TACHYON V2 User Manual

Revision 2

Thank you for purchasing a Tachyon!

Before you start, please take a moment of your time to read this quick guide about using your Tachyon Weapon Computer.

If you ever need more help than this manual can give you, visit us at **tachyonelectronics.com** or leave a message through **fb.com/TachyonElectronics**

A few important notes

- **Keep the device away from water.** While a few droplets of rain probably won't cause damage, **Tachyon is not water resistant**. If the device gets wet, be sure to disconnect the battery and let it dry before using it again.
- **Do not use Tachyon with real weapons. Tachyon is built only for airsoft weapons and attempting to do this will almost certainly result in damaging the device or the weapon itself.**
- **Use only power sources (batteries) with voltage of 5-15 volts.** Higher voltages will damage the device. Voltages under 5 volts will make the device run unreliably or incorrectly.
- Don't be afraid to open the case to perform maintenance or switch to a different type of battery. It is easier than you think!

Setup

Standard kit contents:

Tachyon V2 Weapon Computer

- Tachyon base board
- 128x128p Color TFT LCD Display
- Laser printed 3-piece enclosure + rail clamp
- 3x M3x35 mm bolts and nuts
- Acrylic screen protector
- External Reload button
- CR1220 timekeeping coin-cell battery

Tachyon V2 Barrel Sensor

- Tachyon barrel sensor board
- Laser printed 2-piece case
- 2x M3x16 bolts and nuts
- 2x M2x16 bolts and nuts

Other accessories:

- Computer-sensor cable
- Battery splitter cable and/or 9v battery clip
- Hex key + Flat head screwdriver

Before handling your weapon, make sure that the magazine is removed and chamber is empty. Mind your own safety and safety of those around you!

A detailed assembly video-guide is available on https://tachyonelectronics.com/

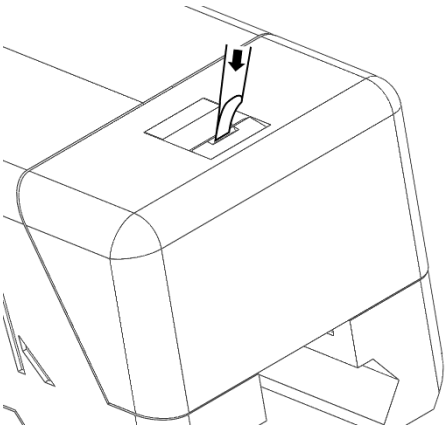
Steps:

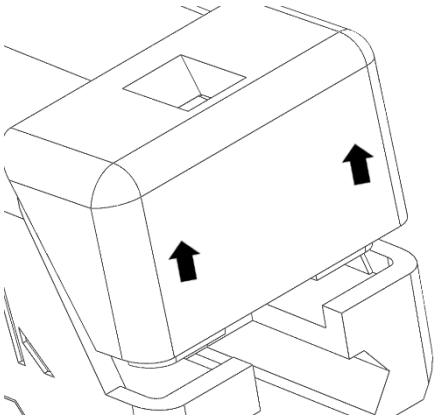
1. Remove any muzzle devices if present. Note that on most weapons, the muzzle thread is inverted (counter-clockwise)!

2. Install the muzzle sensor on the thread/barrel. If the spacing between the sensor and the barrel is too great, use tape or other spacers to ensure a good fit

3. Tighten the clamp screws on the sensor

4. Open front cover and connect sensor cable, power cable and reload button





5. Mount the Tachyon on any accessory rail of your preference

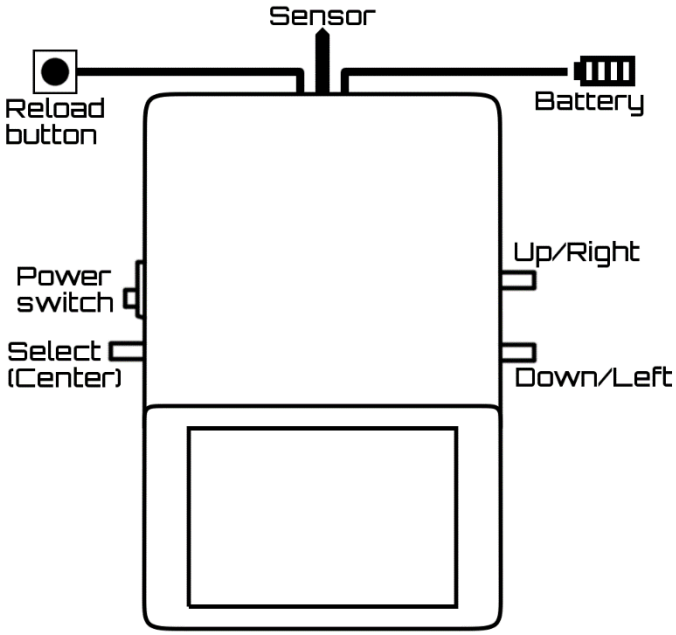
6. Connect the sensor cable (black) to the barrel sensor

7. Optional: Attach the external Reload button to a place of your liking using attached double-sided tape

Using Tachyon

Main screen

After powering on, Tachyon will display the main screen with the current ammo count and ammo bar, time, battery level and selected preset indicator.



To adjust display brightness, press and hold the Up/Down button. (**Note:** to save the current brightness as default for the next time the device powers up, you have to select *Save brightness* in device settings)

Tachyon can remember up to 6 custom ammo presets. **To change the selected preset,** first press and release the Select button, and after arrows appear on the sides if the preset indicator, press Up or Down to cycle between available presets. After a moment of not pressing any buttons, Tachyon will then exit preset selection and apply the selected preset.

To reset the ammo counter after reloading the weapon, press the Select button (this can be turned off in device settings) or the external Reload button.

Settings

To enter settings, press and hold Select, until the Settings screen appears. Use the Up/Down buttons to navigate through the menu and Select to confirm selection.

Customizing ammo presets

Navigate to *Manage presets* in the settings menu.

Now, select a preset and use Up/Down to adjust the value. Press Select to confirm the preset.

- **If a preset is set to "0"** it will be **disabled**. Disabled presets will be always skipped when choosing the active preset at the main screen. (Preset 1 cannot be disabled)
- **If a preset is set to "-1" – shown as "UP",** it will be set to start from 0 and **count up.**

Setting up time

Navigate to *Set time* in settings.

Hold Up/Down to adjust the selected value and Select to advance to the next value or exit.

Due to natural crystal imperfections, the clock might drift slightly without proper **calibration** (See Clock calibration below)

NOTE: Tachyon uses a **CR1220** coin-cell battery to drive the clock circuitry, which needs replacement roughly every 1-2 years.

Setting up battery

Tachyon features a battery level indicator, but before it can function properly, you first need to select which type of battery you are using to power the device. Navigate to *Battery setup* and choose the correct type of battery and thus the correct charge calculation function.

Alternatively, you can select "Raw voltage" to directly display the battery's voltage without any mathematical processing.

NOTE: To calibrate the battery measurement system, select "**Calibrate**" in *Battery setup* when your battery is discharged and your weapon stops shooting. This will save the current battery level as minimum and adjust the readout accordingly.

Rotate display image

To rotate the display image when the Tachyon is mounted on a side accessory rail, navigate to *UI Settings* and select *Rotate UI 90 dgrs* to rotate the image in increments of 90 degrees.

Customizing UI Colors

Tachyon lets you customize the UI's colors to your liking:

- UI Color for all common UI elements and menus
- Background color for all screens
- Ammo color (Full) – used exclusively for the ammo bar and ammo counter
- 2/3 & 1/3 Ammo color – will be used for the ammo bar and ammo counter to alert you when you reach 2/3 or 1/3 of the selected preset capacity.

Navigate to *UI Setup* and choose the color you wish to edit to open the color editor. Use the Up/Down and Select buttons to choose and adjust the RGB color components and finally, confirm the color by selecting *Back*.

Customize ammo bar

To choose the ammo bar style, navigate to *Ammo bar style* in device settings and choose the style of your liking.

You can also choose the ammo bar direction – either left to right or right to left. (*Ammo bar dir.)*

Finally, **you can enable or disable ammo bar flashing** when the ammo count reaches 0. (*Ammo bar flash*)

Factory reset

To reset all settings to factory defaults, navigate to *Factory reset* and press Select **6 times.**

Alternatively, use the following scheme:

Power up the device > Hold Select for 5 seconds > 6x Down > Select > 6x Down > 6x Select

Clock calibration

Tachyon uses a 32.768kHz crystal oscillator to generate the clock's timing frequency, but since no two crystals can be manufactured exactly the same, it is likely that each device will have a small time drift, at worst of about 10 minutes / year.

To account for this, a calibration value can be specified to make the clock run a little faster or slower and thus account for the crystal's error. The calibration value is the amount of clock cycles multiplied by two, that is added or subtracted to the clock's internal timing function every minute.

To find out the correct calibration value for your device:

First, set up the **correct** time and mark down the exact date when you do this. Now you will have to wait for a significant period of time (several days), until you observe, that the device's clock is roughly one minute late or forward of the correct time. (We will assume that the difference is exactly 60 seconds)

Now, based on the date you marked down, find out how many days have passed since the time was correct, and solve the following equation:

$$CAL = 983040 * \left(\frac{D * 1440 \pm M}{D * 1440} - 1\right)$$

Where

CAL is the resulting calibration value,
D is the number of days that passed and
M is the time difference in minutes: **+1** when the device is one minute **late**, and **-1** when the device is 1 minute **forward**

Now you can specify this value in *Set time* in the device's settings.

For more information about this subject, see the Calibration section in the **MCP79401** datasheet.