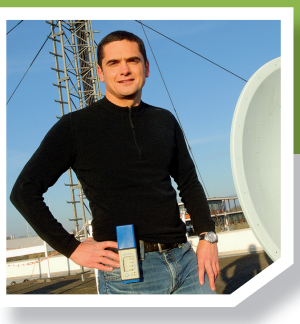
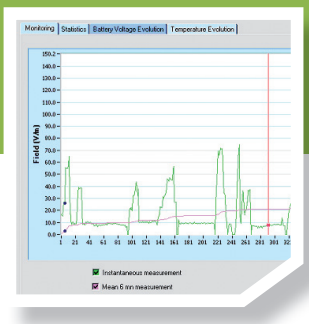
User Manual





EME GUARD

Personal exposure meter

SATIMO
A microwave vision company

SATIMO Bretagne
Zone du Vernis
225 rue Rivoalon
29200 Brest, FRANCE
Tél. : +33 (0) 2.98.05.13.34
Fax. : +33 (0) 2.98.05.53.87

USER MANUAL

Reference :

EME Guard

PERSONAL EXPOSURE METER

EME Guard

Dosimeter equipped with an alarm system to guarantee the safety of people working in strong fields.

WARNING

USE

The EME Guard is an alarm dosimeter designed for use as surveillance equipment of people who could be exposed to high levels of electromagnetic field. It provides NO protection in any way against possible exposure. The EME Guard is purely a monitoring device.

The use of this device complies with different international recommendations concerning the exposure of workers to electromagnetic fields and notably the European directive 2004/40/EC.

The EME Guard can be worn on a belt or strapped across the body and has been designed to fulfil the following requirements:

- detect the presence of electromagnetic fields,
- alert the user when predetermined levels have been exceeded,
- record the field levels to which the worker has been continually exposed so that they can be downloaded, analysed and stored.

The thresholds above which the alarms are required to be triggered are to be defined and configured by the person responsible for parameterization of the device. All legal norms and directives in force relative to the exposure of individuals to electromagnetic fields must be respected.

The EME Guard Analysis software provided with the dosimeter enables the alarms to be configured and the data to be recorded.

The EME Guard enables the field measurements to be recorded at a period and duration configured by the user. It also allows the downloading and display of field measurements.

This device has left our premises in perfect working order. The following safety measures must be respected in order to guarantee accurate results.

This device must only be used for the applications for which it has been designed.

It is essential that only people authorized by SATIMO should carry out repairs and maintenance of the device.

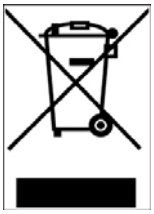
Before use make sure that the batteries are sufficiently charged.

WARNING

SAFETY MEASURES

The safety measures concerning the use of field monitors are as follows :

- never touch sources of electricity, not even with your field monitor.
- respect the safety measures stipulated by the equipment operator or original equipment manufacturer.
- respect the operating instructions and recommendations for equipment which generates, emits or uses electromagnetic energy.
- never expose the field monitor to high intensity electric fields (for example inside a microwave oven). Such exposure could damage the device.
- secondary sources (reflective objects such as metal fences) can also locally increase the field intensity.
- the intensity of the electromagnetic field can be under-evaluated if the wearer's body comes between the field source and the measuring device.
- the data provided in the technical characteristics will only be accurate if the tests are carried out in optimal conditions, in the absence of all interference radiation.
- Measuring devices can under-evaluate the intensity of pulsating signals.
- Fields composed of a spectrum situated outside the frequency band covered by the device can be incorrectly evaluated and can be under- or over-evaluated.



CORRECT DISPOSAL OF THIS PRODUCT

(Waste electrical and electronic equipment applicable in the European Union and in other European countries with separate collection systems).

This symbol displayed on the product indicates that it should not be disposed of with other household waste. Irresponsible disposal of waste can lead to damage of the environment and health. Therefore please separate this product from other types of waste so that it can be recycled to conserve resources.
Businesses should contact their suppliers and consult the conditions in their sales contracts. This product should not be disposed of with other commercial waste.

CONTACTS

For any questions or suggestions about this product and/or its use, contact your local supplier or our after sales service, specifying the type of product and its serial number.

SATIMO Bretagne
Zone du Vernis
225 rue Rivoalon
29200 Brest, FRANCE
Tel: +33 (0)2 98 05 13 34
Fax: +33 (0)2 98 05 53 87
E-mail : hotline.RF-Safety@satimo.fr

Declaration of Conformity

CE

SATIMO hereby declare that the product defined below, to which this declaration of conformity belongs, adheres to the following clause and conforms to the Standards and other Normative Documents listed below:

- 73/23/EEC, The Low Voltage Directive (safety).
- 89/336/EEC, EMC Directive.

Type of product:	Measuring device
Name/Model of product:	EMEGuard
Product number:	331 001 A
Designed for :	Measurement of electronic fields

Norms concerned:

- NF-EN-61010-1: Safety Regulations for Electrical Measuring Instruments, Control Instruments and Laboratory Equipment.
- EN-61326-1: Electrical Equipment for Measurement, Control and Laboratory Use. EMC Requirements [EN 55022 (98) /A1 (00) /A2 (03), EN 61000-4-3 (02) /A1 (02), EN 61000-4-4 (95) /A1 (01) /A2 (01), EN 61000-4-5 (95) /A1 (01), EN 61000-4-6 (96) /A1 (01), EN 61000-4-8 (93) /A1 (01), EN 61000-4-11 (94) /A1 (01), EN 61000-3-2 (00), EN 61000-3-3 (95) /A1 (01)].

Hervé LATTARD
Director

Contents

1 INTRODUCING THE EME GUARD ____ 7
1.1 THE TRANSPORT CASE ____ 7
1.2 THE DOSIMETER ____ 8
1.3 TECHNICAL CHARACTERISTICS ____ 10
2 OPERATING THE DOSIMETER ____ 11
2.1 PARAMETERS FOR USE ____ 11
2.1.1 Reference Threshold – Visual Alarms ____ 11
2.1.2 Audio Alarm and Vibrating Alarm ____ 11
2.1.3 Recording Measurements ____ 12
2.2 STARTING PROCEDURE ____ 12
2.2.1 Auto-test sequence of lights and alarms ____ 12
2.2.2 Estimation of Remaining Autonomy ____ 13
2.2.3 Starting Measurements ____ 13
2.3 LOW BATTERY ____ 13
2.4 STOPPING THE DEVICE ____ 14
2.5 INTERPRETATION OF OPERATIONS LIGHTS ____ 14
2.6 RECHARGING THE BATTERY ____ 14
2.6.1 Precautions for Use. ____ 14
2.6.2 How to Recharge the EME Guard Battery ____ 15
3 EME GUARD ANALYSIS V2.0: USE ____ 16
3.1 RUNNING THE SOFTWARE ____ 16
3.2 LOGGING IN AS ADMINISTRATOR ____ 17
3.3 CONFIGURING THE DOSIMETER ____ 18
3.3.1 Configuring a recording cycle ____ 20
3.3.2 Configuring the Alarms ____ 21
3.3.3 Configuring Information ____ 21
3.3.4 Configurating Date and Time ____ 22
3.3.5 Validating the Configuration ____ 23
3.4 TRANSFER OF RECORDED DATA ____ 23
3.5 DISPLAYING THE MEASUREMENTS ____ 25
3.5.1 Information on the Measurements ____ 26
3.5.2 Monitoring ____ 26
3.5.3 Statistical field measurement display. ____ 29
3.5.4 Battery Monitoring Screen ____ 30
3.5.5 Temperature Monitoring Screen ____ 30
3.5.6 Information Display ____ 31
3.5.7 Creation of an Excel Report. ____ 31
3.5.8 Creation of a Text Report ____ 33
3.6 MENUS ____ 34
3.6.1 File Menu ____ 34
3.6.2 Administrator Menu ____ 34
3.6.3 Unit Menu ____ 35
3.6.4 EME Guard Menu ____ 35
3.6.5 Help Menu ____ 36

1 INTRODUCING THE EME GUARD

1.1 THE TRANSPORT CASE

Figure 1 : Case Presentation

The transport case includes the EME Guard dosimeter, the battery charger and its power supply cable, the USB cable to connect the measuring device to a PC, the user manual and the EME Guard Analysis V2 software CD.

1.2 THE DOSIMETER

The user interface of the dosimeter is composed of an on/off button and the following lights: power on light, low battery warning light, reference threshold for visual alarm lights and the indicator lights expressing the field measurements as a relative value of the reference threshold.

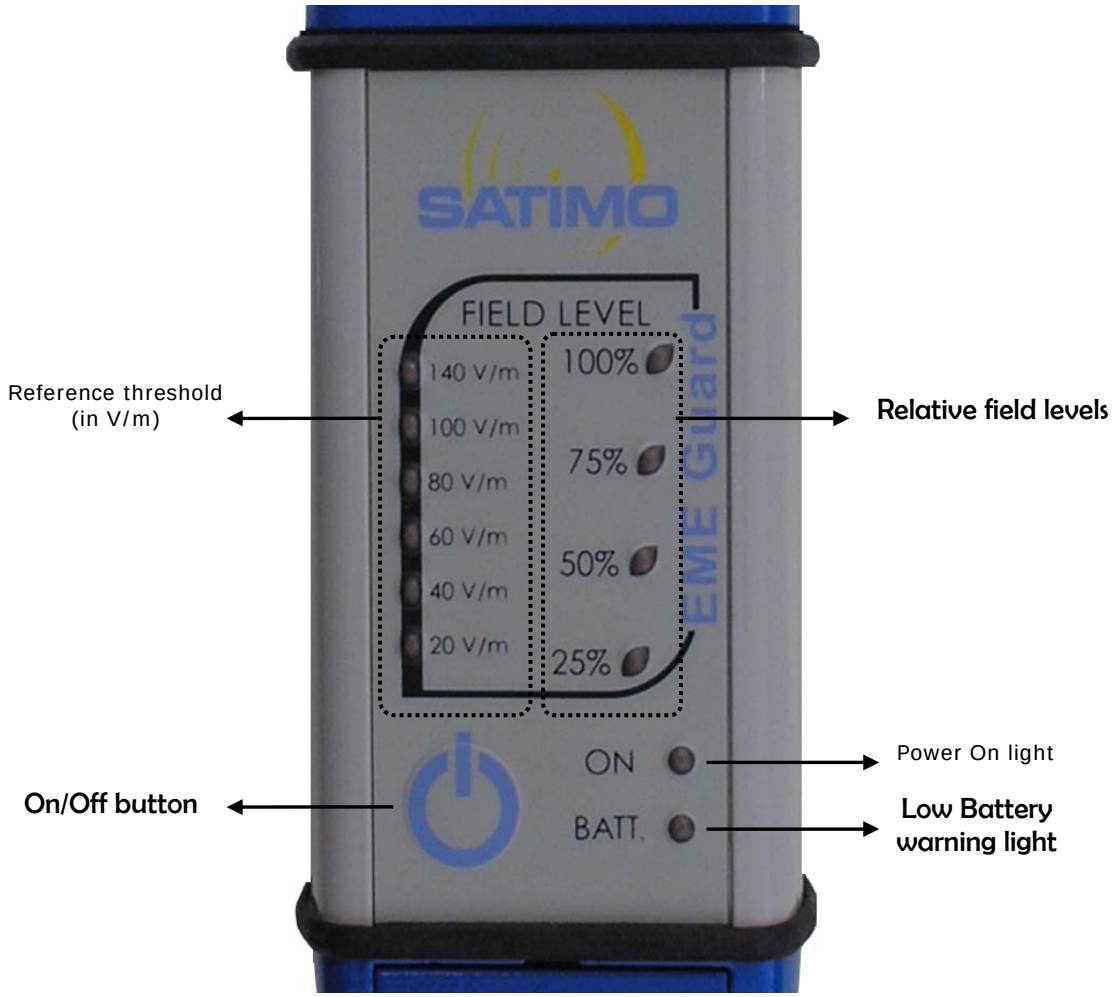
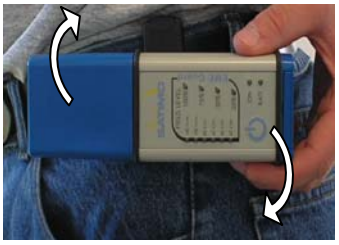


Figure 2 : user interface of the EME Guard

So that the EME Guard can be « worn » it is equipped with a two-part clip belt; a belt clip which slides onto a stud situated on the back of the device.

Slide the stud horizontally into the groove.



Pivot the dosimeter downwards.

The connectors for the battery charger and the USB are situated on the base of the dosimeter, protected by a lid.

The following procedure must be followed when opening the lid.

To open the lid:

apply pressure to the hinge…

…and lift the lid

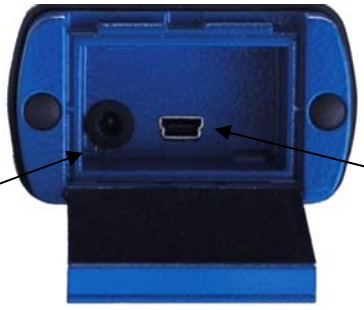


Figure 3 : The EME Guard Dosimeter seen from below

1.3 TECHNICAL CHARACTERISTICS

❶ Technical characteristics	
Frequency range	27 MHz – 40 GHz
Upper detection limit	200 V/m
Lower detection limit	5 V/m

❷ Measurement uncertainty	
Axial isotropy	+/- 1 dB at 1400 MHz +/- 2 dB at 2100 MHz
Frequency response	27 MHz - 2.5 GHz : +/- 3 dB 2.5 GHz - 6 GHz : + 6/0 dB 6 GHz - 10 GHz : + 12/+ 6 dB 10 GHz - 20 GHz : + 10/0 dB 20 GHz - 40 GHz : + 8/- 3 dB

❸ Alarm configuration	
Reference threshold	Configurable by the user 20, 40, 60, 80, 100 or 140 V/m
Alarm mode	Instantaneous or 6 min. mean
Visual alarm	4 LEDs 25%, 50%, 75% and 100% of the reference threshold
Audio alarm	Activated (from 5 V/m to 137 V/m) or de-activated
Vibrator	Activated (from 5 V/m to 137 V/m) or de-activated
Low battery indicator	Orange LED

❹ Measurement configuration	
Update period for display and alarms	1 sec
Measurement recording	Activated or de-activated
Recording capacity	30 000 measurements MAX
Recording period	1-255 sec
Duration of recording • min. • max.	 1 mn Duration (in mn) = $\frac{\text{30 000 points x recording period (sec)}}{60}$

❺ Conditions for use	
Temperature, humidity	-10 to 50°C, 85% max. humidity
Power supply of battery charger	110 - 240 VAC, 50 - 60 Hz
Battery	Lithium-Ion
Battery autonomy	> 100 hours
Type of link	USB

❻ Mechanical characteristics	
Dimensions	172 x 60 x 35 mm (H, L, W) without belt clip
Weight	320 g
Protection	IP 55

2 OPERATING THE DOSIMETER

2.1 PARAMETERS FOR USE

The different configurable parameters and thus the EME Guard Dosimeter can be adapted to suit the needs of each user, through the EME Guard Analysis Software.
How to configure these parameters is explained in detail in the paragraph **3.3 CONFIGURING THE DOSIMETER**.

2.1.1 Reference Threshold – Visual Alarms

The reference threshold is used by the device to determine the visual alarms.
The measurements displayed by the 4 visual alarm lights are the instant field value expressed as a percentage of the chosen reference threshold.

Light status – Reference Threshold						
Lights						Reference threshold
20 V/m	*40 V/m*	*60 V/m*	*80 V/m*	*100 V/m*	*140 V/m*	
On	*Off*	*Off*	*Off*	*Off*	*Off*	**20 V/m**
Off	*On*	*Off*	*Off*	*Off*	*Off*	**40 V/m**
Off	*Off*	*On*	*Off*	*Off*	*Off*	**60 V/m**
Off	*Off*	*Off*	*On*	*Off*	*Off*	**80 V/m**
Off	*Off*	*Off*	*Off*	*On*	*Off*	**100 V/m**
Off	*Off*	*Off*	*Off*	*Off*	*On*	**140 V/m**

2.1.2 Audio Alarm and Vibrating Alarm

The EME Guard has also two additional independent alarms (audio alarm and vibrating alarm).

Three operating modes are possible for both of these alarms. The trigger threshold of these alarms is expressed directly in V/m.
The alarms are triggered if the measurement taken is superior to the configured threshold without reference to a percentage to the reference threshold which is used only by the visual alarms.

Definition of Alarms						
Type	Audio			Vibrating		
Threshold	from 5 to 137 V/m			from 5 to 137 V/m		
Mode	De-activated	instantaneous(1)	6 minutes (2)	De-activatedi	instantaneous(1)	6 minutes (2)

(1) These alarms are immediately triggered by measured field values.
(2) These alarms are triggered by the mean value of fields measured over the last six minutes of measurement.

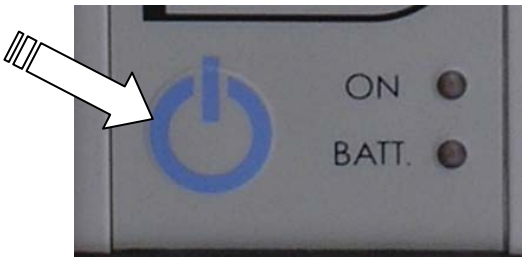
2.1.3 Recording Measurements

The EME Guard has a measurement recording function which can be activated or de-activated with the help of the EME Guard Analysis V2.0 Software
The non-volatile internal memory enables a maximum number of 30,000 measurement points (each measurement is time/date-stamped).
Measurement recording depends on the period and duration configured using the EME Guard Analysis V2.0 Software.

This function enables the study of the level of exposure of the user to electric fields over a predetermined period of time.

2.2 STARTING PROCEDURE

Press the **ON / OFF** button.



The **ON** light is activated.
Maintain pressure for approximately one second until the **ON** light switches off and the **BATT.** light comes on.

The device will then run an auto-test sequence enabling the user to check that all display and alarm functions are operational.

2.2.1 Auto-test sequence of lights and alarms

The **ON** and **BATT.** lights are activated simultaneously for approximately 0.2 seconds**.**

The **25%**, **50%**, **75%** and **100%** lights are activated successively in this order then de-activated in reverse order.

Each threshold reference light (**20 V/m**, **40 V/m**, **60 V/m**, **80 V/m**, **100 V/m** and **140 V/m** lights in this order) is activated for approximately 0.1 seconds.

The audio alarm is activated for approximately 0.2 seconds.

The vibrating alarm is activated for approximately 0.2 seconds.

If one of these elements is not activated during the auto-test it is probably defective.

2.2.2 Estimation of Remaining Autonomy

The field level lights (**25%**, **50%**, **75%** and **100%** lights) enable the display of an estimation of remaining power autonomy.

Display of Estimated Remaining Electric Autonomy	
>72 hours	>54 hours
>36 hours	>18 hours
<18 hours	If the battery power is insufficient to give accurate readings, the **BATT.** light flashes. (see **2.3 Low Battery**)

2.2.3 Starting Measurements

The light corresponding to the reference threshold defined by the user is activated.
The **ON** light remains on for approximately 3 seconds (the internal function parameters are activated.)

Measurements are then taken every second. The **ON** light flashes every time a measurement is taken.

The different alarms (visual, audio, vibrating) are updated upon each measurement (every second). Recordings can be made at a different rhythm.

2.3 LOW BATTERY

When the battery is too low to give accurate readings, the measurements stop automatically and the BATT. light flashes indicating that the battery must be recharged.

Pushing the ON / OFF button will stop the device.
Connecting the device to a computer (USB) will stop the device

Note 1 : If the battery continues to weaken, the BATT. light will switch off automatically when the energy level is insufficient to power the device.

2.4 STOPPING THE DEVICE

The dosimeter can be switched off at any moment by pressing the ON / OFF button. The button must be depressed for one or two seconds until the ON light switches off. This is so that if the button is pressed accidentally the device will not be switched off.
3 audio beeps are emitted, indicating that the device is switching off.

If switched off in mid measurement cycle, the cycle will pick up where it left off when the dosimeter is switched back on. This downtime will not be recorded in the total time of the measurement recording cycle.

2.5 INTERPRETATION OF OPERATIONS LIGHTS

Light Status – operation indicators		
Lights		*indicating*
ON	***BATT.***	
Off	off	The dosimeter is switched off (all lights are off).
Flashing	off	The dosimeter is taking measurements.
off	flashing	Battery power is too low to take accurate readings, measurements have stopped.

Light Status – visual alarm (field measurements)				
Lights				*indicating*
25%	***50%***	***75%***	***100%***	
Off	Off	Off	Off	The field measured is strictly inferior to 25% of the chosen reference threshold.
On	Off	Off	Off	The field measured is greater than or equal to 25% of the chosen reference threshold and less than 50% of the chosen reference threshold.
Off	On	Off	Off	The field measured is greater than or equal to 50% of the chosen reference threshold and less than 75% of the chosen reference threshold.
Off	Off	On	Off	The field measured is greater than or equal to 75% of the chosen reference threshold and less than 100% of the chosen reference threshold.
Off	Off	Off	On	The field measured is greater than or equal to 100% of the chosen reference threshold.

2.6 RECHARGING THE BATTERY

The battery must only be recharged using the battery charger provided.

The following advice and instructions will help you to use the charger more effectively and to recharge the battery correctly.

2.6.1 Precautions for Use.

The battery charger has been designed for interior use only and must not come into contact with water or dust.
To avoid overheating, the charger must not be covered when in use.
The mains electric socket must be easily accessible. If an operating error occurs, the charger must be unplugged immediately.
The charger is designed to be used exclusively with lithium-ion batteries.

The charger is under high voltage thus the cover must never be removed.
The charger is equipped with an interchangeable jack. Do not remove this jack or modify the initial set up. In case of doubt, contact our after sales service.

2.6.2 How to Recharge the EME Guard Battery

❶ Switch off the device.

❷ Open the fliptop cover to access the battery charger connector.

❸ Plug the charger into the EME Guard

❹ Plug the charger into the mains power supply.

❺ An orange light indicates the battery is recharging.

❻ A green light indicates recharging has finished.

❼ When recharging has finished, unplug the charger from the mains power supply before unplugging the charger from the device.

Do not plug the charger into the mains power supply before plugging the charger into the device.

Do not leave the charger plugged into the mains power supply if it is not plugged into the device.

Do not leave the charger plugged into the device if it is not plugged into the mains power supply.

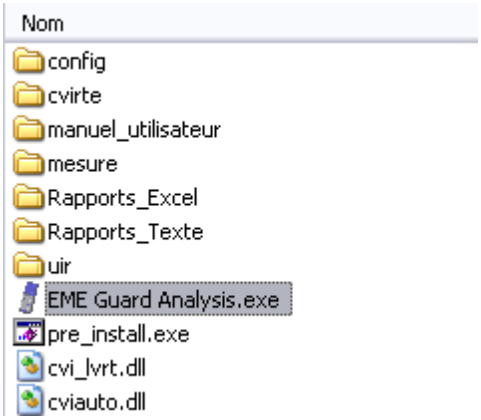
A complete battery recharge takes an estimated 6 hours.

3 EME GUARD ANALYSIS V2.0: USE

3.1 RUNNING THE SOFTWARE

In the Windows **start** menu, select **EME Guard Analysis V2.0** situated in the **EME Guard Analysis V2.0** folder in the menu **All Programs**.

Or select **EME Guard Analysis.exe** situated in the software installation folder.



When running EME Guard Analysis V2.0 for the first time, the operational language can be chosen (French or English). The following window appears:

Figure 4 : Opening screen of EME Guard Analysis V2.0 software (choice of language).

The software will automatically select the chosen language for subsequent openings.

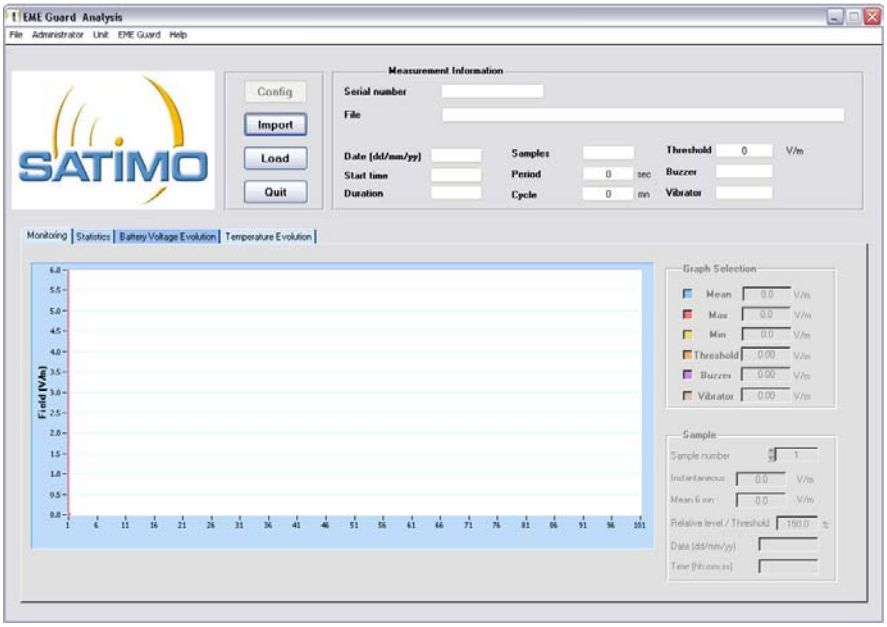


Figure 5 : Main screen of the EME Guard Analysis V2.0 software

This screen enables four functions:

⇨ **Configure:** to configure the dosimeter using a USB connection.
⇨ **Import:** to transfer the measurements recorded in the dosimeter's internal memory using a USB connection.
⇨ **Load:** to load one measurement file and to display all the information it contains on the screen
⇨ **Quit:** to quit the software.

The language can be changed at any moment through the submenu **Language** of the menu **File** present in the menu bar of the main window. The language change will only become effective on the next opening of the application.

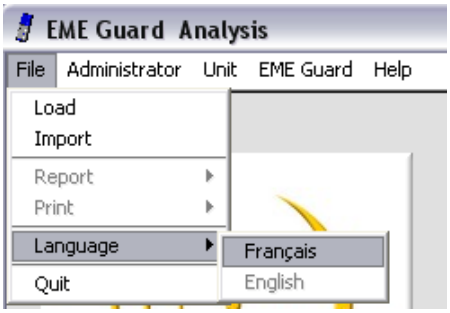


Figure 6 : Choice of language menu

3.2 LOGGING IN AS ADMINISTRATOR

Only the administrator can access configuration of the device for modification or display.

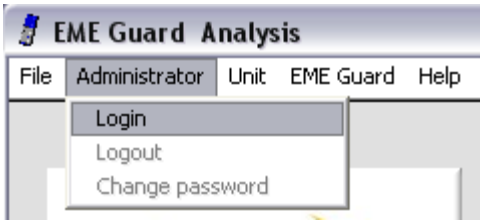


Figure 7 : Administrator menu

There are 3 possibilities in the **Administrator menu**:
⇨ **Login:** for administrator authentification.
⇨ **Logout:** to exit administrator mode.
⇨ **Change password:** to change the password.

To log in as administrator, select the menu **Administrator ⇨ Login**.

The following screen appears:

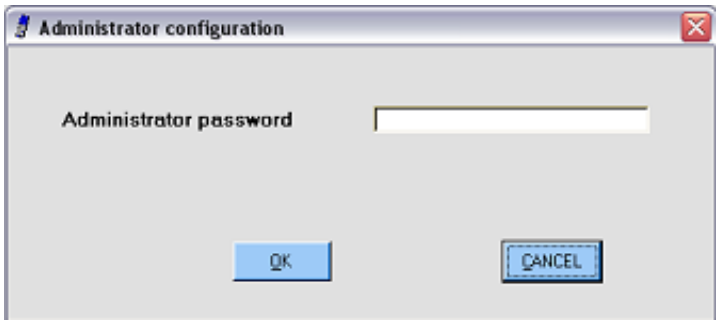


Figure 8 : Enter password

On the first use, the user should enter the password provided by the head of software. The user thus becomes administrator and can access configuration.

The administrator can then modify the password by selecting the menu **Administrator ⇨ Change password.**

The following screen appears:

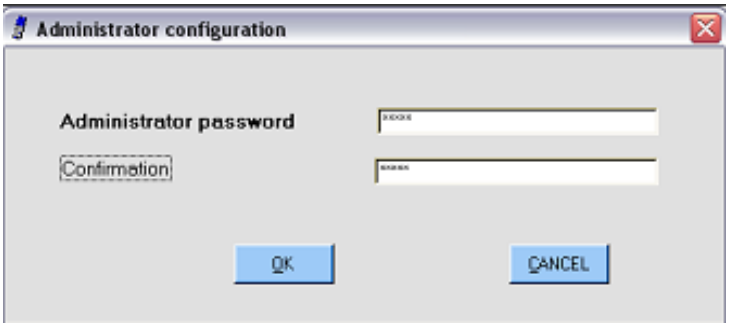


Figure 9 : Modification of password

The user should enter this new password the next time he wishes to access configuration.

3.3 CONFIGURING THE DOSIMETER

To access the following information:

- Battery level,
- Measurement recording cycle,
- Alarm levels,
- information (according to embedded software version),
- date and time,

log in as administrator, connect the dosimeter to the computer and click on **Configure**.
Warning! After any new configuration, the EME Guard is ready to start a new cycle of measurement recordings. Before starting a new measurement cycle, make sure the data recorded during the previous measurement cycle have been correctly downloaded onto your computer.

After having clicked on the button **Configure**, the following message appears:

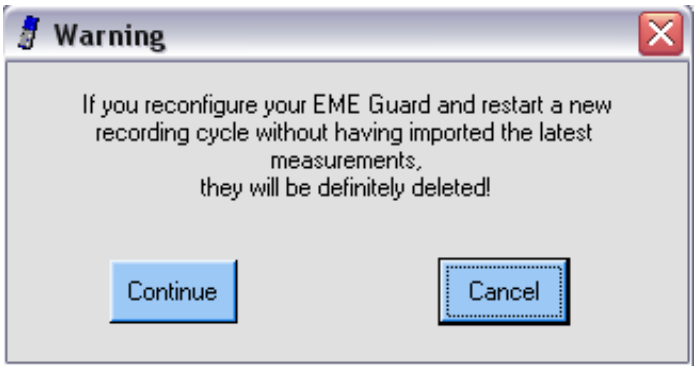


Figure 10 : Warning message concerning EME Guard configuration and the transfer of data

By clicking on **Continue**, the COM port number enabling communication is automatically detected. The user is asked to wait while communication is reopening and the configuration is reloading.

The configuration screen appears:

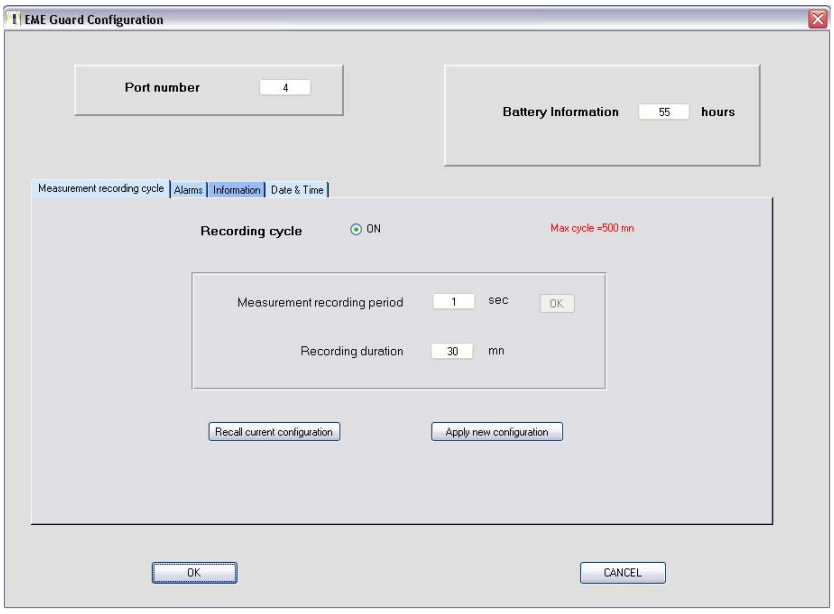


Figure 11 : Dosimeter configuration screen

The port number (COMx) should appear if the USB port connection has been established. The tabs **Measurement recording cycle**, **Alarms**, **Information** and **Date & Time** display the values of the current configuration. The **Information** tab will only be displayed if the embedded software version of the device allows this function.

In the top right of the screen, the estimated electrical autonomy is displayed.

As soon as the autonomy falls below 10 hours the text becomes red and a warning message is displayed:

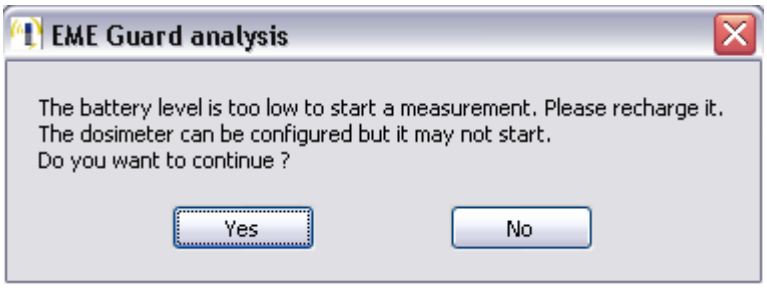


Figure 12 : Battery level too low – warning message

3.3.1 Configuring a recording cycle

The administrator can activate or de-activate the recording cycle.

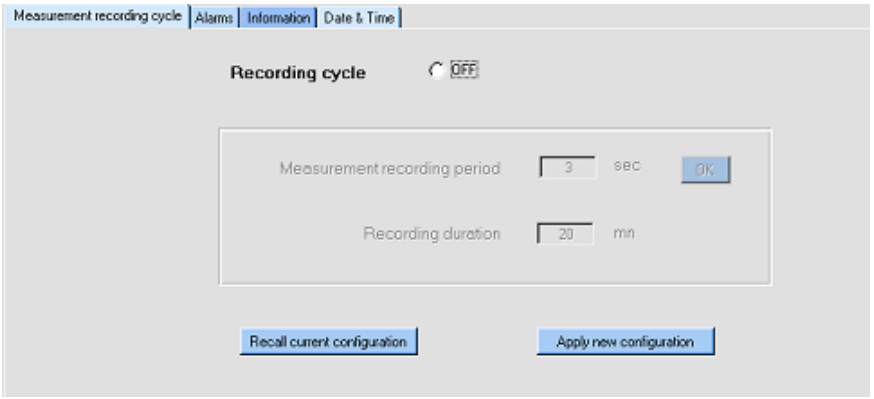


Figure 13 : Recording cycle off

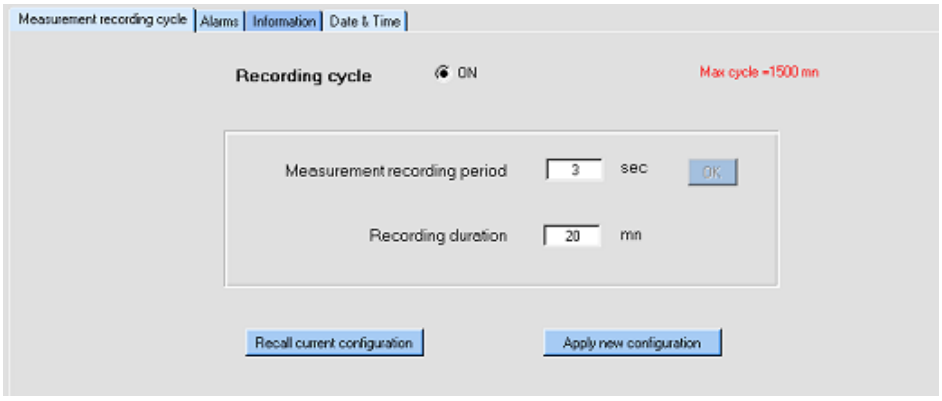


Figure 14 : Recording cycle on

⇨ **Recording period:** time in seconds between two consecutive recordings. This time must be between 1 second and 255 seconds. The recording duration can then be established.

⇨ **Recording duration:** total time (in minutes) of the measurement recording cycle. The number of measurements to be recorded during the cycle corresponds to:

$$NumberOfMeasures = \frac{CycleDuration \times 60}{Period}$$

where $CycleDuration$ is expressed in minutes.

The **Recall current configuration** button enables the reading at any time of the measurements recorded in the dosimeter.

The **Apply new configuration** button enables the new configuration to be validated and the new parameters to be transferred to the dosimeter.

3.3.2 Configuring the Alarms

The **Alarms** tab enables the information relative to the alarms to be read and configured.

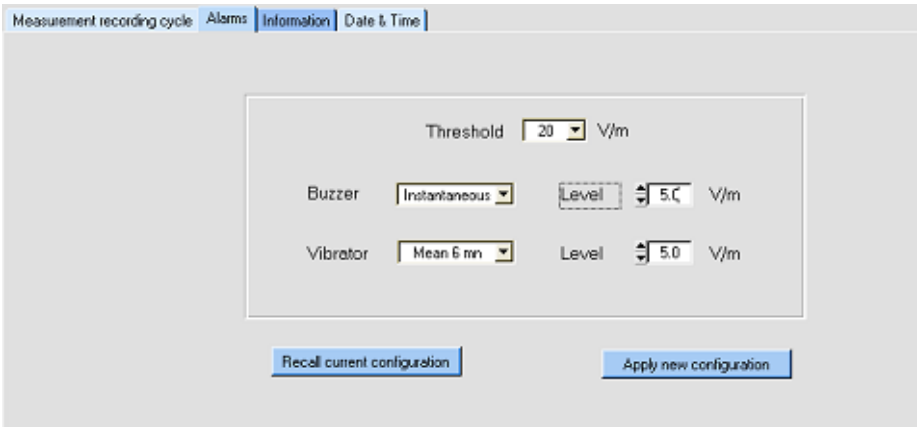


Figure 15 : Alarm configuration screen of the dosimeter

⇨ **Threshold (V/m)**: in the drop-down menu choose the reference threshold to be used by the device to trigger a visual alarm (20, 40, 60, 80, 100 or 140 V/m).
⇨ **Buzzer**: in the drop-down menu, choose the alarm function mode : **Inactive**, **Instantaneous** or **Mean 6 mn**. If necessary, (in **Instantaneous** or **Mean 6 mn** mode) establish the trigger value of the alarm (between 5 and 137V/m).
⇨ **Vibrator**: in the drop-down menu choose the alarm function mode : **Inactive**, **Instantaneous** or **Mean 6 mn**. If necessary, (in **Instantaneous** or **Mean 6 mn** mode) establish the trigger value of the alarm (between 5 and 137V/m).
⇨ **Recall current configuration**: this button enables the threshold, buzzer and vibrator parameters to be reread at any moment.
⇨ **Apply new configuration**: this button enables the new configuration to be validated and the new parameters to be transferred to the dosimeter.

3.3.3 Configuring Information

The **Information** tab is only displayed if the embedded software version of the device allows this function. It enables the information relative to the measurement cycle to be configured.

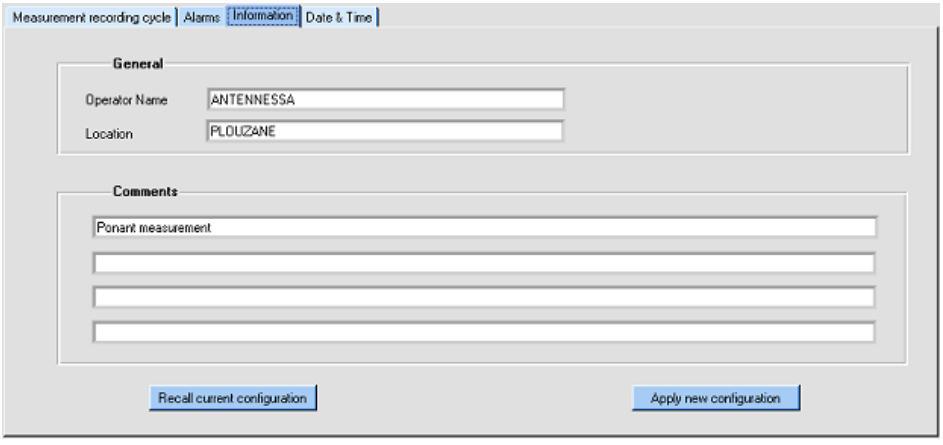


Figure 16 : Information configuration screen of the dosimeter

⇨ **General**: The **General** text boxes enable the name of the operator and the place of measurement to be recorded.
⇨ **Commentaries**: The **Commentaries** text boxes enable additional information to be entered.
⇨ **Recall current configuration**: this button enables information on the dosimeter to be reread at any moment.
⇨ **Apply new configuration**: this button enables the entered information to be validated and the new parameters to be transferred to the dosimeter. An error message appears if the format of the entered information is incorrect. The (*) character indicates that the field is invalid.

Figure 17 : Invalid characters entered

3.3.4 Configurating Date and Time

The **Date & Time** tab enables the date and time of the device.

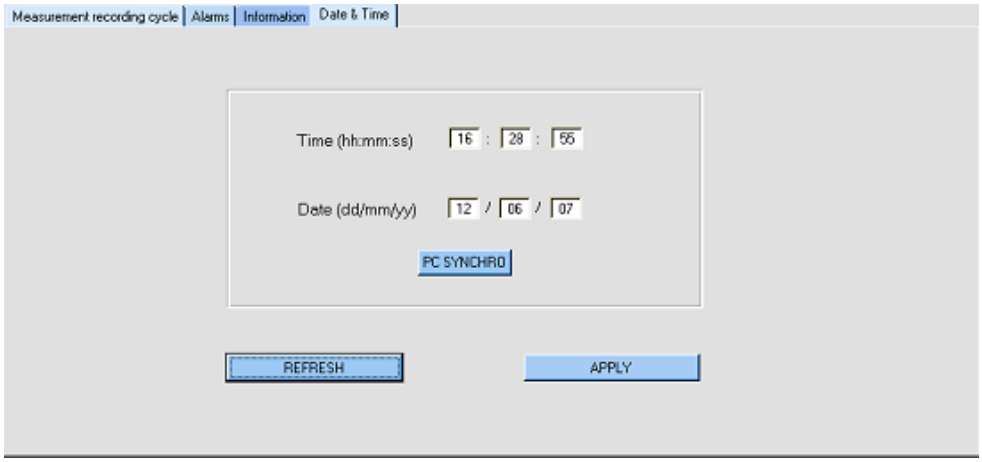


Figure 18 : Date and Time configuration screen of the dosimeter

⇨ **Time (hh:mm:ss)**: this field enables the time of the dosimeter to be updated in the format Hours:Minutes:Seconds
⇨ **Date (dd/mm/yy)**: this field enables the date of the dosimeter to be updated in the format Day/Month/Year.
⇨ **PC Synchro**: this button enables the dosimeter to be configured with the date and time of the PC on which the software is installed.
⇨ **Refresh**: This button enables the current date and time of the dosimeter to be reread at any moment.
⇨ **Apply**: this button enables the modifications to be validated and transferred to the dosimeter.

3.3.5 Validating the Configuration

When all the fields have been completed, click on **OK** at the bottom of the window to validate the configuration of the dosimeter.
After several seconds a dialog box appears.

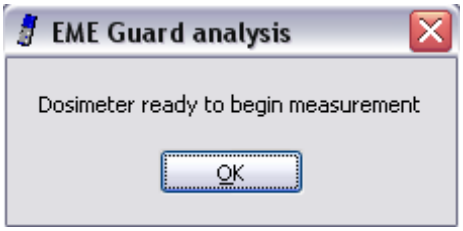


Figure 19 : Dialog box after successful configuration

3.4 TRANSFER OF RECORDED DATA

The measurement transfer enables the last measurement cycle of the dosimeter to be safeguarded in a file on your computer. By clicking on the **Import** button a dialog box opens and asks you to wait.

Then the Windows file recording window appears:

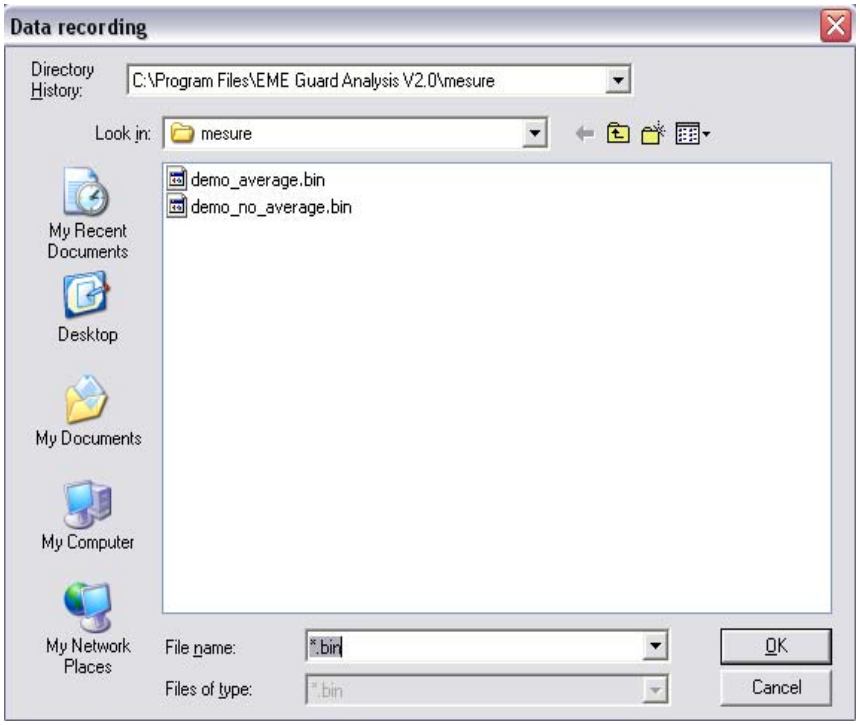


Figure 20 : Data Recording

Select the folder in which you would like to store the measurement file (by default it uses the **Mesure** file in the installation directory.).
Write the file name in the text box, then click on **OK.**
The measurements files are recorded with the extension « bin ».

The following screen appears:

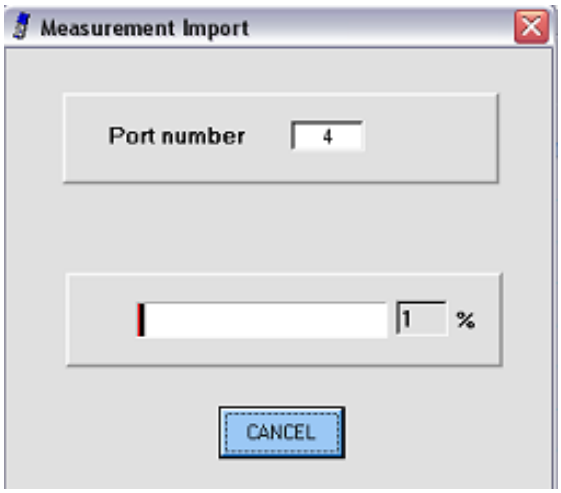


Figure 21 : Measurement transfer screen during data importation.

⇨ **Port number**: the port number indicates the communication port used.
⇨ **CANCEL**: enables importation to be stopped at any moment and the measurement import screen to be closed.

The progression bar indicates the percentage of imported measurements downloaded.

After importation the following window appears:

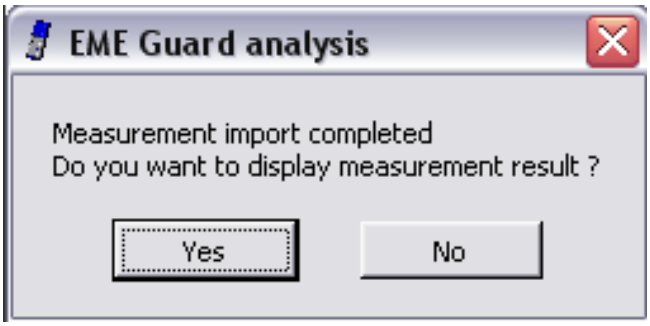


Figure 22 : Confirmation Message to display the measurement result.

If you click on **YES**, the measurements will be immediately displayed on the screen.

3.5 DISPLAYING THE MEASUREMENTS

Click on the **Load** button to display the file selection window. Select a measurement file « .bin » (or « .mes » for measurements taken using the V1 version of the EME Guard Analysis software). By clicking on **OK**, the measures displayed are in V/m by default in the main window.
Four tabs are visible:

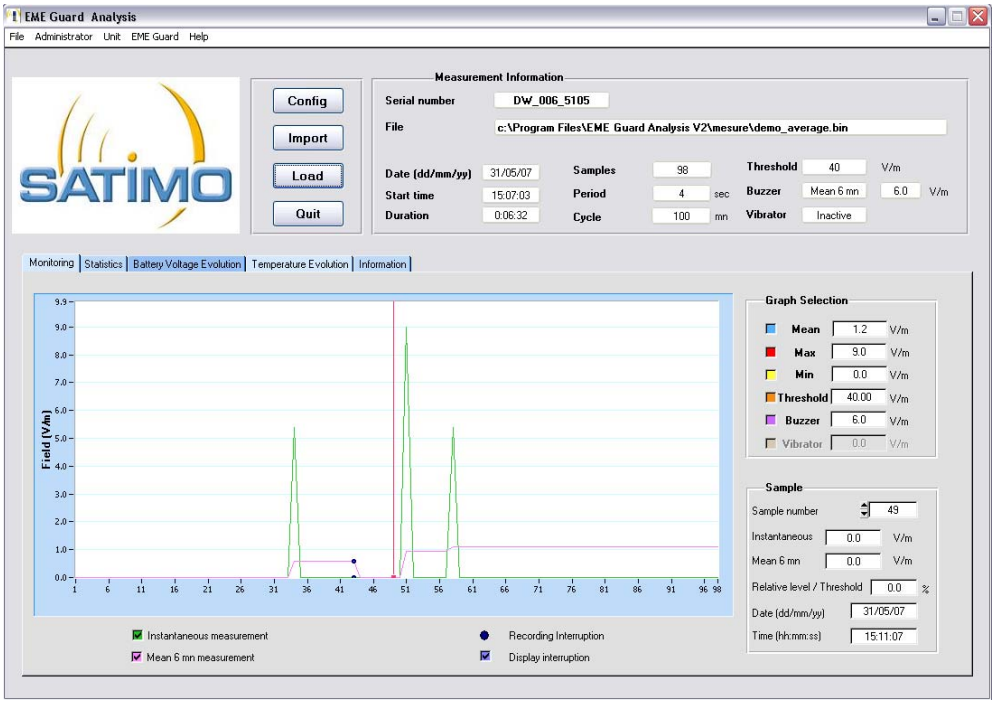


Figure 23 : Main screen – measurement display

⇨ **Monitoring**: shows the pattern of field results over the measurement time.
⇨ **Statistics**: shows the statistical results relevant to the loaded measurement.
⇨ **Battery voltage evolution**: shows the battery level throughout the measurement.
⇨ **Temperature evolution**: shows the temperature pattern throughout the measurement

There is a fifth tab in some versions of the software:

⇨ **Information**: shows information relevant to the measurement.

The EME Guard automatically measures in V/m.
The EME Guard Analysis software enables these measurements to be recorded in different units.

The **Unit** menu enables modification of the unit of measurement used to display the data. Three units are possible: V/m, mW/cm² and W/m².

The following conversion rates are applied by the EME Guard Analysis software.

Conversion of unit		
Field	***Power density***	
(V/m)	*(mW/cm^2)*	(W/m^2)
E	$\frac{E^2}{3770}$	$\frac{E^2}{377}$

3.5.1 Information on the Measurements

The dialog box on the top right of the main panel shows specific information concerning the measurement cycle displayed on the screen:

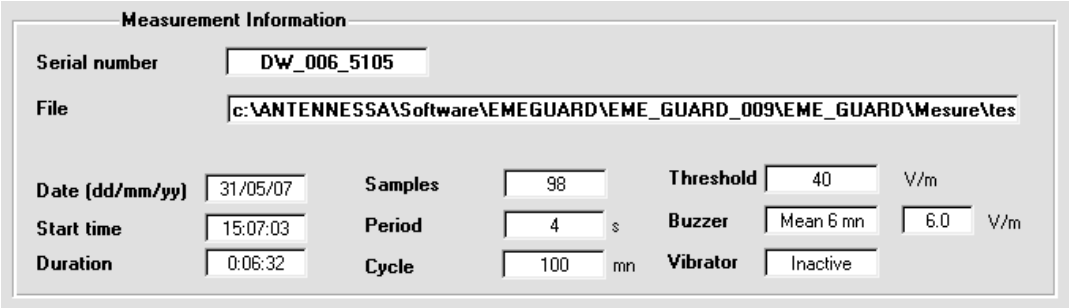


Figure 24 : Measurement information and dosimeter configuration window

⇨ **Serial number**: serial number of the dosimeter
⇨ **File**: name of the file containing the measurements. To read the complete file path, click to the right of the text using the right button of your mouse.
⇨ **Date**: start date of the measurement cycle.
⇨ **Start time**: start time of measurement recording cycle.
⇨ **Duration**: real duration of the measurement recording cycle.
⇨ **Samples**: number of measurements recorded during the cycle.
⇨ **Period**: time (in seconds) between two consecutive recordings.
⇨ **Cycle**: total time (in minutes) of the measurement recording cycle.
⇨ **Threshold**: the reference threshold for the visual alarms (in V/m).
⇨ **Buzzer**: operation mode and audio alarm threshold.
⇨ **Vibrator**: operation mode and vibrating alarm threshold.

3.5.2 Monitoring

The **Monitoring** tab shows the pattern of field measurements over time.

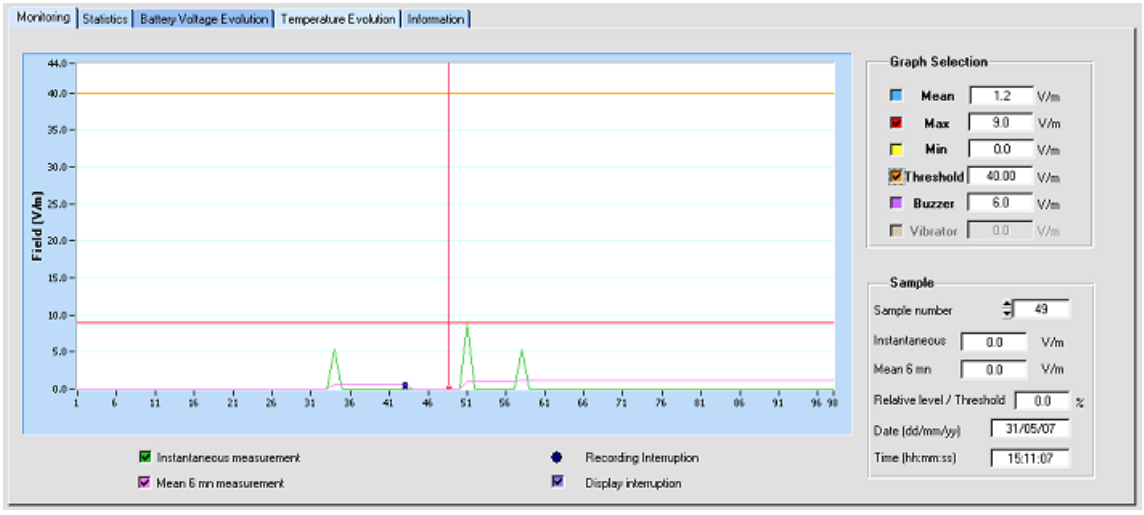


Figure 25 : Monitoring graph

- Selection of curves to be displayed:

By default, the graph shows the pattern of field measurements over time (instantaneous field measurements made by the device), and thus the pattern of mean field values calculated over the six last minutes of measurement (value calculated by EME Guard Analysis software using those instantaneous measurements). Any interruptions to the measurement cycle are indicated by a blue circle on the graph.

To display **Instantaneous measurement**, **Mean 6mn Measurement** and **Display Interruption**, select the appropriate checkbox under the graph.

The different checkboxes situated in the **Graph Selection** dialog box enable the display of the mean (**Mean**) the maximum (**Max)** and the minimum (**Min**) field measurement values, as well as the reference threshold value (**Threshold**) and the thresholds for the audio alarm (**Buzzer**) and vibrator alarm (**Vibrator**) used during measurement.

- Information on a Sample:

It is possible to display precise information on a specific sample. The sample number, the field value and its level in relation to the reference threshold, the date and time of acquisition are displayed in the **Sample** dialog box.

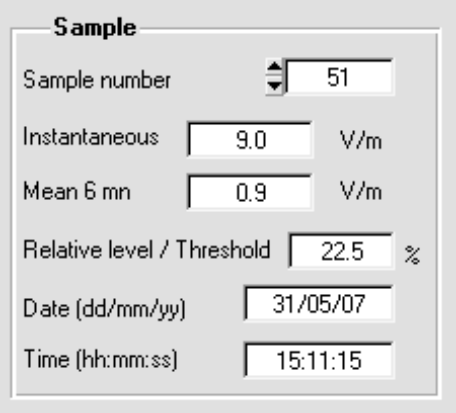


Figure 26 : Sample Dialog Box

Sample selection is possible in 2 ways:

- Numerical list box **Sample Number**: the sample number can be typed in directly or selected using the on-screen arrows or "↑" and "↓" buttons on your keyboard to increase or decrease the number.
- **Cursor** on the graph: position the mouse wherever required then click on the left button of the mouse, or with the left mouse button click on the cursor and drag and drop to its new position. The cursor will automatically fall on the nearest measurement.

Note 2 : Interaction cursor – numerical list box: the numerical list box and the position of the cursor are linked. By modifying the measurement number in the numerical list box, the cursor will move to this measurement. Likewise, if the cursor is moved to a determined measurement, that measurement number will be displayed in the numerical list box.

- Zoom :

It is possible to zoom in between two samples. With a right click drag from the start sample on the left, to the final sample on the right. A blue frame defines the zoom zone on the graph.

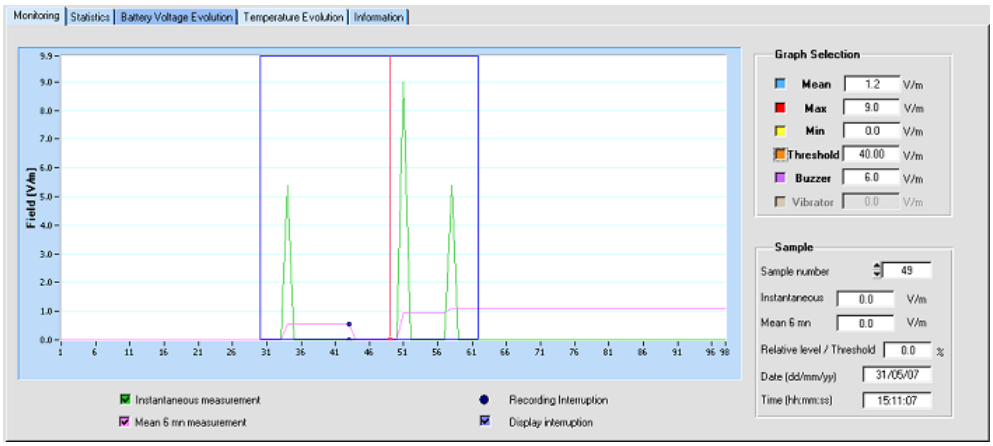


Figure 27 : Selection of Zoom zone

Release the mouse. The graph shows the field values between the two selected samples.

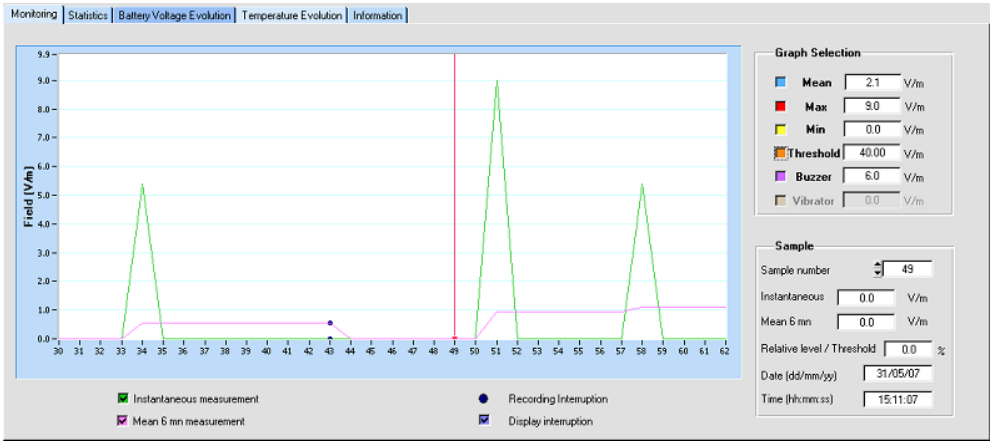


Figure 28 : Monitoring Graph after Zoom

All the display functions described for a graph in normal mode are also available in zoom mode.

To go back to the initial display, position the mouse in the graph and with a right click, drag the cursor to the left, then release.

- Display recording cycle interruptions:

Any interruptions in the recording cycle are indicated on the Monitoring graph by dark blue circles. To display the length of interruption, zoom in with a window width of less than 30 samples.

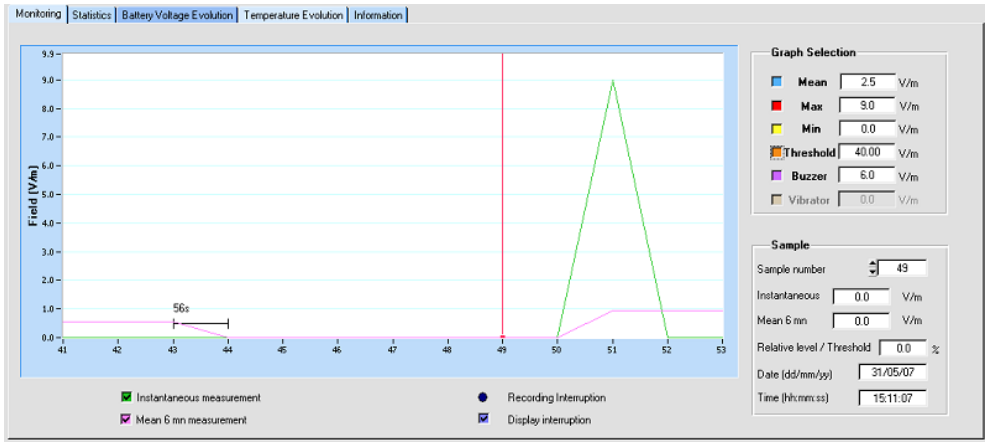


Figure 29 : Length of interruption display

3.5.3 Statistical field measurement display.

The **Statistics** tab shows the statistical data relevant to the loaded measurement file.

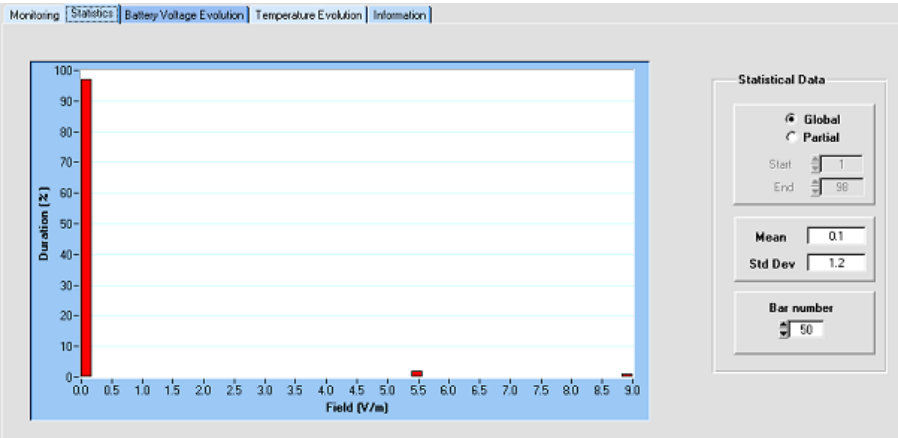


Figure 30 : statistical field data over time

To the right of this graph two values have been calculated:

⇨ **Mean**: mean value of field variation over time.
⇨ **Standard Deviation**: standard deviation of this variation.

Note 3 : use the Bar Number list box to establish the number of bars to be displayed on the graph. This number is automatically set at 50 but it can be modified to between 10 and 200.

It is possible for the user to define a sub-sample of statistics. Select the **Partial** checkbox to the right of the graph. The interval of measurements to be considered can now be defined:

Start: first measurement of the interval
End: last measurement of the interval

Upon each change of interval limits (as long as this is valid), the graph, mean values and standard deviation are refreshed. It is possible to decrease or increase the number of bars in the graph.

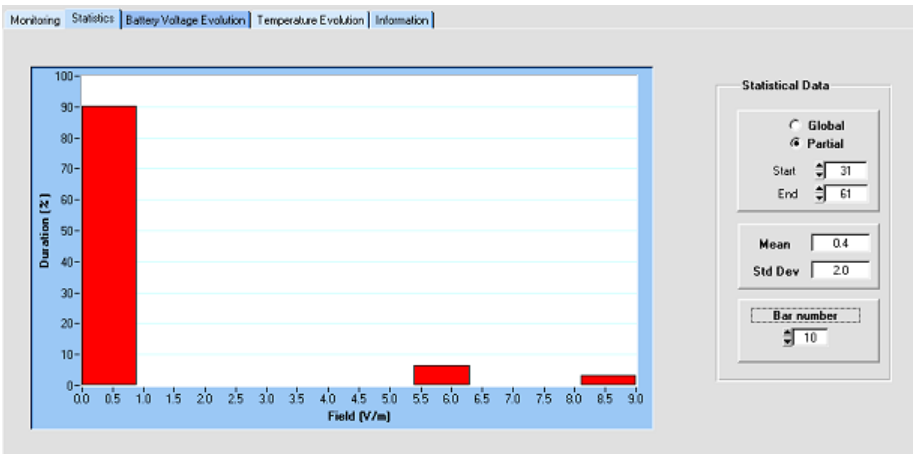


Figure 31 : Statistical display of mean and standard deviation for a measurement interval defined by the user.

By selecting the checkbox **Global,** the statistical display is determined from the total number of measurements.

3.5.4 Battery Monitoring Screen

The Battery Voltage Evolution tab enables the battery voltage over the measurement cycle to be monitored.
The following graph is displayed:

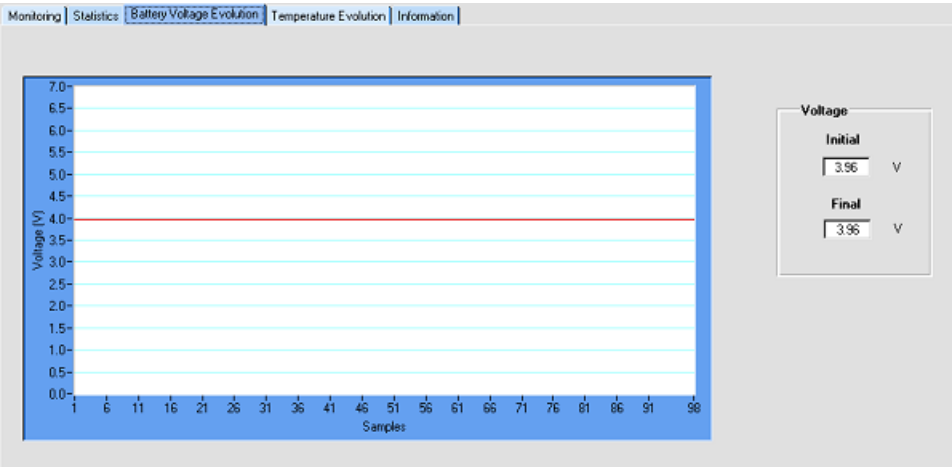


Figure 32 : Battery monitoring screen

In this window a red line indicates battery voltage level over time. To the right of the graph two numerical values are displayed.

⇨ **Initial**: battery voltage at beginning of cycle.
⇨ **Final**: battery voltage at the end of the cycle.

3.5.5 Temperature Monitoring Screen

The **Temperature Evolution** tab enables the temperature over the measurement cycle to be monitored. The following graph is displayed:

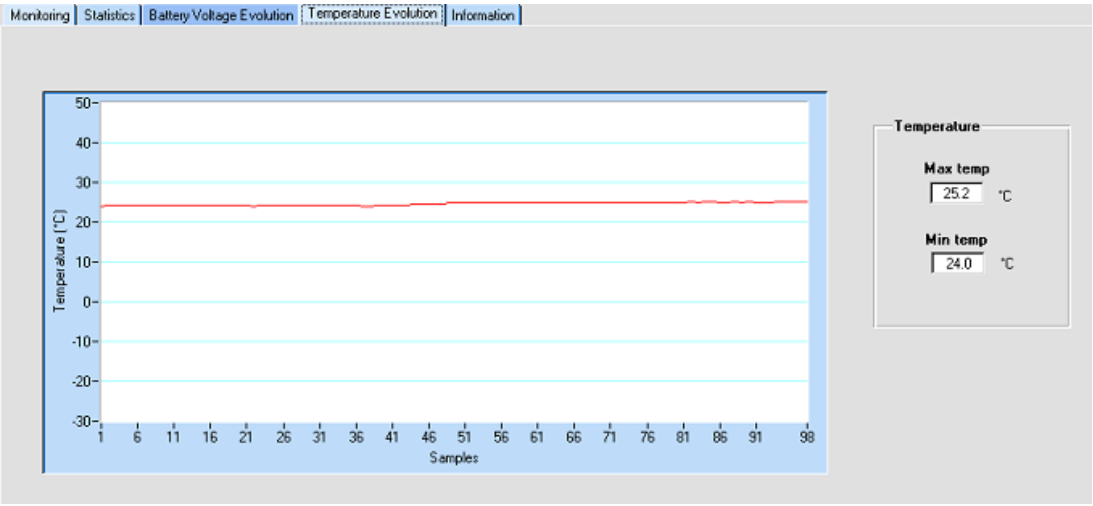


Figure 33 : Temperature monitoring screen

In this screen, a red line on the graph indicates the temperature during the measurement cycle. To the right of the graph two numerical values are displayed:

⇨ **Max Temp**: maximum temperature over the measurement cycle.
⇨ **Min Temp**: minimum temperature over the measurement cycle.

3.5.6 Information Display

The **Information** tab enables the display of information relevant to the measurement. The following dialog box is displayed:

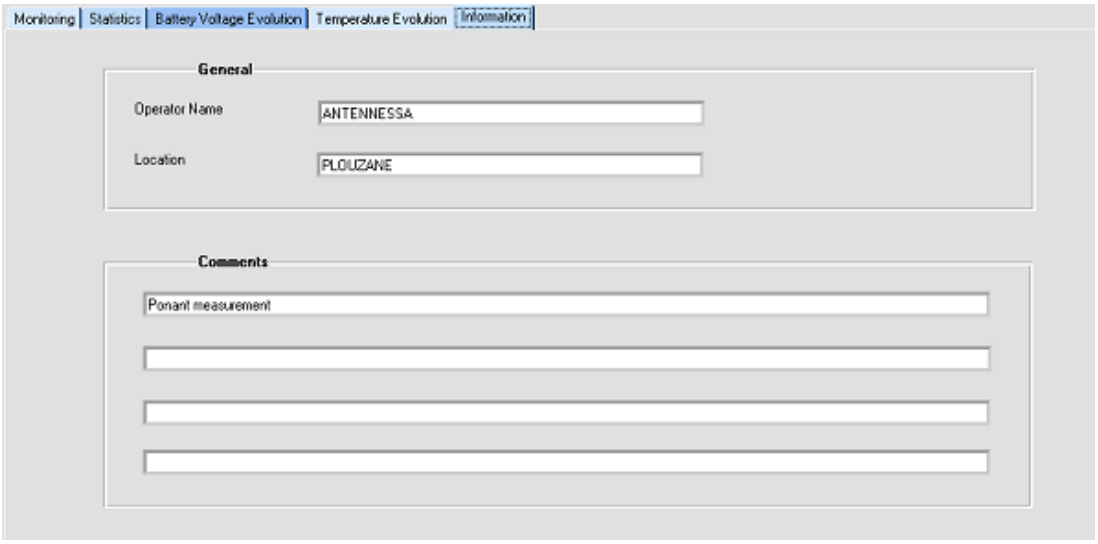


Figure 34 : Information display

This is the information entered by the administrator when configuring the device before the measurement cycle.
No information can be entered in this dialog box.

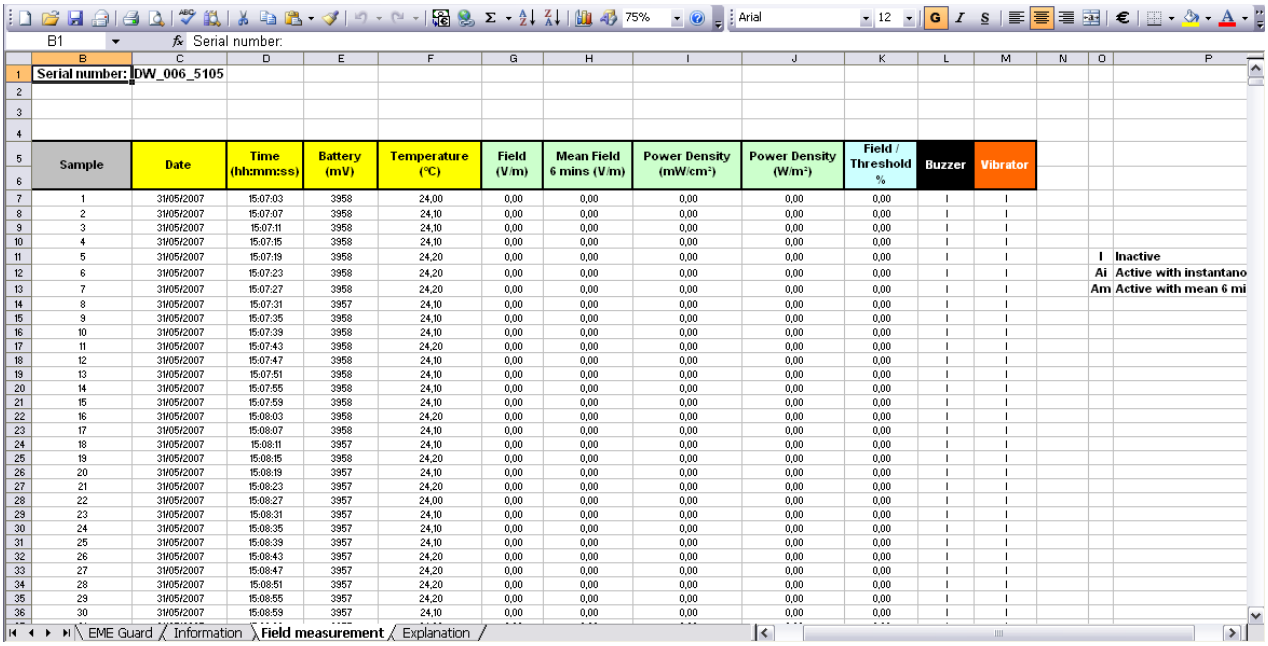
3.5.7 Creation of an Excel Report.

Microsoft Excel is required for this operation

It is possible to create an Excel file from a measurement file.

This Excel file enables access to the information contained in the measurement files:

- Serial Number and calibration dates of the dosimeter which made the measurements.
- Name of Excel file.
- Sample number.
- Date and time of beginning and end of measurement recording cycle.
- Configuration of the dosimeter during the measurement recording cycle (period and duration of cycle, reference threshold for the visual alarms and configuration of the audio and vibrating alarms.
- Measurement details (sample number, date and time of measurement, battery and temperature levels, field values in V/m, W/m² and in mW/cm², level relative to reference threshold and alarm configuration at the time of measurement).
- Information entered (Name of operator, place of measurement and commentaries).



Serial number: DW_006_5105

Sample	Date	Time (hh:mm:ss)	Battery (mV)	Temperature (°C)	Field (V/m)	Mean Field 6 mins (V/m)	Power Density (mW/cm²)	Power Density (W/m²)	Field / Threshold %	Buzzer	Vibrator
1	31/05/2007	15:07:03	3958	24,00	0,00	0,00	0,00	0,00	0,00	I	I
2	31/05/2007	15:07:07	3958	24,10	0,00	0,00	0,00	0,00	0,00	I	I
3	31/05/2007	15:07:11	3958	24,10	0,00	0,00	0,00	0,00	0,00	I	I
4	31/05/2007	15:07:15	3958	24,10	0,00	0,00	0,00	0,00	0,00	I	I
5	31/05/2007	15:07:19	3958	24,20	0,00	0,00	0,00	0,00	0,00	I	I
6	31/05/2007	15:07:23	3958	24,20	0,00	0,00	0,00	0,00	0,00	I	I
7	31/05/2007	15:07:27	3958	24,20	0,00	0,00	0,00	0,00	0,00	I	I
8	31/05/2007	15:07:31	3957	24,10	0,00	0,00	0,00	0,00	0,00	I	I
9	31/05/2007	15:07:35	3958	24,10	0,00	0,00	0,00	0,00	0,00	I	I
10	31/05/2007	15:07:39	3958	24,10	0,00	0,00	0,00	0,00	0,00	I	I
11	31/05/2007	15:07:43	3958	24,20	0,00	0,00	0,00	0,00	0,00	I	I
12	31/05/2007	15:07:47	3958	24,10	0,00	0,00	0,00	0,00	0,00	I	I
13	31/05/2007	15:07:51	3958	24,10	0,00	0,00	0,00	0,00	0,00	I	I
14	31/05/2007	15:07:55	3958	24,10	0,00	0,00	0,00	0,00	0,00	I	I
15	31/05/2007	15:07:59	3958	24,10	0,00	0,00	0,00	0,00	0,00	I	I
16	31/05/2007	15:08:03	3958	24,20	0,00	0,00	0,00	0,00	0,00	I	I
17	31/05/2007	15:08:07	3958	24,10	0,00	0,00	0,00	0,00	0,00	I	I
18	31/05/2007	15:08:11	3957	24,10	0,00	0,00	0,00	0,00	0,00	I	I
19	31/05/2007	15:08:15	3958	24,20	0,00	0,00	0,00	0,00	0,00	I	I
20	31/05/2007	15:08:19	3957	24,10	0,00	0,00	0,00	0,00	0,00	I	I
21	31/05/2007	15:08:23	3957	24,20	0,00	0,00	0,00	0,00	0,00	I	I
22	31/05/2007	15:08:27	3957	24,00	0,00	0,00	0,00	0,00	0,00	I	I
23	31/05/2007	15:08:31	3957	24,10	0,00	0,00	0,00	0,00	0,00	I	I
24	31/05/2007	15:08:35	3957	24,10	0,00	0,00	0,00	0,00	0,00	I	I
25	31/05/2007	15:08:39	3957	24,10	0,00	0,00	0,00	0,00	0,00	I	I
26	31/05/2007	15:08:43	3957	24,20	0,00	0,00	0,00	0,00	0,00	I	I
27	31/05/2007	15:08:47	3957	24,20	0,00	0,00	0,00	0,00	0,00	I	I
28	31/05/2007	15:08:51	3957	24,20	0,00	0,00	0,00	0,00	0,00	I	I
29	31/05/2007	15:08:55	3957	24,20	0,00	0,00	0,00	0,00	0,00	I	I
30	31/05/2007	15:08:59	3957	24,10	0,00	0,00	0,00	0,00	0,00	I	I

I	Inactive
Ai	Active with instantano
Am	Active with mean 6 mi

Figure 35 : Excel report of measurement file

This Excel report facilitates information processing, graph creation, printing and the calculation of complex functions.

Creation of Excel File:

- Open the measurement file and select **File ⇨ Report ⇨ Excel Report**. This opens the Windows save file window.
- Choose the name and location in which the measurements are to be saved. By default, the file is placed in the folder **Rapports_Excel** in the work folder and will have the same name as the measurement file (if the opened measurement file is « mesure1.bin »,the Excel file created will have the name « mesure1.xls »).

NB :

- Each time the **Excel Report** menu is selected, a new Windows Save File window is opened, even if the .xls file has already been created. Thus several Excel files for one measurement file could possibly be created.
- Once created , it is always possible to access the Excel files directly through the Excel application.

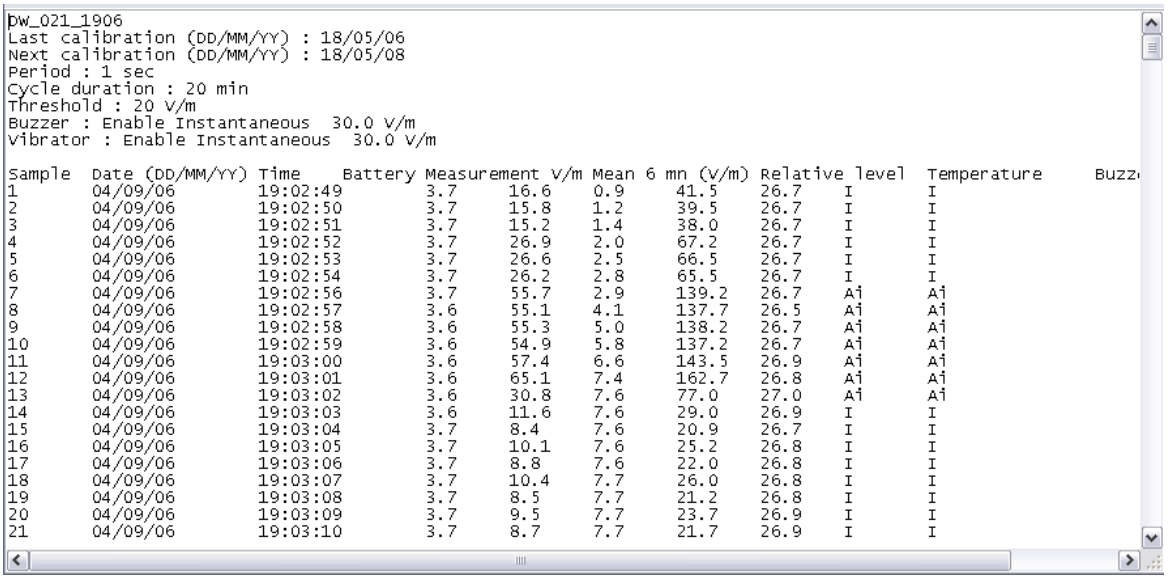
3.5.8 Creation of a Text Report

NotePad is required for this operation

It is possible to create a file in text format from a measurement file.

The text file also enables access to the information contained in the measurement file:

- Serial Number and calibration dates of the dosimeter which made the measurements.
- Name of Excel file.
- Sample number.
- Date and time of beginning and end of measurement recording cycle.
- Configuration of the dosimeter during the measurement recording cycle (period and duration of cycle, reference threshold for the visual alarms and configuration of the audio and vibrating alarms.
- Measurement details (sample number, date and time of measurement, battery and temperature levels, field values in V/m, level relative to reference threshold and alarm configuration at the time of measurement).



Dw_021_1906
Last calibration (DD/MM/YY) : 18/05/06
Next calibration (DD/MM/YY) : 18/05/08
Period : 1 sec
Cycle duration : 20 min
Threshold : 20 V/m
Buzzer : Enable Instantaneous 30.0 V/m
Vibrator : Enable Instantaneous 30.0 V/m

Sample	Date (DD/MM/YY)	Time	Battery	Measurement V/m	Mean 6 mn (V/m)	Relative level	Temperature	Buzz
1	04/09/06	19:02:49	3.7	16.6	0.9	41.5	26.7	I	I	
2	04/09/06	19:02:50	3.7	15.8	1.2	39.5	26.7	I	I	
3	04/09/06	19:02:51	3.7	15.2	1.4	38.0	26.7	I	I	
4	04/09/06	19:02:52	3.7	26.9	2.0	67.2	26.7	I	I	
5	04/09/06	19:02:53	3.7	26.6	2.5	66.5	26.7	I	I	
6	04/09/06	19:02:54	3.7	26.2	2.8	65.5	26.7	I	I	
7	04/09/06	19:02:56	3.7	55.7	2.9	139.2	26.7	Ai	Ai	
8	04/09/06	19:02:57	3.6	55.1	4.1	137.7	26.5	Ai	Ai	
9	04/09/06	19:02:58	3.6	55.3	5.0	138.2	26.7	Ai	Ai	
10	04/09/06	19:02:59	3.6	54.9	5.8	137.2	26.7	Ai	Ai	
11	04/09/06	19:03:00	3.6	57.4	6.6	143.5	26.9	Ai	Ai	
12	04/09/06	19:03:01	3.6	65.1	7.4	162.7	26.8	Ai	Ai	
13	04/09/06	19:03:02	3.6	30.8	7.6	77.0	27.0	Ai	Ai	
14	04/09/06	19:03:03	3.6	11.6	7.6	29.0	26.9	I	I	
15	04/09/06	19:03:04	3.7	8.4	7.6	20.9	26.7	I	I	
16	04/09/06	19:03:05	3.7	10.1	7.6	25.2	26.8	I	I	
17	04/09/06	19:03:06	3.7	8.8	7.6	22.0	26.8	I	I	
18	04/09/06	19:03:07	3.7	10.4	7.7	26.0	26.8	I	I	
19	04/09/06	19:03:08	3.7	8.5	7.7	21.2	26.8	I	I	
20	04/09/06	19:03:09	3.7	9.5	7.7	23.7	26.9	I	I	
21	04/09/06	19:03:10	3.7	8.7	7.7	21.7	26.9	I	I	

Figure 36 : Measurement file text report

Creation of a text file:

- Open the measurement file and select the menu **File ⇨ Report ⇨ Text Report**. The Windows Save File window opens.
- Choose the name and location of the file in which the measurements are to be saved. By default the file will be placed in the folder **Rapports_Texte** in the work folder and will have the same name as the measurement file (if the name of the loaded measurement file is « mesure1.bin », the text file created will have the name « mesure1.txt »).

NB :

- Each time **Text Report** menu is selected, a new Windows Save File window is opened, even if the .txt file has already been created. Thus several Text files for one measurement file could possibly be created.
- Once created, it is always possible to access the Text files directly through the NotePad application. Opening the Text file through Excel displays the information in different columns.

3.6 MENUS

The EME Guard Analysis measurement software proposes different menus to obtain and help and information on its use.

3.6.1 File Menu

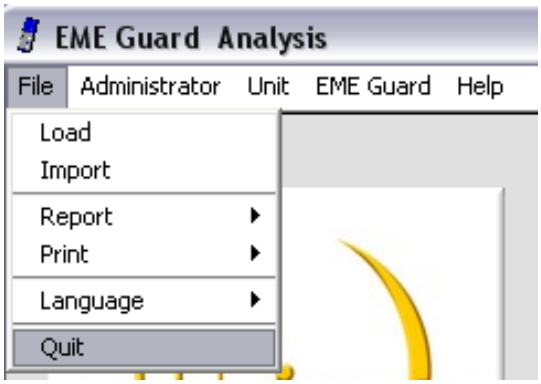


Figure 37 : File Menu

1. **Load**: like the **Load** button on the main interface, enables the measurement file to be loaded.
2. **Import**: like the **Import** button on the main interface, enables the measurements recorded in the EME Guard to be imported.
3. **Report**: this submenu is only activated if a measurement file has been opened. It contains the two submenu **Excel**.**Report** and **Text Report**.
4. **Print**: This submenu is only activated if a measurement file has been loaded. It contains two submenus **Monitoring Print** and **Print Screen**.
5. **Language**: enables selection of software language.
6. **Quit**: like the Quit button on the main interface, enables the user to quit the application

3.6.2 Administrator Menu

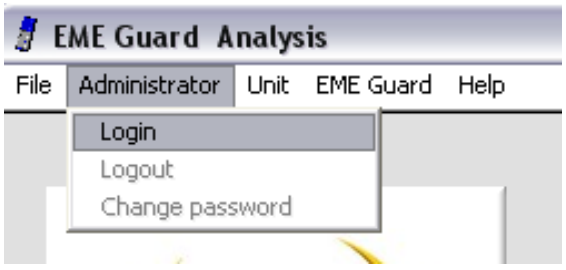


Figure 38 : Administrator Menu

1. **Login**: enables the user to log in using administrator mode. The user defines the administrator mode password on first use of the software. The user will have to enter this password to log in as administrator for subsequent connections. The **Configuration** button on the main interface will then become accessible.
2. **Logout**: enables the user to log out of administrator mode. The **Configuration** button of the main interface thus becomes inaccessible. This submenu is only accessible if the user connects in administrator mode.
3. **Change password**: enables the administrator password to be changed. This submenu is only accessible if the user has logged in as administrator.

3.6.3 Unit Menu

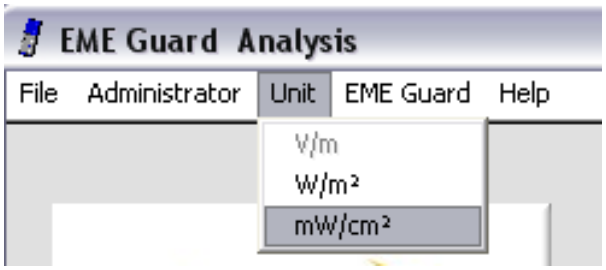


Figure 39 : Unit Menu

This window enables the display of measurements either in V/m (unit by default) or in W/m² or mW/cm².

The active unit is inaccessible.

Warning ! A change of unit is only possible if a measurement file has been loaded.

3.6.4 EME Guard Menu

Only the administrator can access the submenus **Configure** and **Read the calibration dates** in the **EME Guard** menu.

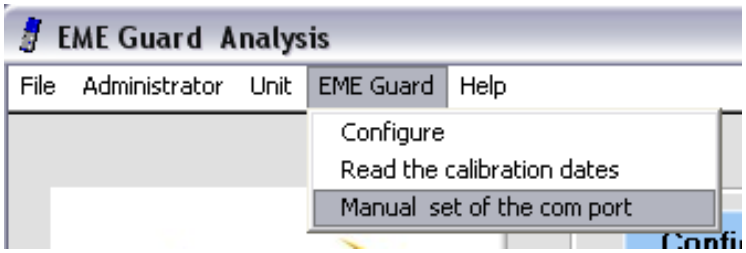


Figure 40 : EME Guard Menu

1. **Configure**: like the **Configure** button on the main interface, enables the dosimeter to be configured (measurement recording cycle, alarms, information, date and time).
2. **Read the calibration dates**: enables the last and next calibration dates of the connected device to be displayed. To access this information, connect the device to the computer. When the device has been connected, the following dialog box is displayed:

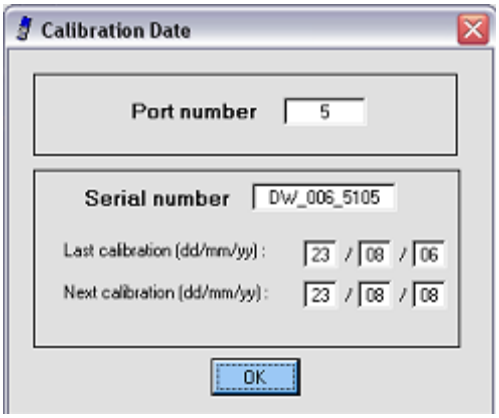


Figure 41 : Calibration Date

The dates and serial number of the dosimeter are displayed in the text boxes of the dialog box.

3. Manual identification of serial number: enables the serial number used for dialog between the computer and dosimeter to be entered manually.

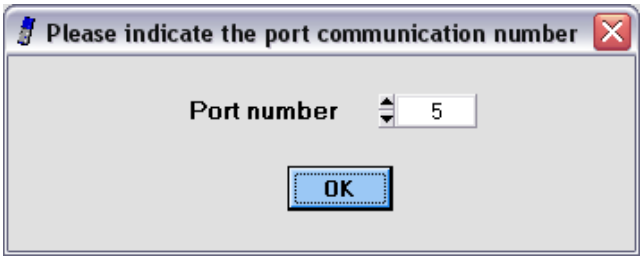


Figure 42 : Manual communication port identification

The communication port which was previously used or detected automatically is indicated in the port number text box of the dialog box.

3.6.5 Help Menu

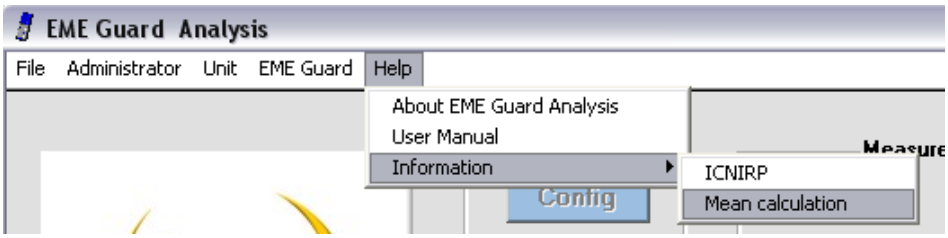


Figure 43 : Help Menu

1. About EME Guard Analysis: provides information on the software version and the contact details of the company SATIMO.

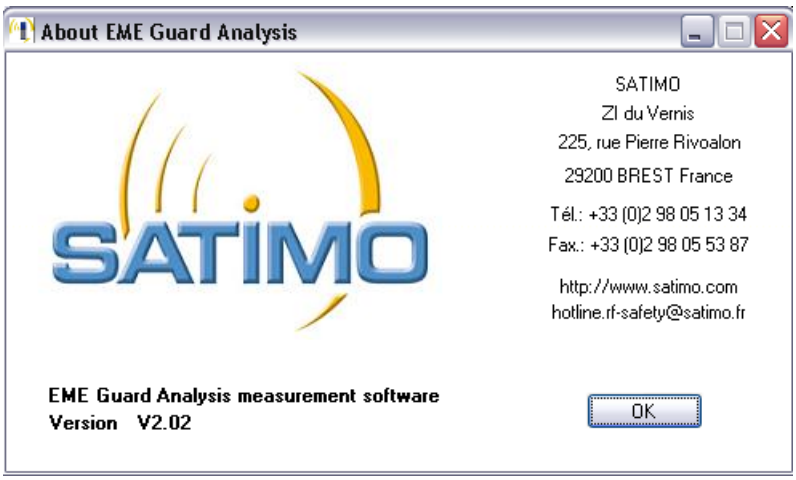


Figure 44 : Software information screen

2. User manual: enables access to the EME Guard Analysis V2 user manual.

Adobe Reader is required for this operation.

3. Information on the subject of ICNIRP values: enables the display of the different reference values for the exposure of the public and workers recommended in the ICNIRP norm. When selected from the menu, the following dialog box is displayed:

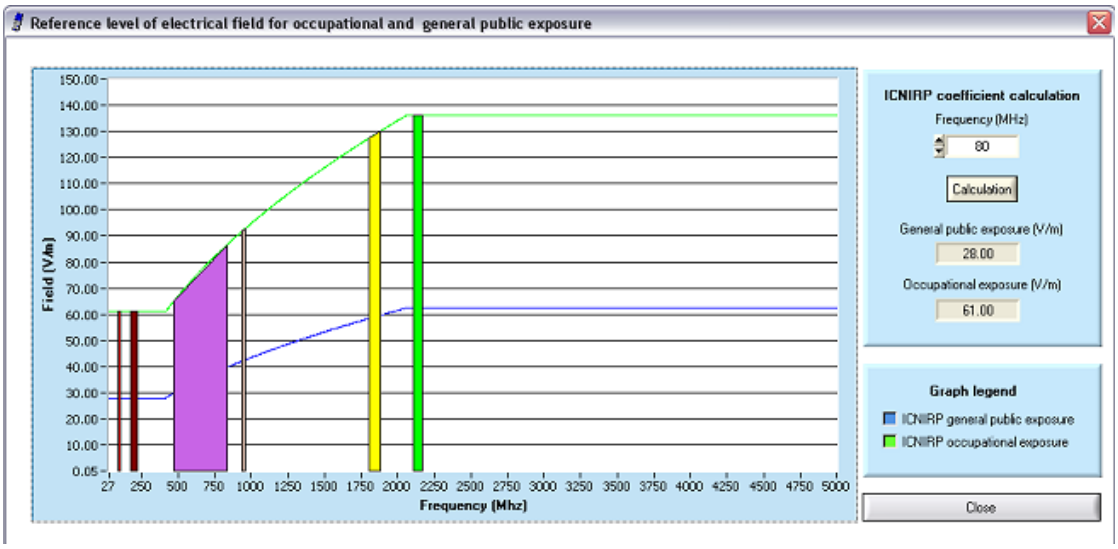


Figure 45 : Information graph on the subject of ICNRP values

4. Information on the calculation of the mean value over 6 minutes: when selected from the menu, the following dialog box is displayed:

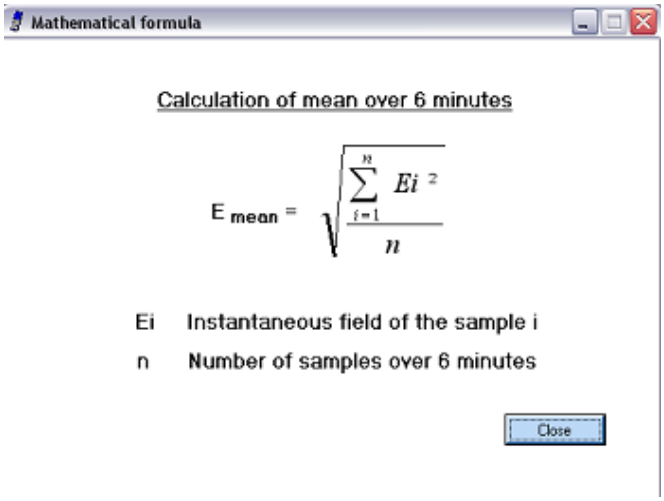


Figure 46 : Information on the subject of mean field calculation

RF Safety Product Center
SATIMO Bretagne

Technopole Brest Iroise
Z.I. du Vernis
225 rue Pierre Rivoalon
29200 Brest, FRANCE
Tel: +33 (0)2 98 05 13 34
Fax: + 33 (0)2 98 05 53 87
hotline.rf-safety@satimo.fr
www.satimo.com