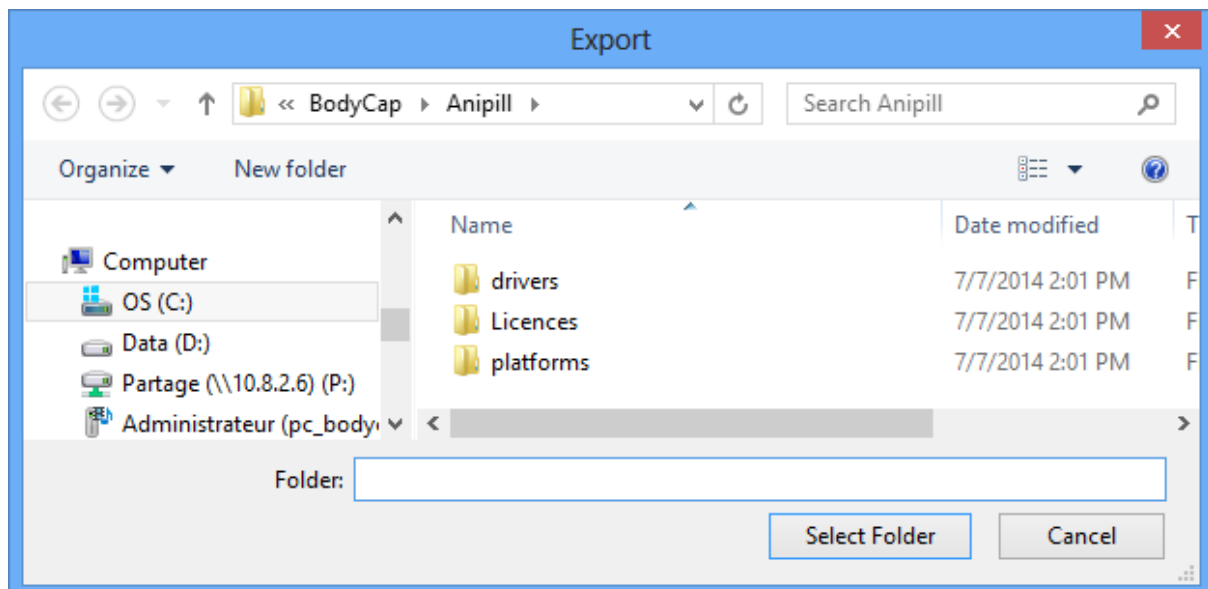

Figure 39 : Window for folder export

⚠ **It is strongly recommended not to change the name or the extension of this folder otherwise, it will be unreadable.**

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- Import a measurement data folder

In order to find the source data and to view again this data in an ANIPILL® PC software, it is possible to import the measurements data files. This archived file can be read only with an ANIPILL® PC software. To do so, click on the menu bar (Fig. 30 e) "File" then click on "Folder" then click on "Import a folder". Select the folder to import. The folder will appear in the "List of existing measurements' (Fig 30 c) with the name of the original folder.
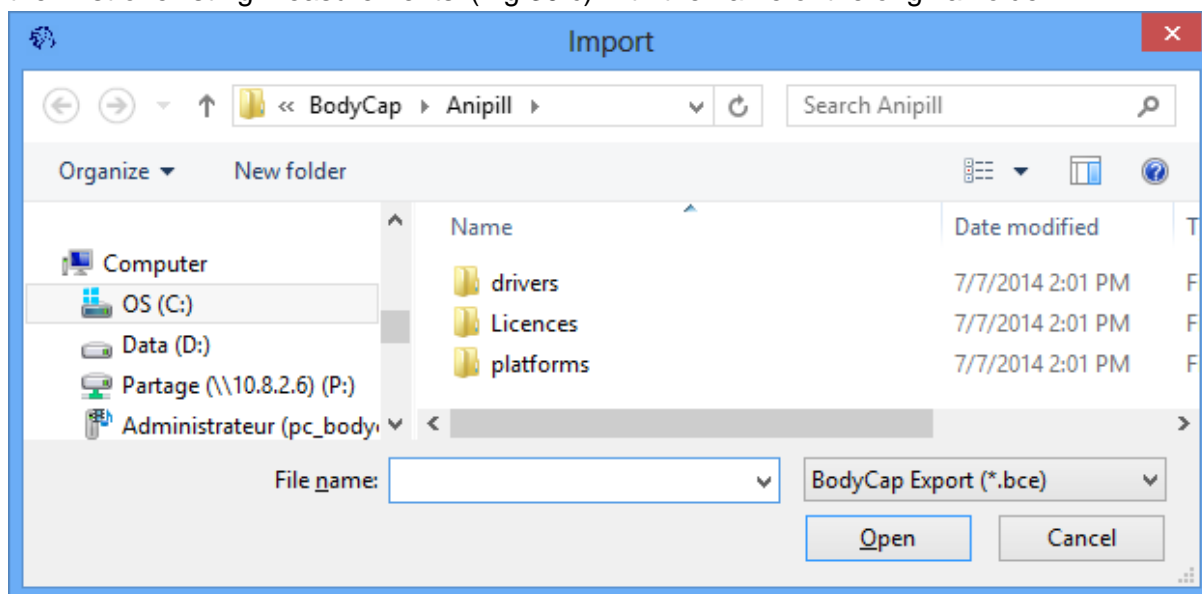

Figure 40 : Window for data import

⚠ **It is impossible to have in ANIPILL® PC software, two files with the same name. If it happens, please archive the unused folder before importing the new one.**

- Archive a measurements data folder

To help you to visualize the active folders, it is possible to archive a folder. This involves keeping the folder available for viewing, but no further changes (adding a marker, a point of ignorance, etc.) can be saved on this archived folder. The export of a file from the archived folder into a spreadsheet format (. Csv) remains possible. It is impossible to download data from a capsule into this folder. To archive a folder, select it in the "list of existing measurements" (Fig. 30 c), click on the menu bar (Fig. 30 e) "File" then click on "Folder" and then click on "Archive Folder". The folder name will be the same as the original one.
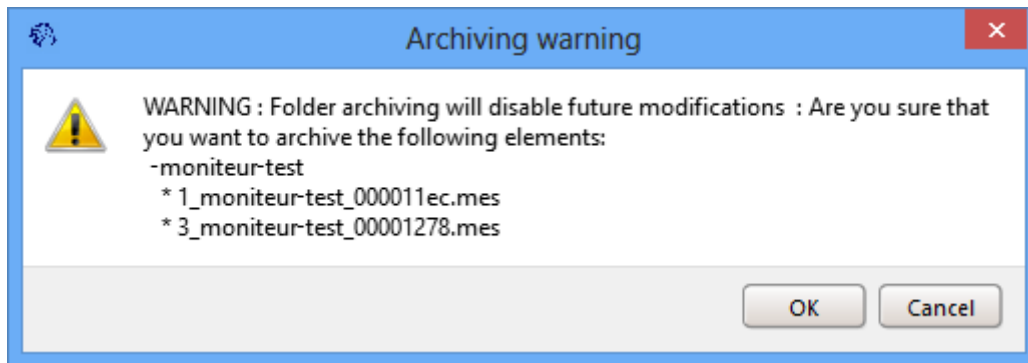
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Figure 41 : Archiving alert message

WARNING:

This action is irreversible! The folder will be deleted from the list of available folders and you will not be able to change or un-archive it. We advise you to make a copy of the folder with the "Export Folder" function before archiving.

- Delete a measurements data folder

To help you to visualize the active folders, it is possible to delete a folder. To delete a folder, select a folder in the "list of existing measurements" (Fig. 30 c), click on the menu bar (Fig. 30 e) "File" then click on "Folder" and click on "Delete Folder".
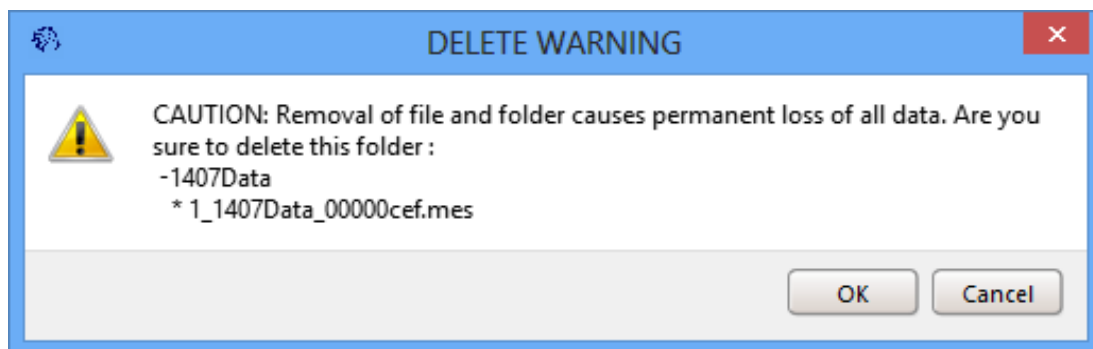

Figure 42 : Deletion alert message

Warning: This action is irreversible! The folder will be deleted from the list and you will not be able to restore it. We advise you to use the archiving folder function.

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6.2.7 Set a marker

To mark an event, it is possible to position *a posteriori* an indicator at a specific time to inform or mark a change or a particular action (e.g., food intake, or pharmacological test ...). This moment will be marked chronologically on the measurement file with "marker No. XX."

To establish or remove a marker via the ANIPILL[®] PC software, select the desired data (Fig 30b), then right-click on the desired position (close to the target curve), a menu appears, choose add a marker / Delete a marker. It is possible to name the marker or to add a comment to the marker.

NOTE: For more details when using this feature, you can use the zoom features (Accessory functions 6.3).

The management of the markers is unique to each user; it is possible to delete a marker with a right-click on the latter via the ANIPILL[®] PC software- "remove marker". This click should be carried close to the curve related to the marker.

6.2.8 Ignore the values

To ignore a value, select the relevant data (Fig. 30 b). In the graphics area (Fig. 30 a), make a right click on the data you want to ignore and click on "Ignore value." The point will not be visible neither on the curve nor on the data file created during the export.

To restore all the ignored values, view the desired data (Fig. 30 b); Then right-click on the curve in the graphics area (Fig. 30 a) then click on "Restore the ignored values."

NOTE: For more details when using this feature, you can use the zoom features (Accessory functions 6.3).

Warning: All the values ignored since the first data download of the curve will be restored

6.2.9 Recovery mode

When a monitor is not working, it is possible to recover the communication with the capsules that were associated with it with a different monitor. This operation allows you to continue a measurement cycle with a new monitor.

To do so, it is necessary to start the recovery mode with a working monitor. This mode allows you to recover the data from all the capsules in use on the selected channel, and present in the communication field of Anipill[®] capsules.

It is very important to check if there is no other monitor (or other capsules) operating on this channel in this environment. This check ensures that

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there will be no data corruption.

First, bring a working monitor fully charged and on time; then verify that there is no associated capsule with this monitor and that its memory is fully available. If this is not the case, follow the detailed instructions in § 5.9.8 and § 6.2.1. Then set the channel of the monitor on the selected channel during the activation of the capsules you want to recover. To do so follow the procedure detailed in § 5.9.9.

After launching the ANIPILL® PC software, connect the operating monitor to a PC with the cables provided by the manufacturer and press the OK button on the monitor to validate the "remote mode". On the ANIPILL® PC software, go to the "Navigation" menu and then go to the "Monitor" submenu, and finally select the "Recovery Mode". A window opens on the ANIPILL® PC software; confirm this command. The message "Recovery Mode Activated" will appear. Click on "Yes" to start the recovery mode.

⚠ **Once recovery mode is running on your monitor, the activation of new capsules, the channel change and the real-time mode functions will not be available on the ANIPILL® PC software of this monitor**.

The PC software allows you to recover the data stored on a monitor (§ 6.2.3). To exit the recovery mode, turn off the monitor capsules (§ 5.9.7), save data via the PC software if necessary and delete the monitor's data (§ 5.9.8).

Note: To exit the recovery mode launch the ANIPILL® PC software and connect the monitor to a PC with the cable provided by the manufacturer and press the OK button to switch to "remote mode". On the ANIPILL® PC software, go to the "Navigation" menu and then go to the "Monitor" submenu, and select "Recovery Mode". A window opens on the ANIPILL® PC software; please answer "no". The message "Recovery Mode Off" will appear.

6.3 Accessory functions

Change the language of the ANIPILL® PC software
In the menu bar (Fig 30 e) click on the «Language» tab and select the desired language.

Browsing the software
In the menu bar (Fig 30 e), click on the «Navigation» tab and select the desired window.

NOTE: configuration windows and data recovery are available only when a monitor is connected to the ANIPILL® PC software.

Change the graph's scale

You can change the scale of the X-axis or Y-axis. To do so, right click on the y-axis or x-axis in the graphics area (Fig. 30 a). A window opens in the ANIPILL® PC software the window proposes you to select the minimum and maximum values of the selected axis.

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Change the title of the chart

You can change the title of the graphics area. To do so, right click on the title in the graphics area (Fig. 30 a). A window opens and proposes you to change the chart title.

Zoom

You can use different zooms, to do so, right click on the chart and select:

- ➢ Auto Focus: the graphic display is then automatically adjusted according to the temporal extent of the data.
- ➢ Wheel: the wheel of your mouse lets you zoom in / zoom out on the graphics area
- ➢ Slide - drop: keeping pressed the left click of your mouse, allows you to drag the curves on the graphics.
- ➢ Zoom box: pressing and holding the left click of your mouse, allows you to frame a zoom area with a rectangle.

6.4 Modifications of the PC software

6.4.1 Update

When a new version of the PC software is available, it is possible to download it for an update (menu => run as Windows administrator). To do so, a setup procedure is initiated (see § 2.1). Accounts, records and temperature data are conserved. The uninstallation is not necessary to run an update.

6.4.2 Uninstalling

When uninstalling the PC software, the user chooses if he wants to keep the stored data. The drivers are not uninstalled. To uninstall them, simply go to the Control Panel "Uninstall or change a program" and double-click on the drivers. The drivers are identified by the name "Windows Driver Package - Bodycap (silabenm) Ports (10/18/2013 6.6.1.0)".

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7 Power supply unit and cables

⚠️ Two cables are supplied with the system: two USB cables - micro-USB that connect the Aniview® monitor to a PC to download data or to power the monitor and / or the activator by connecting them to a turned on PC, or to the mains outlet with the adapter.

Figure 43 : Cable and AC adapter

Only the cables supplied by the manufacturer must be used to ensure the proper functioning of the system and to avoid degrading it.

The power supply unit of this device has the following characteristics:
Brand: Globtek (HONG KONG) LTD
Model: GTM41078-05-USB

Identification plate:

Figure 44 : Identification plate of the power supply unit

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8 User's skills

The user is the person who uses the device and initiates a measurements cycle. The concerned staff are animal keepers, lab technicians or researchers.
The following knowledge is recommended:
- Read and understand the monitor's information
- Implantation technique
- Know how to install a software

9 Basic functions

The basic functions are :

Tableau 4 : Basic functions

Basic functions	Principal (P) / Secondary (S)
Activate a capsule	*P*
Take the temperature	*P*
Set the date and the time of the monitor via the PC software	*S*
Set the measurement frequency of the capsules via the monitor	*S*
Set the RF channel of the monitor	*S*
Recover the data of the capsules with the monitor	*P*
Store the data in the capsule	*P*
Viewing the monitor's data	*P*
Shutdown a capsule at the end of a cycle of measurement	*P*
Transfer to PC software (and saving)	*P*
Viewing the data on the PC software	*P*
Pre-processing the data on the PC software (marker, ignored values)	*S*
Export data to the PC software (spreadsheet or curves in pdf format)	*P*
Management of the monitor's battery	*P*
Export/Import folders	*S*

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