

# ThunderBox | User Manual

Advanced power distribution module

Model: TB-U01, TB-U02

## 1. Foreword

Congratulations on your purchase of a ThunderBox power distribution module.

At HealTech Electronics Ltd. we are committed to producing the best aftermarket accessories for motorcycles and we would like to thank you for choosing this product.

The ThunderBox simplifies and safeguards the process of connecting aftermarket electronic accessories (*such as extra running lights, heated grips, GPS, phone charger, extra gauges and any other powered devices*) to your vehicle. It acts as an automatic and easy-to-handle power distributor between the battery and the accessories. With the quick connect terminal blocks supplied, the installation process is quick and simple, requiring no tools nor specialist knowledge.

## 2. Features

### Compatibility

Compatible with ALL vehicles using a 12V battery system (*all battery types and capacities are supported*), including all motorcycles, cars, ATVs/UTVs, kit cars and even lawnmower trucks. Available in two versions: 16A (TB-U01) and 2x 16A (TB-U02).

### Awesome tech

The TB constantly monitors the battery voltage, engine state (running/off) and the outputs, then switches the loads on/off automatically. The TB isolates/disables the power supply to the accessories until the engine is started and running smoothly, ensuring 100% battery power is always available for starting. This is a fully automated process, resulting in trouble-free starts and enhanced battery life.

### Quick and simple to use

Connect the TB directly to the battery terminals and decide whether you want a fully automatic or ignition key controlled operation. Connect the auxiliary equipment fast, conveniently and safely to the tool-free splitter terminal blocks supplied. Just plug in the wires and you're good to go!

### Small but tough

We use only the best components and technology to create products that can withstand the harshest environments. The TB has no moving parts, no relays and no fuses. Inside the rugged plastic case the circuitry is encased in epoxy resin, which makes it fully oil and water resistant, shock and vibration proof.

### USB charger

A weatherproof USB charger is available separately (part no.: TB-USB1) so that power to your USB devices will be turned on/off automatically and protected too. You may connect multiple USB chargers to one TB unit.

### 3. Specifications

- Compatible with ALL vehicles using a 12V battery
- Solid-state, fuseless design
- Reverse polarity and transient protection
- Standby current at 12V: less than 1 mA
- Operating temp: -40°C to +80°C (-40°F to +176°F)
- Unit size: 59 x 35 x 17 mm (2.3 x 1.4 x 0.7 inches)
- Waterproof (IP68)

### 4. Included items

- TB module with main wiring
- *for TB-U01*: one set of quick connect terminals
- *for TB-U02*: two sets of quick connect terminals
- 1pc 15cm / 5" control wire with bullet connector
- 1pc wire tap connector, gel-filled
- 2pcs HealTech sticker sets

### 5. Operation modes

The ThunderBox can operate in three different modes. Depending of the connection of the **WHITE control wire** the following modes can be acquired:

> **Automatic mode:**

*The White control wire is left disconnected/unused.*

When the engine is started and runs evenly, the TB switches the outputs ON.

When the engine is stopped, after a few seconds the TB switches the outputs OFF.

> **Ignition-controlled mode:**

*The White control wire is connected to an ignition key switched +12V power source, e.g. to the hot wire of the number plate light or running light.*

The TB will switch the outputs ON/OFF (with a few seconds delay) following the ignition key switch position.

> **Stay-off mode:**

*The White control wire is connected to the TB's Black wire terminal block (either directly or via an on/off switch).*

The TB will keep the outputs OFF even if the engine is running.

### 6. Power management

> **Delayed ON**

When the power-up conditions are met, the TB delays power output for about 3 seconds.

*Indicated with a rapidly flashing green light.*

> **Delayed OFF**

When the ignition key is turned off, the TB turns the outputs OFF within 5-30 seconds (depending on motorcycle model, battery condition, etc).

*Indicated with the green light blinking slowly.*

> **Overload management**

The intelligent overload management allows inductive loads such as halogen bulbs to be lit/turned on. The TB allows overloading its circuit(s) for 200 milliseconds.

If the overload (greater than 16A) duration exceeds 200 milliseconds, the TB will turn the power output OFF. The TB attempts to restore power to the output three times. If the overload persists, that circuit will remain switched-off/disabled until the TB has been reset by disconnecting the TB Red wire from the battery then reconnecting after about 5 seconds.

The TB-U02 has two independent output circuits so if one is disabled due to overload, the other will still work normally.

*A constant red light indicates that the output is disabled.*

#### > **Auto standby**

When the ignition key is turned OFF, after one minute the TB will reduce its status LED brightness to 10% and goes into an extra-low consumption standby mode. After 24hrs of inactivity, the TB LED turns off completely to further minimize energy consumption.

The unit activates automatically when the start-up conditions are met.

## 7. Installation

**Disclaimer:** Do not attempt to install the product if you don't have basic mechanical and electronic skills. HealTech Electronics Ltd. and its distributors shall not be liable for any loss or damage caused by improper installation.

1. Make sure the ignition key is turned OFF. Locate the battery of the vehicle: on most motorcycles the battery is under the front seat.
2. For safety, disconnect the negative (-) terminal of the battery. This ensures that an accidental short-circuit (e.g. via a metal tool) between the +12v terminal and the frame will not have any consequence.
3. Remove the bolt of the positive (+) battery terminal. Connect the **TB Red wire** ring terminal. It should go under the fastening bolt. Ensure the connections are clean/uncorroded. Tighten the bolt fully.
4. Connect the **TB Black wire** ring terminal to the battery negative (-) terminal.
5. We recommend leaving the **TB White wire** disconnected. This ensures the TB unit will work automatically (*refer to chapter 5 for operation modes*). Use the Ignition-controlled mode if the automatic mode does not work properly on your bike, or your battery charger sets the TB outputs ON.
6. Connect your accessories (and the optional TB-USB1 charger) to the TB output terminal blocks. Note that the **TB's Positive** (switched and managed) output wire color **is Green**. The **TB's Negative** output wire color **is Black**.  
Connecting the wires of the auxiliary equipment is simple:
  - Strip 4-5mm of the outer insulation from the accessory wires. If your accessory wiring came with a fuse, keep that fuse, do not cut that off.
  - Open the orange flap of the port of the terminal block you wish to use, plug the wire into the port and close the flap.
7. When all the accessories are connected, check for loose cables/wires and poor contacts. Make sure all the cables are routed neatly along solid parts of the vehicle, such as the frame and the bike's main wiring harness. Avoid routing the wires in proximity to moving parts and hot surfaces.
8. When the installation is complete and verified, turn the ignition key ON and start the engine. Let the engine idle and the TB's output should turn ON after a few seconds. Check the status LED.

#### Notes:

- If you do not intend to use the vehicle for more than 3 weeks, put the battery on a charger to maintain its condition.
- When you charge the battery and Automatic mode is used, the TB LED will blink quicker periodically, but normally the output will remain OFF. Otherwise, use the Ignition-controlled mode or Stay-off mode (*refer to chapter 5*).

## 8. LED status codes

<b>RED-GREEN</b> <i>blinks once</i>	Unit is connected to the battery terminals.
<b>Flashing GREEN</b> <i>rapid flashes</i>	The output power-up delay is in progress.
<b>GREEN</b> <i>solid color</i>	Output is active, no fault detected.
<b>Blinking GREEN</b> <i>slower flashes</i>	The output power-down delay is in progress.
<b>Flashing RED</b> <i>rapid flashes</i>	At least one of the outputs is in short circuit. Monitoring continues.
<b>RED</b> <i>solid color</i>	A permanent short circuit was detected, and the outputs are now disabled. Turn the ignition key OFF and correct the short circuit fault. Reset the ThunderBox: disconnect the TB's Red wire terminal from the battery for about 5 seconds, then reconnect.
<b>Periodic GREEN</b> <i>once in 3 seconds</i>	Output is turned off, unit is in stand-by. After one minute the LED is dimmed down and the unit goes to deep sleep. After 24hrs of inactivity, the TB LED turns completely OFF to further minimize energy consumption.

## 9. Warranty

HealTech Electronics Ltd. guarantees this product against defects in material and workmanship for a period of two (2) years. The warranty period starts from the date of the original purchase as shown on the invoice.

