






SAFETY RULES

-  **Improper connections may be dangerous, it can damage the controller and loss of the warranty.**
-  **DANGER! Risk of electric shock! Even with the device turned off, the outputs may be live. All assembly work should be ALWAYS performed with the disconnected power circuit.**
-  **The installation of the device to a power mains that does not meet the quality requirements defined by EN 50081-1, EN 50082-1, UL508, EN 60950, will result in the loss of the warranty.**

1 INSTALLATION - BASICS

- Disconnect supply voltage circuit before installing the controller. Remember that any mounting works should be carried out when the main voltage is disconnected (switch off the mains fuse or disconnect the power supply from the socket).
- The device should be mounted in a place protected from direct adverse environmental conditions, in particular atmospheric precipitation. At the same time, should be paid attention to ensuring a good air exchange around the device. Remember that metallic elements (wires, housing parts) have a negative influence on the range of the device, and consequently the comfort of use. It is recommended that the device be mounted in a stable and fixed position, correctly oriented (according to the inscriptions on the casing), fastened with screws, wall plugs or by means of a double-sided assembly tape.
- Remove the cover of the device by lifting it. Choose a power supply - a 5V USB connector located on the left side of the device or a 12-24V AC / DC mains adapter connected via wires to a plug-in connector located in the right part of the PCB (polarization is irrelevant). Connect the power wire to the USB connector or plug-in connector. Bringing in the power wire outside the housing through the aperture in the inferior part, replace the housing.



WARNING!
Never connect at the same time power to the USB connector and to the plug-in connector. It may cause damage to the device.

- Turn on the device by switching on the power supply voltage (switching on the main power supply circuit fuse or connecting the power supply to the socket). The device will turn on the LEDs on white color for a few seconds and then will change into a color depending on the air quality. Continuous lighting in white color indicates the sensor error, which is also signaled by the red status visible in the wBox application (more information about the wBox application later in the manual). In this case, check the wire connected to the sensor circuit board.

2 FIRST START

- Download the **free wBox application**. If you have an Android mobile device, you will find the application in the Play Store. For iOS devices the application is in the App Store.
- By using your mobile phone or tablet, connect it to the device wireless network. To do this, enter to your smartphone or tablet settings, then go to setting of the WiFi network and find the network named „airSensor-xxxxxxx“ where xxxxxxxx is the serial number of the device. Connect to this network.
- Open the wBox application. A device will appear at the top of the screen. To add it to the application, click on “+” on the right side of the name. To pre-configure the controller, click on the default device name.



You can also set the configuration using the web browser of your phone / tablet. After connecting to the wireless network of the controller, turn on the browser and go to: www.blebox.eu

3 MEASURING DATA

- The main controller screen shows current information from the air quality sensor. Air quality is determined based on the measurement of particulate matter concentrations PM2.5 and PM10 and is shown the worst value of both. The current state of air quality is displayed in the upper part of the screen in a colored icon and also in word status, and is signaled by colored LEDs built into the device and it shows in the following way:

very good (intense green color)

good (light green)

moderate (light yellow)

sufficient (orange color)

bad (bright red)

very bad (intensive red)

very good
good
moderate
sufficient
bad
very bad

- At the bottom of the screen there is a table with numerical values of particulate matter concentrations. Fields with concentration values PM2.5 and PM10 change its color in relation to the degree of exceeding the standard in the color scale presented before, moreover, the percentage value in relation to the value of the standard is presented in brackets. For example, a reading (50%) means that the current air pollution concentrations is only half of the acceptable value, while the indication (300%) means a 3-fold exceedance of the standard. Next to the percentage, the change trend is also calculated, compared to the average of the last hour of measurements. The trend is indicated by an up, down arrow or a horizontal line in the case that no changes have been registered, it is only displayed after the sensor's working one hour.
- At the very bottom of the screen is presented the status of measurements on the device. “Last measurement” means that the device displays a measurement taken within a time not exceeding 10 minutes. The device automatically performs another measurement every 10 minutes and displays the last air pollution concentrations value. This behavior is dictated by the care of the sensor's lifetime due to the fact the air pollution slowly changes over the time. It is also possible to manually force the measurement. To do this, press the “Refresh” icon (two arrows) in the upper right part of the screen. Within the first 20 seconds shows the status “Measurement in progress”, which next will be change to “Current measurement” and the concentration values will be updated. To switch the device into continuous measurement mode, in which measurements are taken every 1 second, hold down the “Refresh” icon for over 3 seconds. The icon background will turn gray and the device will start a continuous measurement, the device will start the continuous measurement, which will last until the moment it returns to the main screen of the application or the browser page is closed. Leaving the device in continuous measurement mode, should remember about the lifetime of the measuring system, estimated at approx. 8000 hours.
- Historical measurement data are only available for sensors mounted outside, configured in remote access mode, with a correctly set location and they are stored only on BleBox servers. They are available by clicking on the diagram icon in the upper right corner of the screen. They are also presented on the map available on blebox.eu

4 OTHER DEVICE SETTINGS

- Go to „Settings“ (icon in the upper right corner of the screen). In the “Main settings” section, you can change the device name which is visible in the wBox application. The option “Signal LED on” allows you to turn on the LEDs built into the device.
- In order to communicate with a device being out of the local WiFi network, from anywhere in the World, via wBox applications, must be set to “Yes” the option “Enable remote access”. Setting this option to “Yes” also means giving consent for the sending of the measurement data to a public map of the air pollution available on the web page blebox.eu and the archiving of this data together with its location. Setting the “No” option will result in the lack of the access to the controller when it is out of the local network and the lack of access to historical data - only the current values will be visible.
- Setting the “Enable event log” option to “Yes” will cause the device to record events (e.g. sending the notification set in the “Actions” section) in the BleBox cloud system. This allows the history of the events to be viewed later also when the controller is offline.

- The "Make geolocation coarse for sensor data" option helps you maintain privacy if you do not want your device to be located on the air pollution map with high precision.
- In the "Sensor settings" section, select the place of its installation - outside or inside the building (measurement of indoor air quality).

- It is possible to turn off the table with the numerical values of particulate matter concentrations on the main controller screen by setting the "Detailed view" option to "No". Then only an icon with a description will be shown.

5 ACTIONS

- The controller allows you to send control commands to other controllers of the wBox series via the WiFi network through the API. Each action will be deployed on particular trigger, eg. change of air quality level.
- When editing actions select "Control other device" as the "Action type", select "Value greater/worse than or equal to", "Value less/better than or equal to", "Air quality level change" as the "Trigger". Select "Value type" - a specific value of particulate matter (PM1, PM2.5 or PM10) or air quality level (for PM2.5, PM10 or worse of them). In the "Value" field enter or select from the list the border value after which the action is to be called once. Selecting the "Trigger periodically" option will trigger the action every time specified in the "Interval in minutes" field for the entire period of the exceeded value.
- Click on the "Select device" button. The controller will search the network for compatible devices and display them in a list. Select the device you want to control and click the "Select" button. If the device is not listed you must use the general API control method described further.
- Then in the "Call API" field enter the API command that the driver will call.
- The most popular API commands for shutterBox and wLightBox are presented below. It was assumed that the IP address of the device which will be controlled is: 192.168.1.123

Opening the window by the shutterBox: <http://192.168.1.123/s/u>

Closing the window by the shutterBox: <http://192.168.1.123/s/d>

Change LED strip color to red by the wLightBox: <http://192.168.1.123/s/ff000000>

Change LED strip color to yellow by the wLightBox: <http://192.168.1.123/s/ffff0000>

Change LED strip color to green by the wLightBox: <http://192.168.1.123/s/00ff0000>

- If the device was not on the found list or you want to control another device in the network, select "Call URL" as "Action type".
- In the "URL" field, enter the API command preceded by the http protocol prefix and the IP address of the wBox device which will be controlled. The IP address can be found in the device settings. Caution! All the controllers must be in the same subnet, usually the subnet of a home router.
- Confirm the entry with the "Save" button.
- A detailed description of how to control other controllers of the wBox series is available in the "Extended instructions for wBox devices", while all the technical documentation API of the wBox controllers is available at: <http://technical.blebox.eu>

6 NOTIFICATIONS

- The controller allows you to display a system notification on a phone with the wBox application installed on the particular trigger, e.g. to change the air quality level.
- Notifications are added similarly to "Actions" - as "Action type" select "Notification / Event log" fill in the remaining fields of the form and confirm with the "Save" button.
- In order for the notification to be displayed on the phone it is necessary to allow the controller to display notifications. Go to the main menu of the wBox application, to the "Notifications" tab. Then go to the settings (the "Settings" icon in the upper right corner of the screen). Find the device on the list and select "Action notification" from the drop-down list next to the device name. You can also select other types of available notifications or μ Portal notifications. Confirm the change of preferences with the "Save" button in the upper right corner of the screen.
- If notifications are not displayed despite their configuration check in the phone system settings (Android / iOS) whether the wBox application is authorized to display system notifications.

ACCESS POINT AND WIFI NETWORK SETTINGS

- Go to "Connect to WiFi network" section, where you can connect the device to the WiFi home network to be able to connect to it via it or from anywhere in the world. To do this, select the network name from the list and press "Connect". If required, enter the WiFi network password. When connecting the device to the home network, the phone / tablet may be disconnected from the device's network.
- After completing the WiFi network configuration, you can disconnect from the device network and connect the phone / tablet directly to your home WiFi network. Control from the wBox application will work in the same way as when the phone / tablet is connected to the device's network. If as a user you leave the local network, eg leaving your home or enclosing mobile data, the wBox application will signal this status as "Remote mode". In this case, you will have access to the device data, but for security reasons settings options will not be available.
- In the "Access point settings" section, you can change the name and give the password of the WiFi network emitted by the device. Remember that changing the network name or password can cause disconnection with the device immediately after clicking the "Save" button, so you should reconnect to the WiFi network.

TECHNICAL SPECIFICATIONS

power supply	12-24V AC/DC through a plug-in connector or 5V via micro USB connector
power in active state	max 2W
power in inactive state	less than 1W
particulate matter classification	PM1: 0,3-1,0 μ m, PM2.5: 1,0-2,5 μ m, PM10: 2,5-10 μ m
type of sensor	laser, PMS5003
measurement precision	50% for particles with a size of 0,3 μ m, 98% for size particles \geq 0,5 μ m
total response time of the impulse in active state	10 sec
resolution of the detection	1 μ g/m ³
frequency of the measurement	every 10 minutes or on demand
effective range of the detection	for PM2.5, 0-500 μ g/m ³
dimensions	71 x 71 x 27 mm
controller operating temperature	from -20 to + 50°C protect of the direct sunlight
mounting	screws, wall plug or double-sided adhesive tape
operating humidity range	0.99%
protection level	IP32, mounting in a place protected from rain
type of air quality indication	numeric and graphic indicator in wBox application, changing LED colors
communication standard	μ WiFi, compatible with WiFi, 802.11g

radio frequency	2.4 GHz
transmission type	bi-directional, encrypted
API	open
mode	direct connection (as Access Point), Wi-Fi connection via a standard router, connection with access from any location in the world (requires only access to the Internet)
compatible devices and systems	Apple iPhone, Apple iPad, iPad Mini, Android, computers and mobile devices supporting HTML5
encryption	WPA2-PSK and authenticated encryption with associated data (AEAD)

ADDITIONAL INFORMATION

LOCATION AND TIME OF THE DEVICE, SCHEDULE

To be able to use historical air quality data, it is necessary to set the clock and location of the device. Go to the "Device time" section of the settings and then click "Change zone". Select your region and locations from the list, confirming your selection with the "Save" button. The device will synchronize its time with the time server (if the controller is in a WiFi network with Internet access) or it will download time from the phone/tablet.

Next, in the "Device location" section, click "Set locations". The application / browser will ask whether to share locations - allow. In the "Coordinates" field, the approximate coordinates of your location should appear. If the "Set locations" button blinks red with the word "error" or the "Coordinates" field did not change the value from "Not set" to numeric data, a failure occurred in the location download. You should then make sure that the phone / tablet has a GPS module and that the location sharing support is enabled on the phones

SOFTWARE UPDATE

To update the software in the controller, connect it to your home WiFi network (see "Access Point and WiFi settings" section) which is connected to the Internet. Go to "Settings" (icon at the top-right corner of the screen) and click the "Get new firmware" button in the final section on settings. Wait about 1 minute, do not close the interface and don't perform other actions. The device will download the latest software. The software version number, hardware version and device identifier can be read at the bottom of the settings screen.

For more information visit our website

www.blebox.eu

Or send us an email to: info@blebox.eu

Support is available at support@blebox.eu

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