

HRM Fan – User Manual



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1. History of changes in the document

The table below presents a list of changes made in this document.

Version no	Date	Changes
1.0	28.10.2023	First version in English is released
1.1	31.10.2023	New version of Android application, unified screenshots in the document

2. HRM Fan ROM change log

The table below presents a list of released ROMs (software packages) for HRM Fan. Each ROM introduced some changes, which are described below. To upgrade the ROM of your HRM Fan device, please use the “HRM Fan&Led” mobile application (see chapter “Mobile application”, “Remote software update”).

Version no	Date	Changes
3.1.7	28.10.2023	First official version of ROM working with HRM Fan&Led mobile application

3. History of changes in the mobile application

The table below presents a list of changes in the mobile application – „HRM Fan&Led”.

Version no	Date	Platform	Changes
2.0.25	28.10.2023	Android	First official version of the HRM Fan&Led app for Android
2.0.27	31.10.2023	Android	Unified look of Android and iOS applications
2.0.16	28.10.2023	iOS	First official version of the HRM Fan&Led app for iOS
2.0.17	02.11.2023	iOS	Unified look of Android and iOS applications

4. Short description of the product

HRM Fan is a device used to automatically control the speed of the fan, based on heart rate or bicycle speed. The heart rate / speed is read by the device from the hr/speed sensor worn by a person doing a workout / installed on the bike and, on this basis, and according to the configuration, the speed of the connected fan is regulated. This allows to adjust the blowing force to the current effort.

An additional option of the device is to wirelessly control a compatible RGB led driver. When connected to the HRM Fan controller, it can smoothly change the led colors in a given range (e.g., from green to red) with changing heart rate, bike speed or power.

5. Basic information

5.1. What's in the box?

The contents of the box are:

- HRM Fan device,
- Power cable,
- Fan adapter.

The type of plug of power cable and socket in the fan adapter is selected in the purchase process. There are four options available: EU/US/AU/UK.

5.2. Physical device and connection method

HRM Fan is a one-piece device. It is a black box with two cable ports in the IEC standard: a power cable port to connect the device to power outlet using a dedicated power and a fan port to connect the fan using a dedicated adapter or multiple fans using a dedicated splitter. Both required cables are included in the standard set available in our online shop <https://dragilla.com/shop>. The splitter can be bought separately (it is also available in our online shop).

There is a LED in the housing that indicates the status of the device (see the list of device states in the next chapter) and a control button to put the device to sleep / wake up.

The photo below shows the appearance of the HRM Fan device.



5.3. Device states and LED signaling

The HRM Fan can be in one of three states when plugged into power. All states and the way they are signalled by the device are described in the table below:

STATE NAME	DESCRIPTION	LED SIGNALING
ON	The device is searching for available sensors after being powered on.	Continuous light of the led, green color
Sleeping	The device has entered the sleep state. It does not accept signals from external sensors. The user can connect to it from the mobile app or press the button on the housing to wake it up.	Continuous light of the led, red color
ROM update	The device is in ROM update mode. A new ROM is being installed on it.	Continuous light of the led, red color

6. How to use HRM Fan

Using HRM Fan is relatively simple. The device is ready to work right out of the box after being connected to the power supply. It is recommended to configure it using the mobile application to adjust the settings to the individual needs of the user. The configuration process has been described in a chapter dedicated to mobile app – “Mobile application”.

NOTE: HRM Fan does not require a running mobile application to function. The communication between the HRM Fan, the sensors, optional led driver, and the fan is direct.

The app is mainly for configuration and manual control. You can also use it to monitor the current state of the sensors, led driver, and the fan – it presents current data coming from the

sensors in use (i.e., heart rate, bike speed and/or bike power), the current fan speed and RGB led strip color (if in use).

Assuming that the device is configured, its use is limited to the following steps:

- Connect HRM Fan to the power outlet via the power cord,
- Connect the fan to the device using the attached adapter with a socket. The fan should be turned on and set to the highest speed,
- (Optionally) Connect a compatible RGB LED driver to the power outlet (not to HRM Fan, to a power outlet in the wall). Wait for HRM Fan to connect to the driver (this can be monitored in the mobile app).
- After detecting your heart rate and/or other configured sensors the device will start controlling the fan and LEDs (optionally, if connected),
- After the training, you can put the device to sleep - from the mobile application (sleep button) or by pressing the button on the housing. If you leave the device turned on, it will go to sleep after a programmed period of inactivity - 15 minutes by default. The sleep can be turned off from the mobile application – this way the device will always stay on searching for sensors in range.

NOTE: Make sure there are no obstructions between the device and the sensors and that they are relatively close to each other. Otherwise, the data transmission from sensors to the device (i.e., heart rate, bike speed and/or bike power), and thus the smooth operation of the device and the fan, may be impaired. It is best to place the HRM Fan in front of the fan and within 3m of the sensors (for example your heart rate monitor). If you are using a compatible LED driver, also make sure it is within range of the HRM Fan device - preferably within 3m of the device, with no physical obstacles between the driver and the HRM Fan device.

7. Supported devices

7.1. Mains / sockets standards

HRM Fan supports global power standards, i.e., it operates on alternating current (AC) in the voltage range from 110-240V at a frequency of 50-60Hz. Connection standards (power cable and fan adapter) are selected when purchasing the device in our online store: <https://dragilla.com/shop>

7.2. Fans

HRM Fan supports fans with an alternating current (AC) motor with a voltage of 110-240V 50-60Hz, i.e., fans that are connected to the mains.

The minimum supported power of the fan is 35W at 230-240V or 20W at 110V (see the rating plate on the fan).

The safe maximum power of the fan is 240W at 230-240V or 120W at 110V (see the rating plate on the fan).

If you are in doubt as to whether your fan will work with HRM Fan, please contact us.

HRM Fan can be purchased together with a compatible fan. Information on available fans is available on the website of our online store at: <https://dragilla.com/shop>

7.3. Heart rate monitors

The device supports heart rate sensors based on the following technologies:

1. ANT+, HR profile, for example straps from Garmin, Wahoo, Polar and similar, smartwatches with HR broadcast function, like Garmin 735xt, etc.
2. BLE (Bluetooth Low Energy), HR profile (for example HRM Dual from Garmin, Wahoo, Polar H7, H9, H10).

NOTE: When using a Bluetooth LE heart rate sensor, please keep in mind that due to the technology used, such a sensor can only connect to one data recipient. In such a situation, if the sensor first connects to a watch, a bicycle computer, or a computer on which a training app like Zwift is running - such a sensor will not be able to connect to the HRM Fan device anymore. The opposite situation may also occur - the sensor will first connect to HRM Fan and then it will no longer be available to other recipients (for example it will not be detected in Zwift). This limitation does not apply to ANT+ sensors - there is no limit for the number of data recipients in ANT+. Most of popular heart rate sensors, for example from Wahoo or Garmin, transmit in both technologies (ANT+ and BLE). In such a situation, we recommend choosing the ANT+ technology in the HRM Fan&Led mobile application. The process of configuring the heart rate sensor and selecting its type is described in "Mobile application" chapter of this manual.

7.4. Bicycle Speed sensors

The device supports most ANT+ speed sensors (i.e., those that conform to the Bicycle Speed ANT+ profile). Examples include:

1. Garmin GSC10 – combined speed/cadence sensor
2. Garmin Speed & Cadence sensors V2 (only the speed sensor is required)
3. Bontrager Interchange Digital Combo Sensor, and many others.

NOTE: Some proprietary speed sensors don't conform to the ANT+ speed profile. An example is Wahoo speed sensor build into the later editions of Wahoo Kickr Core trainers. Such sensors won't work with HRM Fan.

The process of configuring the bike speed sensor is described in the chapter titled "Mobile application".

7.5. Bicycle Power sensors / power meters

The device supports almost all ANT+ power sensors (i.e., those that conform to the Bicycle Power ANT+ profile). Examples include:

1. Favero Assioma (both single and dual sided)
2. Garmin Vectors (all versions)
3. Power meter build in Tacx trainers, and many more.

The process of configuring the power sensor is described in the chapter titled "Mobile application".

7.6. RGB LED drivers and strips

HRM Fan works with dedicated RGB led drivers, which can be purchased in a set with a power supply and a compatible RGB led strip in our online store at: <https://dragilla.com/shop>

NOTE: It is not recommended to use RGB led strips that are not part of the RGB Led set sold in Dragilla online store. The use of other RGB led strips is not covered by the warranty and may damage the components of the set.

7.7. Mobile devices

Smartphones with the Android (5.1+ versions) and iOS (13+ versions) mobile platforms are supported. Smartphones must have Bluetooth LE (Low Energy) to communicate with the HRM

Fan device. If you have doubts as to whether your smartphone will work with HRM Fan, please contact us.

8. Mobile Application

Mobile application designated to HRM Fan devices is called “HRM Fan&Led”. The app is available for Android and iOS platforms.

The main functions of the application are:

- Configuration of a connected HRM Fan device – configure connected sensors, ranges of operation, sleep timer, etc.
- Manual, remote control of the speed of the fan connected to HRM Fan,
- Manual, remote control of the color and brightness of a compatible RGB led set, connected to HRM Fan.

The application is available in two languages that automatically switch depending on the language set on the phone:

- English – the default language,
- Polish.

8.1. App installation

8.1.1. Android

The application can be downloaded from the Android Play Store. The name of the application is “HRM Fan&Led”. The link to the application can be found on the website: <https://dragilla.com/support>.

8.1.2. iPhone

The application can be downloaded from the Apple App Store. The name of the application is “HRM Fan&Led”. The link to the application can be found on the website: <https://dragilla.com/support>.

8.2. First run

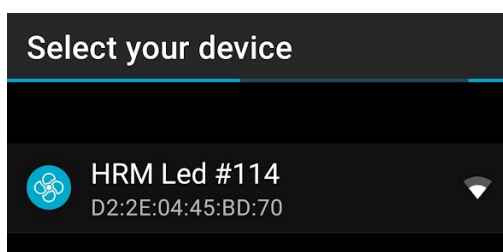
After installing the application, its icon will appear in the list of applications installed on the phone:



After clicking on the icon, the application will start. Right after booting, you'll be asked to turn Bluetooth on. Bluetooth is used for communication between the mobile device (smartphone) and HRM Fan, and between HRM Fan and the LED driver.

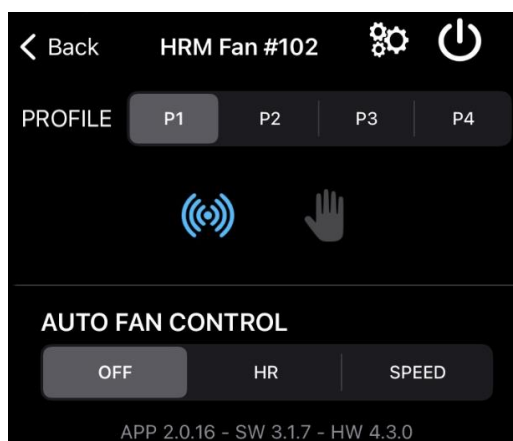
After turning the Bluetooth on, the app will start looking for your HRM Fan device. Power on your device. Once connected to power, the green LED will light up on it.

The device will appear on the list in the application - select it.







List of devices

After selecting the device, the application will establish a connection with it and the main application screen will open. The initial screen will look as follows:





Initial screen

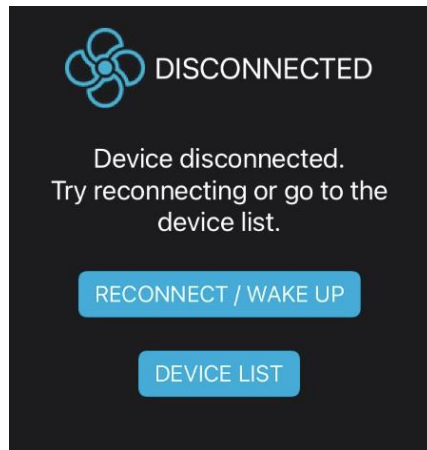
On this screen you will see:

- Button to return to the device scanning screen:  or .
- The device name (e.g., HRM Fan #102).
- The sleep button , which puts the device to sleep.
- The settings button , which displays the settings screen.
- List of profiles. You can switch between profiles by clicking on them. The active profile is highlighted.
- A bar with section icons. Individual icons are displayed or hidden depending on the selected sensors, settings mode (advanced or standard) and whether the use of an external led driver is enabled. The description of each section is presented in the following chapters of this manual. To change the section, just click on the selected section icon.

Two icons will be visible on first run (active section's icon is highlighted in blue):

- Icon of the "Sensors" section , which is used to configure the sensors and what they control,
- "Manual" section icon  - used for manual fan and led control. Manual fan control allows to test the fan before configuring its ranges. In this section, it is also possible to set any color from the displayed rainbow pallet and brightness (1-10 range) that will be displayed on the connected RGB led strip (assuming the led driver is enabled in settings and connected). Controlling RGB leds is possible only through a dedicated Bluetooth RGB led driver, which can be purchased separately in our store: <https://dragilla.com/shop>.
- Contents of the current section. "Sensors" section is displayed on the first run (above – "AUTO FAN CONTROL").
- Footer with running application (APP), device software (SW) and device hardware (HW) versions.

NOTE: When the application loses connection to the HRM Fan device (e.g., the user take the phone beyond the Bluetooth range, puts the device to sleep or the device goes into sleep mode automatically), the reconnect/wake-up screen will appear. From this screen, you can try to connect again (the device will then wake up from the sleep state) or return to the list of devices.



Disconnected screen

8.3. Device configuration

The configuration is saved locally on the phone in the current profile. Each time you change the settings they are automatically saved and the configuration from the current profile is sent to the device. HRM Fan remembers the last settings sent to it between runs.

First step in the configuration process is selecting the sensors that control the Fan and external RGB leds. This is done in the "Sensors" section, described in one of the following chapters.

After selecting and configuring sensors, you should go through all the available sections and set your desired parameters.

8.3.1. Fan configuration

Due to the need to support various types of fans, the device allows the user to configure a wide range of operation (from 0 to 100%). **Most fans will NOT work in the full range.** This is why you need to check the speed at which your fan will turn on and have the right speed for you (appropriate blowing power). The test can be performed in the "Manual" section.

Once you have tested the fan speeds using the slider in the "Manual" section, you are ready to set the selected speeds in the "Fan" section.

8.4. Navigating through the app and Sections

Navigating the application is about switching between sections available in it. Changing sections is achieved by clicking on icons of selected sections. Menu bar with section icons is








located below the bar with profiles (P1/P2/P3/P4). Active icon (icon of the section which contents are displayed) is highlighted in blue.

Not all icons are visible at a time. Only “Sensors” and “Manual” icons are always visible. Other icons are shown when the corresponding sections is available for configuration. For sensors this happens when a sensor is selected as controller for the fan or leds in the “Sensors” section.






The fan section (and its icon) is visible when AUTO FAN CONTROL in the “Sensors” section is set to something other than OFF.

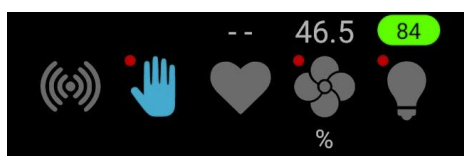
The led section (and its icon) is visible when AUTO LED CONTROL in the “Sensors” section is set to something other than OFF. The use of external RGB leds must be additionally enabled in the settings (See “Settings screen”).

The following sections are available (although not always visible) in the application (from left to right). Each section is described in a dedicated chapter in this document.

Icon	Section name	Description
	Sensors section	In this section you can configure what sensor controls the fan and the external RGB leds (must be enabled).
	Manual section	A section that allows you to manually set the speed of the fan and color and brightness of RGB leds (must be enabled).
	Heart rate section	Here you set the ranges of heart rate in which the target devices will be controlled (fan and/or leds). For the fan configuration you can also divide the workout into stages and set the ranges individually for each stage.
	Speed section	Here you set a range of speed in which the target devices will be controlled (fan and/or leds).
	Power section	On the power section screen you can configure the power range or zones for which the colors of RGB leds will change. Power configuration is only available for leds (not the fan).
	Fan section	Fan ranges configuration – either one range (for heart rate single range or speed range) or three ranges for three stages if configured on the heart rate section screen. Additionally, exponentiability can be configured here.
	RGB Led section	On the screen of the led section, you can configure either a single range of colors (for hr single range, or speed range), three ranges (for three workout stages), or six ranges (for either hr or power zones). Ranges are configured on a “rainbow slider”.

Additionally for sensors icons (hr, speed and power) and target device icons (fan and led) additional information is presented above and below the icon.

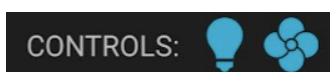
Icon	Section name	information above the icon	Information below the icon
	Heart rate section	Current heart rate, if sensor is connected, or “- -” otherwise	Heart rate units – beats per minute – “bpm”, only if the sensor is connected
	Speed section	Current speed, if sensor is connected, or “- -” otherwise	Current speed units as configured in settings (“kmh” or “mph”), only if the sensor is connected
	Power section	Current power, if sensor is connected, or “- -” otherwise	Units of power – watts – “W”, only if the sensor is connected
	Fan section	Current fan speed (0-100)	Units of fan speed – “%”
	RGB Led section	Current color number and actual color as background, if RGB leds are connected, or “- -” otherwise	-



Example section icons with additional information

NOTE: Red dots in the top-left corner of Manual, Fan and Led icons indicate that the manual mode is turned on. Read more about manual mode in “Manual” section chapter.

In each section corresponding to a sensor (heart rate, speed, or power) there is a special header at the top that displays information icons explaining what target device is controlled by this sensor. For example, the following header would inform you, that the speed sensor controls both the RGB leds and the fan.

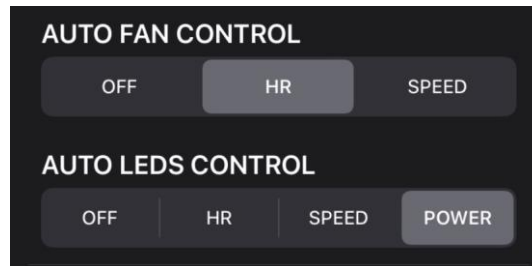


Similarly, for each section corresponding to a target device (fan and RGB leds) there is a special header at the top that displays information icon explaining by what sensor it is controlled. For example, below you can see the header in the fan section informing you that fan is controlled by speed.



8.4.1. Sensors section

The "Sensors" section is a place where you can configure which sensors control which target devices. The target device is the fan and optionally the RGB leds if enabled in settings.



Selection of control sensors for the Fan and RGB Leds

NOTE: You can enable external leds for HRM Fan in the Settings screen.

For each sensor you select above, there is additional configuration, described in the following chapters.

8.4.1.1. *Heart Rate sensor configuration*

Heart Rate sensor configuration includes:

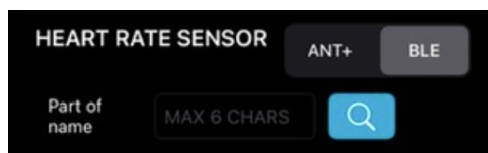
1. The type of the sensor (ANT+/Bluetooth Low Energy – BLE)
2. ANT+ ID or part of BLE name (available only if the advanced settings are enabled)

NOTE: You can enable the advanced settings in the Settings screen.

If you don't set the ANT+ ID or part of BLE name, the HRM Fan device will search for any heart rate sensor of the selected type. The sensor with the strongest signal (which usually is the one closest to the device, but not always) will be selected.

If you are the only person training in the area and you don't expect other sensors to appear, this is a good solution. However, if you want to avoid accidental connections from sensors of other people (maybe your neighbours or your spouse) then you should enter the ANT+ ID or part of BLE name.

The ID/name of the HR sensor can be read e.g., in the Garmin device or in the Zwift application, in the device detection section. The BLE name can be additionally found by searching for it in the mobile application (Button with magnifying glass). After selecting a sensor from the list, a fragment of its name will be automatically copied to the field in the application.



Heart rate sensor configuration – part of BLE name

NOTE: The search function is only applicable to a Bluetooth heart rate sensor. The search button is not available for ANT+. This functionality has not been implemented because the search takes place on the smartphone, and most smartphones sold today are not equipped with ANT+.

8.4.1.2. Speed sensor configuration

For the speed sensor you can configure the following parameters:

1. The wheel circumference (using presets).
2. The wheel circumference (manual entry).
3. The ANT+ ID.

If the advanced configuration is set to OFF, then only three presets for the wheel circumference are available. The “Custom” option is hidden. The manual entry field for the wheel circumference and ANT+ ID field are also hidden when advanced settings are OFF.

The “Road” preset defines the circumference of a regular road bike wheel. If your indoor trainer is “tire driven”, in which you don’t take off the rear wheel of your bike, then this preset is probably for you.

The “MTB” preset is for the same type of indoor trainer (tire drive) but for smaller, MTB wheels.

The third type (“D.Drive”) is for Direct Driver trainers, like Elite Turno, and alike.

Please test all presets and if your speed is not in line with the expected speed, consider entering the wheel circumference manually. This option is available when advanced settings are ON.

If you don’t set the ANT+ ID, the HRM Fan device will search for any speed sensor in range. The sensor with the strongest signal (which usually is the one closest to the device, but not always) will be selected.

If you are the only person training in the area and you don’t expect other sensors to appear, this is a good solution. However, if you want to avoid accidental connections from sensors of other people (maybe your neighbours or your spouse) then you should enter the ANT+ ID.

The ANT+ ID of the sensor can be read e.g., in the Garmin device or in the Zwift application, in the device detection section.

SPEED SENSOR CONFIG

WHEEL CIRCUMFERENCE

ROAD MTB D.DRIVE CUSTOM

Circum. (mm) 2096

ANT+ ID 1-65535

Speed sensor configuration

8.4.1.3. Power sensor configuration

The configuration for the power sensor (also known as power meter) is only available when the advanced settings are turn on.

If you don't set the ANT+ ID, the HRM Fan device will search for any power sensor in rage. The sensor with the strongest signal (which usually is the one closest to the device, but not always) will be selected.

If you are the only person training in the area and you don't expect other sensors to appear, this is a good solution. However, if you want to avoid accidental connections from sensors of other people (maybe your neighbours or your spouse) then you should enter the ANT+ ID.

The ANT+ ID of the sensor can be read e.g., in the Garmin device or in the Zwift application, in the device detection section.

POWER SENSOR CONFIG

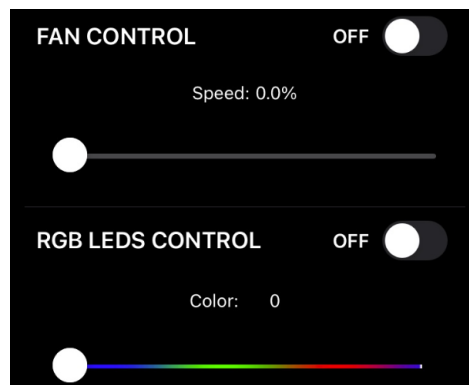
ANT+ ID 1-65535

Power sensor configuration

8.4.2. Manual section

Manual section allows for:

- Manual fan speed control in the range from 0 to 100%
- Manual control of color of the external RGB leds (only if external leds were enabled in Setting and HRM Fan is connected to them).
- Adjustment of the RGB leds brightness during manual control (only if external leds were enabled in Setting and HRM Fan is connected to them).



Manual section

If either manual fan control or manual led control is turned on, this fact will be indicated by a red dot in the top-left corner of the Manual section icon.

When manual fan control is enabled, the fan will run at the speed set on the slider regardless of the data coming from the sensors. This is indicated by a red dot visible in the top-left corner of the Manual section icon. If "AUTO FAN CONTROL" is not set to OFF, the red dot will also appear in the top-left corner of the Fan section icon (if the fan control is set to OFF, this icon is not visible).

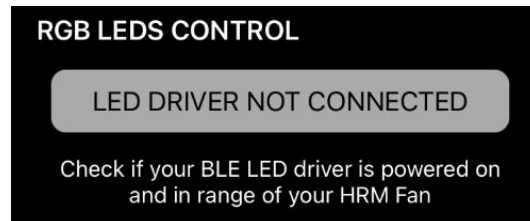
When RGB leds manual control is on, external leds will show the color and brightness set on the sliders regardless of the data coming from the sensors. This is indicated by a red dot visible in the top-left corner of the Manual section icon. If "AUTO LED CONTROL" is not set to OFF, the red dot will also appear in the top-left corner of the RGB Led section icon (if the led control is set to OFF, this icon is not visible).

Manual fan speed control is done by setting the required value on the slider and setting the switch on the right to "ON", which will turn on the test mode. After turning on the fan speed test mode, any adjustment of the value on the slider will automatically send a new value to the HRM Fan device, which will change the speed of the connected fan accordingly.

Manual control of the colors of the external RGB leds is done by selecting a color on the slider with a range of colors (rainbow) and setting the switch on the right to "ON", which will turn

on the test mode. After turning on the test mode, each adjustment of the value on the slider will automatically send a new value to the HRM Fan device, which will change the color of external RGB leds accordingly.

If the HRM Fan device has failed to connect to the RGB led driver, it is not possible to test the colors. The manual section for leds will display an adequate message instead.

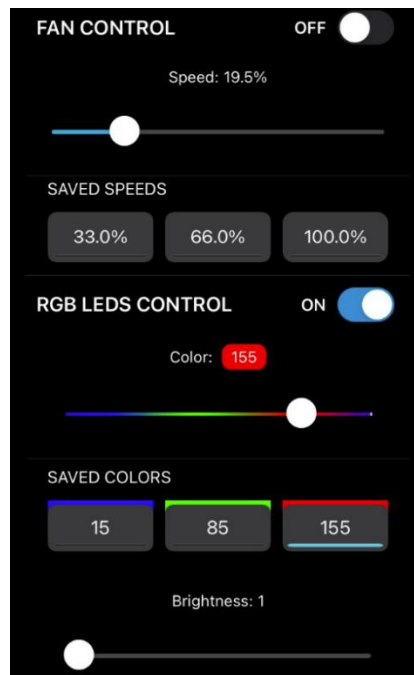


Leds not connected

In addition to the color itself, the number of the selected color appears above the slider. This number allows you to remember the exact color that has been tested in manual mode to be used in the color configuration ("RGB Leds" section).

The rightmost color on the slider is white (200). The leftmost is black (000) which represents the RGB leds being off. This allows you to set the color ranges in such a way that, for example, during the Warm-up stage, the leds are white, and they turn off during the Cool down stage. A detailed description of the division of workout into phases is provided in the "Heart Rate" section in the "Dividing the workout into phases". For a description of the color configuration, see the "RGB Leds" section.

Additionally, if the Advanced settings are ON, the programmable presets are visible in the Manual section:



Manual section – advanced mode

The currently active preset is highlighted in light-blue from the bottom.

Programming a preset is done by setting the selected value on the speed or color slider and holding the selected button with your finger for one second. After this time, the phone will vibrate, and the value will be programmed into the selected preset.

Below the presets, also in the advanced mode, there is the additional slider that allows you to adjust the brightness of connected external RGB leds. The range is from 1 (dimmiest) to 10 (brightest).

NOTE: This setting affects the led brightness only during manual control. If you want to configure the led brightness for automatic mode, when the leds are controlled by the HRM Fan device, please do in the “RGB Leds” section.

8.4.3. Heart Rate section

The "Heart Rate" section is used to set the heart rate thresholds, which determine the heart rate ranges within which the device will control the fan and/or external RGB leds.

8.4.3.1. Standard configuration

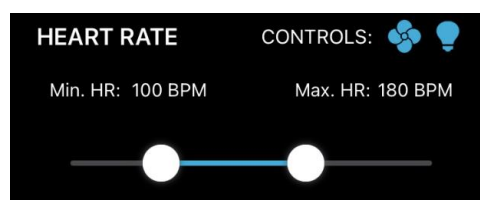
When controlling the fan, when the lower heart rate threshold is reached, the device will set the fan to the speed configured as the lower threshold in the "Fan" section. As the heart rate

increases, the device will steadily increase the fan speed until the upper heart rate threshold is reached - the fan will then reach the maximum speed defined as the upper limit in the "Fan" section. A further increase in heart rate will not change the speed of the fan. When the heart rate starts to drop, the HRM Fan will reduce the fan speed accordingly until the heart rate reaches the lower limit of the defined range - then the fan will turn off.

The same configuration as for the fan speed can be made for the external RGB led driver. The colors on the RGB led strip connected to the driver will change smoothly in the given range, which can be configured in the "RGB Leds" section.

NOTE: To avoid switching the fan on/off several times, when the heart rate fluctuates around the lower limit of the range, the so-called hysteresis was introduced, which gives the fan a buffer and causes it to turn off two beats/min below the set value and turn on exactly when this value is reached. For example, when the user sets the heart rate range as 100-200 beats/min and his/her heart rate increases from 90 beats/min, the fan will turn on when the heart rate reaches 100 beats/min. When the heart rate starts dropping from over 100 beats/min, to 100, then 99 beats/min, the fan will remain on. It will turn off only at 98 beats/min.

If the advanced settings are disabled, the Heart Rate section consists of a single slider which is used to define the range of heart rate used for controlling the fan and/or leds.



Heart rate range slider

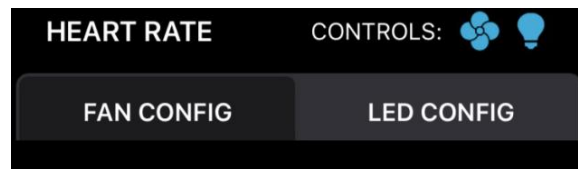
8.4.3.2. Advanced configuration

If the advanced settings are enabled, the Heart Rate screen is divided into two sections:

1. Settings for the Fan (Fan config)
2. Settings for the external leds (Led config)

The second section is available if external Leds are enabled.

If both sections are available, the special selection menu is displayed (see picture below). You can use this menu to switch between the two configurations (for the fan and for the leds).



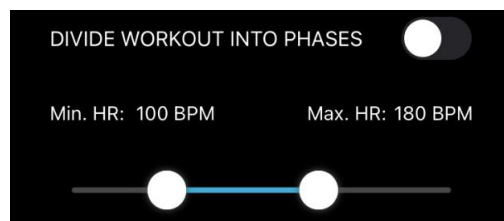
Heart rate target configuration selection menu

If only one of the above sections is available, the selection menu is not displayed and only the configuration for the available section is presented.

Both configurations are described in detail in the following chapters.

8.4.3.3. *[Advanced] Fan config*

By default, the heart rate configuration for the fan is the same regardless of the advanced setting – single range slider. The only difference is the presence of additional configuration parameter (OFF by default) – “divide workout into phases”.



View of the heart rate configuration for the fan – advanced settings enabled

8.4.3.4. *[Advanced] Fan config – Workout phases*

The “divide workout into phases” option allows you to define separate values of selected parameters independently for the three phases/stages of training:

1. Warm up,
2. Training,
3. Cool down.

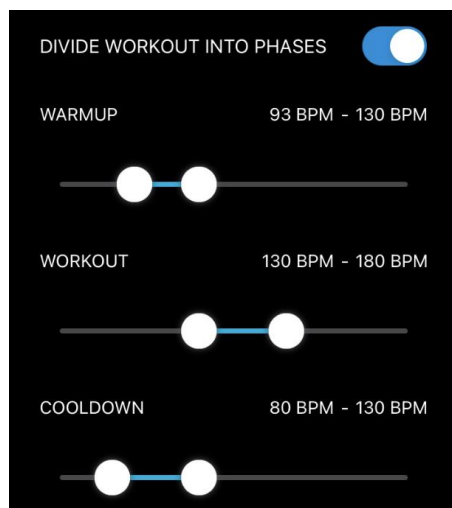
Workout phases are defined by heart rate ranges, for example:

1. Warmup – from 80 to 120 beats/min,
2. Training - from 120 to 190 beats /min,
3. Cool down - from 120 to 100 beats /min.

The app works in such a way that the stages flow seamlessly into each other – it is impossible to set the heart rate ranges that define the stages so that they overlap or are separate. In addition, the transition points between the warmup phase and the training phase and between the training phase and the cool down phase must be set with the same value. In the example above, it is 120 beats per minute.

The user can define the following parameters individually for each stage:

- Fan speed ranges (see the description in the "Fan" section),
- Exponentiality of fan speed changes (see description in "Exponentiality of the speed increase"),
- Color ranges, if the Led configuration is set to “same as fan” (see the description in chapters: “[Advanced] Led config” and "RGB Led section").



Heart rate section with phases turned on

8.4.3.5. [Advanced] Led config

The heart rate configuration for the external led driver has three modes:

1. Range (default),
2. Zones (6 zones, each defined by two heart rate values),
3. Same as fan – which uses the same settings as set in “[Advanced] Fan config”.

Heart rate range configuration for the leds

Range configuration works in the same way as described in “Standard configuration” section of the “Heart rate section” chapter.

Heart rate zones divide the full heart rate range (defined by the “Max HR” parameters entered in a text field above the zones) into six partitions (zones 1 to 6). If zones are selected, then the following screen is displayed.

Heart rate zones configuration for the leds

Above the individual zone definition fields, there is selector menu, that has two options: Default and Custom. The default setting calculates the zones automatically, based on the max heart rate entered in the dedicated “HR Max” field.

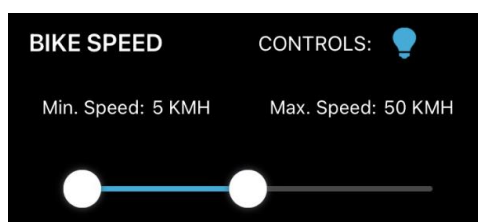
The default zones are calculated using the following table:

Zone	Lower limit	Upper limit
1	0	$0.5 * \text{HR Max} - 1$
2	$0.5 * \text{HR Max}$	$0.6 * \text{HR Max} - 1$
3	$0.6 * \text{HR Max}$	$0.7 * \text{HR Max} - 1$
4	$0.7 * \text{HR Max}$	$0.8 * \text{HR Max} - 1$
5	$0.8 * \text{HR Max}$	$0.9 * \text{HR Max} - 1$
6	$0.9 * \text{HR Max}$	HR Max

If you want to change the default zones to your desired values, you can edit the higher limit of zones 1 through 5 – the other values are updated automatically. Once you change any of the fields the selector menu changes to “Custom” automatically.

8.4.4. Speed section

Speed can be used to control the fan and/or the external leds. The mechanism used to control the targets is the same as in the case of heart rate, when advanced options are disabled – there is only a single slider that is used to define the range of operation (see “Heart rate section”, “Standard configuration”).



Speed configuration – kmh

Depending on the speed unit setting defined on the settings screen (see “Settings screen”) the speed range set on the slider are either expressed in kilometres per hours (kmh) or miles per hour (mph).

8.4.5. Power section

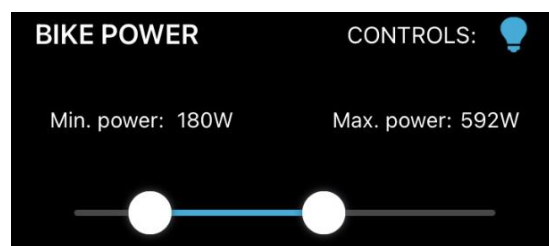
Power can only be used to control external leds. If you want this section to be available, you must enable the “connect to leds” setting (see “settings screen”) and select Power as the sensor controlling leds on the “Sensors” screen.

Power section looks differently depending on the “show advanced options” setting. The following chapters describe both settings.

8.4.5.1. *Standard configuration*

In the standard configuration (advanced options are disabled) the power settings are limited only to a single range, defining the boundaries of operation for the external leds.

The mechanism used to control the leds is the same as in the case of heart rate, when advanced options are disabled (see “Heart rate section”, “Standard configuration”).

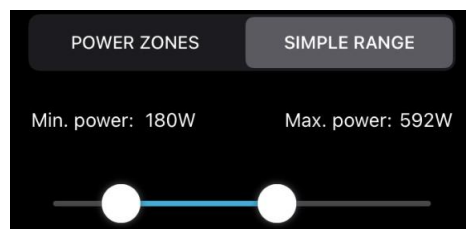


Power settings

8.4.5.2. *Advanced configuration*

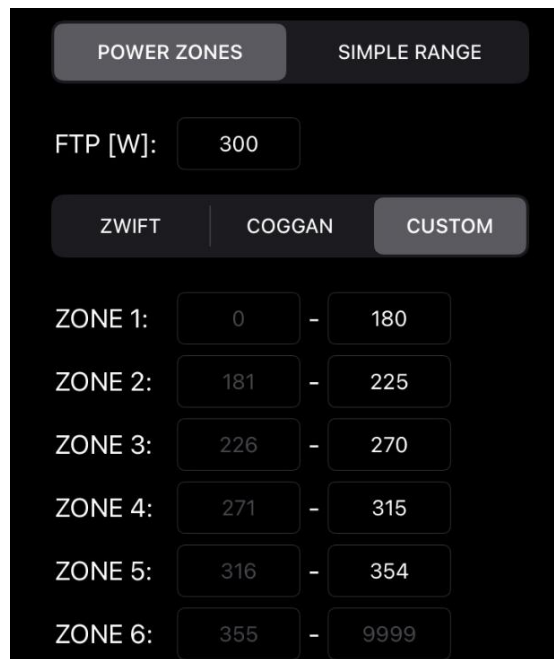
When the advanced options are ON, you are presented with additional selector, allowing you to choose between a simple range and zones configurations.

Simple range allows for the same configuration as can be done when advanced settings are OFF – single range slider.



Simple range – advanced options enabled

Power zones divide the full power range (from 0 to 9999) into six partitions (zones 1 to 6). If zones are selected, then the following screen is displayed.



Power zones

Above the individual zone definition fields, there is selector menu, that has three options: Zwift, Coggan and Custom. The Zwift and Coggan settings calculate the zones automatically, based on the FTP value entered in dedicated “FTP” field.

The zones are calculated using the following table:

	ZWIFT		COGGAN	
Zone	Lower limit	Upper limit	Lower limit	Upper limit
1	0	$0.60 * \text{FTP} - 1$	0	$0.56 * \text{FTP} - 1$
2	$0.60 * \text{FTP}$	$0.76 * \text{FTP} - 1$	$0.56 * \text{FTP}$	$0.76 * \text{FTP} - 1$
3	$0.76 * \text{FTP}$	$0.90 * \text{FTP} - 1$	$0.76 * \text{FTP}$	$0.91 * \text{FTP} - 1$
4	$0.90 * \text{FTP}$	$1.05 * \text{FTP} - 1$	$0.91 * \text{FTP}$	$1.06 * \text{FTP} - 1$
5	$1.05 * \text{FTP}$	$1.19 * \text{FTP} - 1$	$1.06 * \text{FTP}$	$1.21 * \text{FTP} - 1$
6	$1.19 * \text{FTP}$	9999	$1.21 * \text{FTP}$	9999

The Zwift setting aims to reflect the zones that are calculated in Zwift – an online cycling platform. This way you can match the colors that are displayed in Zwift for each power zone on the external leds. There is a dedicated setting for colors in the “RGB Leds” section to match the colors displayed in Zwift.

The Coggan setting is based on the zones determined by Dr. Andrew Coggan PhD, a well-established training expert.

If you want to change the automatically calculated zones to your desired values, you can edit the higher limit of zones 1 through 5 – the other values are updated automatically. Once you change any of the fields the selector menu changes to “Custom” automatically.

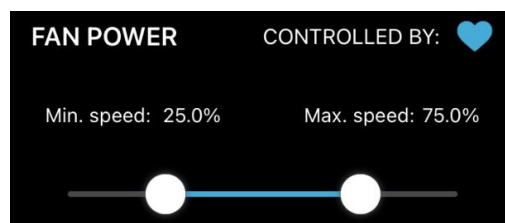
8.4.6. Fan section

This section looks differently depending on the “Show advanced settings” option. Details of both versions are presented in the following chapters.

8.4.6.1. *Standard configuration*

In the standard configuration (when advanced options are disabled) the screen contains only a single range slider, which enables you configure the range of operation of the fan. It allows you to set the desired range of operation of your fan:

- The minimum speed at which the fan turns on when the heart rate or speed reaches the lower threshold, defined in the settings of the controlling.
- The maximum speed that the fan will reach when the heart rate or speed reaches or exceeds the upper threshold.

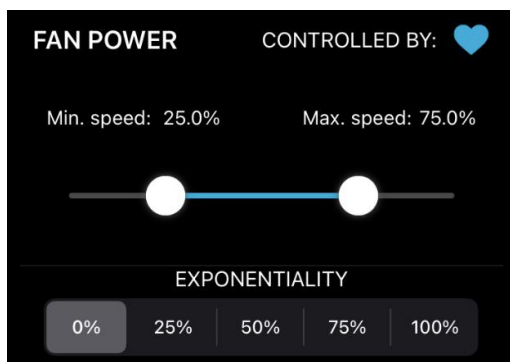


Fan configuration – advanced OFF

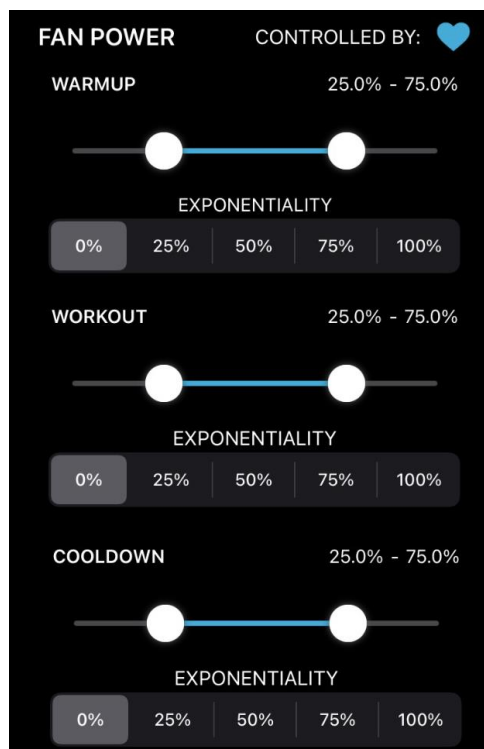
8.4.6.2. *Advanced configuration*

The look of this screen depends on the sensor that has been set to control then in the “Sensors” section. If the controlling sensor is speed, the screen will look the same as in the Standard configuration (advanced settings disabled) – only a single slider will be available (see above).

If, however, the controlling sensor is heart rate, then depending on the “divide workout into phases” setting, you will see either one, if phases are OFF, or three sliders – one for each phase. Additional option available in the advanced configuration is the exponentiality, described in the next chapter.



Advanced fan configuration – one phase



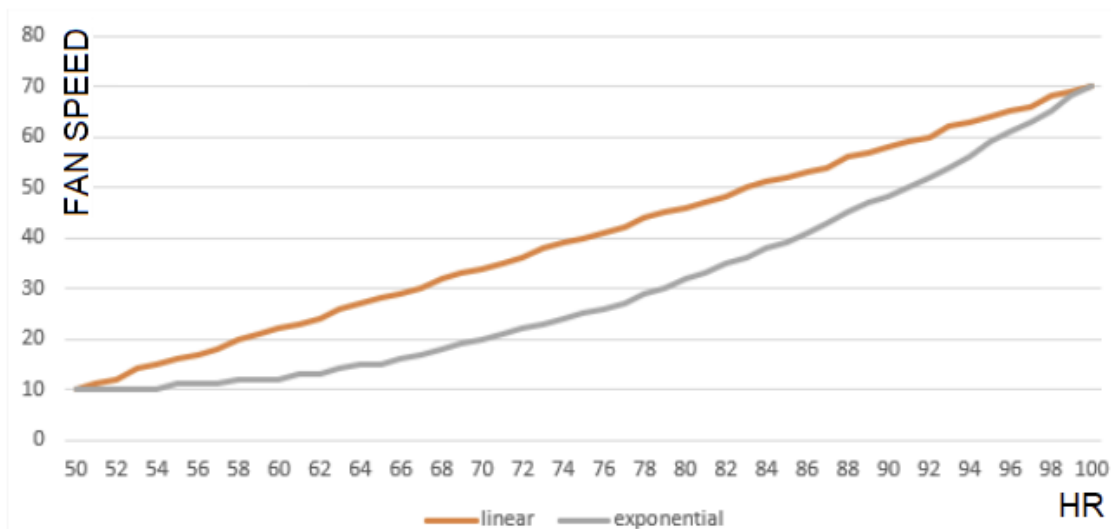
Fan configuration for heart rate with phases ON

8.4.6.3. *Exponentiality of the fan speed increase*

By default, the fan speed controlled by HRM Fan changes uniformly (linearly) within the defined range, i.e., it increases by the same amount when the heart rate changes e.g., from 100 to 120 beats per minute and the same when the heart rate increases from 160 to 180 beats.

Research shows that the increase in heart rate is not proportional to the increase in subjective fatigue, i.e., an increase from 100 to 120 beats/min will be felt as less fatiguing than an increase from 160 to 180.

For this reason, HRM Fan allows you to change the way the fan speed increases - from linear to exponential. The exponential increase works in such a way that in the lower heart rate range (e.g., 100-120 beats/min) the speed will increase slower than in the upper range (e.g., 160- 180 beats/min). In other words, the closer the heart rate is to the upper range limit, the more the increase in fan speed will be. This is illustrated in the chart below.



Fan speed changes - vertical axis (from 10-70%) in the heart rate range from 50 to 100 beats/min (horizontal axis) for two types of speed increase: linear (orange) and exponential (gray)

There are five settings for the parameter that determines the exponential growth of velocity: from 0% (default, linear increase), through 25%, 50%, 75% to 100% (fully exponential growth). It is recommended to test different settings and choose the subjectively best.

NOTE: Exponentiality setting is available for the fan configuration only if the controlling sensor is set to heart rate.

NOTE: If the division of workout into stages has been enabled in the "Heart rate" section, exponentiality can be defined for each stage independently, for example:

1. For the warmup stage, we can set the exponentiality to 0% (linear increase),
2. For the training stage, we can define the exponentiality as 50%,
3. For cool down, we can go again with a linear increase (0%).

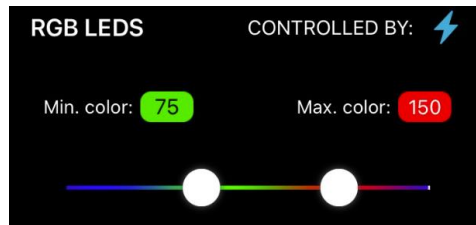
8.4.7. RGB Leds section

In the "RGB Leds" section, you can configure the brightness and color ranges that will be used by your HRM Fan device.

The content of this section depends on the "Show advanced settings" option (on or off). Details of both versions are presented in the following chapters.

8.4.7.1. Standard configuration

When advanced settings are OFF, the colors are selected on a single slider with a rainbow of colors underneath.



Color range slider – standard configuration

The color on the left selected on the slider will be sent to the connected RGB LED driver when the controlling sensor (heart rate, speed or power) reaches the lower limit.

The second color is the "maximum" color - corresponding to the upper limit of the controlling sensor. If the sensor data rises above the upper threshold, the color will no longer change.

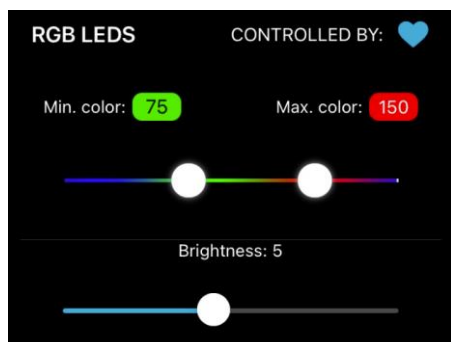
The colors will smoothly change over the configured range, from the left color to the right, through all the colors of the rainbow in between.

8.4.7.2. Advanced configuration

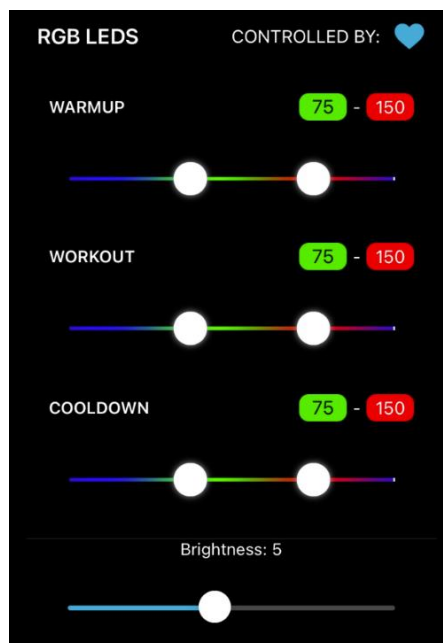
If the advanced settings are enabled, the screen can display three variants, depending on the controlling sensor and its configuration. All options are listed in the table below.

What controls the leds	Controlling sensor configuration	What is displayed
Heart rate	Simple range	Single color range slider (see above)
	Same as fan (single phase)	Single color range slider (see above)
	Same as fan (three phases)	Three color sliders, one for each phase (see below)
	Zones	Six color sliders, one for each zone (see below)
Speed	Simple range	Single color range slider (see above)
Power	Simple range	Single color range slider (see above)
	Zones	Six color sliders, one for each zone (see below)

Single slider configuration looks the same in the advanced mode as in the standard mode with addition of led brightness regulation.

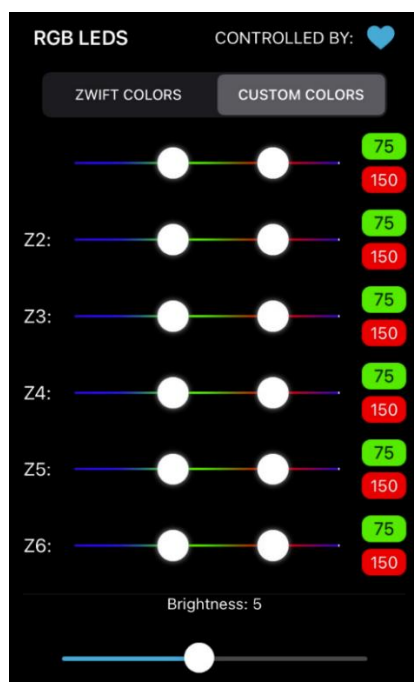


Single slider in advanced mode



RGB Leds configuration – three Phases

In the variant with six sliders, additionally you will have a possibility to use the preset configuration called “Zwift colors”. Selecting this option will set the sliders to the colors that Zwift uses for individual power zones (colors are displayed in-game on the power chart on the bottom of the screen). This setting combined with the “Zwift” zones setting in the “Bike power” section, allows you to visualize on the external RGB leds the same colors as Zwift is currently showing.



RGB Leds configuration – Zones

8.5. Settings screen

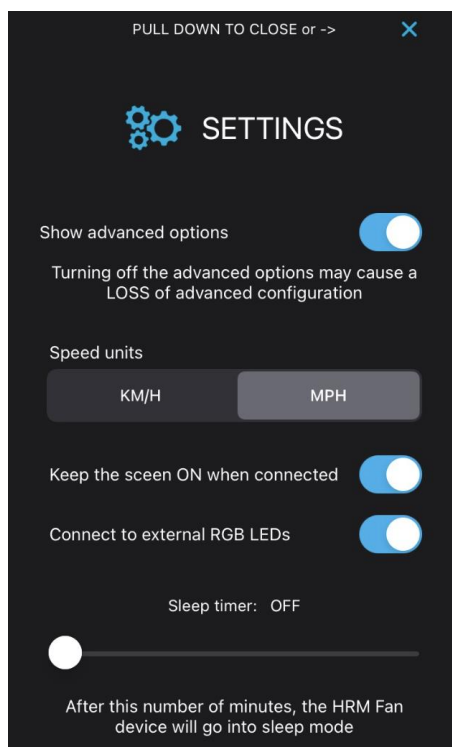
Settings screen is a view that is displayed when you click on the gears icon in the top right of the main screen in the app, next to the sleep button.



Top bar with gears icon

The settings screen includes the following settings:

1. Show advanced options.
2. Speed units (kmh / mph),
3. Keep screen on when connected,
4. Connect to external RGB Leds,
5. Sleep timer configuration (only visible when advanced options are on).



Settings screen – Advanced ON

To close the settings screen, click on the “x” button in the top right corner. For iOS you can also swipe down. For Android, there is an additional “Close” button on the bottom.

8.5.1. Show advanced options

This setting allows you to enable advanced options and settings across the application. This gives you more flexibility in configuring your sensors and target devices (fan and external leds).

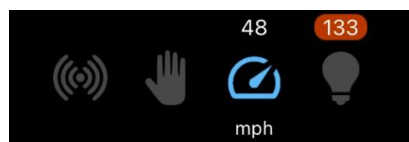
When you turn this setting ON, certain parts of the app will become visible. The details of each section and what configuration parameters are visible with advanced settings on or off, are described in individual chapters dedicated to each section.

NOTE: Since disabling the advanced options hides some parts of the application and simplifies the view and the configuration, some advanced configuration might be lost when turning the advanced options OFF.

NOTE: Turning the advanced settings on will show the sleep timer configuration. Disabling advanced options will hide this section. See “Sleep timer configuration” for more information.

8.5.2. Speed units

This simple setting allows you to change the speed units displayed across the application. This applies to the “Speed” section, where you can set the speed range at which speed will control the fan and/or external RGB leds and to the top menu bar, with section icons – the units are shown below the speed icon. Speed is automatically recalculated when changing the units.



Speed units in menu bar – mph

8.5.3. Keep screen on when connected

This option, when on, will keep the screen of your phone on, when the application is connected to a HRM Fan device. This can be useful if you want to monitor the parameters and data coming from the sensors while doing your training.

8.5.4. Connect to external RGB Leds

After enabling this option, HRM Fan will start searching for a compatible RGB led driver. Make sure that the driver is connected to the power supply and is within range of the HRM Fan

device. Enabling this option also makes certain parts of the app to become visible, i.e., the “AUTO LED CONTROL” section on the “Sensors” screen. Using this section, you can configure the sensor that will be controlling the external leds. You can read more about this configuration in the “Sensors” section chapter.

8.5.5. Sleep timer configuration

Configuration of the time that must elapse before the device goes into sleep mode is possible thanks to the slider, on which the time is set in minutes (from 0 to 60). If you set the slider to 0 minutes (OFF), the device will never go to sleep automatically. It will be possible to put it to sleep using the sleep button or the physical button on the housing. Disabling the automatic sleep mode allows you to automate the use of the device. If, for example, you are sure that there will not be an accidental sensor in the vicinity of the device, which could unnecessarily turn on the fan or RGB leds, then leaving the device in the awake mode allows for immediate detection of the sensors when you start training - it will not be necessary to wake up the device.

NOTE: In the standard mode (advanced settings disabled), the configuration of the sleep timer is hidden, while the sleep mechanism itself works in the same way as in the advanced mode. Thus, it is possible to switch to advanced mode for a while, change the sleep timer setting and return to the standard mode keeping the sleep configuration.

8.6. The Sleep mechanism


The sleep mechanism is a function of the HRM Fan device that allows you to:

- Easily turn off the fan or leds after training without disconnecting the cables or reaching to the fan / leds to physically turn them off.
- Leave the device connected to the power supply between workouts. In sleep mode, the fan / leds will not turn on, even if there is an active heart rate monitor or other sensor in range of the HRM Fan device,
- Conveniently turn on the device (wake it up) just before training (i.e., from a mobile application or by pressing the button on the housing).

The device in sleep mode indicates its state with a constantly lit red led on the housing. In sleep mode, the device does not search for sensors, so it will not connect to them and will not start the fan or turn on the external leds. However, it is visible for scanning in the mobile application.

The device can be put to sleep in three ways:

1. By pressing the button on the housing,

2. By clicking on the Sleep button in the mobile application 
3. The device will go into sleep mode by itself after a certain period of inactivity (when no sensor is connected, and the device is not in manual mode). The default timeout (set when the application is started for the first time) is 15 minutes.

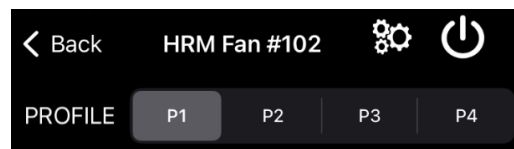
You can wake up the device by:

1. Pressing the button on the housing,
2. Connecting to the device using the mobile application.

Configuration of the time that must elapse before the device goes into sleep mode is available in the settings screen and is described in the chapter: "Settings screen".

8.7. Profiles & Global application settings

There are four profiles available in the mobile application (P1, P2, P3, P4). Profiles are sets of settings that you can switch between using the profile buttons. Clicking on one of the buttons will load the configuration from the selected profile and send it to the connected HRM Fan device. The data in the profile is saved automatically when the configuration is changed. Configurations in all profiles are saved locally on the phone, so they can be used on several HRM Fan devices and between runs. Information about the currently set profile is also saved locally, so that after turning the mobile application off and on again, it will be set to the last used profile.



Profile switching buttons (P1-P4)

Profiles can be used for several purposes:

- When more than one person is using one HRM Fan device, it is possible to save several sets of settings, e.g., one for each person. Then there is no need to reconfigure the device each time the device is handed over to another person,
- When you want to use more than one configuration for different types of training (e.g., a different configuration for running on a treadmill and a different configuration for training on a trainer).
- When you want to keep more than one configuration for different training intensities or your own fatigue levels.

The entire configuration of the HRM Fan device and other application settings are saved as part of the profile, except for the settings available on the Settings screen:

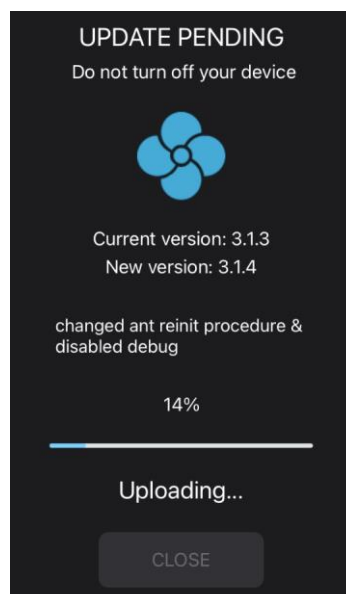
1. Show advanced options.
2. Speed units (kmh / mph),
3. Keep screen on when connected,
4. Connect to external RGB Leds,
5. Sleep timer configuration.

Those settings are saved globally for the application and kept locally on the phone.

8.8. Remote Software Update

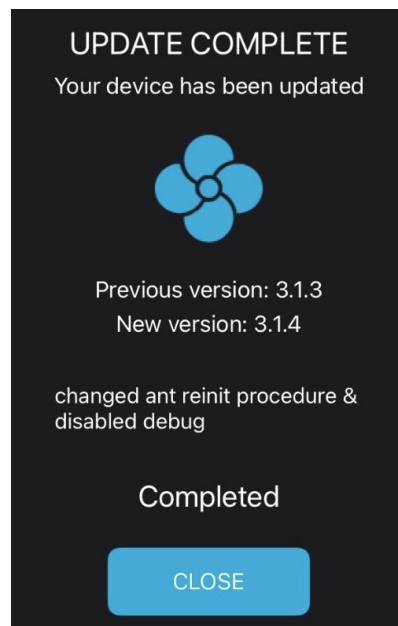
The mobile application allows you to update the software on the HRM Fan device. New versions of the software for the device are created and published on a special website available only for the HRM Fan&Led mobile application. Each new version has its own unique software version number, as well as the minimum mobile application and device hardware version number required to run it.

After connecting to the device, the mobile application checks the current software version and hardware version of HRM Fan device. Then it checks the software versions available on the website. Based on this information, the application decides whether a new software version is available for the device it is connected to. If yes - the update procedure is initiated. A simple list of changes in the new software is displayed and you can track the progress of the update on the screen.



Update in progress

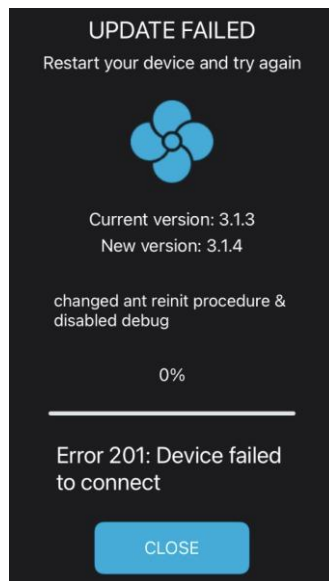
The update should not take longer than 1 minute. After the update is finished, the device is ready for use. Just click on the “CLOSE” button and the device will reconnect.



Update complete

NOTE: Updates contain bugfixes and improvements over existing features. Sometimes also new features are introduced. We are doing our best to preserve user configuration between software updates, however if the update is big and changes the way the device communicates or stores data, the profiles and other user configuration might be lost.

NOTE: If an update fails. Please close the application, restart the HRM Fan device (disconnect from the power source, wait five seconds and reconnect) and try again. Try to keep your phone well within 1-2 meters from the device during the whole update process. Keep the application running in foreground.



Update failed

9. Safety Notes

Do not connect devices other than supported, compatible fans to HRM Fan - this can damage both the HRM Fan, and the device being connected. Due to variety of fans available on the market the producer of HRM Fan does not take responsibility for the damages caused by using fans other than the one sold with it.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory, or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

Children shall not play with the appliance.

Cleaning and user maintenance shall not be made by children without supervision.

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent, or similarly qualified persons to avoid a hazard.

10. Trouble shooting

The table below lists known problems and suggests solutions. If you have any other problem with our device or the suggested solution does not solve your problem, please contact us for support. We are happy to help.

Problem	Solution
The fan / RGB led operation is interrupted during training. The fan stops spinning / the leds stop changing colors. Sometimes they restart after a few seconds. It happens even though my heart rate / speed / power was within the configured range.	<p>This is usually due to one of two things:</p> <ol style="list-style-type: none"> 1. Low battery in your sensor, or 2. Obstacles between the sensors, RGB led driver and HRM Fan. <p>Make sure the sensors and RGB led driver remain within range of HRM Fan (maximum 3 meters) throughout training and that there are no physical obstructions that could block the transmission. Otherwise, replace the battery in your sensor.</p>
My fan does not spin when I set it its speed to low values.	<p>Not all fans are the same. Because of that we designed our device to have a range of operation wider than most fans.</p> <p>Using the manual mode increase the percentage value to the level at which the fan starts spinning and then configure the lower fan speed range at this or higher level. Most fans will start spinning above about 20%.</p> <p>If your fan does not spin at 25% and higher, there might be a problem with the HRM Fan device, your fan, or there might be a compatibility issue.</p> <p>In that case contact us as soon as possible.</p>
My fan is humming / buzzes	<p>A moderate humming / buzzing sound, especially at lower speed levels, is normal. It is caused by the fan's engine not getting the full power.</p> <p>If you think the sound is too loud or it is something else than buzzing or humming, please contact us.</p>
After the heart rate monitor connects to HRM Fan, I can no longer see my heart rate on my watch / cycle computer / in Zwift	<p>When using a Bluetooth LE heart rate sensor, remember that due to the technology used, such a sensor can only connect to one data recipient. We recommend using ANT+ technology to connect the heart rate sensor to HRM Fan. More info can be found in the "Supported devices" chapter and in the mobile applications' manuals.</p>
The leds won't connect to my device even though they are powered on and in range of my HRM Fan device.	<p>Please make sure that the led driver is not connected to another device / application. If you have controlled the leds for example using the duoCo Strip mobile app, please make sure you have disconnected this app prior to using the leds with HRM Fan. Due to the technology used in the led driver (Bluetooth) it is possible for the driver only to connect to one device or application at a time.</p>

11. Contact information

The manufacturer and seller of the device is:

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