Hitmate Advanced Epee Analyser User Guide

INTRODUCTION

Wireless scoring systems including Hitmate Totally Wireless Epee, require a well maintained epee to achieve maximum performance.

Hitmate has developed this Advanced Epee Analyser (Analyser) to help identify the majority of epee faults that can effect the performance of wired and wireless scoring systems.

The epee connector next to the handle has three pins:

Pin 1 connects to a fine wire, which runs down the length of the blade to the barrel and is glued in place. Inside the barrel, the wire connects to a small contact pad.

Pin 2 connects to a fine wire, which runs down the length of the blade to the barrel and is glued in place. Inside the barrel, the wire connects to a small contact pad.

Pin 3 connects directly to the sword metalwork, including handle, guard, blade and barrel.

A small spring (contact) in the base of the tip, connects the two contact pads together when fully pressed, therefore connecting pin 1 to pin 2.

The Analyser checks the health of the epee by automatically measuring the resistance between the three pins looking for valid and invalid values, when the tip is pressed or not. In particular the following resistances are measured:

- Pin 1 to pin 3
- Pin 2 to pin 3.
- Pin 1 to pin 2.
- Tip to pin 1.
- Tip to pin 2.
- Pin 3 to the guard/blade.

The Analyser operates for approximately 100 hours from two AAA batteries and automatically switches off after 10 minutes.

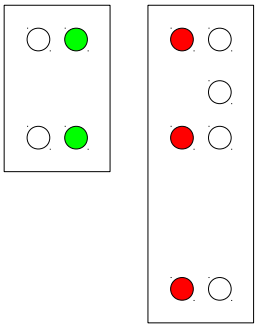
TEST

1. Briefly press the button on the top of the Analyser.

2. Plug an epee body wire into the Analyser.

3. Plug the supplied test lead into the Analyser.

If the LEDs match the following diagram continue with the next instruction.



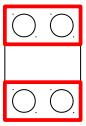
The LEDs are separated into two groups for easy identification in the following instructions.

Press and hold the power button to see all the LEDs dimly illuminated.

If the LEDs don't match the diagram above, it indicates a fault. Remove the body wire from the Analyser. If the LEDs now match the diagram the fault must be with the body wire. If the fault remains it may be due to low battery voltage. Follow the instructions in the Battery Replacement section.

If the fault persists, please contact Hitmate for advice.

4. Plug the epee into the body wire.



These two LEDs indicate the resistance from pin 1 to pin 3

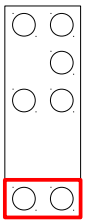
These two LEDs indicate the resistance from pin 2 to pin 3.

Above 1MΩ, which is good. Proceed to the next instruction.

Between 1KΩ and 1MΩ, which is bad. This is likely due to a breakdown of the insulation around the two wires running the length of the blade and may require a complete rewire of the epee.

Below 1KΩ, which is bad. Check for a bare wire touching the guard at the epee connector or a trapped wire between the guard and handle.

5. Touch the end of the test lead on the guard.



These two LEDs indicate the resistance from pin 3 to the guard/blade.

Below 2Ω, which is good. Proceed to the next instruction.

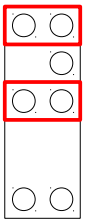
Between 2Ω and 100Ω, which is bad. Tighten the handle and pin 3 of the epee connector.

Above 100Ω, which is bad. Tighten the handle, pin 3 of the epee connector and check the body wire for loose or broken wires.

6. Repeat step 5, but touching the test lead on the blade.

P.T.O

7. Touch the test lead to the epee tip and press the tip switch using the lead.



These two LEDs indicate the resistance from the tip to pin 1.

These two LEDs indicate the resistance from the tip to pin 2.

○ ● Below 2Ω, which is good. Proceed to the next instruction.

● ● Between 2Ω and 100Ω, which is bad.

Perform the following checks in the order given until the problem is resolved:

1) The contact spring and/or contact pads may be dirty. Remove the tip and clean the contact spring and contact pads.

2) The contact spring may be too short and only just making contact with the contact pads in the barrel when the tip is fully pressed. Remove the contact spring and replace with a new one and set the correct distance.

3) There may be poor contact between the wire and the pin in the epee connector. Remove the wire from the pin, clean the wire, insert and tighten.

4) There may be poor contact between the contact spring and the metal end of the tip. Replace the contact spring.

5) There may be poor contact between the wire and the contact pad inside the barrel. A full rewire of the epee may be required.

● ○ above 100Ω, which is bad.

Perform the following checks in the order given until the problem is resolved:

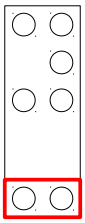
1) The complete list of 1 to 5 above.

2) The metal end of the tip may be missing. Replace the tip.

3) There may be a break in the wire running down the blade. A full rewire of the epee will be required.

Note: For optimum performance there must be some further travel in the tip after both green LEDs are on. This ensures there is sufficient pressure between the contact spring and contact pads to form a low resistance path. Ideally a further 0.2mm to 0.4mm travel is required.

8. Touch the test lead to the epee tip and press the tip switch using the lead.



These two LEDs indicate the resistance from the tip to pin 3.

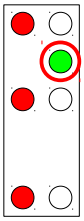
● ○ Above 100Ω, which is good. Proceed to the next instruction.

● ● Between 2Ω and 100Ω, which is bad.

○ ● Below 2Ω, which is bad.

The problem is due to a short circuit between the contact spring and the inside of the barrel when the tip is pressed. Remove the tip and inspect the contact spring for breaks, contamination or de-lamination of the wire.

9. Press the tip switch with your finger



This green LED indicates an a resistance less than 500Ω between pin 1 and pin 2 when the tip is pressed, which is good. If all previous tests have passed, this one should also. The epee is fully working and ready for use with wireless scoring systems.

Note: If you press the tip with your finger whilst touching the metalwork, some of the other LEDs may change status. These do not indicate a problem and should be ignored.

BATTERY REPLACEMENT

Remove the four screws from the front of the box. The battery holder is easily accessible. Ensure the replacement batteries are correctly orientated.