

CAT FIRE



CFTU-0124

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CATFire – CFTU-0124 Trigger Unit

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	Minor corrections to spelling and grammar. Section: “CFTFU-X16 disarming trigger”, CFTFU-X16 contains “a safety lamp and bleeper”.
3	Missing “Run time” section header restored. “Features of your unit” section now specifies the capacitor discharge system Joules and continuous output current capability @ 24V added.

Familiarising yourself with the CFTU-0124

Front of unit



Rear of unit



Battery cover
shown removed

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 unit has several intended uses.

Primarily it is used to trigger the CTFU-X16 firing unit (and others) into firing its pre-programmed sequence(s) of firing actions where a remote firing computer and wireless remote control is not needed.

Secondly it is used as a single cue manually operated firing unit. Firing many igniters in one hit over hundreds of metres of wire.

It can also be used to disarm a single radio controlled CTFU-X16 firing unit.

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

How this unit works

The 9 volts from the battery is boosted to provide 24 volts for trigger/firing function via a large capacitive discharge circuit.

Pressing the FIRE button connects this store of energy directly to the terminals thereby triggering/firing the igniters attached to them.

When turned off, the capacitive discharge circuit is discharged rapidly, typically in around 1 second.

When turned off, the firing button is immediately and physically disconnected from the energy rendering it inoperable.

The unit contains electronics that test the wiring that connects the CFTU-0124 to the firing unit (or igniters) and provide a visual indication of the state of the circuit.

This unit is not weatherproof and so must be protected from the elements.

It is intended to be used from -20 to 60 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 product, could malfunction.



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.



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

Cleaning your unit

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

Do not get the unit wet.

Features of your unit

1. Hand held unit with removable soft bumper cover
2. 9 volt PP3 battery powered
3. On off rocker switch
4. Large and brightly coloured trigger / firing press button
5. Battery test function
6. Cue test circuit with resistance check
7. 24 volt trigger / firing function via large capacitive discharge circuit
 - a. 2.7 Joules of energy.
 - b. 100mA continuous output @ 24VDC.
8. Can operate relays and solenoids / release mechanisms.
9. Rugged connection terminals
10. Indication lamps for power, battery, test and capacitive discharge readiness

Powering on the unit



Ensure all personnel are away from the pyrotechnics/devices this unit is attached to. As soon as the unit is powered on, test current will be applied to the connected wires and the firing circuit will charge.



As soon as the unit is powered on the capacitive discharge circuit charges, pressing the FIRE button will fire!

KEEP YOUR FINGERS AWAY FROM THE FIRE BUTTON!

Place the rocker switch into the ON position.

The unit immediately begins to charge the capacitor bank and test the electrical circuit.

Once charged, if the battery is good, the ON lamp will illuminate. If the ON lamp does not illuminate the unit may still charge as expected but the battery is in a very weak condition and should be replaced as soon as possible.

Test current will also flow, if the connected resistance is acceptable the green TEST lamp will illuminate.

The capacitive discharge circuit will charge to full energy. The READY lamp indicates when the energy is at its highest level. If it does not, even after a few seconds, change the battery immediately.

Connecting to igniters or CTFU-X16 (or similar sequencer device)



TURN OFF THE UNIT WHEN CONNECTING OR DISCONNECTING WIRES

At the top of the unit are two spring loaded binding posts.

Two wires connect these terminals to the trigger terminals of the firing unit or to the wires of an igniter thereby forming an electrical circuit.

The cable, depending on its resistance, could be hundreds of metres in length.

Here are some typical examples, pay close attention to the footnotes.

Cable type***	CTFU-X16 Trigger**	1 x Igniter*	5 x igniter in series*
Shoot wire 26 AWG 0.212 ohm/m	40 metres	60 metres	25 metres
'Heavy duty' Shoot wire 24 AWG 0.168 ohm/m	50 metres	80 metres	30 metres
0.5mm ² flex 22 AWG 0.069 ohm/m	130 metres	190 metres	70 metres
0.75mm ² flex 20 AWG 0.046 ohm/m	190 metres	290 metres	110 metres
1mm ² flex 18 AWG 0.0344 ohm/m	260 metres	390 metres	150 metres
1.5mm ² flex 16 AWG 0.0266 ohm/m	330 metres	500 metres	200 metres
2.5mm ² flex 14 AWG 0.0160 ohm/m	560 metres	840 metres	340 metres

* Igniter here refers to a typical professional E-Match pyrotechnic igniter with 2 ohm nominal resistance (per igniter) requiring 1 Ampere of firing current for 50ms.

** More than 0.5 Ampere for more than 50ms. Debounce function must be set no higher than 50ms.

*** Round trip resistance



Do not use a multi-meter for testing circuit resistance, they can apply far too much electrical current and cause the pyrotechnics to ignite.

If the green TEST lamp is ON the circuit is good. Alternatively use a blasting galvanometer to check resistances.

Testing the electrical connection



Ensure all personnel are away from the pyrotechnics or devices this unit is attached to. As soon as the unit is powered on test current will be applied to the connected wires and the firing circuit will charge.



KEEP YOUR FINGERS AWAY FROM THE FIRE BUTTON!

Make sure all personnel are clear of the firing site and are aware of what is happening.

As soon as the unit is powered on test current will flow.

The resistance of the electrical circuit is measured. If acceptable the green TEST lamp will illuminate. If the resistance is too high the TEST lamp will NOT illuminate.

Test current will continue to flow for as long as the unit is on, this will run down the battery.



For safety, TURN OFF the unit as soon as you confirm a good electrical link.



For additional safety, disconnect the igniter wires from the unit and shunt them (connect them together so as to short them out).

Run time

Using fresh best quality Energizer® 9 volt PP3 Alkaline batteries we expect the unit to operate, and passing test current, for around 4 hours.



It is not recommended you operate the unit continually in this manner, it is always safer to keep the unit turned OFF unless you need to test or fire, remember when turned on pressing the FIRE button at any time will fire.

Triggering or firing



Make sure all personnel are clear of the firing site and are aware of what is happening.

IMPORTANT: When triggering a CFTFU-X16 firing unit, ensure its step sequence is programmed as desired, the firing unit is on and is “Locally ARMED” and so ready to accept triggers.

IMPORTANT: Do not short circuit the cue terminals of the unit, the capacitive discharge system can deliver a very high pulse of current – a short circuit of this nature will damage the unit and is not covered under our guarantee.

Turn ON the CFTU-0124 unit.

The TEST lamp should illuminate.

The READY lamp should illuminate once the capacitive discharge firing circuit has charged.

The ON lamp should illuminate to indicate the battery is good, if it does not the unit may still fire provided the READY lamp is illuminated but the battery is weak. If you have time turn off the unit and change the battery.

To FIRE, firmly and decisively press the FIRE button until you get visual confirmation that the desired firing or triggering action has been accomplished then release the button.

IMPORTANT: The READY and ON lamps may extinguish during firing as the capacitive circuit discharges its energy. Once the FIRE button is released the circuit will recharge and the READY lamp will illuminate once more.

If the ON lamp does not turn on again the battery has become weak.

NOTE: The TEST lamp may extinguish once the igniters have fired, however some igniters burn in an electrically shorted-out way: meaning they will appear to still test good even though they have fired correctly.

Voltage Safety

The unit generates 24 volts from the 9-volt battery, with the electrical energy stored in a large capacitive energy bank storing 2.7 Joules.

This is a very safe low voltage, but we do not recommend operating the unit with wet hands.

Also keep your fingers away from the cue terminals when firing.

The capacitive discharge circuit can deliver a very high pulse of current (amps) – do not short circuit the cue terminals of the unit as damage will result, this is not covered under our guarantee.

The circuit can output a continuous 100mA of current at 24VDC if needed so as to activate relays or solenoids as may be necessary.

CFTFU-X16 triggering

The CFTU-0124 may be used to trigger the CFTFU-X16 firing unit (and others like it) into performing its pre-programmed sequence of actions on each press of the fire button. This is useful where radio control of the CFTFU-X16 is not wanted.

Ensure you have pre-programmed your intended sequence and rehearsed several times prior to your display, perhaps using simple indicator lamps as substitutes for igniters.

Further, ensure the CFTFU-X16 trigger debounce is set correctly, the default of 50 milliseconds is fine but check this has not been changed. Rehearsing several times with the intended wire length will confirm this.

IMPORTANT: A debounce time that is set too long may cause triggers to be missed. A debounce time far too short may cause several trigger signals to occur even though you have pressed the FIRE button once.

Also ensure the firing pulse time the CFTFU-X16 will generate is suitable for the igniters attached to it.

Once the FIRE button has been released the TEST lamp should illuminate once more, wait until it illuminates before further trigger operations.

The CFTFU-X16 trigger contains thermal protection, holding FIRE button down for an extended period can cause this circuit to overheat: the TEST lamp to take longer to illuminate afterwards.

CFTFU-X16 disarming trigger

When the CFTFU-X16 is being controlled via radio from a firing computer its trigger input becomes a disarming function instead.

The CFTU-0124 can be used to disarm a **SINGLE** CFTFU-X16 in this way using the trigger input.

This can be useful in scenarios where a 'nearby' observer needs to stop the CFTFU-X16 from firing, the observer can be positioned at a 'safe' distance with the CFTU-0124 wired to it and disarm if needed.

In this scenario we recommend that you use a heavier gauge flame proof wire to connect the CFTU-0124 to the CFTFU-X16.

Protect the wire, be aware that animals (for example rabbits) have been known to enjoy biting through wiring – this would render disarming using this technique impossible.

It is vital you test repeatedly (i.e. remotely arm and then trigger a disarm) to ensure that the setup works as intended.

Consider this function as another tool in your toolbox to deal with unfavourable conditions that require firing to stop.

Also remember that when firing a CFTFU-X16 remotely using radio it is possible for the computer operator to check that the unit has disarmed before approaching the site. Remember the CFTFU-X16 also contains the safety lamp and bleeper: Observe these indicators when approaching the site unless the unit is in discreet mode then additional caution is needed.

Always use a fresh battery in the CFTU-0124 in this scenario.

End of life

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 CFTU-0124

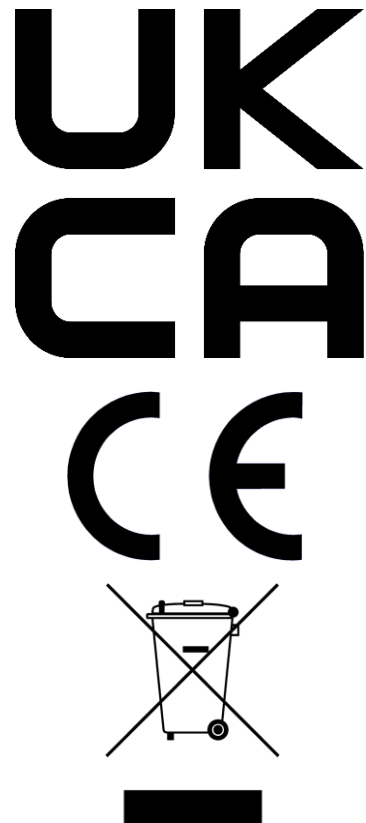
Conforms to the essential requirements of the above listed regulations and directives on this day Monday 5th April 2021.



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