

**Warning**

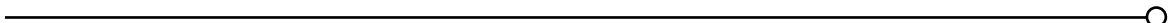
The NEX7250 System described herein operates on a logic voltage of 24VDC and as standard 24VDC is used for the field contact supply voltage. External power supplies using higher voltage AC/DC primary sources and optional high voltage field contact voltages may be present if this is the case please ensure the necessary precautions are taken.

REV	DATED	DESCRIPTION	AUTHOR	APPROVED
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## CONTENTS

<b>Section</b>	<b>Description</b>	<b>Page</b>
<b>1</b>	<b>Introduction</b>	<b>6</b>
<b>2</b>	<b>Installation Guide</b>	<b>7</b>
<b>3</b>	<b>Front View Examples</b>	<b>8</b>
<b>4</b>	<b>NEX7250 Enclosure</b>	<b>9</b>
	4.1 General	
	4.2 Panel Mount	
	4.3 Wall Mount	
	4.4 Alarm Connections	
	4.5 Relay Connections	
	4.6 External Power Supply	
	4.7 Certification	
	4.8 Labelling	
	4.9 Documentation	
<b>5</b>	<b>P725 Description And Features</b>	<b>12</b>
	5.1 General	
	5.2 Window Colours	
	5.3 Laser Printed Legends	
	5.4 Adding Or Changing Film Legends	
	5.5 LED Illuminations	
	5.6 Window Numbering	
	5.7 Alarm Card Types	
	5.8 Pushbutton/Programming Module	
	5.9 Pushbutton/Programming Module Options	
	5.10 Fully Field Programmable	
	5.11 Sleep Mode	
	5.12 Automatic Mute or Automatic Acknowledge	
	5.13 Integral Audible Alarm	
	5.14 Remote Pushbutton Inputs	
	5.15 Terminations	
	5.16 Failsafe Mode	
<b>6</b>	<b>Inputs</b>	<b>20</b>
	6.1 Optically Coupled Inputs	
	6.2 Standard Input Configurations	
	6.3 Signal Supply Voltage	
	6.4 Input Time Delay- options AD1, AD2, AD3	
	6.5 Input Wiring Segregation	
	6.6 No Master Module	
<b>7</b>	<b>Outputs</b>	<b>22</b>
	7.1 Common Outputs	
	7.2 Critical Horn Relay – HNA	
	7.3 Non-Critical Horn Relay – HNB	
	7.4 Critical Group Relay – GPA	
	7.5 Critical Group Relay – GPB	
	7.6 Reflash Critical Group Relay – GPA	
	7.7 Reflash Non-Critical Group Relay – GPB	
	7.8 Common Relay Function Codes	
	7.9 Multi-Function Relay Operating Modes	

<b>Section</b>	<b>Description</b>	<b>Page</b>
<b>8</b>	<b>Technical Specifications</b>	<b>25</b>
	8.1 General	
	8.2 Fuse Details-SPR Module	
	8.3 Suitable Power Supplies	
	8.4 P725 Annunciator Standard Versions	
	8.5 P725 Annunciators Fitted With The Repeat Relays Per Channel Option	
<b>9</b>	<b>Mechanical Details</b>	<b>27</b>
	9.1 Panel mounting Clamps	
<b>10</b>	<b>Alarm Sequences</b>	<b>28</b>
	10.1 Summary	
	10.2 Audible Alarm Grouping	
	10.3 Ringback Audible	
<b>11</b>	<b>Additional Features</b>	<b>29</b>
	11.1 Automatic Reset	
	11.2 Non-Latch Sequence (No Lock-In)	
	11.3 Reflash Feature	
	11.4 Ringback Sequence	
	11.5 Two Pushbutton Operation	
	11.6 First-Up Sequences	
<b>12</b>	<b>Sequence Configuration and Tables</b>	<b>30</b>
	12.1 Manual Reset                      ISA-Sequence M	
	12.2 Automatic Reset                  ISA-Sequence A	
	12.3 Non Lock-In Function           ISA-A-4 Sequence	
	12.4 Ringback                           ISA-R Sequence	
	12.5 Automatic Reset First-Up       ISA-F1A Sequence	
	12.6 Manual Reset First-Up          ISA-F2M-1 Sequence	
	12.7 Manual Reset First-Up          ISA-F3-A Sequence	
<b>13</b>	<b>Options</b>	<b>40</b>
	13.1 General	
	13.2 LED Assemblies                   Option LED	
	13.3 Tropicalised                       Option TRO	
	13.4 Individual Channel Repeat Relay   Option RLY	
	13.5 Individual Channel with Dual Relays   Option RL2	
	13.6 Customer Specified Response Time   Option CRT**	
	13.7 Adjustable Response Time          Option AD1-AD3	
	13.8 Disable Integral Horn               Option DHN	
	13.9 RS485 Serial Communications       Option COM	
	13.10 Individual Channel Repeat Relays Powered By The Field Contact Voltage   Option RAV	
	13.11 Three Horn Relay Outputs          Option 3HN	
	13.12 Three Group Relay Outputs        Option 3GP	
	13.13 Repeat pushbutton Outputs         Option RPB	
	13.14 Group Relays Follow Inputs         Option GFI	
	13.15 Additional Group Relay Contact    Option 2GA or 2GB	
	13.16 Total Group Relay Contact         Option RTG	
	13.17 SPR Module (Supply-Pushbuttons-Relay Module)	
	13.18 Logic Power Connection	
	13.19 Signal Supply Voltage Connection	
	13.20 Common Horn/Group/Multi-Function Relay & Remote Pushbutton Connection	

<b>Section</b>	<b>Description</b>	<b>Page</b>
<b>14</b>	<b><i>NEX7250 Connection Details</i></b>	<b>44</b>
<b>15</b>	<b><i>Large Window Alarm Module Wiring</i></b>	<b>46</b>
	15.1 Standard Unit Without Repeat Relay Facility	
	15.2 Optional Unit With Repeat Relay Facility	
	15.3 Large Window Version Fitted With An Odd No Of Alarms	
	15.4 Standard Unit Without Repeat Relay Facility	
	15.5 Optional Unit With Repeat Relay Facility	
<b>16</b>	<b><i>Medium Window Alarm Module Wiring</i></b>	<b>48</b>
	16.1 Standard Version Without Repeat Relay Facility	
	16.2 Optional Version with Repeat Relay Facility	
<b>17</b>	<b><i>Small Window Alarm Module Wiring</i></b>	<b>49</b>
	17.1 Standard Version Without Repeat Relay Facility	
	17.2 Optional Version With Repeat Relay Facility	
<b>18</b>	<b><i>Dual Repeat Relay Version</i></b> Option RL2	<b>50</b>
<b>19</b>	<b><i>Signal Supply Voltage Options</i></b>	<b>51</b>
	19.1 Standard Systems With Combined Logic & Signal Power	
	19.2 Standard Systems Using Externally Powered Inputs	
	19.3 Higher Voltage Direct Powered Inputs	
<b>20</b>	<b><i>Systems With Serial Communication Option</i></b>	<b>53</b>
	20.1 Connection Details	
<b>21</b>	<b><i>System Configurations And Programming</i></b>	<b>54</b>
	21.1 Programming Mode	
	21.2 Changing A Function Setting	
	21.3 Programming Example	
	21.4 Checking Programmed Settings	
	21.5 Systems With Unarmed Ways	
	21.6 Points To Note When Programming	
<b>22</b>	<b><i>Function No Key &amp; Description</i></b>	<b>57</b>
<b>23</b>	<b><i>Function Descriptions</i></b>	<b>58</b>
<b>24</b>	<b><i>Alarm Card Address &amp; Output Drive Settings</i></b>	<b>64</b>
	24.1 Selecting Output Drive To Lamp Or LED	
	24.2 Address Setting Key	
<b>25</b>	<b><i>Adjustable Response Time</i></b>	<b>69</b>
<b>26</b>	<b><i>Systems With Serial Communications</i></b>	<b>70</b>
<b>27</b>	<b><i>Serial Communication Card Details</i></b>	<b>72</b>
<b>28</b>	<b><i>Serial Communication Port Details</i></b>	<b>74</b>
<b>29</b>	<b><i>Systems Linked To 3<sup>RD</sup> Party Devices</i></b>	<b>78</b>
<b>30</b>	<b><i>P725 to P725 Serial Links</i></b>	<b>79</b>
<b>31</b>	<b><i>Commissioning</i></b>	<b>80</b>
<b>32</b>	<b><i>Maintenance</i></b>	<b>81</b>
<b>33</b>	<b><i>Spare Parts</i></b>	<b>82</b>
<b>34</b>	<b><i>Other RTK Products</i></b>	<b>83</b>
<b>35</b>	<b><i>Function Setting Key Per Alarm Sequence</i></b>	<b>84</b>

# 1. Introduction

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The NEX7250 combines the RTK 725 Series Alarm Annunciator installed in a IP rated enclosure and self certified to comply with the European standard BS EN 50021:1999. The Safety parameters of the unit are identified as EEx nA [L] IIC T4, with an ambient temperature range of -20°C to +50°C. The IP rated enclosure is available in two forms: A wall mount IP65 rated enclosure or a panel mount IP54 rated enclosure.

Each NEX7250 comes with its own certificate and scheduled report that goes through the BS EN 50021:1999 step by step. This allows the unit to be customer specified, giving the customer a wide range of options that are covered in this manual.

The annunciator is manufactured from universal cells, each 60 x 60mm, which can be assembled in an array to provide the number of rows and columns required to suit individual panel designs.

Each cell within the annunciator is able to contain either: - ONE large, TWO medium or FOUR small alarm windows, which can be illuminated by “fit and forget” LED assemblies.

The assembled unit is fully field programmable which allows the user to enable a number of pre-defined features to control the operation of the annunciator with regards to alarm sequence, horn groups, common alarm groups or optional Modbus communications.

Selection of features is on a per channel basis with no special tools or programming knowledge required. All programming is carried out from the front of the unit using the integral pushbutton / programming module, which allows changes to be easily made during commissioning or at a later date after the equipment has been installed.

Large and medium window version alarm cards are fully interchangeable within the annunciator, on small window versions an additional card type is used for the 2<sup>nd</sup> pair of alarm channels but cards of the same type remain fully interchangeable.

Reliability of operation is increased over conventional annunciators as each alarm card is fitted with its own application specific integrated circuit (ASIC), which is capable of complete system control. During initial power up one of the alarm cards will automatically act as a master controller with regards to flash rates etc and in the event that this card fails or is removed another card will automatically take over the role of master controller.

The standard unit is supplied with five integrally mounted common output relays, which are used to provide 2 horn relay outputs, 2 group relay outputs and a multifunction relay output with programmable function.

Additional options exist for more complex requirements including integrally mounted signal duplicating relays on a per channel basis, bi-directional RS485 serial communications link and user selectable time delays on each channel.

Accessibility for normal maintenance, LED changes, legend/filter changes and programming is accomplished from the front of the panel without the use of special tools.

**PLEASE NOTE WHEN INSTALLED UNIT MUST BE DE-ENERGISED BEFORE THE NEX7250 ENCLOSURE DOOR IS OPENED**

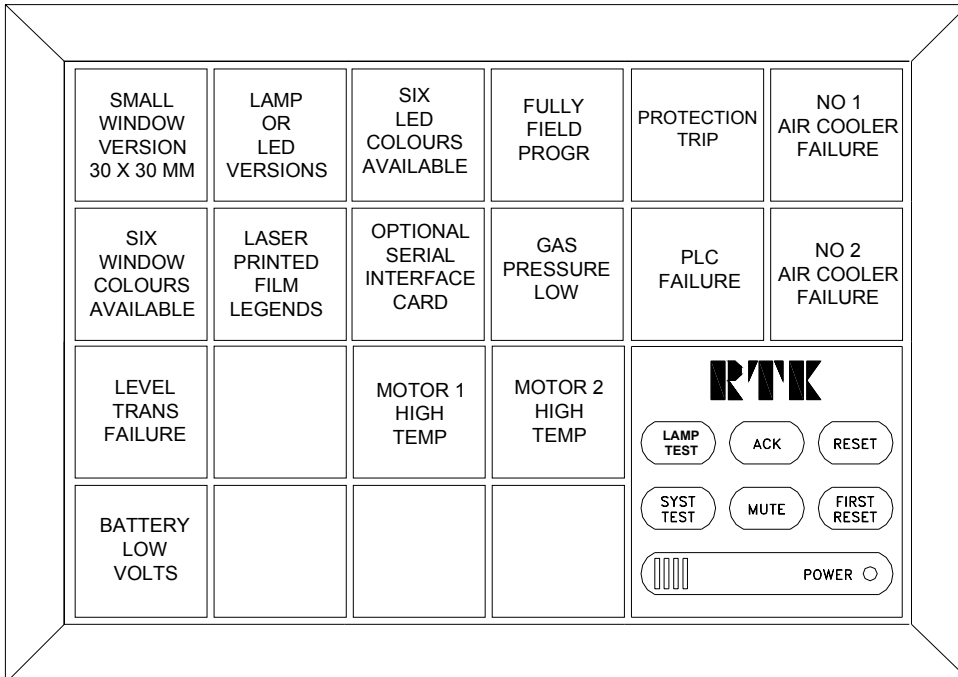
## 2. Installation Guide

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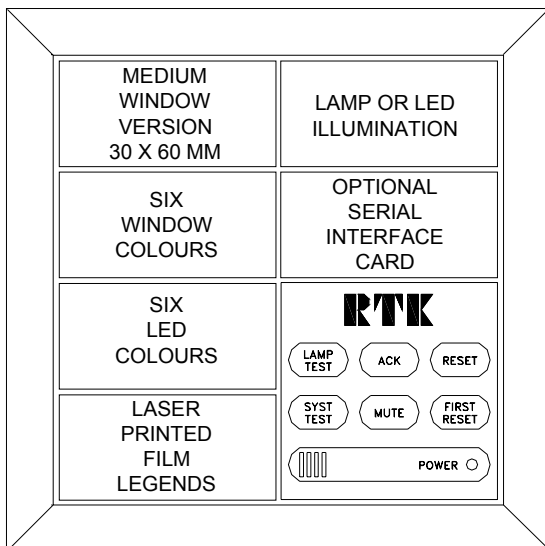
This product has been certified to be mounted in a zone 2 (equipment category 3) hazardous area. There are various requirements that need to be met in order for this equipment to be used safely. These requirements are as follows:

1. The IP rating of the enclosure should not be compromised when mounted or when inserting the cable glands
2. All external earthing should use 4mm cable as a minimum
3. The earth of the enclosure should be connected to the main plant earth to prevent electric shock
4. The earth points of the zener barriers should be connected to a dedicated high integrity earth intended for intrinsically safe equipment. (This earth may be omitted)
5. If fused terminals are used, the fuses should have a label giving type and rating. Fuses should not be replaced with the power connected as this may cause sparks, which could potentially cause explosions.
6. Voltage and currents connected to relay terminals MUST NOT be allowed to exceed the values given in the standards BS EN 50021:1999 Annex A. This may be achieved by the use of a zener barrier, galvanic isolator or by an energy-limited supply. Failure to comply with this requirement may cause sparking of the relay contacts.
7. If relays are used with the RTK energy limited terminals (DK4-RZ-300R-24), the customer must connect to the 'NO' terminal with the positive supply (28V maximum). This supply (if external) must be fused with an in-line fuse of 50mA. The R\* terminal will then be connected to the positive terminal of the customers apparatus and the negative of the customers apparatus must be connected to the 0V of the power supply.
8. Cables must be clamped in cable glands and must pass the pull tests with the following forces – 10 times the value in millimetres of the diameter of the cable, with a minimum of 100N, when the cable entry is designed for circular cable; or 3 times the value in millimetres of the perimeter of the cable, with a minimum of 100N, when the cable entry is designed for non-circular cable
9. If multi-core cables are used, these must not contain non-intrinsically safe and intrinsically safe circuits within the same multi-core cable.
10. Any external equipment connected outside the enclosure but still within the Zone 2 area must meet BS EN 50021:1999 requirements.

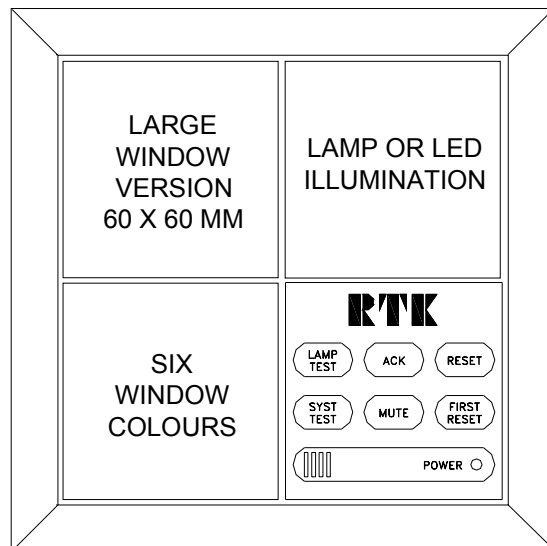
### 3. Front View Examples



**Small Window Version**



**Medium Window Version**



**Large Window Version**



## 4. NEX7250 Enclosure

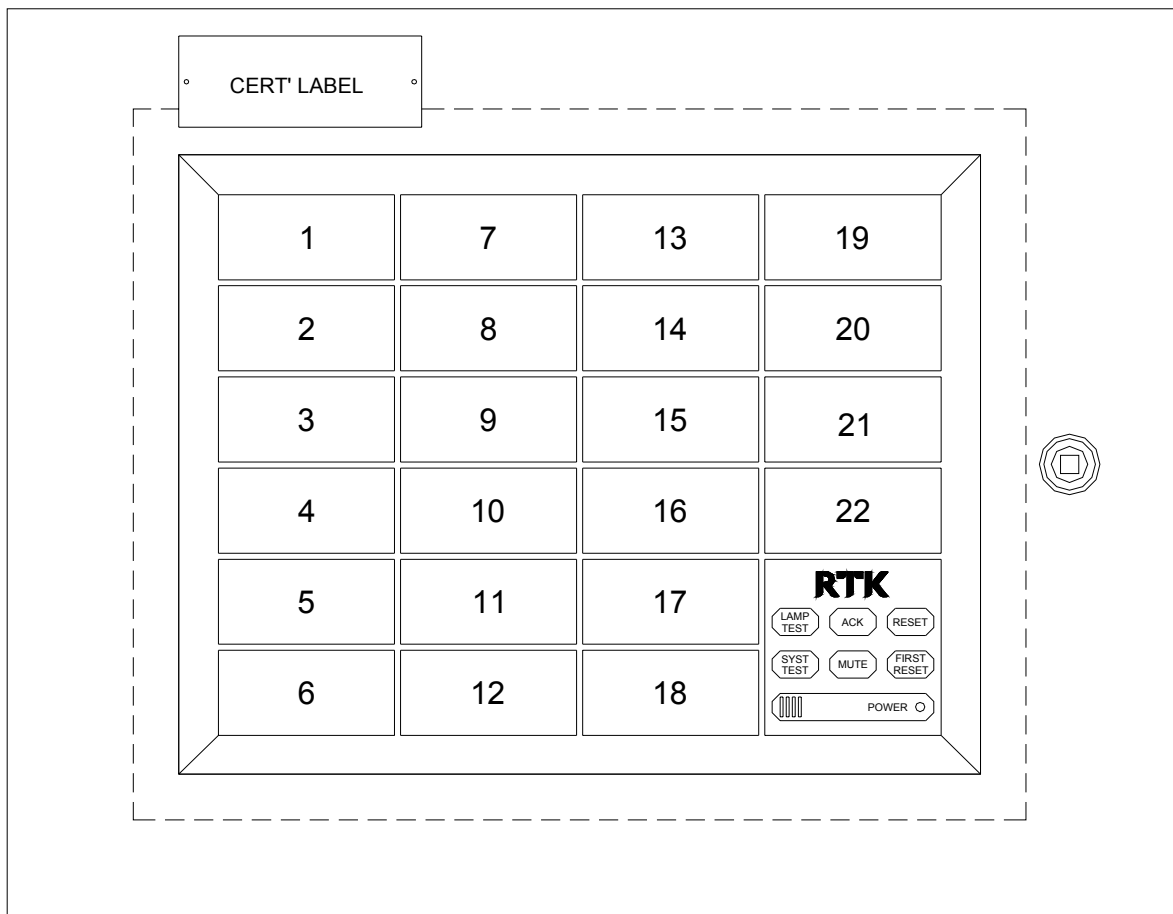
### 4.1 General

The NEX Systems are manufactured to meet individual customer's requirements as long as they meet BS EN 50021:1999.

### 4.2 Panel mount

The panel mount version consists of an IP54 rated stainless steel door with a Perspex viewing window, the 725 unit is then mounted in an IP54 rated box which is mounted in the viewing window. The size of this enclosure is depended on the cell size of the annunciator, but as long as the box doesn't exceed the minimum size the customer can specify their size of enclosure required.

#### Layout of panel mount box

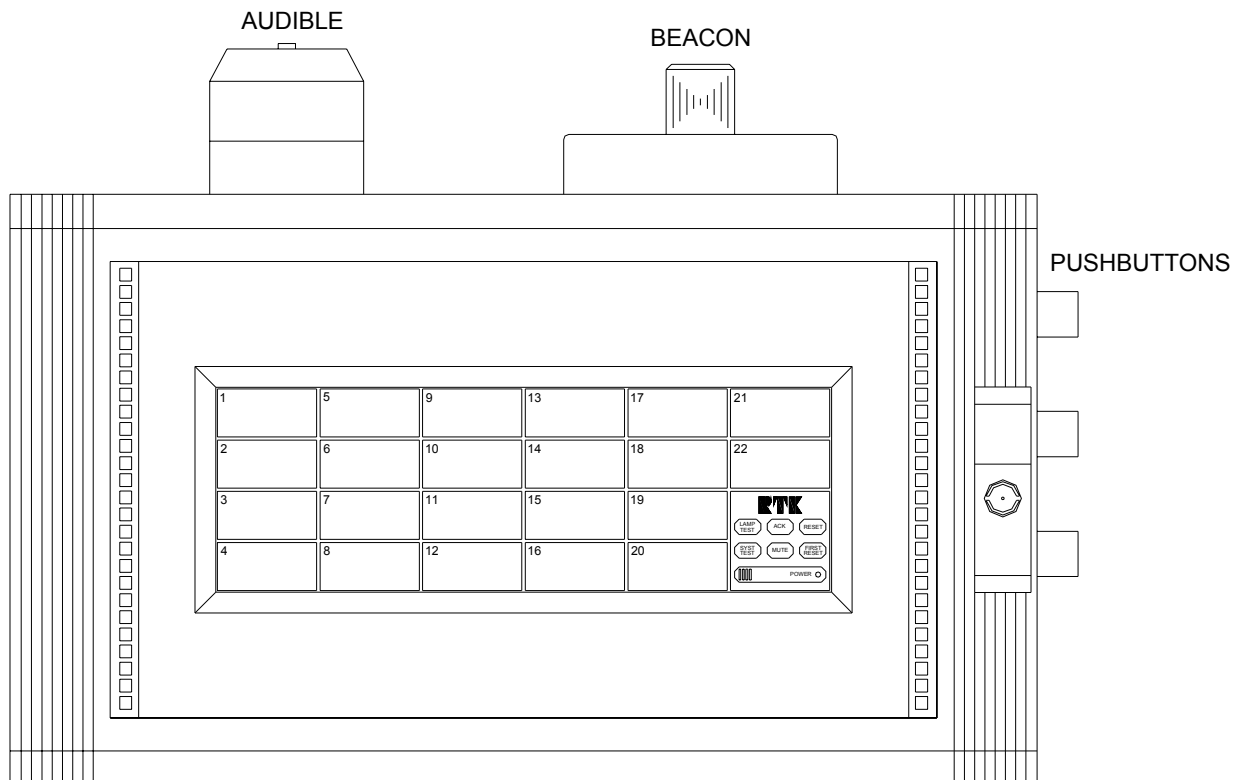


This type of NEX7250 allows the user to connect external pushbuttons which can then be mounted in a suitable control panel. If this panel is situated in the Zone 2 area, zone 2 certified pushbuttons must be used. The customer may also incorporate a Zone 2 isolator into the enclosure to allow them to drive an external I.S horn.

### 4.3 Wall Mount

The wall mount version consists of an IP65 rated box with an IP65 rated viewing window. The 725 unit is then mounted in an IP54 rated box which is mounted in the viewing window. The enclosures used are manufactured externally so the size of the unit is dependent of the sizes available from the manufacturer. The wall mount version has the external pushbuttons mounted on the enclosure and also gives the option for audible and visual devices to be mounted to the enclosure. It is also possible to mount the customer power supply within the enclosure.

#### Layout of Wall mount box



### 4.4 Alarm connections

Due to the type of application the NEX7250 is used in the user may connect their alarms from any zone. If these alarms are associated with a hazardous area suitable protection must be used.

For connections to a safe area it is recommended fused terminals are used, either in the enclosure or from the area in which they are coming from.

If fused terminals are used the correct type and value and type of fuse shall be shown on a label next to the fuse holder. A warning label will also be present stating **DO NOT REMOVE FUSE WHEN ENERGISED**.

### 4.5 Relay connections

Because of the certification type used for the NEX7250 all relays within the 725 must via suitable energy limited terminals, this includes both group and repeat relays.

#### 4.6 External power supply

If the customer is mounting the power supply externally, but still within the Zone 2, a certified power supply must be used.

#### 4.7 Certification

The NEX7250 is self-certified to EEx nA [L] IIC T4 (where [L] is for associated apparatus connected to the relays) conforming to BS EN 50021:1999. The [L] shows that the unit contains relays which could cause sparking in normal operation. To combat this the relays must be connected to energy limiting terminals. To conform to the standard the unit must contain the following information.

Name of manufacturer or his registered trade mark – RTK Instruments Limited

Manufacturers type identification – NEX7250

Marking – EEx nA [L] IIC T4 (where [L] is for associated apparatus connected to the relays)

Ambient temperature range – Tamb -20°C to 50°C

A serial number or batch identification code

The name or mark of the organisation that issues the certificate and the number of the certificate

The year in which the equipment was constructed.

Hexagon followed by equipment group and category (II 3 G) group II category 3 gas (G)

CE marking - CE marking shall be no less than 5mm high and shall be followed by the identification number of the notified body involved in the production control phase. As this product is self-certified and no authorised body has had any involvement, the CE mark should not be followed by any numbers whatsoever.

Group II category 3G is subject to internal control of production (annex VII) without the necessity to lodge a design dossier with a notified body.

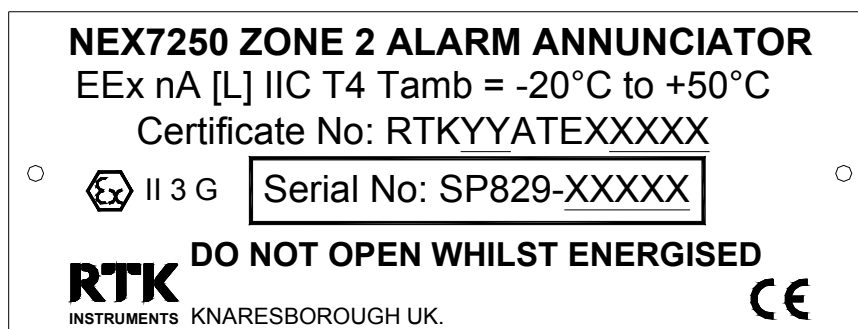
#### 4.8 Labelling

The following labels will be mounted inside the enclosure:

1. Relays **MUST** be connected via an energy-limited supply **ONLY**. (see installation instructions)
2. High integrity dedicated earth for intrinsically safe apparatus **MUST** be connected to barriers
3. Enclosure earthing **MUST** be connected to normal installation plant earth

If fused terminals or fuses are used, the correct type and value of fuse shall be shown on a label next to the fuse holder. A warning label will also be present stating **DO NOT REMOVE FUSE WHEN ENERGISED**

A certification label must also be present on the front of the unit as shown below:



#### 4.9 Documentation

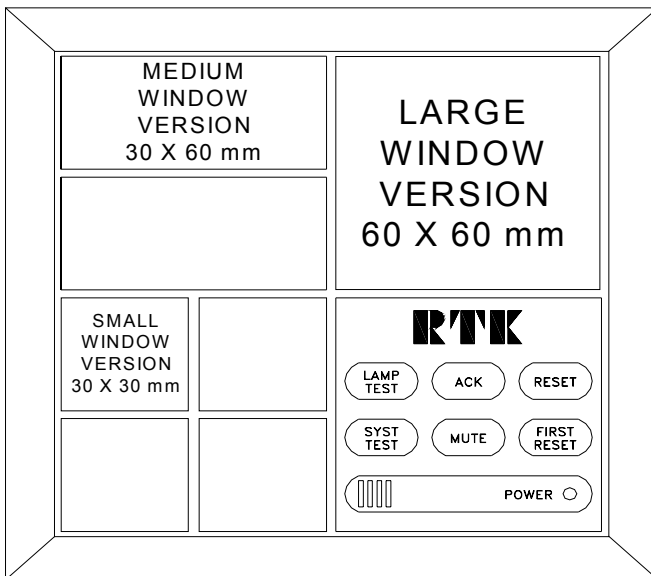
All NEX7250 systems will be supplied with their own Certificate along with the complete test report detailing the system conforming to BS EN 50021:1999.

## 5. P725 Description and Features

### 5.1 General

Annunciators are manufactured to meet individual customer's requirements using separate "cells" which can be assembled in configurations from 1 to 16 cells high and 1 to 16 cells wide as required. The finished array is "picture framed" using standard lengths of aluminium extrusion. Individual alarm channels can be displayed in one of three sizes as shown below

#### Large, Medium & Small Window Sizes



### 5.2 Window Colours

Each channel is equipped with its own removable lens assembly, which contains a white diffuser, coloured filter and a laser printed film legend.

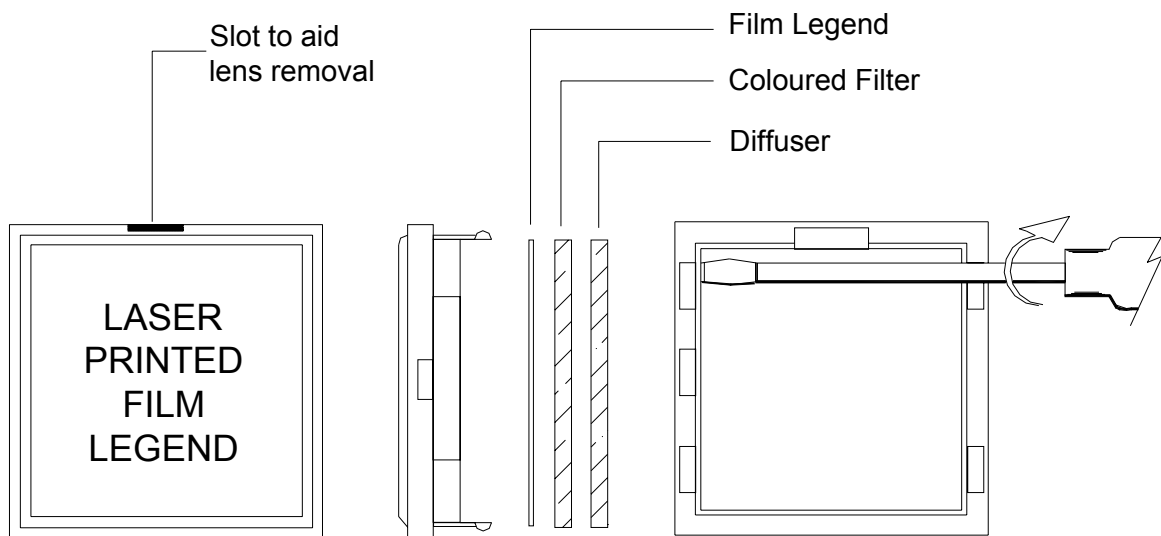
<b>Part</b>	<b>Small Window</b>	<b>Medium Window</b>	<b>Large Window</b>
White Diffuser	ID-SLC-3PF-WH	ID-SLC-3PH-WH	ID-SLC- 3PG-WH
Clear filter (for white windows)	ID-SLC-3PF-WH	ID-SLC-3PH-WH	ID-SLC- 3PG-WH
Red filter	ID-SLC-3PF-R	ID-SLC-3PH-R	ID-SLC- 3PG-R
Amber filter	ID-SLC-3PF-A	ID-SLC-3PH-A	ID-SLC- 3PG-A
Yellow filter	ID-SLC-3PF-Y	ID-SLC-3PH-Y	ID-SLC- 3PG-Y
Blue filter	ID-SLC-3PF-B	ID-SLC-3PH-B	ID-SLC- 3PG-B
Green filter	ID-SLC-3PF-GD	ID-SLC-3PH-GD	ID-SLC- 3PG-GD

### 5.3 Laser Printed Legends

Laser printed film legends are easily generated, from within Microsoft Excel, in a font style and size to suit individual applications. A software template is available, free of charge from RTK, which allows the user to produce film legends locally if required. Completed film legends are located between the clear front lens of the removable window assembly and the associated coloured filter and diffuser.

#### 5.4 Adding Or Changing Film Legends

Each lens assembly has a small slot in the upper ridge of the surround bezel, which allows a flat blade terminal screwdriver to be used to gently lever the assembly forward. Once the assembly has been removed the diffuser, coloured filter and film legend can be accessed using a flat blade screwdriver to gently lever the lens clear of the associated parts as indicated in the diagram below. This MUST be levered on the side NOT the top or bottom



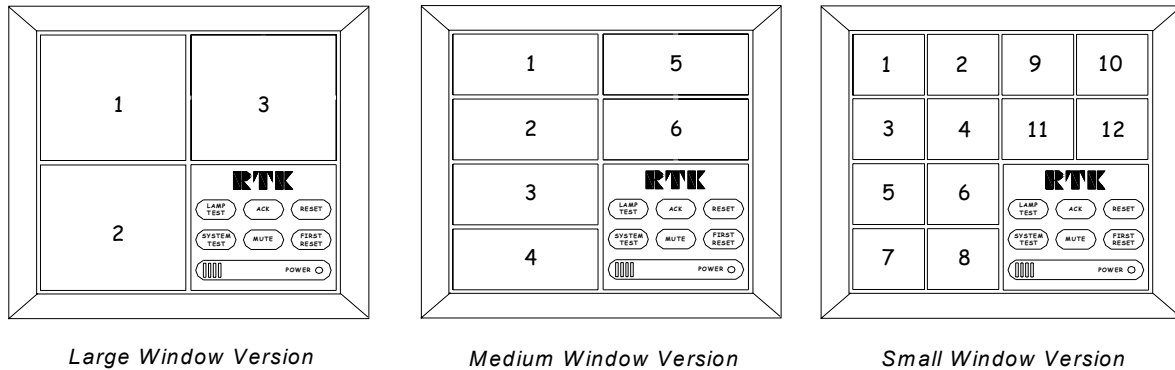
#### 5.5 LED Illumination

All units are suitable for "fit and forget" LED assemblies part no. P725-LED-\*\* specify colour

RD = red,  
 YW = yellow,  
 AM = amber,  
 BL = blue,  
 GN = green,  
 WT = white.

## 5.6 Window Numbering System

RTK have adopted the following window numbering system to aid with the location of the film legend and the associated alarm cards. This method is used to ensure that the legend matches the functions selected for the designated alarm.



## 5.7 Alarm Card Types

There are 4 basic types of dual channel alarm cards

PART NO	DESCRIPTION	USED ON
CB5674POP1	2 Channel alarm card (Without repeat relays)	Large, medium and small window versions Locates in the upper slot of the associated cell
CB5674POP2	2 Channel alarm card (With repeat relay facility)	Large, medium and small window versions Locates in the upper slot of the associated cell
CB5674POP3	2 Channel alarm card (Without repeat relays)	Small window versions Locates in the lower slot of the associated cell
CB5674POP4	2 Channel alarm card (With repeat relay facility)	Small window versions Locates in the lower slot of the associated cell

Alarm cards are plugged into the rear of the annunciator and once inserted automatically connect to a pre-tested passive display motherboard.

## 5.8 Pushbutton / Programming Module

The pushbutton/programming module is located in the bottom right hand corner of the annunciator when viewed from the front unless otherwise specified. It has a power-on LED, integral audible and six pushbuttons to cover all of the possible sequence combinations. The six pushbutton are:- Lamp Test, Functional Test, Mute, Acknowledge, Reset and First Reset

### **5.9 Pushbutton / Programming Module Options**

The pushbutton/programming module is normally integrally mounted within the annunciator however if required it can be supplied as a stand alone item suitable for panel mounting, DIN-rail mounting or wall mounting.

### **5.10 Fully Field Programmable**

In addition to controlling the alarm sequence the pushbutton module is also used as a configuration tool to programme the required features on the annunciator. To access the programming functions the pushbutton fascia must be hinged down to reveal a configuration switch (labelled CONF) located on the inner face of the assembly. Once the unit is in the CONF mode the user is able to enable or disable a range of pre-defined features and options. The dual function pushbutton assembly allows the user to enable any of the 25 embedded features on a per channel basis without having to remove the power to the annunciator or to remove light-boxes, back-planes or alarm cards.

All programmed information is stored in EEPROM, with a minimum 20-year retention, giving repeatability and reliability without the need for battery backup.

Note:- Alarm sequences will operate in accordance with any of the standard sequences defined in the ISA publication "Alarm Sequences and Specifications S18.2 - 1979 (R1985)"

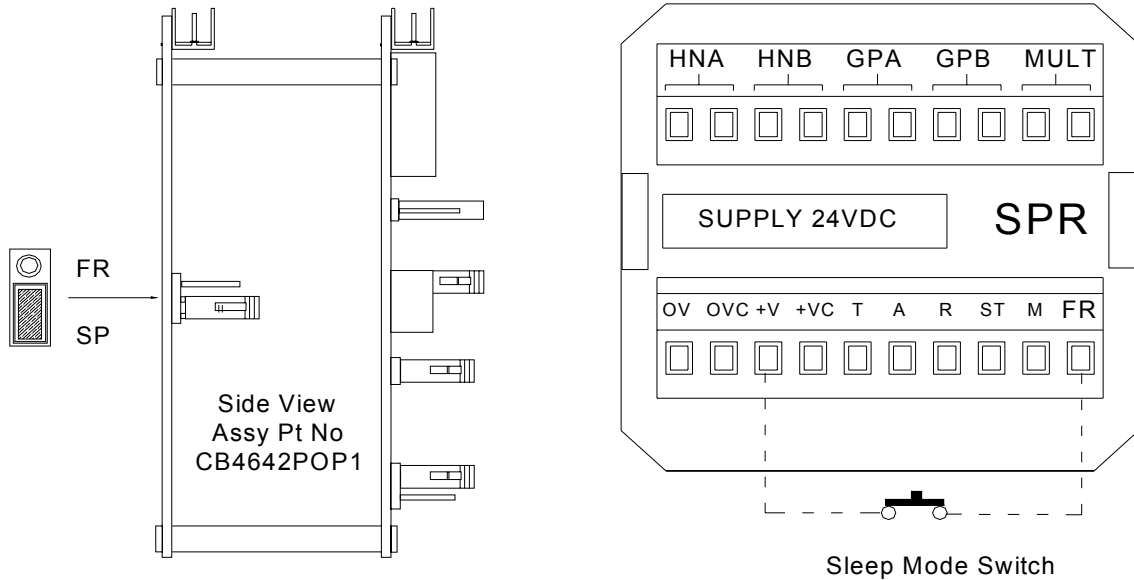
### **5.11 Sleep Mode**

Sleep mode is typically used in sub station applications where the visual and audible outputs are disabled during unmanned periods to reduce the drain on the associated station batteries. Whilst in sleep mode the logic of the annunciator will continue to react in the normal way including the operation of common alarm relays, watchdog relay and optional signal duplicating relays, only the drive signals to the lamp and audible drives are disabled.

Before sleep mode can be enabled a jumper link must be pre-set on the SPR card located inside the pushbutton / programming cell. To gain access to the SPR card first remove the back-plate on the SPR module and then remove the associated circuit card assembly using a flat blade screw driver to gently lever the assembly out using the white nylon pillar. Once the card has been removed locate the 3 pin header marked FR and SP which is located on the lower of the two cards and check that the 2 way shorting bar is in the SP position as shown below. Once the jumper has been placed into the correct position and the card assembly placed back into the annunciator the unit can be set to sleep mode using a remote mounting normally open maintained switch with one side of the switch connected to +V (+24VDC) and the other side of the switch connected to terminal FR located on the rear of the pushbutton / programming cell. Whilst the switch is maintained in the closed position the unit will remain in sleep mode.

Note: - All normal pushbutton functions are inhibited during sleep mode to ensure that the operator can view any alarms that occur as soon as the unit is returned to its normal operational state.

## Sleep Mode Jumper Location

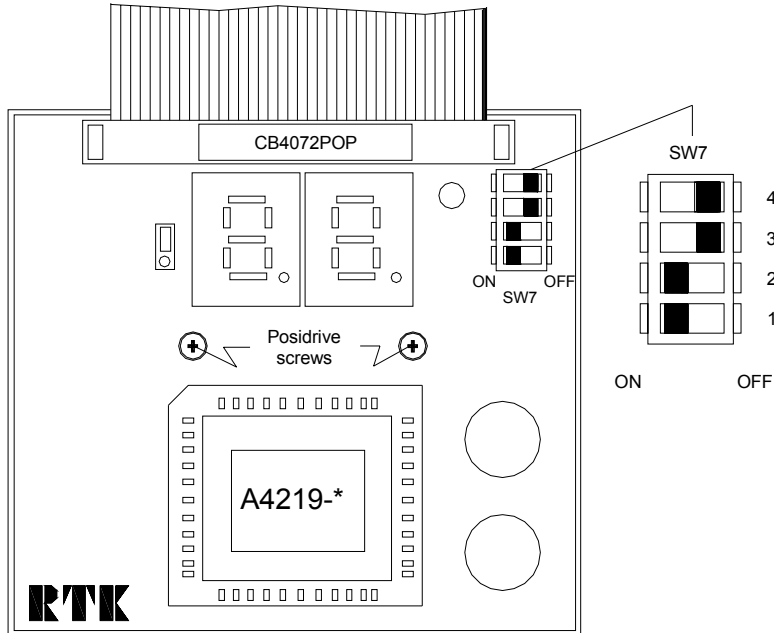


### 5.12 Automatic Mute Or Automatic Acknowledge

Each annunciator is equipped with an integral timer that can be enabled to allow the user to automatically mute or acknowledge alarms after a pre-set time delay. To set the automatic mute or acknowledge feature the pushbutton / programming module must be hinged down by inserting a small flat blade screw driver into the recess on the upper face of the associated surround bezel and gently levering the pushbutton assembly forward to reveal the information plate which is visible on the inside face of the module. The two pozidrive screws and washers in the centre of the plate should be removed to allow access to DIL switch SW7, which is used to set the unit to automatically silence or acknowledge and to set the required time delay.



**Auto Mute / Ack Delay Switch Location** (Information Plate Removed)



**Automatic Acknowledge or Silence Time Selection**

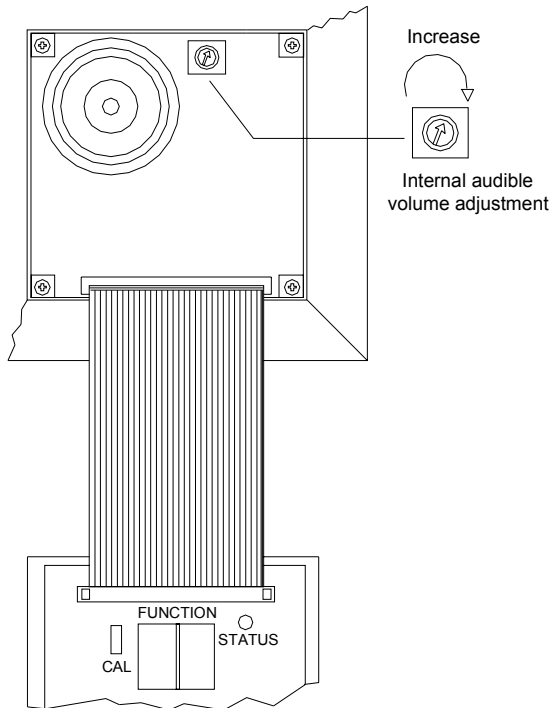
FUNCTION	SW7-1	SW7-2	SW7-3	SW7-4
Automatic acknowledge	ON			UNUSED
Automatic mute	OFF			
Disable automatic timer		OFF	OFF	
Enable 1 minute time delay		ON	OFF	
Enable 4 minute time delay		OFF	ON	
Enable 8 minute time delay		ON	ON	

**5.13 Integral Audible Alarm**

Each annunciator is equipped with an internal 3.5kHz 95dB(A) audible located behind the integral pushbutton module. The audible is supplied with an adjustable volume control using a single turn potentiometer. The potentiometer can be accessed by hinging down the integral pushbutton module using a small flat blade screwdriver in the slot of the surround bezel. The potentiometer is located in the top right hand corner of the cell as shown below. On systems with channels configured to activate either the urgent or non-urgent audible relays it is important to note that the internal audible will only operate on channels set to operate the critical audible relay HNA (see Function F23).

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## ***Integral Horn Volume Adjustment Location***



### ***5.14 Remote Pushbutton Inputs***

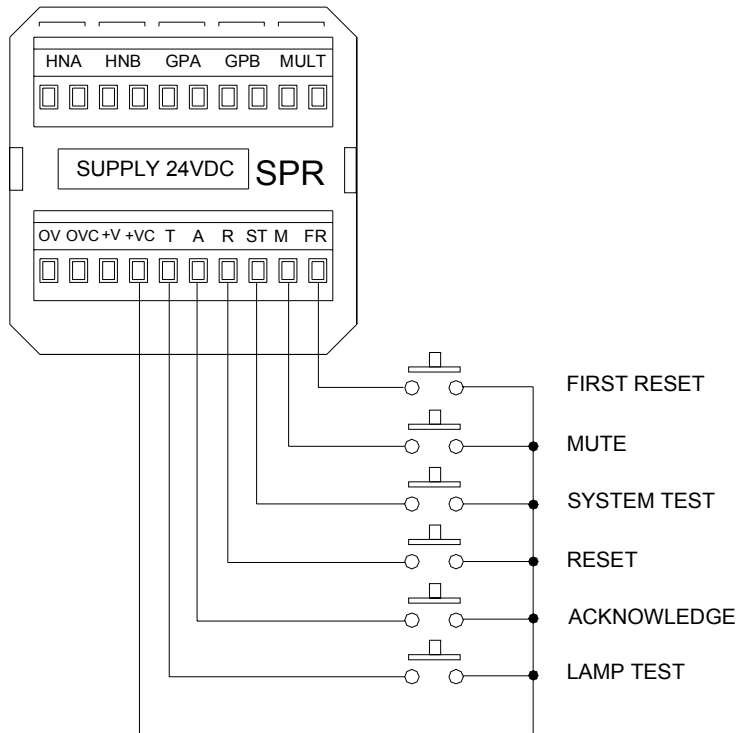
Because the NEX7250 has to be mounted in an IP rated enclosure these pushbuttons will not be accessible in the Zone 2 area. Remote pushbuttons can be connected to the P725 SPR module either in place of or in addition to the integral pushbuttons or to allow multiple annunciators to share common pushbuttons for example a common mute pushbutton mounted in the operator desk console.

The Pushbuttons should be of the Normally Open, Momentary type and it is recommended that if long cable runs are required through electrically noisy environments a screened cable is used with the screen connected to a suitable instrument earth at one end only.

If the pushbuttons are to be located in a classified hazardous area they must be certified for use in that area. We recommend that Pushbuttons are pre mounted or supplied as part of the NEX7250 equipment.

Please note:- When the annunciator is in the configuration mode with the CONF switch in the ON position all integral or remote pushbutton inputs are disabled until the unit has been returned to its normal operating state.

## Remote Pushbutton Wiring



### 5.15 Terminations

All active cells within the annunciator are provided with quick disconnect (2) part pluggable, rising clamp, terminals capable of accepting up to 2.5mm<sup>2</sup> cable. In the unlikely event that a card fails the associated field wiring can remain connected and the terminal temporary unplugged to allow removal and replacement of the associated card.

### 5.16 Failsafe Mode

All relays are configured in their default setting as energised. The relays will de-energise on trip or in the case of a power failure.

## 6. Inputs

### 6.1 *Optically Coupled Inputs*

All alarm inputs are provided with fully isolated inputs using optical couplers and a transient filter is built into the input circuitry so that low voltage interference will be ignored.

### 6.2 *Standard Input Configuration*

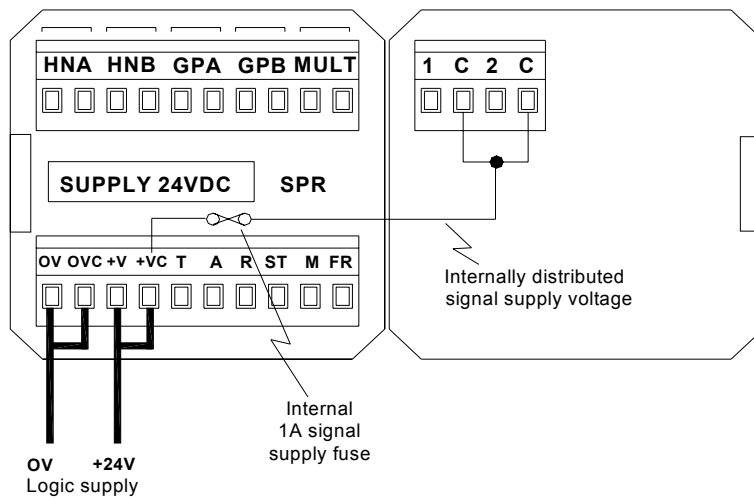
The standard Series 725 annunciator can be set to operate from volt free signal contacts that are either normally open or normally closed.

Setting function F1 to the off state conditions the input to accept a normally open contact.  
Setting function F1 to the on state conditions the input to accept a normally closed contact.

### 6.3 *Signal Supply Voltage*

On standard units an internally fused 24vdc signal supply (+VC), derived from the 24VDC logic supply (+V), is distributed to all of the common terminals marked "C" which are located to the right of each signal input terminal as typically shown below.

#### *Typical Signal Supply Voltage Distribution*



---

#### **6.4 Input Time Delay – Option AD\***

As an option each channel can be provided with a potentiometer, which allows the user to select a time delay to prevent the alarm from occurring unless it has been present for a pre-defined period.

Option AD1 = Adjustable Delay Range 5 – 50 ms

Option AD2 = Adjustable Delay Range 20ms - 2 seconds

Option AD3 = Adjustable Delay Range 5ms – 5 seconds

#### **6.5 Input Wiring Segregation**

Field contacts are often great distances from the annunciator it is therefore advisable to run the contact cables separately from circuits carrying heavy currents and/or high voltages to minimise the affects of induced voltages.

#### **6.6 No Master Module**

Each dual channel alarm card is equipped with a dedicated application specific integrated circuit (ASIC). System control is automatically allocated to one of the alarm cards during power on and if this card is removed, damaged or fails (apart from catastrophic failure), another card will automatically take over the common control functions. This method of operation eliminates the need for a traditional style common services/control module and removes common failure points thus increasing reliability.

# 7. Outputs

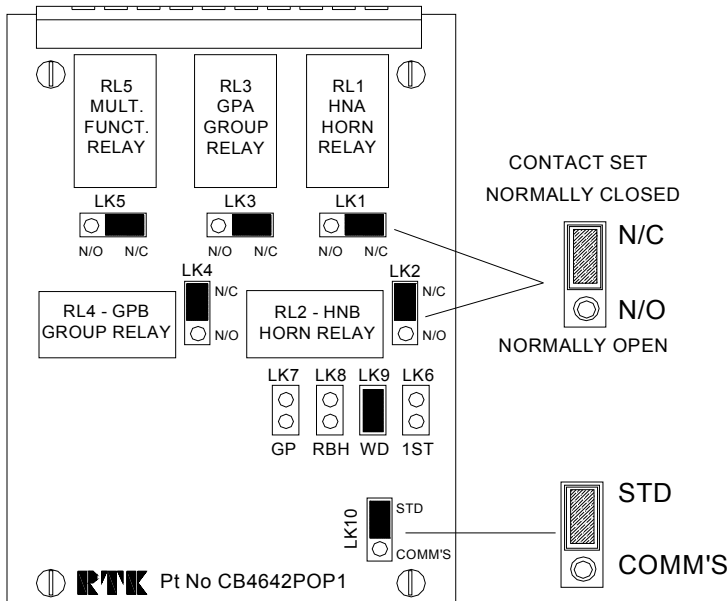
## 7.1 Common Outputs

All series 725 annunciators are equipped with five common output relays located on the upper card of the SPR module. (Part no CB4642POP1). As standard all five relays are factory set to be normally energised and will de-energise when activated.

Each Relay is wired to energy limited terminal with Volt Free Contacts for Customer use, which can be selected to be either Normally Open or Normally Closed in the Non Alarm State per the following table.

				CONTACT STATE	
FUNCTION	REF.	RELAY	LINK	OPEN	CLOSED
Critical horn relay	HNA	RL1	LK1	N/O	N/C
Non critical horn relay	HNB	RL2	LK2	N/O	N/C
Critical group relay	GPA	RL3	LK3	N/O	N/C
Non-critical group relay	GPB	RL4	LK4	N/O	N/C
Multifunctional relay	MUL	RL5	LK5	N/O	N/C

### SPR Card Showing Relay And Jumper Locations



### **7.2 Critical Horn Relay - HNA**

When an alarm occurs the horn relay will change state and remain in the alarm condition until the mute or ack pushbutton has been pressed. Each channel can be set to operate the critical horn relay as required. Please note:- Channels set to operate the critical horn relay will also operate the integral audible alarm.

### **7.3 Non-Critical Horn Relay - HNB**

When an alarm occurs the relay will change state and remain in the alarm condition until the mute or ack pushbutton has been pressed. Each channel can be set to operate the non-critical horn relay as required. Please note:- Channels set to operate the non-critical horn relay will not operate the integral audible alarm.

### **7.4 Critical Group Relay - GPA**

When an alarm occurs the relay will change state and remain in the alarm condition until all alarms in the group have returned to normal and the logic has been reset. Each channel can be set to operate the critical group relay as required.

### **7.5 Critical Group Relay - GPB**

When an alarm occurs the relay will change state and remain in the alarm condition until all alarms in the group have returned to normal and the logic has been reset. Each channel can be set to operate the non-critical group relay as required.

### **7.6 Reflash Critical Group Relay - GPA**

When an alarm occurs in the critical group the relay will change state and if reflash is set any subsequent alarm occurring in the same group will cause the relay to drop out for 0.5 seconds. Each channel can be set to reflash the critical group relay as required.

### **7.7 Reflash Non-Critical Group Relay - GPB**

When an alarm occurs in the non-critical group the relay will change state and if reflash is set any subsequent alarm occurring in the same group will cause the relay to drop out for 0.5 seconds. Each channel can be set to reflash the non-critical group relay as required.

### **7.8 Common Relay Function Codes**

FEATURE DESCRIPTION	FUNCTION	SETTING
Critical horn relay enable	F23	ON
Non-critical horn relay enable	F24	ON
Critical group relay enable	F21	ON
Non-critical group relay enable	F22	ON
Reflash critical group relay enable	F8	ON
Reflash non-critical group relay enable	F9	ON

---

### 7.9 Multi-Function Relay Operating Modes


The multi-function relay RL5 can be configured to act in different ways to suit particular applications by selecting one of the features detailed below and placing the shorting bar on the associated LK\* jumper.

RELAY	FUNCTION	LINK
RL5	RTG = Summary group relay (Common relay which acts as a summary relay of the GPA & GPB relays)	LK7
	RB = Ringback horn relay	LK8
	FU = First up relay	LK6
	WD = Power On – Watchdog relay	LK9

When the shorting bar is set to LK7 the MUL relay will act as a summary group relay, therefore any alarm in the system set to operate either the group A or group B common alarm relay will also operate the summary group relay



## 8. Technical Specifications

FEATURES	DETAILS		
Input type	Each channel can be set to operate from either a normally open or normally closed contact as required		
Standard version Signal voltage	24VAC/DC	9V to 33V	
Contact resistance	Normally Open 20 K Ohm maximum series resistance		
	Normally Closed 50 K Ohm minimum parallel resistance		
Contact current	Typically 3mA		
Response time	Typically 25ms (alternatives available on request)		
First up	5ms Discrimination		
Input protection	Reverse polarity of the input supply Application of a 1000V megger tester between input and earth		
Input Delay	Options exist for fixed or adjustable input time delays. Adjustable delays AD1= user selectable from 5 to 50ms AD2 = user selectable from 20ms to 2 seconds AD3 = user selectable from 5ms to 5 seconds		
Internal audible	3.5 kHz @ 95db(A) At 1 Metre distance complete with volume adjustment (Functions as a slave of the critical horn circuit)		
Common relays	Contacts rated 2A@24VDC		
Individual channel Repeat relay option	Each alarm can be supplied with an individual repeat relay with a changeover contact rated 2A@24VDC		
Communication option	The unit can be supplied with RS485 bi-directional Serial communications baud rate: 4800 or 9600 / Parity: odd or even / protocol: Modbus ASCII or RTU (user selectable)		
Window sizes (H x W)	Small 30 x 30 mm    Medium 30 x 60 mm    Large 60 x 60 mm		
Window colours	Red, Amber, Yellow, Green, White, or Blue		
Illumination	"fit & forget" LED assembly which fits into the same lamp socket		
	Small windows use single LED arrays Medium windows use dual LED arrays Large windows use quad bulbs LED arrays		
Alarm legends	Laser printed film legends plus software template if required		
Zone 2 Compliance	BS EN 50021:1999 and EN 50039:1982		
Certificate Type	 II 3 G EEx nA [L] IIC T4 Tamb = -20°C to +50°C		
Certification No	Self Certified by RTK in the form RTK(Year)ATEX(cert. No.)		
EMC compliance	IMMUNITY TO BS EN50082-2:1995 EMISSIONS TO BS EN50081-2:1994		
LVD compliance	BS EN61010 1:1993		
Operating temp.	-20°C to +50°C	Storage Temp.	-20°C to +80°C
Humidity	0 to 95% RH Non Condensing		
Protection	Wall Mount	IP65	Panel Mount    IP54
Terminals	Rising clamp type terminals. Maximum cable size 2.5mm <sup>2</sup>		

### 8.1 General

Supply voltage:- 24VDC (19 to 28VDC)  
Quiescent supply current 9mA per channel @ 24VDC

ALARM STATE CURRENT PER CHANNEL			
Window size	Small window	Medium window	Large window
Standard systems	20 mA	40 mA	80 mA
Systems with repeat relays	30 mA	50 mA	90 mA
Pushbutton module plus common relays and integral audible alarm			100 mA Extra

## 8.2 Fuse Details - SPR Module

FUSE	FUNCTION	RATING	TYPE	PURPOSE
F1	Logic supply	10A/T	20 x 5 mm	Protects the logic supply within the alarm annunciator
F2	Signal supply	1A/F	Surface mount	Protects the signal supply voltage feed to the common "C" terminals

## 8.3 Suitable Power Supplies

The table below indicates the maximum numbers of alarm channels that can be connected to a standard power supply from the RTK range of products. Each PSU provides a 24VDC output for use as the logic voltage to the annunciator.

## 8.4 P725 Annunciator Standard Versions

PSU RATING	WINDOW TYPE		
@ 24VDC	WINDOW TYPE		
CURRENT (A)	SMALL	MEDIUM	LARGE
1.1	34	20	11
1.8	58	34	19
2.5	82	49	27
4.5	151	89	49
6.5	220	130	72
12.5		253	139

## 8.5 P725 Annunciator Fitted With The Repeat Relays Per Channel Option

PSU RATING	WINDOW TYPE		
@ 24VDC	WINDOW TYPE		
CURRENT (A)	SMALL	MEDIUM	LARGE
1.1	25	17	10
1.8	43	29	17
2.5	61	40	24
4.5	113	74	44
6.5	164	108	64
12.5		210	125

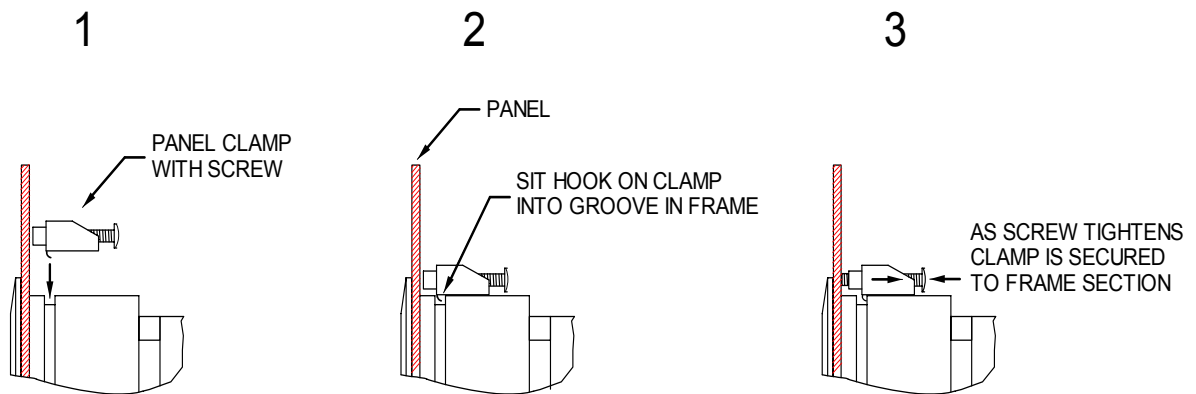
Larger PSU or multiple PSU can be used if required

**All unit are built to customer Specific dimensions. All unit are supplied with there own GA drawing showing all relevant dimensions and layout.**

## 9.0 Alarm Sequence Details

### 9.1 Panel Mounting Clamps (panel mount version only)

The NEX7250 panel mount version is shipped with the panel mounting clamps fitted to the sides of the enclosure these must be removed to allow the unit to be placed in the panel cut out and secured from behind. Once the unit has been placed in the panel cut out the panel clamps and screws are used to secure the unit as shown below. Maximum panel thickness 5mm



### 10.1 Summary

Each channel within the annunciator can be set to operate in a pre-defined manner in accordance with internationally recognised standards ISA-S18.1 1979 alarm sequences. Typically when an alarm occurs the associated window will flash and the operator uses specific pushbuttons to control the audible alarm and associated lamps or LED's:-

# 11. Additional Features

---

**Test** is used to test the lamps or optional LED's only by illuminating them in a steady on state for as long as the pushbutton is pressed.

**System Test** is used to simulate a full functional test therefore all windows and horn circuits will operate in accordance with the selected sequence and additional pushbuttons will need to be pressed to step through the sequence and return the unit to its normal state.

**Mute** is used to silence the audible but allow the associated alarm window to continue to operate as per the selected sequence.

**Acknowledge** will silence the audible alarm and change the state of the associated window in accordance with the selected sequence.

**Reset** will return the alarm to the normal off state only if the unit has been acknowledged and the associated alarm contact has returned to its normal non-alarm state.

**First Reset** is used after acknowledge to reset the flash sequence on the first alarm to occur within a defined group of alarms. Once first reset has been pressed the next alarm to occur within the group will flash at the first-up alarm rate.

## 10.2 Audible Alarm Grouping

Each channel within the annunciator can be set to operate the audible alarm relays as follows:-

1. Critical horn relay
2. Non critical horn relay
3. Both the critical and non critical horn relay
4. Neither of the horn relays (Typically status only alarms)

Please note channels, which are set to operate the critical horn relay, will automatically operate the internal piezo buzzer.

## 10.3 Ringback Audible

When using ISA "R" ringback sequence the MULT relay can be set to operate as a ringback audible if required. The ringback audible would normally have a distinct tone to allow the operator to distinguish between a standard alarm and an channel that has returned to normal and needs to be reset.

## 11.1 Automatic Reset

Once an alarm has been acknowledged and its input has returned to its normal state the alarm can be set to automatically reset without the operator having to press the reset pushbutton.

## 10. Sequence Configuration and Tables

### 11.2 Non-Latch Sequence (No Lock-In)

Alarms can be set to non lock-in, which allows the alarm to automatically return to the non alarm ( off ) state as soon as the signal input returns to normal.

### 11.3 Reflash Feature

Input reflash is used to inform the operator that an acknowledged alarm has returned to normal and re-alarmed whilst waiting for reset.

### 11.4 Ringback Sequence

Ringback sequence is used to inform the operator, both visually and audibly, that an alarm condition has cleared and the channel can be reset to its normal off state. When a contact returns to normal the associated window will flash at approx ½ the speed of a normal alarm and the audible alarm will sound. This identifies the specific alarm and allows the operator to reset as soon as the process is normal. As an option the MULT relay can be used to drive a 2<sup>nd</sup> audible set to a different tone to the main audible for use as a ringback audible. Please note ringback cannot function if a channel is set to auto- reset or non lock- in.

### 11.5 Two Pushbutton Operation

In certain circumstances using remote pushbuttons, it may be desirable to use only two pushbuttons: reset and lamp test. The reset pushbutton is used to acknowledge an alarm if the contacts are in the alarm condition and to reset it if the contacts are clear.

### 11.6 First-Up Sequences

When monitoring devices with interlinked functions such as a turbine or compressor it is often important to know the specific alarm that occurred first, as it will invariably result in cascade of secondary alarms. This allows the operator to focus on the root cause of failure and therefore limits the downtime and associated costs. This is achieved by having the first-up alarm flashing in a different manner compared to the subsequent alarms. Four different first-up sequences are available F0, F1, F2 and F3 as detailed below and in the following sequence tables.

- F0** The standard mode adopted by RTK Instruments, which indicates the first-up alarm by flashing at twice the rate of subsequent alarms.
- F1** In this mode subsequent alarms appear in the acknowledged state, hence they do not flash. The audible device does not operate when subsequent alarms occur, unless still operating from the first alarm. The acknowledge pushbutton will reset the first-up indication.
- F2** In this mode all subsequent alarms do not flash, they will however operate the audible device. The acknowledge pushbutton will reset the first-up indication.
- F3** In this mode initial alarms appear with an intermittent flash rate and subsequent alarms flash at a steady rate. On acknowledge subsequent alarms revert to the steady on state and only the first alarm continues to flash at a slower rate.

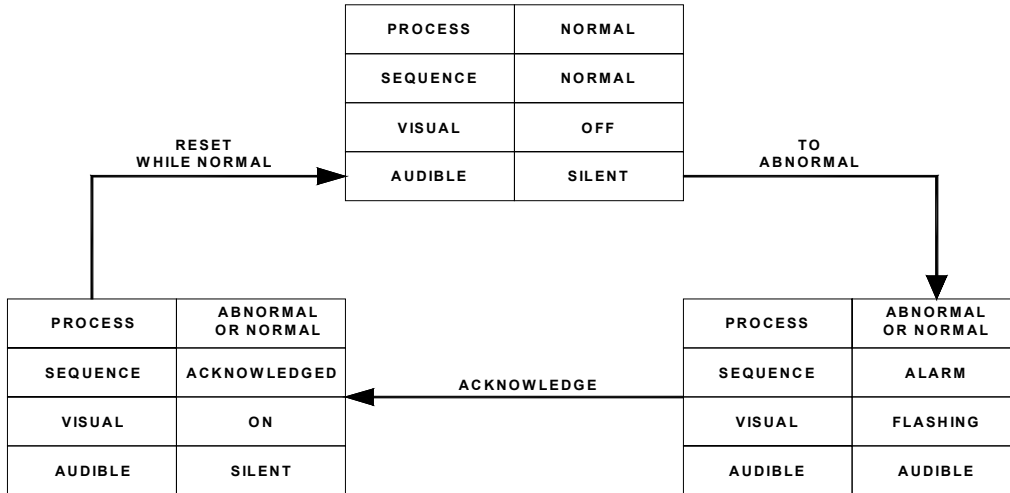
Please note auto reset and non lock- in functions are not recommended when using first up sequences as the true sequence of events cannot be guaranteed.

Each pair of alarm channels can be configured to suit the operating sequence required, as listed in the ISA publication "Annunciator sequences and specifications" S18.1 1979.(R2004). Systems can be configured with different features on each individual channel and there is no need to switch the power off when making these changes. Different operating modes can be selected using the integral Pushbutton/Programming module as described later in this manual. The following tables show the most commonly used examples.

**10.1 Manual Reset**

**ISA-Sequence M**

**SEQUENCE DIAGRAM**



**SEQUENCE ISA M**  
(MANUAL RESET)

**SEQUENCE TABLE**

LINE	PROCESS CONDITION	PUSHBUTTON OPERATION	SEQUENCE STATE	VISUAL DISPLAY	ALARM AUDIBLE DEVICE	REMARKS
1	NORMAL		NORMAL	OFF	SILENT	
2	ABNORMAL		ALARM	FLASHING	AUDIBLE	LOCK-IN
3	ABNORMAL OR NORMAL	ACKNOWLEDGE	ACKNOWLEDGED	ON	SILENT	MANUAL RESET REQUIRED
4A	ABNORMAL	RESET	TO LINE 3			
4B	NORMAL	RESET	NORMAL	OFF	SILENT	MANUAL RESET

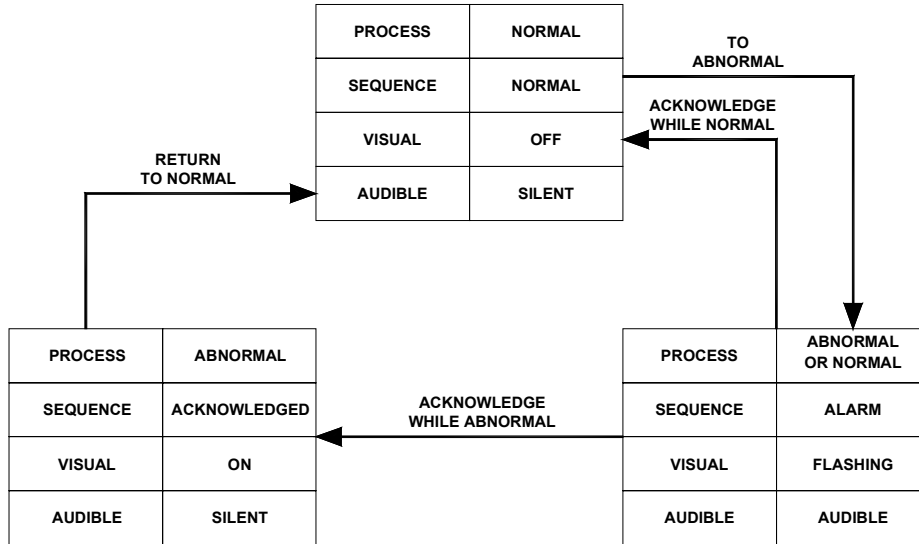
**SEQUENCE FEATURES**

1. ACKNOWLEDGE, RESET AND TEST PUSHBUTTONS
2. ALARM AUDIBLE DEVICE
3. LOCK-IN OF MOMENTARY ALARMS UNTIL ACKNOWLEDGED
4. THE AUDIBLE DEVICE IS SILENCED AND FLASHING STOPS WHEN ACKNOWLEDGED
5. MANUAL RESET OF ACKNOWLEDGED ALARM INDICATIONS AFTER PROCESS CONDITIONS RETURN TO NORMAL
6. OPERATION TEST

**10.2 Automatic Reset**

**ISA-Sequence A**

**SEQUENCE DIAGRAM**



**SEQUENCE ISA A**  
(LOCK IN)

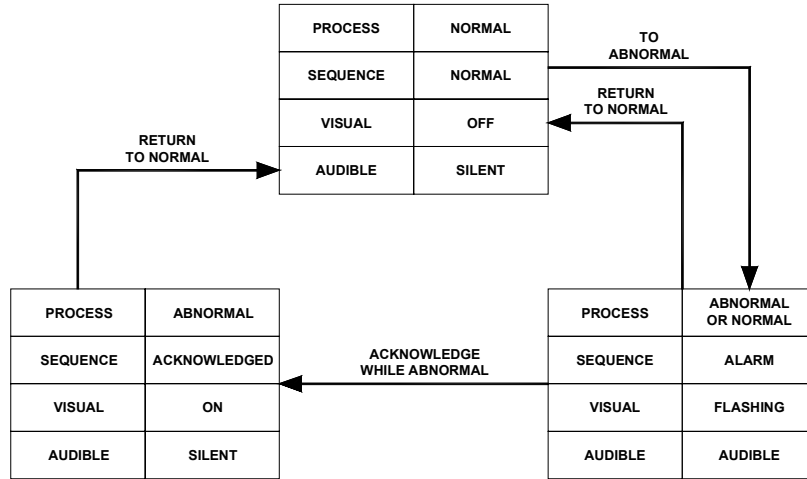
**SEQUENCE TABLE**

LINE	PROCESS CONDITION	PUSHBUTTON OPERATION	SEQUENCE STATE	VISUAL DISPLAY	ALARM AUDIBLE DEVICE	REMARKS
1	NORMAL		NORMAL	OFF	SILENT	
2	ABNORMAL		ALARM	FLASHING	AUDIBLE	LOCK-IN
3A	ABNORMAL	ACKNOWLEDGE	ACKNOWLEDGED	ON	SILENT	MAINTAINED ALARM
3B	NORMAL	ACKNOWLEDGE	TO LINE 4			MOMENTARY ALARM
4	NORMAL		NORMAL	OFF	SILENT	AUTOMATIC RESET

**SEQUENCE FEATURES**

1. ACKNOWLEDGE AND TEST PUSHBUTTONS
2. ALARM AUDIBLE DEVICE
3. LOCK-IN OF MOMENTARY ALARMS UNTIL ACKNOWLEDGED
4. THE AUDIBLE DEVICE IS SILENCED AND FLASHING STOPS WHEN ACKNOWLEDGED
5. AUTOMATIC RESET OF ACKNOWLEDGED ALARM INDICATIONS WHEN PROCESS CONDITIONS RETURN TO NORMAL
6. OPERATION TEST

**SEQUENCE DIAGRAM**



**SEQUENCE ISA A - 4**  
(NON LOCK IN)

**SEQUENCE TABLE**

LINE	PROCESS CONDITION	PUSHBUTTON OPERATION	SEQUENCE STATE	VISUAL DISPLAY	ALARM AUDIBLE DEVICE	REMARKS
1	NORMAL		NORMAL	OFF	SILENT	
2	ABNORMAL		ALARM	FLASHING	AUDIBLE	
3	RETURN TO NORMAL BEFORE ACKNOWLEDGE		NORMAL	OFF	SILENT	NON LOCK IN
4	ABNORMAL	ACKNOWLEDGE	ACKNOWLEDGED	ON	SILENT	MAINTAINED ALARM
6	NORMAL		NORMAL	OFF	SILENT	AUTOMATIC RESET

**SEQUENCE FEATURES**

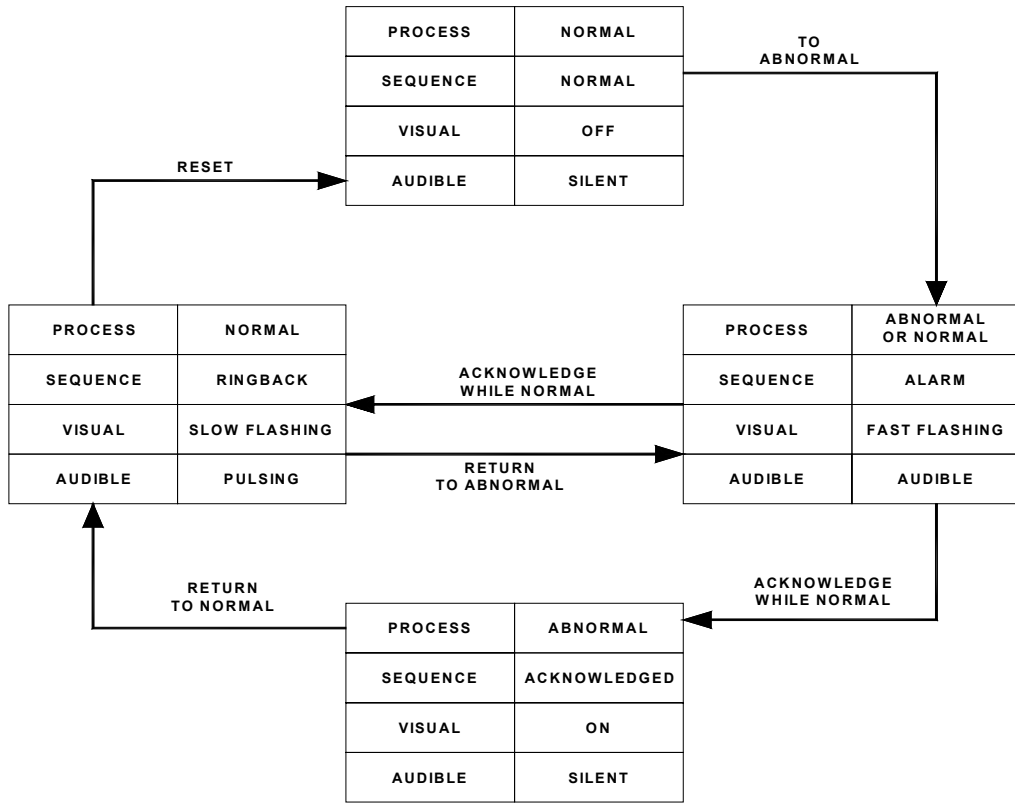
1. ACKNOWLEDGE AND TEST PUSHBUTTONS
2. ALARM AUDIBLE DEVICE
3. NON LOCK-IN OF MOMENTARY ALARMS
4. THE AUDIBLE DEVICE IS SILENCED AND FLASHING STOPS WHEN ACKNOWLEDGED
5. AUTOMATIC RESET OF ALARM INDICATIONS WHEN PROCESS CONDITIONS RETURN TO NORMAL BEFORE OR AFTER ACKNOWLEDGE (NON LOCK-IN)
6. OPERATION TEST



10.4 Ringback

ISA-R Sequence

SEQUENCE DIAGRAM



SEQUENCE ISA R  
(RING BACK)

## SEQUENCE TABLE

LINE	PROCESS CONDITION	PUSHBUTTON OPERATION	SEQUENCE STATE	VISUAL DISPLAY	ALARM AUDIBLE DEVICE	REMARKS
1	NORMAL		NORMAL	OFF	SILENT	
2	ABNORMAL		ALARM	FAST FLASHING	AUDIBLE	LOCK-IN
3A	ABNORMAL	ACKNOWLEDGE	ACKNOWLEDGED	ON	SILENT	MAINTAINED ALARM
3B	NORMAL	ACKNOWLEDGE	TO LINE 4			MOMENTARY ALARM
4	NORMAL		RINGBACK	SLOW FLASHING	SILENT	MANUAL RESET REQUIRED
5	ABNORMAL		TO LINE 2			RETURN TO NORMAL
6	NORMAL	RESET	NORMAL	OFF	SILENT	MANUAL RESET

### SEQUENCE FEATURES

1. ACKNOWLEDGE, RESET AND TEST PUSHBUTTONS
2. ALARM AUDIBLE DEVICE (OPTIONAL RINGBACK AUDIBLE DEVICE)
3. LOCK-IN OF MOMENTARY ALARMS UNTIL ACKNOWLEDGED
4. THE AUDIBLE DEVICE IS SILENCED AND FLASHING STOPS WHEN ACKNOWLEDGED
5. RINGBACK VISUAL AND AUDIBLE INDICATIONS WHEN PROCESS CONDITIONS RETURN TO NORMAL.
6. MANUAL RESET OF RINGBACK INDICATIONS
7. OPERATION TEST

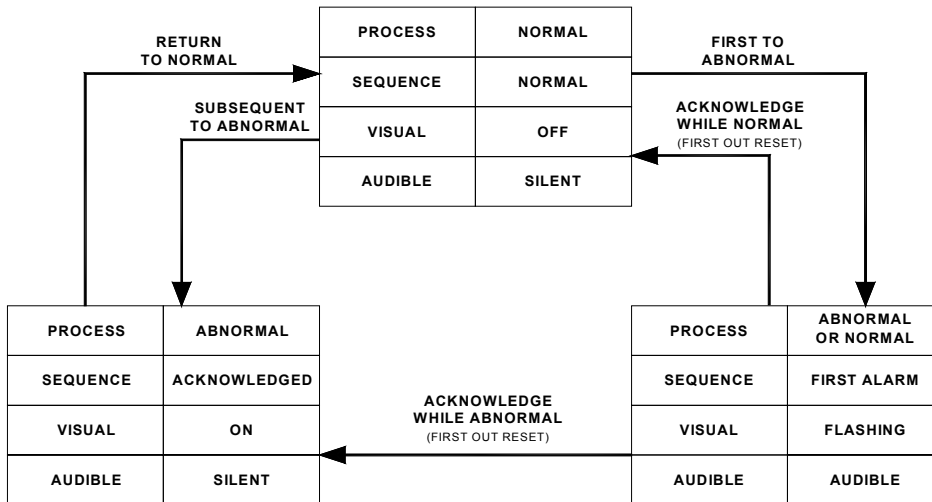
### ***Optional Ringback Audible***

As an option the Multifunction "MULT" Relay can be used to provide a separate Ringback audible if required. When an alarm returns to normal a MULT relay set as a Ringback audible will activate until the Reset Pushbutton has been pressed. (See Para 5.9 for details)

10.5 Automatic Reset First-Up

ISA-F1A Sequence

SEQUENCE DIAGRAM



SEQUENCE ISA F1A

(AUTOMATIC RESET FIRST OUT WITH NO SUBSEQUENT ALARM STATE)

SEQUENCE TABLE

LINE	PROCESS CONDITION		PUSHBUTTON OPERATION	SEQUENCE STATE	VISUAL DISPLAY	ALARM AUDIBLE DEVICE	REMARKS
1	NORMAL			NORMAL	OFF	SILENT	
2	FIRST	ABNORMAL		FIRST ALARM	FLASHING	AUDIBLE	LOCK-IN
3	SUB	ABNORMAL		ACKNOWLEDGED	ON	SILENT	NO LOCK-IN
4A	FIRST	ABNORMAL	ACKNOWLEDGE	TO LINE 3			MAINTAINED ALARM FIRST OUT RESET
4B	FIRST	NORMAL	ACKNOWLEDGE	TO LINE 3			MOMENTARY ALARM FIRST OUT RESET
5	NORMAL			NORMAL	OFF	SILENT	AUTOMATIC RESET

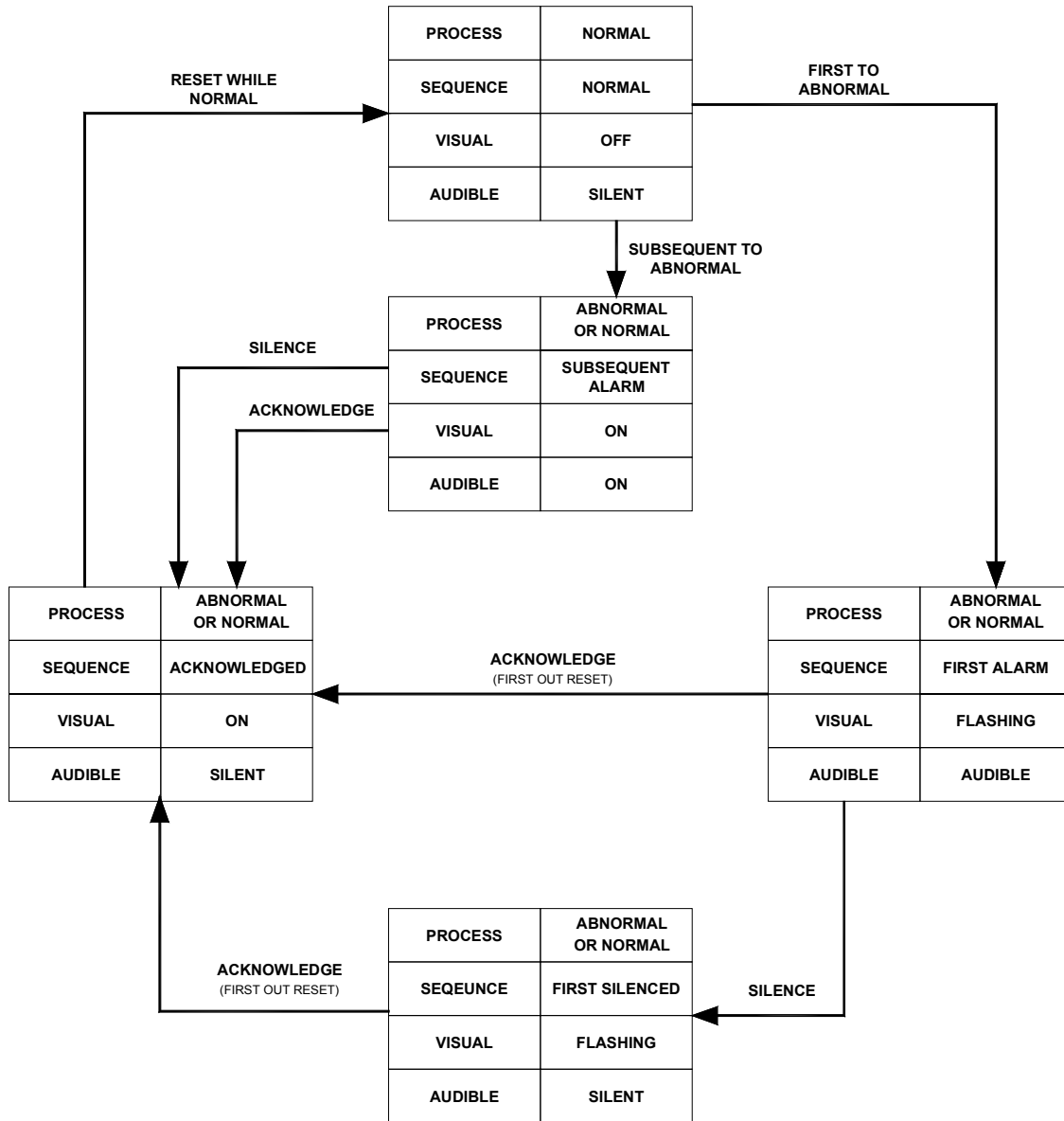
SEQUENCE FEATURES

1. ACKNOWLEDGE, AND TEST PUSHBUTTONS
2. ALARM AUDIBLE DEVICE
3. LOCK-IN OF MOMENTARY FIRST ALARM ONLY. NO LOCK IN OF MOMENTARY SUBSEQUENT ALARMS.
4. FLASHING AND AUDIBLE INDICATIONS FOR FIRST ALARM ONLY. NEW SUBSEQUENT ALARMS GO TO THE ACKNOWLEDGE STATE.
5. FIRST OUT INDICATION IS RESET AND THE AUDIBLE IS SILENCED WHEN ACKNOWLEDGED.
6. AUTOMATIC RESET OF ACKNOWLEDGED ALARM INDICATIONS WHEN PROCESS CONDITIONS RETURN TO NORMAL
7. OPERATIONAL TEST

10.6 Manual Reset First-Up

ISA-F2M-1 Sequence

SEQUENCE DIAGRAM



SEQUENCE ISA F2M-1

(MANUAL RESET FIRST OUT WITH NO SUBSEQUENT ALARM FLASHING & SILENCED PUSHBUTTON)

**SEQUENCE TABLE**

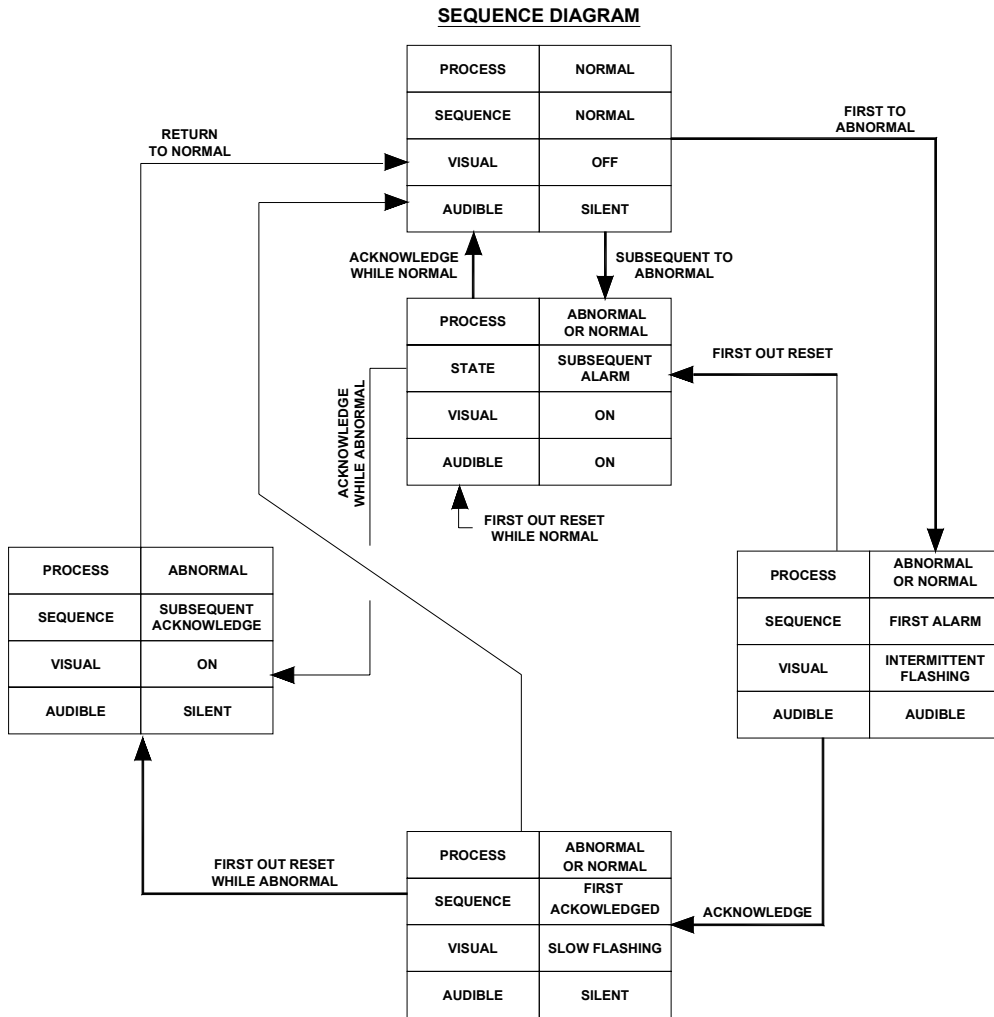
LINE	PROCESS CONDITION		PUSHBUTTON OPERATION	SEQUENCE STATE	VISUAL DISPLAY	ALARM AUDIBLE DEVICE	REMARKS
1	NORMAL			NORMAL	OFF	SILENT	
2	FIRST	ABNORMAL		FIRST ALARM	FLASHING	AUDIBLE	LOCK-IN
3	SUB.	ABNORMAL		SUB. ALARM	ON	AUDIBLE	LOCK-IN
4	FIRST	ABNORMAL OR NORMAL	ACKNOWLEDGE BEFORE SIL	TO LINE 7			FIRST OUT RESET
5	SUB.	ABNORMAL OR NORMAL					
6	FIRST	ABNORMAL OR NORMAL	SILENCE	FIRST SILENCED	FLASHING	SILENT	
7	SUB.	ABNORMAL OR NORMAL	SILENCE	ACKNOWLEDGE	ON	SILENT	MANUAL RESET REQUIRED
8	FIRST	ABNORMAL OR NORMAL	ACKNOWLEDGE AFTER SILENCE	TO LINE 7			FIRST OUT RESET
9	NORMAL		RESET	NORMAL	OFF	SILENT	MANUAL RESET

**SEQUENCE FEATURES**

1. SILENCE, ACKNOWLEDGE, RESET AND TEST PUSHBUTTONS
2. ALARM AUDIBLE DEVICE
3. LOCK-IN OF MOMENTARY ALARMS UNTIL ACKNOWLEDGED.
4. OPTION1 – SILENCE PUSHBUTTON TO SILENCE THE ALARM AUDIBLE DEVICE WHILE RETAINING THE FIRST OUT FLASHING INDICATION
5. FLASHING INDICATION FOR FIRST ALARM ONLY. NEW SUBSEQUENT ALARMS HAVE THE SAME VISUAL INDICATION AS ACKNOWLEDGED ALARMS.
6. FIRST OUT INDICATION IS RESET WHEN ACKNOWLEDGED
7. MANUAL RESET OF ACKNOWLEDGED ALARM INDICATIONS AFTER PROCESS CONDITIONS RETURN TO NORMAL.
8. OPERATIONAL TEST

## 10.7 Automatic Reset First-Up

## ISA-F3A Sequence



**SEQUENCE ISA F3A**  
(AUTOMATIC RESET FIRST OUT WITHOUT FLASHING & RESET PUSHBUTTON)

**SEQUENCE TABLE**

LINE	PROCESS CONDITION		PUSHBUTTON OPERATION	SEQUENCE STATE	VISUAL DISPLAY	ALARM AUDIBLE DEVICE	REMARKS
1	NORMAL			NORMAL	OFF	SILENT	
2	FIRST	ABNORMAL		FIRST ALARM	INTERMITTENT FLASHING	AUDIBLE	LOCK-IN
3	SUB.	ABNORMAL		SUB. ALARM	FAST FLASHING	AUDIBLE	LOCK-IN
4	FIRST	ABNORMAL OR NORMAL	FIRST OUT RESET BEFORE ACKNOWLEDGE	TO LINE 3			FIRST OUT RESET
5	FIRST	ABNORMAL OR NORMAL	ACKNOWLEDGE	FIRST ACKNOWLEDGED	SLOW FLASHING	SILENT	FIRST OUT RESET REQUIRED
6A	SUB.	ABNORMAL		SUB. ACKNOWLEDGE	ON	SILENT	MAINTAINED ALARM
6B	SUB.	NORMAL		TO LINE 8			MOMENTARY ALARM
7A	FIRST	ABNORMAL	FIRST OUT RESET AFTER ACKNOWLEDGE	TO LINE 6A			FIRST OUT RESET
7B	FIRST	NORMAL		TO LINE 8			FIRST OUT RESET
8	NORMAL			NORMAL	OFF	SILENT	AUTOMATIC RESET

**SEQUENCE FEATURES**

1. SILENCE, ACKNOWLEDGE, RESET AND TEST PUSHBUTTONS
2. ALARM AUDIBLE DEVICE
3. LOCK-IN OF MOMENTARY ALARMS UNTIL ACKNOWLEDGED.
4. OPTION1 – SILENCE PUSHBUTTON TO SILENCE THE ALARM AUDIBLE DEVICE WHILE RETAINING THE FIRST OUT FLASHING INDICATION
5. FLASHING INDICATION FOR FIRST ALARM ONLY. NEW SUBSEQUENT ALARMS HAVE THE SAME VISUAL INDICATION AS ACKNOWLEDGED ALARMS.
6. FIRST OUT INDICATION IS RESET WHEN ACKNOWLEDGED
7. MANUAL RESET OF ACKNOWLEDGED ALARM INDICATIONS AFTER PROCESS CONDITIONS RETURN TO NORMAL.
8. OPERATIONAL TEST

# 13. Options

## 13.1 General

The standard 725 Series alarm annunciator is designed to meet the majority of alarm specifications but in certain applications additional options may be required. Please note:- The following options are usually specified at the time of ordering. Please consult factory if you would like to check suitability of adding options to existing units.

## 13.2 LED Assemblies – fitted as standard on NEX7250 units (Option LED)

Fit and forget LED assemblies, which plug into the same lamp socket as conventional filament lamps, are available in the following colours Red, Amber, Yellow, White, Blue or Green. Please note all alarm cards are equipped with dual function output drives allowing the standard card to be used with either conventional filament lamps or LED's. Switch SW1-8 on each card is used to select the output drive characteristics.

FUNCTION	SW1-8
Outputs suitable for driving lamps	ON
Outputs suitable for driving LED's	OFF

## 13.3 Tropicalisation (Option TRO)

In harsh environmental conditions all of the associated cards are sprayed with a conformal coating and sealed relays are used as required.

## 13.4 Individual Channel Repeat Relays (Option RLY)

As an option each dual channel alarm card within the annunciator can be supplied with two relays to allow a repeat signal from each channel to be sent to third party devices as required. The non alarm coil state of each relay can be set to be either:-

FEATURE	FUNCTION	SETTING
Normally energised	F2	OFF
Normally de-energised	F2	ON

The operation mode of each relay can be selected to be either:-

### Input Follower

The individual relay will activate when an alarm occurs and automatically return to normal when the signal input returns to the normal state.

FEATURE	FUNCTION	SETTING
Input follower	F18	OFF
	F19	ON

### Logic Follower

The individual relay will activate when an alarm occurs and only return to normal when the signal input has returned to the normal state and the logic has reset, this may require the operator to press the associated pushbuttons to reset the alarm depending on the sequence selected.

FEATURE	FUNCTION	SETTING
Logic follower	F18	ON
	F19	OFF



**Display Follower**

The individual relay will activate when an alarm occurs and faithfully mimic the state of the output drive to the associated lamp (flashing, on or off)

FEATURE	FUNCTION	SETTING
Display follower	F18	ON
	F19	ON

**13.5 Individual Channel Dual Repeat Relays** (Option RL2)

In applications that require two repeat relay outputs for each channel a dual channel alarm card complete with repeat relays and a dual channel relay card are required. The dual channel relay card provides the additional set of volt-free changeover contacts. Please note:- As this feature requires additional card slots it is only available on systems using medium or large windows.

**13.6 Customer Specified Response Time** (Option CRT\*\*)

The response time for standard units is factory set at 25ms. If alternative response times are required, option CRT is used to specify a fixed response time, between 1ms and 2 seconds.

**13.7 Adjustable Response Time** (Option AD\*)

If specified at the time of order each channel can be supplied with a trim pot that allows the user to adjust the response time between two set points as required.

AD1 = 5mS to 50mS

AD2 = 25mS to 2 seconds

AD3 = 5mS to 5 seconds

**13.8 Disable Integral Horn** (Option DHN)

All units are supplied with an integral piezo audible as standard, which follows the critical audible group (HNA). If remote audibles only connected to the integral horn relays are required the unit can be supplied with the horn disabled.

**13.9 RS485 Serial Communications** (Option COM) Part No. CB4468POP1

All series 725 annunciators can be fitted with the optional serial communications card, which is usually located in the cell directly above the pushbutton module. This card provides RS485 bi-directional communication to and from third party devices using modbus ASCII or modbus RTU protocols as standard. All pushbutton controls can be local to the annunciator or driven remotely via the communications link. Up to 64 annunciators can be multi-dropped on the same communications connection.

**13.10 Individual Channel Repeat Relays Powered By The Field Contact Voltage** (Option RAV)

Option RAV is used in safety critical applications to power the individual channel repeat relays using the field contact supply voltage. In this mode even if the annunciator logic supply is lost the repeat relay facility will continue to function as normal. Please note:- The repeat relay can only function as a signal follower when option RAV is used.

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### **13.11 Three Horn Relay Outputs** (Option 3HN)

Option 3HN provides three horn relays, (HNA, HNB, GPB), and one common alarm relay (GPA) instead of two horn and two group relays. Channels are programmed to operate any of the relays using function codes, F23 = HNA, F24 = HNB, F22 = GPB, (F21 = GPA).

### **13.12 Three Group Relay Outputs** (Option 3GP)

Option 3GP provides three group relays, (GPA, GPB, HNB), and one horn relay (HNA) instead of the two horn and two group relays. Channels are programmed to operate any of the relays using function codes, F21 = GPA, F22 = GPB & F24 = HNB, (F23 = HNA).

**Please note:- The HNB relay is not equipped with a reflash function.**

### **13.13 Repeat Pushbutton Output** (Option RPB)

Option RPB provides two independent volt-free contact outputs, which follow the operation of a chosen pushbutton. A two channel relay card is added to the system and switches on the card are used to set the function of each relay to follow either:- System test, lamp test, silence, ack, reset or first reset.

### **13.14 Group Relays Follow Inputs** (Option GFI)

Option GFI allows the GPA and GPB group relays to follow the function of the alarm contact. If an alarm occurs within the group the relay will change state and will remain in the alarm condition until the associated input has returned to normal. If multiple inputs within the group are in the alarm state all inputs must return to normal before the group relay automatically returns to normal. Individual channels can be assigned to the GPA and GPB relays, (function F21 & F22), in the normal way and the optional reflash function, (Function F8 & F9), can be enabled as required.

### **13.15 Additional Group Relay Contact** (Options 2GA or 2GB)

Option 2GA or 2GB is used in applications where a second isolated contact is required to work as a slave of either the GPA or GPB relay, (Function F21 & F22), The multi function relay (MUL) located in the SPR module is used to provide the additional contact.

### **13.16 Total Group Relay** (Option RTG)

Option RTG is used in applications that require two common alarm groups, (GPA and GPB), PLUS a total group relay. The multi function relay (MUL) located in the SPR module is used to provide the total group relay contact, which automatically operates if either the GPA or GPB relay are activated.

### **13.17 SPR Module (Supply-Pushbuttons-Relay Module)**

All Series 725 annunciators are equipped with 24VDC Logic. If external AC/DC or DC/DC Power supplies are required they should be capable of handling the maximum surge current, which is typically twice the maximum load when all lamps are on steady.

### **13.18 Logic Power Connections**

In standard applications a power supply with a single 24VDC output can be wired to the 24VDC logic power by connecting to terminals 0V and +V on the rear of the SPR Module.

### **13.19 Signal Supply Voltage Connections**

In standard applications the logic supply terminals 0V and +V can be cross-linked to the signal supply input terminals OVC and +VC on the SPR module to provide +24VDC to distribute to the associated field contacts. (0V links to OVC and +V links to +VC)

### 13.20 Common Horn/Group/Multi-Function Relay & Remote P.B. Connections

Customer connections for the common functions should be wired to the rear of the SPR module. These connections are shown below: -

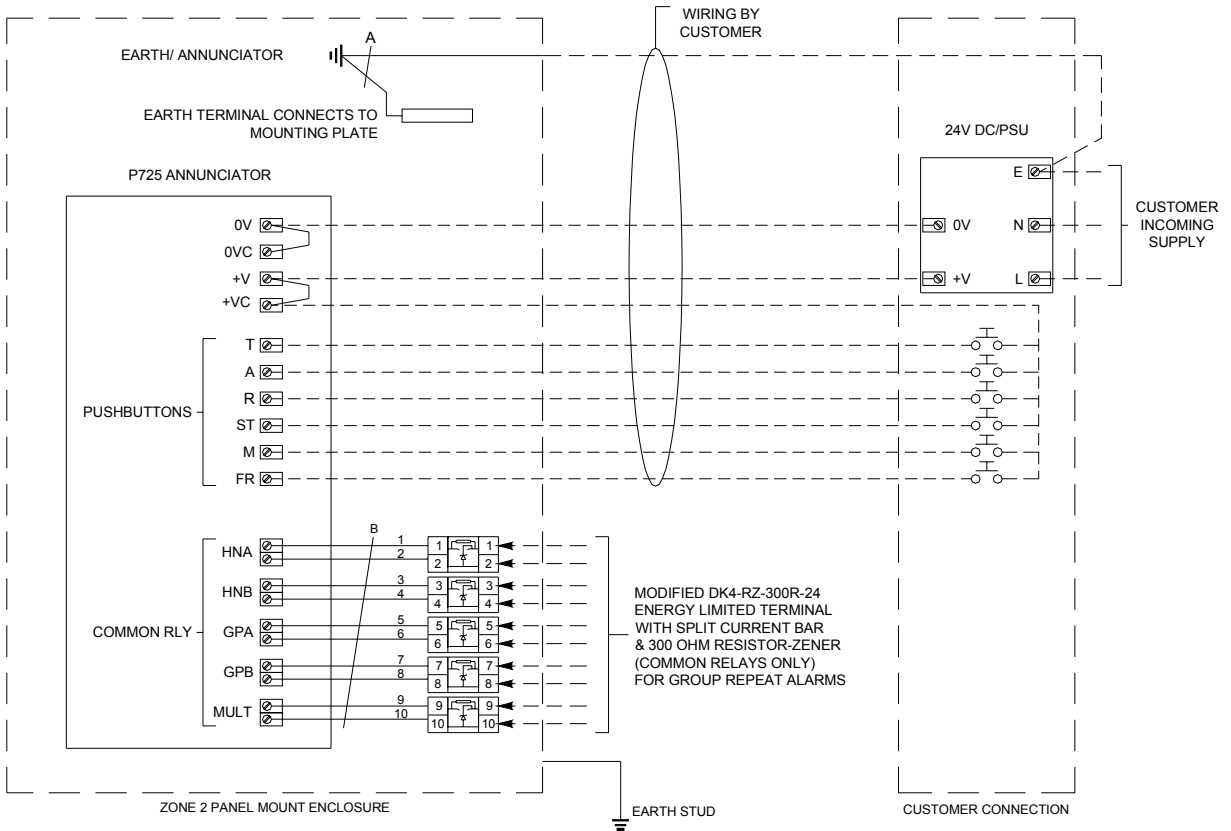
<b>COMMON CONNECTIONS</b>	
<b>24VDC Logic power</b> (OV & +V)	<b>24VDC Signal contact voltage</b> (OVC & +VC)
<b>Dual horn relay contacts</b> Critical horn relay – HNA Non critical horn relay - HNB	<b>Dual common alarm relay contacts</b> Critical group relay – GPA Non critical group relay - GPB
<b>Multi-function relay contact</b> MUL	<b>Optional remote pushbutton inputs</b> T = Lamp test A = Acknowledge R = Reset ST = System test M = Mute FR = First reset Pushbutton common connection = +V

# 14. NEX7250 Connections details

## 14.1 Typical Panel mount wiring

The example shown below is a typical system, all NEX designs are customer specified and come supplied with they're own unique customer wiring diagram.

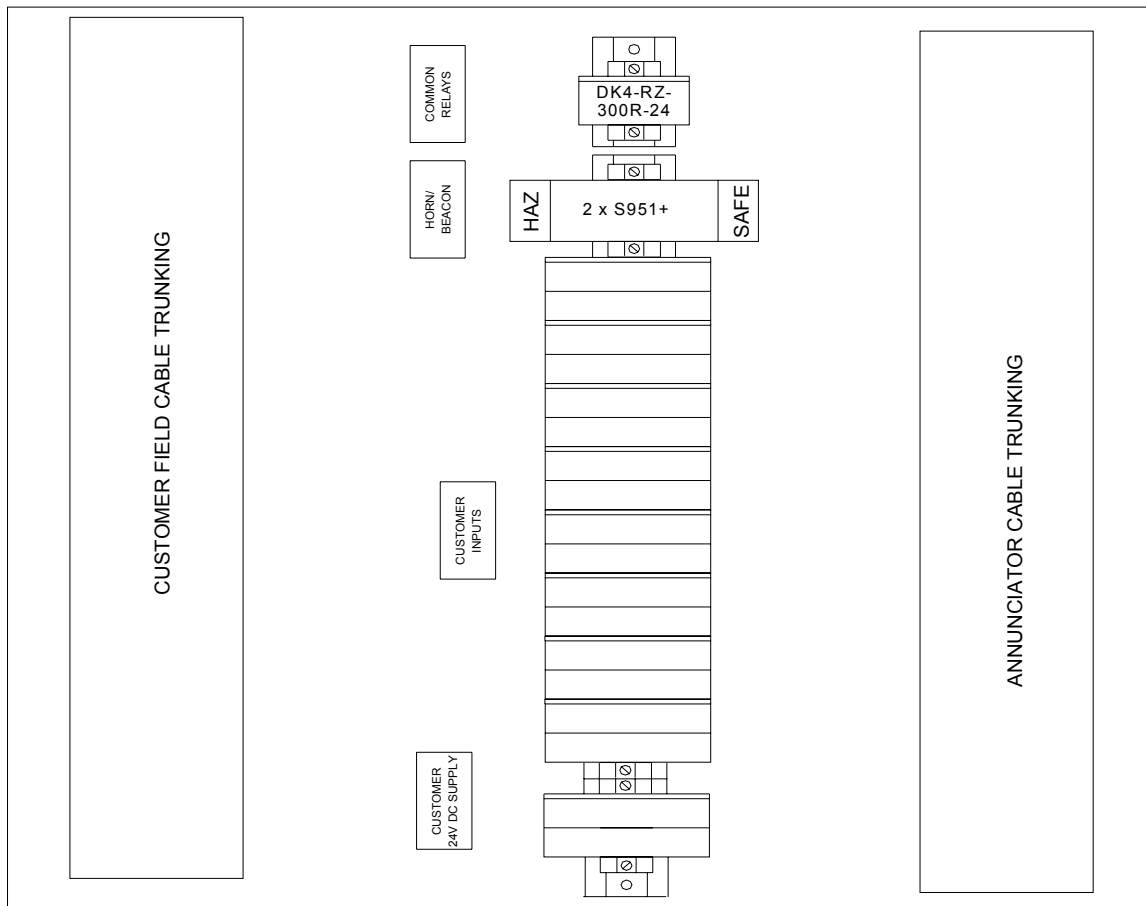
### Typical Customer connections to NEX7250 Panel mount Unit



**14.2 Typical Wall mount wiring**

The example shown below is a typical system. The wall mount enclosure is has more space than the panel mount version giving the customer space for additional terminals for connection into the 725. The pushbuttons are also mounted in the enclosure, with the option of an additional sounder and beacon mounted on the top of the unit. All NEX designs are customer specified and come supplied with their own unique customer wiring diagram.

**Typical Customer connections to NEX7250 Wall mount Unit**



# 15. Large Window Alarm Module Wiring

Series 725 units supplied with large windows provide one alarm per cell. In order to maximise the use of the standard two channel alarm card all odd cells within the annunciator, (1,3,5,7, etc), are equipped with alarm cards and all even cells, (2,4,6,8, etc), are left unequipped. Channel 1 of the alarm card is routed to the LED's in the normal way and channel 2 is routed by the display motherboard to the LED's located in the cell directly below.

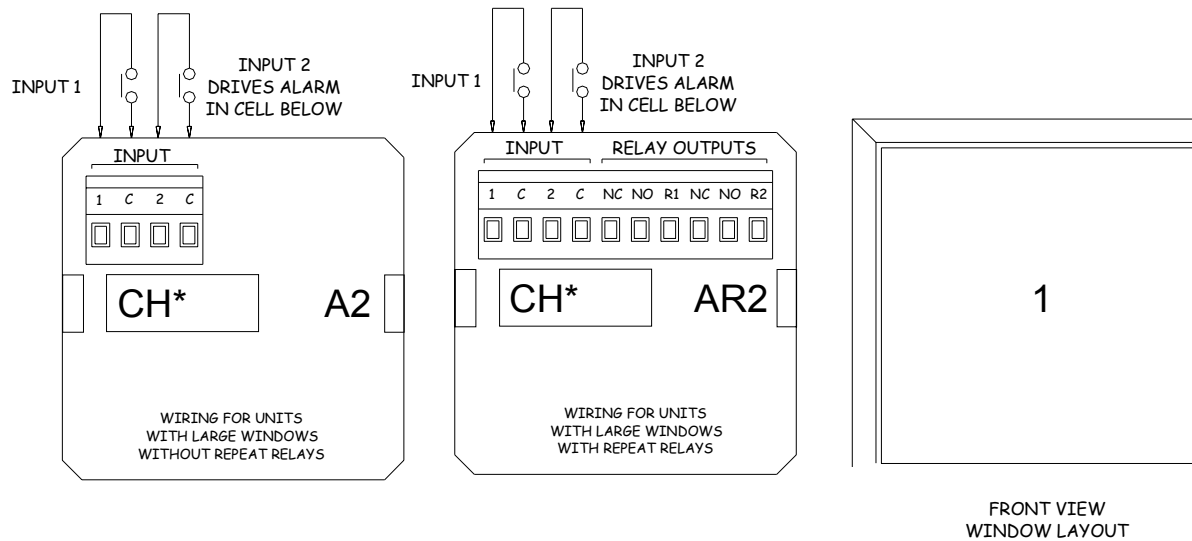
## 15.1 Standard Unit Without Repeat Relay Facility

Each cell is equipped with a type A2 back plate and a dual channel alarm card model no CB5674POP1, which is suitable for 2 signal inputs. The alarm card is located in the upper card slot

## 15.2 Optional Unit With Repeat Relay Facility

Each cell is equipped with a type AR2 back plate and dual channel alarm card model no CB5674POP2, which is suitable for 2 signal inputs and provides 2 relay outputs each having one set of changeover contacts. The alarm card is located in the upper card slot

### Wiring Details For A2 And AR2 Modules In Large Window Versions



**15.3 Large Window Versions Fitted With An Odd Number Of Alarms**

Series 725 units that use large windows and have an odd no of total alarms in the system, 1,3,5,7,9, ways etc, will be supplied with dual channel cards in alternative cells as described in the previous paragraph with the exception of the last cell which will be supplied for use as a single alarm cell only as detailed below.

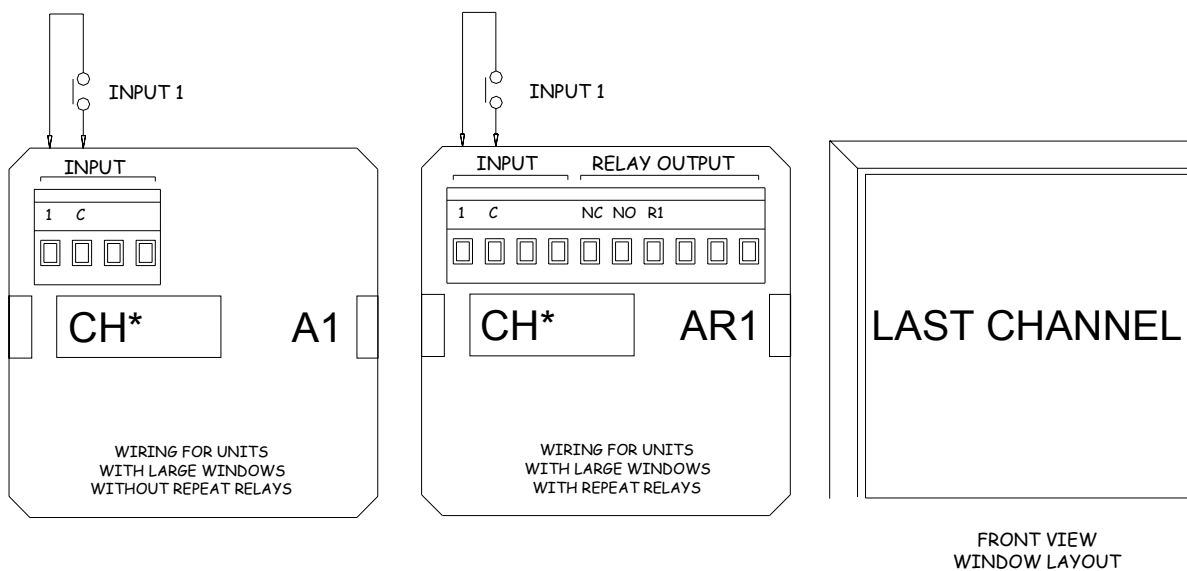
**15.4 Standard Unit Without Repeat Relay Facility**

The last active alarm cell is equipped with a type A1 back plate and a dual channel alarm card model no CB5674POP1, which is suitable for 2 signal inputs. The alarm card is located in the upper card slot. Note. Only 1 channel is used in this configuration.

**15.5 Optional Unit With Repeat Relay Facility**

The last active alarm cell is equipped with a type AR1 back plate and dual channel alarm card model no CB5674POP2, which is suitable for 2 signal inputs and provides 2 relay outputs each having one set of changeover contacts rated at 3A @ 24VDC. The alarm card is located in the upper card slot. Note. Only 1 channel is used in this configuration.

**Wiring Details For A1 And AR1 Modules Used In The Last Cell Of 725 Units Fitted With Odd Numbers Of Alarms**



# 16. Medium Window Alarm Module Wiring

Series 725 units supplied with medium windows provide two alarms per cell.

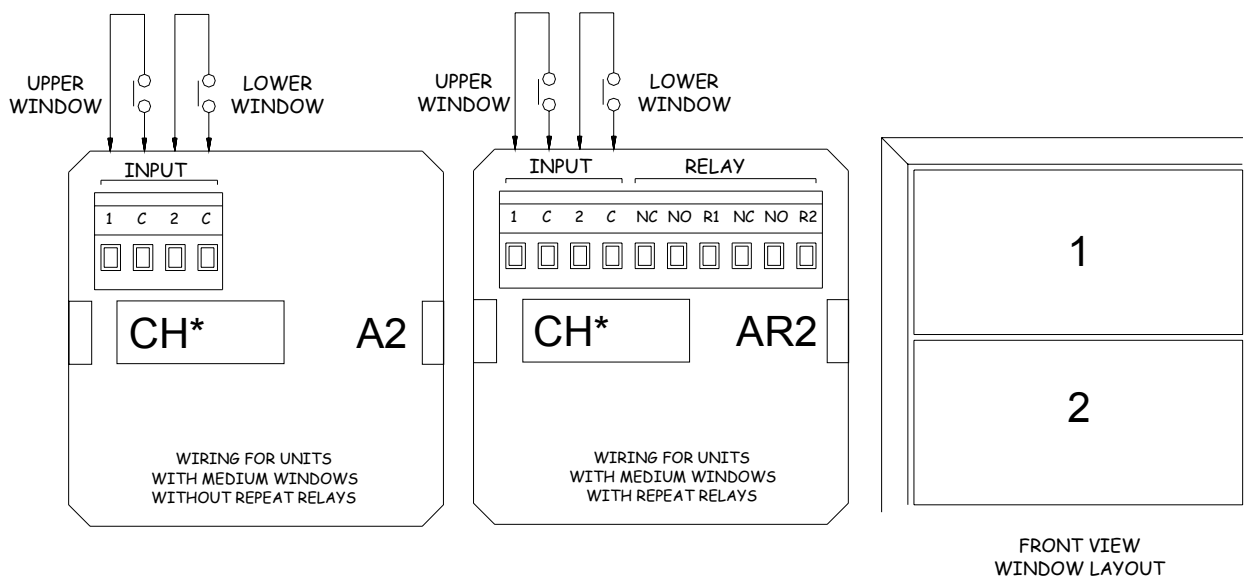
## 16.1 Standard Version Without Repeat Relay Facility

Each cell is equipped with a type A2 back plate and a dual channel alarm card model no CB5674POP1, which is suitable for 2 signal inputs. The alarm card is located in the upper card slot

## 16.2 Optional Version With Repeat Relay Facility

Each cell is equipped with a type AR2 back plate and dual channel alarm card model no CB5674POP2, which is suitable for 2 signal inputs and provides 2 relay outputs each having one set of changeover contacts. The alarm card is located in the upper card slot

### Wiring Details For A2 And AR2 Medium Window Versions





# 17. Small Window Alarm Module Wiring

Series 725 units supplied with small windows provide four alarms per cell.

## 17.1 Standard Version Without Repeat Relay Facility

Each cell is equipped with a type A4 back plate and two x dual channel alarm cards.

Model no CB5674POP1 suitable for 2 signal inputs. The alarm card is located in the upper card slot and

Model no CB5647POP3 suitable for 2 signal inputs. The alarm card is located in the lower card slot

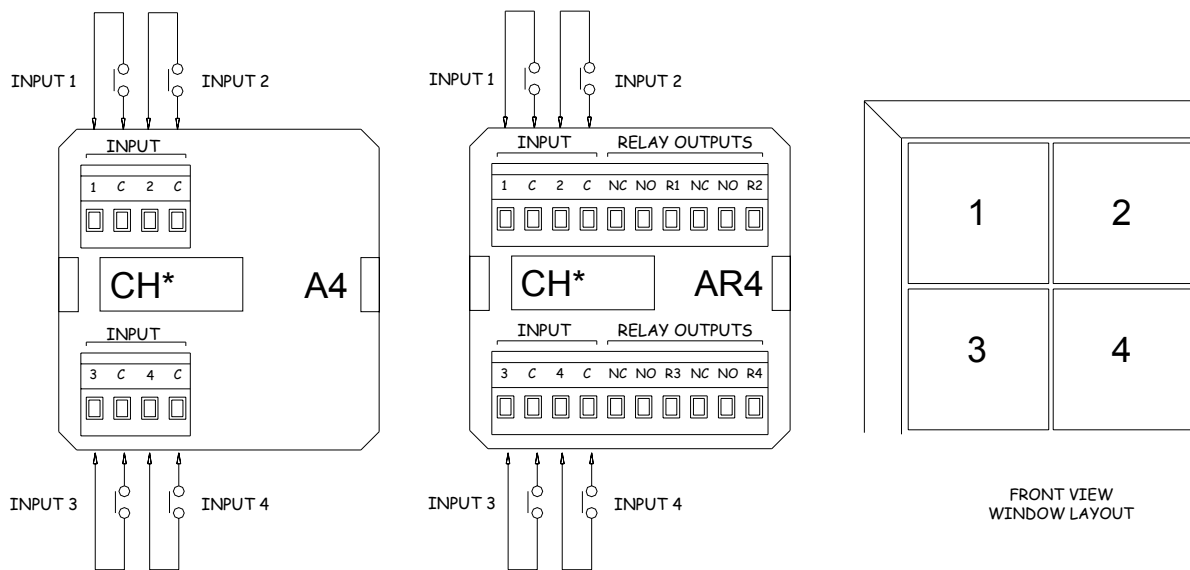
## 17.2 Optional Version With Repeat Relay Facility

Each cell is equipped with a type AR4 back plate and two x dual channel alarm cards

Model no CB5674POP2 suitable for 2 signal Inputs and equipped with 2 relay outputs each having one set of changeover contacts located in the upper card slot

Model no CB5674POP4 suitable for 2 signal Inputs and equipped with 2 relay outputs each having one set of changeover contacts located in the lower card slot

## Wiring Details For A4 And AR4 Small Window Versions



# 18. Dual Repeat Relay Option

## 15.1 Optional Version With Dual Repeat Relay Facility (Option RL2)

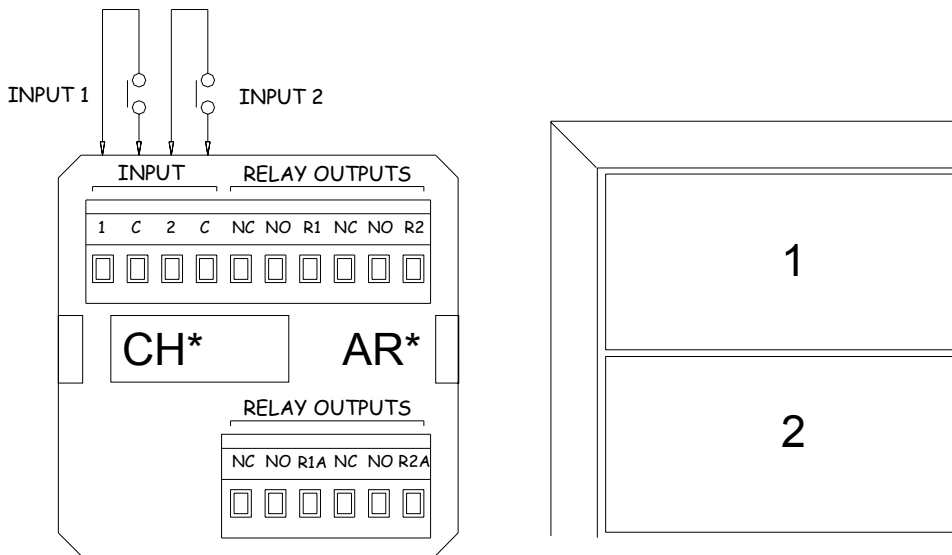
Each cell is equipped with a type AR\* back plate, a dual channel alarm card and a dual channel repeat relay card.

Relay contacts R1 and R1A operate in conjunction with channel 1

Relay contacts R2 and R2A operate in conjunction with channel 2

Please note relays R1A & R2A follow the functions set for relays R1 & R2 they cannot be set to independently.

### Wiring Details For Dual Repeat Relay Versions



FRONT VIEW  
WINDOW LAYOUT

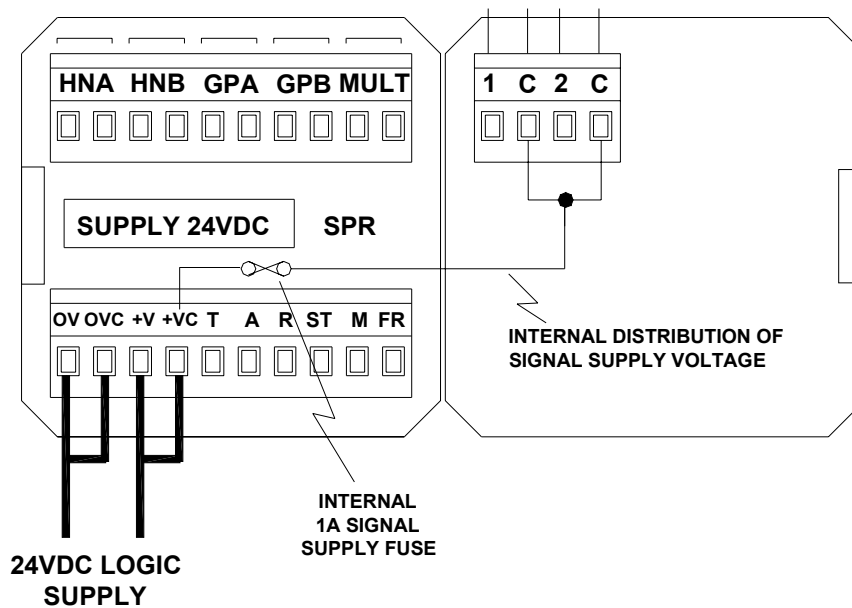
# 19. Signal Supply Voltage Options

## 19.1 Standard Systems With Combined Logic And Signal Supply.

In standard systems the 24VDC logic supply, OV and +V is cross-linked to the signal supply input terminals, OVC and +VC to provide the voltage required to power the input contacts. Systems are supplied with a factory fitted jumper between these terminals.

The signal supply input terminal +VC is used to internally link 24VDC Via a fuse to all of the common terminals within the annunciator marked "C" ready for connection to customer signal contacts

### Systems Using A Single 24VDC For Logic And Signal Supply



### Earthing

All NEX725 Series Alarm Annunciators are fitted with a separate earth stud, which is located on the metal enclosure.

**Warning:-** To ensure the final installation meets all relevant Zone 2 safety standards and EMC directives this earth must be connected

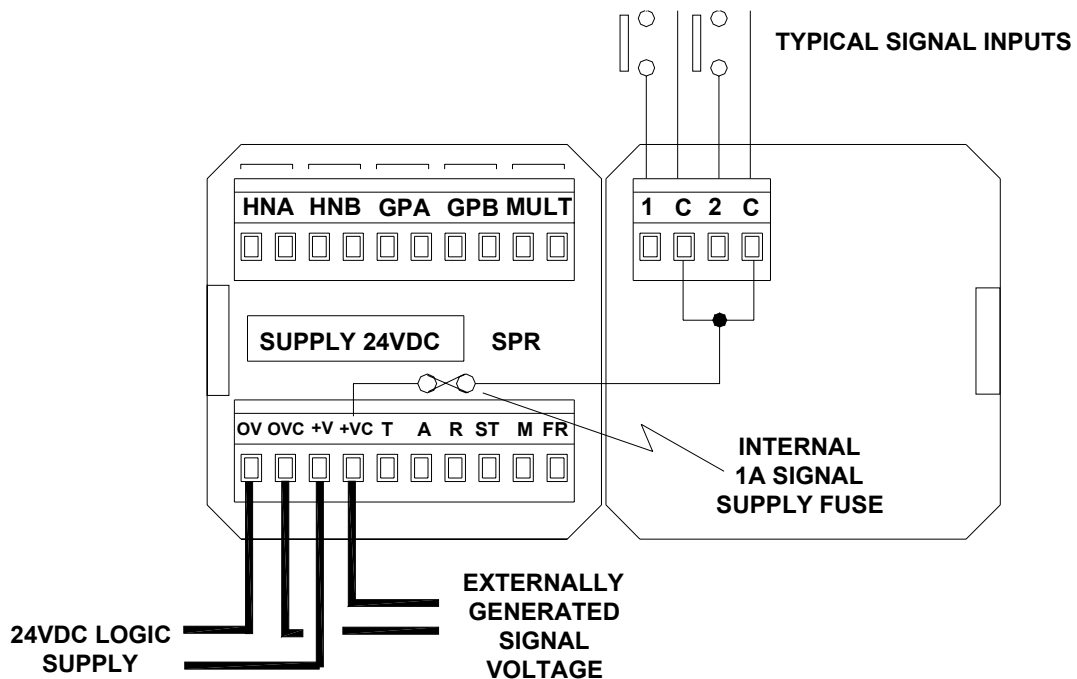
## 19.2 Standard Systems Using Externally Powered Inputs

24VDC powered inputs. As an option systems can use externally generated signal supply voltage sources to power the inputs.

If the externally generated signal supply voltage is 24VAC/DC then the standard annunciator can be used without modification.

The external supply should be connected to signal supply input terminals, OVC and +VC to distribute the voltage required to power the input contacts. +VC is used to internally link the externally generated signal supply voltage, via a fuse, to all of the common terminals within the annunciator marked "C" to allow connection to customer signal contacts

### Systems Using Isolated Logic And Signal Supplies



## 20. Systems Fitted With Serial Comm.'s

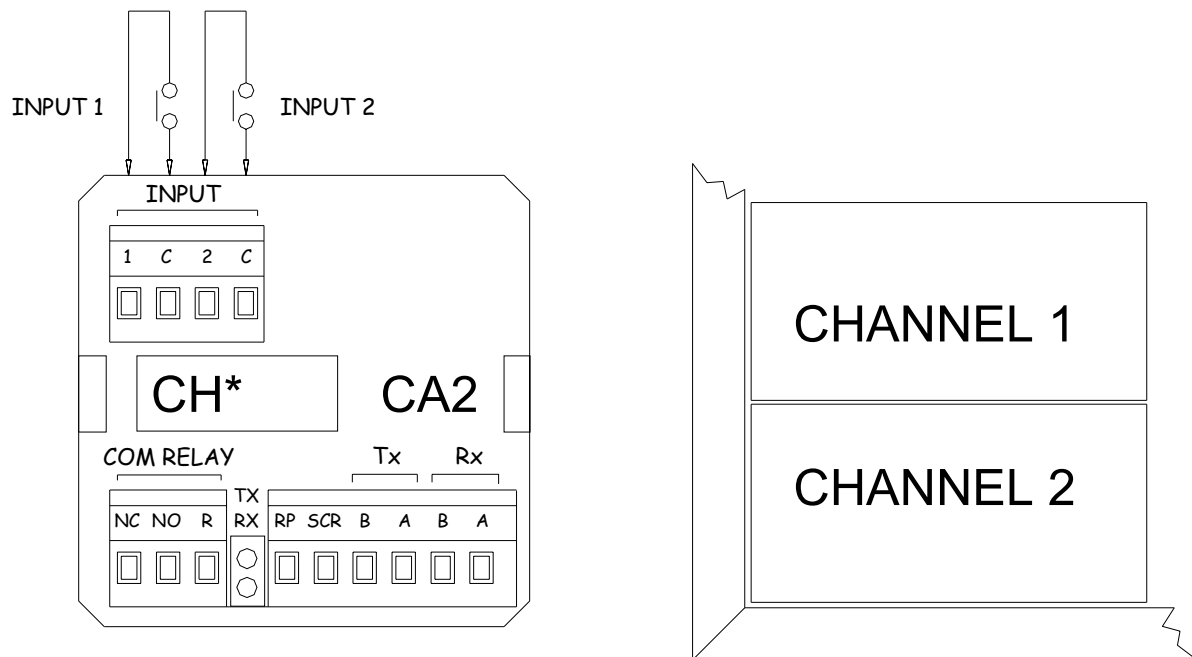
### Systems Fitted With the Serial Communications Option

All NEX7250 units can be supplied with a bi directional serial output card and RS485 serial port, which can be used to transmit or receive serial alarm data to and from 3<sup>rd</sup> party devices on a channel-by-channel basis or in master /slaves configurations between annunciators.

#### 20.1 Connections

It is recommended that the RS485 communications output be wired in twin twisted pair cable, which has both an inner and outer screen. The inner screen should be connected to the communications 0V line and one end of the outer screen should be taken to an instrument earth. It is also recommended that the communication cable is run in separate trunking to cables carrying high current or high voltages. The unit is provided with a communication watchdog relay, which is normally energised and will de-energise if a communications fault occurs. Note:- (Rx) and (Tx) refers to data transmission to the P725 annunciator i.e. Rx refers to data received in the annunciator and TX refers to data transmission out of the annunciator.

#### Communications Card Fitted In Typical Medium Cell



Note:- Full details of communication are provided later in the manual.

# 21. System Configurations And Programming

**IMPORTANT NOTE: -  
PLEASE ENSURE ALL PROGRAMMING AND CONFIGURATION IS DONE BEFORE UNIT IS MOUNTED IN ZONE 2 AREA. AS CUSTOMER WILL NO LONGER HAVE ACCESS TO THE CONFIGURATION PANEL**

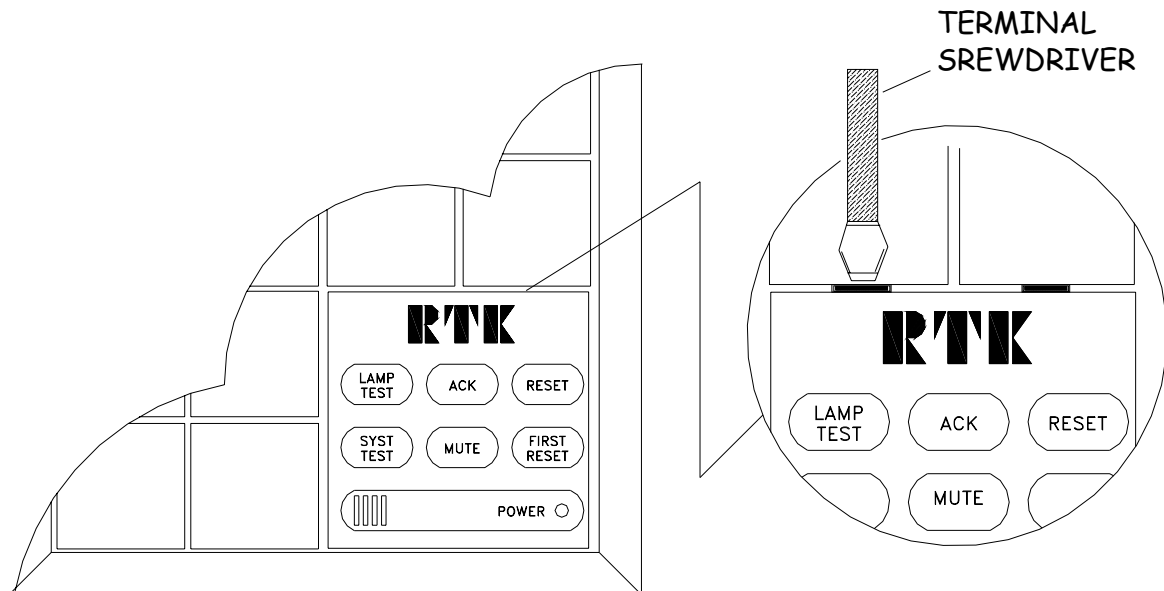
## Functions

The 725 Series alarm annunciator is always supplied with a comprehensive range of pre-defined options which can be enabled or disabled on a channel by channel basis using the integral, (or as an option remote), pushbutton / programming module. To simplify the configuration process each option has been allocated a unique "Function No." between 1 and 24, any combination of these functions can be selected for each alarm way but care must be taken to ensure the operating modes selected do not conflict with each other. For example if ringback alarm sequence R is required the system should also be set to manual reset for the sequence to operate correctly. The key for functions 1 to 24 is shown later in the manual.

## 21.1 Programming Mode

The programme function of the unit is accessed by hinging down the pushbutton / programming module using a small terminal screwdriver in the recess in the top of the bezel and levering forward the top edge of the assembly. This allows the assembly to hinge down to reveal the programming information plate. To programme the unit, first place it in the configuration mode by moving the yellow switch to the "CONF" position, the "function" display will indicate 0 to confirm that the unit can be set.

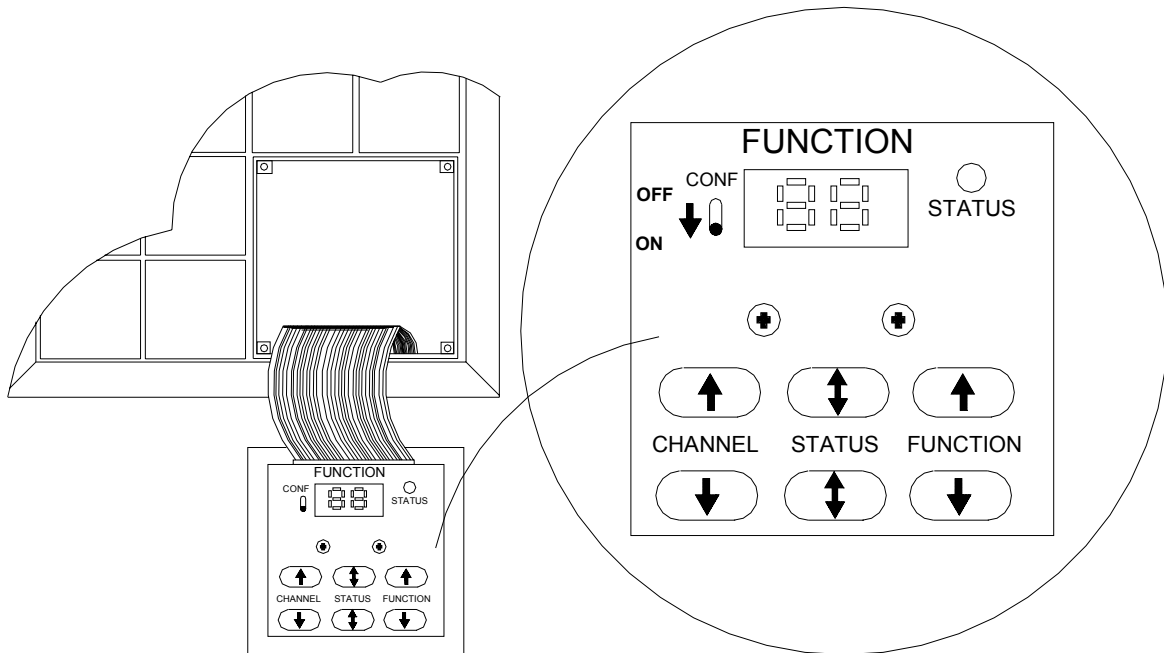
## Removal Of The Pushbutton/Programming Module



## 21.2 Changing A Function Setting

When the pushbutton / programming module has been hinged down and the “CONF”, “programme mode”, switch has been placed to the ON position the operation of the pushbuttons changes as indicated on the information plate on the underside of the unit as detailed below:-

### Programming Information Plate Details



Once the unit is in the (CONF), programme mode, the window associated with the channel selected for programming will fast flash.

1. The lamp test / system test pushbuttons are used to select the required channel
2. The reset / first reset pushbuttons are used to select the required Function No.
3. The ack / mute pushbuttons are used to enable or disable the feature.

Note:- If the status LED is on the feature has been enabled.

### Important note:-

If the user programmes a channel as detailed above and simply returns the unit to the run mode by placing the CONF switch to the off position the information will not be stored. Programme changes are only stored after the user has moved onto an adjacent channel, using the system test or lamp test pushbuttons, at that point the programmed information is stored in EEPROM on the associated alarm card

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### **21.3 Programming Example**

Example:- If channel 7 is currently set to manual reset but the user would like to change this to allow the window to automatically reset, (after acknowledge), the following procedure should be followed.

1. First hinge down the pushbutton module to access the programming plate.
2. Place the unit into (CONF), programming mode, using the yellow switch to the left of the display
3. Use first reset / reset pushbuttons to select function 3 (reset function)
4. Use the system test / lamp test pushbuttons to select channel 7 and note the associated window will fast flash.
5. Use the mute / ack pushbuttons to enable function F3 which is confirmed when the status LED is on.
6. Scroll to the next channel up or down to store the required setting using the system test / lamp test pushbuttons.
7. Return to normal operation by placing the CONF switch to the off state

### **21.4 Checking Programmed Settings**

After all of the required functions have been set on the unit it is recommended that the user checks the configuration to avoid problems during the commissioning stage. This is a simple process that should only take a few minutes and is achieved by placing the unit into the "CONF" mode and scrolling through each channel noting that as each Function is selected the status LED is on if enabled or off if disabled. When functions such as F23 (Critical horn group HNA) are selected all windows selected to operate the relay are illuminated in a steady on state to help the user identify which alarms are within the horn group. Please note:- A window selected for programming automatically fast flashes therefore the window of the channel that is being programmed cannot be viewed to determine status information. The status LED on the information plate can be used as an alternative to view the setting for this channel, if the status LED is on the function has been enabled, or the user can move to an adjacent channel to allow the alarm window to be used in the normal way.

### **21.5 Systems With Unarmed Ways**

Each dual alarm card in the system is provided with a unique binary address, which is set using on board DIL switches during manufacturing. If the system has been supplied with unarmed ways the address normally used for the associated channels will be reserved to allow the user to add the card at a later date. The programming module is designed to stop navigating between channels when it detects a missing card address (normally the last card in the system). When the channel navigation stops because of unarmed ways it is necessary to "jump over" the missing address to access any further channels. To "jump" an address the user needs to hold down the reset pushbutton and then press and hold the "channel up or down" pushbutton.

### **21.6 Points To Note When Programming**

Alarm channels are always numbered in a standard format depending on window size and the channel up / down pushbuttons are used to automatically move between each channel in the correct order. The selected feature is only stored when the user selects an adjacent channel (either going up or down). After the programming is complete it is recommended that the user checks the required functions have been enabled correctly. After programming it is recommended that any channels that have been changed are tested to ensure that the operation is in line with the required functions. The programming process includes an inbuilt comprehensive error checking routine. In applications where there is extreme electrical noise this may result in the program not being accepted. If this happens, simply repeat the process for that particular alarm channel. If units are supplied with unarmed alarm channels it is necessary to jump over these missing cards (addresses) to access the next channel.



## 22. Function No Key And Descriptions

### General Description

The P725 is equipped with numerous pre-defined features that can be simply enabled or disabled on a per channel basis as required. Functions numbers are assigned to each feature for ease of selection.

### Feature and Function Key

FEATURE	FUNCTION	STATUS LED	
		OFF	ON
Monitor current input contact state	F0	Alarm Contact Open	Alarm contact closed
Set signal contact non alarm state	F1	Normally Open	Normally closed
Set individual channel repeat Relay non alarm state	<b>F2</b>	Normally energised	Normally de-energised
Set automatic or manual Reset function	F3	Manual Reset	Automatic reset
Set fleeting alarm state	F4	Lock in	Non lock in
Set alarm to ringback sequence	F5	N/A	Ringback
Pushbutton interlock	F6	Enable	Disable
Input reflash	F7	Disable	Enable
Reflash critical group relay	F8	Disable	Enable
Reflash non critical group relay	F9	Disable	Enable
Set alarm to first up sequence F0	F10*	Disable	Enable
Set alarm to first up sequence F1	F11	Disable	Enable
Set alarm to first up sequence F2	F12	Disable	Enable
Set alarm to first up sequence F3	F13	Disable	Enable
Set alarm to be in first up group A	F14*	Disable	Enable
Set alarm to be in first up group B	F15	Disable	Enable
Set alarm to be in first up group C	F16	Disable	Enable
Set alarm to be in first up group D	F17	Disable	Enable
Set repeat relays to follow logic	<b>F18</b>	Disable	Enable
Set repeat relays to follow input	<b>F19</b>	Disable	Enable
Set repeat relays to follow lamps	<b>F18 &amp; F19</b>	Disable	Enable
Repeat relays inhibited on test	F20	Disable	Enable
Set alarm to critical group relay	F21*	Disable	Enable
Set alarm to non critical group relay	F22*	Disable	Enable
Set alarm to critical horn relay	F23*	Disable	Enable
Set alarm to non critical horn relay	F24*	Disable	Enable

#### Note 1

The Functions marked with the \* are the default settings if no programming is requested with the order

#### Note 2

Functions F2, F18 & F19 are only available if individual channel repeat relays are fitted (Option RLY).

## 23. Function Descriptions

Function Numbers are used to describe pre-defined features that can be enabled or disabled by the Customer as required.

### **F0- Contact Status**

Function F0 allows each window in the annunciator to be illuminated if the associated signal contact is in the closed state. This is normally used to help the user identify the current state of the input device from the front of the unit without disturbing plant wiring.

### **F1- normally open (N/O) or normally closed (N/C) signal input contact**

Each alarm input can be configured to allow operation from a N/O or N/C field contact.

FEATURE-F1	STATUS LED
Set channel to operate from a normally open signal input contact	OFF
Set channel to operate from normally closed signal input contact	ON

### **F2- Individual Channel Output Relay State**

This feature is only available if individual channel repeat relays, option RLY, are fitted to the annunciator.

FEATURE-F2	STATUS LED
Set individual channel repeat relay to be normally energised in non alarm state	OFF
Set individual channel repeat relay to be normally de-energised in non alarm state	ON

### **F3- Manual Or Automatic Reset**

Acknowledged alarms can be set to manual reset where the operator must press the reset pushbutton to clear the alarm after the input has returned to normal or acknowledged alarms can be set to automatic reset which allows the alarm to automatically clear as soon as the input returns to normal.

FEATURE-F3	STATUS LED
Set channel to manual reset	OFF
Set channel to automatic reset	ON

### **F4- Lock-In Or Non-Lock-In Operation**

Alarms that occur and return to normal can be set to lock-in where the alarm is maintained until acknowledge and reset has been pressed. (Depending upon sequence selected) or alarms that occur and return to normal can be set to non-lock-in which allows the alarm to automatically return to the off state as soon as the input returns to normal.

FEATURE-F4	STATUS LED
Set channel to lock-in	OFF
Set channel to non-lock-in	ON

**F5- Ringback Sequence**

Ringback sequence is used to inform the operator that an acknowledged alarm has returned to normal. When an acknowledged alarm returns to normal the associated window will slow flash to indicate to the operator that the alarm can be reset.

FEATURE-F5	STATUS LED
Set channel to ringback not required	OFF
Set channel to ringback sequence	ON

Please note:- Function F3, F4 must be set to the off state for ringback sequence to function correctly. As an option a unique sounding ringback audible can be wired to the unit, which will provide audible notification that the alarm can be reset. The ringback audible feature is described later in the manual

**F6- Reset Pushbutton Optional Function**

If required the reset pushbutton can be used for both acknowledge and reset.

FEATURE-F6	STATUS LED
Set channel to allow acknowledge & reset pushbuttons to operate independently	OFF
Set channel to allow the reset pushbutton to be used for acknowledge & reset	ON

**F7- Input Reflash (Re-Alarm)**

On Manual Reset Sequences Input reflash is used to inform the operator that an acknowledged alarm waiting to be Reset has returned to normal and re-alarmed.

FEATURE-F7	STATUS LED
Set Channel To Disable Input Reflash	OFF
Set Channel To Enable Input Reflash	ON

**F8- Critical Group Relay Reflash Function**

Group relays are typically used to inform third party devices that there is an alarm within a local panel, however in the standard mode additional alarms occurring within the same group will not change the state of the relay if one alarm remains active. The reflash function allows the relay to change state for 0.5 seconds every time a new alarm occurs within the same group.

FEATURE-F8	STATUS LED
Set channel to disable reflash function on critical group relay	OFF
Set channel to enable reflash function on critical group relay	ON

Please note:- Only alarms with function F21 set to on will activate the critical group relay.

---

### **F9- Non-Critical Group Relay Reflash Function**

Group relays are typically used to inform third party devices that there is an alarm within a local panel, however in the standard mode additional alarms occurring within the same group will not change the state of the relay if one alarm remains active. The reflash function allows the relay to change state for 0.5 seconds every time a new alarm occurs within the same group.

FEATURE-F9	STATUS LED
Set channel to disable reflash function on non-critical group relay	OFF
Set channel to enable reflash function on non-critical group relay	ON

Please note:- Only alarms with function F22 set to on will activate the non critical group relay.

### **F10- First-Up Sequence FO Or Enable Slow Flash On Non-First Out Sequences**

This feature is used to enable first-up sequence FO on individual channels as required. Full sequence tables are provided in Section 10

FEATURE-F10	STATUS LED
Set channel to first-up sequence FO not required	OFF
Set channel to first-up sequence FO required	ON

Please note:- F10 is used to enable slow flash for non first up sequences.

### **F11- First-Up Sequence F1**

This feature is used to enable first-up sequence F1 on individual channels as required. Full sequence tables are provided in Section 10

FEATURE-F11	STATUS LED
Set channel to first-up sequence F1 not required	OFF
Set channel to first-up sequence F1 required	ON

### **F12- First-Up Sequence F2**

This feature is used to enable First-Up sequence F2 on individual channels as required. Full sequence tables are provided in Section 10

FEATURE-F12	STATUS LED
Set channel to first-up sequence F2 not required	OFF
Set channel to first-up sequence F2 required	ON

### **F13- First-Up Sequence F3 Or Enable Fast Flash On Non-First Out Sequences**

This feature is used to enable first-up sequence F3 on individual channels as required. Full sequence tables are provided in Section 10

FEATURE-F13	STATUS LED
Set channel to first-up sequence F3 not required	OFF
Set channel to first-up sequence F3 required	ON

Please note:- F13 is used to enable fast flash for non first out sequences

**F14 - First-Up Group A**

All alarms set to function F14 will operate as a single first-up group in accordance with the selected first-up sequence. F14 is the function code allocated for first-up Group A.

FEATURE-F14	STATUS LED
Set to remove channel from first-up Group A	OFF
Set to include channel in first-up Group A	ON

**F15 - First-Up Group B**

All alarms set to function F15 will operate as a single first-up group in accordance with the selected first-up sequence. F15 is the function code allocated for first-up Group B.

FEATURE-F15	STATUS LED
Set to remove channel from first-up Group B	OFF
Set to include channel in first-up Group B	ON

**F16 - First-Up Group C (Four First-up Group version only)**

All alarms set to function F16 will operate as a single first-up group in accordance with the selected first-up sequence. F16 is the function code allocated for first-up Group C.

FEATURE-F16 (FOUR FIRST-UP GROUP VERSION ONLY)	STATUS LED
Set to remove channel from first-up Group C	OFF
Set to include channel in first-up Group C	ON

**F16 – Alarm Input Selection (Standard version)**

On standard units that have the communications capability enabled there are only two first-up groups A and B. On these units Function 16 is used to configure how the communications operate. With the communications option fitted it is possible to receive alarms in the normal way, from volt-free contacts, or via the serial communications port. This function is used to select where the system is looking to receive this alarm information. If the function is not selected then the normal volt-free contacts are used. If the function is selected then the serial communications port will be monitored for details of alarm status. It is possible to set this feature on an individual channel basis hence having some alarm channels monitoring volt-free contacts and some monitoring the communications.

FEATURE-F16 (STANDARD VERSION)	STATUS LED
Set to get alarm information from volt-free contact input	OFF
Set to get alarm information from the serial communications	ON

**F17 - First-up Group D (Four First-up Group version only)**

All alarms set to function F17 will operate as a single first-up group in accordance with the selected first-up sequence. F17 is the function code allocated for first-up Group D.

FEATURE-F17 (FOUR FIRST-UP GROUP VERSION ONLY)	STATUS LED
Set to remove channel from first-up Group D	OFF
Set to include channel in first-up Group D	ON

### **F17 – Alarm Logic Selection (Standard version)**

On standard units that have the communications capability enabled there are only two first-up groups A and B. On these units Function 17 is used to configure how the communications operate. In most situations the control of the logic functions of the annunciator are done locally but in some cases this would be done remotely. The Series 725 Annunciator would simply operate as a dumb display indicating and flashing in a manner defined by some external equipment. The external equipment would monitor the alarm points, define which is first-up, which is acknowledged and reset etc. This function is selected if it required to have the annunciator logic remote from the P725. More details on this feature are provided in the section on Serial Communications

FEATURE-F17 (STANDARD VERSION)	STATUS LED
Set For Annunciator Logic To Be Locally Controlled	OFF
Set For Annunciator Logic To Be Remote From The P725	ON

### **F18- Individual Channel Repeat Relay (Follows Alarm Logic)**

A relay set to function F18 will activate on alarm and remain in the alarm state until the alarm has returned to normal and the associated pushbuttons have been pressed. Please note:- The individual relay is activated by the alarm logic or when system test is pressed (See function F20).

FEATURE-F18	STATUS LED
Set Channel To Off If This Feature Is Not Required	OFF
Set Channel To Repeat Relay Follows Alarm Logic	ON

### **F19- Individual Channel Repeat Relay (Follows Signal Input)**

A relay set to function F19 will activate when the signal input is in the alarm state and will automatically return to normal when the signal input returns to normal. Please note:- The individual relay is only activated by its signal input and never operates as a result of lamp or system test only

FEATURE-F19	STATUS LED
Set Channel To Off If This Feature Is Not Required	OFF
Set Channel To Repeat Relay Follows Signal Input	ON

### **F18 And 19- Individual Channel Repeat Relay (Follows Display)**

A relay set to both function F18 and F19 will follow the alarm display. Please note:- The individual relay operates as a slave of the lamp output signal and when system test or lamp test is pressed. (The relay cannot be prevented from operating when lamp or system test are pressed (See function F20).

FEATURE-F18 AND F19	STATUS LED
Set Channel To Off If This Feature Is Not Required	OFF
Set Channel To Repeat Relay Follows Display	ON

**F20- Inhibit Group Repeat Relays On System Test**

If any channel in the system has been assigned to either the GPA or GPB relays using function F21 or F22 and system test is pressed the group relays will activate. However if function F20 is enabled the GPA and GPB relays cannot be triggered by system test.

FEATURE-F20	STATUS LED
Set Channel To Operate The GPA & GPB Relays On System Test	OFF
Set Channel To Inhibit The GPA & GPB Relays On System Test	ON

**F21- Critical Group Relay (GPA)**

Each channel can be set to operate the critical group relay using function F21. When set the alarm channel will activate the group relay when an alarm occurs and the relay will remain active until the alarm has returned to normal and the channel has been acknowledged and reset.

FEATURE-F21	STATUS LED
Remove channel from the critical group relay	OFF
Set channel to operate the critical group relay	ON

**F22- Non-Critical Group Relay (GPB)**

Each channel can be set to operate the non-critical group relay using function F22. When set the alarm channel will activate the group relay when an alarm occurs and relay will remain active until the alarm has returned to normal and the channel has been acknowledged and reset.

FEATURE-F22	STATUS LED
Remove channel from the non-critical group relay	OFF
Set channel to operate the non-critical group relay	ON

**F23- Critical Audible Relay (HNA)**

Each channel can be set to operate the critical horn relay using function F23. When set the alarm channel will activate the horn relay when an alarm occurs and the relay will remain active until the mute or acknowledge pushbutton has been pressed.

FEATURE-F23	STATUS LED
Remove channel from the critical horn relay group	OFF
Set channel to operate the critical horn relay	ON

**F24- Non-Critical Audible Relay (HNB)**

Each channel can be set to operate the non-critical horn relay using function F24. When set the alarm channel will activate the horn relay when an alarm occurs and the relay will remain active until the mute or acknowledge pushbutton has been pressed.

FEATURE-F24	STATUS LED
Remove channel from the non-critical horn relay group	OFF
Set channel to operate the non-critical horn relay	ON

# 24. Alarm Card Address Settings

## Dual Channel Alarm Card Address And Output Drive Type Settings

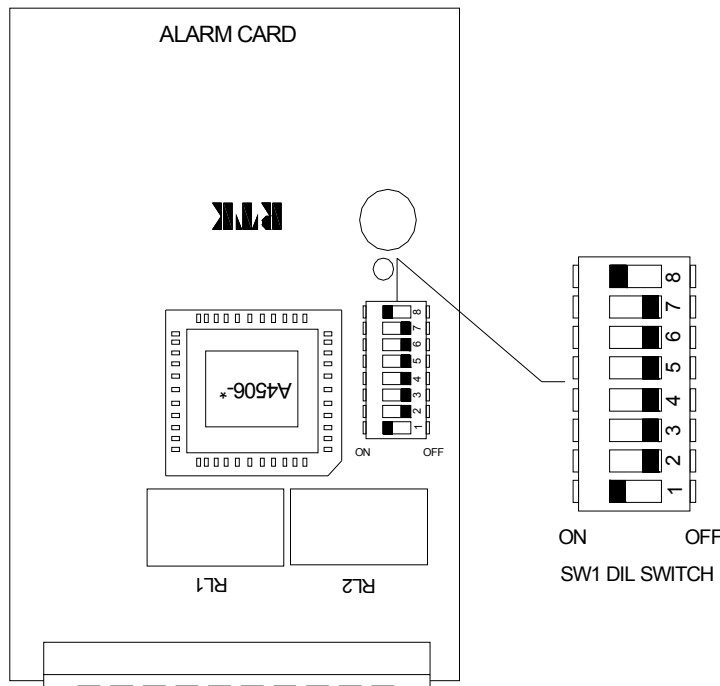
Before each card is placed within the annunciator a unique address No. has to be set using the switches located on DIL switch SW1, which allows the programming module to communicate and pass programming instructions to and from the associated alarm channels. When replacing an alarm card the switches on DIL Switch SW1 must be set to match the card that is being removed.

SW1-*	FUNCTION	ON	OFF
SW1-1	Set address Bit 1	1	0
SW1-2	Set address Bit 2	1	0
SW1-3	Set address Bit 3	1	0
SW1-4	Set address Bit 4	1	0
SW1-5	Set address Bit 5	1	0
SW1-6	Set address Bit 6	1	0
SW1-7	Set address Bit 7	1	0

### 24.1 Set Output Drive To Operate Withr LED

SW1-8	Fit & forget LED assemblies	SW1-8	OFF
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### Alarm Card DIL Switch SW1 Location





**24.2 Alarm Card DIL Switch SW1 Address Settings 0 To 40**

ADDRESS		64	32	16	8	4	2	1
NO.	BINARY	SW1-7	SW1-6	SW1-5	SW1-4	SW1-3	SW1-2	SW1-1
0	0000000	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1	0000001	OFF	OFF	OFF	OFF	OFF	OFF	ON
2	0000010	OFF	OFF	OFF	OFF	OFF	ON	OFF
3	0000011	OFF	OFF	OFF	OFF	OFF	ON	ON
4	0000100	OFF	OFF	OFF	OFF	ON	OFF	OFF
5	0000101	OFF	OFF	OFF	OFF	ON	OFF	ON
6	0000110	OFF	OFF	OFF	OFF	ON	ON	OFF
7	0000111	OFF	OFF	OFF	OFF	ON	ON	ON
8	0001000	OFF	OFF	OFF	ON	OFF	OFF	OFF
9	0001001	OFF	OFF	OFF	ON	OFF	OFF	ON
10	0001010	OFF	OFF	OFF	ON	OFF	ON	OFF
11	0001011	OFF	OFF	OFF	ON	OFF	ON	ON
12	0001100	OFF	OFF	OFF	ON	ON	OFF	OFF
13	0001101	OFF	OFF	OFF	ON	ON	OFF	ON
14	0001110	OFF	OFF	OFF	ON	ON	ON	OFF
15	0001111	OFF	OFF	OFF	ON	ON	ON	ON
16	0010000	OFF	OFF	ON	OFF	OFF	OFF	OFF
17	0010001	OFF	OFF	ON	OFF	OFF	OFF	ON
18	0010010	OFF	OFF	ON	OFF	OFF	ON	OFF
19	0010011	OFF	OFF	ON	OFF	OFF	ON	ON
20	0010100	OFF	OFF	ON	OFF	ON	OFF	OFF
21	0010101	OFF	OFF	ON	OFF	ON	OFF	ON
22	0010110	OFF	OFF	ON	OFF	ON	ON	OFF
23	0010111	OFF	OFF	ON	OFF	ON	ON	ON
24	0011000	OFF	OFF	ON	ON	OFF	OFF	OFF
25	0011001	OFF	OFF	ON	ON	OFF	OFF	ON
26	0011010	OFF	OFF	ON	ON	OFF	ON	OFF
27	0011011	OFF	OFF	ON	ON	OFF	ON	ON
28	0011100	OFF	OFF	ON	ON	ON	OFF	OFF
29	0011101	OFF	OFF	ON	ON	ON	OFF	ON
30	0011110	OFF	OFF	ON	ON	ON	ON	OFF
31	0011111	OFF	OFF	ON	ON	ON	ON	ON
32	0100000	OFF	ON	OFF	OFF	OFF	OFF	OFF
33	0100001	OFF	ON	OFF	OFF	OFF	OFF	ON
34	0100010	OFF	ON	OFF	OFF	OFF	ON	OFF
35	0100011	OFF	ON	OFF	OFF	OFF	ON	ON
36	0100100	OFF	ON	OFF	OFF	ON	OFF	OFF
37	0100101	OFF	ON	OFF	OFF	ON	OFF	ON
38	0100110	OFF	ON	OFF	OFF	ON	ON	OFF
39	0100111	OFF	ON	OFF	OFF	ON	ON	ON
40	0101000	OFF	ON	OFF	ON	OFF	OFF	OFF

**Alarm Card DIL Switch SW1 Address Settings 41 To 80**

ADDRESS		64	32	16	8	4	2	1
NO.	BINARY	SW1-7	SW1-6	SW1-5	SW1-4	SW1-3	SW1-2	SW1-1
41	0101001	OFF	ON	OFF	ON	OFF	OFF	ON
42	0101010	OFF	ON	OFF	ON	OFF	ON	OFF
43	0101011	OFF	ON	OFF	ON	OFF	ON	ON
44	0101100	OFF	ON	OFF	ON	ON	OFF	OFF
45	0101101	OFF	ON	OFF	ON	ON	OFF	ON
46	0101110	OFF	ON	OFF	ON	ON	ON	OFF
47	0101111	OFF	ON	OFF	ON	ON	ON	ON
48	0110000	OFF	ON	ON	OFF	OFF	OFF	OFF
49	0110001	OFF	ON	ON	OFF	OFF	OFF	ON
50	0110010	OFF	ON	ON	OFF	OFF	ON	OFF
51	0110011	OFF	ON	ON	OFF	OFF	ON	ON
52	0110100	OFF	ON	ON	OFF	ON	OFF	OFF
53	0110101	OFF	ON	ON	OFF	ON	OFF	ON
54	0110110	OFF	ON	ON	OFF	ON	ON	OFF
55	0110111	OFF	ON	ON	OFF	ON	ON	ON
56	0111000	OFF	ON	ON	ON	OFF	OFF	OFF
57	0111001	OFF	ON	ON	ON	OFF	OFF	ON
58	0111010	OFF	ON	ON	ON	OFF	ON	OFF
59	0111011	OFF	ON	ON	ON	OFF	ON	ON
60	0111100	OFF	ON	ON	ON	ON	OFF	OFF
61	0111101	OFF	ON	ON	ON	ON	OFF	ON
62	0111110	OFF	ON	ON	ON	ON	ON	OFF
63	0111011	OFF	ON	ON	ON	OFF	ON	ON
64	1000000	ON	OFF	OFF	OFF	OFF	OFF	OFF
65	1000001	ON	OFF	OFF	OFF	OFF	OFF	ON
66	1000010	ON	OFF	OFF	OFF	OFF	ON	OFF
67	1000011	ON	OFF	OFF	OFF	OFF	ON	ON
68	1000100	ON	OFF	OFF	OFF	ON	OFF	OFF
69	1000101	ON	OFF	OFF	OFF	ON	OFF	ON
70	1000110	ON	OFF	OFF	OFF	ON	ON	OFF
71	1000111	ON	OFF	OFF	OFF	ON	ON	ON
72	1001000	ON	OFF	OFF	ON	OFF	OFF	OFF
73	1001001	ON	OFF	OFF	ON	OFF	OFF	ON
74	1001010	ON	OFF	OFF	ON	OFF	ON	OFF
75	1001011	ON	OFF	OFF	ON	OFF	ON	ON
76	1001100	ON	OFF	OFF	ON	ON	OFF	OFF
77	1001101	ON	OFF	OFF	ON	ON	OFF	ON
78	1001110	ON	OFF	OFF	ON	ON	ON	OFF
79	1001111	ON	OFF	OFF	ON	ON	ON	ON
80	1010000	ON	OFF	ON	OFF	OFF	OFF	OFF

**Alarm Card DIL Switch SW1 Address Settings 81 To 120**

ADDRESS		64	32	16	8	4	2	1
NO.	BINARY	SW1-7	SW1-6	SW1-5	SW1-4	SW1-3	SW1-2	SW1-1
81	1010001	ON	OFF	ON	OFF	OFF	OFF	ON
82	1010010	ON	OFF	ON	OFF	OFF	ON	OFF
83	1010011	ON	OFF	ON	OFF	OFF	ON	ON
84	1010100	ON	OFF	ON	OFF	ON	OFF	OFF
85	1010101	ON	OFF	ON	OFF	ON	OFF	ON
86	1010110	ON	OFF	ON	OFF	ON	ON	OFF
87	1010111	ON	OFF	ON	OFF	ON	ON	ON
88	1011000	ON	OFF	ON	ON	OFF	OFF	OFF
89	1011001	ON	OFF	ON	ON	OFF	OFF	ON
90	1011010	ON	OFF	ON	ON	OFF	ON	OFF
91	1011011	ON	OFF	ON	ON	OFF	ON	ON
92	1011100	ON	OFF	ON	ON	ON	OFF	OFF
93	1011101	ON	OFF	ON	ON	ON	OFF	ON
94	1011110	ON	OFF	ON	ON	ON	ON	OFF
95	1011111	ON	OFF	ON	ON	ON	ON	ON
96	1100000	ON	ON	OFF	OFF	OFF	OFF	OFF
97	1100001	ON	ON	OFF	OFF	OFF	OFF	ON
98	1100010	ON	ON	OFF	OFF	OFF	ON	OFF
99	1100011	ON	ON	OFF	OFF	OFF	ON	ON
100	1100100	ON	ON	OFF	OFF	ON	OFF	OFF
101	1100101	ON	ON	OFF	OFF	ON	OFF	ON
102	1100110	ON	ON	OFF	OFF	ON	ON	OFF
103	1100111	ON	ON	OFF	OFF	ON	ON	ON
104	1101000	ON	ON	OFF	ON	OFF	OFF	OFF
105	1101001	ON	ON	OFF	ON	OFF	OFF	ON
106	1101010	ON	ON	OFF	ON	OFF	ON	OFF
107	1101011	ON	ON	OFF	ON	OFF	ON	ON
108	1101100	ON	ON	OFF	ON	OFF	OFF	OFF
109	1101101	ON	ON	OFF	ON	ON	OFF	ON
110	1101110	ON	ON	OFF	ON	ON	ON	OFF
111	1101111	ON	ON	OFF	ON	ON	ON	ON
112	1110000	ON	ON	ON	OFF	OFF	OFF	OFF
113	1110001	ON	ON	ON	OFF	OFF	OFF	ON
114	1110010	ON	ON	ON	OFF	OFF	ON	OFF
115	1110011	ON	ON	ON	OFF	OFF	ON	ON
116	1110100	ON	ON	OFF	ON	OFF	OFF	OFF
117	1110101	ON	ON	ON	OFF	ON	OFF	ON
118	1110110	ON	ON	ON	OFF	ON	ON	OFF
119	1110111	ON	ON	ON	OFF	ON	ON	ON
120	1111000	ON	ON	ON	ON	OFF	OFF	OFF

**Alarm Card DIL Switch SW1 Address Settings 121 To 127**

ADDRESS		64	32	16	8	4	2	1
NO.	BINARY	SW1-7	SW1-6	SW1-5	SW1-4	SW1-3	SW1-2	SW1-1
121	1111001	ON	ON	ON	ON	OFF	OFF	ON
122	1111010	ON	ON	ON	ON	OFF	ON	OFF
123	1111011	ON	ON	ON	ON	OFF	ON	ON
124	1111100	ON	ON	ON	ON	ON	OFF	OFF
125	1111101	ON	ON	ON	ON	ON	OFF	ON
126	1111110	ON	ON	ON	ON	ON	ON	OFF
127	1111111	ON	ON	ON	ON	ON	ON	ON

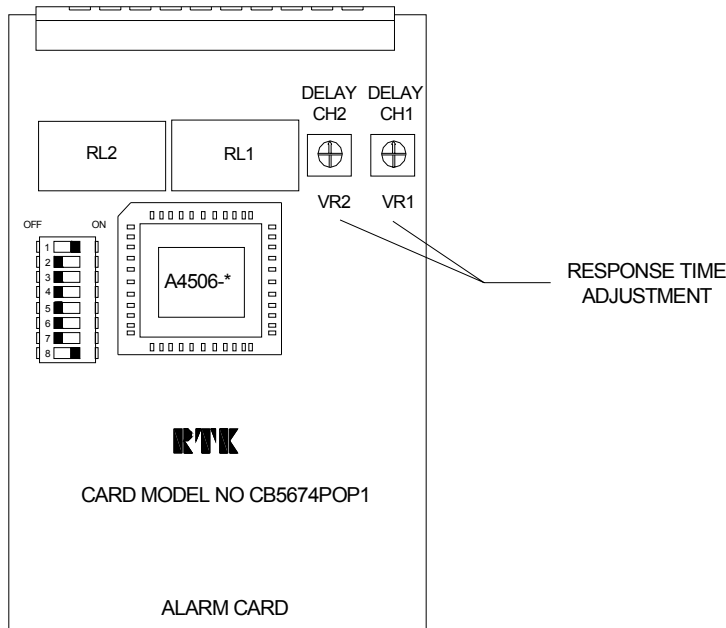
## 25. Adjustable Response Times

If specified at the time of ordering alarm cards can be supplied with single-turn potentiometers that allow the user to set the response time of each input.

Option AD1 = 5 – 50 ms

Option AD2 = 20ms - 2 seconds

Option AD3 = 5ms – 5 seconds



To access the individual alarm card the plastic cover plate on the rear of the associated cell must be removed by squeezing the lock-in tabs on either side of the cover. The alarm card can then be removed to allow adjustments to be made to VR1 (Channel 1) and VR2 (Channel 2) as required. The standard adjustment is in the range 5mS to 50 mS turning the trim pot in a clockwise direction to increase the response time.

## 26. Systems With Serial Communication

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### **Introduction**

The 725 Series alarm annunciator can be supplied with a serial communications card as an option using either modbus ASCII or modbus RTU protocol as standard. This allows the unit to interface to 3<sup>rd</sup> party devices such as PLC's, DCS systems, industrial computers, SCADA packages etc. The annunciator is RS485/RS422 compatible and can easily be converted to RS232 using a suitable external converter. As standard the annunciator acts as a 'slave' device, but can be configured as a master in certain applications.

### **Bi-Directional Communications**

The 725 bi-directional communications card allows the unit to read and write data to each alarm window, which provides alarm contact status, window illumination control/status, and pushbutton information. Each channel can be set to alarm from hard wired signal inputs from the associated input terminal or via serial communications as required.

### **Configuration**

The baud rate, parity and protocol are selected by changing DIL switch settings on the communications card

### **Address Selection**

Each annunciator is set with a unique address from 0 to 63, which allows up to 64 separate annunciators to be connected in a single RS485 multi-drop loop. RTK can also supply comprehensive alarm monitoring and logging software if required.

### **Character Format**

ASCII 7 data, 1 start, 1 stop, 1 parity  
RTU 8 data, 1 start, 1 stop, 1 parity

### **Message Format**

In accordance with the standard modbus protocols, all data exchanges are assumed to comply strictly with these standards. ASCII transmissions will start with a colon and end with longitudinal redundancy check (LRC), carriage return and line feed. RTU transmissions will not use framing characters and will incorporate a cyclic redundancy check (CRC).

For further details please refer to the "Modicon modbus protocol reference guide" available from Modbus-IDA [www.modbus.org](http://www.modbus.org)

### **Fault Indication**

If communications cannot be established within a specified time-out period (typically 10 seconds) then the watchdog relay on the communications card will trip and, if fitted, the "communications fault" window will illuminate. This indicates there is a communications fault either with the external device or with the integral alarm cards within the annunciator. Because the system continually attempts to regain communications it will self-recover as soon as communication is re-established.

### **P725 to P725 Connections**

For applications where local and remote annunciators are required two or more P725 annunciators can be interconnected. In the normal situation one of the annunciators will monitor the standard volt-free alarm contacts or voltage inputs and indicate the alarms as normal. This alarm information is then transmitted on the serial communications to another P725 annunciator using either two or four wires for the communications. These systems are interconnected as shown later in this section.

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### **System 9000TS To P725 Annunciator**

The System9000TS Annunciator from RTK Instruments can also be used as described above to monitor a number of alarm contacts and transmit the information via the serial communications to a remote P725 annunciator. The System9000TS can optionally have a display to indicate alarm information or simply operate as a data gathering and transmission device. Please refer to our sales office for further information on these systems.

### **Modbus Communications**

Full details on how to use modbus ASCII and modbus RTU protocols are not given within this manual as they are well covered by more specialised manuals. A brief overview of the main features is shown below.

### **Modbus Function Codes**

The function code field tells the addressed 'slaves' what function to perform. The only relevant function codes when communicating to the P725 annunciator are as follows:-

- 03     Read register     This reads 16 bit data registers containing alarm information
- 06     Write register     Writes data to 16 bit register. This data request can be used as an alternative alarm input source.

### **Error Check**

The error check is either LRC (Longitudinal redundancy check) or CRC (Cyclic redundancy check) depending on whether ASCII or RTU modbus is selected.

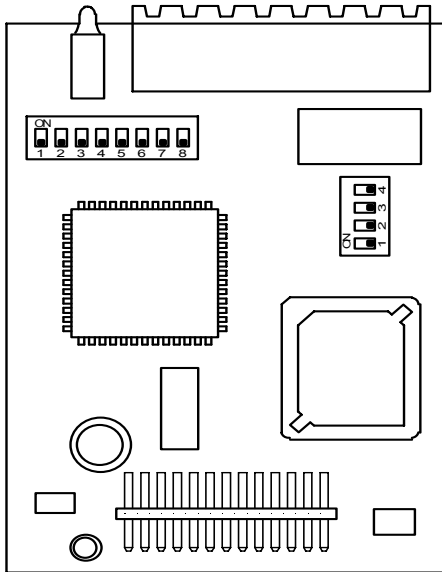
### **Software**

RTK Instruments can supply comprehensive monitoring software for use with the 725 Series alarm annunciator. This can be configured as an alarm/event management system with user generated custom displays to monitor plant wide system operation.

## 27. Serial Communication Card

The series NEX7250 Alarm Annunciator can be fitted with a serial communications card, which will provide an RS485 port to connect to external equipment. A number of features on this card are DIL-switch selectable as described below.

### Position Of DIL Switches On Communications Card



SW1-*	FUNCTION	ON	OFF
SW1-1	Address bit 1	1	0
SW1-2	Address bit 2	1	0
SW1-3	Address bit 3	1	0
SW1-4	Address bit 4	1	0
SW1-5	Address bit 5	1	0
SW1-6	Address bit 6	1	0
SW1-7	Enable remote serial pushbutton control	ON	OFF
SW1-8	Enable outputs for bulb drive	ON	OFF

SW2-*	FUNCTION	ON	OFF
SW2-1	Set communication baud rate	4800	9600
SW2-2	Set Modbus protocol type	RTU	ASCII
SW2-3	Set parity type	ODD	EVEN
SW2-4	Set as Modbus master or slave	Master	Slave



**Address selection**

Each annunciator needs to have a node address selected. This must be between 0 and 63. It is this address that makes the annunciator unique and allows the external equipment to communicate to a defined annunciator within a multi-drop system. The required node address should be converted to a binary number to give the DIL switch settings with the least significant digit on S1 and the most significant on S6.

**Pushbutton selection**

In systems that are connected to a remote device via the communications it is sometimes a requirement for the pushbutton control to be provided externally via the communications port. S7 on SIL switch SW1 is used to enable this feature. The local pushbutton will still be operational even if this feature is enabled.

**Selection**

The table below indicates additional communication parameters that are available for configuration by the user. All switches are set to off in the default conditions so it is only necessary to make changes if the standard parameters do not suit the particular configuration. The master/slave selection is only used when a P725 annunciator is using the serial communication link to communicate to another P725 annunciator in a local/remote configuration as detailed earlier.

**DIL Switch 2**

SWITCH	FUNCTION	ON	OFF
SW2-1	Baud rate	4800	9600
SW2-2	Modbus protocol	RTU	ASCII
SW2-3	Parity	ODD	EVEN
SW2-4	Modbus master / slave	Master	Slave

All switches are factory set to off as default.

**Option MOD C7 High Speed Communication Version**

As an option the Communication port can be supplied as a high speed version with the following selectable speeds.

SW2-*	FUNCTION	ON	OFF
SW2-1	Set communication baud rate	19200	38400

## 28. Serial Communication Port

This section describes the process of reading from and writing data to a P725 slave annunciator, and also the different types of data interchange possible. The tables below show the standard message formats for data interchange, for both ASCII and RTU protocols.

ASCII tables. Each character represents 7 bit binary data in ASCII format with the exception of the characters in brackets, which should be considered as one character.  
X represents a character with more than one possible value.  
All characters are framed with 1 start bit, 1 parity bit and 1 stop bit.

RTU tables. Each character represents 8 bit binary data in hexadecimal format.  
Y represents a character with more than one possible value.  
All characters are framed with 1 start bit, 1 parity bit and 1 stop bit.

### Read Request – Master

ASCII	START	ADDRESS	FUNCTION	REGISTER ADDRESS	NO OF REGISTERS	ERROR CHECK	STOP
	:	XX	03	XXXX	0001	XX	[LF] [CR]

RTU	START	ADDRESS	FUNCTION	REGISTER ADDRESS	NO OF REGISTERS	ERROR CHECK	STOP
	ELAPSED TIME 3 ½ CHARACTERS MIN	Y	3	YY	01	YY	ELAPSED TIME 3 ½ CHARACTERS MIN

### Read Response - P725 Slave

ASCII	START	ADDRESS	FUNCTION	BYTE COUNT	DATA	ERROR CHECK	STOP
	:	XX	03	02	XXXX	XX	[LF] [CR]

RTU	START	ADDRESS	FUNCTION	BYTE COUNT	DATA	ERROR CHECK	STOP
	ELAPSED TIME 3 ½ CHARACTERS MIN	Y	3	2	YY	YY	ELAPSED TIME 3 ½ CHARACTERS MIN

**Write Request/Response**

Master write request and P725 slave write response, are the same.

ASCII	START	ADDRESS	FUNCTION	REGISTER ADDRESS	DATA	ERROR CHECK	STOP
	:	XX	06	XXXX	XXXX	XX	[CR] [LF]

RTU	START	ADDRESS	FUNCTION	REGISTER ADDRESS	DATA	ERROR CHECK	STOP
	ELAPSED TIME 3 ½ CHARACTERS MIN	Y	6	YY	YY	YY	ELAPSED TIME 3 ½ CHARACTERS MIN

**Address**

The address field, in the range 0 to 63, should be set to match the address set on DIL switch SW1 on the save P725 communication card

**Register Address**

The register address field contains the address of data within the P725 slave.

REGISTER ADDRESS	CHANNEL NO	TYPE
0	1	Data
1	2	Data
2	3	Data
255	256	Data
256	Pushbutton	Data

**Data**

The data field uses 16 bits. The information it contains is dependent on the type of data interchange being performed i.e. read or write, register address, status of functions 16, 17 and the status of SW1 Position 7 on the communications board. The table below lists the main types of data interchange and the various settings required. It is assumed in the table below that remote data originates from a master, and local data from a P725 slave.

DATA INTERCHANGE	SETTINGS		
	F16	F17	SW1-7
Read local channel input	OFF	X	X
Read local channel logic	X	OFF	X
Read local channel input + logic	OFF	OFF	X
Read local pushbutton	X	X	X
Write remote channel input	ON	X	X
Write remote channel logic	X	ON	X
Write remote channel input + logic	ON	ON	X
Write remote pushbuttons	X	X	ON

---

### **Channel Data**

The following table shows the name, function, and relative position of data bits in the data field for a read response or write request of alarm channel data.

	BIT	DATA
LOWEST WORD	0	Input state
	1	First up
	2	Acknowledge
	3	Input latch
	4	Ringback
	5	Not used
	6	Not used
	7	Not used
HIGHEST WORD		Not Used

Channel data request register address 0 - 255

#### **Input State-BIT 0**

0 = Normal, 1 = Abnormal

Read response + F16 deselected – Indicates status of local alarm contact

Read response + F16 selected – Indicates status of input bit

If the alarm contact is in the alarm state then this bit will be one. This has no relation to the actual contact being open or closed which is set using the function number F1, it simply states that the contact is in the alarm state.

#### **First-Up-BIT 1**

If this bit is set to one then this channel is a first-up alarm. If multiple first-up groups are used it will be possible to have multiple first-up alarms. The serial communications transmits no details on alarm grouping so this would need to be done externally if required.

#### **Acknowledged-BIT 2**

When an alarm channel is acknowledged the visual and audible states are normally changed. When this bit is set to one it indicates that the alarm channel has been acknowledged.

#### **Input Latch-BIT 3**

Each alarm channel has an integral latch that is normally set when an alarm occurs and does not reset until the alarm is acknowledged and also reset. This bit will indicate that this latch is on when set to one which means there is still an alarm present that has not been acknowledged and reset.

#### **Ringback-BIT 4**

With this sequence set further indication will show that the alarm channel has returned to normal and can be reset. If this bit is set to one then the channel is in ringback mode.

### **Control Functions - (Pushbuttons)**

All the control functions with the exception of sleep and lamp test can be written to or read from the P725 slave. The following table shows the name, function, and relative position of data bits in the data field for a read response or write request of pushbutton data.

	BIT	DATA
LOWEST WORD	0	Test
	1	Acknowledge
	2	Reset
	3	Not used
	4	Not used
	5	Not used
	6	Not used
HIGHEST WORD	7	Not used

### **Pushbutton Address 256**

The first three data bits are used to indicate the pushbutton action. Their relationship to the pushbutton action is summarised in the table below.

CONTROL FUNCTION	BITS		
	Test (0)	ACK (1)	Reset (2)
Test	1	0	0
Ack	0	1	0
Reset	0	0	1
First-up reset	0	1	1
System test	1	0	1
Mute	1	1	1

### **Read of multiple channels**

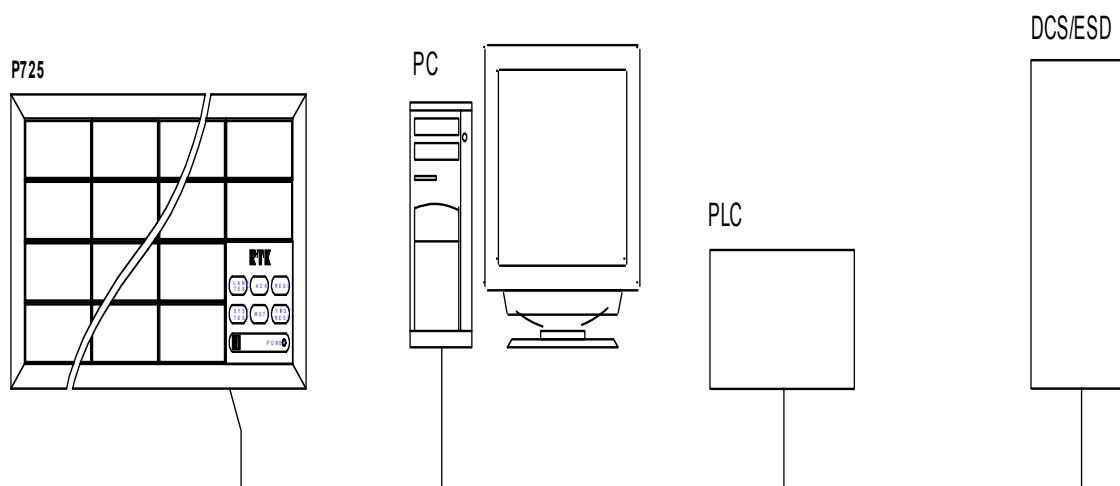
- In applications where you need to read or write the status of the input channel without any information on the full alarm status it is possible to transmit 16 channels in a single read/write cycle. This information can be read (Modbus Function 3) or written to (Modbus Function 6) and starts at address 2000 for channels 1 to 16 (bit 0 = channel 1, bit 15 = channel 16), address 2001 for channels 17 to 32 (bit 0 = channel 17, bit 15 = channel 32) and so on.
- On Systems supplied after May 1<sup>st</sup> 2006 the user is also able to read or write the latch state of the input channel and transmit 16 channels in a single read/write cycle. This information can be read (Modbus Function 3) or written to (Modbus Function 6) and has a starting address of 2016 for channels 1 to 16 (bit 0 = channel 1, bit 15 = channel 16), address 2017 for channels 17 to 32 (bit 0 = channel 17, bit 15 = channel 32) and so on.

## 29. Systems Linked To 3<sup>rd</sup> Party Devices

### **General**

Using the advanced communications facilities on the series 725 annunciator, it is possible to connect the unit to a variety of 3<sup>rd</sup> party devices to monitor or control the alarm annunciator. Any 3<sup>rd</sup> party device equipped with either a RS485 or a RS232 port using modbus protocol can be connected to the P725 annunciator. Please note:- If the RS232 port of the 3<sup>rd</sup> party device is used a RS485/232 converter will be required. The P725 annunciator always operates as a slave device and it is therefore only able to read and write following requests from the master device. Various parameters of the communications are user configurable using DIL switches on the communications card. In larger applications up to 63 separate annunciators can be connected to a single communication network to allow remote monitoring by 3<sup>rd</sup> party equipment. In addition to the annunciation RTK can also supply suitable alarm management software pre-installed onto a single computer or as part of a complete plant wide alarm management system.

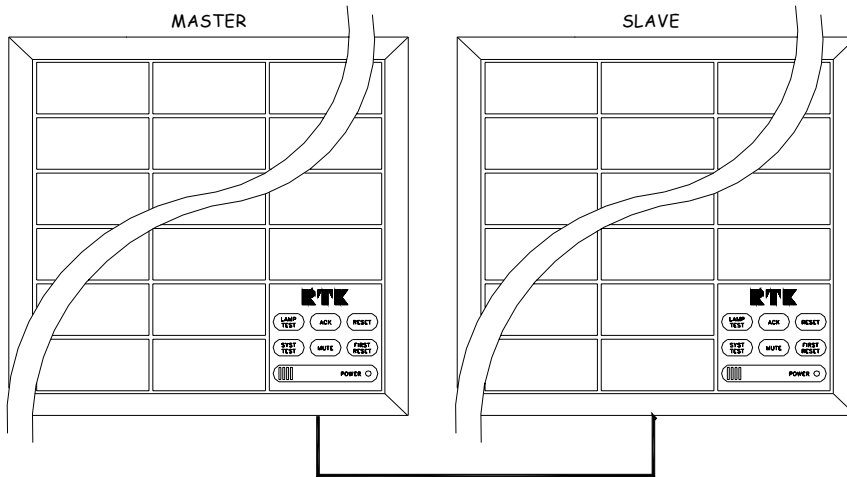
### **P725 Connected To 3<sup>rd</sup> Party Equipment**



# 30. P725 To P725 Serial Links

## Local And Remote Systems Linked Via Communications

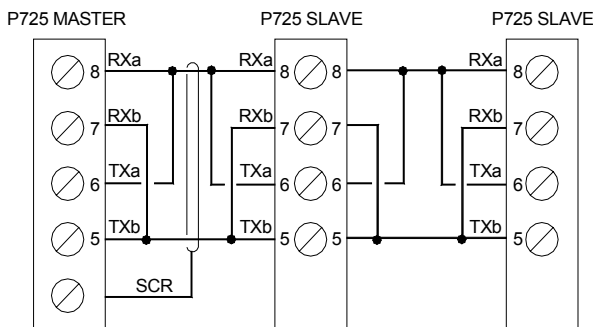
In applications that require local panel alarms to be duplicated or summarised in central control rooms or monitoring stations the P725 can be supplied with a communications option which allows RS485 communication using Modbus protocol as standard between units. In this application the local annunciator is directly wired to the alarm contacts in the normal way but the alarm information is also made available to transmit over the RS485 communications link to a 2<sup>nd</sup> P725 unit mounted in the control room or monitoring station.



RS485 LINK BETWEEN P725 ANNUNCIATORS

All systems supplied with serial communication cards are automatically equipped with integral watchdog relays, which will change state if any errors in the internal or external communication are detected. In larger schemes multiple remote P725 Annunciators, each with serial communications, can be connected to a single P725 used for central monitoring. The key advantage with units configured in this manner is the central monitoring annunciator only requires 24VDC logic power and a 4 core RS485 cable to function. In this example functions F16 and F17 are used to configure each unit to either transmit or receive serial data as required. Local panel units are hard wired to the associated field contact and once configured transmit alarm data over the serial communication link. Please note:- one of the devices must be set as a master.

## Communication Link Wiring Details



## 31. Commissioning

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A qualified technician properly trained and authorised to work with this type of equipment should carry out commissioning and servicing operations. The following procedure is a summary of the steps normally taken when installing an alarm system. This is the absolute minimum requirement and will generally be supplemented by a number of additional checks relating to the particular application and installation.

STEP	FUNCTION
1	Check all external customer connections to the annunciator are free from earth faults.
2	Ensure the annunciator has been correctly earthed using appropriate sized cable.
3	Check that all customers wiring added during installation is secure and correctly wired.
4	Apply a 24vdc logic supply and check that the power on LED illuminates correctly.
5	Press the system test pushbutton to check that all active alarm channels flash and the audible alarm sounds in accordance with the programmed sequence.
6	Press the remaining pushbuttons required to control the programmed sequence.
7	Refer to the section on programming and check that all of the required functions have been correctly set.
8	Initialise each channel one by one from the field device to check that the laser printed film legend and filter colour matches the associated process.



## 32. Maintenance

**PLEASE NOTE WHEN INSTALLED UNIT MUST BE DE-ENERGISED BEFORE ANY MAINTAINACE IS UNDERTAKEN**

### 31.1 No Special Tools

All normal maintenance and programming is carried out from the front of the annunciator without the use of special tools. Filter and film legend changes and lamp and LED replacement are all undertaken by unclipping the front filter assembly.

### 31.2 Removing Filter Assemblies

See Section 16.

### 31.3 Changing Film Legend

See Section 16.

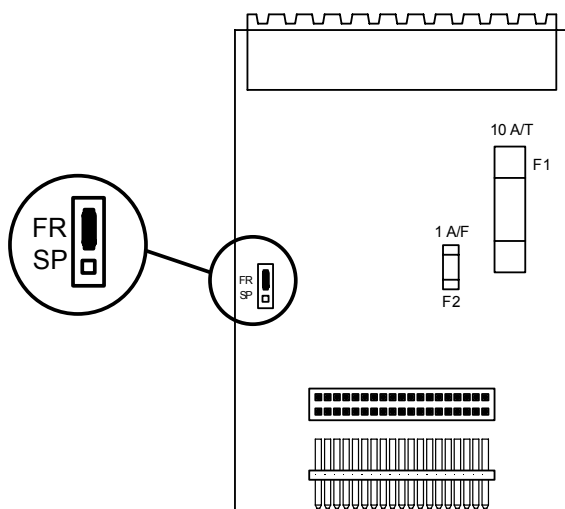
### 31.4 Changing LED Assemblies

After removal of the filter assembly the lamp holder will be visible. A lamp test pushbutton can be pressed to ascertain which LED's have failed; it is then a simple matter to remove the faulty LED's. The LED assemblies are removed and replaced in exactly the same way except that the glass wedge is replaced with a small PCB connecting tag. The LED's are not polarised so can be fitted in either orientation.

### 31.5 Fuse Replacement

Two fuses protect the overall system, one protects the supply and motherboard (F1) and the other protects the feed to the alarm contacts (F2). These are both situated on the supply card, which is fitted in the SPR module. The location of the two fuses is shown below. Take care to replace fuses with fuses of exactly the same type. Spare fuses are supplied with all annunciator shipments

### 31.6 Position Of Fuses On The Supply Card



## 33. Spare Parts Description

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### **Alarm Card Types**

There are 4 basic types of dual channel alarm cards

PART NO	DESCRIPTION	USED ON
CB5674POP1	2 Channel alarm card (Without repeat relays)	Large, Medium and Small window versions Located in the upper slot of the associated cell
CB5674POP2	2 Channel alarm card (With repeat relay facility)	Large, Medium and Small window versions Located in the upper slot of the associated cell
CB5674POP3	2 Channel alarm card (Without repeat relays)	Small window versions Located in the lower slot of the associated cell
CB5674POP4	2 Channel alarm card (With repeat relay facility)	Small window versions Located in the lower slot of the associated cell

### **SPR Dual Card Assembly (Supply And Relay Card)**

PART NO	DESCRIPTION	USED ON
CB4190POP	SPR card supply card	All versions to distribute and fuse logic and signal supplies within the annunciator
CB4210POP	SPR card relay card	All versions to provide the 5 common relay functions. (Dual horn and group plus multifunction relays)

### **Pushbutton Assembly**

Part no P725-TAR

#### **LED version**

LED Assembly Part no P725LED-XX (where xx is the colour) RD-Red, YW-Yellow, AM-Amber, WT-White, BL-Blue, GN-Green

## 34. Other RTK Products

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RTK Instruments Ltd is fully ISO9001:2000 approved and manufactures a comprehensive range of complementary products from our factory in Knaresborough, UK for use in the Industrial Control and Instrumentation field as per the summary list provided below.

All standard products come complete with a 5 year guarantee

- Sequential event recorder
- Alarm management systems
- Programmable remote logic alarm systems
- Hazardous area alarm systems
- Trip amplifiers
- Trip monitoring systems
- Signal isolators
- Multi-output isolators
- Signal converters
- Frequency converters
- Tachometers and inverse tachometers
- Universal panel meters
- Large character displays
- Power supplies
- Loop powered isolators and displays
- Intrinsically safe alarm and status display products including:-
  - LED beacons
  - Sounders
  - Led clusters

Please ring the sales office on 0044 (0) 1423 580500 for latest product information or visit our web site [www.rtkinstruments.com](http://www.rtkinstruments.com)

## 35. Function Selections For Alarm Sequence

FUNCTION NUMBER	FEATURE DESCRIPTION	STD ISA SEQUENCES				FIRST-UP ISA SEQUENCES				STATUS ONLY
		M	A	A-4	R	F1A	F2M-1	F3A	FFAM2	
F3	Manual / Automatic Reset	OFF	ON	ON	OFF	ON	OFF	ON	OFF	OFF
F4	Lock In / Non Lock In	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
F5	Ringback Sequence	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
F6	2 Pushbutton Operation	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
F10	First Up Seq. FO	** Set To On For Slow Flash				OFF	OFF	OFF	OFF	OFF
F11	First Up Seq. F1	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
F12	First Up Seq. F2	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
F13	First Up Seq. F3	** Set To On For Fast Flash				OFF	OFF	ON	ON	OFF
F14	First Up Group A	OFF	OFF	OFF	OFF	When using First-Up sequences Functions F14 to F17 allow the user to link each channel into the required First-Up Group A, B, C or D. Channels can linked to more than one group if required.				OFF
F15	First Up Group B	OFF	OFF	OFF	OFF					OFF
F16	First Up Group C	OFF	OFF	OFF	OFF					OFF
F17	First Up Group D	OFF	OFF	OFF	OFF					OFF
F23	Critical Horn Drive	Channels selected to F23 will drive the internal horn and critical horn relay								
F24	Non Critical Horn Drive	Channels selected to F24 will drive the non-critical horn relay only								

### Function Setting Per Alarm Sequence

\*\* Note 1 When using Std. ISA sequences Functions F10 or F13 sets the preferred Flash Rate, F10 = slow flash F13 = fast flash.