A Guide to Operating the Chameleon.

These operating instructions have been prepared as an operating aid in addition to the Chameleon Safety Instructions which **MUST** be read prior to using the Chameleon.

What is the Chameleon?

The Chameleon is a stand alone machine that produces coloured flames and flame balls. The machine operates using mains power, 3 channel DMX and Chameleon Aerosol Canisters. The chameleon produces real coloured flame effects and as such the flames/flame balls produced are HOT and thus careful attention MUST be paid as to the location and use of these machines.

Equipment Supplied with the Chameleon

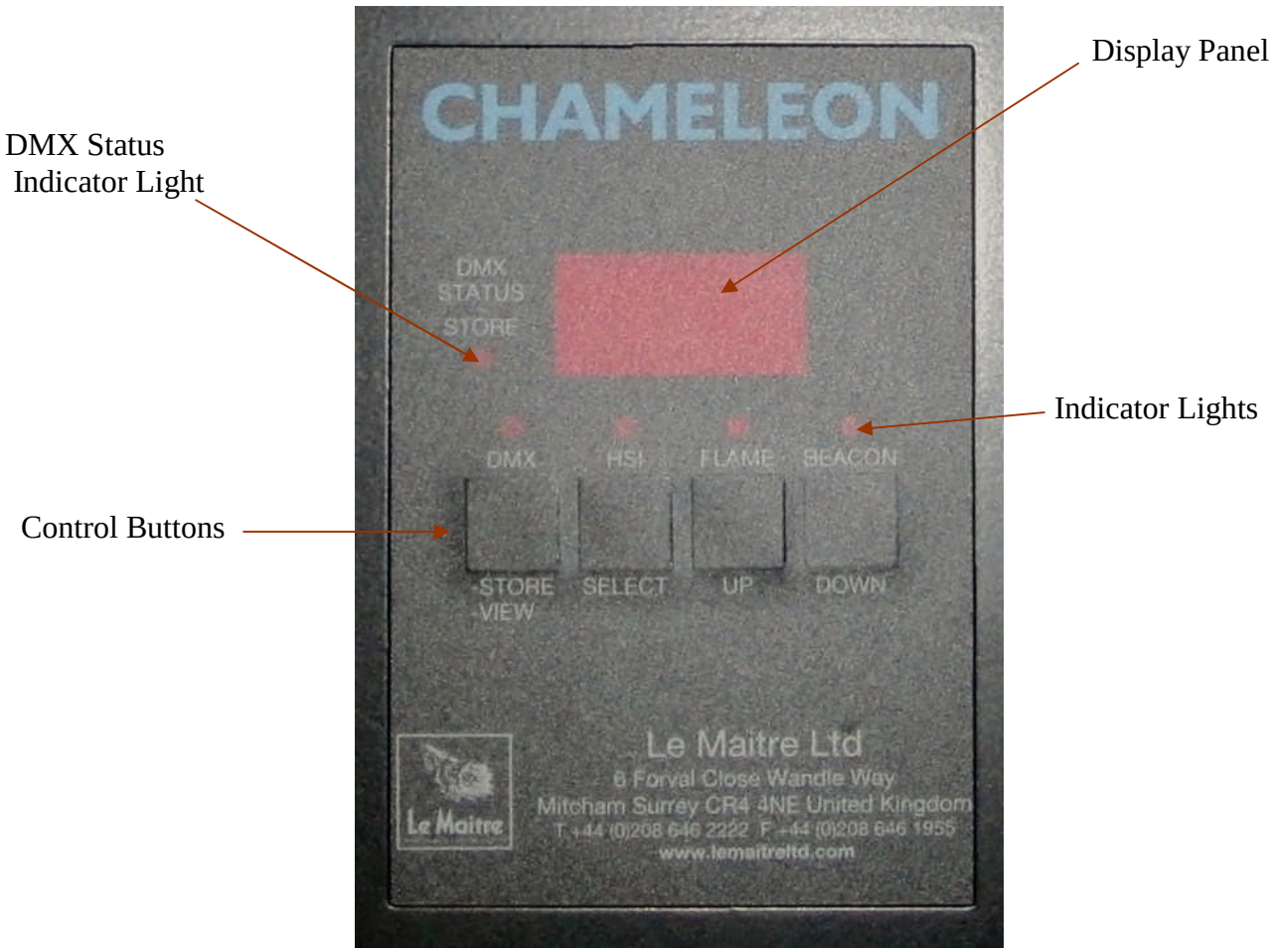
1. Chameleon Machine
2. Mains power cable (and Transformer for 110V systems).
3. Test Certificate
4. Packing Check List
5. Labels (if not already applied)

Additional Equipment Required

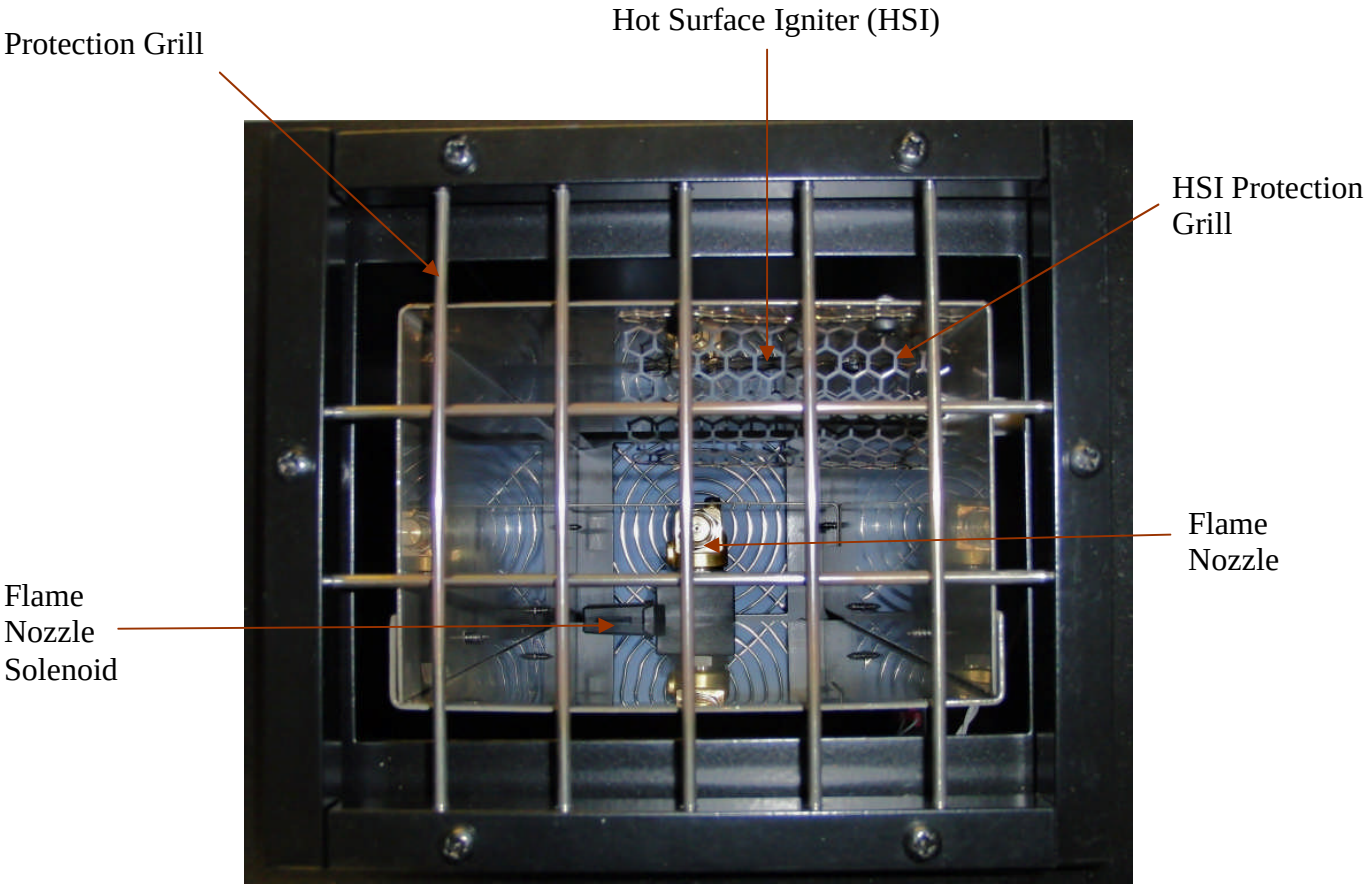
1. DMX Board (minimum 3 Channels)
2. DMX cables (5 pin)
3. Chameleon Canisters
4. Electric Beacon (Recommended)

1.0 Identification of Main Components

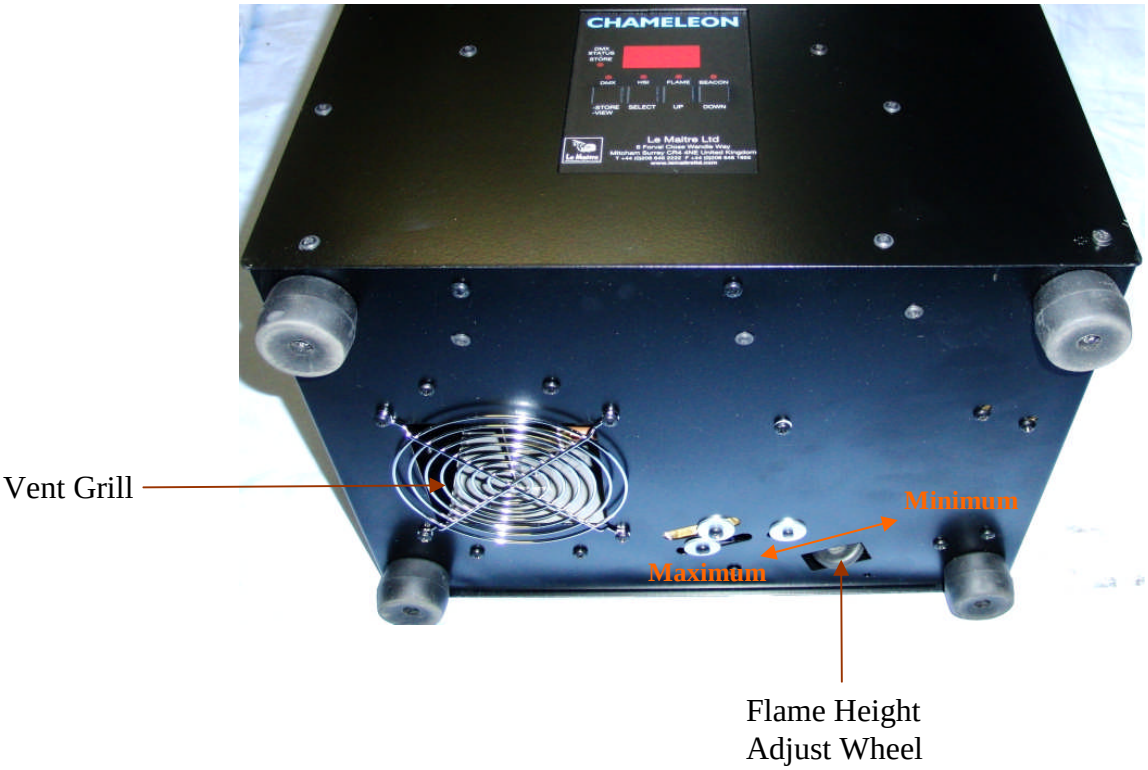
1.1 Control Panel



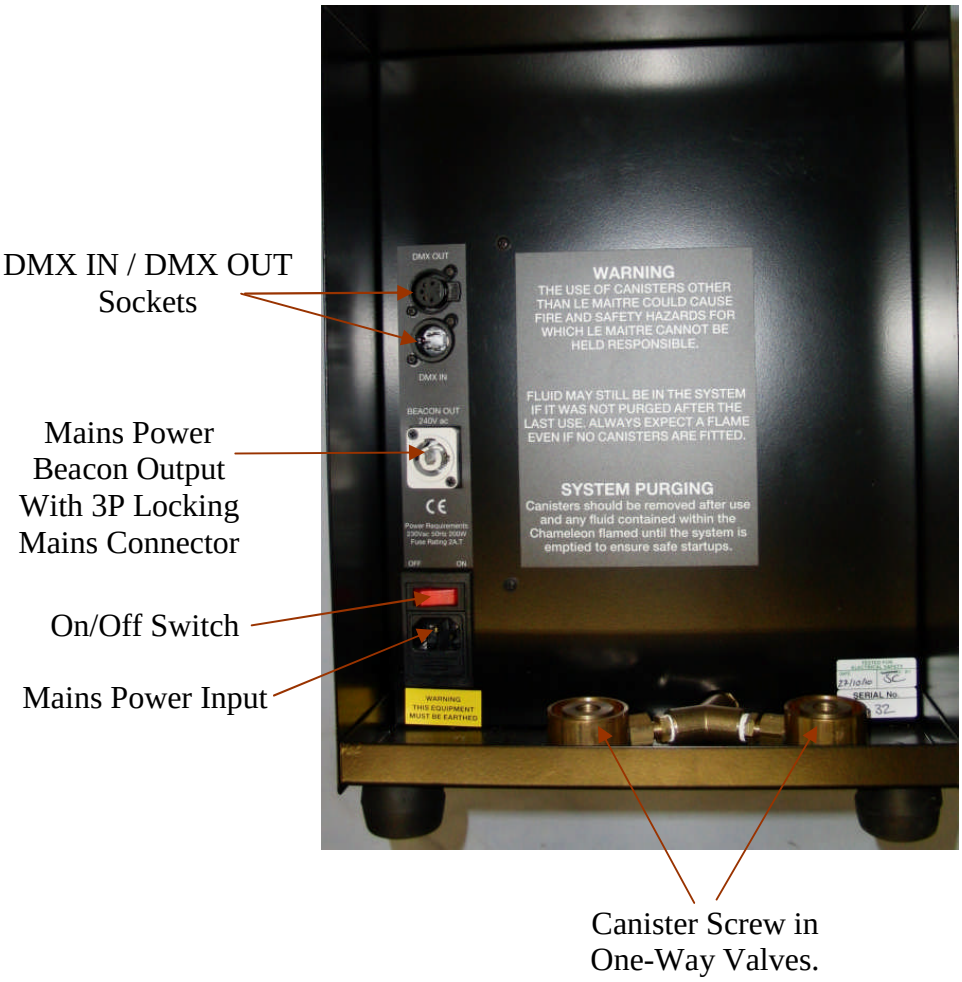
1.2 View From the Top



1.3 View From the Bottom



1.4 View From the Back



1.5 Canisters

The Chameleon canisters are classed as **Aerosols, Flammable,** UN1950.

Underneath the protective cap is a screw in valve.

The canisters MUST be protected from sunlight and temperatures exceeding 50 degrees Celsius. They should not be pierced or burned even after use. When not being used in the Chameleon, Keep away from all sources of ignition.

Contents = 500 ml

2.0 Terminology

BEACON – A visual or oral indicator that can be connected to the Chameleon such that activation of the BEACON alerts persons in the vicinity of the Chameleon to its imminent use.

DMX – Short for DMX 512, is a standard for digital communication networks that are commonly used to control stage lighting and effects. It was originally intended as a standardized method for controlling light dimmers, which, prior to DMX512, had employed various incompatible, systems. However, it soon became the primary method for linking not only controllers and dimmers, but also more advanced fixtures and special effects devices such as fog machines and moving lights and now the Chameleon.

DMX works on "Channels", each function of the machine is assigned a number or channel and when connected to a DMX controller by a DMX cable the functions of the machine can be controlled independently. All functions of a machine or machines that are given the same channel number will activated or function when that channel is activated on the DMX controller.

FLUSHING – The process of removing any residual fluid from the machine by means of igniting the fluid.

HOT SURFACE IGNITER (HSI) – This is an electrically heated device that is the ignition source. As this device does not employ a flame it does require approximately 10 seconds to achieve the correct functioning temperature.

PURGING – The process of removing any residual fluid from the machine without igniting the fluid.

SOLENOID – Short for Solenoid Valve, this is an electromechanical one –way electronic valve. On applying an electrical current to the solenoid, the valve will either open or close.

3.0 Safety Features

Tilt switch – If the machine is tilted the HSI will cool/not heat and the two solenoids will close until the machine is reset.

Two One-Way Solenoids – Isolates the Fuel supply and prevents the flame backing up into the canisters.

HSI Temperature cut out – If the HSI is not at temperature or cools at any time then the two solenoids will shut and not function until the HSI has heated to the correct operating temperature.

Fluid/Gas Aerosols 500 ml each – In the case of a leak then there is a minimum amount of liquid fuel and gas propellant available for release.

4.0 Summary of How the Chameleon Works

When the canisters are loaded, the pressurized fluid within the canisters is retained behind the canister solenoid. When the HSI is activated and up to temperature, the canister solenoid maybe opened which allows the pressurized liquid into the tube within the Chameleon up to the point of

the Nozzle Solenoid. Opening the Nozzle solenoid releases the pressurized liquid which is vaporized an ignited on passing the HSI producing a coloured flame effect. Closing the Nozzle solenoid at this point will immediately stop the flame effect. If during functioning the Nozzle solenoid is left open but the canister solenoid is closed then the flame effect will continue to be seen but reduce in height until all the pressurised fluid within the internal pipes is expended.

5.0 Setting up the Chameleon

1. The Chameleon should be initially set up without any canisters connected. It should be assumed that there is still flammable fluid within Chameleon as it may not have been flushed/purged after the last use.
2. Place the Chameleon on a flat level surface where it is not likely to be knocked. The Chameleon contains a tilt switch and will not operate at an angle or if nudged/knocked/moved when set to function.
3. Set the Flame height to an appropriate level using the rubber flame height adjust wheel on the base of the machine. Minimum height = 1 metre; Maximum Height = 5 metres).
4. Plug in the mains power cable and connect to a mains power supply. Turn ON the power to the Chameleon (On/Off Switch Illuminates), at this point "dOF" should be seen in the display panel and the DMX indicator light should be blinking. This indicates that the machine is on but there is no DMX signal to the machine.
5. Tilt the machine through approximately 30 degrees from vertical until the display panel shows "001", this indicates that the tilt switch is working. At this point the machine needs to be reset before it can be used.
6. Reset the machine by turning the power off then on again using the illuminated switch.
7. It is recommended that an electric beacon e.g. flashing light, be connected to the "Beacon Output" socket on the back of the machine and placed in a suitable position to act as a warning prior to the Chameleon being fired.
8. Press the "Select" Button on the display panel so that the "HSI" light is illuminated.
9. Using the buttons marked "UP" and "DOWN" select the DMX channel for the HSI (default channel is 1).
10. Press the "Select" Button on the display panel so that the "NOZZLE" light is illuminated.
11. Using the buttons marked "UP" and "DOWN" select the DMX channel for the Nozzle Solenoid (default channel is 2).
12. Press the "Select" Button on the display panel so that the "BEACON" light is illuminated.
13. Using the buttons marked "UP" and "DOWN" select the DMX channel for the Beacon/Canister Solenoids (default channel is 3).
14. Press the "Select" button on the display panel so that the "DMX" light is illuminated. At this point "dOF" should be seen in the display panel and the DMX indicator light should be blinking.
15. Ensure that all sliders/controls on the DMX controller are set to zero.
16. Connect a DMX cable from the "DMX OUT" socket on the DMX controller to the "DMX IN" socket on the back of the machine.
17. Ensure that there is no one within 2 metres of the Chameleon.
18. Turn on the power to the DMX controller, "H00" should now been seen in the display panel and the DMX indicator light should be on constantly.

Setup is complete and the Chameleon can be flushed.

6.0 Flushing the Chameleon

Before and after use the Chameleon should be flushed. The Chameleon MUST be flushed before transportation. To flush the Chameleon set up as described in Section 5 above.

1. If there are any canisters loaded (e.g. after use), these Must be removed.
2. Ensure the master control on the DMX board is set to “maximum”.
3. Move the HSI control on the DMX Controller to maximum, “H99” should be seen flashing in the display panel. The HSI will start to heat up and glow orange, when at temperature (approx 12 seconds) the “H99” in the display panel will stop flashing and the system is ready to be flushed.
4. Ensure no one is within 2 metres of the machine.
5. Move the Canister solenoid/Beacon (default channel 3) slider to maximum, a clicking noise should be heard.
6. Open the Nozzle solenoid (default Channel 2) a clicking noise should be heard and a flame will be visible if there is any fluid within the internal pipes. When no flame is visible the machine can be considered to be flushed of any fluid.
7. Set all DMX channels to Zero, power down the Chameleon and leave to cool if necessary.

The machine is now ready to function or store/transport

If there is nowhere available to flush the Chameleon and have a naked flame then any excess fluid maybe removed by purging the machine (Section 9.0).

7.0 Operating the Chameleon

The Chameleon should only be used with two canisters loaded. The canisters can be of different colours but when fired both colours will be used and the colour of the flame may not be that expected.

Setup and Flush the Chameleon as described in sections 5.0 and 6.0 above.

1. Ensure that the power to the machine is turned OFF and that the DMX cable in the back of the Chameleon is disconnected.
2. Load two canisters into the rear of the machine by screwing them into the one-way valves at the rear of the machine. Ensure that the canisters are screwed in correctly and fully but do not over tighten. DO NOT use any tools to tighten the canisters.
3. Check for gas leaks using an electronic gas detector.
4. Connect the DMX cable from the DMX controller to the “DMX IN” socket on the rear of the machine.
5. Ensure all DMX controls are set to Zero and turn the power on to the DMX controller.
6. Turn on the Power to the machine using the illuminated power switch.
7. Ensure the master control on the DMX board is set to “maximum”.
8. Move the HSI control on the DMX Controller to maximum, “H99” should be seen flashing in the display panel. The HSI will start to heat up and glow orange, when at temperature (approx 12 seconds) the “H99” in the display panel will stop flashing and the system is ready.
9. Ensure no one is within 2 metres of the machine.
10. Open the Canister solenoid/Beacon (default channel 3) a clicking noise should be heard and the beacon (if connected) should function. The machine is now in “Standby”.

7.1 Sustained Flame - operate the DMX channel for the Nozzle solenoid (default Channel 2) to >50% a clicking noise should be heard and a flame will be visible. Turn off the DMX channel to

stop the flame. A full height (5 m) flame will be sustained for approximately 1 minute when two FULL canisters are used.

7.2 Flame Ball - Operate the DMX channel for the Nozzle solenoid (default Channel 2) to above 50% for a split second.

For long periods of “standby” set the HSI (Default Channel 1) and Canister/Beacon solenoid (Default Channel 3) to zero on the DMX controller.

When the Chameleon is no longer required:

1. Set all DMX channels to zero.
2. Allow the Chameleon to cool.
3. Carefully remove the canisters.
4. Flush the system as described in Section 6.0. Alternatively the system maybe purged following the steps outlined in Section 9.0.

8.0 Storing DMX Channel Presets

If different DMX channels other than the default ones wish to be stored for future use (on powering down the machine the DMX channel preset will return to the default value if no presets are stored) then:

1. Disconnect the DMX cable from the “DMX IN” socket at rear of the machine.
2. Plug in the mains power cable and connect to a mains power supply. Turn ON the power to the Chameleon (On/Off Switch Illuminates), at this point “dOF” should be seen in the display panel and the DMX indicator light should be blinking.
3. Press the “Select” Button on the display panel so that the “HSI” light is illuminated.
4. Using the buttons marked “UP” and “DOWN” select the required DMX channel for the HSI.
5. Press the Store/View button to enter this value into the memory.
6. Press the “Select” Button on the display panel so that the “NOZZLE” light is illuminated.
7. Using the buttons marked “UP” and “DOWN” select the required DMX channel for the Nozzle Solenoid.
8. Press the Store/View button to enter this value into the memory.
9. Press the “Select” Button on the display panel so that the “BEACON” light is illuminated.
10. Using the buttons marked “UP” and “DOWN” select the required DMX channel for the Beacon/Canister Solenoids.
11. Press the Store/View button to enter this value into the memory.

DMX channels are now preset/stored.

9.0 Setting the HSI Delay Time / Purging

The HSI delay time is the duration between activation of the HSI and the point at which the solenoids can be activated. The factory setting for HSI delay is 102 corresponding to a delay time of approximately 12 seconds. This can be increased or decreased if special circumstances arise. A value of 50 equates to approximately 5 seconds and a value of 200 equates to approximately 35 seconds.

When residual fluid needs to be removed from the machine prior to storage or transport and there is no facility to burn off the fluid then the HSI can be deactivated using the HSI delay time and the

system purged without ignition of the fluid. The HSI is essentially deactivated by setting the HSI delay time to zero. HOWEVER before purging the system ensure that there are no sources of ignition in within 5 metres of the Chameleon.

To change the HSI delay time:

1. Remove any loaded canisters.
2. Disconnect the DMX cable from the rear of the machine.
3. Plug in the mains power cable and connect to a mains power supply. Turn ON the power to the Chameleon (On/Off Switch Illuminates), at this point "dOF" should be seen in the display panel and the DMX indicator light should be blinking.
4. Press the "STORE/VIEW" Button together with the "UP" button, "dEL" should be seen scrolling across the display panel. A number will then appear.
5. Make a note of the number in the display panel.
6. Use the "DOWN" Button to change the display to "000" for zero delay time.
7. Press "SELECT" to return to normal mode with "dOF" shown in the display panel.

The nozzle and canister solenoids will now operate without the need for the HSI to be activated and thus heating up. The system can be purged following steps 4, 5, 6 and 7 of **section 6**. **DO NOT** activate the HSI channel during purging.

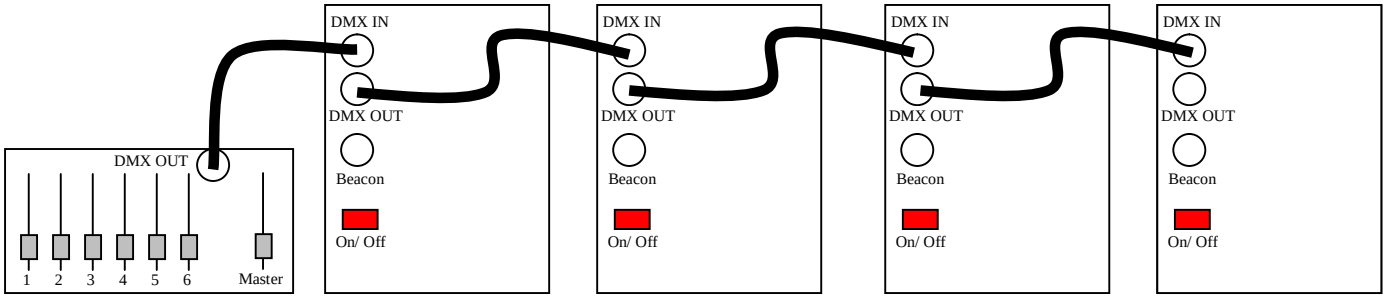
When the system has been purged, return the HSI setting to the value that was in the display at point 5 above. The factory setting is a value of "102" which corresponds to a delay time of approximately 12 seconds.

Under certain circumstances e.g. particularly cold weather or drafty conditions, the HSI delay time may need to be extended in order for the HSI to heat up sufficiently. HOWEVER extreme care must be taken when reducing the HSI delay time (except when purging) as lowering the delay time too much may result in the liquid fuel failing to ignite, which may be hazardous. Minimum recommended delay time is 10 seconds.

10. 0 Linking Chameleon Machines by DMX

The Chameleons maybe linked together such that the linked machines can operate together or separately.

1. Connect Chameleon 1 to the DMX controller.
2. Connect Chameleon 2 to Chameleon 1 using a DMX cable from the "DMX OUT" of Chameleon 1 to the "DMX IN" of Chameleon 2
3. Repeat this process for all Chameleons in the chain. (see below)



DMX Controller Chameleon 1 Chameleon 2 Chameleon 3 Chameleon 4

10.1 Simultaneous Operation
To set the linked Chameleons so that they all operate together from the same channels on the controller, assign each of the machines with the same HSI, NOZZLE and BEACON channel numbers as described in section 5.0.

For example if all machines are set with HSI = Channel 1, NOZZLE = Channel 2 and BEACON = Channel 3, then when channel 1 from the controller is activated the HSI's on all machines will activate and heat up. When Channel 3 is activated the canister solenoids on each machine will open and any beacon that is connected will be switched on. When channel 2 is activated in this sequence then a flame/flame ball will be emitted from each machine.

10.2 Separate Operation
Although the machines are linked they can be operated separately by assigning each machine with different channel numbers for the HSI, NOZZLE and BEACON.

For example:

Chameleon 1: HSI = Channel 1, NOZZLE = Channel 2 and BEACON = Channel 3,
Chameleon 2: HSI = Channel 4, NOZZLE = Channel 5 and BEACON = Channel 6,
Chameleon 3: HSI = Channel 7, NOZZLE = Channel 8 and BEACON = Channel 9,
Chameleon 4: HSI = Channel 10, NOZZLE = Channel 11 and BEACON = Channel 12,

Then each machine will operate independently from the others.

11.0 Transportation
Before shipping the Chameleon the unit MUST first be either flushed (section 6) or purged (section 9) to ensure that there is no flammable liquid left in the system. The canister MUST also be removed. Ensure that the unit is packaged sufficiently well to avoid damage during transport.

A declaration MUST accompany the unit, stating that the unit has been flushed/purged.

The Chameleon Canisters Must be shipped in accordance with the International rules for Transport which may vary depending on the mode of Transport being used.

Road Transport – ADR (Europe Only).
Sea Transport – International Maritime Dangerous Goods Regulations (IMDG).
Air Transport – International Air Transport Association Regulations (IATA).

The Chameleon canisters are classed as **Aerosols, Flammable,** UN1950.

12.0 Maintenance
The Chameleon does not require any maintenance by the user apart from flushing / purging the machine prior to storage or transport. In addition the canister screw in valves on the machine should be kept clear of dirt and debris as this may cause the seals to leak.

The Chameleon should be electrically tested on a yearly basis and regularly serviced by a qualified engineer, service intervals will depend the amount of use.