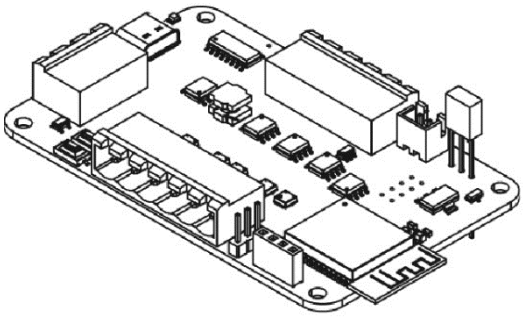
ClimateGuard

CG_led-1v0

LED tape controller

Specification



1 Key features

Functional:

Ability to control RGBW and addressable LED tapes

5 channels of shared anode LED tape control

The maximum current of one control channel - 6 *A*

Support for IR remotes

WLED firmware support

Removable screw cleats for connection

Built-in programmer

Type-c connector

Microcontroller ESP32-WROOM

The presence of a current shunt

Tact button connector

Reverse polarity protection

LED tape parasitic inductance protection

Support NRF24L01 radio module and 433MHz modules

Built-in Wi-Fi and Bluetooth

Electrical:

Power supply: 5*V*, 12…24*V*

Technical:

- Module size:
  90 *mm* x 53 *mm* x 12 *mm*
- Module weight: 50 *gr*
- Operating temperature range:
  -30°*C* to +60°*C*

2 Description

CG_led is a universal board for controlling various types of LED strips. The maximum current per tape channel is 6 *A*. The total maximum current is 30 *A*. The main controller is esp32 with built-in Wi-Fi and Bluetooth.

No external programmer is required for board utilization due to the built-in programmer on the CH340 chip.

Built-in infrared receiver allows you to control the board from the remote.

Table of Contents

3 Device specification

3.1 Technical

Parameter	Value			Dimension
	Min	Operating	Max	
Power supply	5	-	24	V
Consumption 5V	-	-	0.5	A
Temperature range	-30	+20	+60	°C
Humidity range	0	60	98	%

Table 1 (technical characteristics)

3.2 Dimensions

Module size: 90 *mm* x 53 *mm* x 12 *mm*

Module weight: 50 *gr*

4 Start and operation

The WLED firmware is installed on the module during manufacturing.

To connect to the controller, you need to: turn on the module, scan available Wi-Fi networks, select the "WLED-AP" network (by default, the network is not password protected). After connecting, you will be automatically redirected to the landing page (if redirection does not occur, you must go to the address "4.3.2.1"). From the landing page, you can navigate to the settings and to the control panel.

4.1 Firmware

The firmware of the controller is carried out via the USB Type-C connector.

The controller successfully works with all IDEs (Arduino, PlatformIO, ESP Tools).

4.2 LEDs connection

By default, the WLED firmware is configured to work with address tapes (WS281x series). To run an LED tape, you need to connect it in accordance with the pinout to the 5-pin connector (see paragraph 9 "Pinout"). Please note that the connection should only be made to a connector that has a GPIO22 output. Next, you need to turn on the controller and connect to the WLED-AP network. After connecting, you need to go to the control panel, select the “LED preferences” item in the settings and set the parameters:

- LED Voltage – voltage specified by the manufacturer;
- LED Outputs/1 – used series of addressable LEDs;
- Color Order – the sequence of reading indicators for color channels, is set arbitrarily.

After setting the parameters, click on the "Save" button. Setup is complete.

4.3 Connecting RGB LEDs

To start the RGB LED, you need to connect it in accordance with the pinout (see paragraph 9 "Pinout"). Please note that the connection must be made only to a 6-pin connector that has outputs for channels R, G, B (GPIO 17, GPIO 16, GPIO 2, respectively). Next, you need to turn on the controller and connect to the WLED-AP network. After connecting, you need to go to the control panel. In the settings, select the "LED preferences" item and set the parameters:

- LED Voltage – voltage specified by the manufacturer;
- LED Outputs/1 – used series of addressable RGB LEDs;
- GPIOs – 17, 16, 2 correspondingly;
- Color Order – the sequence of reading indicators for color channels, is set arbitrarily.
- After setting the parameters, click on the "Save" button. Setup is complete.

5 RGB Control

By default, the channel control keys RED, GREEN, BLUE, WCOLD, WWARM are closed, there is no voltage on the channels. To open the key, you must apply a high level to the esp32 output, which number corresponds to the selected tape channel (see paragraph 9 "Pinout" or marking on the board). To close the channel that controls the key, you must set a low level at the output of the microcontroller.

If necessary, a PWM signal can be applied to the control outputs.

6 Current shunt control

The current shunt is designed to measure the consumption of LEDs on a 5V line.

The consumed current is calculated according to the formula 1 mV = 5 mA (see paragraph 9 "Pinout").

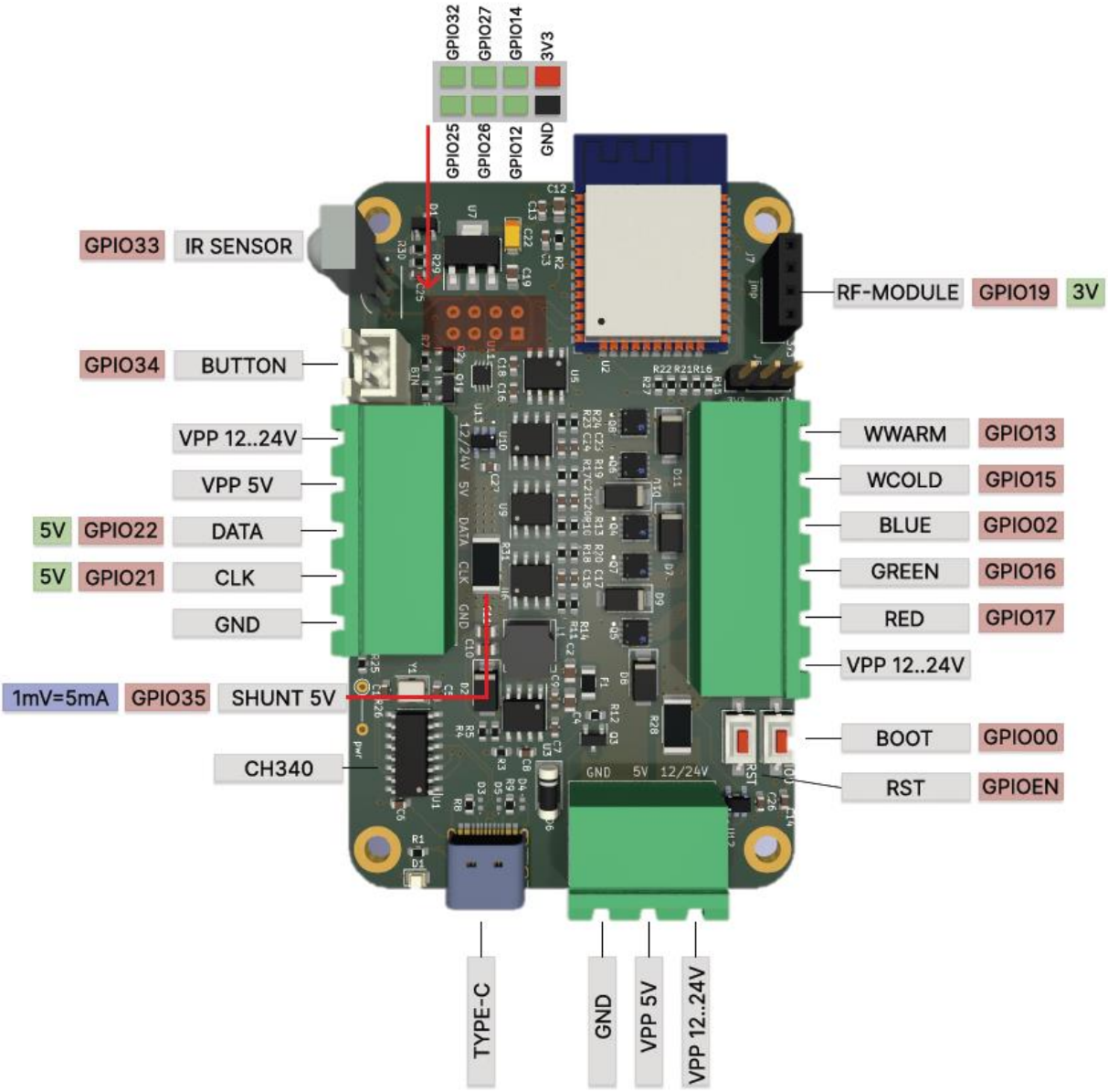
7 Power supply indicator

The power supply indicator (red LED) is designed to notify the user about the board's power status. A stable glow of the LED indicates the correct power supply of the module, in other cases there are power issues.

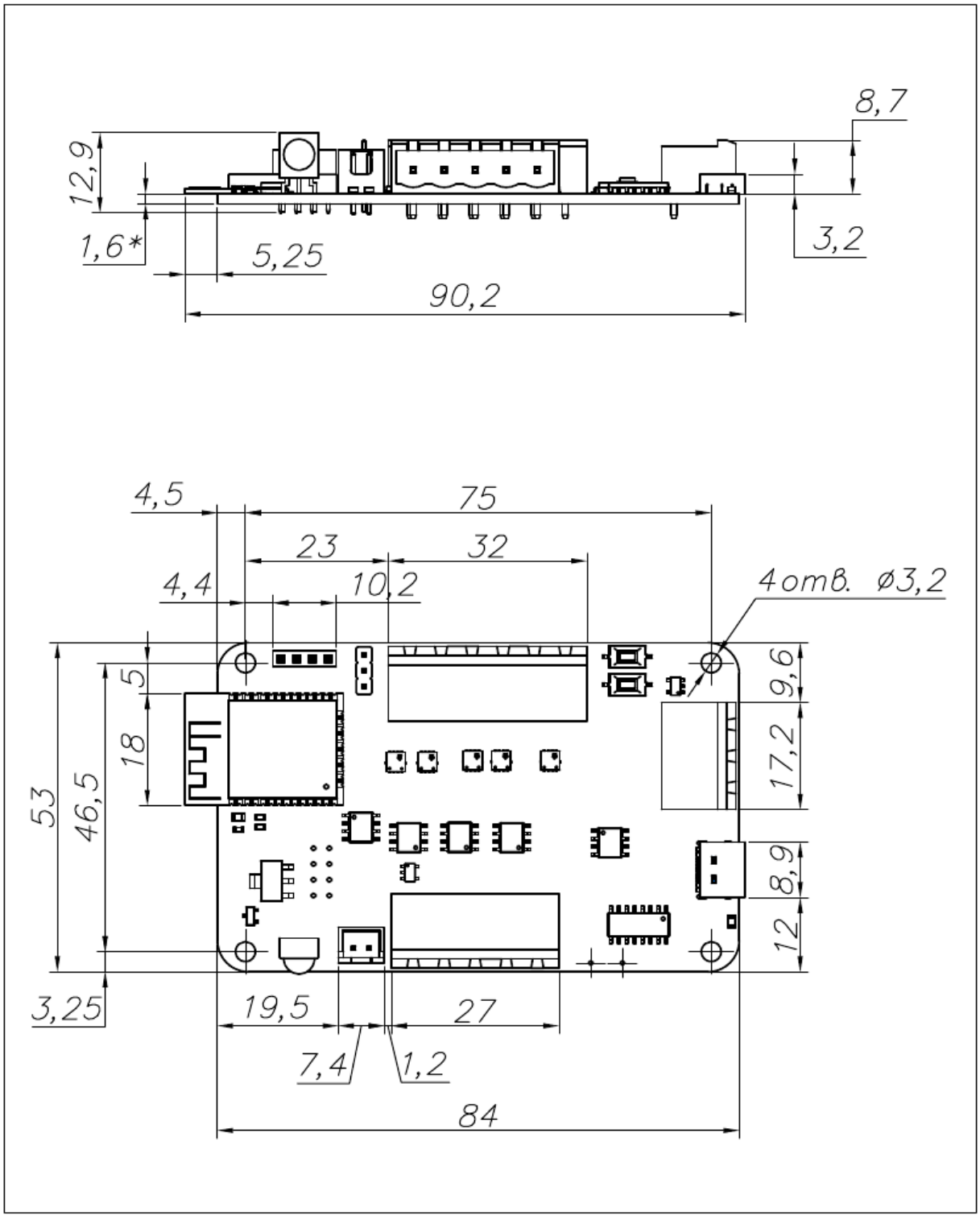
8 Alternative uses

CG_led is a universal controller that can act as a powerful PID or other controller for various low-voltage loads, direct current. Paired with a mechanical or solid state relay, CG_led can be used to regulate high power AC and DC.

9 Pinout


GPIO32
GPIO27
GPIO14
3V3
GPIO25
GPIO26
GPIO12
GND
GPIO33
IR SENSOR
GPIO34
BUTTON
VPP 12..24V
VPP 5V
5V
GPIO22
DATA
5V
GPIO21
CLK
GND
1mV=5mA
GPIO35
SHUNT 5V
CH340
RF-MODULE
GPIO19
3V
WWARM
GPIO13
WCOLD
GPIO15
BLUE
GPIO02
GREEN
GPIO16
RED
GPIO17
VPP 12..24V
BOOT
GPIO00
RST
GPIOEN
TYPE-C
GND
VPP 5V
VPP 12..24V

10 Drawings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12,9
1,6*
5,25
90,2
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32
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10,2
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5
18
53
46,5
9,6
17,2
8,9
12
3,25
19,5
27
7,4
1,2
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11 Reference

Contact information and information about module operation are presented in the table.

Description	Link
Manufacturer website	http://climateguard.ru/
Additional data and modules	https://github.com/climateguard/CG_led
Module library	https://github.com/Aircoookie/WLED

Table 2 (reference materials)