



SENTINEL S70 INSTALLATION AND OPERATION MANUAL

(Version 16 December 2013)

CAN'T SEE IT? CAN'T STEAL IT!

Thank you for purchasing a Concept Smoke Screen system. Your choice to protect your property and premises with this equipment has given you the use of one of the most effective security systems currently available. Concept Smoke Screen systems have been in service for over 35 years and have protected many millions of pounds worth of property, defeating criminals and securing premises on an almost daily basis. Please take the time to read and understand this guide to ensure you achieve the maximum performance from your Smoke Screen. If you have any questions that remain unanswered, please call our experts at Concept Smoke Screen and we will help. Once again, thank you for your decision; we hope that it's one that never needs to be tested.

A handwritten signature in black ink, appearing to read 'Carl Gibbard', with a horizontal line extending to the right.

Carl Gibbard, Managing Director

HOW DOES YOUR SMOKE SCREEN WORK?

Your Smoke Screen heats a non-toxic fluid under pressure to create smoke, or more accurately a thermally generated fog, that obscures visibility to discourage intruders from entering your premises.

This fog is very persistent and will stay suspended in the room for a significant length of time until it is vented by opening the doors and windows.

The Smoke Screen uses a sophisticated electronic control system to ensure it heats up to, and maintains, its ideal operating temperature using a minimal amount of electricity.

This control system similarly provides a flexible interface with intruder detectors and alarm systems to ensure that you are always protected and free of inadvertent activations.

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INTRODUCTION

Before commencing installation of the Smoke Screen ensure that you have all of the following equipment supplied in the box:

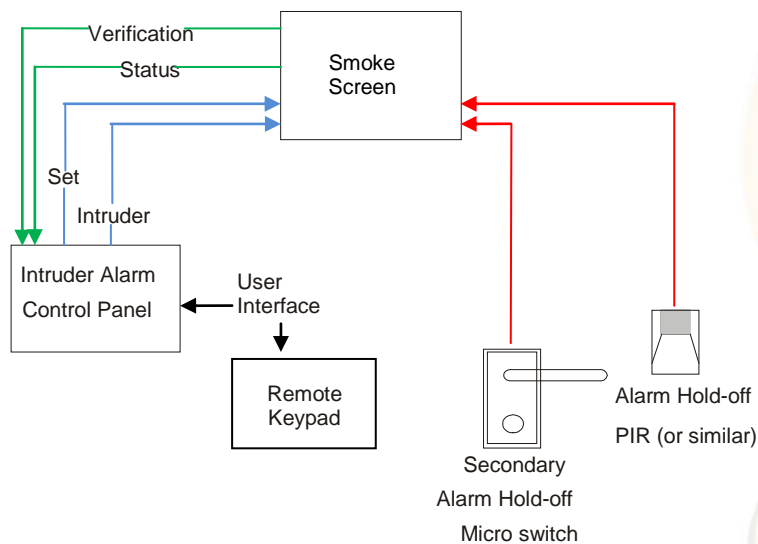
- 1 x Smoke Screen
- 1 x Wall Mounting Bracket
- 1 x Smoke Fluid Bag (Boxed)
- 2 x 12v Batteries.
- 1 x Literature Pack & Warning Sign

You will also require:

- 230-volt mains supply and connections into the Alarm Panel or other triggering system.
- PIR (or equivalent) to provide the hold-off where required.

OVERVIEW

The Smoke Screen is designed to form part of an existing intruder alarm system but may also be configured as a 'stand-alone' system. A 'standard' installation is shown in the following schematic:



STANDARD INSTALLATION

A 'standard' installation is configured in the following way:

- **The Smoke Screen** wall or ceiling mounted in the appropriate location.
- **A Hold-off PIR** (or similar device) located within the same area as the Smoke Screen providing a confirmation signal to the Smoke Screen to start 'smoke' production.
- **A Set** command supplied by an Alarm Control Panel, or equivalent, in the form of an N/C (*Normally closed*) relay opening when the Alarm system is set for operation.
- **A Trigger** command supplied by the Alarm Control Panel, or equivalent, in the form of an N/C (*Normally closed*) relay opening when the Alarm system confirms an intruder alert.

POSITIONING

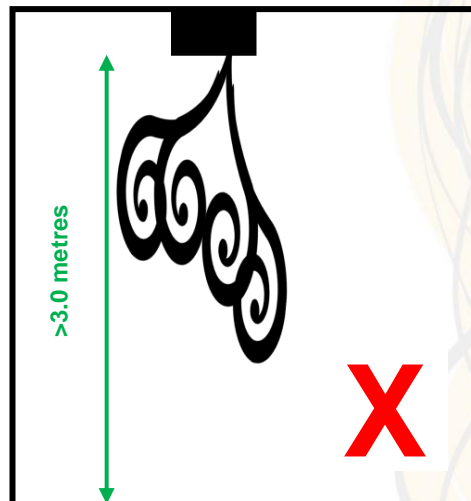
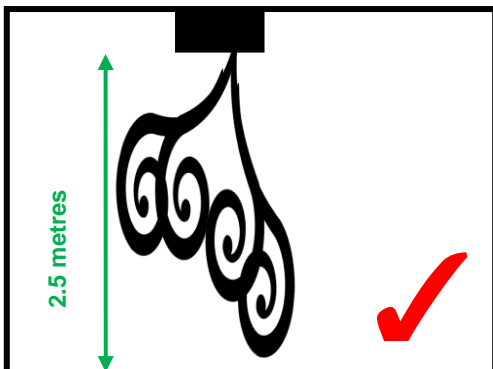
The Smoke Screen should ideally be sited in a covert position away from prying eyes and thereby reducing the possibility of tamper or an attack. The ideal place for the Smoke Screen is above a ceiling from where the smoke plume is used to its best effect, bursting on the ground and spreading outwards and upwards through 360°. If no suitable ceiling location is available then the next best location is a wall mounting as close to ceiling height as possible.

Wall-mounting.



The optimum wall mounting position for the Smoke Screen is 2.5 metres above the floor facing the area to be protected and using an appropriate angle nozzle. The maximum mounting-height above floor level is 3 metres, the minimum is 1 metre and there should be no obstacle within 1 metre of the smoke output nozzle.

Ceiling-mounting.



The optimum ceiling mounting height for the Smoke Screen is 2.5 metres above the floor over the area to be protected and using a straight nozzle. The maximum mounting-height above floor level is 3 metres and there should be no obstacle within 1 metre of the smoke output nozzle.

INSTALLATION PROCEDURE

1. Site the Smoke Screen and fix the bracket to the wall or ceiling as appropriate.
2. For wall mounting leave minimum 150mm clearance to ceiling.
3. Fasten the Smoke Screen to the bracket and open front cover.
4. Make connections as required to the Alarm Panel and Hold-off PIR.
5. Make connection to the Exagon panel (if used) and set the key switch to isolate mode.
6. Connect mains power (230-volt AC, 50Hz).
7. The Smoke Screen will heat up to operating temperature in approximately 20 minutes.
8. Set correct time/date and smoke timing for the specified room size.
9. Ensure the "Service Mode" dip switch No 3 is selected to "Off".
10. With the power applied insert fluid bag and make sure the fluid switch is closed correctly.
11. Make sure all tamper switches are closed and you are ready for test.

ACCESS

To access the PCB connections and programming panel (battery and fluid bag access covered in the relevant sections) remove the front cover by unscrewing the 2 set screws on either side and unhooking it from the top of the case; refitting is the reverse process. Installation cable entry is through the serrated grommet on the left back of the case.

MOUNTING

The Smoke Screen can either be ceiling mounted, or wall mounted, using the bracket supplied. If ceiling mounted, it is recommended that the Smoke Screen is suspended on 2 lengths of M8 studding from a Unistrut section (pictured). In all cases, the installer must fit the Smoke Screen using appropriate fasteners.

Suspension Kit (All M8)

Uni-strut 1 x 1 metre

Threaded bar 2 x 1 metre

Fixings:

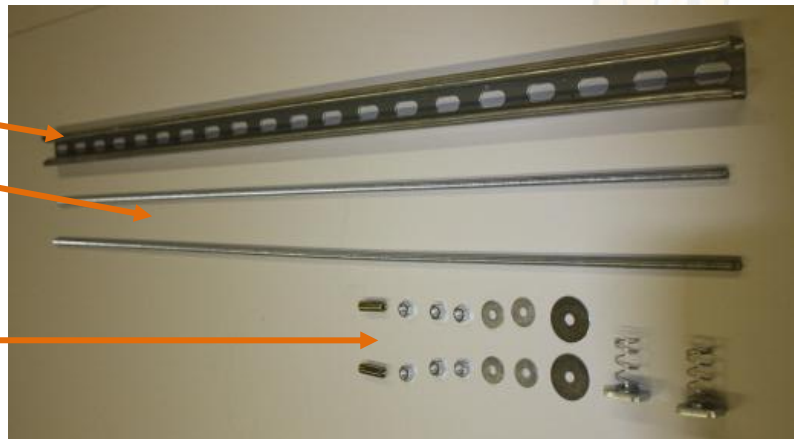
2 x 38mm washer

4 x 25mm washer

6 x full nut

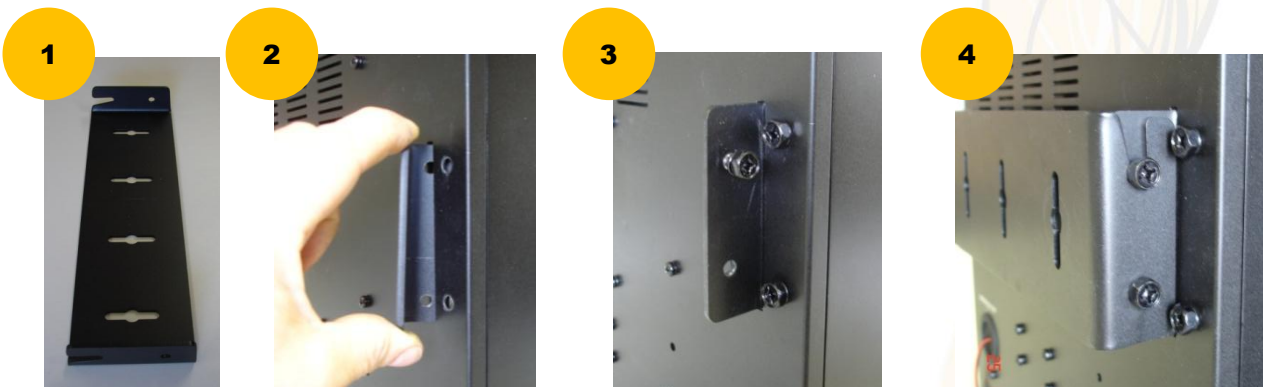
2 x drop-in anchor

2 x channel nuts,



Wall mounting

Wall mounting is achieved using a simple wall bracket (1). The bracket should be attached to a suitable wall. Use appropriate fixings to secure the bracket to the wall. We recommend as high a fixing as possible for aesthetic and security/anti-tamper reasons, but no higher than 3 metres above the floor. Fit the angle brackets to the Smoke Screen with 4 x set screws and put 2 more set screws a few threads into the top holes (2 & 3). Carefully locate the Smoke Screen on the bracket locating the top set screws onto the wall bracket hooks, add 2 set screws to lock the unit and tighten all four (4).



Suspension mounting

Suspending the Smoke Screen range is achieved using the 'Suspension Kit' comprising a length of Uni-strut, two sections of threaded bar and fixings (1). Prepare the Smoke Screen by fitting the angle brackets as described above. Fix the required length of M8 threaded bar to the wall bracket using 4 x nuts and 4 x 25mm washers (5). Fix the uni-strut into place. There are a range of fixings to accommodate concrete ceiling, girders etc; if in doubt contact the fixing supplier. Attach the threaded bar to the uni-strut using the channel nuts, 38mm washers and M8 nuts (6). Once this is done the Smoke Screen can be lifted into position and the set screws tightened as above (4). Any final adjustments to height can be made at this stage as the nuts and the threaded bar will take the weight of the Smoke Screen. The final assembly, viewed 'through the ceiling' is in photo (7).



NOZZLE CHANGING

To change the nozzle, first remove the front cover then remove, and replace, the nozzle using a 12mm ring spanner. Always use a new copper washer, which may need dressing slightly to seat an angled nozzle in the correct orientation. The Smoke Screen is delivered with a single-hole straight nozzle and the following are also available – 2-hole horizontal, 3-hole horizontal, 1-hole 30 deg angle down and 2-hole 30 deg angle down.

WARNING

This operation is usually carried out during installation. If the Smoke Screen has been in service the nozzles will be extremely hot and will cause injury if touched. Therefore, the Smoke Screen should be switched off and time should be allowed for the nozzles to cool.

CONTROLLING THE SMOKE

Inputs. There are 3 sets of input connections on the Smoke Screen (Alarm Set, Trigger and Hold Off) that should be connected to clean contacts. For the Smoke Screen to produce 'smoke' all 3 sets of connections must be 'open circuit' (this can be changed to 'closed' – see "Invert Trigger Mode" in the Programming section). If one set of connections is 'closed circuit' then the Smoke Screen is prevented from producing smoke. Hence the production of smoke is controlled using one or a combination of the following:

- **Alarm Set** – a normally closed relay connected across the Alarm Panel 'Set' connections, which open when the Alarm Panel is 'Set' and closing when the panel is 'Unset'.
- **Trigger** – a normally closed relay connected across the Alarm Panel 'Trigger' or 'Intruder' connections, which open when the Alarm Panel is in 'alarm'.
- **Hold-off** – usually a PIR or movement sensor connected to the 'Hold-off PIR' connections (N/C), which opens when the sensor sees movement.
- **Additional Hold-off** – any form of N/C relay or micro switch can be connected to the 'Hold-off' connections. Where fitted in addition to the Hold-off PIR both sets of relays must be 'open' to produce 'smoke'.

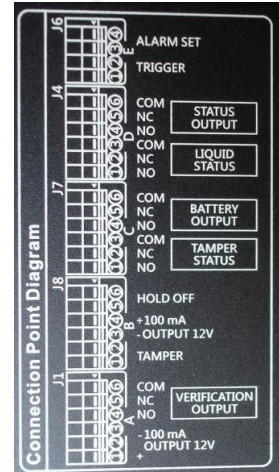
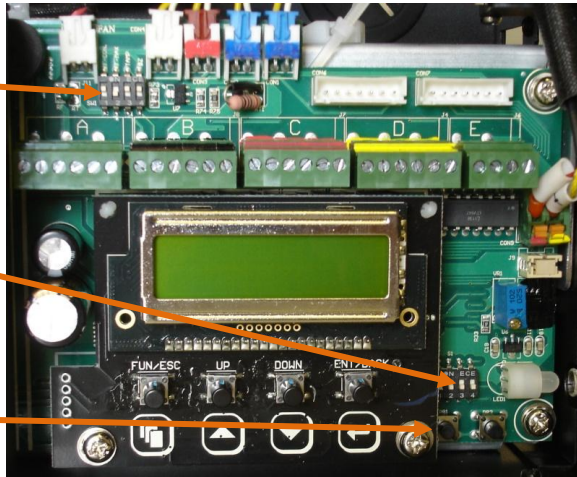
Outputs. Clean contact outputs are provided for connection to the Alarm Panel for 'Status Output', 'Liquid Status', 'Battery Output', 'Tamper Status' and 'Verification Output'. See the notes on the "Generic Connection Diagram" for the function of these outputs.

CIRCUIT BOARD LAYOUT

See below for Dip switch settings.

Dip switch 3 to "On" for Service Mode.

Activation test button "PB1".



Dip	Label	Function	Delivery setting
1	F-CON	Select to "On" to run fan permanently at a speed dependent on the ambient temperature.	Off
2	F-MAX	Select to "On" to run fan at max setting	Off
3	TAMP	Select to "On" to bridge external tamper input pins on PCB to prevent tamper fault indications if not in use.	On
4	BZ	Select to "Off" to silence buzzer indications.	On

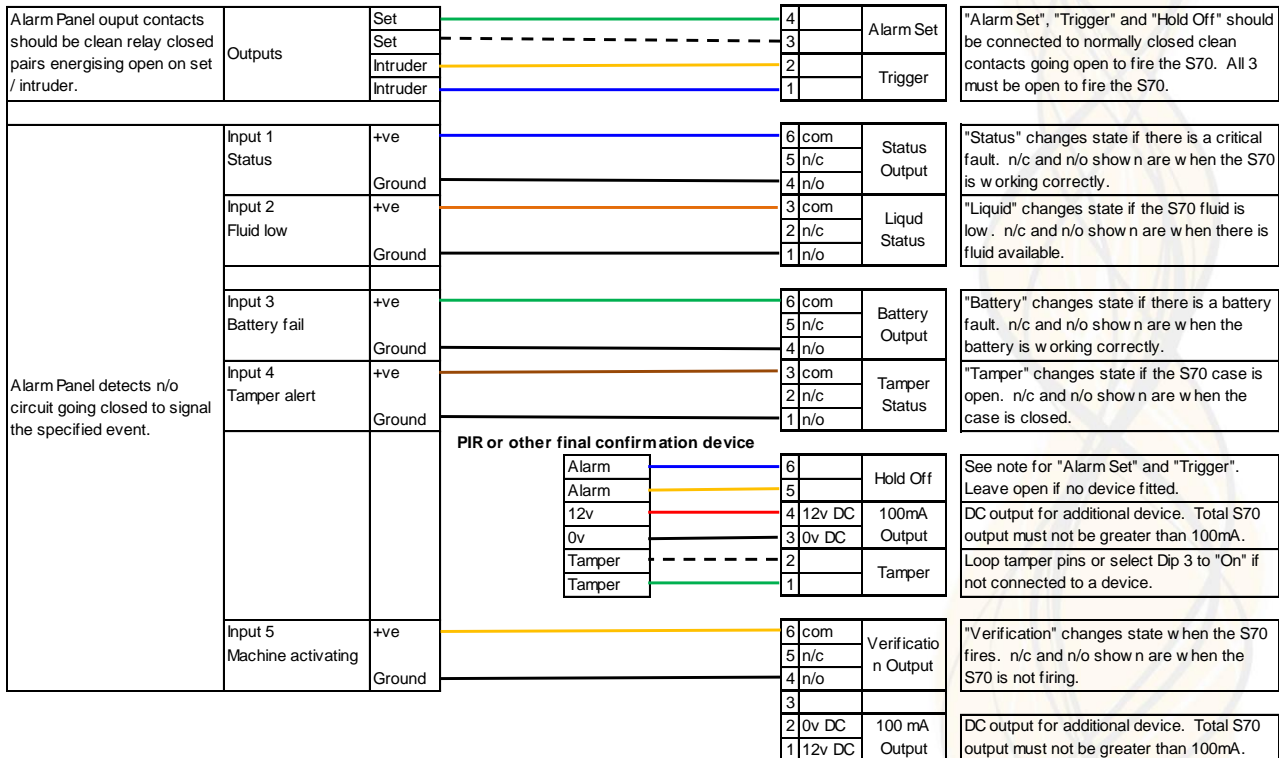
GENERIC CONNECTION DIAGRAM

S70 Generic Connection Diagram

Alarm Panel or similar control device

S70

Notes



ENERGY SAVING MODE (ESM)

When ESM is set and the Alarm Panel input to the Smoke Screen is “Unset” the Smoke Screen lowers its running temperature to a standby level to reduce power consumption and cost. When the Smoke Screen receives an ‘Alarm Set’ input it automatically heats to its normal operating temperature.

SERVICE MODE

Setting dip switch No 3 of the bank marked “On – Service Mode” (see diagram under “Circuit Board Layout”) to “on” puts the Smoke Screen into “Service Mode”. This setting prevents the Smoke Screen from making smoke whilst work is conducted with power applied.

FAILURE TO DISABLE SERVICE MODE WHEN NO LONGER REQUIRED WILL PREVENT THE SMOKE SCREEN OPERATING.

TURBO SMOKE MODE

When “Turbo Smoke Mode” is set (see section under “Programming”) the Smoke Screen produces a high-volume burst of smoke to provide rapid obscuration of a local, high value protected area. In “Normal Smoke Mode” the Smoke Screen produces a short full-output burst followed by a lower output over a longer period.

TAMPER

There are 4 tamper circuits on the Smoke Screen, one on each cover (front, battery and fluid) and an external tamper input on PCB Terminal Block “B”. The external tamper input can be disabled if not in use by selecting Dip Switch 3 (marked “TAMP”) to “On”, which bridges the input pins on the PCB. A “Tamper Status” output is provided on PCB Terminal Block “C”. A tamper ‘open’ state provides only an indication of the event; it **does not** automatically activate the Smoke Screen or prevent it from activation.

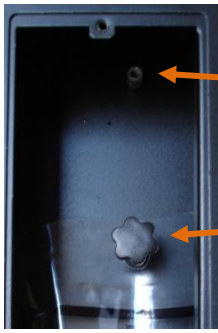
FLUID MANAGEMENT

Fluid capacity. There are 2 sizes (500ml or 1000ml) of transparent bag containing ‘Smoke Fluid’ for the Smoke Screen. It can also be operated with an external 5000ml bottle – please contact Concept Smoke Screen if you wish to use this facility.

Fluid monitoring. The Fluid Level is monitored using an on-board timer that measures the amount of fluid used by timing consumption when the Smoke Screen is activated. Each time the bag clamp is unfastened and the fluid bag is replaced the micro switch is cycled which resets the timer and the Smoke Screen will calculate this as a new fluid bag. See the section on “Programming” to set the volume of fluid available to the Smoke Screen.

External reservoir. When a 5-Litre external fluid bottle is used and the timer is set to 5000ml via the LCD control panel the function of the micro switch on the fluid bag holder is changed and a bag should not be fitted. In this mode, with power applied to the Smoke Screen, pressing and leaving open the micro switch on the fluid bag holder resets the fluid timer to 5000ml available.

Changing a fluid bag: Ensure that power is applied to the Smoke Screen. Open the right-hand access panel. Unscrew the bladder neck holder retaining screw and the bag support screw. Push the fluid probe into the “out” position in the bag neck. Place the other end of the bag onto the support and insert the retaining screw.



Use the upper support point for 1000ml bags
and
the lower support point for 500ml bags.

Carefully locate the bag neck in the cradle (1). Close the retaining gate and insert the retaining screw (2). Ensure the bag neck is held correctly and the fluid micro switch is activated properly.



ALWAYS REPLACE A FULL FLUID BAG OR 5000ML BOTTLE EVERY TIME THE FLUID BAG HOLDER MICRO SWITCH IS RESET. FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE SMOKE FLUID PUMP.

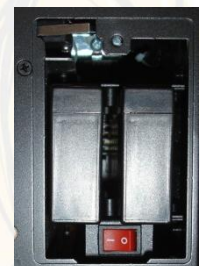
WHEN A NEW FLUID BAG IS FITTED POWER MUST BE APPLIED TO THE SMOKE SCREEN TO RESET THE FLUID TIMER.

BATTERY MANAGEMENT

Operation. The Smoke Screen is fitted with a battery to provide power to the electronic circuits and pump (not to the fluid heater) in the event of a mains power failure. This ensures that 1 hour after a mains power failure at an ambient temperature of 20 deg C the Smoke Screen can provide a 20 second activation. The Smoke Screen is capable of activating in the event of a battery fault or if the batteries are not fitted; in the latter case, to avoid battery fault indications, the facility should be disabled (see section under “Programming”). The Smoke Screen is supplied with a set of batteries but they are not fitted on delivery. Replacement batteries may be obtained from your Smoke Screen installer or Concept Smoke Screen.

Removal and replacement. To remove the batteries, open the access panel on the left side of the Smoke Screen. Slide out the old batteries and replace with new units ensuring that the battery is upright and the contacts enter the battery compartment first.

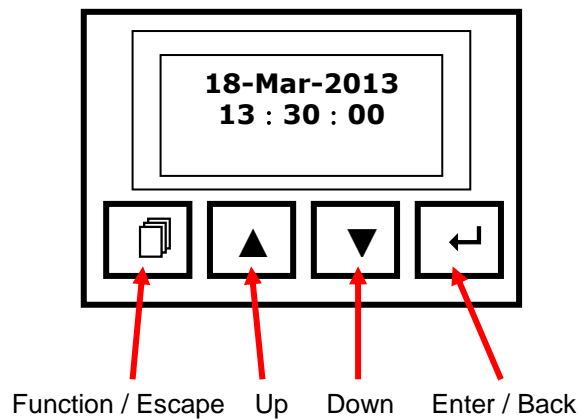
Battery Switch. Later models (post serial number 1013301) of the Smoke Screen have a switch in the battery compartment to permit the batteries to be disconnected from the system whilst remaining in place. The delivery setting is “Off”; select to “On” if intending to use the battery facility.









THE SMOKE SCREEN WILL NOT FUNCTION AT ALL DURING A MAINS POWER FAILURE IF THE BATTERIES ARE DISABLED.





PROGRAMMING




















The S70 LCD Display and operating buttons



LCD illumination. The LCD backlight automatically extinguishes after 1 minute of inactivity; pressing any button illuminates the backlight.

Setting the time and date. In the Smoke Screen Status or Current Time display press and hold  for 3 seconds until the date and time are shown with the Day flashing. Use the  and  buttons to change the value.  saves a change and moves to the next parameter and  returns to the previous parameter without saving any change. Repeated presses of  will return the display to the higher level menu.

Accessing information and setting variable parameters. In the Smoke Screen Status or Current Time display press  to access the variable parameters. Use the  and  buttons to scroll through the available functions and  to select items to change/view each one as follows:

- **Event Log.** In the “Event Log” display press  to show the latest event and the time of that event. Use the  and  buttons to scroll through the event log. Pressing  will return the display to the higher level menu. Events recorded are as per the Section “LCD, LED and Sound indications”.
- **Setting Smoke Time.** In the “Setting Smoke Time” display press  to show the current smoke time set. Use the  and  buttons to move up and down to select a time between 5 and 360 seconds in 5 second intervals. Press  to save the new setting and return to the higher level menu. Press  to return to the higher level menu without saving changes. The delivery Smoke Time Setting is “5 seconds”.
- **Setting Fluid Capacity.** In the “Setting Fluid Capacity” display press  to show the current fluid capacity set. Use the  and  buttons to move up and down to select 500ml, 1000ml or 5000ml. Press  to save the new setting and return to the higher level menu. Press  to return to the higher level menu without saving changes. The delivery Fluid Capacity Setting is “1000ml”.
- **Setting Temperature.** This is preset at manufacture and should only be altered by Concept Smoke Screen.
- **Setting Smoke Mode.** In the “Setting Smoke Mode” display press  to show the current smoke mode set. Use the  and  buttons to move up and down to select “Turbo Mode” or “Normal Mode”. Press  to save the new setting and return to the higher level menu. Press  to return to the higher level menu without saving changes. The delivery Smoke Mode Setting is “Normal Mode”.

- **Invert Trigger Mode.** In the “Invert Trigger Mode” display press ← to show the current trigger mode set. Use the ▲ and ▼ buttons to move up and down to select “N/O Mode” or “N/C Mode”. Press ← to save the new setting and return to the higher level menu. Press ↵ to return to the higher level menu without saving changes. The delivery Trigger Mode Setting is “N/C Mode”.
- **Enable / Disable Battery.** In the “Enable / Disable Battery” display press ← to show the current battery setting. Use the ▲ and ▼ buttons to move up and down to select “Disable” or “Enable”. Press ← to save the new setting and return to the higher level menu. Press ↵ to return to the higher level menu without saving changes. The delivery Battery Setting is “Enable”. NB: the function of the battery switch as described in the “Battery Management” Section.
- **Enable / Disable ESM (Energy Saving Mode).** In the “Enable / Disable ESM” display press ← to show the current ESM setting. Use the ▲ and ▼ buttons to move up and down to select “Disable” or “Enable”. Press ← to save the new setting and return to the higher level menu. Press ↵ to return to the higher level menu without saving changes. The delivery ESM Setting is “Disable”.

OPERATION

While the Smoke Screen is heating up the LCD display will show “Heating up” and the LED indicator will be Yellow. If any of the access panels are open “Tamper Fault” will be displayed on the LCD and the LED indicator will flash yellow once every 5 seconds; a tamper indication will not, on its own, prevent the Smoke Screen from producing smoke. When the Smoke Screen reaches the correct working temperature, and a full Smoke Fluid Bag has been correctly installed, the LED Indicator will go Green and the LCD Display will show the date and time.

Stopping smoke. If the ‘Hold-Off’ is closed during an activation the Smoke Screen will continue to produce smoke for the set Smoke Time. An activation can only be stopped by closing the ‘Alarm Set’ and/or the ‘Trigger’.

Re-triggering smoke (Hold-off attached). If, after it has made smoke for the preset time, the Smoke Screen receives another hold-off alarm with open ‘Alarm Set’ and ‘Trigger’ inputs it will ‘re-trigger’ and make smoke again.

TESTING

Full alarm test. Where possible a full alarm test should be conducted to check that all inputs, outputs and wiring connections to the Smoke Screen are correct. If a PIR or other detector is fitted the Smoke Screen will fire for the designated Smoke Time period once the ‘Alarm Set’, ‘Trigger’ and ‘Hold Off’ (if fitted) contacts are open. It will stop producing smoke if the ‘Alarm’ or ‘Trigger’ contacts are closed.

Smoke Screen stand-alone test. The Smoke Screen can be tested when it is ready to operate (indicated by a steady green LED) and it is not in “Service Mode” by pressing the button on the PCB marked “PB1”. This produces smoke only whilst the button is pressed. **NB: this does not check that the inputs and connections to the Smoke Screen are correct.**

LCD, LED AND SOUND INDICATIONS

The Smoke Screen provides onboard status monitoring via an LCD, a multicolour LED and a sounder. Indications displayed are:

LCD Message	LED Colour	Buzzer Sound	Relay status change	Indication Meaning
Heating up	● permanent.	Nil.	Nil.	Smoke Screen heating to operating temperature.
Heating Completed	● permanent.	Nil.	Nil.	Smoke Screen ready to operate.
Charging Battery	●● flash once every 5 sec.	Nil.	Nil.	Battery charging.
Alarm Set	● permanent.	Nil.	Nil.	Smoke Screen has received a "Set" input from the Alarm Panel.
--	● flash.	1 beep every 0.5 sec.	Verification output n/c to open.	Smoke Screen producing smoke.
Thermal Fault	● permanent.	1 long / 3 short beeps every 3 mins.	Status output n/c to open.	Temperature too high or sensor failure.
Heater Fault	●● flash once every 5 sec.	1 long 2 short beep every 3 min.	Status output n/c to open	Smoke Screen not heating at the correct rate within 30 min of power on.
Empty Fluid	●● flash once every 5 sec.	1 long beep every 3 min.	Liquid output n/c to open. Status output n/c to open.	Fluid less than 10ml or no Bladder installed.
Low Fluid	●● flash once every 5 sec.	1 short beep every 5 min.	Liquid output n/c to open.	Fluid less than 50%.
Battery Fault	●●● flash once every 5 sec.	3 short beep every 5 min.	Battery output n/c to open.	Battery lower than 18V or battery removed > 2 min.
Tamper Fault	● flash once every 5 sec.	2 short beep every 5 min.	Tamper status n/c to open.	One or more of the access panels, or the external tamper if dip set to "off", are open.
Mains Fault	● flash once every 5 sec.	1 long 1 short beep every 3 min.	Status output n/c to open.	Main power failure.
System Fault	Any	Any	Status output n/c to open.	Critical system fault.
Service Mode Setting	●● alternate flash.	Nil.	Nil.	Smoke Screen in Service Mode.

Once resolved, fault indications can be cleared by removing and restoring all power, mains and battery, from the Smoke Screen.

ACTION AFTER EVERY ACTIVATION

- Wait until the smoke production has ceased. **Do not try to enter the affected area as you will not be able to see through the fog.**
- Look for signs of forced entry. If you find any, or you believe that intruders are on the premises, call the Police and wait for them to arrive. **Take no further action.**
- Where there are no signs of forced entry, open all external doors and wait for the fog to start clearing – this may take 10 to 15 minutes. Keep watch for intruders that may have been screened by the fog.
- As visibility returns open more doors or windows to speed up the venting process.
- Check the fluid level for the Smoke Screen by checking the appropriate LEDs as described above. It is recommended that the installer or Concept Smoke Screen are requested to service/replenish the Smoke Screen if there have been 2 or more activations of the Smoke Screen.

SERVICING AND FLUID REPLENISHMENT

Please note that it is a requirement of the standards relating to security fogging devices the Smoke Screen is serviced/replenished by an engineer certified by the manufacturer. If you are unsure, ask the engineer for his certification ID card. It is recommended that the Smoke Screen is checked and the fluid changed annually by the installer or Concept Smoke Screen. Always ensure that the Smoke Screen has sufficient fluid or it will not produce smoke when needed. It is recommended that the installer or Concept Smoke Screen are requested to service/replenish the Smoke Screen if there have been 2 or more activations of the Smoke Screen.

WARNING - only Smoke Screen fluid should be used as other smoke fluids may cause damage or noxious fumes.

FAQ

Q: The Smoke Screen is indicating it is ready to operate but does not respond to a full alarm test.

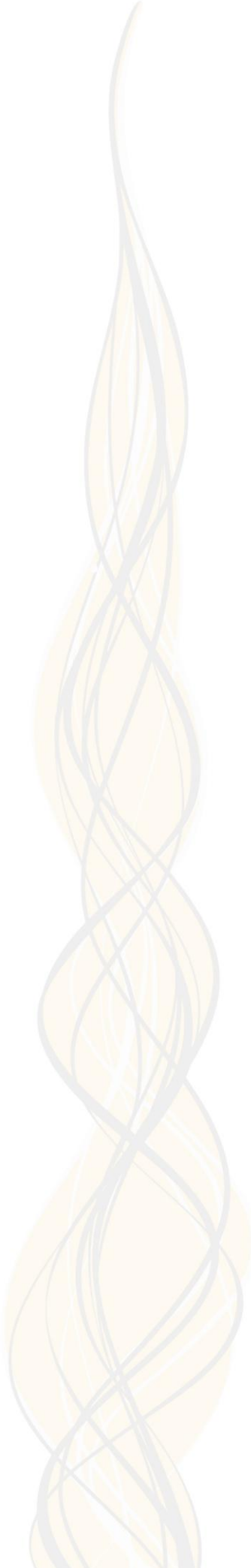
A: Ensure “Service Mode” is disabled.

A: With power applied, and keeping clear of the smoke nozzle, disconnect the “Alarm”/“Trigger” and “Hold Off” connection plugs from the PCB. If the Smoke Screen produces smoke there is a miss-connection in the system wiring.

Q: The Smoke Screen is puffing out smoke whilst heating up.

A: This is the result of very small amounts of air and residual fluid in the heater block being changed into an insignificant volume of smoke and can happen particularly after the Smoke Screen has been moved about when cold.

INSTALLER NOTES





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