



temperature sensor with the  $\mu$ WiFi technology



MINIATURE TEMPERATURE SENSOR WITH EXTERNAL ANTENNA

### 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

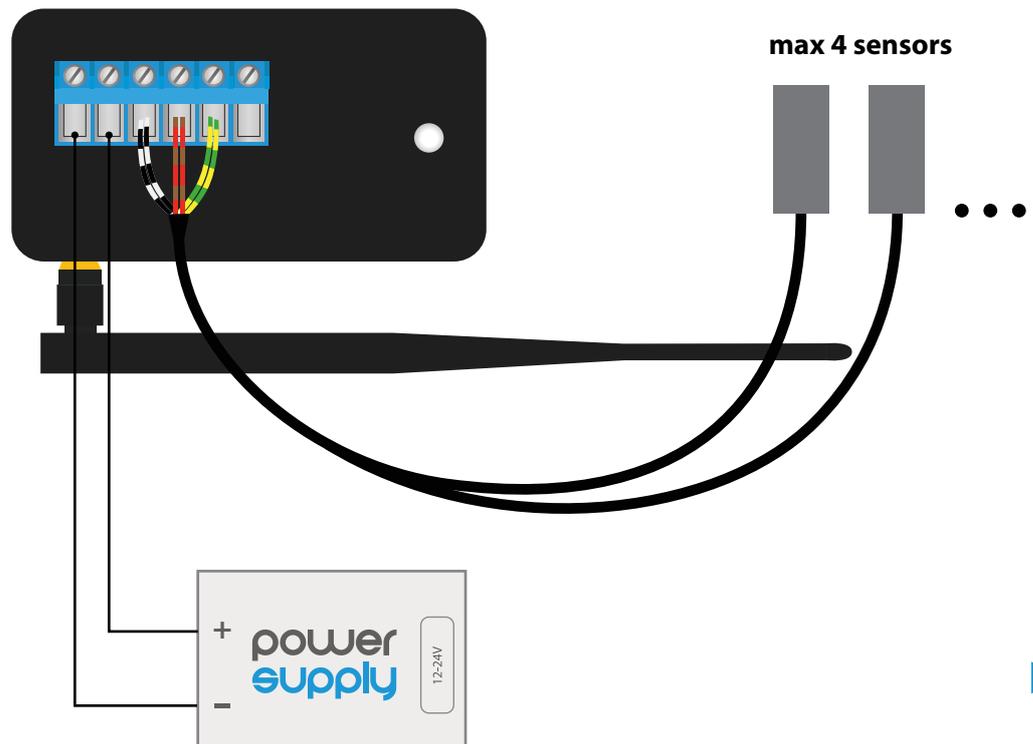
### INSTALLATION - BASICS

- 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 controller should be installed in a place protected against accidental destruction. The measurement probe is waterproof. It is not allowed to install the probe in a place exposed to contact with oils, liquid fuels, solvents and caustic substances, as well as in places exposed to the direct action of high temperatures. Remember that metallic elements (wires, large fitting elements) 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 with the antenna upside. When installing the device outside of dry rooms, pay special attention to provide tightness of the rubber cable glands.
- Read the diagram and then proceed to install the controller. Pay particular attention to the designation of the controller connectors. Start by connecting (from left) the GND (black) from +5V to +24V DC power wires (red or black with a white dotted line).
- Then connect the external temperature probe, in the order of wire colors (from left): black, red and yellow or white, brown and green. If the additional probes are also installed they must be connected in parallel. The last connector, on the far right, must be left unconnected, it has been designed to allow the expansion of the capabilities of the product and is currently not used.
- A digital probe was used to measure the temperature. It is not recommended to extend the original temperature probe cable excessively since the induced interference can cause the controller malfunction or even damage it.
- After making sure that the device is connected in accordance with the diagram and that there are no metal components near the controller which may accidentally cause short-circuit, start the device by turning on the power (turning on the mains fuse or connecting the power cord to the power outlet).

### CONNECTION DIAGRAM

Connection order (color):  
 - **black, red, yellow**  
 - **white, brown, green**



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### 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 name „tempSensor\_PRO-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 preconfigure 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 website [www.blebox.eu](http://www.blebox.eu)

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### MEASURING DATA

- The main screen of the controller shows the current temperature readings from individual probes, below there is a trend indicator for its changes.
- Historical measurement data is available by clicking on the diagram icon in the upper right corner of the screen which is displayed only when the device has access to the Internet - the data are stored only on the BleBox server.
- Historical measurement data can be exported for further analysis. The export form will be displayed after clicking on the cloud icon in the upper right corner of the screen.

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### MEASURING DATA

- Go to the configuration ("Settings" icon in the upper right corner of the screen). In the "Main configuration" section, you can change the name of the device that is displayed in the wBox application. The "Status LED enabled" option allows you to turn off the built-in LED on the device.
- To communicate with the device from outside the local Wi-Fi network, from anyplace in the world, through the wBox application, the option "Enable remote access" must be set to "Yes". Selecting the option "Yes" also means accepting to send measurement data to [blebox.eu](http://blebox.eu) server in order to process them and archive them together with the location. Setting this option to "No", will cause no access to the controller from outside the internal network or access to the historical data; it will only be possible to obtain a visualization of the current values.
- 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.
- In the "Sensors" section, you can configure the temperature probes connected to the device. The probes are detected automatically after the first power connection and assigned, based on identifiers, to individual tabs that represent a given sensor (or rather its place of installation, e.g. water temperature, air temperature, etc.). Further configuration is carried out independently for each of the connected probes, on individual tabs.

- You can disable the individual sensor display on the main screen by setting the "Sensor on" option to "No". In the "Name" field, set a friendly name for the sensor, eg. "air temperature".
- The "Probe" table displays a list of found probes with the current temperature values. To recognize the probes heat one of them e.g. by holding it in your hand. Refresh the temperature readings by pressing the button with two arrows. Select from the list the probe you want to assign to the given sensor.
- The "Temperature value shift" option allows to correct the temperature reading from the probe by a constant value. Settings can be made with a slider or by filling a value in the field. This option is useful in case of unusual probe installation when it turns out that the probe lowers or increases the real temperature. Default: 0°C.
- Confirm the settings by clicking the "Save" button just below.

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### ACTIONS / TEMPERATURE REGULATOR

- The controller allows you to send control commands to other controllers of the wBox series through the home WiFi network, through the so-called API, which allows you to build eg. a temperature control system.
  - When editing actions, select "Control other device" as the "Action type", select "Temperature higher than" or "Temperature lower than" as the "Trigger". In the "Trigger parameter" field, enter the temperature limit value, expressed in degrees Celsius, by which, after being reached, the action will be triggered, e.g. "20". Selecting the "Do not trigger more often than" option will trigger the action at every specific time, set in the "Value in minutes" field, throughout the 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 switchBox and shutterBox are presented below. It was assumed that the IP address of the device which will be controlled is: 192.168.1.123
- Switching on the radiator via switchBox: <http://192.168.1.123/s/1>*  
*Switching off the radiator via switchBox: <http://192.168.1.123/s/0>*  
*Opening the roller shutter via shutterBox: <http://192.168.1.123/s/u>*  
*Closing the roller shutter via shutterBox: <http://192.168.1.123/s/d>*
- 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.



The temperature regulator requires a hysteresis configuration, it means, a certain difference between the switch on temperature and the switch off temperature. In the case of the radiator control, the switch on temperature must be lower than the switch off temperature, e.g. "Temperature lower than: 19°C, action: turn on", "Temperature higher than 21°C, action: turn off".



- 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>

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## NOTIFICATIONS

- The controller allows you to display a system notification on a phone with the wBox application installed on the particular trigger, e.g. "Temperature higher than".
- Notifications are added similarly to "Actions" - as "Action type" select "Notification", 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  $\mu$ 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.

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## 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 anyplace 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 reconnecting the phone to the controller's WiFi network, check the "WiFi Client status" and "Remote access status" fields. The controller is equipped with a network connection supervision system which in case of problems with connection to the WiFi or the Internet will report the problem and its possible causes. If the network is working properly both fields will be set to "Connected".
- 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.
- It is also possible to completely disable the Access Point emitted by the device. To do this, uncheck the "Access point enabled" field and confirm your selection with the "Save" button. Attention! If the controller does not have a stable connection to the WiFi network ("WiFi client status": "Connected", without any error warnings), turning the access point back on will not be possible - in this situation, the only solution is to reset the controller to factory settings. Disabling the access point is recommended only after the complete device configuration and making sure that the entire system is working properly.

## TECHNICAL SPECIFICATIONS

<b>power supply</b>	12 - 24V DC
<b>energy consumption</b>	< 1W
<b>measurement range</b>	from -55°C to 125°C
<b>controller operating temperature</b>	from -20°C to 50°C
<b>measurement accuracy</b>	$\pm 0,5^\circ\text{C}$ in the range of -10°C to 85°C
<b>dimensions</b>	50 x 92 x 28 mm (without antenna), 85 x 230 x 28 mm (with the antenna located vertically), antenna length 197 mm
<b>housing</b>	plastic, covered with a polyurethane composition not containing halogens, self-extinguishing for thermal class B (130°C)
<b>dimension of the probe</b>	diameter 6 mm, length 51 mm
<b>type of probe</b>	single wired waterproof probe, cable length 2m
<b>additional probe</b>	yes, available as an accessory
<b>maximum number of connected probes</b>	4
<b>mounting method</b>	two oval mounting holes with dimensions of 18 mm x 3,5 mm (width x height) or self-adhesive element (tape)
<b>protection level</b>	IP54
<b>protection</b>	inverted polarization, ESD
<b>antenna output</b>	yes
<b>antenna connector type</b>	RP-SMA
<b>antenna</b>	omnidirectional, 5dB gain - included in the kit
<b>communication standard</b>	$\mu$ WiFi, compatible with WiFi, 802.11g
<b>transmission type</b>	bi-directional, encrypted
<b>encryption</b>	WPA2-PSK and authenticated encryption with associated data (AEAD)
<b>modes</b>	direct connection (as Access Point), Wi-Fi connection via a stan- dard router, connection with access from any location in the world (requires only access to the Internet)
<b>radio frequency</b>	2.4 GHz
<b>API</b>	open
<b>compatible devices and systems</b>	Apple iPhone, Apple iPad, iPad Mini, Android, computers and mobile devices supporting HTML5



## ADDITIONAL INFORMATION

### LOCATION AND TIME OF THE DEVICE

To be able to use historical 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 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 phone.

### 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](http://www.blebox.eu)

or send us an email to: [info@blebox.eu](mailto:info@blebox.eu)

support is available at [support@blebox.eu](mailto:support@blebox.eu)

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