



Wiring Pyrotechnics

There are 3 ways in which you can wire pyrotechnics. This document is designed to outline the differences, benefits and disadvantages of all three methods.

The easiest wiring method is direct connection. This is simply where the twin-cable is placed from one effect to one Channel twin output on the Controller/Firing Module. This gives the user the most flexibility, as the shooter has unlimited options for selecting and de-selecting specific effects from the firing cues, and programming for accurate timing sequences. Additionally, it allows accurate Ohms resistance testing and continuity. The only potential disadvantage is that this method may require long cable runs, if controllers are limited with the number of Channel outputs they have available. However, modern wireless (radio-controlled) Field Units have multiple outputs, which negates the long runs as they can be in close proximity to the group of Pyrotechnics Effects mounted on a Pyro Board.

The following two methods are for when firing multiple effects from one channel.

Parallel Wiring

Wiring pyrotechnics, in parallel, is easy to rig and understand. Each pyro Channel Output requires 2 connections, similar to home loudspeaker terminals. The first Pyro effect cables go into the Output from the Controller/Firing Module, and then each one 'layered' on to the same Channel and so on. This configuration is not as capable of firing as high a number of igniters as in series (depending on the type and Capacitive power output of controller) because a high number of paralleled igniters will require significantly more current to fire. Another drawback is the testing procedure. When the controller performs diagnostic tests for a pyrotechnic circuit, it runs a continuity check. With parallel circuits, only one Pyrotechnic effect in the 'layered' group is necessary to be correctly wired, and functioning properly, for a pass to be given. All others could potentially be disconnected. You could have 5 effects, of which 4 of them have been incorrectly wired and 1 of them is fine, when you test the circuit you see the test LED light to give you a pass. Press the fire button, only the 1 effect correctly wired will fire.

Series Wiring

Series wiring is slightly more complicated but the preferred method. When you make a series circuit, one continuous loop of pyrotechnics is created, all 'holding hands'. The disadvantage is that your circuit is vulnerable if you have a break, or a cross-ignition whereby one of the effects is accidentally fired, then the loop will have been broken and none of the effects will fire. This rarely happens, especially as one would take prohibitive steps to protect pyrotechnics from cross-firing. The main advantage with series wiring is the resistance test is passing through all of the effects in the circuit, so you see a genuine pass test LED, and can measure the Ohms resistance. With a malfunctioning, or incorrectly wired, effect, the break in circuitry is immediately visible to the operator who can then investigate the problem. You can also use a multimeter on the circuit to check you have continuity and the correct resistance.

IMPORTANT – IT IS ADVISED TO NOT MIX SERIES AND PARALLEL WIRING.