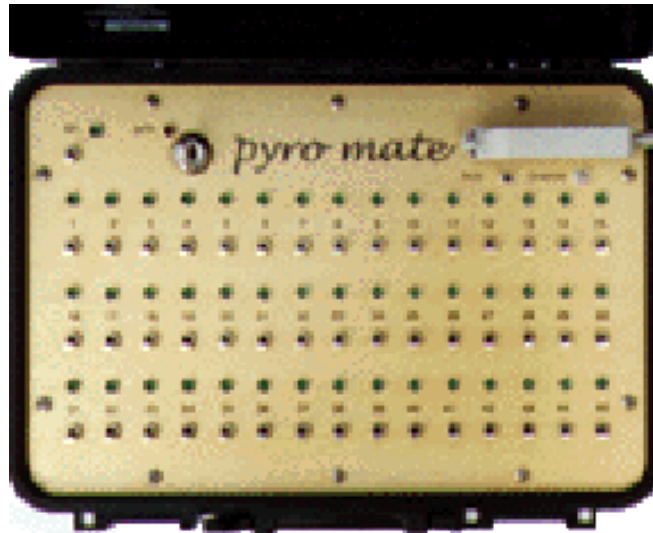


Pyromate P-45 Firing System



Pyromate P-45 Firing System

The Pyromate P-45 pyrotechnic firing system provides the ability to individually apply an activating voltage to 1 to 45 separate circuits. The 24 volt power source is internal to the control panel and is recharged thru the charge jack using a 12 VDC external power supply.

The Pyromate P-45 firing system consists of a control panel and up to 12 directly attached firing modules. Each firing module is attached to the control panel using a 50 pin multi-conductor cable.

Using the firing system

1. Open the control panel lid.
2. Verify that the ON/OFF switch is set to OFF.
3. Verify that the ARM KEYSWITCH is set to SAFE by rotating counter-clockwise until vertical.
4. Select Bank A using the rotary knob.
5. Turn the ON/OFF switch to ON and verify that the LED indicator above the ON legend lights.
6. Turn the ON/OFF switch to OFF again.
7. Make sure that the shunting plugs are inserted into the firing modules while igniters are being attached.
8. Attach pyrotechnic igniters to the firing modules that will be used.
9. Inspect the male end of cable for bent pins before attaching firing cable to the connector labeled A on the Expansion Module.
10. Remove and save the SHUNT PLUG from the firing module and then attach the firing cable to the input connector on the firing module.
11. Repeat steps 9 and 10 for each firing module that will be used.
12. Remove personnel from the proximity of the firing area while performing continuity status checking.
13. Verify that firing area is clear.
14. Verify that the ARM key is vertical (safe).
15. Verify that the Selector is set to A.
16. Turn the ON/OFF switch to ON.
17. Observe the light above each firing switch is lit for each expected pyrotechnic igniter.
18. Rotate the Selector to the next used firing module position and check the continuity indicators.
19. Repeat step 18 until all used firing modules have been checked.
20. Ready to fire connected pyrotechnic igniters.
21. Verify that none of the firing switches 1 thru 45 are stuck ON.
22. Verify firing area is clear.
23. Select the 1st firing module position by turning the rotary selector to A.
24. Turn ARM KEYSWITCH clockwise until it stops in a horizontal position and the ARM indicator LED lights.
25. Press each numbered firing switch up to activate the connected electrical ignition device and then release it.
26. When another firing module is required, release all firing switches first, then rotate the Selector to the required module letter.

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Control Panel

The Panel CONTROLS consist of the following:

Power Switch – This toggle switch, labeled ON OFF controls the power of the control panel. When the power is on, the ON indicator LED will light and any igniters attached to selected firing module is shown by the associated continuity LED.

Firing switch 1 thru 45 – These 45 momentary toggle switches control power to the associated terminal connections on the selected firing module. The switch will only apply the power to the terminal while the ARM keyswitch is turned to ARM (clockwise horizontal position). To fire igniter attached to the associated terminal connectors of the selected firing module, the appropriate switch is moved upward momentarily and then released. The continuity LED of the terminal position will go out while the switch is held in the activated position, but may relight when the switch is released.

Arm KEYSWITCH – This keyswitch controls the firing operation of the firing toggle switches by applying or interrupting power to firing switch. The vertical position (switch rotated counter-clockwise) is the SAFE position where power is interrupted to the firing switches. The horizontal position (switch rotated clockwise) is the ARM position and also is indicated by the ARM LED being lighted.

Bank Select Rotary Switch (A-L) – Each firing module that is attached to the control panel is accessed by rotating the Bank Selector to the associated Selector letter A thru L. Each letter on the rotary switch refers to the similarly lettered DB15 connector at the top of the control panel. When a cable and firing module is attached to the selected connector, a pin on the firing module can be activated (fired) by pressing the desired firing switch on the control panel.

The INDICATORS consist of:

Charge Status LED – This LED located by the charging jack shows the status of the battery as it is being charged. The LED is off when no charger is connected. When the correct charger is plugged into the charging jack, the LED will be RED if the internal battery is charging or GREEN if the internal battery is fully charged.

Power ON LED – This status LED located Right of the ON legend in the upper left corner of the control panel indicates that the ON-OFF switch is set to ON and that the internal battery does have some power. If this LED doesn't turn on when the ON switch is set ON, the internal battery is completely discharged and will need to be replaced.

Continuity 1 thru 45 LEDs – These status LEDs located above each of the 45 firing toggle switches show the presence of a electrical connection (igniter) attached to the selected firing module when the control panel is ON. Each of the continuity LEDs will conduct 20 milliamps of current thru the connected device.

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ARMED LED – This status LED located above the ARM keyswitch at the upper left corner of the control panel will light when the ARM key is turned clockwise to the horizontal position, but only if the panel is ON.

The Panel CONNECTORS consist of:

Charge Jack

BANK A,B,C,D,E,F,G,H,I,J,K,L



Firing Module

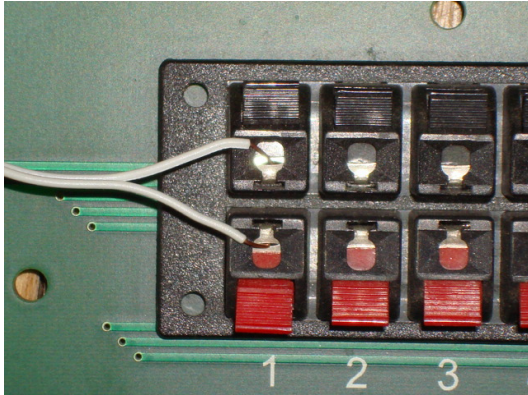
The Pyromate firing modules appropriate for this firing system contains blocking diodes that allow switched common buss operation (firing modules selected using the rotary selector A-H). *Using modules that do not contain these diodes will cause un-intended results!*

The Panel CONNECTORS consist of:

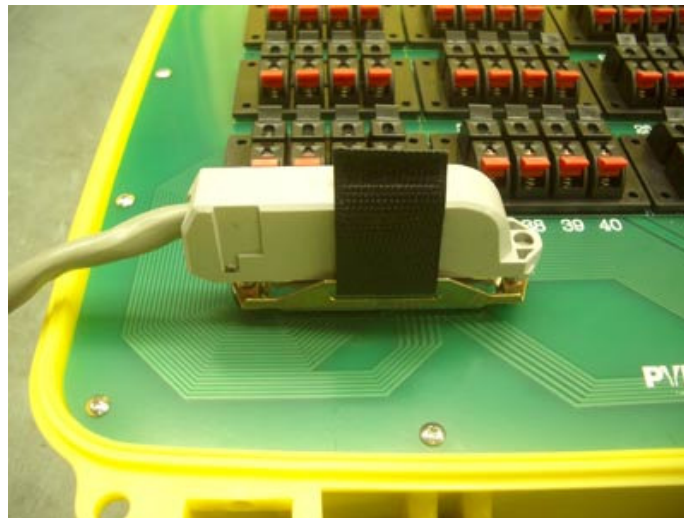
50 Pin Input (male) Connector – Left side connector receives the firing cable from the control panel. While attaching igniters to the Firing Pin terminals, a shunt device should be installed in this connector.

Output (female) Connector – Right side connector is used to attach another firing cable that connects an additional firing module. Connecting additional cables and firing modules to these output connectors is a configuration often referred to as *daisy-chaining*. The purpose of daisy-chaining addition modules together is to fire multiple modules together on the same terminal pin numbers. The disadvantage of this configuration is that continuity testing becomes less accurate because the additional pins connect in a parallel electrical circuit. See the section **Series vs. Parallel Circuits**.

Pyromate P-45 Firing System



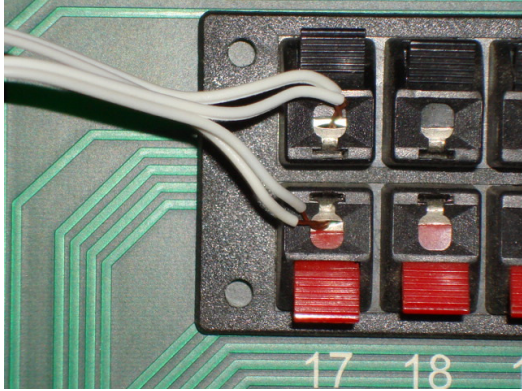
Firing Pin terminal blocks – The pyrotechnic igniter is connected to a set of terminals notated with a number 1 thru 45. Each igniter is connected between the top row and bottom row in line with the pin number. The igniter is attached by depressing the spring loaded lever and inserting the exposed bare-copper end into the revealed opening in the terminal. Care must be taken to position the bare copper igniter wire end in the connector so that the insulation portion of the wire is not pinched in the contact jaws of the connector. Also the amount of exposed copper wire outside of the terminal connector must be controlled to prevent the copper from contacting other exposed wires. *Either condition will result in unpredictable operation of the firing system!*



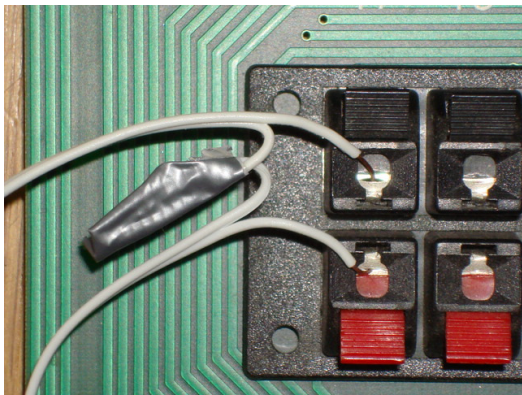
Firing module with shunt device inserted into firing cable input connector.

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Series vs. Parallel Circuits – Igniters have two wires. When just one igniter is connected to a firing pin terminal set the circuit is simple. When 2 or more igniters must be connected to the same numbered firing circuit, the connection becomes more complicated. The two types of configuration are **series** and **parallel** electrical connections. There are different advantages to each type of circuit.



When 2 igniters have one wire from each igniter inserted into the same terminal pin, the configuration is called a **parallel** circuit. This is because power will pass thru each igniter separately, but in parallel. A *shorted igniter will prevent the circuit from firing any of the paralleled igniters. An open igniter will not be detectable using the continuity circuit for multiple parallel connections.* **This is the least favorable method and should be avoided.**



When 2 igniters have one wire plugged into one terminal pin and the other wire only connecting the 2 igniters together, this is called a **series** circuit since the power passes thru one igniter and then the other igniter. Any open igniters or broken wires in the series circuit will be detected by the continuity circuit of the control panel. *It is not a good idea to series different brands of igniters together.*

This is the best method of wiring multiple igniters.

Pyromate P-45 Firing System

Firing System Do's and Don'ts

- 1- **Never enter field with panel connected and or powered up!!!**
- 2- **DO NOT GET WET!!!!** Treat your system like it's your Laptop computer or other electronic device, **IT IS NOT WATERPROOF.** Under no circumstance should you allow moisture of any kind to fall on Panel or modules, **Cover and protect modules from Fireworks Fallout and moisture, as you would the fireworks you are shooting. (There is no Excuse acceptable)!**
- 3- **Keep cable ends off the ground, Do not drag along ground, dirt is the enemy. Always inspect ends for debris before plugging in.**
- 4- **Always unplug cables carefully and not by yanking the cable or rocking plug back and forth, always pull straight out by body of connector.**
- 5- **Never apply any kind of spray or lubricant to connector contacts.**
- 6- **Keep your system charged, Do not let system get low on charge, (battery Damage can occur) always keep charger with panel.**
- 7- **Always roll cables out and roll cables in, Do not wind around arm or force cable to twist against its natural coil, Twisting will destroy cable!**
- 8- **If you are unfamiliar with proper winding technique let someone that knows the proper way wind your cables, not everyone can do this.**
- 9- **Do not rip igniter wires from Clip connectors, remove them individually with care.**
- 10- **Always series multiple igniters on one circuit (Never Parallel)**
- 11- **Following these simple steps will keep your system functioning properly for many years.**

Pyromate P-45 Firing System



FIRING SYSTEMS

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Pyromate Terms/Warranty,

All Pyromate products are covered by a one year limited warranty which pertains to factory defects in components or assembly, any systems opened without the express permission of Pyromate Inc will be void of such warranty as well as any abuse issues. There is no 30 day trial period as stated in any printed brochures or written advertisements.

All freight charges will be the responsibility of the end user.

Terms, 1-All Systems are built to order and require a non refundable 20% down payment and Cancellation of said orders are subject to a 20% restocking fee.

2- All orders must be paid in full prior to shipping unless previously agreed to on paper,

3- All delinquent payments will be subject to Finance charges of 2% monthly.

4- Anyone purchasing equipment from Pyromate is bound by these terms.

DISCLAIMER: The purpose of this equipment is to cause initiation of industry standard Pyrotechnic electric matches to ignite display type fireworks or pyrotechnic special effects. Fireworks and special effects materials are explosives and may cause personal injuries or death to yourself or others, including spectators. SAFETY IS YOUR RESPONSIBILITY and is beyond the control of PYROMATE Inc. The buyer / user assumes all responsibility and liability in the use of this equipment and further agrees, by purchase and /or use of this equipment, to indemnify and hold harmless PYROMATE Inc. and its agents against all liability for injury, loss, or damage direct or consequential arising out of the use of, or inability to use this equipment. Any subsequent purchaser is also bound by these conditions of sale.

This Warranty and Terms Supersede any previously written terms or warranty on Brochures or written advertisements prior to 2-17-10

Pyromate P-45 Firing System