User manual

1.3.2

Envira Sostenible S.A.

Nanoenvi IAQ

envira IOT

Copyright © 2022 Envira Sostenible S.A.

All rights over modifying or correcting the contents of this document without prior notification are reserved. These specifications apply to orders received. Envira Sostenible S.A. accepts no liability for possible misprints or any information not included in this document. All rights to the content, images and figures included in this document are reserved. The reproduction, transmission or use of this document or of its contents, in whole or in part, by third parties without the consent of Envira Sostenible S.A. is prohibited.

Table of Contents

1. Version control 1
2. Preface 2
2.1. About this manual 2
2.2. Conventions used 2
2.3. Safety symbols 2
2.4. Obtaining documentation and information 3
2.4.1. Internet 3
2.4.2. Requesting information 3
2.4.3. Errata and amendments 3
3. Safety instructions 4
3.1. Safety instructions 4
3.2. Foreseeable incorrect use of the device 5
4. Description of the product 6
4.1. Description 6
4.1.1. Air quality measurements to improve people's lives 6
4.1.2. Measure up to 10 variables with just one device 6
4.1.3. Air quality traffic light 6
4.1.4. Quick installation 7
4.1.5. Zero maintenance 7
4.1.6. Accuracy and reliability 7
4.2. Product overview 8
5. Technical specifications 10
5.1. General specifications 10
5.2. Especificaciones de sensores 10
5.2.1. CO sensor technical characteristics 10
5.2.2. CO2 sensor technical characteristics 11
5.2.3. PM sensor specification 11
5.2.4. Pressure sensor technical characteristics 11
5.2.5. Temperature sensor specification 11
5.2.6. Relative humidity sensor technical characteristics 12
5.2.7. VOC sensor technical characteristics 12
5.2.8. Noise level sensor technical characteristics 12
5.3. Communications characteristics 12
5.3.1. LoRaWAN communication 12
6. Installation 14
6.1. Installation of Nanoenvi™ IAQ LoRaWAN 14
6.2. Configuration of LoRaWAN 14
6.2.1. Example of the configuration of AppKey and AppEUI via USB port on PC with Windows Operating System 16
6.3. Installation of Nanoenvi™ IAQ LoRaWAN on the wall 16
6.4. Integration and data usage 18
6.5. Updating software 18
7. Expected use of Nanoenvi™ IAQ LoRa 20
8. Manteinance 21
8.1. Cleaning 21
9. Troubleshooting 22
9.1. Troubleshooting 22
9.2. FAQ 22
9.3. Repairs 24
10. Protecting the environment 25
A. Order information 26
A.1. Product reference 26

A.2. Content of the package 26
B. Nanoenvi IAQ status lights 28
B.1. Light code 28
11. Contact 29
11.1. Contact information 29

List of Figures

4.1. Front view of the Nanoenvi™ IAQ with wall bracket 8
4.2. Back view of the Nanoenvi™ IAQ 8
6.1. USB-C configuration port 15
6.2. Configuration of Nanoenvi IAQ port 16
6.3. LoRaWAN configuration 16
6.4. Configuration of Nanoenvi IAQ port 19
6.5. firmware update 19

List of Tables

5.1. General specifications 10
B.1. LED light – device status key 28

Chapter 1. Version control

Version	Changes
V1.3.2	Drawing up of user manual for LoRa variant

Chapter 2. Preface

2.1. About this manual

Nanoenvi™ IAQ is intended for companies and people interested in ongoing indoor air quality monitoring. This manual is part of the product and contains important information on safety and the installation, use and disposal of the product. Please read this manual and follow the instructions carefully. The manual will help you prevent damage to people and property and ensure the correct use of the device, thereby extending its useful life. Envira Sostenible S.A. accepts no liability for failure to comply with the instructions described in this document.

Before installing and using Nanoenvi™ IAQ you should read this manual.

As a user of the product, you do not need any specific qualifications to install and use it. However, we would recommend you become familiar with the use of a Smartphone and/or PC.

The product should not be used by anyone under the age of 14.

2.2. Conventions used

The following conventions for style and symbols are used in this manual:

This symbol highlights important information that requires special attention.

This symbol means there is a note.

	This symbol highlights important information for the protection of the environment.

2.3. Safety symbols

The following symbols and warnings are used in this manual:

This symbol warns of hazards due to electrical current. Ignoring this symbol may result in the risk of personal injury or fire due to electrical voltage from the mains connection.

Indicates a dangerous situation that could pose a serious threat to people's bodily integrity.

This symbol indicates a risk of damage to the product. Failure to follow the instructions and warnings may result in partial or total damage to the device.

2.4. Obtaining documentation and information

2.4.1. Internet

The latest version of the Nanoenvi™ IAQ user manual can be found at:

`https://enviraiot.es/nanoenvi-iaq/`

2.4.2. Requesting information

Documentation, user instructions and technical information can be requested by:

- Email <<nanoenvi.support@envira.es>>
- The website `https://enviraiot.es/`

2.4.3. Errata and amendments

Comments and remarks on the manual can be sent to:

- Email <<nanoenvi.support@envira.es>>
- Email `https://enviraiot.es/`

We would be delighted to receive your comments and suggestions for improvement.

Chapter 3. Safety instructions

Nanoenvi™ IAQ has been designed for installation in a safe indoor space for the purpose of ongoing air quality monitoring; use for any other purpose will be considered incorrect.

Nanoenvi™ IAQ is manufactured in accordance with the latest safety and reliability standards for the technology and its operation. It is factory tested and distributed, technologically safe and completely reliable. However, there may always be a residual risk. Please read the safety instructions carefully and follow them in order to prevent these risks and ensure correct use. Envira Sostenible S.A. cannot accept any liability deriving from non-compliance with the safety and operating instructions.

Before installing and/or using the device, make sure that you have read and understood this manual.

3.1. Safety instructions

The device should be handled according to the instructions specified in this manual. The following risks and instructions should be taken into account:

- Never use the equipment with defective or damaged wires.
- The incorrect use or opening of your Nanoenvi™ IAQ may cause electric shock, fire, flames and other problems.
- Do not use Nanoenvi™ IAQ close to or immersed in liquids.
- Do not open the device cover or remove its fastenings.
- Do not use the device if it is faulty to the point of risk.
- Do not alter or repair the device, its components or accessories without authorization.
- Keep the device away from water.
- Nanoenvi™ IAQ is not designed for use by under-14s.
- Do not use Nanoenvi™ IAQ close to water, fire or sources of extreme heat.

Extreme levels of humidity and pollution may damage the device.

Protect the device against humidity, dirt and impact during transport, storage and operation.

Please follow the instructions below in order to avoid damage to the device:

- Do not cover your Nanoenvi™ IAQ either partially or completely.
- Use Nanoenvi™ IAQ as described in this manual.
- Do not use Nanoenvi™ IAQ if it has been damaged or you think it doesn't work as it should.
- Do not install or place Nanoenvi™ IAQ on surfaces exposed to heat.
- Do not try to open the case or alter the Nanoenvi™ IAQ.
- Do not use Nanoenvi™ IAQ for anything other than the uses specified in this manual.

- Do not use Nanoenvi™ IAQ outside.
- Do not expose Nanoenvi™ IAQ to concentrations of gas higher than those defined in the technical specifications.

3.2. Foreseeable incorrect use of the device

Any use different from those described in this section is considered incorrect use of the equipment and could lead to a risk of damage to the device, the environment or people. Envira Sostenible S.A. accepts no liability for damage caused by any use of the device different from its intended use. The user (or operator) is solely responsible for any risk in this regard.

The device is *NOT* meant to be used under the following conditions:

- Exposure of the equipment to levels of gas concentration, temperature and/or relative humidity outside those specified in the operating range.
- Installation that is not with the wall bracket provided, fixed to a vertical surface.
- Electrical supply outside the range defined in the technical specifications.
- If it has been splashed by any kind of liquid.
- If it has been physically modified.
- If it has been physically damaged.

Chapter 4. Description of the product

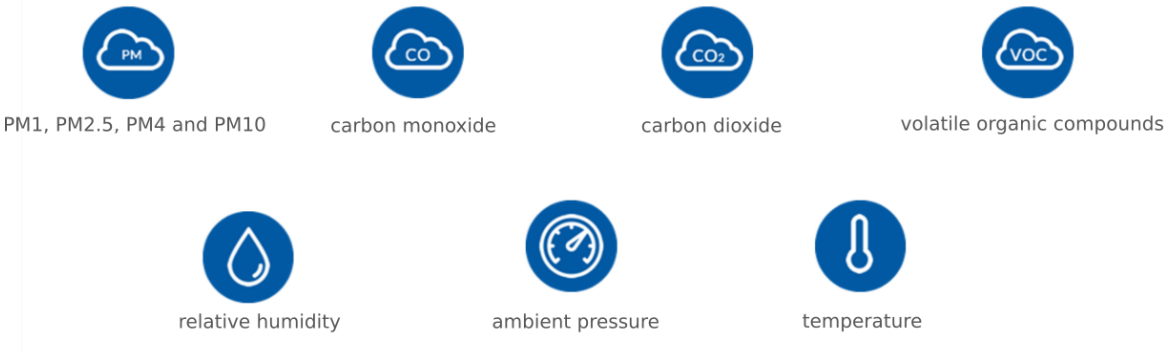
4.1. Description

4.1.1. Air quality measurements to improve people's lives

Nanoenvi™ IAQ is a device designed and manufactured by Envira Sostenible S.A. so that building managers and owners can make decisions to improve the comfort, well-being and health of people based on real air quality data. Nanoenvi™ IAQ lets you set up wireless networks of indoor air quality sensors to provide real-time information about the air we breathe. Nanoenvi™ IAQ is suitable for use in homes, workplaces, classrooms, hospitals, conference rooms, garages, laboratories, cinemas, theatres, vehicles and any other indoor space where people spend their time.

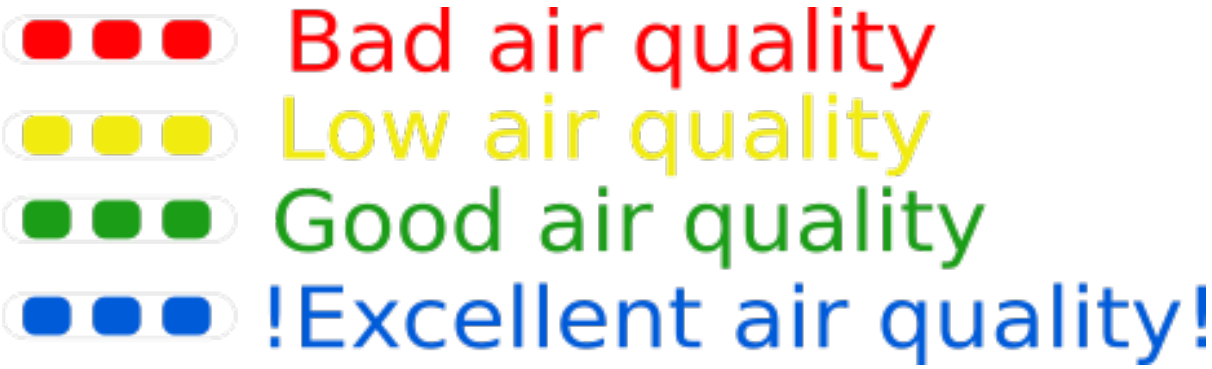
4.1.2. Measure up to 10 variables with just one device

Nanoenvi™ IAQ is capable of measuring temperature, humidity, atmospheric pressure and concentration of CO_2, CO (optional), noise level (optional), VOCs, PM1, PM2.5, PM4 and PM10.



4.1.3. Air quality traffic light

The lights on the Nanoenvi™ IAQ change colour depending on the air quality. This allows people to see air quality immediately and to ensure appropriate and efficient ventilation.



4.1.4. Quick installation

Nanoenvi™ IAQ is designed for quick and easy installation.

By means of its USB port, the device can be configured before it is installed. The configuration can be changed remotely via downlink messages.

Once installed, Nanoenvi™ IAQ will measure air quality continuously and will automatically manage reconnection if there is a communication network or power failure.

4.1.5. Zero maintenance

Nanoenvi™ IAQ requires no specific maintenance. Additionally, it implements configuration messages that allow you to see the status of the device, perform software updates and change the configuration remotely. In this way, building managers or integrators can manage the devices installed without having to travel or incur additional costs.

4.1.6. Accuracy and reliability

Nanoenvi™ IAQ includes the latest indoor air quality measurement technology. In order to achieve this, Envira Sostenible S.A. trusts and relies on European manufacturers that offer state-of-the-art technology, with the highest quality standards.

4.2. Product overview

Figure 4.1. Front view of the Nanoenvi™ IAQ with wall bracket

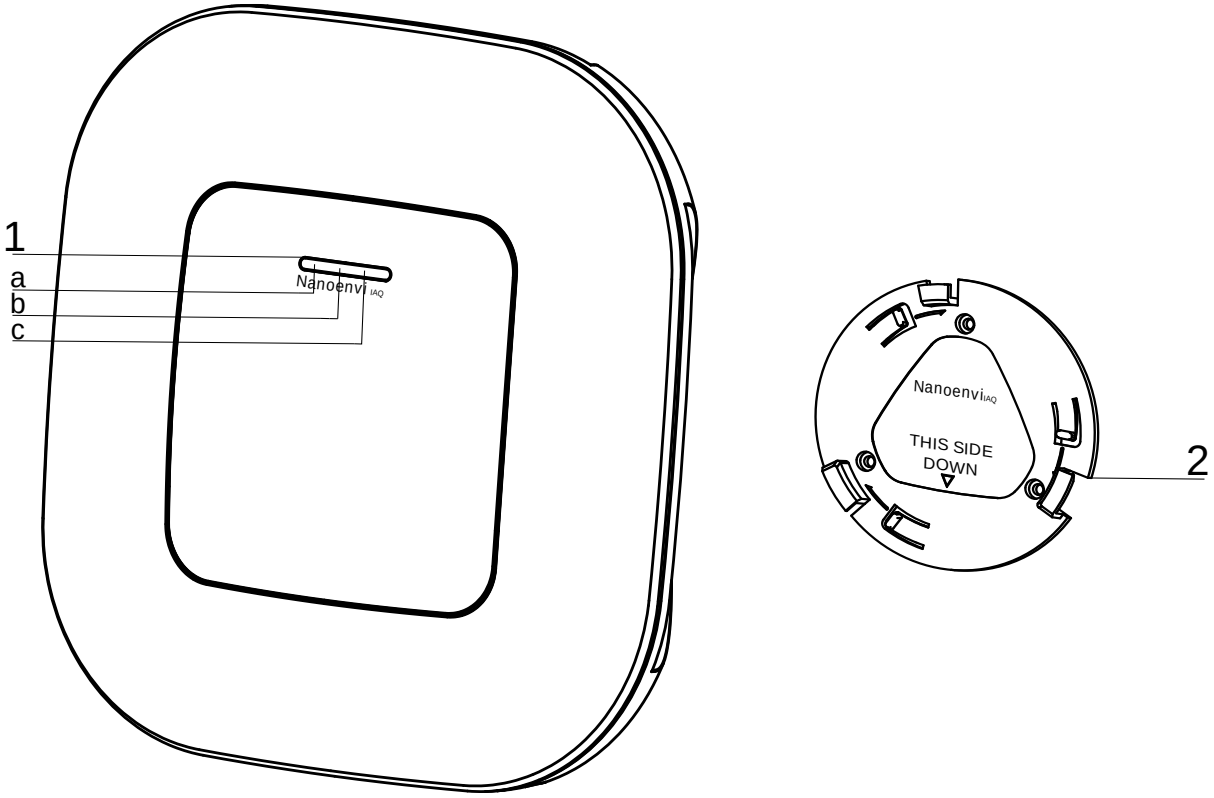
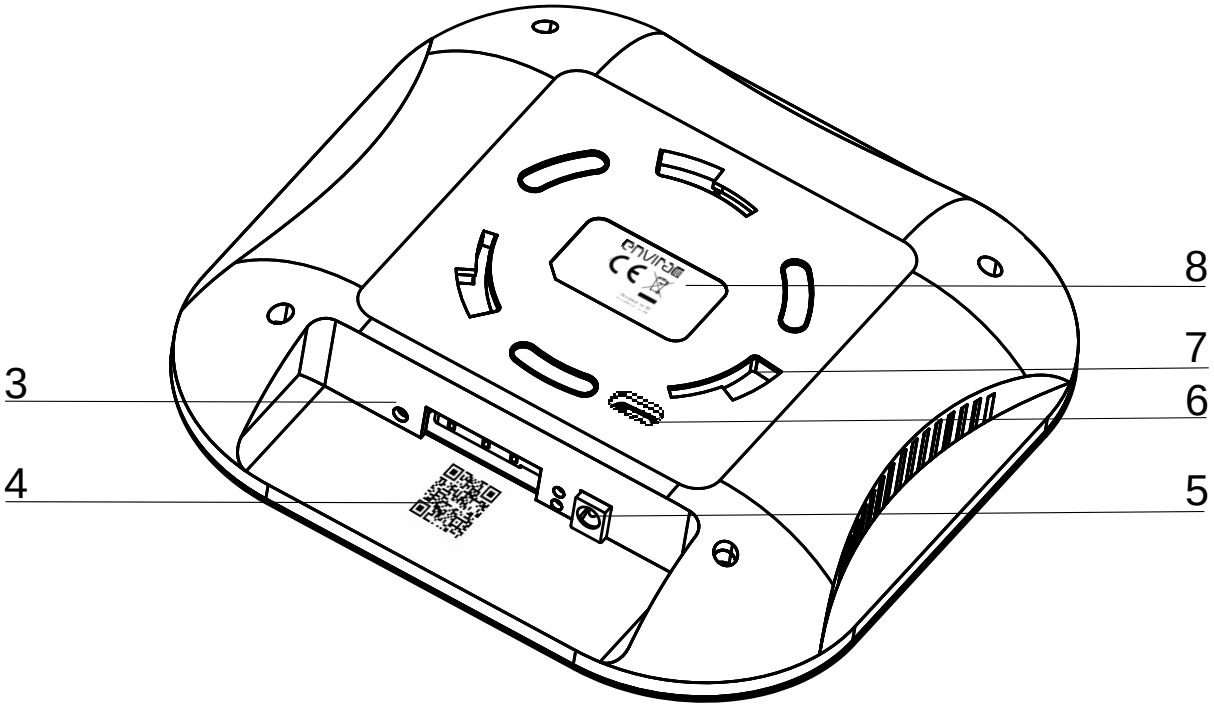


Figure 4.2. Back view of the Nanoenvi™ IAQ



1. LED status lights:
    a. LED1
    b. LED2
    c. LED3
2. Wall fastening.
3. Configuration mode button (also referred to as 'AP mode button'). Not used in the LORA variant.
4. QR code for automatic onboarding of LoRaWAN.
5. Power connector.
6. USB-C connector, used to configure and update the device’s firmware.
7. Wall bracket
8. CE marking.

Chapter 5. Technical specifications

5.1. General specifications

Table 5.1. General specifications

Parameter	Value
Supply	Input: 100-240V AC @ 50-60 Hz (power supply included). Output: 5 V DC External power adapter
Maximum consumption	5 W
Average consumption	2,5 W
Working conditions	10 ~ 55 ° C / 5 ~ 90 % RH (no condensation)
Storage conditions	10 ~ 55 ° C / 5 ~ 90 % RH (no condensation)
IP protection	IP21
Sensors	CO (optional), CO2, atmospheric pressure, VOCs, PM1, PM2.5, PM4, PM10, temperature, humidity and noise (optional)
Weight of package	800 g
Weight of device	340 g
Dimensions	189x189x37 mm
Conformity marking	CE
Made in	

5.2. Especificaciones de sensores

5.2.1. CO sensor technical characteristics

Accuracy	± 5%
Measurement range	0 ~ 5000 ppm
Operational range	-10 ~50 ºC, 10 ~95 % RH
Calibration	Initial laboratory calibration
Response time	60 seconds

Technology	Electrochemical

5.2.2. CO2 sensor technical characteristics

Accuracy	± 30 ppm
Measurement range	400 ~ 10000 ppm
Operational range	0 ~50 ºC, 0 ~95% RH
Calibration	Self-calibrating
Response time	20 s (63 %)
Technology	NDIR

5.2.3. PM sensor specification

Accuracy for PM1 and PM2.5	±10 µg/m3 for measurements in range from 0 to 100 µg/m3 and ±10 % for measurements in range from 100 to 1000 µg/m3
Accuracy for PM4 and PM10	±25 µg/m3 for measurements between 0 and 100 µg/m3 and ±25% for measurements between 100 and 1000 µg/m3
Measurement range	0 ~1000 µg/m3
Operational range	-10 ~ 60 ºC y 0 ~ 95 % RH
Calibration	Initial factory calibration
Response time	1 s

5.2.4. Pressure sensor technical characteristics

Accuracy	±10 hPa
Measurement range	500 hPa to 1150 hPa
Operational range	-40 a 105 ºC
Calibration	Factory calibrated
Response time	N/A

5.2.5. Temperature sensor specification

Accuracy	± 1 º C
Measurement range	0 ~65 ºC

Operational range	0 ~100 % RH/ -20 ~ 85 ºC
Calibration	Not required
Response time	8 s

5.2.6. Relative humidity sensor technical characteristics

Accuracy	±5 % RH
Measurement range	10 ~95 % RH
Operational range	0 ~100 % RH/ -20 ~ 85 ºC
Calibration	Not required
Response time	8 s

5.2.7. VOC sensor technical characteristics

Accuracy	30% on value measured
Measurement range	0 ~ 60000 ppb
Operational range	5 ~90 % RH/ 5 ~55 ºC
Calibration	Autocalibration
Response time	< 30 s
Technology	Metal oxide

5.2.8. Noise level sensor technical characteristics

Accuracy	Not characterized, qualitative measurement
Measurement range	0 ~ 100 % of noise level
Operational range	0 ~ 95 % RH/ 0 ~ 60 ºC
Calibration	Factory calibrated
Frequency measured	20 - 20000 Hz

5.3. Communications characteristics

5.3.1. LoRaWAN communication

LoRaWAN version	1.0.4

LoRaWAN communication	OTAA
Device type	Class A
Scope	Depends on distance to gateway and/or obstacles present
Maximum transmission power	14dBm
Maximum sensitivity reception	-137 dBm
LoRaWAN region supported	EU868
Data rate	Fixed, (ADR not supported) DR3 (SF9)
Data sending period	70 seconds
Configuration	USB-C or LoRaWAN downlink messages

Chapter 6. Installation

6.1. Installation of Nanoenvi™ IAQ LoRaWAN

The installation of Nanoenvi™ IAQ requires the device to be configured and then placed in the location where it will measure the air quality.

Make sure you have LoRaWAN network coverage in the location where you install the device.

If you are an end user and have purchased your Nanoenvi™ IAQ device from a dealer, the device may already be configured to connect to a LoRaWAN network. Check with your dealer whether Nanoenvi™ IAQ is pre-configured or not.

Nanoenvi™ IAQ can be configured via the USB-C port on the rear (see Section 4.2, “Product overview”) or via downlink messages once connected to a LoRaWAN network.

For configuration via the USB-C port Envira Sostenible provides the NanoenviIAQToolbox™ desktop software that receives configuration parameters from the user and sends them to the device via the serial port.

If you are a dealer or partner and have purchased your Nanoenvi™ IAQ device directly from Envira Sostenible, you will need to integrate Nanoenvi™ IAQ with other systems such as a data visualization platform, BMS etc. In the developer manual you can find all the information you need for this: message format with measurements, the communication model and configuration message format etc.

6.2. Configuration of LoRaWAN

Nanoenvi™ IAQ only supports OTAA activation. This means that the LoRaWAN Network Server and Nanoenvi™ IAQ should be configured with the same AppKey and AppEUI. Additionally, to activate the device on the Network Server, it may be necessary to register the device’s DevEUI (unique for each Nanoenvi™ IAQ) on the Network Server.

You will probably have to edit or add settings to the LoRaWAN Network Server which you will connect Nanoenvi™ IAQ to. Please refer to the Network Server documentation for this, or contact your LoRaWAN network provider.

The DevEUI is unique to each Nanoenvi IAQ™, fixed at manufacture and it cannot be edited by users. The DevEUI is included in the QR code on the back of the device (see Section 4.2, “Product overview”) together with the onboarding information in the following format: LW:D0:<AppEUI>:<DevEUI>:FFFFFFFF

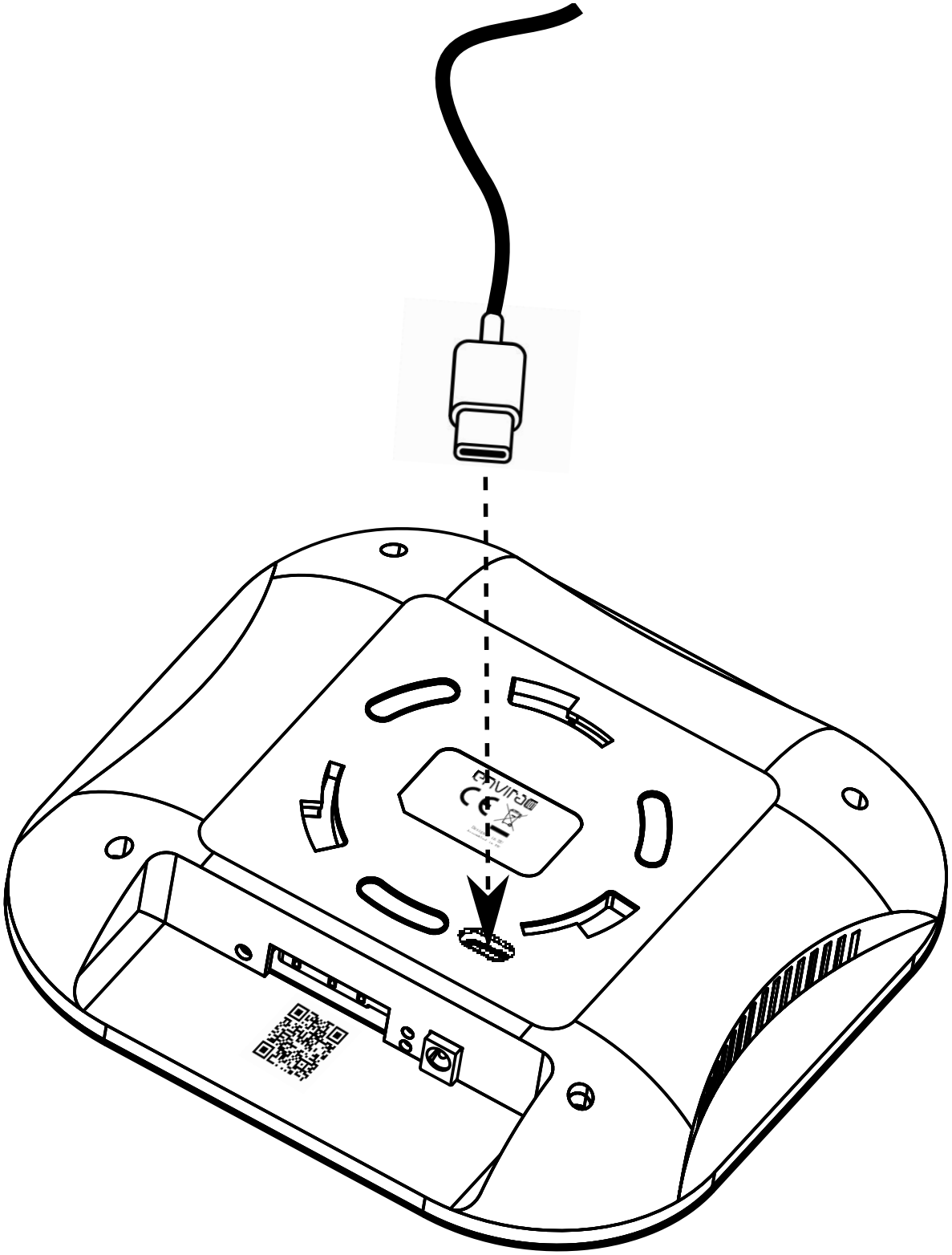
The AppKey and AppEUI have the following factory values:

- AppEUI: `00 00 00 00 00 00 00 00`
- AppKey: `38 78 2F 41 3F 44 28 47 2B 4B 62 50 65 53 68 56`

The AppKey and AppEUI values can be changed by users (on the device) in two different ways:

- By the USB-C configuration port on the back of the device:

Figure 6.1. USB-C configuration port



- With LoRaWAN downlink messages. Once the device has been connected to a LoRaWAN network (either with default or user-set credentials), downlink messages can be sent to change AppKey and AppEUI.

Remotely editing AppKey and AppEUI will cause Nanoenvi™ IAQ to reboot and attempt to connect to a LoRaWAN network with the new keys. If the AppKey and/or AppEUI are incorrect, the device will not reconnect. It may then need to be configured via USB.

For further information on formatting and sending downlink messages, please see the developer manual.

The following section shows an example of Nanoenvi™ IAQ AppKey and AppEUI configuration via the USB port using the NanoenviIAQToolbox™ software.

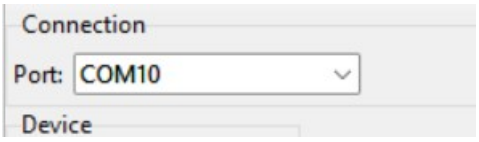
6.2.1. Example of the configuration of AppKey and AppEUI via USB port on PC with Windows Operating System

Before you begin, you should have the nanoenvi_toolbox_gui_windows™ software provided by your Nanoenvi™ IAQ supplier installed on your PC.

You should follow these steps:

1. Connect Nanoenvi™ IAQ to your PC with a type USB-C data cable.
2. Execute the nanoenvi_toolbox_gui.exe file
3. In the Port field, select the serial port corresponding to your Nanoenvi™ IAQ device.

Figure 6.2. Configuration of Nanoenvi IAQ port



4. Key in the AppEUI and AppKey you want in the corresponding fields and click on Submit.

Figure 6.3. LoRaWAN configuration

5. Wait for a few seconds, the device will reboot and try to connect to the network with the keys configured.

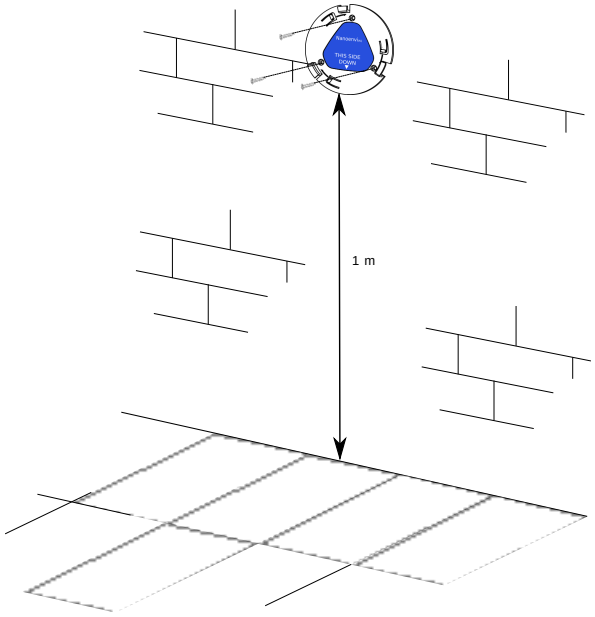
6.3. Installation of Nanoenvi™ IAQ LoRaWAN on the wall

The purpose of installation is to place the device in a suitable location with LoRaWAN network coverage.

To install Nanoenvi™ IAQ, you should follow the steps below:

1. Remove Nanoenvi™ IAQ from its box along with the wall bracket. Hold the wall bracket with one hand and rotate the device counter clockwise with the other hand to separate it from the wall bracket and packaging.

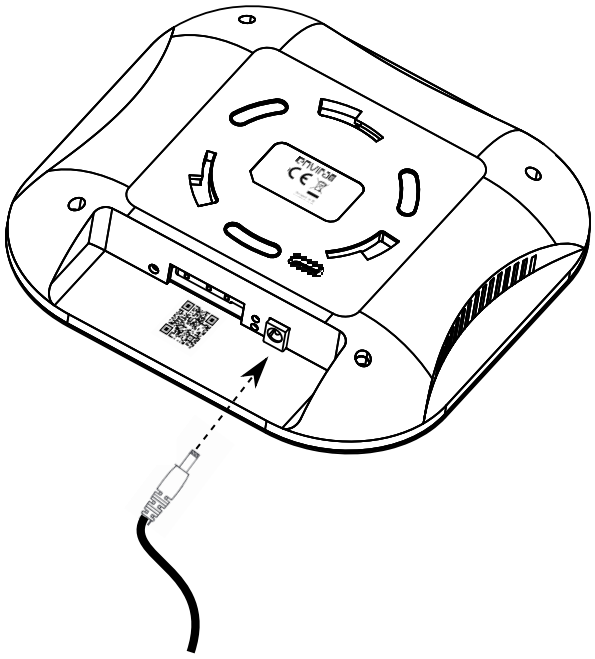
2. For the wall-mounted version, install the bracket on a vertical wall at mid-height (you can use your hip height as a reference). To attach the bracket to the wall use a fixing method that is sufficient to support the weight of the Nanoenvi™ IAQ. We would recommend using three screws suitable for the surface on which it is to be installed (screws are not included). Please note that Nanoenvi™ IAQ needs to be plugged in.



Make sure that you have the skills and knowledge to install the wall bracket. If not, get someone who knows to do it.

3. Prepare the power supply. Remove the power supply from the box and attach the compatible plug adapter to the socket to which the Nanoenvi™ IAQ will be connected.

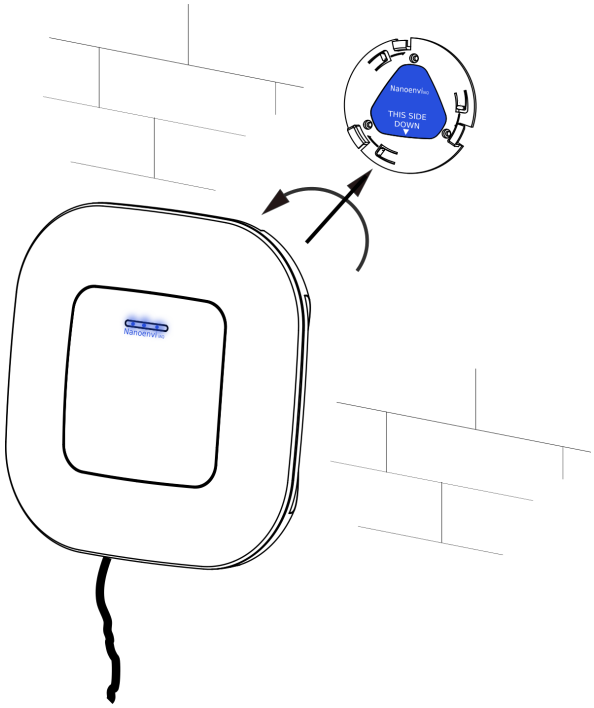
4. Plug the power supply into the wall and then connect the end of the cable with the jack connector to Nanoenvi™ IAQ.



5. After connecting the device, the lights will remain cyan (not flashing) for a few minutes while the device attempts to join the LoRaWAN network.

6. After a few minutes, the three lights on the device should change from cyan to blue, yellow, green or red depending on the air quality (see Appendix B, *Nanoenvi IAQ status lights*). This means that Nanoenvi™ IAQ is connected to the LoRaWAN network, can send data with no problems and the LEDs on the device show the air quality. If this does not happen (only one of the three lights is red), please refer to Chapter 9, *Troubleshooting*.

7. You can now place the device in the wall bracket. To do this, align the case with the bracket and turn it clockwise.



Make sure the device is correctly put in place.

6.4. Integration and data usage

If you are a Nanoenvi™ IAQ end-user, please ask your dealer how you can obtain the data from the device.

If you are a dealer or an end user whose dealer does not provide you with a way to access Nanoenvi™ IAQ data, please refer to the developer manual for instructions detailing the integration of Nanoenvi™ IAQ with the Network Server. This document also shows how to deserialize messages with measurements and the protocol and format of downlink messages.

6.5. Updating software

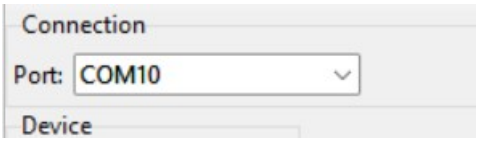
The Nanoenvi™ IAQ software can be updated via the USB-C port using the nanoenvi_toolbox_gui_windows™ software provided by your Nanoenvi™ IAQ supplier. To do so:

1. Connect Nanoenvi™ IAQ to your PC with a USB-C type data cable.

2. Execute the nanoenvi_toolbox_gui.exe file

3. In the Port field, select the serial port corresponding to your Nanoenvi™ IAQ device.

Figure 6.4. Configuration of Nanoenvi IAQ port



4. In the Firmware update section, select the file with the firmware update and click on the Update button.

Figure 6.5. firmware update

5. Wait a few minutes (about 3), and your device will reboot.

6. Check that the new firmware version has been applied by clicking on the Get device info button and check the value of the FW variant field.

Chapter 7. Expected use of Nanoenvi™ IAQ LoRa

Once installed, Nanoenvi™ IAQ will take and send indoor air quality data on an ongoing basis. The device works autonomously and requires no calibration or maintenance programmes.

If you wish to change the Nanoenvi™ IAQ settings you can do so via LoRaWAN downlink messages or via the device's USB port.

Chapter 8. Manteinance

Nanoenvi™ IAQ requires no specific maintenance. However, certain considerations about cleaning should be taken into account.

8.1. Cleaning

- Do not wash with water.
- Do not wash with objects that emit dust.
- Do not wash with solvents or alcohol.
- Do not use aerosols on the device.
- Simply wipe the device casing with a sterile gauze.
- Dry air can be used to clean sensors if measurement levels are unusual.

Chapter 9. Troubleshooting

9.1. Troubleshooting

Q: I have installed Nanoenvi™ IAQ following the instruction manual but LED1 is red.

A: A red LED1 means that the device has not been able to connect to the LoRaWAN network. There may be a number of reasons for this, including the possibility that the device is incorrectly configured or that the LoRaWAN network coverage at the point of installation is not sufficient. We would advise you to try connecting the device from a point just a few metres away from the nearest LoRaWAN gateway, or try connecting another device at the point where you are installing Nanoenvi™ IAQ.

Q: I have moved the device to a different location and LED1 is now red.

A: This is probably because in the new location, the LoRaWAN network that the device is saved on is probably not available. You should reconfigure the device.

Q: LED2 is red.

A: This means that the Nanoenvi™ IAQ was connected to the LoRaWAN network, but at some point lost the connection. Check that the LoRaWAN network is available as there is most probably a problem with it.

Q: Only one of the LEDs on the Nanoenvi™ IAQ is on, and it is yellow.

A: No problem, Nanoenvi™ IAQ is updating the software.

Q: The CO2 values on the device are very low, under 400 ppm.

A: It is possible that your device has suffered an impact or has been exposed to very high CO_2 levels for a long time. It is likely that your dealer has provided you with information on how to correct this. Check the documentation provided by your dealer and if you cannot find anything about this, please contact your dealer.

Q: The values of one or more of the variables measured by the device are out of range.

A: Check that the measurements are actually wrong. Check that you are consulting the measurements in real time and if you are comparing them, that the reference is reliable and takes measurements under the same conditions. Try disconnecting and reconnecting the power supply to the device if the problem persists. If this still does not solve the problem, contact your dealer.

9.2. FAQ

Q: How should I integrate Nanoenvi™ IAQ onto my own platform?

A: Nanoenvi™ IAQ uses the LoRaWAN protocol as standard and serializes the sensor measurements in protobuf format. In the LoRaWAN protocol the data is sent to a Network Server. Refer to the Nanoenvi™ IAQ developer manual and the documentation about your Network Server to determine which steps to take in order to obtain and use the data.

Q: Does Nanoenvi™ IAQ have an API REST?

A: No, the measurements taken are sent to the Network Server of the LoRaWAN network from where they can be redirected to wherever the integrator decides.

Q: Can I use a different power supply?

A: No. Use the power supply that comes with Nanoenvi™ IAQ. If integration issues (e.g. vehicle integration) require a different power supply, please contact your distributor.

Using a power supply other than the one supplied with Nanoenvi™ IAQ may result in permanent damage to the device and loss of the guarantee. Only if the integration of the device requires a different power supply, get in touch with your dealer for power supply requirements and the means of integration.

Q: I have configured Nanoenvi™ IAQ correctly, what do I have to do to see the data?

A: If the device is configured correctly and the lights do not show any errors, it is connected to the LoRaWAN network. To view the data, you should refer to the information provided to you by your dealer. He will probably have provided you with a website address and login credentials for this purpose.

Q: What do the indices TCI, EIAQI and IAQI measured by the device stand for?

A: All three are calculated by the device and stand for:

- IAQI: Indoor Air Quality Index. This is a value on a scale from 0 to 100 showing the air quality (0 being the worst and 100 the best). By default, this index is derived from the concentration of CO, CO_2, VOC and PM10.
- TCI: Thermal Comfort Index. This is a value on a scale from 0 to 100 (0 is the lowest thermal comfort and 100 is optimum comfort) obtained from the relative humidity and temperature, which shows the comfort level of the ambient conditions.
- EIAQI: Environment Indoor Air Quality Index. This index combines the two previous ones and provides information on the general comfort of the environment. It is on a scale from -3 to 7 (-3 being the worst index and 7 the best).

Q: Nanoenvi™ IAQ is going to be installed in a place where the power is periodically cut off, will the configuration be lost?

A: No. No matter whether you lose power or connection to the LoRaWAN network, the device will automatically reconnect when possible, with no need for you to do anything.

Q: Can I use the device for something not defined in the manual?

A: You shouldn't. However, you can consult your dealer for advice and authorization as to whether it is an appropriate use.

Q: What criteria does Nanoenvi™ IAQ use for changing the colour of the lights?

A: When Nanoenvi™ IAQ is measuring and sending data, the colour of the lights varies depending on the air quality. By default, the colour is obtained from an air quality index calculated by the device. This calculation is implemented based on an algorithm developed by Envira Sostenible S.A. in turn based on empirical studies by the company and different universities and air quality regulatory bodies. The algorithm weights gas concentrations, temperature and humidity with different weights. If you need further information, please consult your dealer.

Q: Do I have to calibrate Nanoenvi™ IAQ?

A: In principle it is not necessary. The device implements state-of-the-art calibration algorithms. However, you can request a quote from your dealer if you require additional calibration.

Q: How many Nanoenvi™ IAQ devices do I need to monitor the air quality of a space? How much surface area does the device cover?

A: It depends on the type of space and application: each Nanoenvi™ IAQ is a sampling point, so the higher the number of sampling points, the higher the resolution and the more knowledge you will have about air quality. It is up to the user or installer to determine how many sampling points they need. Some installers prefer to apply UNE 171330-2 (Indoor Air Quality, Part 2), while others prefer to increase the number of sampling points in crowded places such as offices, meeting rooms etc. Moreover, certification standards such as WELL set their own criteria for the number of sampling points and their placement.

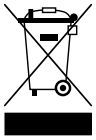
In the end, the number of Nanoenvi™ IAQ devices should be determined by the user or installer.

9.3. Repairs

In case of breakage, damage or malfunction check your Nanoenvi™ IAQ device, make sure that the device is actually faulty, and if necessary, contact your dealer. Nanoenvi™ IAQ should not be repaired or modified by an unauthorized entity.

Chapter 10. Protecting the environment

All the materials that make up the device and its packaging are marked and stamped for appropriate disposal. This product complies with all applicable legal regulations, in particular the regulations concerning electrical and electronic equipment (EU Directives 2002/96/EG WEEE and 2002/95/EG RoHS) and the REACH ordinance (EC Directive EU-REACH and Act for the Implementation of EC Directive (EG) No.1907/2006).

	This device contains valuable materials that can be recycled. Electrical and electronic equipment must not be disposed of in conventional waste containers. Always use the authorized procedures for the collection of electrical and electronic equipment and packaging materials. Use the appropriate containers in each case.

Appendix A. Order information

A.1. Product reference

NE_IAQ_WALL_WIFI_CO

Placement
WALL: wall placement

Communication module
WIFI: WiFi communication
LORA: LoRaWAN communication

Sensor types
CO: CO sensor
NOISE: noise level sensor

A.2. Content of the package

The Nanoenvi™ IAQ box purchased includes:

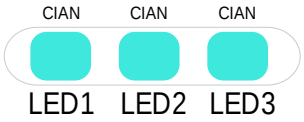
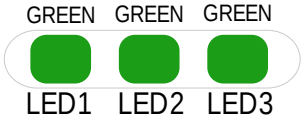
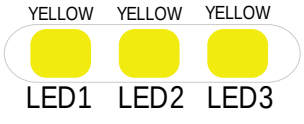
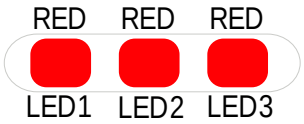
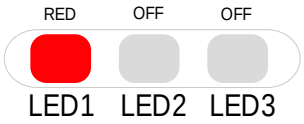
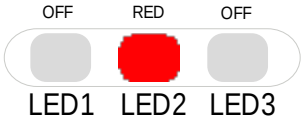
1. Nanoenvi™ IAQ.
2. Power supply with power adapter and plug adapters:
   - Type G (UK)
   - Type B (USA)
   - Type C (Europa)
   - Type I (Australia)

3. Packaging.
4. Wall bracket.

Appendix B. Nanoenvi IAQ status lights

B.1. Light code

Table B.1. LED light – device status key

LED light	Device status	Description
	Connecting to LoRaWAN network	When the LED lights are solid cyan (not flashing), Nanoenvi™ IAQ is initiating and attempting to connect to the LoRaWAN network configured.
	Connected to LoRaWAN network and measuring with excellent air quality	When the LED lights are blue, the device is measuring the different parameters and sending the data to the Network Server. The air quality index selected in the configuration (either IAQI, TCI or EIAQI) is excellent.
	Connected to LoRaWAN network and measuring with good air quality	When the LED lights are green, the device is measuring the different parameters and sending the data to the Network Server. The air quality index selected in the configuration (either IAQI, TCI or EIAQI) is good.
	Connected to LoRaWAN network and measuring with low air quality	When the LED lights are yellow, the device is measuring the different parameters and sending the data to the Network Server. The air quality index selected in the configuration (either IAQI, TCI or EIAQI) is low.
	Connected to LoRaWAN network and measuring with poor air quality	When the LED lights are red, the device is measuring the different parameters and sending the data to the Network Server. The air quality index selected in the configuration (either IAQI, TCI or EIAQI) is poor.
	Error in the configuration of the LoRaWAN network	If LED 1 is red (while LED 2 and LED 3 are off), it means that the device has not been able to connect to a LoRaWAN network. This in turn means that either the LoRaWAN network to which the device is trying to connect does not exist or that the device has an incorrect LoRaWAN network configuration.
	Error in connection to the LoRaWAN network	If LED 2 is red (while LED 1 and LED 3 are off), it means that the device was connected to a LoRaWAN network but has lost the connection, and cannot reconnect.

Chapter 11. Contact

11.1. Contact information

Envira IoT is a brand belonging to Envira Sostenible S.A.

Envira Sostenible S.A.
P.C.: 33428
Calle Ablanal Nº 11
Parque Tecnológico de Asturias
Llanera – Asturias
Spain

www.enviraiot.es
www.enviraiot.com
sostenible@envira.es

Sales and customer support service: +34 985 73 39 52

Nanoenvi