Sentinel
Desktop Version
User Guide

Software version 1.0.3

Document revision 6

Contents

Sentinel Setup

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What You Need

To use the Sentinel and the Desktop Software, you will need:

- At least one Sentinel Pro or Sentinel Micro.
- Windows 2000 operating system or better
- At least 1 GB of Physical RAM
- At least 1 GB of Hard Disk space
- Screen resolution of 800x600 or better, 16-bit color depth
- Aginova Desktop Software (CD-ROM)
- A WiFi Access Point with the following capabilities:
    - 802.11 b/g
    - Open security or WPA2 PSK
    - DHCP (or provided by your network)
    - 1,2 Mbps basic rate set

Introduction to the Sentinel

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Introduction

The Sentinel Wi-Fi Sensors are devices with various sensors (depending on configuration temperature, humidity, moisture, light) that use your existing 802.11b/g Wi-Fi network infrastructure.

The sensors will take a measurement at a regular time interval (for the remaining of this guide, we will use temperature as an example) and report them to a local PC. When not taking a measurement, the sensor will enter a low power sleep mode to preserve the internal lithium battery.

The Sentinel Pro and Micro compared

Sentinel PRO	Sentinel MICRO
Temperature Sensor with Humidity Sensor Option	Temperature Sensor Only
Onboard T sensor or Tethered sensor probe	Onboard T sensor only
Temperature range possible -100°C to +100°C	Temperature range 0°C to 100°C
512K Flash Memory	No Flash Memory
LED for alarms and debugging	No LED
External power option available	No external power option
Store & Forward (with flash memory)	No Store & Forward

Chapter 2   Introduction to the Sentinel

Low-power WiFi Sensors

The Sentinel uses a low-power duty cycling algorithm to preserve battery power and perform scheduled temperature measurements.

Desktop Software Setup

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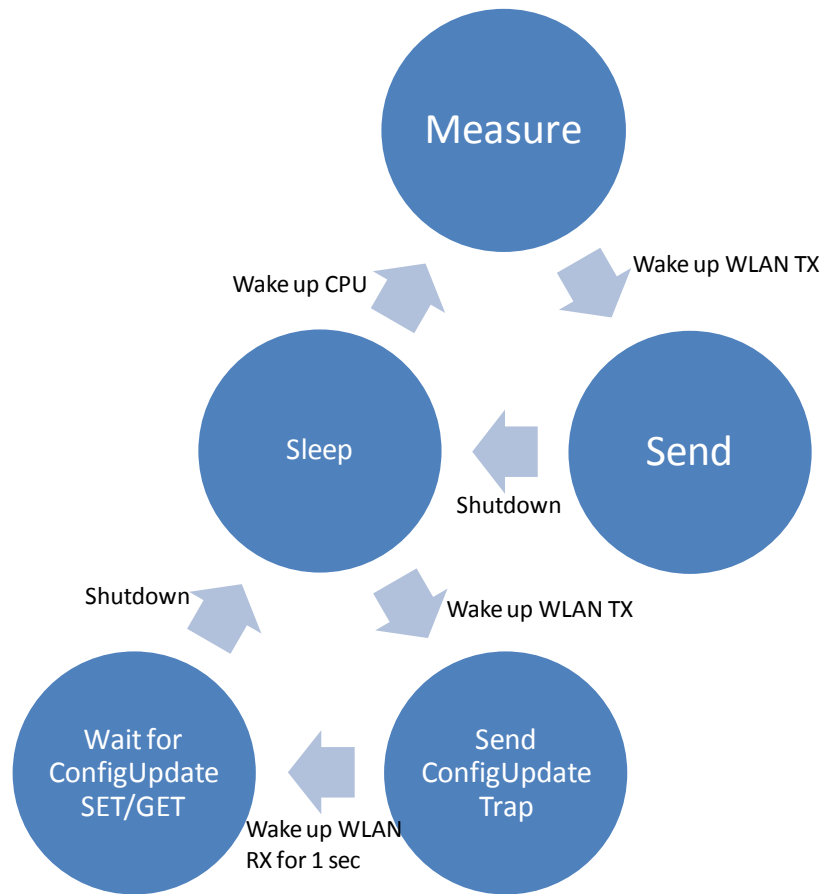
> ⓘ You only need to go through these steps if the sensor was configured for DESKTOP application. This will not work for WEB application.

Overview

In the desktop software application, the sensor is pre-configured to send its data to a Personal Computer (PC) whose IP address is set by default to 172.19.0.10.

In order to connect to the sensors, you will first need to configure your WiFi router, reconfigure your PC with the appropriate settings, and install the Desktop Software. Once you are able to connect to the sensors, you can reconfigure them to send the data packets to a different IP address.

In summary:

- Configure the Wi-Fi router
- Change your PC IP address (and network addressing)
- Install the Software on the PC
- Turn on the sensor(s) and wait until they appear on the Desktop Software
- Reconfigure the sensors to point to a different IP address
- Reconfigure your PC IP address back to its original settings

Configure your Wi-Fi router

For desktop software configure the Access Point with the following settings:

SSID:	**demokit**	(case sensitive)
Channel:	**1**	
Mode:	**802.11 b/g**	
DHCP:	**enabled**	
Security:	**Either Open or WPA2 Personal, with PSK "demokit1234"**	
Basic rate set:	**1, 2 Mbps**	
IP Address:	**172.19.0.1**	
Netmask:	**255.255.0.0**	

NOTE
- WEP, or WPA1+2 is not supported at this moment
- You must connect your PC to the one of the LAN ports of your router

An illustrated reconfiguration of a Linksys WRT54GC router is available at www.aginova.com

Changing the PC's network IP address
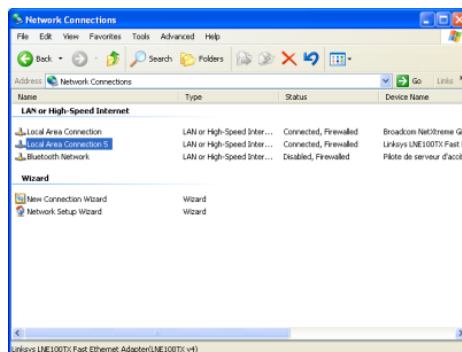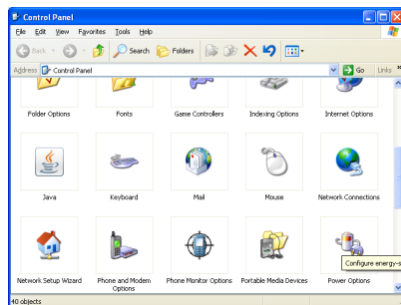
Computer has to be set up as follows when using the desktop software OR the RTMS (No set up necessary when using Aginova's hosted solution):
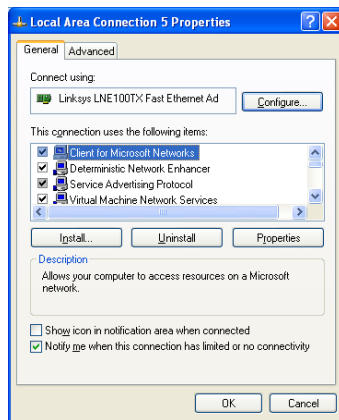

A. Open the Control Panel, Network Connections

Go to START
Select Control Panel
Double-click on the network connections icon.

B. Disable the Ethernet network interface

Right-click on the Ethernet network interface and select **disable.**

C. Open the TCP/IP configuration

Right-click on the Ethernet network interface and select **Properties.**

Double-click on **Internet Protocol (TCP/IP).**
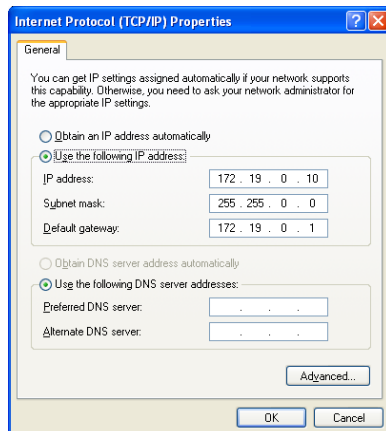
D. Change the configuration to use static IP

Write down your previous settings.

Select **Use the following address:**

IP address: **172.19.0.10**
Subnet mask: **255.255.0.0**
Default gateway: **172.19.0.1**

E. Enable the Ethernet network interface

Right-click on the Ethernet network interface and select **enable.**

Installing the Desktop Software

Insert the provided CD-ROM or download the latest release from www.aginova.com .

The installer should start automatically. If not, locate and run the installer file.

Once the installation starts, you can leave all options with default values.

Chapter 3   Desktop Software Setup
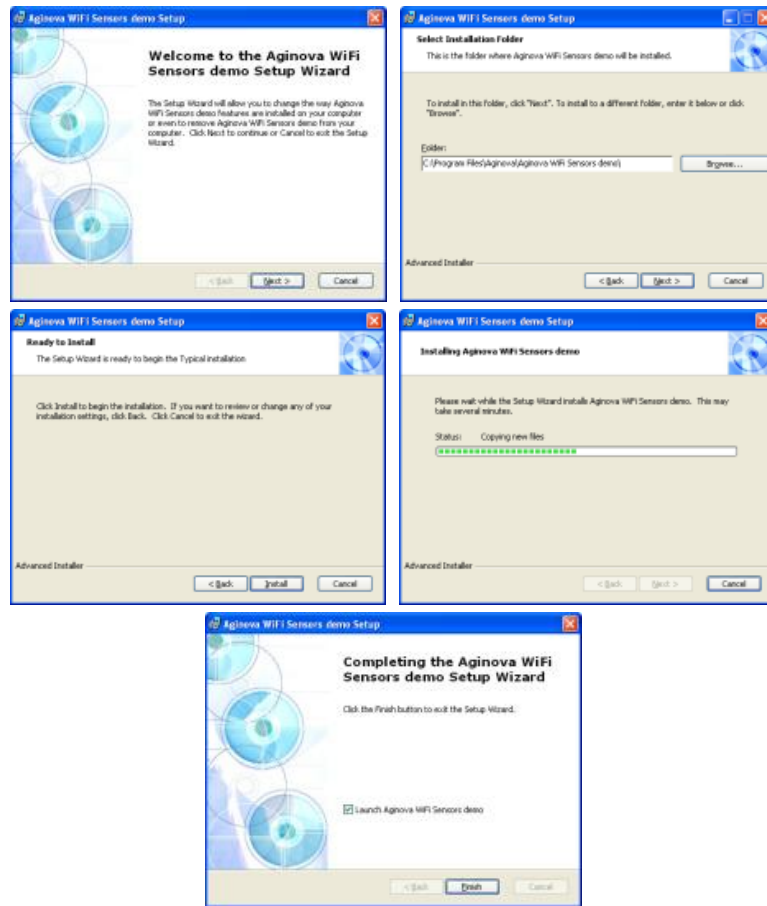
Setup of the Sentinel Sensor

> The Sentinel Pro & Micro come pre-installed with a 3.6V lithium battery.

Perform the following steps:
- Connect the sensor probe (depending on setup)
- Connect the power supply (optional)
- Turn the power switch to LED (to see LED indications)

POWER   SENSOR   OFF ON LED

Desktop Software Guide

<div style="text-align: right;">

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Introduction

The Aginova Sentinel Application allowsthe user to quickly set up a full sensor-based environment. It has a small embedded database that stores temperature information for several months. The Desktop Software features :

- A simple installation (no database or web server needed)
- Embedded database for temperature storage
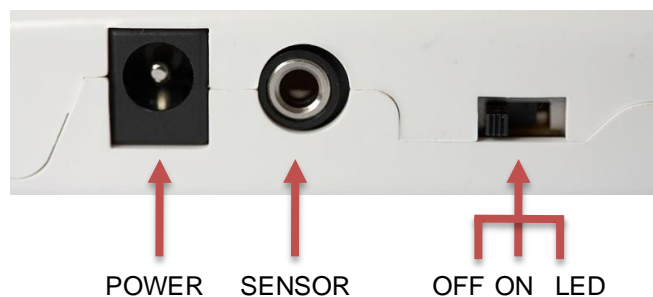- Graphs & simple data extraction
- Visual map of the sensors

The Gold Edition has the same features as the Silver Edition but also includes:

- Email alerting
- Reports

Running the Desktop Software

When the installer finishes, it will prompt you to automatically start the Desktop Software application. To run it manually,

Go to **Start** ⊕ All Programs ⊕ Aginova Desktop Software Silver Edition ⊕ Aginova Desktop Software Silver Edition
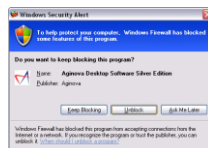
Note: If you see this security warning, please click on the "**Unblock**" button. This will allow the Application to receive sensor data.

The *Overview* section

The Desktop Software always begins in the **Overview** page. The Overview page displays instantaneous information about all the sensors on one screen. It features a placeholder that displays a map (of the building, for example) for visualization of the sensors.
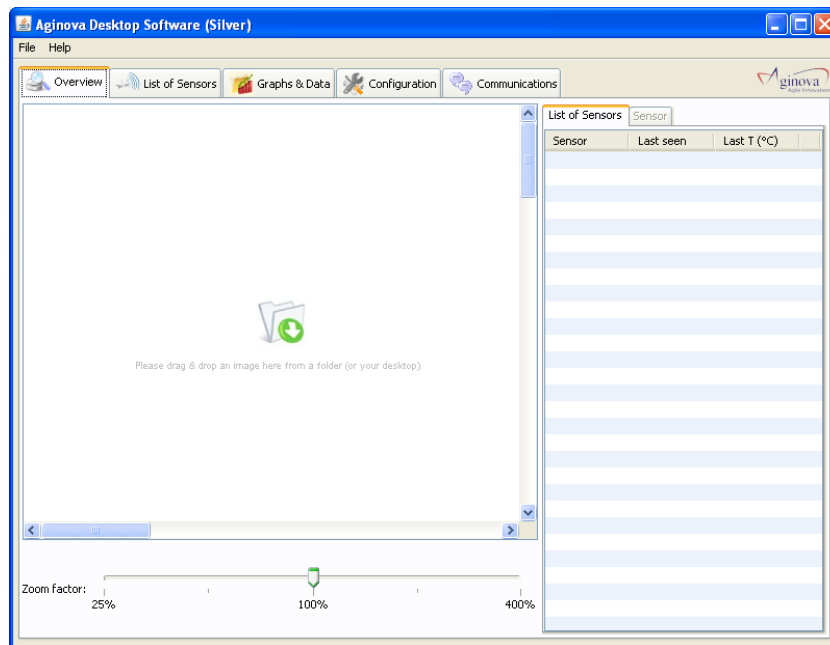
At the beginning, this page is empty since no sensor is detected.

You can drag & drop an image to define a Map of your location.

When sensors are detected, they will start appearing on the Map (see on next picture). You can drag a sensor to a new location using the mouse. When clicking on a sensor, detailed information will be displayed on the right panel.

You can use the zoom factor slider to zoom in and out of the picture.
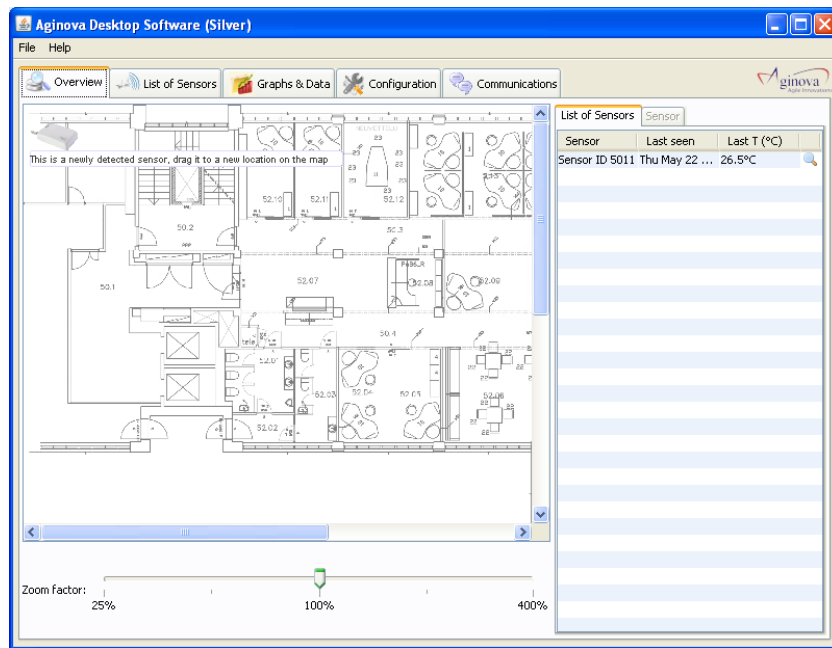
The List of Sensors section

Clicking on the List of Sensors section displays all the sensors that ever connected to the system.
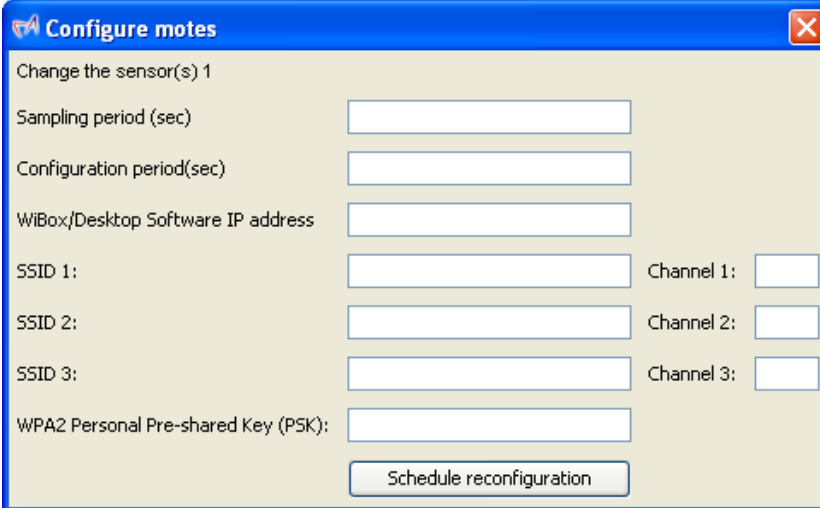
Give a meaningful name to each sensor by double-clicking on its Sensor N°.
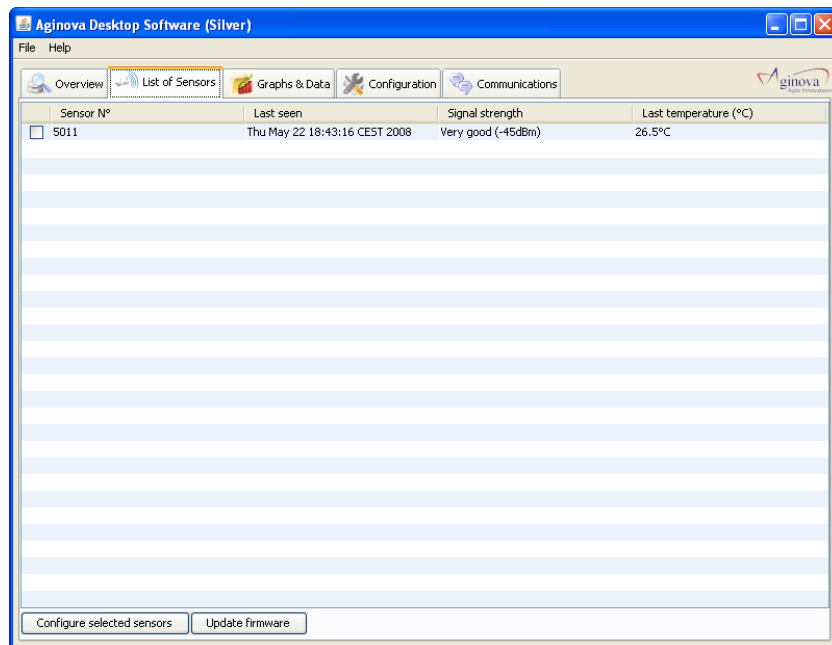
Note: You can change the temperature unit to **°F** under the Setup section.

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Reconfiguring your sensors

To reconfigure one (or many sensors), go to the List of Sensors page (refer to previous section for more details), and select the sensor(s) that you would like to reconfigure. Then click on the **Configure selected sensors** button. A screen like this one should appear:

The following parameters can be set from the Desktop Software application:
-   Sampling period
-   Heartbeat period (not available in this version)
-   Configuration period
-   WiBox / Desktop Software IP address
-   Wi-Fi parameters: SSIDs, channels, PSK password

Sampling period
The sensors will use this duration to determine at which moment the temperature (or humidity, light etc) measurement is made. Typical applications require a 60 second sampling period.

Configuration period
The sensor will wake up at this specified interval to poll the server for updates. If you want to change a setting (like the sampling period), you must wait until the next configuration period. Setting a low value (like 60 seconds) will let you update the configuration faster but will lower the battery life significantly.Typical applications require a 600 second configuration period.

WiBox / Desktop Software IP address

This parameter (an IP address, for example <u>172.19.0.10</u>), controls where the sensor sends its data information. By default (factory settings), the sensor will send its information to 172.19.0.10. Once you connect to the sensor, you can change this value to your preferred IP destination. Once the sensor is reconfigured, it will try to communicate to the new address. Make sure that you also update your PC to match the new settings.

SSID (1/2/3)

SSIDs are used to differentiate different IEE 802.11 Wi-Fi networks. For example, you might have settheSSID to **myhome**.

The sensor will try to connect to SSID1, if not found, SSID2, and if still not found, SSID3.

By default, the sensor will try to connect to the **demokit** SSID (for SSID1) and then **demokit** for SSID2. If everything fails, it will use the Key written at the back of your sensor as SSID3 (in case you forget to what it is set).

Channel (1/2/3)

These channels are set by default to **1, 6 and 11**. They should not be changed unless you want to use different channels.

WPA2 Personal Pre-Shared Key (PSK)

By default, this is set to **demokit**. You can change that security key to match your existing setup.

Reconfigure multiple settings in one shot. Afterward, click on the **Schedule Reconfiguration** button. Go to the **Communications** section to verify that your Reconfiguration was effective.

Reprogramming your sensors

The Sentinel Sensors can be reprogrammed wirelessly.

Chapter 4   Desktop Software Guide
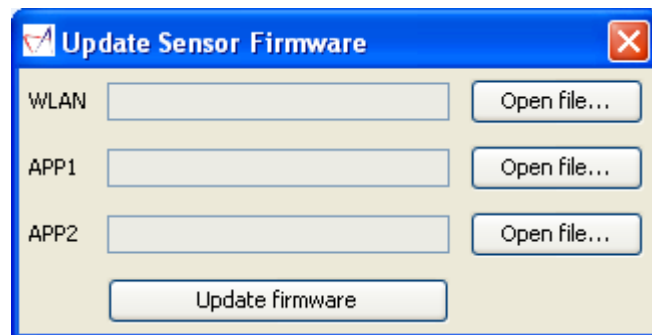
To reprogram a sensor, go to the List of sensors section, select the sensor(s) to reprogram and click on the **Update firmware** button.

Select the new firmware (can be found on Aginova.com) and click on the **Update firmware** button. You can verify that the firmware was updated properly on the **Communications** section.

The Graphs & Data section

The Graphs & Data section allows the user to quickly view the temperature evolution of a subset of your sensors.

Select multiple sensors by holding the "Ctrl" key while selecting sensors on the list.
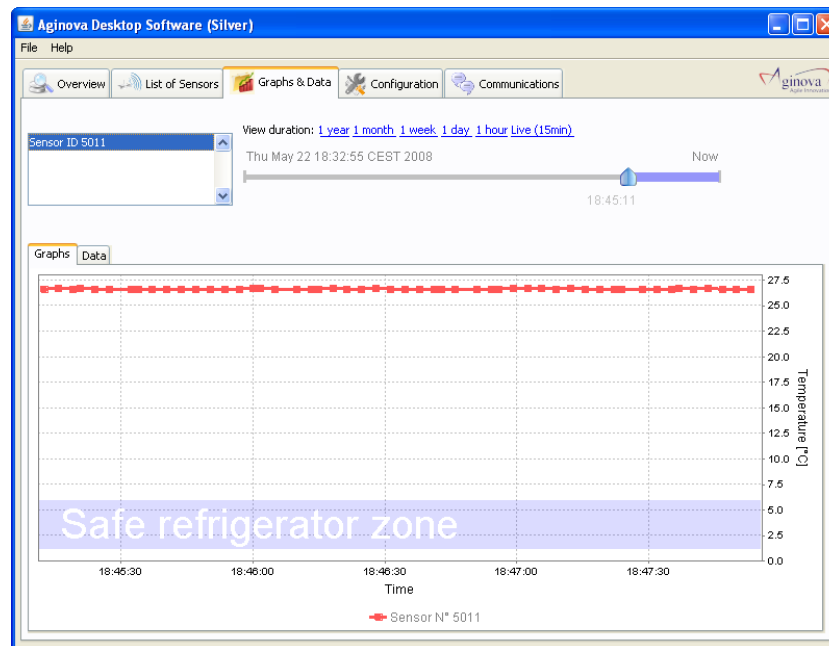
Select various durations (from 1 year to the last 15 minutes) and use the slider to adjust the desired time window .

Note: depending on the duration scale, data might be averaged in order to reduce computation time.

The Data section shows the same data as currently displayed on the Graph.

The Configuration section

Temperature unit can be changed in the Configuration section.
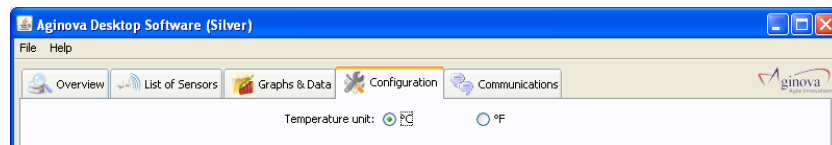
The Communications section

In case of problems, troubleshoot communications in the Communications section. This shows the latest packets received by this software from the sensors.

Troubleshooting

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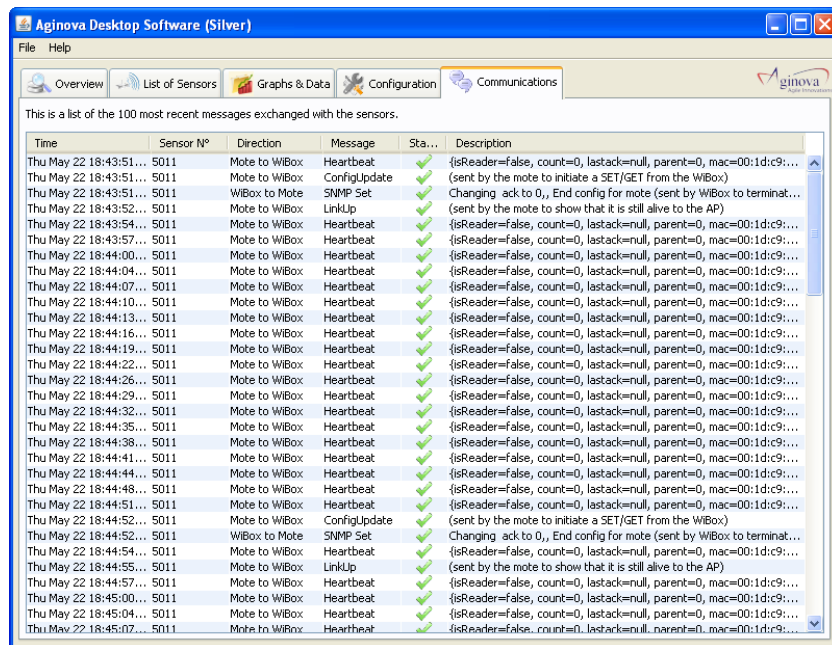
Overview of the data flow

Here is the typical path of data between the Sentinel Sensor and the Desktop Software.

Device	Common issues
Sensor Probe	**Bad temperature reading**
	- Wrong probe attached
	- Wrong product number set
↓	
Sentinel Pro / Micro	**Cannot see sensor**
	- No batteries (or voltage too low)
	- Not turned ON (middle position)
	-
	Cannot see sensor
	- Sensor too far
↓	
Access Point	**Cannot see sensor**
	- SSID wrong
	- Channel wrong
	- DHCP not enabled
	- Security type or PSK wrong
	Sensor disappears
	- Group key update causes problems (set it to high value)
↓	
Desktop Software	**Cannot see sensor**
	- IP address of PC not configured properly

Common problems

Not able to see any sensors?

Verify the following points:

- Make sure that you can reach your WiFi Access Point (AP) from your PC
- Verify that the AP is correctly configured (SSID, channels, DHCP, etc). You can use another device (PDA, laptop) to verify that it can reach your PC.
- Verify that your PC has the correct IP address set (172.19.0.10)
- Disable any firewall/antivirus that could prevent sending/receiving UDP/SNMP packets
- Try to restart your networking equipments (routers) as well as computers

Understanding LEDs' meaning

> (i) At the time of writing, the LEDs were not configured to display these values. Reprogram the Sensors with the latest Firmware to update the LEDs.

When the switch is set to the LED position:

LEDS	Problem description
One Amber	No Access Point with the corresponding SSIDs was found.
One Red	Low battery
Two Red	Association / Authentication problems
Two Amber	Unable to complete DHCP
Three Amber	Cannot resolve route to WiBox / Desktop
Three Red	Configuration messages not acknowledged by WiBox / Desktop
Four Amber	SNMP or UDP packet sending error
Four Red	Flash Write error
Five Red	Other sensor error
Five Amber	Unknown error

No Access Point with the corresponding SSIDs was found

Verify that your Access Point (AP) is set with the correct SSID and enable broadcast of SSID. Make sure that the AP also uses the correct channel.

Factory settings are: SSID: **demokit**, Channels: **1** or **6** or **11**

Association / Authentication problems

Try to disable security on your Access Point and try again. If that works, make sure that when you enable security, please only use WPA2 – PSK.

Unable to complete DHCP

Make sure that a DHCP server is running on the same network where the sensors are placed. Make sure that the DHCP offer is broadcasted using 1,2Mbps only (rendering some routers like the Devolo incompatible).

Cannot resolve route to WiBox / Desktop
Verify that the Sensor can "ping" the WiBox or Desktop. There must be a possible route between the two.

Configuration messages not acknowledged by WiBox / Desktop

The Sentinel did not receive an acknowledgment from the WiBox / Desktop when sending a reconfiguration message.

SNMP or UDP packet sending error

There was an error when the Sentinel tried to send a packet (data or other) to the WiBox / Desktop.

Other sensor error / Unknown error

Please contact Aginova support if the error persists.

Using Wireshark to sense Ethernet packets

Please refer to http://www.wireshark.org.

Using Wireshark to sense Wi-Fi packets

Please refer to http://www.wireshark.org.

You can setup Wireshark to sniff Wi-Fi packets using a Ubuntu Linux Desktop 7.10 or better. We found that using the US Robotics USR805423 was the best option.

Under Linux, enable the correct mode on the terminal:

```
sudo iwconfig
sudo iwconfig <interface> mode monitor # for example interface=eth1
sudo iwconfig <interface> freq 1  # (to listen to channel 1)
sudo iwconfig <interface> essid null # to discard any relationship with SSID
sudo iwconfig # to check that the change was done properly
```

Notice

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FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- The devices may not cause harmful interference

- The devices must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

Modifications to this product not authorized by Aginova could void the FCC, CE & Industry Canada regulations and negate your authority to operate the product.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Recycling
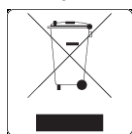
This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste.

Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designed collection point for the recycling of waste electrical and electronic equipment.

The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service, or the shop where you purchased the product.

Health and Safety precautions

Only qualified persons are authorized to carry out maintenance on this device. Read this user manual carefully and follow the correct procedure when setting up the device.

Do not open your Sentinel Sensor or attempt to disassemble or modify it. Your Sentinel Sensor contains no user serviceable parts except the battery. If it appears to be malfunctioning, have it inspected by a qualified Aginova Technical Support representative.

Never expose your device to rain, or use it near water, or in damp or wet conditions. Never place objects containing liquids on the Sentinel Sensor, as they may spill into its openings. Doing so increases the risk of electrical shock, short-circuiting, fire or personal injury.

General Use Precautions

Do not expose the Sentinel Sensor to temperatures outside the range of -20° C to 80° C (-4° F to 176° F); or to operational humidity beyond 5-80%, non-condensing, or non-operating humidity beyond 10-90%, non-condensing. Doing so may damage the Sentinel Sensor or disfigure its casing. Avoid placing your Sentinel Sensor near a source of heat or exposing it to sunlight (even through a window). Inversely, placing your Sentinel Sensor in an environment that is too cold or humid may damage the unit.

Use only the power supply shipped with the device.

Do not use the Sentinel Sensor near other electrical appliances such as televisions or radios. Doing so may cause interference which will adversely affect the operation of the other products.

Warranty Information 7

Aginova warrants your Sentinel Sensor against any defect in material and workmanship, under normal use, for the period designated on your warranty certificate. In the event this product is found to be defective within the warranty period, Aginova will, at its option, repair or replace the defective device. This warranty is void if:

- The device was operated/stored in abnormal use or maintenance conditions;
- The device is repaired, modified or altered, unless such repair, modification or alteration is expressly authorized in writing by Aginova;
- The device was subjected to abuse, neglect, lightning strike, electrical fault, improper packaging or accident;
- The device was installed improperly;
- The serial number of the device is defaced or missing;
- The broken part is a replacement part.

Aginova and its suppliers accept no liability for any loss of data during the use of this device, or for any of the problems caused as a result.

Aginova will not, under any circumstances, be liable for direct, special or consequential damages such as, but not limited to, damage or loss of property or equipment, loss of profits or revenues, cost of replacement goods, or expense or inconvenience caused by service interruptions.

Any loss, corruption or destruction of data while using a Aginova device is the sole responsibility of the user, and under no circumstances will Aginova be held liable for the recovery or restoration of this data.

Under no circumstances will any person be entitled to any sum greater than the purchase price paid for the device.

To obtain warranty service, call Aginova Technical Support. You will be asked to provide your Aginova product's serial number, and you may be asked to furnish proof of purchase to confirm that the device is still under warranty.

All devices returned to Aginova must be securely packaged in their original box and shipped with postage prepaid.

Customer Support

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Before Contacting Customer Support

Read the User Manual and review the Troubleshooting section.

Try to isolate the problem. If possible, make the Sentinel Sensor the only wireless device connected to your computer, and make sure that all of the cables are correctly and securely attached.

If you have asked yourself all of the pertinent questions in the troubleshooting checklist, and you still can't get your Sentinel Sensor to work properly, contact us using the contacts listed in next section. Before contacting us, make sure

that you are in front of your computer and that you have the following information on hand:

- Computer Operating System and version
- Computer brand and model

Technical support contacts

Please submit your issue to the following email address:

support@aginova.com

In case the support requests you to ship back units, please use the following contact details unless instructed differently:

For the Americas (U.S.A., Canada, South America, Mexico,etc):

Aginova Inc.
3 Chambry Ct.
Freehold, NJ 07728. U.S.A
Tel: 732-780-7065

For EMEA (Europe, Middle-East, Africa, Asia):

Aginova Sàrl
23, Rue Pré-du-marché
CH-1004 Lausanne, Switzerland
Tel: +41 21 647 17 58

For India:

Aginova Technologies.
503, Brindavan, Opp IIT Main Gate,
Powai, Mumbai-400076.

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