Le-PST-25 LINE PROTECTOR

- **ACLine Load Protection**
- **Programmable Timer**
- **AC Line Voltage Monitoring**

- **100…250V AC working voltage**
- **Up to 25 A load current**
- **Protects the load against voltage drops and surges, with programmable limits and against spikes caused by thunderstorms and other causes. Programmable delay start**
- **Configurable from any browser from a PC or phone, via Wi-Fi**
- **32 bits microcontroller Esp-32**
- **Supercap-backed real-time clock maintains time and date for several days without mains power.**
- **Can be used as a timer. Up to 4 fully programmable daily events**
- **Stores historical network voltage, displaying monitoring graph**
- **Several LEDs indicate the AC Line and Load status**
- **Two connection modes: AP – you connect to it within the wifi range, and ST mode – You can connect it to the Router and access it from anywhere (IoT)**
- **Spanish / English language Selection**
- **110 mm x 80 mm x 25 mm. Weight: 130 g.**

The device is an advanced network voltage protector with integrated Wi-Fi, which can also function as a periodic event timer. Up to four events can be programmed daily, and the days of the week on which they are executed can also be selected.

The device can also be used to monitor the network voltage; voltage data from the last seven days is stored in its permanent memory, and is displayed as a graph on the screen of the mobile phone or PC.

To access the device, it is necessary to connect to it from a phone or PC via Wi-Fi using the default connection parameters:

Wifi_Id: Ledoelectronics

Password: 12345678

On a phone, whether Android or iPhone, go to Settings → Wi-Fi, select to connect to "Ledoelectronics" and enter the default password. This can then be changed from the device's configuration menu.

Once connected, we can access it from the browser of the mobile phone or PC by typing the address 10.10.10.1

On the first connection, it is necessary to synchronize the time of the device with that of the phone or PC, and to do so, click on the "Adjust" button on the main screen. Once this is done, the device will keep the correct date and time, even if the mains voltage fails for a period of no more than three days.

The main screen of the device shows us the real-time value of the date, time and mains voltage. It also shows us the programming data of all timing events.

Timing events appear in the table, with the following colors:

1. Gray: The event is deactivated
2. Orange: The event is activated, but it will not be executed because the load control mode is "always On".
3. Green: The event is activated and will be executed on the scheduled date and time.

The main screen also allows us to activate or deactivate the load manually, using the two buttons below.

The menu at the top allows us to navigate through the other pages and access the different configuration and monitoring menus.
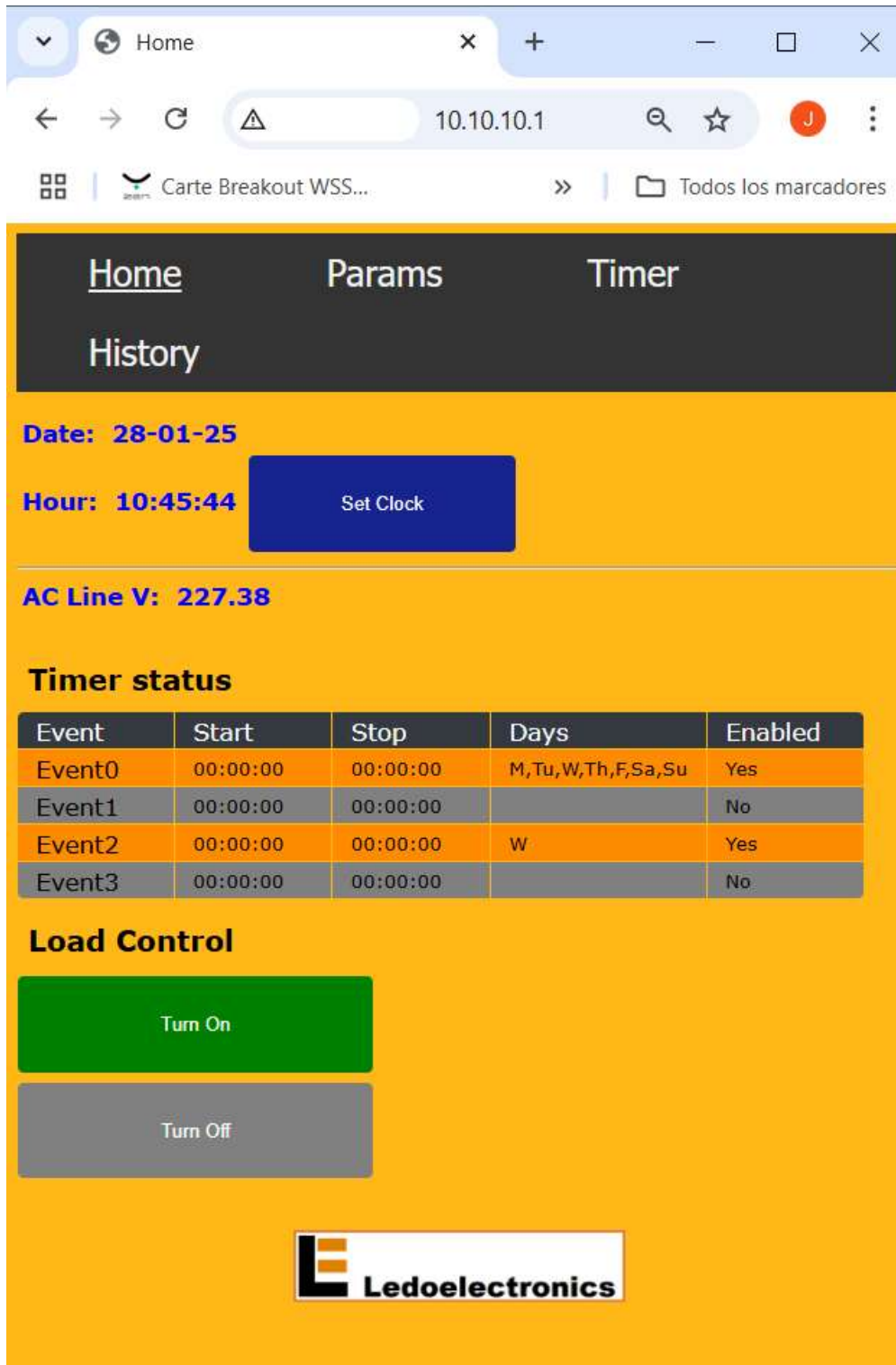
Fig.1 Main landing page.

Fig.2. Parameters configuration screen.

From the "Config." screen we can modify the equipment configuration: at the top are the Wi-Fi access credentials, and below are the output protection and control parameters.

V_min: Low voltage protection. If the grid voltage falls below this value, the load is disconnected from the grid and will remain in this state until the voltage recovers again.

V_max: High voltage protection. If the grid voltage rises above this value, the load is disconnected from the grid and will remain in this state until the voltage recovers again.

V calibration: Voltage calibration coefficient. Used to ensure that the voltage reading of the equipment matches reality.

Power-on delay: Power-on delay time, in seconds. Necessary to avoid transient processes in the network at each start-up.

Load control: Selects the equipment's working mode:

Always On: The equipment works only as a voltage protector, ignoring timing events, even if they have been enabled.

Timer control: The equipment works as an event timer, keeping the protection functions active. In this mode, the output status is governed by the timing events that have been programmed and enabled.

Language: Allows you to select between Spanish or English.

Please note that the Wi-Fi password cannot be less than eight characters long, and you must be careful not to forget it, otherwise everything would have to be reset to factory settings.

The equipment has a configuration jumper J2 accessible from the outside of the box, which has the following functionality:

1. Wifi in AP mode, if the jumper is closed (by default).
2. Wifi in ST mode, if the jumper is open.
3. Reset to factory settings, if its status changes when the equipment is On.

Before using the equipment, it is necessary to set the voltage protection parameters according to the nominal AC Line voltage:

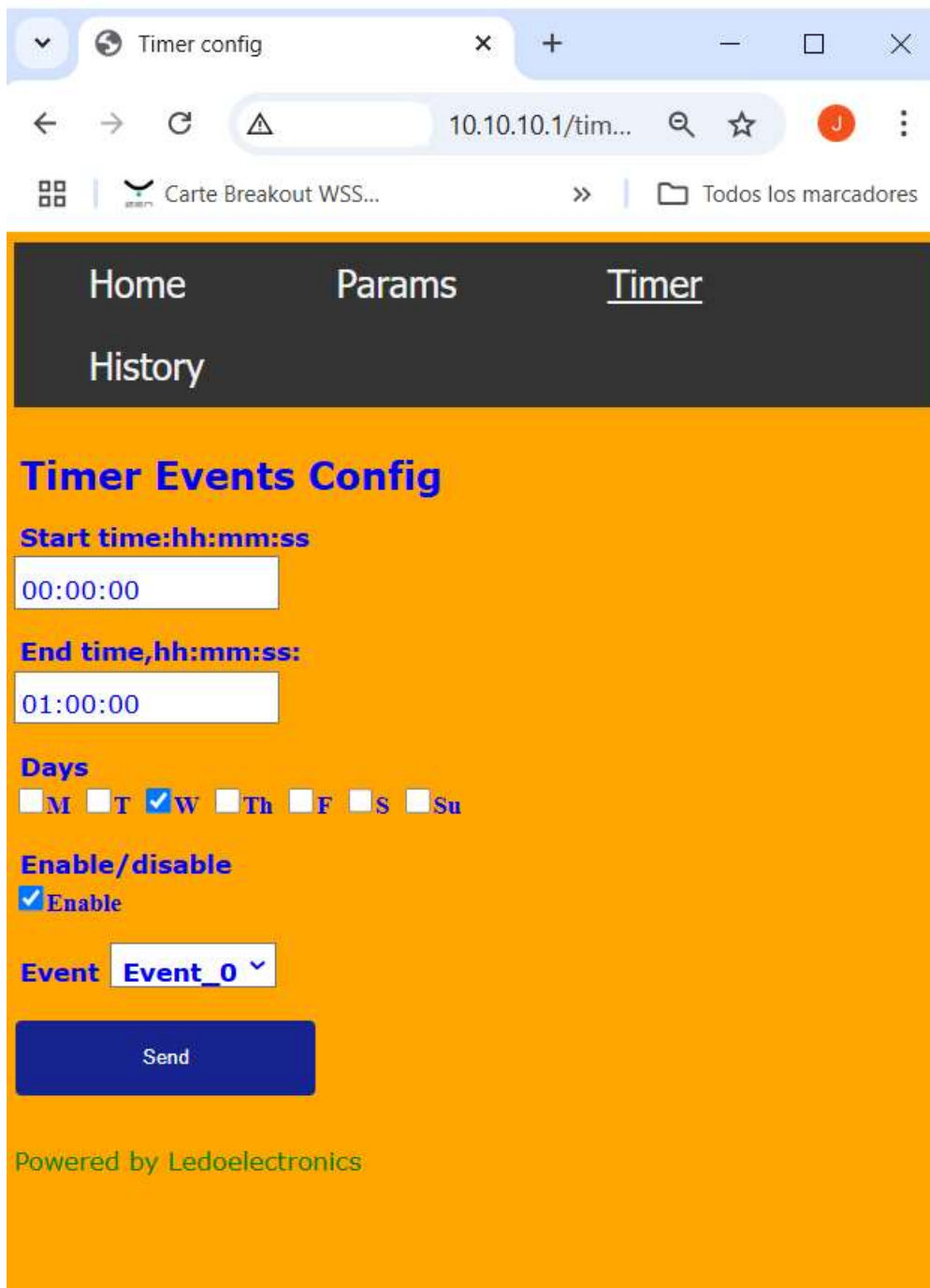| PARAMETER	115V AC	230V AC
V_min, V	100	200
V_max, V	135	245
On_delay, s	60…300	60…300
V calibration	0.99 a 1.1	0.99 a 1.1

Fig.3. Timer events programming screen.

Here we select one by one the events to modify, configure the On and Off time, the days of the week on which it should run, and enable or disable it as appropriate.
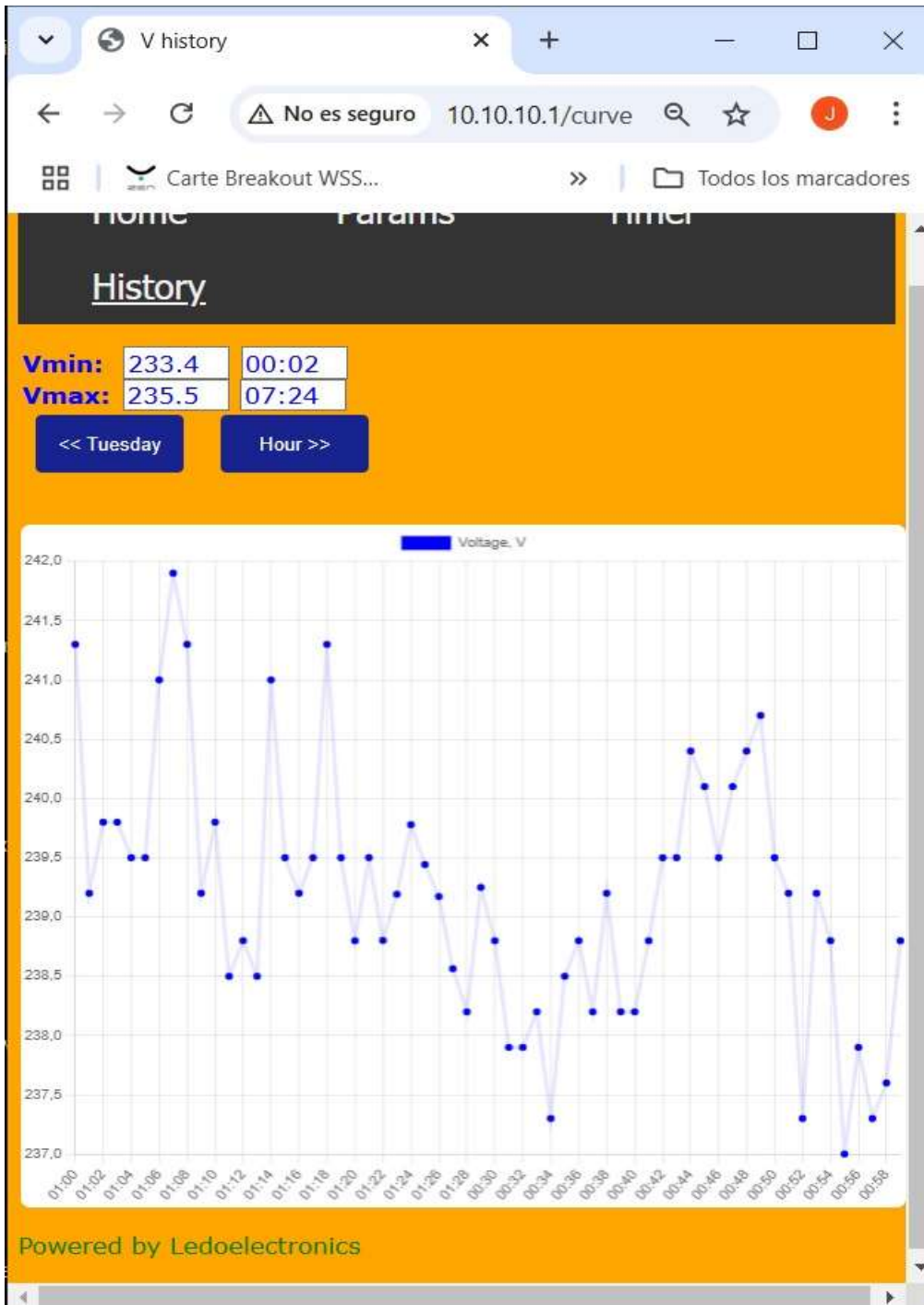
Fig.4. AC line voltage evolution graph.

The "History" screen allows us to view the evolution of the line voltage over the last seven days. It also shows the minimum and maximum values per day.

The buttons at the top allow us to select the day and time to be displayed on the graph, the button on the left decreases the days, and the button on the right increases the display time.

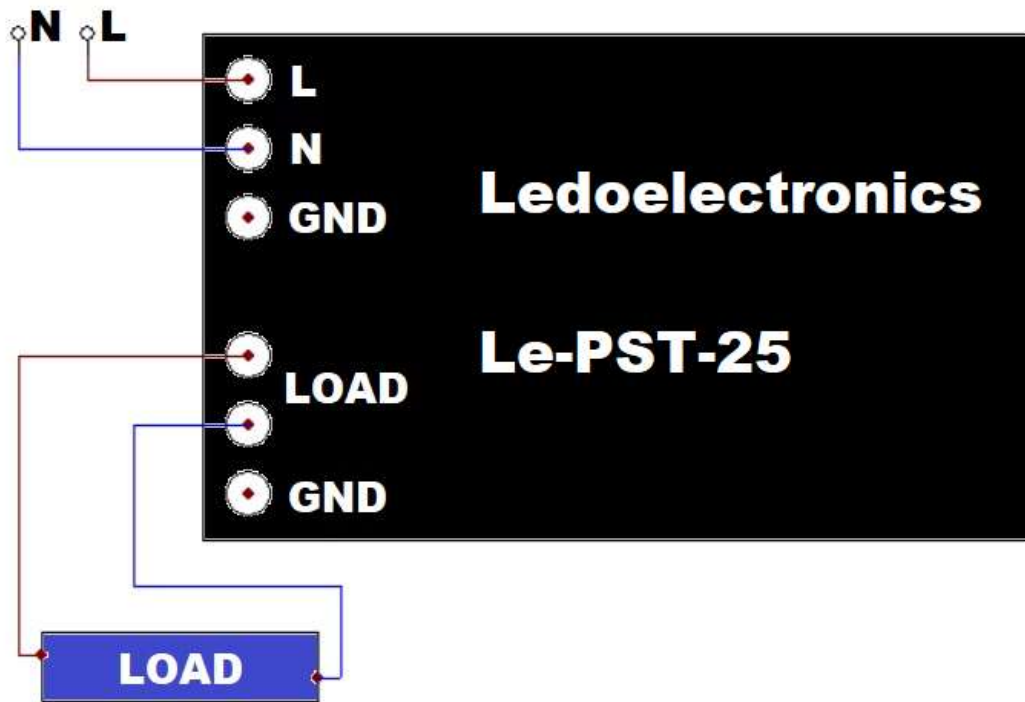## Electrical connection of the equipment
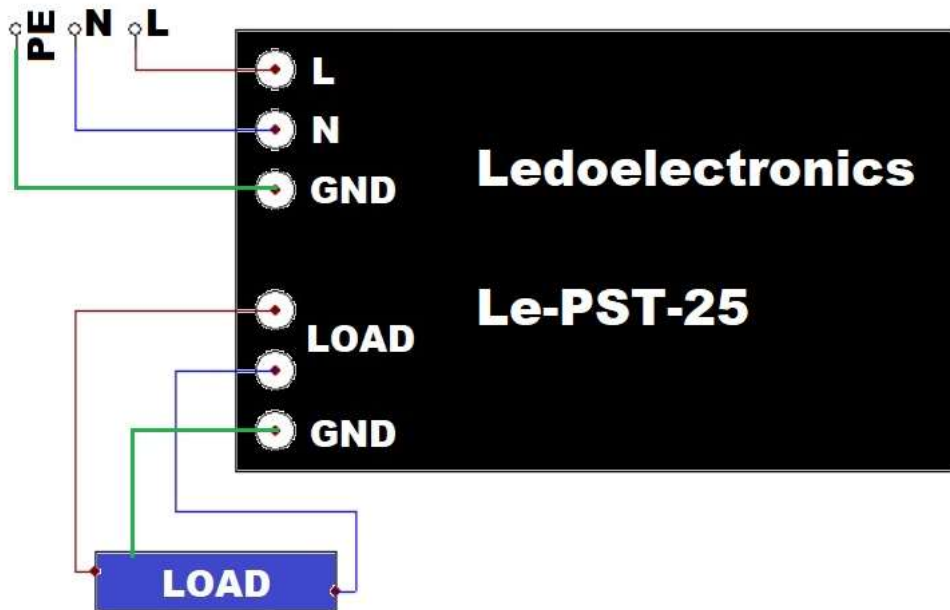

Fig.5. Two-wire, groundless connection.

Fig.6. Connection with grounding.
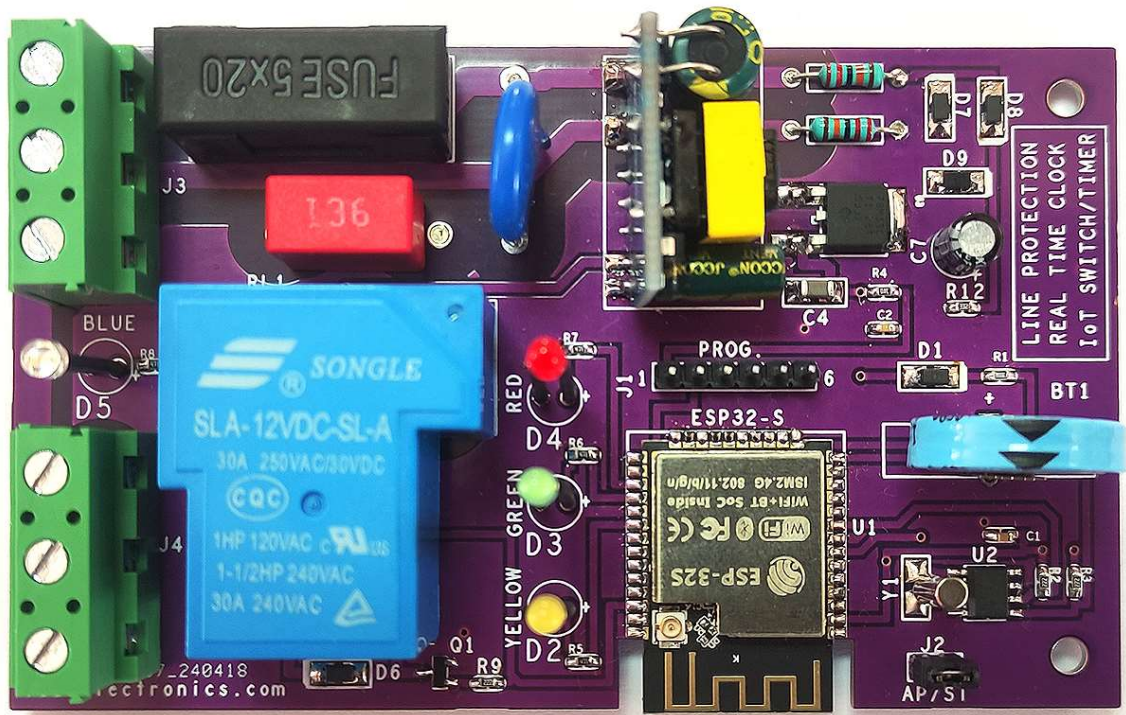
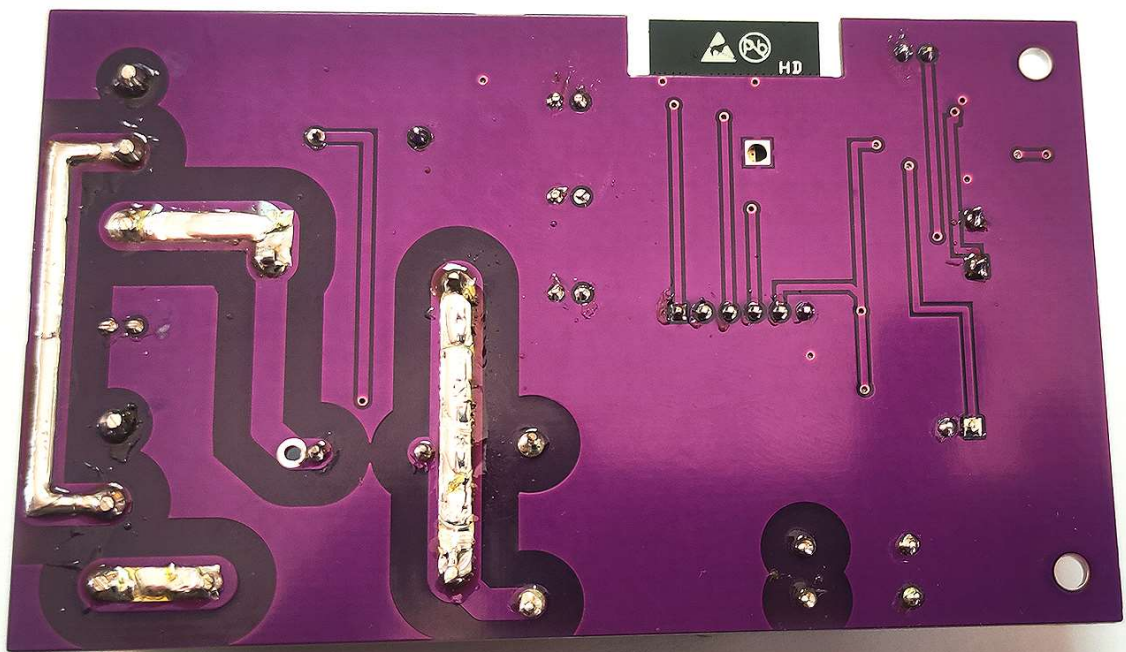Below is an overview of the PCB of the equipment

Fig.7. PCB top view.

Fig.8. PCB bottom view.

https://ledoelectronics.com

Le – PST-25 possible applications:

1. Refrigerator Protector
2. 115/230V AC single-phase air conditioning equipment protector
3. General appliance protector.
4. Events Timer.
5. Timed filling of water tanks.
6. Automatic irrigation control.
7. Fish tank and plant light control.
8. Power grid voltage monitoring.
9. Etcs.