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User Manual

OAS-S

(Optical Alarm System)

Updated to firmware version:
V_1.01

SAFETY NOTES

Read carefully before using the product

MPB works to provide its customers with the best safety conditions available, complying with the current safety standards. The instrumentation described in this manual has been produced and tested in conditions that fully comply with the European standards. To maintain these conditions, please carefully follow this manual. This product is intended for industrial environments and laboratories and should be used by authorized personnel only. MPB disclaims any responsibility for different uses of the device.

MPB

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Declaration of Conformity

C E

This is to certify that the product: OAS-S

Complies with the following European Standards
(2014/35/EU)
(2014/30/EU)
(2011/65/EU)

EMC: EN 61326-1
EMC: EN 61010-1

MPB Srl

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Contents

OAS-S (Optical Alarm System – Smoke)

1) Introduction

Figure 1.1: OAS

The OAS-S is an optical alarm system to be mounted in proximity of the MRI toroid. This system is composed by electronic parts that are vital for its correct functioning. The OAS-S signals the alarm status through a light indicator (LED) and a buzzer. Thanks to its fiber optic connection and its battery power supply, the OAS-S does not influence in any way the artifact of the MRI. The system is equipped with a Test function so to enable a complete periodic diagnosis, therefore it is recommended to run it periodically, in order to verify the correct system response to smoke presence and contacts opening.

2) Composition

The standard configuration includes:

- OAS-S detector
- OAS Control Unit
- 2 Batteries
- Kit (2 screws, 2 dowels, 2 washers to fix the sensor on the ceiling)
- Fiber Optic 15 m
- User Manual

Options:

- USB optical converter
- Fiber Optic – customizable length up to 40m max
- Switchboard with power supply and button (to reset the alarm)
- Smoking test spray

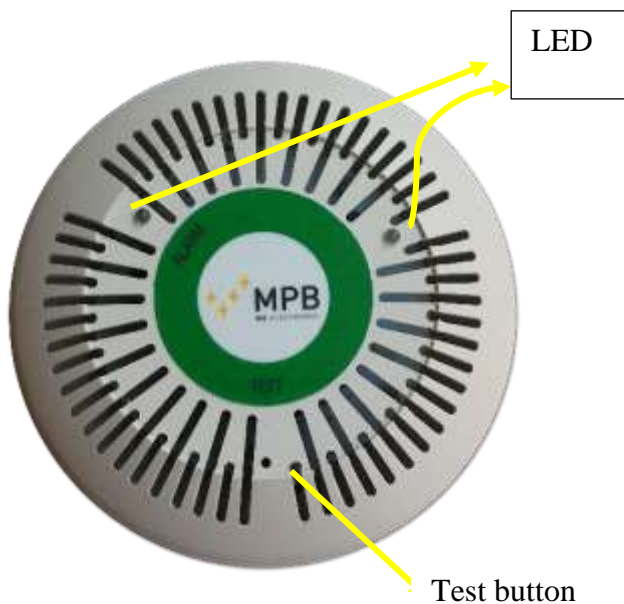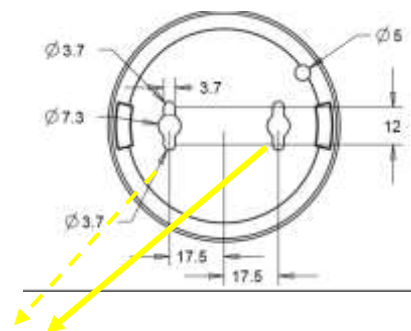# 3) Overview

Figure 1.2 shows an overview of the instrument:

LED

Test button

Figure 1.2 shows light indicators (LED) and the button for the Test function.

LED	MEANING
On (Red Colour)	Ongoing Alarm
Off	No ongoing alarm

Figure 1.2: OAS-S front view

Figure 1.3: OAS-S rear view

Fixing element

Figure 1.4: OAS-S

4) Technical Specifications

Sensing element	Electro-optical infrared
Sensing element test	Electro-optical element self-test
Sampling interval of smoke	43 sec (typ)
Test button	Alarm condition simulation
Light signal	Red LED reports: - Every 43 sec, sampling of smoke presence - In case of alarm, light signal every 0,5 sec (Typ.)
Connections	Unidirectional fiber optic with ASCII serial protocol
Reporting	Alarm – transmitted after smoke detection Status – Contains battery voltage and is transmitted every 10 sec
Power supply	2 batteries
Battery life	Over 6 months (with 2x Panasonic BR-AG 1.8 Ah MRI compliant)
Dimensions	Diameter 110mm height 70cm

5) OAS-S installation

For a correct installation, in order to better monitor the smoke inside the shielding room, it is recommended to install the OAS-S on the ceiling, nearby the tomograph of the MRI (it will not affect the result of the resonance).
Inside the packaging, the kit to fix the instrument is available.

Figure 1.5: OAS-S fixing kit

After having placed the OAS-S to the ceiling, (see quick user manual guide provided with the instrument):

1. Connect the optical fiber from the sensor to the outside of the room and plug the connector
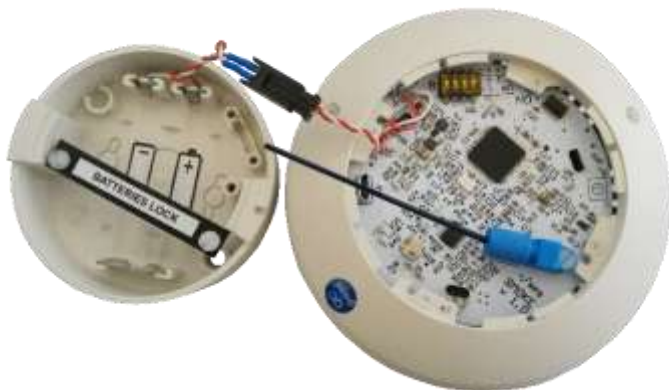

Figure 1.6: OAS-S fiber optic

2. Insert the batteries paying close attention to the polarization:
WARNING! Battery polarity reversal can damage the equipment and cause battery overheating!
The polarity reversal protection protects the functionality of the device if the batteries are removed within one minute from the insertion.
Then screw the battery lock system to make sure that the batteries are well tightened to their room.

Figure 1.7: OAS-S batteries

3. Close the box

Figure 1.8: OAS-S closing

4. Press the Test button (see figure 1.2)
(Warning! This operation triggers an alarm simulation)

6) Maintenance

For a correct use, it is highly recommended:

- Battery replacement every 6 months

- When replacing batteries, perform the test of the system through the Test button, in order to allow a correct functional diagnosis

7) Alarm System

The sensor detects the presence of the fire through an electro-optical system that recognizes the presence of smoke by sampling every 43 seconds and then providing the alarm information on the optical fiber/interface.
Under normal conditions, every 10 seconds the unit transmits on the interface/fiber optic, a message that contains the operating status of the sensor (intrinsic security system). Within the same message is shown the voltage value of the installed batteries.

7.1 Alarm message description:

The sensor transmits two types of messages:

1) **Status Message**; transmitted every 10 seconds
2) **Alarm message;** transmitted right after the detection of smoke presence

Example of **status message** transmission:

```
#F00Vbat=3.08V;0;0;0;0;Vreg=3.25V*<0D><0A>
```

`#`	=>	Indicates the beginning of a new message
`F`	=>	indicates the sensor's model
`00`	=>	indicates the sensor's configuration
`Smoke`	=>	indicates that the internal batteries have a level of 3.08V
`;`	=>	separator the following fields are reserved
`*`	=>	indicates the end of the message
`<0D>`	=>	CR character (Enter)
`<0A>`	=>	LF character (end line)

Example of **alarm message** transmission:

```
#F00Smoke;1;1;0;0;Vreg=3.24V*<0D><0A>
```

```
#              =>  indicates the beginning of a new message
F              =>  indicates the sensor's model
00             =>  indicates the sensor's configuration
Vbat=3.08V =>  indicates that the internal batteries have a level of 3.08V
;              =>  separator the following fields are reserved
*             =>  indicates the end of the message
<0D>           =>  CR character (Enter)
<0A>           =>  LF character (end line)
```

8)   Alarm types: OAS Control Unit

The OAS Control Unit comes with a fiber optic output for the connection with the detector.

1) In case of fire → The red LED (ALARM) is activated and the acoustic signal will have a continuous buzzer. To stop the alarm condition, press TEST, and remove the alarm condition (e.g. fire the fire)

2) Fiber optic disconnection or electronic issues → The yellow LED is activated (ERROR) and the acoustic signal will be one second intermittent lasting for two minutes (intermittent Buzzer). To stop the alarm condition, tighten the fiber optic connection. If the problem persists, replace the fiber optic or the electronics.

3) Low battery→ The blue LED (BATTERY) is activated. Under 2.1 V the buzzer does not start, while under 1.5 V the buzzer is activated with an intermittent signal.
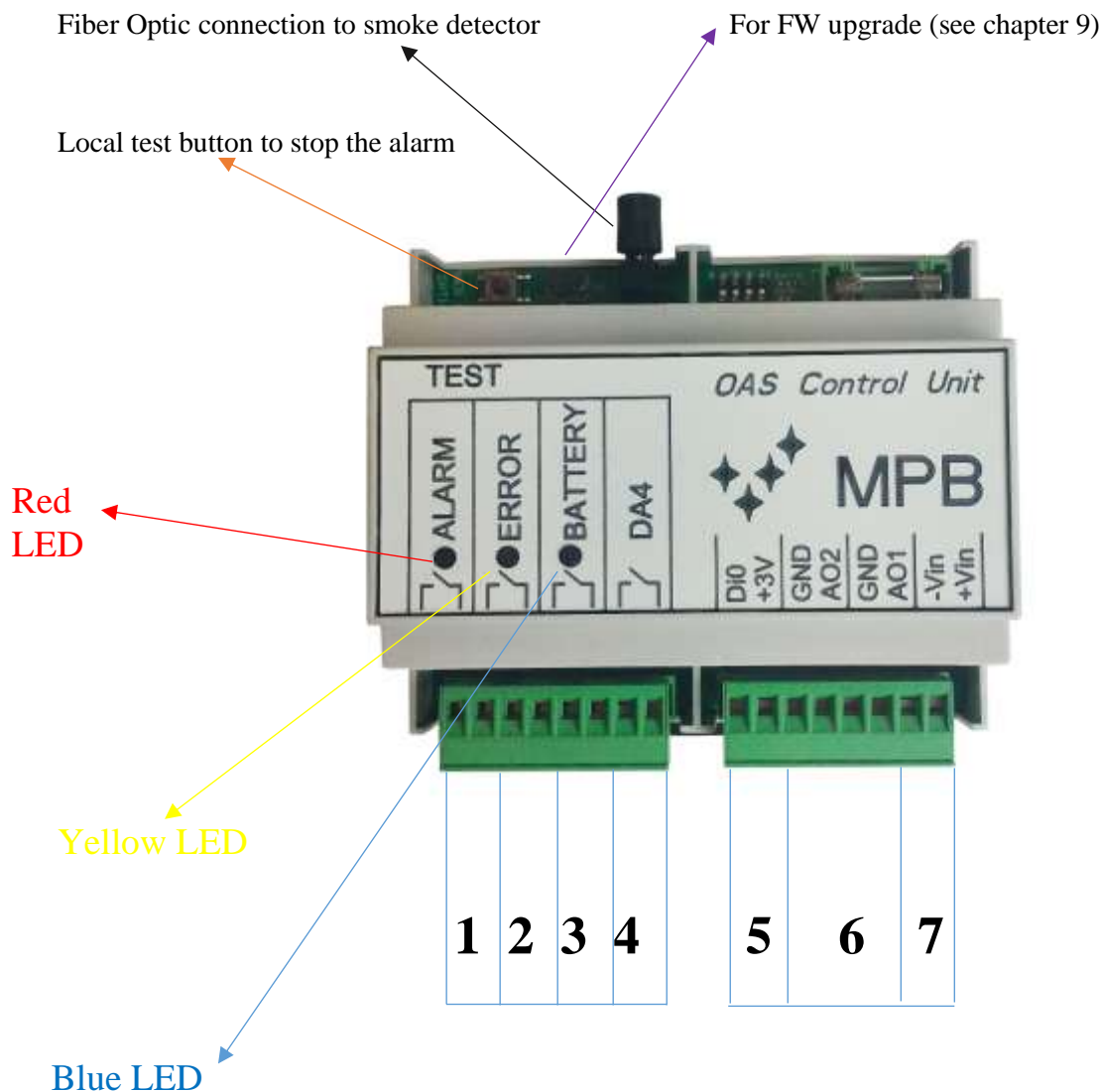
Fiber Optic connection to smoke detector

For FW upgrade (see chapter 9)

Local test button to stop the alarm

Red LED

Yellow LED

Blue LED

Figure 1.9: OAS-S Control Unit

1 Contact normally closed, it opens in case of fire

2 Contact normally closed, it opens in case of connection error

3 Contact normally closed, it opens in case of low battery of the smoke detector
All three contacts open on case of control unit power supply missing

4 Reserved for future expansions

5 Remote test button to stop the alarm

6 Reserved for future expansions

7 Battery tension: 12...24 Vdc max 1A

WARNING! During operations, please keep all switches off

9)　Mandatory Procedures

Follow the procedures below step by step to avoid malfunctions and false alarms.

9.1 First ignition

First put the batteries and connect the sensor's optical fiber to the Control unit, now, power the control unit to turn it on.

9.2 Batteries replacement

Remove power from the control unit to turn it off. Replace the sensor batteries and then restore power to the control unit.

WARNING!
Turn off the control unit before performing any operations on the sensor.
Check what the control unit is connected to. Disconnecting power to the
control unit requires the opening of the contact and therefore the alarm.
Check the system to understand what is connected after the control unit

10) FW Update

WARNING! During the FW update procedure of the sensor, the instrument will appear as disconnected from the control unit, so the latter could transmit a random alarm: please inhibit the functioning of the control unit in such cases.

To update to the last version of the firmware, please connect to our website at the link www.gruppompb.uk.com, move the cursor to **services**, and in the **download** section, click on **MPB update**.

10.1 Download and installation:

Then click on the link, in the firmware column related to the device to update.
Make sure to download also USB Firmware Updater.
Open the downloaded file via WinRAR and extract it on the pc.

Double click on one of the two files named USB_UPDATER, according to the operating system version in use. The window as in fig. 1.10 will appear

Figure 1.10: USB Firmware Updater first page

Click on the **avanti** button to follow the instructions on the application's window.
Insert the data (name and company) as required in fig. 1.11.
Insert the path where you want to install the program (Fig. 1.12) and click **Avanti**.
Press again **avanti** to proceed as shown in (Fig. 1.13). When reaching the **Installazione completata** screen, please click **fine.**
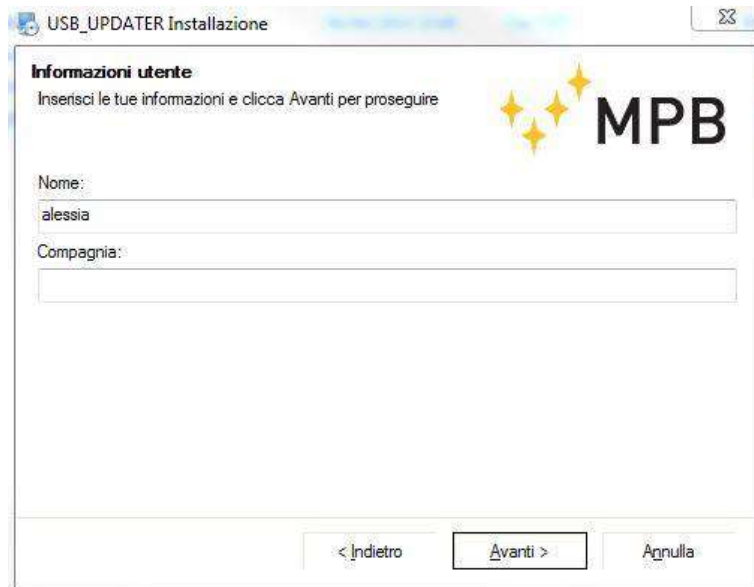
Figure 1.11 USB Firmware Updater second page
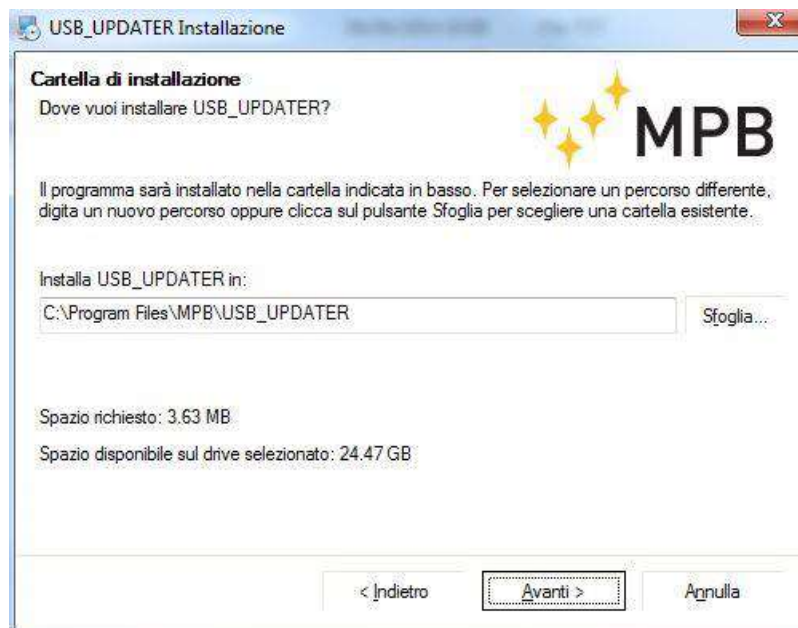

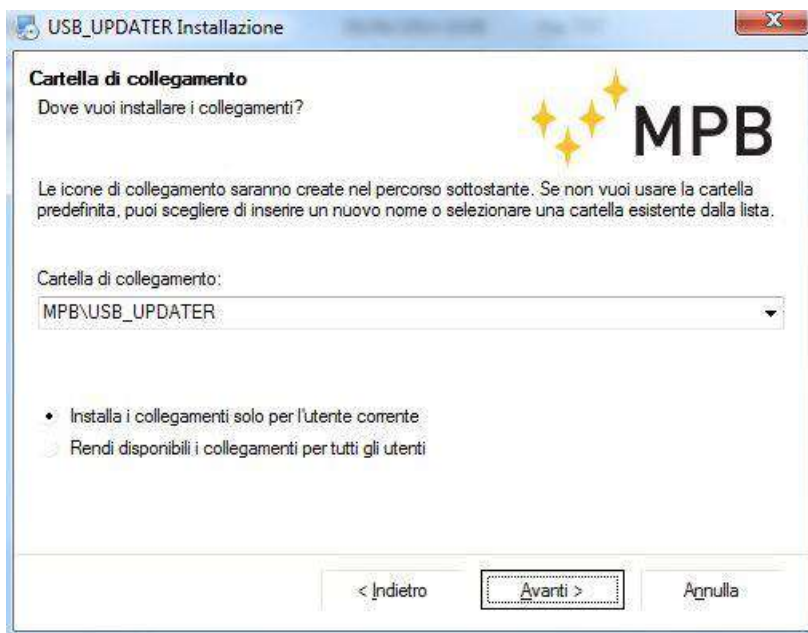Figure 1.12 USB Firmware Updater third page
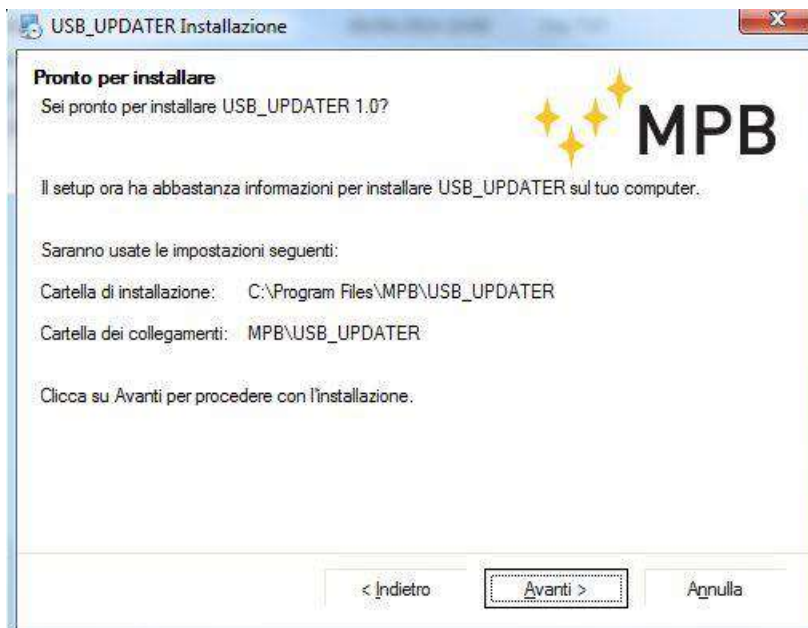
Figure 1.13 USB Firmware Updater fourth page

Figure 1.14 USB Firmware Updater fifth page

In the chosen path, after the installation, there will be the **msp400** update folder that includes the files, as shown in fig. 1.15
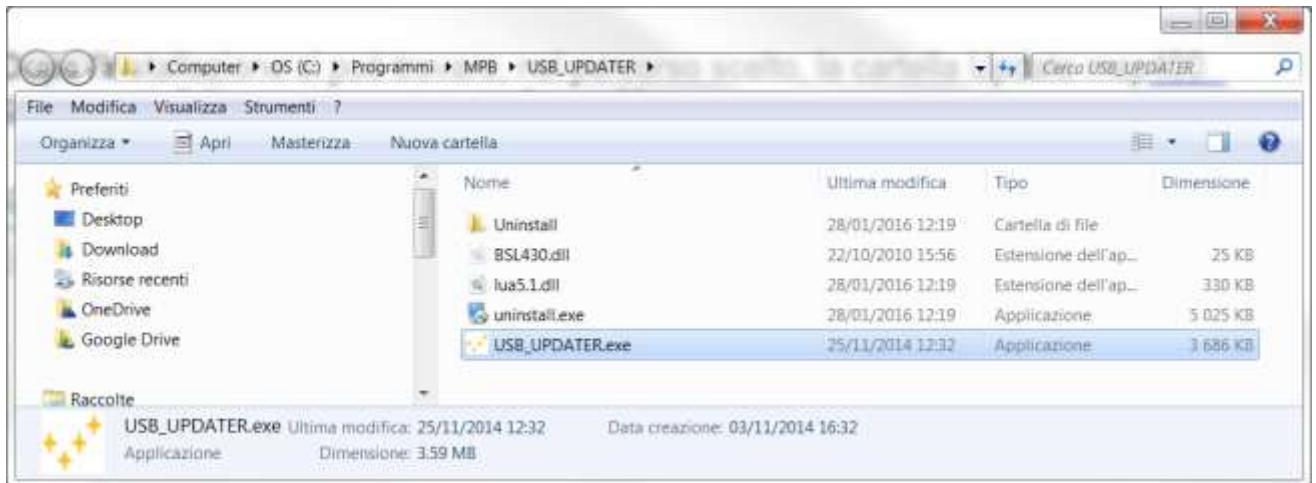
Figure 1.15 Installation path

10.2 Firmware Update

To update the firmware please double click on the USB_UPDATER file and wait until fig. 1.16

Figure 1.16: Firmware Upgrade

Click **next**, **browse**, then choose the path to load the file OAS-Smoke_sensor_vX.XX.txt.

Plug the device and please follow the steps below:

- Make sure that the batteries of the device are at least 50% charged
- Plug the USB cable to the device
- Plug the USB cable to the PC
- Please wait until the PC installs the drivers and enables the **Upgrade Firmware** button
- Click on the **Upgrade Firmware** button
- Please wait for the Firmware update, at the end the following message will appear:
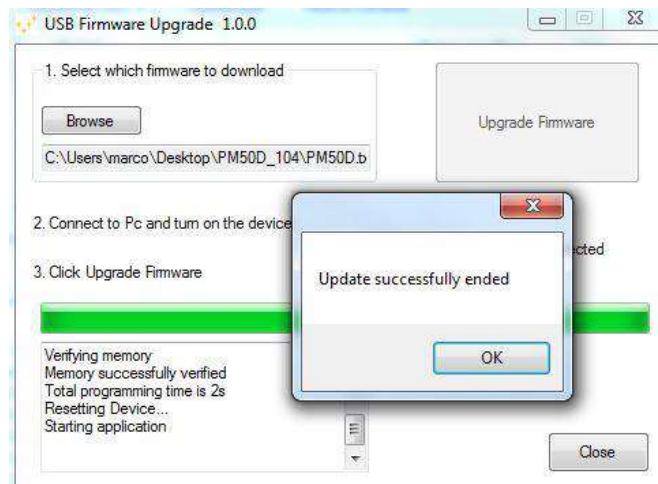

Figure 1.17: Firmware Upgrade end

Press ok, close the program and disconnect the device from the pc:

WARNING! Do not unplug the device from the pc before the end of the firmware installation procedure in order not to lose your data

Terminate the FW update procedure

- Remove the batteries
- Put the dip switch 1 on OFF
- Insert the batteries

This last step is extremely important and enables the sensor to go back to its previous operating status: if it is not performed the sensor will not transmit any status and the control unit will not signal the failed connection to the sensor.