NEMO LOGGER

FOR INDOOR AIR POLLUTANTS

FORMALDEHYDE – CO$_2$ – T – P – RH - LVOC

USER MANUAL

ethera

Certification

NEMo comply with the following European standards:

EN 61326-1 relating to electronics EMC

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General Information

ETHERA® - user Guide of 20/06/2019
NEMO LOGGER FOR INDOOR AIR POLLUTANTS

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Summary

1. FOREWORD

You have acquired a NEMo logger and we thank you for your confidence. The Ethera's NEMo is a professional measurement tool for the specific indoor air pollutant content. This manual is intended to explain how your logger is operating and to detail the measurement procedure and the supplied Profil'air® manager software use.

IMPORTANT

- **This manual describes the functions related to Profil'air manager 3.2.X.X and above. If you have an older version of Profil'air manager, please download the data saved in the internal memory of your NEMo and update Profil'air manager and your NEMo (see the dedicated section in this manual).**

- **The indoor air pollutant concentration measurement uses analysis and sampling technique precisely defined. It is mandatory to comply with the specified instructions and process modes.**

- **It is recommended to read this entire manual before any use of the kit.**

- **To ensure measurement reliability, it is essential to not reuse a sensor once its limit of use has been reached.**

- **In case you have disabled CO_2 sensor auto-calibration, it is essential to carry out regular adjustment of CO_2 sensor offset (maximum advised time between two adjustments: 1 month).**

- **As the recorder can be stored several months before sending, it is necessary to proceed to the unit commissioning as described in this manual before the first use.**

HARDWARE OVERVIEW

1. NEMO

NEMo is a portable logger of Indoor Air Quality (IAQ) to continuously and selectively measure confinement (CO_2) and formaldehyde within the levels stipulated for indoor air quality. NEMo also measures comfort parameters such as temperature and humidity.

Continuous measurement of these parameters, along with new management and analysis software, allows an accurate analysis of occupants' exposure to pollutants and identification of pollution peaks.

Once the campaign is achieved, only a few clicks are required to collect the data and generate complete and visual reports, allowing to understand how the studied building operates and to identify possible sources of pollution.

The manager can thus undertake highly effective and more economic corrective actions best suited to the type of building: optimization of the ventilation, development of "good practices" (opening windows, cleaning schedules...)

Why CO_2?

Carbon dioxide is not chemically toxic (except at very high concentration) but has a strong influence on awareness and psychomotor performance as soon as the concentration in an enclosed space exceeds 1000ppm. It is produced by humans during respiration and is typically extracted through the ventilation system or by aeration. Thus, it is a reliable indicator of good design and operation of the ventilation and confinement of a room.

Why formaldehyde?

Formaldehyde is one of the main pollutants of indoor air. This carcinogenic product is present in many manufactured goods used in building construction or decorative products. It is ubiquitous in dwellings and offices, where we spend over 80 % of our time. In the long term, formaldehyde can lead to serious health problems, especially affecting respiratory tract diseases (asthma, bronchial irritations...).

The combined analysis of these two parameters allows optimal management of the building's energy performance, at the same time preserving the health of its occupants.

2. SIGFOX

Your **NEMo** is equipped with a Sigfox module. The Sigfox network is a cellular network dedicated to the Internet of things (IoT). It allows devices equipped with the Sigfox module and the associated subscription to send data to a cloud via this network.

In order to use this module, you have to subscribe to the following services:

- The NEMo Cloud annual subscription, allowing you to have access to the NEMo Cloud's features (see below)
- The additional annual subscription to the Sigfox service, allowing you to upload data via the Sigfox service.

If you decide to purchase the Sigfox subscription after purchasing NEMo, **it is necessary to return your device to the factory** in order to activate the module. In this case, please contact us.

Once the module has been activated, **data will be sent to the Sigfox network automatically while NEMo is in campaign mode** with no additional operation needed from the user. However, **the time interval must remain default (10 minutes).**

The NEMo Cloud service has following features:

- Visualising data remotely and in real-time via our NEMo Cloud web interface
- Downloading data from NEMo Cloud for integration into Profil'air Manager (For example, to edit a report)
- Exporting measurement curves (available formats: png, jpeg, pdf, svg)

3. CONTENT

NEMO

- NEMo Indoor Air Quality (IAQ) logger (1)
- Charger and USB/MicroUSB cable for NEMo logger (2)
- Profil'air® manager software installation USB key (3)
- Formaldehyde calibration badge (NEMo sensor with black photographic film in the monolithic reagent slot) and outdoor-calibration badge for CO_2 sensor (NEMo sensor with a white plastic monolith in the monolithic reagent slot.
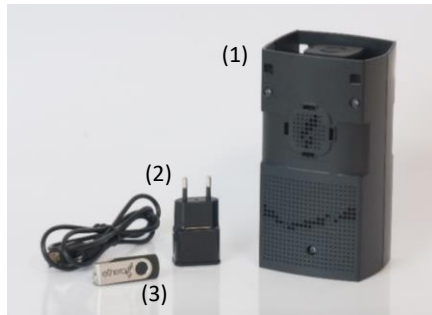
Required configuration: PC with Windows 7/8/10, MAC OSX with 1 available USB ports

ADDITIONAL MODULES (OPTIONAL)

- (4) NEMo Ceiling suspension kit
- (5) NEMo diffuser maintenance pack : 5 microporous membranes + 5 caps
- (6) Additional charger and USB/MicroUSB cable for NEMo logger
- (7) NEMo tube adapter for CO2 sensor's calibration

(4)   (5)   (6)   (7)

SENSORS
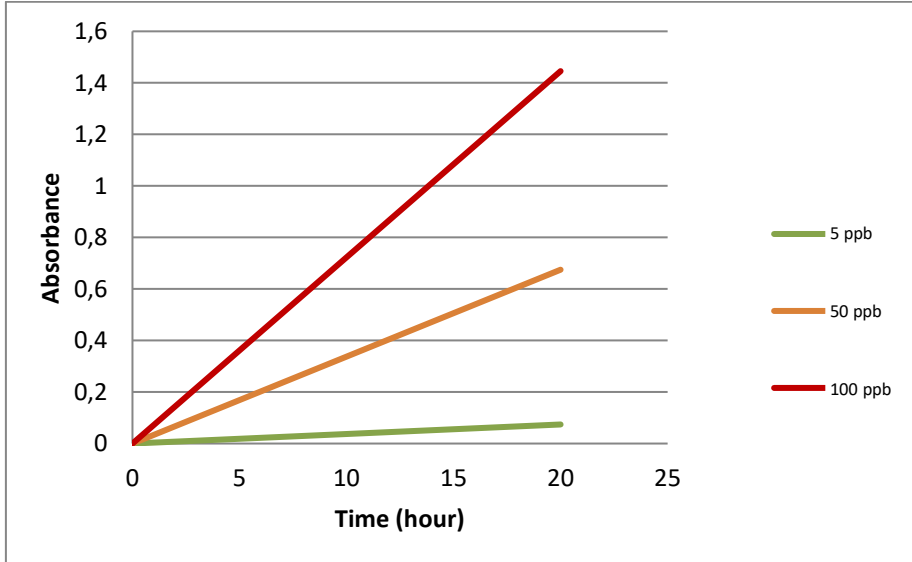
(8) NEMo Formaldehyde Sensors (x5 or x 25 boxes)

(10)

BEFORE STARTING

1. FORMALDEHYDE MEASUREMENT PRINCIPLE

Ethera technology allows an evaluation of gas content by measuring the optical change speed of a specific chemical sensor. **This measurement** is performed with a free air exposure sensor (passive or **static** measurement).

Sensor absorbance variation for different pollutant contents

NEMo incorporates an optical reader capable of measuring at regular intervals the nanoporous material's absorbance of the Formaldehyde sensor and therefore automatically calculate the formaldehyde concentration on defined time intervals. Then, the values are displayed in real time on NEMo cloud interface. They also stored on the device and can be downloaded to the computer in order to get the results and print reports.

2. MEASUREMENT PROCESS

Start and install the logger

Record the data

Download the data

Print the report

a. Insert the sensor, start NEMo in campaign mode (Green LED) and position it at the desired location.

b. Leave NEMo on site for a period of 5 to 7 days (Green LED). Once collection is done, retrieve NEMo and put it in hibernation mode (Red LED).

c. Connect NEMo via USB / MicroUSB cable on a computer equipped with the Profil'Air Manager software, launch the software and set NEMo to "Live" mode (Orange LED). Download the data.

d. Edit report

3. TERMS OF USE AND CONSERVATION

Optimizing the measurement accuracy

- Temperature within 10 and 30°C during measurement

- Humidity within 30 and 70% RH uncondensed during measurement

- Do not perform static measurements near a source of ventilation, heat or combustion (ventilation, lighting, windows, radiators, gas stove, candle, chimney...)

Sensors storage

- Sensors must be stored in a refrigerator at a temperature between 4 and 8 °C.

- Unseal a sensor packaging maximum 20 minutes before the initial measurement.

Equipment storage

- Do not put the equipment close to a heat source.

- Store the equipment in a clean and dry location.

- It is recommended to store the equipment in its original packaging and stored flat in a closed cabinet.

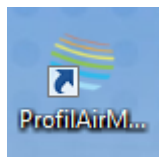# PROFIL'AIR MANAGER INSTALLATION AND CONFIGURATION

1. INSTALLATION PROCEDURE

1. Run the "Profilair_setup.exe" file from USB key and follow instructions of the installation wizard.

2. The default directory is recommended
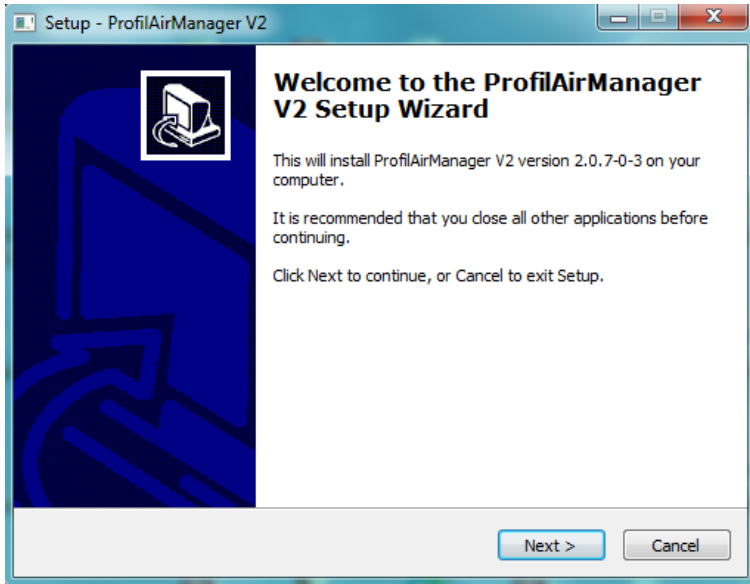
3. Once installation is complete, launch the software from the desktop icon.

2. STARTUP SOFTWARE

To start Profil'Air Manager, double click on the desktop icon.

MAIN MENU / RESULTS

④ ⑤ ⑥ ⑦ ⑧

⑪

(10a)(10b)(10c)(10d)(10e)(10f)(10g)

Details

Device / Logger	Temperature	Pressure	Humidity	CO2	ICO	LVOC
NEMo (6011501000882)	21.4 °C	987 mb	47 HR%	587 ppm	0	56 ppb
(6011501000646)	22.1 °C	987 mb	47 HR%	597 ppm	0	63 ppb

(10h)

(10i)

▼ **Measures**

Start	18/5/15 13:37:18
End	27/5/15 04:37:18
Total time	8 days 15 h 0 min 0 s
Number of values	1243
Confinement index	0 No confinement

	Min.	Max.	Avg.
Pressure	980 mb	994 mb	987 mb
Temperature	21.0 °C	27.0 °C	22.1 °C
Humidity	36 HR%	58 HR%	47 HR%
CO2	341 ppm	1332 ppm	597 ppm
LVOC	22 ppb	266 ppb	63 ppb
Formaldehyde	1.8 ppb	110.4 ppb	25.6 ppb

▼ **Logger (6015010006465)**

Information's date	No information
Firmware's version	--
Available memory	--
Data to download	--
Battery level	--

▼ **Measure Calibration**

No calibration

☑ CO2 (x10 ppm)   ☑ LVOC (x10 ...)   (10j)   ☑ Formaldehyde (ppb)

(10k)

▼ **Messages log**

28/7/15 14:02:45 > Refresh the list of connected devices
28/7/15 14:02:52 > Connection to device PA-STA036 n°
6011501000882
28/7/15 14:05:49 > Users parametrs changes

dim. 24   lun. 25   mar. 26   27/05/15

① "settings" button: select language (restart required), units (ppb ; µg/m3) and date formats. Creation of presence calendar for ICONE index calculation.

② Saving icon : Save your database by clicking on this icon

 Please save your data regularly, especially after downloading data from a sensor.

③ Devices list: A device is either a formaldehyde optical reader, an RF key for Profil'Air station V2 or a NEMo driver.

④ Updating the devices list

⑤ Switching between Profil'Air Station use or NEMo use

 To use a Nemo, you must be in NEMo mode

⑥ "New measurement" button: If the selected device is a Nemo, this button provides access to "Live" mode ("Live" measurement, data download, calibration).

⑦ Return to Main Menu

⑧ Open / close side panels (Grouped by and Details)

⑨ "Grouped by" panel: Displays campaigns or Nemo lists

      (9a): Create a new campaign

      (9b): Edit a campaign

      (9c): Delete a campaign

      (9d): Changing displaying mode

      (9e): Display campaigns list

      (9f): Display Nemo list

(9g): Campaigns / NEMo list

⑩ "Measures" panel: displaying measurements results

(10a): Selection of information to be displayed and display order.

(10b): Display calibration data of the Nemo used for selected measurement.

(10c): Edit a report

If a presence period calendar is selected, the values displayed in the report are the values calculated based on the attendance hours of that calendar.

(10d): Export a measure

(10e): Import a measure

(10f): Edit a measure. Change the following information: campaign, city, building, room.

(10g): Delete a measure

(10h): List of measures carried out for a campaign / a given Nemo.

It is possible to display several measures in the Graph window (10j). To do so, select a measurement by clicking on the corresponding line and then click on the lines corresponding to other measures to be displayed while holding down Ctrl.

(10i): Changing displaying mode

(10j): Selection of parameters to be displayed on the graph

(10k): Graph

When the computation of the formaldehyde concentration is disturbed (considerable humidity change, sensor being outdated or too opaque), the measurement will be represented by a thicker grey line and an error code is shown in the csv file that can be generated using the export button (10d).

When the formaldehyde level in the room is below the detection limit (too low or no pollution), formaldehyde is represented by a thick grey bar on the 0 ppb axis.

⑪"Details" panel: Displays information on the different measures and Nemo

If a presence calendar is selected, the values displayed in the "Details" panel are the values computed on the attendance hours of that calendar.

1. PREAMBLE TO THE IMPLEMENTATION OF MEASURES

Nemo has 3 operating modes. Each mode is associated with a LED color located on its side (1 LED for each mode + 1 LED for battery load indicator). At any time, you can check the activated operating mode. To do this, pass a single magnet stroke on the magnet passage area. The LED that corresponds to the activated operating mode flashes and then stops.

Magnet passage area
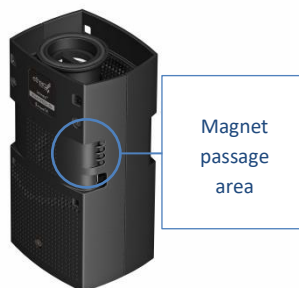
- Hibernation Mode (red LED): In this mode, Nemo is on standby. It does not measure and does not communicate with the computer in order to save battery during storage. Changing mode is done by successive magnet strokes (See Commissioning).

- Live Mode (orange LED): This mode allows to download the measures realized in campaign mode and to configure the device. If needed, the CO_2 sensor calibration is performed in this mode too. For compatible parameters (CO_2, T, HR, P), this mode also allows measurements on short time period (15 seconds by default). These measurements are sent directly to the computer and displayed on the screen. In this mode, measurements are not saved in the internal memory of NEMo or on the computer. In case of loss of the connection (USB cable unplugged, for example), data will be lost (unless user has performed a manual backup using the procedure p 39-40).

- Campaign Mode (green LED): This mode allows to perform measurements on a long time period (10 minutes for CO_2 / VOC / T / P / HR and 2 hours for formaldehyde). During the campaign, these measurements are stored in NEMo's internal memory. Once the campaign ends, the operator returns to Live mode by successive magnet strokes and downloads the data on the computer.

2. CHANGING MODE

To change mode, give several magnet strokes on the area reserved to this purpose. Each mode is symbolized by a colored LED (red = hibernation; green = campaign; orange = Live). The LED flashes correspond to the action performed (Slow flashing = active mode information; steady LED = second magnet stroke taken into account; Fast flashing = changing mode is possible by a magnet stroke.) The changing mode procedure is circular (Hibernation> Campaign> Live> Hibernation etc...) and is performed by the following operations:

a) Give a magnet stroke on the magnet passage area.
b) The LED flashes slowly (LED indicates the active mode).
c) While the LED flashes slowly, give a second magnet stroke on the magnet passage area.
d) The diode freezes (indicating that the second magnet stroke was taken into account) and then quickly flashes (change mode is possible by a magnet stroke)
e) While the LED flashes rapidly, give a third magnet stroke on the magnet passage area.
f) The LED flashes slowly with the color corresponding to the new active mode and then flashes faster
g) At this step, two options are available :
   o IF no magnet stroke is given, the LED switches off, the new active mode is launched.
   o IF a magnet strokes is given during the rapid flashing, Nemo goes to the next mode (and you are back to step f)

You can check the active mode at any time. To do that, give a magnet stroke <u>when the LED are off</u>. The LED corresponding to the active mode flashes slowly and then switches off. If no magnet stroke is given during the flashing, Nemo does not change mode.

3. OTHER OPERATIONS INVOLVING MAGNET

The magnet passage can also be used to trigger some specific actions depending on the active mode and the badge inside NEMo. To do so, a manipulation called "double magnet stroke" shall be used, with steps as the following:

a) Give a magnet stroke on the magnet passage area.
b) The LED flashes slowly (LED indicates the active mode) then turns off after a few seconds.
c) Wait 2 seconds after the LED has turned off, then give a second magnet stroke on the magnet passage area.
d) The LED flashes slowly (LED indicates the active mode) then all the LEDs flash with a predefined sequence.
e) Wait for a few seconds, then the LEDs on NEMo would indicate the status for the action:
   - Fixed orange + flashing green: the action is performed correctly.
   - Fixed orange + flashing red: error, restart manipulation.
f) The said action is performed.
g) Following LEDs flashing sequence would start (duration and sequence of which are depended on the action). As soon as the said action is finished, the LEDs on NEMo would indicate the current status with flashing:
   - Fixed orange + flashing green: the action is performed correctly.
   - Fixed orange + flashing red: error, restart manipulation.

As mentioned above, this manipulation can lead to different effects depending on the initial mode as well as the type of badge inside NEMo at the moment.

Initial mode	Type of badge inside NEMo	Action to launch
Hibernation	Formaldehyde calibration badge	Calibrate NEMo's optical reader (30 s -1 min)
Hibernation	CO_2 outdoor-calibration badge**	Auto-calibrate NEMo outdoor (30 min – 1h)
Hibernation	Paring badge for NEMo connect	Pair NEMo with the NEMo Connect box linked with the badge
Hibernation	Unpairing badge for NEMo connect	Unpair NEMo from all other devices

| Campaign	No badge for formaldehyde measuring	Connect to Sigfox network and/or to the matching NEMo connect

4. COMMISSIONING

This commissioning is necessary to ensure reliable measurements. Indeed, NEMo can be stored for several months before sending so it is necessary to charge the battery and commissioning its various sensors.

CHARGING BATTERIES

Ensure battery is charged before using Nemo by following the next steps:

CHECKING BATTERY LEVEL

- Set NEMo to live mode (orange LED) and connect it to the computer with the USB / MicroUSB cable

- Start Profilair Manager

- Make sure that NEMo is connected. PA-STA036 followed by a number must appear in the devices list

PA-STA036 : 6011501000202
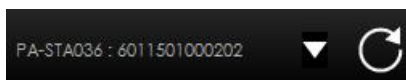
- Switch to live mode using the icon

- Make sure that NEMo is detected and in Live mode. A line must appear in the recorders list with "Live" written in "Mode" column.

Loggers list   Hub 6011501000882

Name	Identification	Mode	To measure	Display	Data to download	Date and time
NEMo	6011501000882	Live	☑ active	☑ shown	About 1242 measures	28/7/15 14:13:49

- Click on this line. Its color changes.

- In the "Details" panel on the right, check battery level in the part "NEMo (serial number)".

- Set NEMo to hibernation mode (by magnet strokes or via the "change mode" menu and then "hibernation")
- If this level is not 100%, charge NEMo.

CHARGING NEMO

To recharge NEMo:

- Set NEMo to hibernation mode (red LED)
- Connect NEMo to an AC outlet using the NEMO® charger and USB / MicroUSB cable.
- The charging LED turns red indicating that NEMO is charging.
- When the charging LED turns green, Nemo is loaded.
- If the charging LED turns orange (safety mode), disconnect and reconnect the charger (the LED turns red again and the charge resumes)

ⓘ *A full charge (0-100%) is about 4 hours for NEMo with one battery*

FORMALDEHYDE SENSOR CALIBRATION

Before carrying out the first formaldehyde measurement, it is necessary to calibrate the NEMo optical reader. It is advised to carry out a calibration every month. To do so:

PERFORMING THE CALIBRATION

- Set NEMo to hibernation mode
- Have the formaldehyde calibration badge ready (provided in the kit)
- Put the calibration badge in NEMo (the one with the black film)
- Perform the manipulation "double magnet stroke" (see the dedicated section)
- Take the calibration badge out and put it back in its holder

CHECKING

- Set NEMo to live mode (orange LED) and connect it to computer with USB / MicroUSB cable
- Start Profil'air Manager
- Make sure that NEMo is connected. The reference PA-STA036 followed by a series of numbers must appear in the "devices" list

PA-STA036 : 6011501000202

- Switch NEMo to live mode by clicking the button
- Make sure that NEMo is being detected on Live mode. A line must appear in the recorders list with "Live" appeared in the column "Mode".

Loggers list Hub 6011501000882

Name	Identification	Mode	To measure	Display	Data to download	Date and time
NEMo	6011501000882	Live	☑ active	☑ shown	About 1242 measures	28/7/15 14:13:49

- Click on this line, as the colour changes.

- In the "Details" panel on the right, go to the "Calibration (serial number)" part. Make sure there is a green square next to the line OP420 as well as the date where the calibration is carried out.

- Click on the button [image] to save all the modifications
- Set NEMo to hibernation mode (using magnet strokes or via "change mode" then "hibernation")

CO$_2$ SENSOR COMMISSIONING

This commissioning operation allows calibrating the CO$_2$ sensor of your NEMo in the outdoor air which is considered stable. We recommend you to carry out the CO$_2$ sensor commissioning when you active your NEMo for the first time or if you have not used NEMo for several months.

> ⓘ   If the CO$_2$ calibration is active, this manipulation will cancel it. In case a CO$_2$ calibration is active, we recommend you to use the calibration module of Profil'air Manager and to use standard gases (see dedicated section in expert functions).

OUTDOOR-CALIBRATION FOR THE CO_2 SENSOR

- Set NEMo to hibernation mode
- Have the outdoor-calibration CO_2 sensor ready (the one with a white plastic block at the monolith's location)
- Put the calibration CO_2 sensor in NEMo
- Perform the manipulation "double magnet stroke" (see the dedicated section)

Please be aware that, since the outdoor-calibration takes fairly long time (30min-1h), the double magnet stroke shall be done in a slightly different way. In fact, the badge must be taken out after the stroke (wait for about ten seconds in any case. The indication that NEMo shows at the start of the procedure (step (e)) must be [fixed Orange LED + flashing Green LED]). Once the outdoor-calibration is done, the green and red LEDs would be flashing at the same time. It is then necessary to give one magnet stroke to complete the procedure. The NEMo is now in hibernation mode.

- Put NEMo outside, avoiding areas that are possibly polluted by CO_2 (such as roadside) and away from direct sunlight and/or rain for a period of time until the green and red LEDs flash at the same time
- Bring NEMo inside the building
- Give one magnet stroke to complete the procedure

CHECKING

- Set NEMo to live mode (orange LED) and connect it to computer with USB / MicroUSB cable
- Start Profilair Manager
- Make sure that NEMo is connected. The reference PA-STA036 followed by a series of numbers must appear in the "devices" list

- Switch to live mode by clicking the button
- Make sure that NEMo is being detected on Live mode. A line must appear in the recorders list with "Live" appeared in the column "Mode".

- Click on this line as the colour changes.

- In the "Details" panel on the right, go to the "Calibration (serial number)" part. Make sure there is a blue square next to the line CO_2 and that "Autocalibration" is shown.

- Click on the button to save all modification
- Set NEMo to hibernation mode (using magnet strokes or via "change mode" then "hibernation")

NEMo commissioning is now completed

5. PERFORMING A MEASUREMENT CAMPAIGN

A NEMo measurement campaign is carried out over several days (typically 7 days). During this period Nemo will record pressure, temperature, humidity, light VOCs and CO2 every 10 minutes. The average formaldehyde concentration will be recorded every hour. The measurement process is the following one:

Start and install the logger
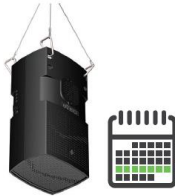
Record the data

Download the data

Print the report

START AND INSTALL THE LOGGER

START NEMO

Formaldehyde sensor preparation

Take out a new formaldehyde sensor from the refrigerator 10 minutes before the measurement and unseal the package. The sensor has to be at room temperature when the campaign is launched to prevent fogging on the glass material.

Insert formaldehyde sensor in NEMo. To do so:

- Remove the NEMo formaldehyde diffuser cap.
- Fix the sensor on the cap. Take care not to put fingers on the glass material (1).
- Insert the sensor in the diffuser without forcing. The sensor has an insertion direction (e-card on the outside of the device), if it does not fit easily, turn it (2).

Set NEMo to campaign mode (Green LED):

- When Nemo is in hibernation mode (red DEL), give a magnet stroke on the magnet passage area.
- The red LED flashes slowly
- While the red LED flashes slowly, give a second magnet strokes on the magnet passage area.
- The red diode freezes (indicating that the second magnet stroke was taken into account) and then quickly flashes (change mode is possible by a magnet stroke)
- While the red LED flashes rapidly, give a third magnet stroke on the magnet passage area.
- The green LED flashes slowly, then flashes faster and finally turns off
- Make sure that campaign mode is launched. To do that, wait 10 seconds, then give a magnet strokes <u>when LED are off</u>. If green LED flashes slowly and then switches off, the campaign mode is launched. If red LED flashes slowly and then switches off, the campaign mode is not launched, you must repeat the process.

ADVICE FOR NEMO POSITIONING

In order to obtain the most representative measure of the average exposure of the investigated room, we advise you to follow these recommendations:

NEMo position:

- If it is possible, in the center of the room. If it is not possible, at a distance of at least 50 cm of the room walls (including the ceiling). For this you can use the NEMo Ceiling suspension kit
- Out of reach of children / students.

Avoid:

- Areas largely exposed to air stream (areas close to air vents, doors and windows)
- Areas close to heat sources
- Areas close to formaldehyde known sources (wood particles panels, interior perfumes ....)

RECORD AND THEN DOWNLOAD DATA

In order to obtain the most representative measure of the average exposure of the investigated room, we recommend you to leave Nemo in the room for a minimum of 4.5 days (from Monday morning to Friday afternoon). You can also sample during 7 days (maximum) to understand how the building behaves during the weekend.

After sampling, Set NEMo to hibernation mode (red LED), as follow:

- When Nemo is in campaign mode (green DEL), give a magnet stroke on the magnet passage area.
- The green LED flashes slowly
- While the green LED flashes slowly, give a second magnet strokes on the magnet passage area.
- The green LED freezes (indicating that the second magnet stroke was taken into account) and then quickly flashes (change mode is possible by a magnet stroke)
- While the green LED flashes rapidly, give a third magnet stroke on the magnet passage area.
- The orange LED flashes slowly and then quickly (change mode is possible by a magnet stroke)
- While the orange LED flashes rapidly, give a fourth magnet stroke on the magnet passage area.
- The red LED flashes slowly, then flashes faster and finally turns off
- Make sure that hibernation mode is launched. To do so, wait 10 seconds, then give a magnet strokes when LED are off. If red LED flashes slowly and then switches off, the hibernation mode is launched. If green LED flashes slowly and then switches off, the campaign mode is still active, you must restart the process.

CREATING A CAMPAIGNS DIRECTORY (OPTIONAL)

- Start Profil'air Manager
- On the main menu, click on the icon of "Grouped by" panel on the left
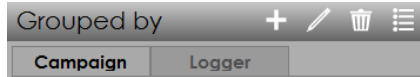
- The central window becomes the "creation of a new campaign" window
- Select an icon and a campaign name
- Click on "Confirm"

DOWNLOAD DATA

- Set NEMo to live mode (orange LED) and connect it to the computer with the USB / MicroUSB cable
- Start Profil'air Manager
- Make sure that NEMo is connected. PA-STA036 followed by a number must appear in the devices list

- Switch to live mode using the icon
- Make sure that NEMo is detected and in Live mode. A line must appear in the recorders list with "Live" written in "Mode" column.

Name	Identification	Mode	To measure	Display	Data to download	Date and time
NEMo	6011501000882	Live	☑ active	☑ shown	About 1242 measures	28/7/15 14:13:49

Loggers list   Hub 6011501000882

- Click on this line. Its color changes.

Loggers list	Hub *6011501000882*					
Name	Identification	Mode	To measure	Display	Data to download	Date and time
NEMo	6011501000882	Live	☑ active	☑ shown	About 1242 measures	28/7/15 14:15:05

- Click on the icon to download the data stored in Nemo on your computer.
- A window opens. Enter information about the campaign, the city, the building and the room (the campaign must have been created previously).

- If you want to calculate the ICONE index, add a calendar characteristic of the presence of occupants during the campaign. For that:
  - ○ Select the desired calendar with the drop down menu. Make this manipulation on the "Building" line to associate a calendar to all room of the selected building or on the "room" to associate the calendar to the selected room.
  - ○ Click on the icon . A copy of your calendar model is created and associated to your measurement campaign.
  - ○ If you want to modify this calendar, click on the icon . The calendar will then appear. Select the wanted slot (10 minutes) by clicking left and unselect by clicking right.
  - ○ Click on "Apply".
- Click on "Download and continue Live Mode"

- **Save your data by clicking on the icon**

- Set NEMo to hibernation mode (by magnet strokes or via the "change mode" menu and then "hibernation")

DELETE DATA FROM NEMO'S INTERNAL MEMORY

- Set NEMo to live mode (orange LED) and connect it to the computer with the USB / MicroUSB cable
- Start Profilair Manager
- Make sure that NEMo is connected. PA-STA036 followed by a number must appear in the devices list

- Switch to live mode by clicking the button

- Make sure that NEMo is detected and is in Live mode. A line must appear in the recorders list with "Live" written in "Mode" column.
- Click on this line. Its color changes.

- Click on the icon
- A window opens. Choose whether to delete data from the Nemo's internal memory by selecting "yes" or "no".
- Set NEMo to hibernation mode (by magnet strokes or via the "change mode" menu and then "hibernation")

PRINT A REPORT

To edit a report, follow the instructions below:

- Go to main screen
- Select a measurement by clicking on the corresponding line in the measurements list. Its color changes.

- Click on the edit button
- A window opens. Select the level of details for your report. You can include in the report all measurements for:
    - A given campaign
    - A given city
    - A given building

In this case, the report will include a summary of the measures for each facility (average values, ICONE index) and one more detailed report per room (if "include rooms reports" is checked)).

It is also possible to include only the measurement of the selected room by choosing "Room report".

Summary for a facility   Detailed report for a room
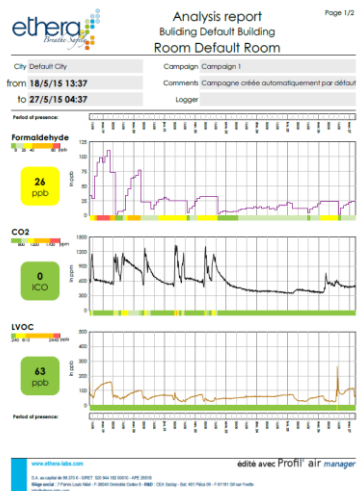
- Select the parameters to include in the report

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- Click on "Continue"
- A new window pops up where you can write conclusion for the building and/or the room in the report. Enter the text and click on "continue".
- Choose the folder where you want to save your report and click on "create the report."
- You can find the report in the selected folder or the default folder (C:\ProfilAirV2).

UPDATE PROFIL'AIR MANAGER AND NEMO

Before any operation

Make sure that you have downloaded all the data saved in your NEMo because they can't be downloaded with the new version of Profil'air manager.

If you have any doubt, please contact us:

> Phone: +33 4.38.12.29.95   @: support@ethera-labs.com

1. BEFORE STARTING

Note the old version of Profil'air manager software. To do that:
- Start Profil'air Manager
    - o Click on Profil'air icon at top left of the main screen (1) then write down the 4 digits following the software name (2).
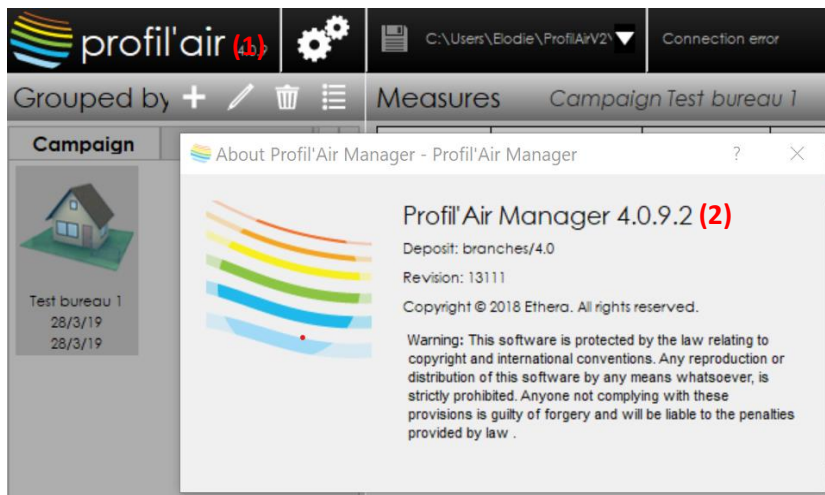
Note the old version of NEMo firmware as well, to do so:
- Set NEMo to live mode (orange LED) and connect it to the computer with the USB / MicroUSB cable
- Start Profilair Manager
- Make sure that NEMo is connected. PA-STA036 followed by a number must appear in the devices list

- Switch to live mode using the icon

- Make sure that NEMo is detected and is in Live mode. A line must appear in the

recorders list with "Live" written in "Mode" column.

- Click on this line. Its color changes.

- In the "Details" panel on the right, refer to the "NEMo (serial number)" box to mark the firmware version.

Set NEMo to hibernation mode (by magnet strokes or via the "change mode" menu and then "hibernation")

2. INSTALL A NEW VERSION OT THE PROFIL'AIR MANAGER SOFTWARE

Use the following link to download your software and NEMo documentation (Password: Ether@):
http://www.ethera-labs.com/notices-documentations-ethera/

To install your software, follow the instructions below:
- Launch the "ProfilAirManagerVX.X.X.X.X.exe" file in the downloaded folder.
- Follow the instructions of the installation assistant (The default directory is recommended).

Remember to regularly download the new versions of Profil'Air Manager in order to benefit from the latest developments!

3. RENEW THE PROFIL'AIR MANAGER DATABASE

This step is mandatory only if the version of Profil'air manager at the beginning of the update is 3.1.6.X or below.

The aim of this step is to save your old database so that Profil'air manager can create a new one compatible with the new badges. The data of your old database will always be available with a special manipulation. However, for your convenience, we advise you to edit reports about the data you would like to see later.To save the database, follow the instructions below:

- Find the folder where your database is saved. By default the location should be: C:\Users\[NAME OF YOUR SESSION]\ProfilAirV2 or C:\Users\[NAME OF YOUR SESSION]\ProfilAirV2.
- If the folder does not contain a "localCtx" folder you can proceed to the NEMo update.
- If the folder contains a folder named "localCtx" (which is your current database that contains all the measurements until now), rename it to "localCtx_archive".

4. UPDATE NEMO WITH PROFIL'AIR MANAGER

- First, disconnect all the devices connected with a USB cable from your computer except for NEMo, keyboard and mouse.
- Set NEMo to Live mode (orange LED) and connect it to the computer using the USB/MicroUSB cable
- Start Profil'air Manager
- Once the NEMo is detected, a screen showing the update appears

Warning:

All data saved in the NEMo's internal memory will be permanently deleted.

Do not disconnect NEMo from the computer in any case.
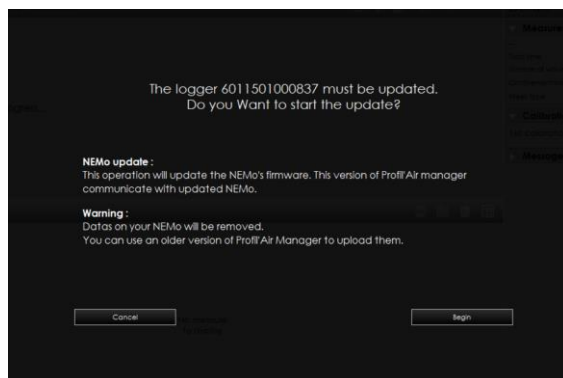
- Click on "Begin".
- The operation can last 3 to 6 minutes per NEMo.
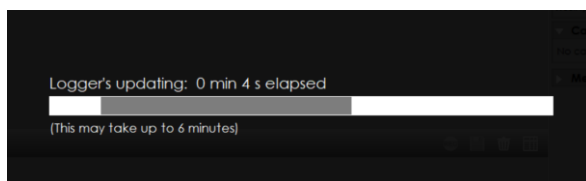
- Once the update is completed, the software shows the following screen:

- Click on "ok"
- After a few seconds, the screen indicating the live mode reappears and the NEMo shall be reconnected on its own (< 1 minute).

The update of NEMo is now completed
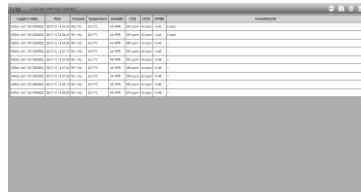
EXPERTS FUNCTIONS

1. USE « TABLE » DISPLAY MODE

By default, in Profil'air Manager the results are displayed as graphs. However, it is possible to display them in a table to have access to all values. For that, use the icon located above the graph (on the right).

Graph display	table display

2. CREATION OF ADDITIONAL PRESENCE CALENDAR

The calculation of the ICONE Index requires knowing the presence of occupants during the measurement (ie when the number of occupants (children for school) present in the local is between 0.5 and 1.5 times the theoretical number of occupants of the room).

To simplify the way this information is inquired, Profil'Air Manager provides a tool in which it is possible to create several calendar for use afterwards.

When you download a campaign, you can:

- Associate a calendar to the campaign without modifing it.
- Associate a calendar to the campaign and then modify it. In this case, a copy of this calendar is created so that the model will not be affected and you can then make changes to perfectly match presence to reality.

To create a calendar you must:

- Click on the button of the main menu
- Go to the tab "Week type management"

- Click on the icon to add a new calendar
- Name it
- Select presences time slots. For that:
    - o Select a time slot by left-clicking on the desired time slot
    - o Unselect a time slot by right-clicking the unwanted time slot.
- Click on "Submit"
- The calendar is created it will be available when downloading data or editing a measure.

3. EXPORTING AND IMPORTING DATA

In Profil'Air Manager, it is possible to export data to process them in spreadsheet software (Excel ...) or import them from another computer equipped with Profil'Air Manager.

EXPORT DATA

- Show main screen
- Select the measure to export by clicking on the corresponding line in the list of measurements. This line color changes.

- Click the "Export" icon
- A window opens, choose:
    - o The name and location of the file to be created (C: \ ProfilAirV2 default) by clicking on "Modify"
    - o Select the column separator (depending on the configuration of your spreadsheet software)
- Click on "Confirm"

IMPORT RESULTS

- Show main screen

- Click on the Import icon

- A window opens, choose:
    - The file to import by clicking "Filemanager"
    - Select the column separator (depending on the chosen separator when exporting)
    - The line separator (UNIX if the export was done from Windows, MAC if the export was done from OSX)
- Click on "Validate"

4. CO2 SENSOR MANUAL CALIBRATION AND VERIFICATION PROCEDURE

- Start Nemo in Live Mode (orange LED) and connect it to the computer with the USB cable.

- Start Profil'Air manager and click on the icon

- After a period of search, Nemo appears in the list of recorders

- Select Nemo then click on the icon

- Choose the Nemo to calibrate by clicking on its name in the list of recorders. Then select an operation and finally select a calibration profile.

- Available operations are the following ones:
    - ○ Factory Settings: perform a calibration of the CO2 sensor with the outside fresh air or a CO2 calibration gas and restore the default settings (slope = 1, offset = 0)
    - ○ New calibration: perform a calibration of the CO2 sensor. Calibration consists in comparing the response of the device to one or more standard gases (or outside fresh air) and from this comparison to adjust the device by recalculating its new calibration parameters (slope and offset). Then, one or more test points are performed to check the device response with these new coefficients.
    - ○ Adjustment (requires a valid calibration): Adjust the response of the CO2 sensor by comparing it to a standard gas or outside fresh air without invalidate the actual calibration.
    - ○ Verification (requires a valid calibration): You can check the response of the CO2 sensor by comparing it to a standard gas or outside fresh air.
- After selecting the calibration profile, click on "Next". (If the device has a valid calibration a window appears, click 'yes').
- Choose standard gases (or outside fresh air) that will be used to perform the calibration and click "Next".

Step	Concentration	Duratic	Selected gas				
Factory setting	100 - 1500 ppm	05:17	Outside fresh air (450 ppm)	▼	+	✎	🗑
Test point 1	100 - 1500 ppm	04:47	Outside fresh air (450 ppm)	▼	+	✎	🗑

- A window summarizing the steps of calibration appears. Click on "Next".
- Follow the instructions on the screen until the end of calibration or verification.

🛈 *If outside fresh air is used as the standard gas, put NEMo outside avoiding potentially polluted areas CO 2 (roadside ...).*

- At the end of the calibration, a summary of operations appears.

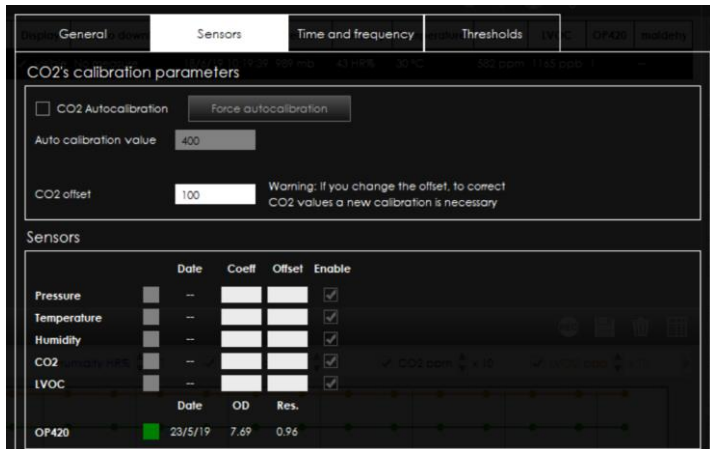## 5. MANUAL MODIFICATION OF CALIBRATION COEFFICIENTS

- Start Nemo in Live Mode (orange LED) and connect it to the computer with the USB cable.

- Start Profil'Air manager and click on the icon

- After a period of search, Nemo appears in the list of recorders

- Select Nemo then click on the icon

- Select the "Sensors" tab

- You can enter in the "Sensors" box a calibration slope and/or an offset that you have calculated yourself, for each parameter (excluding formaldehyde).
- Click on "Apply" to validate the coefficients and communicate them to the NEMo.
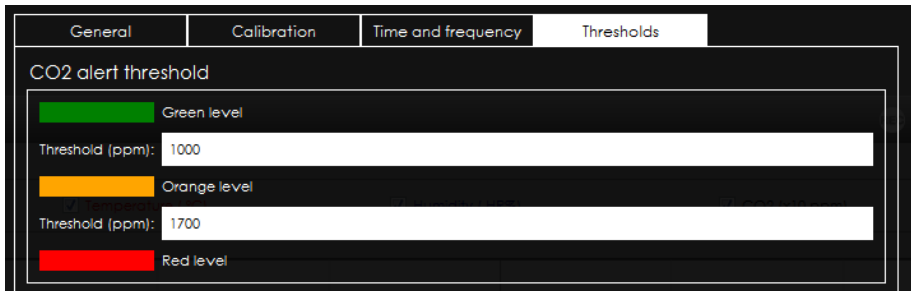
This manipulation can also be applied to the sensors of the daughter cards.

6. CHANGE LED THRESHOLDS (CO2) IN CAMPAIGN MODE

In campaign mode, the LEDs flash 1 time every 15 seconds based on a threshold of CO_2 previously defined. By default, thresholds are configured according to these values:

- o   Green LED: levels of CO_2 <1000ppm
- o   Orange LED: 1000ppm <rate of CO_2 <1700ppm
- o   Red LED: 1700 <rate of CO_2
- It is possible to change the thresholds as follow:
- Start Nemo in Live Mode (orange LED) and connect it to the computer with the USB cable.

- Start Profil'Air manager and click on the icon
- After a period of search, Nemo appears in the list of recorders

- Select Nemo then click on the icon
- Select "Thresholds" tab, then enter the desired thresholds.

- Click "Apply"

7. RECORDING A CURVE IN LIVE MODE

Live mode is mainly used to download data from a NEMo and / or set the device. However, you can save a curve in this mode.

In this mode, measurements are not saved in the internal memory of Nemo or on the computer. In case of loss of the connection (USB cable unplugged, for example), the data will be lost. This mode should therefore not be used to make long campaigns where the campaign mode is more suitable.

RECORDING A CURVE ALREADY REALIZED

You can save a curve already carried out, for this:

- When the curve is displayed on the screen, click on the icon
- A window opens. Enter information about the campaign, the city, the building and the room (the campaign must have been created previously).
- Click on "Save and continue Live Mode"

MAKE A NEW RECORD

- Click on the icon
- The curve on the screen clears and a new record begins.

- When you want to stop recording, click on the icon
- A window opens. Enter information about the campaign, the city, the building and the room (the campaign must have been created previously).
- Click on "Save and continue Live Mode"

APPENDIX A - SERVICE

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