

CAT^{FIRE}



CFCT-FOB

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DIGITAL

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CATFire – CFCT-FOB

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS, FEATURES, FIRMWARE AND ITS FEATURES, SOFTWARE AND ITS FEATURES, DOCUMENTATION AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Errors and Omissions Excepted (E&OE).

Revision history

Revision	Changes
1	First; Support hardware version 1;
2	Business address change

About your unit – intended usage



Keep children, pets and animals away from this unit.



Only competent adults should operate this unit.



Do not operate this equipment if you are unwell or under the influence of drugs or alcohol.

This continuity tester is intended to be used to test the resistance of electrical circuits that contain pyrotechnic igniters, checking the resistance of the circuit does not exceed the ohms limit (the 'pass' ohms) configured.

Throughout this manual when we mention pyrotechnics we are also referring to fireworks.

Familiarising yourself with the CFCT-FOB



Types of igniters

It is intended to work with circuits containing one or more of the following types of igniter:

- Electrical matches (also known as e-matches, i-matches or pyrotechnic igniters) that typically require a 1 ampere firing current and have a characteristic resistance typically of 2 ohms. Such igniters are well used in this industry and are familiar to trained operatives.
- “Solar Flare Igniters” (SFI) [™] which are a safer non-pyrotechnic article used to ignite quick match or similar fuse.
- Talon[™] igniters which are used by hobbyists.

For correct continuity testing, the igniters should be connected in series, electrically, in the circuit to be tested. The exception here is Talon[™] igniters which should be tested individually before connecting into a parallel arrangement on the firing system.

Connecting the circuit to be tested

The electrical circuit will have two wires, connect each bare end to a testing terminals on the unit as shown.

Circuit / igniter connection



STEP 1: Expose the ends of the circuit wires by removing any protective insulation.

STEP 2: Separate the ends so that the copper conductors are not touching each other.

STEP 3: Touch each wire to the brass terminals of the CFCT-FOB, observe the indicator light which will be GREEN if continuity of okay or RED if fail.

Expected run time

Around 2000 test operations (1 second tests) are possible before the battery requires replacement.

Many factors affect run time, including quality of battery, age, temperature and how long you test circuits for.

Safety considerations



This unit uses low DC voltages around 3 volts.

Ensure the circuit to be tested has no other equipment connected to it.

When testing the circuit ensure you and others are well away from the pyrotechnic material.

Untrained operators / Hobbyists

Many fireworks suppliers offer training days to help familiarise yourself with fireworks and how to enjoy them safely and we highly recommend you attend one of these informative and fun days out.

Always set up your fireworks properly in accordance with the manufacturer instructions and best industry standard practice, testing of the circuit is the last thing to be done, then walk away.

Be aware that some fireworks are angled / fanned, so working at the side of fireworks may not be the safest location, the safest location is usually in front of the fireworks.

Use long leaded igniter wires allows you to make electrical connections, and test, at a distance.

Always be aware of “where your head and hands are” at all times.

Keep other personnel away but aware of what you are doing when testing.

How this unit works

This unit uses electronics and software to supply a small electrical current which passes from the brass terminals, through the circuit and igniters that are attached to that circuit.

The signal from the circuit is observed and a GREEN LED indicator is illuminated if the resistance is at or below the configured “Pass” ohms.

If the resistance of the circuit (with its igniters) is above the configured “Pass” ohms the RED LED indicator will illuminate.

This unit is a weatherproof design (IP54), is intended to be used from -5 to 45 degrees Celsius with 90% relative humidity non-condensing.

It is not impervious to damage from things like explosion, fire or misuse, and as with any electronic device, could malfunction.

These statements are not intended to frighten you but to hammer home that safe working practices are essential when working with electronic devices and explosive material.



Never use a unit that looks damaged or is behaving in a way you are not expecting it to. Turn it off and walk away from the danger immediately.



The unit must not be used in an area where static electricity is expected or present.



The unit must not be used when an electrical storm is expected or present.



The operator must wear suitable protective clothing that is also safe work wear around explosive material and electrical devices.



Keep radios, mobile telephones and external power sources away from the unit and pyrotechnics.



Disconnect and turn off any external power you may be supplying to the circuit you wish to test, for example, disconnect the circuit from a firing system.

Cleaning your unit

The unit is IP54 rated.

Clean the unit with a soft damp cloth that has been rinsed in a weak soapy washing up solution.



Air or cloth dry the unit.

Features of your unit

1. IP54.
2. Small and lightweight.
3. Included CR2032 battery, user-replaceable. Good for around 2000 x 1 second tests per battery.
4. Test current less than 25mA.
5. Out of the box, test resistance is configured for 18 ohms.
 - a. Configurable Pass ohms from 3 to 120 ohms in 3 ohm steps.
6. Bright green and red LED indicators visible in daylight.
7. Beeper for audible indication.
8. Auto power-on when applying the circuit to the terminals.
9. Large connection pads for easy connect of the circuit.
 - a. Brass for non-sparking and non-corrosion.
10. Push button to check and/or configure the pass ohms.
11. Auto power off – long battery life.
12. Low battery indication.
13. Included lanyard.
14. Key ring port for easy connection to bag, belt, lanyard etc.



Resistance test choice

The circuit and its igniters have an electrical resistance, measured in units of ohms.

The voltage supplied by a firing system and the resistance of the circuit determine the firing current available.

FIRING CURRENT

=

FIRING SYSTEM VOLTAGE / CIRCUIT RESISTANCE

Typically, professional igniters require at least 1000mA (1 amp) to fire.

Out of the box, the CFCT-FOB tests that the circuit has no more than 18 ohms of resistance, the “Pass” resistance.

The choice of 18 ohms is ideal for most firing systems that operate from 18 volts and above.

If your firing system has a different operating voltage you may need to change the “Pass” ohms especially if the firing voltage is lower than 18 volts, this is easy to do and is explained later.

Using the unit - testing



Ensure all personnel including yourself are at a safe distance and are aware that testing is to take place.



Disconnect the circuit from any other equipment, e.g. firing system.

Expose bare ends of the electrical circuit. Separate the ends slightly so the metal ends are not touching each other.

Holding the CFCT-FOB apply the ends of the wires to the brass contacts of the tester.

If the green lamp illuminates (with a positive beep) the circuit has no more than the pass resistance and is good.

If the red lamp illuminates (with a negative beep) the circuit has a resistance higher than the pass resistance and needs to be remedied.

Remove the circuit wires from the test pads, the unit will auto-power off.

Auto-on

The unit will power on automatically when a circuit is attached.

However if the circuit is broken the unit may not wake up.

Pressing the button once will force the unit on for ten seconds and it will begin to measure the circuit resistance, confirming a broken circuit with a red lamp when the wires are connected to the terminals of the tester.

Waking the unit in this way also confirms the unit is operating and it is not down to a flat battery in the tester.

Beeper

When a good or bad continuity is detected the unit will make a series of beeps.

A single high pitched beep on a positive continuity.

A double low pitched beep on negative continuity.

The unit will only report a beep on a *change* of continuity (bad > good or good > bad).

Silencing the beep

You can toggle on/off the beep tone by pressing the button four times. This may be useful where battery life is to be conserved to allow more testing cycles.

Changing the Pass resistance

The unit can be configured to indicate a 'pass' from 3 to 120 ohms in 3 ohm steps.

Out of the box the unit is configured for 18 ohms.

This default is perfect for most scenarios where your firing system operates from 18 volts and above and usually never needs to be changed.

If your firing system has a lower firing voltage you will need to set the pass ohms to a value that is suitable for your system.

However a higher system voltage than 18 volts will tolerate a higher circuit resistance and still deliver 1 ampere of current so you may wish to increase the pass ohms from 18 to one that best suits you or the circuit you are testing.

As a rule of thumb the pass ohms should be equal to or less than the firing system voltage, e.g. for 18 volts configure for 18 ohms. This ensures that at least 1 ampere of current will flow.

NOTE: Some igniters require higher or lower than 1 ampere of current to fire. Check the specifications of the igniters you are using and adjust the pass ohms accordingly.

The tables below show various firing system voltages and their typical setting to achieve at least 1 Amperes.

Firing system nominal voltage	Maximum Pass resistance	Firing current	Configuration button presses
6	6 ohms	1 Ampere	2
12	12 ohms	1 Ampere	4
14.4	12 ohms	1.2 Ampere	4
18	18 ohms	1 Ampere	6
24	24 ohms	1 Ampere	8
36	36 ohms	1 Ampere	12
48	48 ohms	1 Ampere	16

Wake up the unit

If the unit is not automatically powering on, the circuit may be completely broken (open circuit), press the button once to wake the unit up for ten seconds and perform a test of the circuit.

Report the pass ohms configuration

1. With no igniter attached to the terminals.
2. Press the button twice.
3. The GREEN lamp will flash (and beep) to count out the configuration.
4. Multiply this by 3 to get the configured resistance, by default this is 6 counts ($6 \times 3 = 18$ ohms).

Set the pass ohms configuration

1. Choose your pass resistance which must be a multiple of 3 ohms.
2. Divide this pass resistance by 3 to get the required number of button presses.

3. With no igniter attached to the terminals.
4. Press the button 3 times.
5. The GREEN lamp will then flash (and beep) to count out the current configuration.
 - a. NOTE: You do not have to wait for it to finish doing this before continuing with step 6.
6. Now press the button the required number of times to configure the pass resistance, each press will flash the red lamp.
7. Once you are done, and after a brief delay, the unit will play back your configuration by flashing the GREEN lamp (and beep) the same number of times.
8. This confirms the change has been made.

Battery replacement

When the red and green lamp flash alternately the battery is low and it's time to replace it.

You will need a CR2032 coin cell battery, we recommend Energizer™ batteries for their long life and reliability.

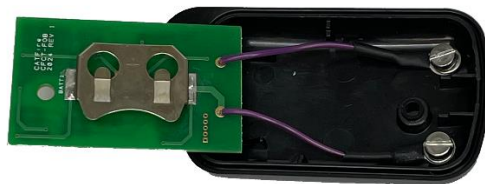
Step 1: Unscrew the two retaining screw on the case, use a PH1 screwdriver.



Step 2: Open the case by separating the two halves, you should remove any lanyard attachment before doing this.



Step 3: Lift the circuit board gently from the case as wires are connected from it to the brass terminals, the battery is on the underside.



Step 4: Slide out the CR2032 battery, use a wooden or plastic tool for this to avoid short circuiting the battery.



Step 5: Reset the circuitry by pressing the button on the circuit board, this removes any residual energy in the circuit.

Step 6: Insert a new CR2032 battery, ensure that the + (positive) side is facing you. A wake up beep sequence should be heard.

Step 7: Reinstall the circuit board into the enclosure, ensuring the wiring is not fouled.

Step 8: Apply the top of the enclosure, bring the two halves together, ensure the hole in the PCB is aligned with the mounting screw position.

Step 9: Reinstall the enclosure screws.

NOTE: You do not need to reset the pass resistance after changing the battery, its prior setting will be remembered.

Recycling

Sadly, this product will not last forever, wear and tear will eventually bring about its end of life.

This product contains precious earth metals and other recyclable material.

You should dispose of the product in accordance with your local authority rules on recycling electronic devices – please do not dispose of this product in general waste.

Alternatively, you may return your end-of-life equipment to Trinity Digital for correct recycling. Please contact support@trinitydigital.co.uk or call +44(0)1782 977500 to do so before returning equipment so that we may track its recycling properly.





Guarantee

The Guarantee is provided by Trinity Digital, the owner of the CATFire® brand.

Terms and conditions

These terms and conditions do not affect your statutory rights.

You must register your product within 14 days of purchase to receive this guarantee, please contact support@trinitydigital.co.uk or call +44(0)1782 977500 to do so.

Have your product model and serial number to hand including the date and place of purchase. If the product is a gift, register the intended owner details.

This product carries a 12-month parts and labour guarantee against defects in workmanship.

These terms and conditions are only applicable within the United Kingdom and is subject to provision(s) that your product:

1. Has been used solely in accordance with the instruction manual.
2. Has not been subject to misuse or accident; modified or repaired by anyone other than our own service engineers.
3. The product is in the United Kingdom.



4. The product has been registered and the person claiming is the registered owner.

If you wish to make a claim contact

support@trinitydigital.co.uk or call +44(0)1782 977500.

Please provide the model number, the serial number, and a description of the fault. When emailing you can also provide images or video footage of the issue you are experiencing.

Trinity Digital will, at its discretion, repair or replace the unit.

Please do not send anything to Trinity Digital without first contacting us, nothing can be accepted without prior authorisation, this is so we can track the product and its problems properly.

Declaration of conformity

- UKCA: Electrical Equipment (Safety) Regulations 2016
- 2014/30/EU Electromagnetic Compatibility
- 2011/65/EU RoHS
- 2012/19/EU WEEE

Trinity Digital hereby certifies that the product

CATFire CFCT-FOB

Conforms to the essential requirements of the above listed regulations and directives on this day Friday 27th September 2024.



Mr. Gareth Williams.

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