

Hitmate Completely Wireless Epee User Guide

INTRODUCTION

Features of the Hitmate Completely Wireless Epee (CWE) system:

- CWES-2 comprises two Plugins.
- CWES-3 comprises two Plugins and one Repeater¹.
- The Plugins are small and insert directly into the epee eliminating the need for body wires.
- The Plugins communicate directly with each other to determine and display the hit result.
- Each Plugin contains a red LED, green LED and buzzer, eliminating the need for a scoring box on the floor.
- Results are displayed simultaneously on both Plugins for each fencer to view.
- Repeater unit for referees (**optional** and not required for full operation of the two Plugins), which displays the same result as the two Plugins.
- Simple plug and play with no need for calibration.
- Guard hits are ignored, allowing the fight to continue².
- Meets all FIE timings.
- Robust translucent polycarbonate case can withstand repeated direct hits.
- Plugins last up to 4 hours and Repeaters up to 20 hours continuous fencing on a single charge³.
- Plugins charge in 2 hours and Repeaters in 4 hours using a standard USB-C cable⁴.
- Plugins have a test/coaching mode to help identify epee related problems.
- Plugins have a timeout mode to prevent fencers leaving the venue with the Plugin still inserted into their epee.
- Plugins are shipped as a pair, but can be paired with any other Plugin and Repeater.

Note 1: The Repeater is optional and does not have any role in determining the hit result. Having the Repeater switched off will not effect the operation of the two Plugins.

Note 2: To obtain optimum performance, a metal handle is advised. Although carbon fibre handles can be used, the guard hit error rate may be greater than with a metal handle. Hits to an unpainted part of the mask will be seen as a guard hit and therefore may not register.

Note 3: Battery life is heavily dependent on the number of hits, since a significant amount of power is drawn by the LEDs and buzzer. The more hits there are the shorter the battery life. The Plugin will typically last 800 hits on a single charge.

Note 4: USB-C cable and power supply are not included.

CWES-2 QUICKSTART

1. Briefly press the black power switch on the first Plugin, which is located between the pins. Remove your finger as soon as the Plugin powers up so that it is not touching the pins.

One of the internal LEDs will illuminate and the buzzer will sound for one second. A green LED indicates the Plugin is charged and ready to use. A red LED indicates the battery is running low and the Plugin requires charging. The red LED will first come on when there is 20-40 minutes of charge remaining.

Note: Immediately after the LEDs turn off the Plugin performs a brief calibration cycle. It is vital that the pins and associated screw heads are not touched during this period, therefore it is important to move your finger away from the switch as soon as the Plugin powers up.

2. Wait for the LEDs to turn off and then insert the Plugin into your epee.

One of the internal LEDs will illuminate and the buzzer will sound for one second. This indicates the epee has been detected and has passed some basic checks. The displayed LED indicates the assigned colour for your epee.

Note: The epee tip switch **must not** be pressed or the pins touched when the Plugin is inserted into the epee. The Plugin will switch off if an epee is not detected within 5 seconds.

3. Repeat instructions 1 and 2 for the second Plugin.

4. Check your epee.

Body hit – Press the tip switch either against your foot or spare hand and confirm your assigned colour LED illuminates and the buzzer sounds on both Plugins for 3 seconds.

Guard hit – Press the tip switch against your opponents guard and confirm nothing happens.

Note: Body hits will only be displayed on both Plugins and the Repeater when both Plugins are switched on, plugged in and the epees correctly detected. Hits indicated on each of the Plugins will be duplicated on the Repeater.

5. You are now ready to start fencing.

6. When you have finished, remove the Plugins from your epees.

One of the internal LEDs will illuminate and the buzzer will sound for one second to indicate the Plugin has shutdown.

Note: Removing the Plugin from the epee between fights will significantly increase the battery life.

CWES-3 QUICKSTART

Follow the instructions in the CWES-2 Quickstart section to use the two Plugins. Follow these instructions if you want to use the optional Repeater.

1. Briefly press the green button on the Repeater.

The front panel LEDs will briefly flash to indicate the battery charge status. Green LEDs indicate the Repeater is charged and ready to use. Red LEDs indicate the battery is running low and the Repeater requires charging. The red LED will first come on when there is 30-60 minutes of charge remaining.

2. Briefly press the green button again to increase the LED intensity and buzzer volume.

Repeated pressing of the green button will change from the low to high settings or visa-versa.

3. Hold the repeater in your hand or leave in the storage box and place on the floor.

4. Press the red button on the Repeater.

The Repeater will turn off immediately.

Note: The Repeater will automatically switch off 10 minutes after the last hit.

TEST/COACHING MODE

In test/coaching mode the two Plugins stop communicating with each other and the LEDs/buzzer remain on only for a short period. This allows for rapid repetition of hits.

1. Briefly press the black power switch on the Plugin.

2. Wait for the LEDs to turn off and then briefly press the button again.

3. Insert the Plugin into your epee.

4. Check your epee.

Body hit – Press the tip switch either against your foot or your spare hand and confirm the green LED briefly flashes and the buzzer sounds.

Guard hit – Press the tip switch against your opponents guard and confirm the red LED briefly flashes.

TIMEOUT

To help prevent fencers leaving the venue with the Plugin still inserted into the epee there is a timeout feature. Six minutes after the last hit, both LEDs will flash and the buzzer will briefly sound and will continue to do so until either another hit is recorded or the Plugin is removed. To record another hit press and hold the epee tip switch until the hit is recorded, which may take up to two seconds.

PAIRING

The CWES-2 and CWES-3 are shipped already paired with one Plugin configured as red and the other as green. If you would like to swap the colour assignment, pair either Plugin with a Plugin from another set or pair to a Repeater, then follow these instructions. Steps 3 and 4 must be completed within 3 seconds or the red Plugin will timeout. It is therefore best if one person performs the pairing operation.

1. Switch on the Repeaters (optional) and then both Plugins.

2. Choose which Plugin will be red and press and hold the switch until the red LED illuminates.

3. Briefly press the switch on the green Plugin until the buzzer sounds.

The red LED on the red Plugin will switch off and the green LED will illuminate to indicate the pairing between the Plugins is complete. The red LED on the red Plugin will illuminate again to show that it is ready to pair to an optional Repeater. If no Repeater is required the red Plugin will switch off after 3 seconds.

4. Press the red button on the Repeater (optional) until the buzzer sounds.

BATTERY CHARGING

CWES-2 and CWES-3 are not shipped with USB charger or cables since these are universally available and most people already have them at hand. However, if you have multiple CWE systems and wish to charge them all at the same time for convenience, then two, three and four way splitter cables are readily available online. A two way splitter cable will allow you to charge two Plugins or Repeaters from

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a single USB-C port. A four way splitter cable will allow you to charge four Plugins or Repeaters from a single USB-C port.

Each Plugin requires a maximum charge current of 50mA. Each Repeater requires a maximum charge current of 256mA.

Power Banks are a very convenient way to charge Plugins and Repeaters between sessions. A four USB-C port Power Bank with four, four way splitter cables would allow you to charge a combination of 16 Plugins or Repeaters at the same time.

1. Insert a USB-C cable into the Plugin.

2. Switch on the USB-C power source.

The Plugin will start charging.

3. Briefly press the power switch to view the charge status.

The red or green LED will flash five times to indicate the charge status. A green LED indicates the battery is fully charged and a red LED indicates the battery is charging.

Note: If the Plugin illuminates one of the LEDs and sounds the buzzer it indicates the Plugin has not detected USB power and has switched into normal fencing mode.

TROUBLESHOOTING

Wireless systems use a completely different method of detecting on-target and off-target hits to a traditional wired system. To maximise performance, equipment must be maintained to a higher standard than required for a wired system. We highly recommend checking your epee with the Hitmate Advanced Epee Analyser at the start of each session.

This section covers some of the more common problems and provides a number of solutions. If you find your problem persists or is not on the list, then please get in contact with us and we will try our best to resolve it.

The epee connector comprises three pins. Pin 1 and 2 connect to two wires which run down the length of the blade to the tip switch. Pin 3 attaches the connector to the bracket, which in turn is clamped between the handle and guard.

Problem 1. The Plugin LEDs do not flash and the buzzer does not sound when it is inserted into an epee.

When the Plugin is switched on, it waits 5 seconds for it to be inserted into a epee. In order to detect the epee, the epee must be in good condition. Follow the instructions in the order given below until one solution works.

Solution 1: Remove the Plugin from the epee and wait for it to power down. This may take up to 20 seconds. Follow steps 1 and 2 in the CWES-2 Quickstart section, making sure you move your finger away from the Plugin pins as soon as it starts to power up. Ensure you are not touching the Plugin pins and associated screw heads when it is inserted into the epee.

Solution 2: Check the epee handle is not loose. Any small movement of the handle can cause a poor connection (several 10s of ohms) between the epee handle, guard and Plugin.

Solution 3: Check the epee connector is not loose on the bracket.

Solution 4: Check the two wires at the epee connector for breaks or loose terminal sockets.

Solution 5: Check the Plugin pins are not loose in the epee socket. Insert the Plugin into the epee at an angle so that only one pin is connected at a time. There should be some resistance to ensure good contact between the pin and socket. If the Plugin pin feels loose it can be adjusted using a small flat bladed screwdriver. Each Plugin pin has four spring fingers running the length of the pin. Using a small flat bladed screwdriver, gently open the spring by a fraction of a millimetre. Repeat for the other three fingers.

Problem 2. The Plugin red or green LEDs illuminate and the buzzer sounds when I hit my opponents guard.

There are a number of epee related issues that may cause this. If it occurs just on the first guard hit after first switching on the Plugin and inserting it into the epee, then carry on. If guard hits continue to register then follow the instructions in the order given below until one solution works.

Solution 1: Remove the Plugin from the epee and wait for it to power down. This may take up to 20 seconds. Follow steps 1 and 2 in the CWES-2 Quickstart section, making sure you move your finger away from the Plugin pins and associated screw heads as soon as it starts to power up. Ensure you are not touching the Plugin pins when it is inserted into the epee.

Solution 2: Check the handle is not loose on both epees. Any small movement of the handle can cause a poor connection (several 10s of ohms) between the epee handle, guard and Plugin.

Solution 3: Check the epee connector is not loose on both epees.

Solution 4: Check the two wires at the epee connector for breaks or loose terminal sockets for both epees.

Solution 5: Using the Hitmate Advanced Epee Analyser or DMM, measure the resistance from the epee tip to pin 1 at the epee socket when the tip is fully pressed. Repeat for pin 2. Both readings should be below 2Ω. If the reading is above 2Ω, remove the tip and then measure the resistance between the tip and the end of the contact spring. If the reading is still above 2Ω replace the contact spring. If the reading is below 2Ω the problems lies with the wiring in the epee. Remove the two wires from the socket, clean them and reconnect. If the problem persists, it could be due to a poor connection between the wires and the contact pads inside the barrel.

Solution 6: Refer to the Test/Coaching section to put the Plugin into the test/coaching mode. Slowly depress the tip until a hit registers. When this happens, there should ideally be a further 0.1mm to 0.4mm of travel before the tip is fully depressed. If a hit only registers when the tip is fully depressed, then you will need to adjust the contact spring. We always recommend replacing contact springs rather than stretching them, since this is a very short term fix.

Problem 3. Hits to my opponents mask do not register.

This may occur if you hit an electrically conductive part of the mask. This occurs when the paint covering the wire mesh gets chipped off to expose bare metal. There are currently no solutions to this problem. Future software updates may eliminate this problem.

Problem 4. Hits to my opponents body do not register.

Follow the instructions in the order given until one solution works.

Solution 1: Remove the Plugin from the epee and wait for it to power down. Follow steps 1 and 2 in the CWES-2 Quickstart section, making sure the Plugin pins are not touched when you press the switch and that you wait for the LEDs to turn off before inserting the Plugin into the epee.

Solution 2: Refer to the Test/Coaching section to put the Plugin into the test/coaching mode. Slowly depress the tip until a hit registers. When this happens, there should ideally be a further 0.1mm to 0.4mm of travel before the tip is fully depressed. If a hit only registers when the tip is fully depressed, then you will need to adjust the contact spring. We always recommend replacing contact springs rather than stretching them, since this is a very short term fix.

Solution 3: Refer to the Test/Coaching section to put the Plugin into the test/coaching mode. Make multiple hits on your opponents body. The green LED should flash for all these hits. If the red LED flashes, it indicates high levels of sweat, which the Plugin has misinterpreted as a guard hit. Make sure all clothing is regularly washed to remove any build up of salts and use a towel rather than your sleeve to wipe off any sweat when fencing.

CWE has been designed to operate with high levels of sweat, however when the sweat levels are extremely high it is difficult to differentiate between body and guard hits.

Problem 5. The two Plugins do not communicate with each other.

Solution 1: Follow steps 1 and 2 in the CWES-2 Quickstart section

Solution 2: Follow steps 1 to 4 in the Pairing section to pair the two Plugins and any optional Repeaters.