USER'S MANUAL

Omniflex

Omni30 Series
Alarm Annunciators

DATE	REVISION	COMMENTS
Aug 2002	1	Initial revision
Jan 2003	2	Corrections for Production
Mar2003	3	Edited for distribution
June 2011	4	Corrected Text on Sequence Diagrams
Nov 2017	5	Updated mechanical drawing for Omni30/8, 32/8 & 33/8
Aug 2021	6	Clarified operation of the GP group output operation

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The Acrobat Portable Document File is named UMC1620AR06.pdf

SCOPE

This User Manual provides information necessary to install, configure and operate your Omni30 product.

This manual covers the following product Model Numbers:

Model	Product	Description
C1620	Omni30/8	8 Way Alarm Module Panel Mount (483mmW x 44.5mmH)
C1620-1	Omni30/8-SL	8 Way Alarm Module 19 inch Rack mount (483mmW x 44.5mmH)
C1621	Omni32/8	4 Way Alarm + Control Module Panel Mount (483mmW x 44.5mmH)
C1621-1	Omni32/8-SL	4 Way Alarm + Control Module 19 inch Rack Mount (483mmW x 44.5mmH)
C1622	Omni33/8	8 Way Control Module Panel Mount (483mmW x 44.5mmH)
C1622-1	Omni33/8-SL	8 Way Control Module 19 inch Rack Mount (483mmW x 44.5mmH)
C1623	Omni30/4	4 Way Alarm Module Panel Mount (267mmW x 44.5mmH)
C1624	Omni33/4	Control Module Panel Mount (267mmW x 44.5mmH)

Introduction

The OMNIFLEX Omni30 family is a range of alarm annunciators designed using the OMNIFLEX Omni16c alarm annunciator technology, packaged in 10.5inch and 19inch housings, in 4 and 8 way configurations.

All products in the range are available "off-the-shelf" with no factory customisation required. Because these units are not built to order, spares holding and maintenance are significantly reduced.

Alarm display options include long-life incandescent lamps for lowest initial cost, or high-bright back-lit LED's for best life cycle cost and lowest power consumption and reliability.

Display legends for the backlit displays are created by the user on any standard laser/inkjet printer using software templates supplied with the product.

All popular configuration options are accomplished by switch settings externally available on the unit.

Additional options include:
- 27 alarm sequences as standard for widest range of applications.
- Flash synchronisation between modules.
- A Software Configuration Utility for more advanced customisation.

- Fully isolated RS232/422/485 Modbus© compatible serial port to interface to PLC, DCS, or SCADA systems.
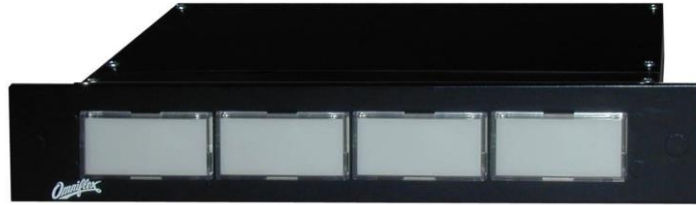
The Omni30/4 Panel Mount 4 point Alarm Annunciator.

The Omni30/8 Panel Mount 8 point Alarm Annunciator.

The Omni32/8 Panel Mount 4 point alarm & Control Module

The Omni33/4 Panel Mount Control Module

The Omni33/8 Panel Mount Control Module

Table of Contents

1. GENERAL DESCRIPTION

1.1   Standard Features

- Standard 4 and 8 point modules allow integral systems from 4 to 128 points to be constructed by the user.
- All products in the range are supplied off-the-shelf with no factory customisation required, to minimise spares holding.
- Panel mounted display options include long-life incandescent lamps or high-bright back-lit LED's.
- User-created display legends on standard laser/inkjet printer using software templates supplied – no window engraving required.
- Plug-in terminals for easy installation and maintenance.
- Switch selectable Normally Open or Normally Closed input contact sense selection while installed. No dismantling required.
- 27 switch selectable alarm sequences built in, covering most alarm annunciator specifications and configurations.
- 24Volt dc powered.

1.2   Options available

- Fully isolated RS232/422/485 Modbus© compatible serial port to interface to PLC, DCS, or SCADA systems.
- Advanced Software Configuration Utility to configure the Omni30 in "SOFT-SET" mode for more specialised applications.

1.3   Rear Views of the Omni30 Series products
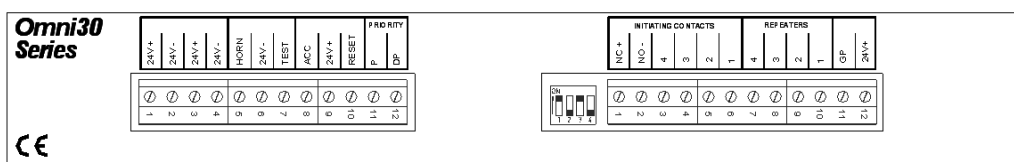
Figure 1-1 – Panel Mount Omni30/4 Rear View
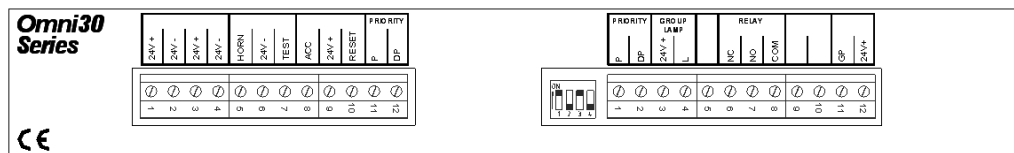
Figure 1-2 – Panel Mount Omni33/4 Rear View

Figure 1-3 – Omni30/8 Rear View

Figure 1-4 – Omni32/8 Rear View

Figure 1-5 – Omni33/8 Rear View

2. MECHANICAL INSTALLATION

2.1 Mechanical Dimensions
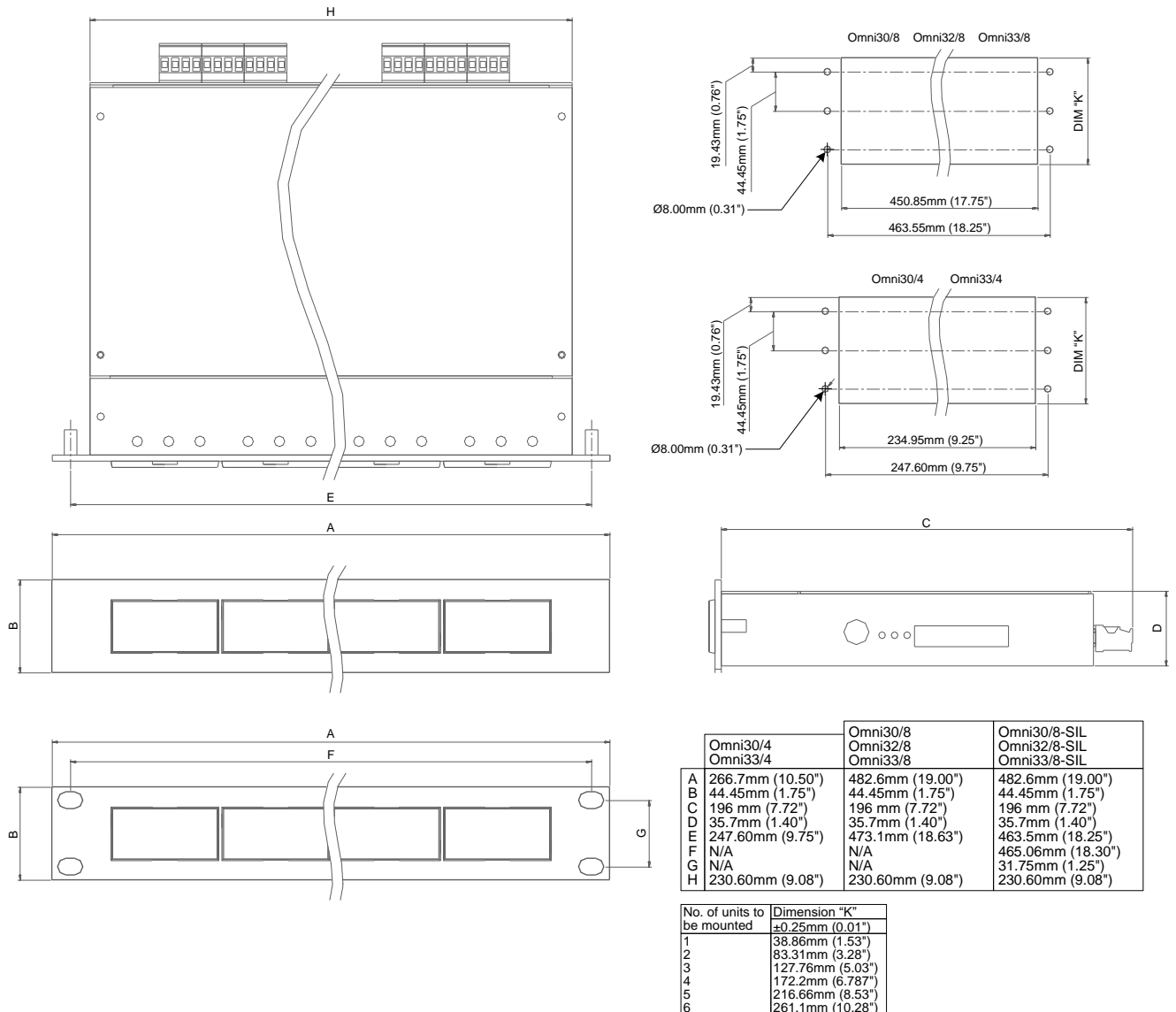
Figure 2-1 –Omni30 Mechanical Dimensions

	Omni30/4 Omni33/4	Omni30/8 Omni32/8 Omni33/8	Omni30/8-SIL Omni32/8-SIL Omni33/8-SIL
A	266.7mm (10.50")	482.6mm (19.00")	482.6mm (19.00")
B	44.45mm (1.75")	44.45mm (1.75")	44.45mm (1.75")
C	196 mm (7.72")	196 mm (7.72")	196 mm (7.72")
D	35.7mm (1.40")	35.7mm (1.40")	35.7mm (1.40")
E	247.60mm (9.75")	473.1mm (18.63")	463.5mm (18.25")
F	N/A	N/A	465.06mm (18.30")
G	N/A	N/A	31.75mm (1.25")
H	230.60mm (9.08")	230.60mm (9.08")	230.60mm (9.08")

No. of units to be mounted	Dimension "K" ±0.25mm (0.01")
1	38.86mm (1.53")
2	83.31mm (3.28")
3	127.76mm (5.03")
4	172.2mm (6.787")
5	216.66mm (8.53")
6	261.1mm (10.28")

2.2 Panel Mounting

The panel mounted Omni30 series units may be mounted individually or in groups in a single cut-out in the panel. Each annunciator is mounted using its own mounting studs. See the Mechanical Dimensions above for detailed requirements for the cutout.

If incandescent lamps are installed in the windows in these units, then the maximum number of units recommended in a single cut-out is 6 units to prevent excessive heat build-up.

2.3 19 inch Rack Mounting

Some of the Omni30 Series units are available in 19inch Rack mountable enclosures.

All 19 inch Rack mounted units are 1U (44.45mm) in height.

If incandescent lamps are installed in the windows in these units, then the maximum number of units recommended to stack without a ventilation gap is 6 units to prevent excessive heat build-up.

2.4 Installing Back-lit LED boards

Back-lit LED boards are installed through the front windows of the unit.

To install an LED board in a window, follow this procedure:

1. Snap out the relevant clear plastic window using slot in the centre (see 2.7.3).
2. Remove any lamps that may already be installed. (Backlit LED boards can be installed in units that have incandescent lamp holders installed, but only after the bulbs have been removed.)
3. Using a pair of long-nose pliers, grip the backlit LED board by the central connector, and carefully insert on to the gold pins located in the centre of the window.
4. Press the board firmly into position so that the white locating spacer clips into the locating hole in the back of the window.

Markings on the LED board indicate the correct insertion orientation. If an LED board is inserted the wrong way around, it will not work, but no damage will be done.

2.5 Installing Incandescent Lamps

If the Omni30 Alarm unit has incandescent lamp-holders fitted, then the incandescent lamps may be fitted and changed through the front windows.

To install the lampholders themselves, however, the Lamp display Assembly must be removed from the main housing. Consult your nearest OMNIFLEX distributor for assistance in installing incandescent lamp holders.

2.6 Creating Window Legends for Back-lit Display Windows

2.6.1 Overview

Legends are created for the Omni30 on a laser or inkjet printer using the software templates provided with the product.

Templates for popular programs are supplied on a 3,5" 'stiffy' diskette with your unit. There are templates for Microsoft Word and Microsoft PowerPoint to run on an IBM compatible computer running the Windows95, Windows 98 or Windows NT/2000/XP operating systems. There is also a README.TXT file on this disk. Read this first to see which versions of program are compatible with these templates.

2.6.2 Creating the Legend Film

To create the legend film, follow this procedure:

1. Start the application program you wish to use.
2. Open the appropriate template from the 'stiffy diskette' supplied.
3. Fill in your legend details in this template.

4. Print the legends created onto overhead transparency film (the type used for overhead presentations). A sheet is included with the product.
5. Cut along the cut marks which will print onto the film to produce the number of individual legends required.
6. Insert them into the Omni30 as described in section 2.7.

Please note that the supplied templates have been tested on a wide range of printers. Your particular printer may scale the image slightly differently. While the front grid markings should accommodate this tolerance, in exceptional circumstances you may have to alter the grid spacing on the template supplied. This needs to be done once only and will then be set for your printer.

2.7 Inserting Legends and Colour Filters into Back-lit Display Windows

2.7.1 Colour of Windows

If Back-lit LED boards are used, then the colour of the window can be set by the choice of LED lamp board colour, and no additional colour filters are required.

If incandescent lamps or white LED boards are used, then a coloured window filter can be inserted into the window to provide the required lamp colour.

These coloured filters are provided in a kit of assorted colours supplied with the product.

Each kit of coloured filters contains the following:

C1663 Colour Filter Kit Contents
8 Red Filters 8 Yellow Filters 8 Green Filters 4 Blue Filters

Additional Colour Filter Kits may be ordered as desired by quoting Model Number C1663.

2.7.2 Assembling Back-lit Display Windows

Assemble back-lit windows into the Omni30 as follows:

1. Assemble each window as shown in Figure 2-2 Backlit Window Order of Assembly.
2. Snap the assembled window into position in the Omni30 Alarm unit.

Rough surface
this side

Legend Film

Colour Filter
(if required)
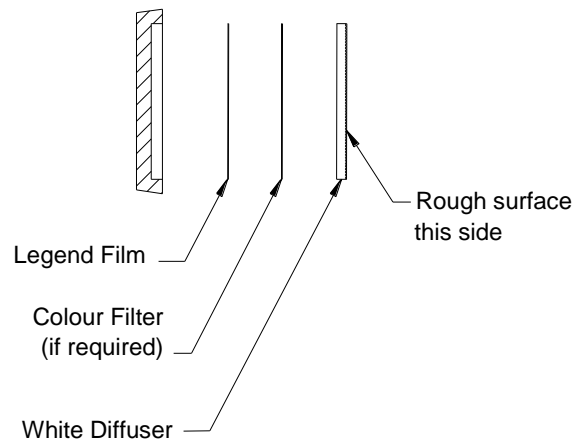
White Diffuser

Figure 2-2 Backlit Window Order of Assembly

2.7.3 Removing Backlit Display Windows

Windows may be removed by inserting a screwdriver in the slot provided on the top or bottom of the clear window to lever it gently out.

The Diffuser, legend and coloured filter may be removed from the window by pressing the window down on to a flat surface such as a desk top. This diffuser, coloured filter and legend will pop out.

3. ELECTRICAL INSTALLATION

3.1 Introduction

All electrical connections to the Omni30 units are made on the rear of the unit on plug-in terminals provided.
The following connection diagrams show the terminations provided on each of the Omni30 product types:

3.2 Omni30 Alarm Input Connections

Inputs to the Omni30 Annunciator must be potential free contacts.
Input contacts to the Alarm Modules can be either Normally Open or Normally Closed. This is dependent upon the way they are wired, and the position of the NO/NC switches.
Normally Open Contact Inputs have a common negative with the relevant NO/NC switch OFF.
Normally Closed Contact Inputs have a common positive with the relevant NO/NC Switch ON, as shown in the wiring diagram below.
Inputs may be mixed Normally Open/Normally Closed on a single module.

A Group Alarm Output and Lamp Repeat outputs are optional on each Alarm Module. Leave these terminals unconnected if these functions are not used.
:
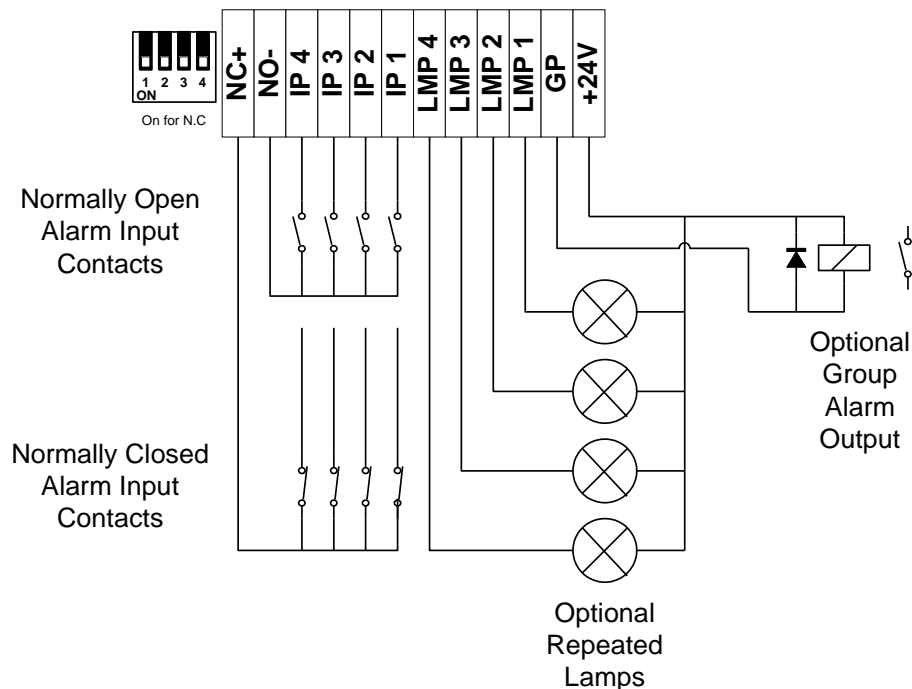
Figure 3-1 –Omni30 Alarm Connections

3.3 Omni30 Common Service Connections using an Omni30 Control Module
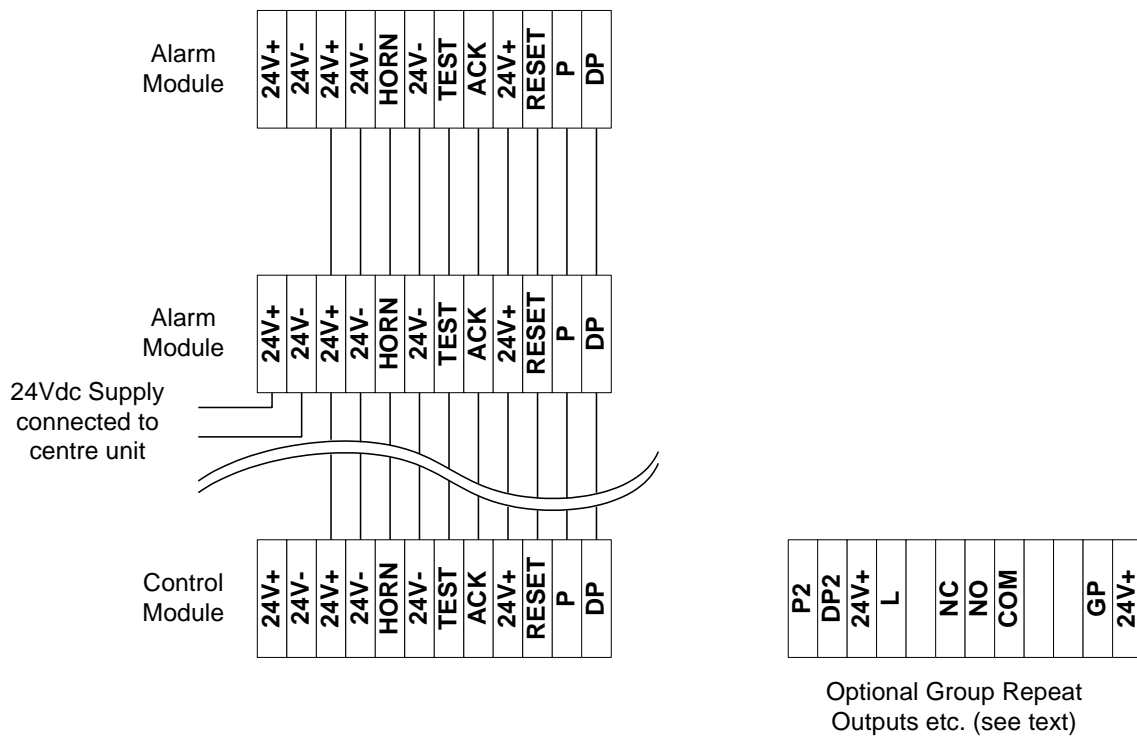
Figure 3-2 – Omni30 Common Service Connections using an Omni30/4 or 30/8 Control Module

NB: Throughout this manual ACKNOWLEDGE and ACCEPT are used interchangeably.

Note that P and DP connections correspond to connections of Rochester UC30 series of annunciators. This compatibility is achieved by setting internal links as follows:

a. On Control Board (inside Control Module) set Links 3, 5, 6, 8 to A-B (as marked).
b. On Main Input Board (main PCB inside the Alarm Module, e.g. Omni30/8) set Links 3, 8 to A-B.

If these Links are left set to C-D, then the P and DP connections operate as described in this manual, namely:

a. Terminal DP operates as FlashSync (flash rate of all lamps in all interconnected Omni30 units is synchronised).
b. Terminal P operates as FirstOut input/output.

The interconnection of units is still accomplished as per diagram above.

3.4 Omni30 Common Service Connections using external Horn and Pushbuttons
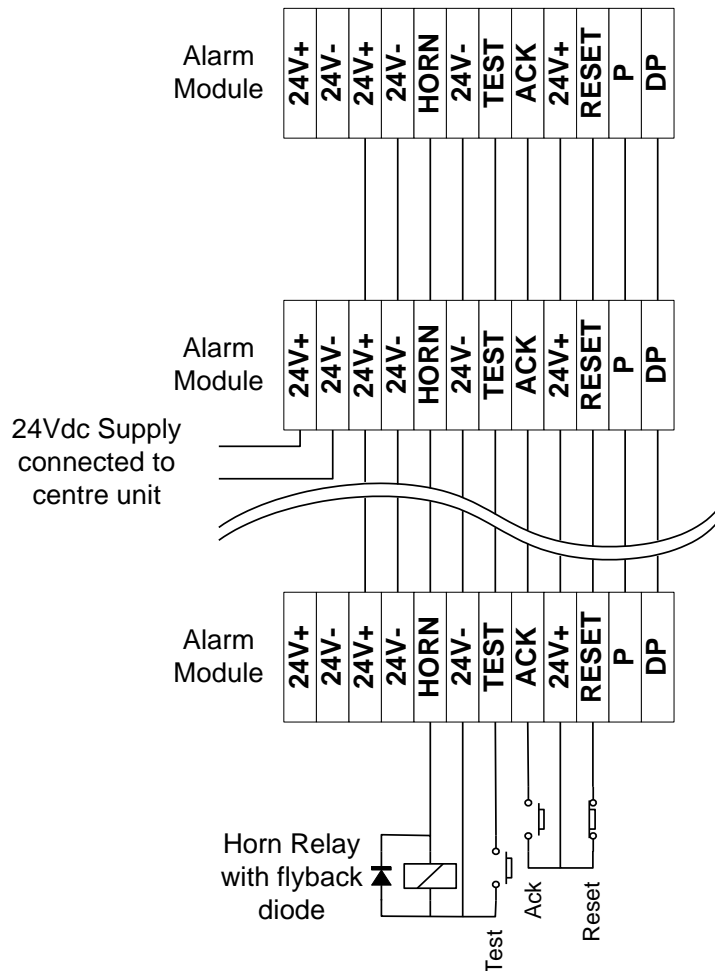
Figure 3-3 – Omni30 Common Service Connections using External Pushbuttons

3.5 Creating two First Out Groups using a single Control Module

Some of the alarm sequences selectable in the Omni30 are "First-Out" alarm sequences. This means that the flashing sequence is such that the first alarm to occur in the group will flash differently to all subsequent alarms to allow the operator to identify which alarm occurred first.

Up to 16 Omni30's may be connected together into a single First-Out group. Wire the P and DP Terminals between modules to create a single First Out Group.

The Control Modules accommodate up to 2 First Out Groups using the two terminal pairs P+DP and P2+DP2. By interconnecting Alarm Modules as shown the diagram below, a single Control Module can be used to control two independent First Out groups.
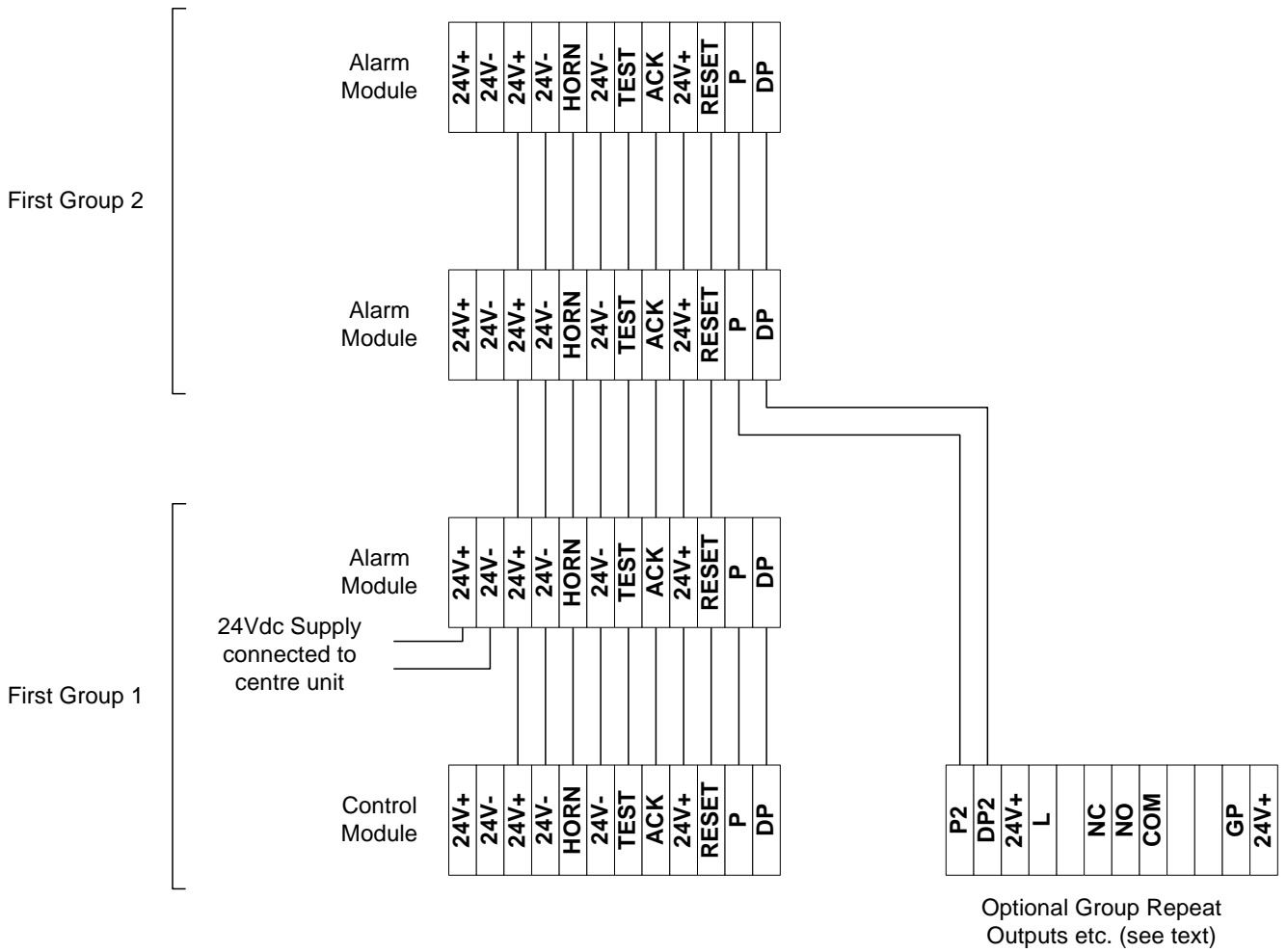
Figure 3-4 – Omni30 connections showing two First Out Groups

3.6 Omni30 Serial Port Pinout

If fitted with the Serial Port Option the Serial connections are as follows:

Omni-8/16C

DB9 Pin	RS232	RS485
1		RxD+
2	RxD	RxD-
3	TxD	
4		TxD+
5	GND	GND
6	Vcc(iso)	Vcc (iso)
7		
8		
9		TxD-
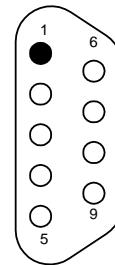
NB! Once the Serial Port (DB9) Option has been fitted the Serial Jack plug facility normally used to configure the annunciator is disabled. Configuration must be done through the DB9 Serial Port once it is fitted to an Omni30.

3.7 Power Requirements

The Omni30 range is 24Volt dc powered.

The table below gives the maximum current requirement of each of the products in the range.

	Model	Max Current Consumption at 24Volts dc
C1620	Omni30/8 8 Way Alarm	1.1 Amps
C1621	Omni32/8 4 Way Alarm + Control	0.8 Amps
C1622	Omni33/8 Control	0.2 Amps
C1623	Omni30/4 4 Way Alarm	0.6 Amps
C1624	Omni33/4 Control	0.2 Amps

Table 3-1 Omni30 Power Consumption

Note: This power consumption excludes the requirements of external Horns or displays used in conjunction with these products, but is given with all Lamps on.

4. CONFIGURING THE OMNI30 FOR OPERATION

4.1 Introduction

The Omni30 is configured by means of two 8-way "set-up" switches marked SW1 and SW2. These are located on the left hand side of each Alarm Module (looking from the back).

Each 8-way switch has 8 individual miniature switches, numbered from 1 to 8. Each of these miniature switches can be referred to individually: for example, the 8 miniature switches on SW1 are referred to as SW1-1 to SW1-8.

4.2 Modes of Operation

SW1 and SW2 are used to set the operational configuration of the Omni30.

The Omni30 can be set into one of two modes of operation:

"**SWITCH-SET**" mode or "**SOFT-SET**" mode.

In "SWITCH-SET" mode, the entire operation of the unit is set by selections on these mode switches.

In "SOFT-SET" mode, the operation of the product is set via the programming port or (serial port if fitted) on the rear of the unit using the optional Software Configuration Software.

The product is put into "SOFT-SET" mode by a specific selection on the mode switch SW1. (SW1-1 to SW1-8 set on). Some features are only available via programming or serial port.

This manual covers the "SWITCH-SET" configuration (for SOFT-SET configuration see the on-line help in the Omni16C Configuration template supplied with the Omniset Configuration Utility).

SOFT-SET mode offers the optimum in flexibility whilst SWITCH-SET Mode offers Omni16a and b style functionality and limited options. The table below summarises the capabilities of each mode and the limitations.

COMPARISON OF DIP SWITCH MODE VERSUS SOFTSET MODE CONFIGURATION OPTIONS		
CONFIGURATION OPTION	*DIP SWITCH SET MODE*	*SOFT-SET MODE*
Alarm Sequences		
Select Sequence number from Table 4-1. DIP switches must be set to Sequence 31 on SW1 for this register to be recognised, otherwise the DIP switch setting is used.	Sets : Input 1-8	Each Input individually set
Timers		
Setup Timer Setting: Input delay timer set per input. One input per byte.	Input 1-8 *Single Timer for all Alarm Points*	*Each Alarm Point individually set Timer*
Setup Timer Resolution	Yes	Yes
Group Alarm Outputs		
Setup Relay Output Function	No Preset as Group Alarm	Yes Choose option for each

COMPARISON OF DIP SWITCH MODE VERSUS SOFTSET MODE CONFIGURATION OPTIONS		
CONFIGURATION OPTION	**DIP SWITCH SET MODE**	**SOFT-SET MODE**
Lamp Sense		
Setup Lamp Sense All Lamps Normal Sense or Lamps Reversed Sense. **Note:** This setting only applies when SW1-8 is ON.	Yes	Yes
System Operation		
Bit 0: Pushbutton Edge/Level Detection Option:	No	Yes
Bit 1: Auto ACK on Startup Option: Turn off running light sequence	No	Yes
Bit 2: Inhibit Input operation Option:N/A in Omni30 **Note:** Only applies when SW1-8 is ON.	Yes	Yes
Bit 3: Repeat Output operation Option: Repeat Input status or Repeat Alarm status (via serial port only)	No	Yes
Bit 4: Repeat Sense operation Option: Normally de-energised, Normally energised (fail safe) (via serial port only)	No	Yes
Bit 5-15: Reserved		

4.3 Selecting the alarm/display logic sequences

There are two fundamental variations to the switch settings chosen, dependent upon the settings of SW1-8 and SW2-7

First decide upon the setting of these two switches before proceeding to select the other switch settings.

These are shown in the following table:

	SW1-8	SW2-7	SW1-1 to 5	SW2-1 to 5	SW2-6 to 8
A	Off	Off	Sets sequence for inputs 1-4	Sets sequence for inputs 5-8	Operate as per Table 4-1
B	Off	On	Sets sequence for inputs 1-8	Sets Timer value for all input timers.	Operate as per Table 4-1
C	On	-	Sets sequence for inputs 1-8	Sets Serial Port address and R/W	Sets Baud Rate etc.

NOTES:

1. Settings A and B are compatible with the previous Omni16a and Omni16b products.

2. When SW1-8 and SW2-7 are set as per A or B in the table above, the serial port address defaults to 2, and the communications settings default to ASCII 9600 baud.

3. When SW1-8 is ON as per C in the table above, then the following default settings apply:

    Inhibit Contact Sense – not used in Omni30.

    Lamp sense is set to normal.

Table 4-1: The Sequence Switch Settings

SEQ. NO.	SW1 1	2	3	4	5	6	7	8	SW2 1	2	3	4	5	6	7	8	DESCRIPTION	ISA DESIGNATION	TIME DELAY ON...
0	0	0	0	0	0				0	0	0	0	0				FACTORY TEST MODE		
1	1	0	0	0	0				1	0	0	0	0				LAMP FOLLOWS INPUT	--	--
2	0	1	0	0	0				0	1	0	0	0				MOMENTARY (FLEETING) ALARM	M-1	INPUTS
3	1	1	0	0	0				1	1	0	0	0				MOMENTARY ALARM, MANUAL RESET	A-1-4	INPUTS
4	0	0	1	0	0				0	0	1	0	0				MOMENTARY ALARM, MANUAL RESET WITH RINGBACK	R-1-10	INPUTS
5	1	0	1	0	0				1	0	1	0	0				MULTIPLE GROUP, FIRST OUT MANUAL RESET	F2M-1	--
6	0	1	1	0	0				0	1	1	0	0				FIRST OUT, AUTO RESET, F.O. RESET INTERLOCK	F3A-1-3	--
7	1	1	1	0	0				1	1	1	0	0				SINGLE GROUP, 1st OUT, MANUAL RESET, 1st UP CONTINUOUS FLASH	--	--
8	0	0	0	1	0				0	0	0	1	0				1st OUT, MANUAL RESET WITH NO SUBSEQUENT ALARM STATE ACCEPT PUSHBUTTON	F1M-1	INPUTS
9	1	0	0	1	0				1	0	0	1	0				MOMENTARY (FLEETING) ALARM MANUAL RESET	--	HORN
10	0	1	0	1	0				0	1	0	1	0				MOMENTARRY (FLEETING) ALARM MANUAL RESET	--	REFLASH
11	1	1	0	1	0				1	1	0	1	0				MOMENTARY (FLEETING) ALARM MANUAL RESET FOR MOTOR ALARMS	--	INPUTS
12	0	0	1	1	0				0	0	1	1	0				MOMENTARY (FLEETING) ALARM	--	RETURN TO NORMAL
13	1	0	1	1	0				1	0	1	1	0				PULSE MONITORING ALARM WITH MANUAL RESET	--	--
14	1	0	0	0	1				1	0	0	0	1				MOMENTARY (FLEETING ALARM), MANUAL RESET, WITH RINGBACK.		
18	0	1	0	0	1				0	1	0	0	1				MOMENTARY (FLEETING) ALARM AUTO RESET	--	INPUTS
21	1	0	1	0	1				1	0	1	0	1				MULTIPLE GROUP, FIRST OUT, AUTO RESET	F2A-1	--
23	1	1	1	0	1				1	1	1	0	1				SINGLE GROUP, 1st OUT, AUTO RESET, 1st UP CONTINUOUS FLASH	--	--
24	0	0	0	1	1				0	0	0	1	1				MULTIPLE GROUP, FIRST OUT, AUTO RESET, NO SUBSEQUENT ALARM STATE, ACCEPT PUSHBUTTON	F1A-1	--
25	1	0	0	1	1				1	0	0	1	1				MOMENTARY (FLEETING) ALARM AUTO RESET	--	HORN
26	0	1	0	1	1				0	1	0	1	1				MOMENTARY FLEETING ALARM, AUTO RESET	--	NO ACTION REALARM
27	1	1	0	1	1				1	1	0	1	1				MOMENTARY ALARM AUTO RESET FOR MOTOR ALARMS	--	INPUT
28	1	0	1	1	1				1	0	1	1	1				PULSE MONITORING ALARM AUTO RESET	--	--
31	1	1	1	1	1	1	1	1	0	1	0	0	1	0	0	1	SOFT-SET MODE. ALL SETTINGS ARE SET VIA SOFTWARE. *(Refer Table 4-2)*	--	--

	SW1 6	7			
FOLLOWS INPUT	0	0			
FOLLOWS ALARM STATE	1	0	FUNCTION OF GROUP ALARM OUTPUT (GP)	NOTE:	
ACTS AS RINGBACK HORN	0	1		In the above sequences, the switch sense is as follows:	
ACTS AS MRF (REFLASH)	1	1		"1" = switch in on position	

	SW1 8	SW2 1	2	3	4	5	6	7	8	Description
SW2=TIMERS/SEQUENCE 9-16	0									When SW1-8 is OFF, SW2 sets functions as shown in this table.
SW2=SERIAL PORT SETTINGS	1	#	#	#	#	#	#	#	#	When SW1-8 is ON , SW2 sets Serial Port Address and Baud Rate etc. See Section 4.7
CLOSE TO INHIBIT							0			With SW1-8 OFF, when SW2-6 is OFF, set Inhibit Input low to stop further alarms (serial port only)
OPEN TO INHIBIT							1			With SW1-8 ON, when SW2-6 is ON, set Inhibit Input high to stop further alarms (serial port only)
TIMERS OFF								0		With SW1-8 OFF and SW2-7 OFF: Timers are off, and SW2-1 to SW2-5 set the sequence of inputs 9-16
TIMERS ON		*	*	*	*	*		1		With SW1-8 OFF and SW2-7 ON: SW2-1 to SW2-5 sets Time-out value. See Figure 4-1
LAMP SENSE NORMAL									0	With SW1-8 OFF, when SW2-8 is OFF: Lamp outputs operate normally
LAMP SENSE REVERSE									1	With SW1-8 OFF when SW2-8 is on: Lamp outputs operate in reverse sense. i.e. On instead of off and v.v.

"0" = switch in off position

4.4 Selecting the Group Alarm Output Function

The Group Alarm (G.A.) output provides a transistor switch on terminal GP of each Alarm Module. SW1-6 and SW1-7 are used to set the mode of operation of this output.

There are four modes to choose from:

1. *Group follows input*

   The GP output is normally off.

   Any abnormal input will turn the output on. The output will turn off when all inputs return to their normal states, regardless of the state of the alarm lamps.
   This is useful for tracking the actual state of the inputs. Any abnormal input will cause the output to turn on.

2. *Group follows alarm state*

   The GP output is normally off.

   Any alarm state will turn the output on. The output will turn off when all alarm states have returned to normal. (i.e. the alarms have been acknowledged by the operator and the entire display is off)
   This is useful for tracking the actions of a local operator in clearing the problem. If a 'fleeting' alarm sequence is chosen, the output will remain on until the operator clears the display, even though the input contact may have already returned to the normal state.

3. *Group acts as ring-back horn*

   The GP output is normally on.
   The output will turn off when any abnormal input returns to normal. The RESET pushbutton must be depressed to return the GP output to its normal state.
   (This G.A. type can be used to alert an operator to the fact that an alarm has returned to its normal state).

4. *Group acts in Multiple Reflash Mode*

   The GP output is off with all inputs in their normal state.
   The output will turn on when the first input changes to the abnormal state.
   Upon each subsequent input changing to the abnormal state, the output will turn off momentarily (for about 1 second), then return to the on state.
   This is useful when the output is used for example to trigger a dial up alarm, and if subsequent inputs going into alarm must also trigger the dial-up alarm.

   Referring to Table 4-1: The Sequence Switch Settings, select one of the 4 G.A. modes by setting switches SW1-6 and SW1-7 to the appropriate positions.

4.5 Selecting the Lamp Status

The lamp status of the display windows may be selected on SW2-8 to give the following:

NORMAL: lamps OFF when inputs are normal, ON when inputs are abnormal.

REVERSE: lamps ON when inputs are normal, OFF when inputs are abnormal.

Note: SW1-8 must be off for this selection to be operational. When SW1-8 is on, SW2-6 is reassigned, and the lamp status defaults to Normal.
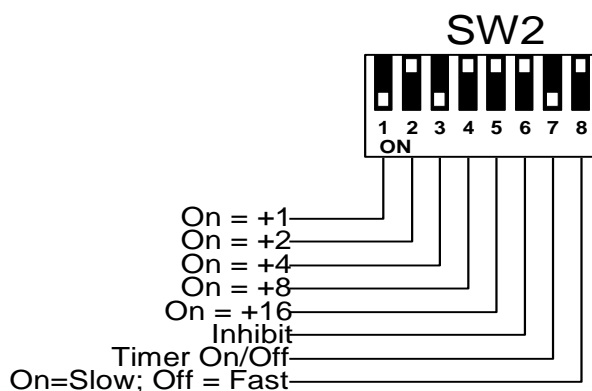
4.6 Selecting Time Delays

The Omni30 Alarm modules have a timer associated with each alarm point.

These timers are used with special Timer sequences. A large "T" in the sequence diagram in Section 7 identifies these sequences.

There are two methods of selecting a time delay setting for these sequences:

1. The timers may be set using SW2-1 to SW2-5. This method is invoked by switching SW2-7 on. This method is recommended when all timers have the same time setting.

2. Programming the memory of the Omni30 using the optional Software Configuration Utility will set each input timer individually. If this memory is not programmed, then the timers default to the switch settings. This method should be used when different input timer settings are required.

SW2

On = +1
On = +2
On = +4
On = +8
On = +16
Inhibit
Timer On/Off
On=Slow; Off = Fast

Example:

SW1-8 must be off to enable SW2 as time setting.

SW2 in this diagram shown set for 0.5 seconds.

Slow = Uses the Slow timer i.e. 1 sec increments

Fast = Uses the Fast timer i.e. 1/10 sec increments

Figure 4-1 Setting Time Delays on SW2

4.6.1 Omni30 Fast and Slow Timers

Figure 4-1 above shows the use of the Fast and Slow timer. These timers allow the user the most flexible timing options. For very short timing durations, the Fast timer should be used. This timer counts time in units of 100ms or 1/10 of seconds.

For longer time periods, the Slow timer should be used. This timer is derived from the Fast timer and therefore counts time in multiples of the Fast timer. The default setting of the Slow timer is to count time in seconds. It is possible to alter the timing mechanism of the Slow timer to count in larger units of time via the programming port.

4.6.2 Explanation of Timer Operation in a Timer Sequence

With reference to any one of the special timer sequences:

When the alarm point moves from a state where the timer is stopped to a state where the timer is running, the timer will be started.

When the alarm point moves from a state where the timer is running to a state where the timer is also running, the timer is allowed to continue timing.

When an alarm point moves from a state where the timer is running to a state where the timer is stopped, the timer is put into the timed-out (stopped) state.

4.7 Selecting Serial Port Settings

The Omni30 can be equipped with an optional RS232/485 serial port. This port supports the Modbus protocol. In Switch set mode, inputs and outputs can be read via the serial port using standard Modbus$^{©}$ commands. Please refer to Section 8 for the layout of Modbus Registers that are available in the Omni30.

When the unit is in Switch set mode (refer to settings A or B of section 4.3), the unit may be accessed via Modbus without changing the dipswitch settings at all. In this mode, communications settings are fixed as follows:

Modbus Settings without changing SW1 or SW2	
Modbus Slave Address	2
Comms settings	ASCII; 9600 baud; No Parity

Table 4-1a – Serial Port Settings with no change to SW1 or SW2

This form of access is made available for setup of input timer values and does allow users to read status information for diagnostic purposes.

In applications where the Modbus Slave address and/or comms settings are to be different from the table above then set SW1-8 ON to enable SW2 for additional serial port settings.

SW2

Serial Port Address
On = +1
On = +2
On = +4
On = +8
On = Write Allowed
Mode Settings see Table
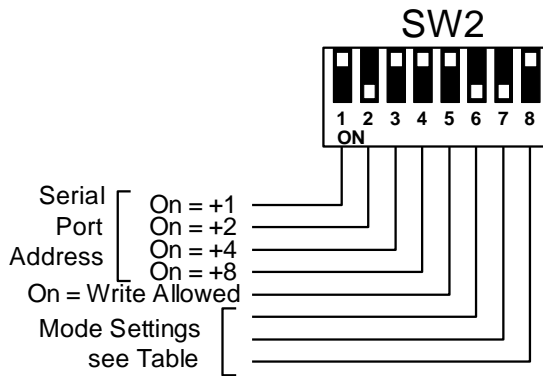
Example:

SW1-8 must be on to enable SW2 for serial port settings.

SW2 in this diagram is shown set for Address 2; Read only; and RTU mode, 1200 baud, No Parity,

Figure 4-2 Serial Port Settings on SW2

SW2-6 to 8 Mode Settings	
(0 = Off ; 1 = On)	6:7:8
ASCII; 9600 baud; No Parity	0:0:1
ASCII; 4800 baud; No Parity	1:0:1
ASCII; 2400 baud; No Parity	0:1:1
ASCII; 1200 baud; No Parity	1:1:1
RTU; 9600 baud; No Parity	0:0:0
RTU; 4800 baud; No Parity	1:0:0
RTU; 2400 baud; No Parity	0:1:0
RTU; 1200 baud; No Parity	1:1:0

Table 4-2 Serial Port Mode Parameters on SW2-6 to 8

5. OPERATION

5.1 Power-up

When power is applied to the Omni30, the unit commences an automatic, built-in circuit test routine. This results in the unit sounding the audible for approximately half a second followed by the cyclic illumination of each lamp in turn starting at lamp 1 to the last lamp and back to 1 again etc. in a "marching sequence".
If no internal faults are detected in the unit, then this test mode display continues until the ACCEPT Pushbutton is pressed or until an input changes to the alarm state.
If an internal fault is detected, then the unit will display a fault indication by continuously flashing one of the lamps. If this occurs, then the unit must be sent for service.
If a new alarm occurs while the Omni30 is in this test routine, the unit will immediately revert to its normal mode of operation and will deal with the alarm state according to the pre-selected alarm sequence.

5.2 Normal Operation

During the normal operation, the Omni30 will deal with any alarm states according to its pre-set alarm sequences. (The instructions for setting-up these sequences are given in section 4.3). Section 7 provides detailed block diagrams for the function of each alarm sequence.
When an alarm condition occurs and the horn sounds, the operator should depress the relevant pushbuttons, where necessary, according to the pre-selected alarm sequence.
When the Omni30 is put into its test routine by depressing the TEST pushbutton, any existing alarm states are "remembered" and the alarm annunciator will revert to its previous state when it returns to its normal mode of operation.
If a new alarm state occurs while the Omni30 is performing its test routine, the unit will immediately revert to its normal mode of operation and deal with the alarm state according to the pre-selected alarm sequence.

5.3 Test Functions

5.3.1 Overview of the Test Functions

The Test button operates as a combined lamp test and circuit test function.

No information is lost during the entire test routine, and each alarm display returns to the exact state it was in before the test.

5.3.2 Pressing the Test Button

When the Test button is pressed, the unit checks the results of its regular full circuit test, and if all checks performed pass, then a conventional lamp test is performed, by illuminating all of the lamps while the Lamp Test Pushbutton is held down. When the Test pushbutton is released, the Omni30 reverts to the state it was in before the Test button was pushed.

If the circuit Test fails then the unit enters its "marching sequence" test routine described in Section 5.3.5 and the test failure code will be displayed by flashing one of the lamps continuously.
In this way, the display/annunciator Test button acts both as a Lamp Test and Circuit Function.

5.3.3 Fault Indication on Circuit Test

If a fault is found in one of the tests performed, then the unit enters its full "marching lamp sequence", with, in addition, one or more of the lamps flashing continuously to indicate the fault located. This is described in detail in Section 5.3.5

5.3.4 Manually invoking the Circuit Test Function (only through serial port).

As a confidence measure, the unit may be placed in the full "marching sequence" Circuit Test Mode at any time by activating Silence and then Test.

See section 5.3.5

5.3.5 The "Marching Sequence" Circuit Test Display

This routine is entered upon the following conditions:

• Upon power up.

• If the Test button is pressed and a fault is detected in the unit.

• Any time during normal operation, if the unit during its regular self-test routines detects a fault.

This test routine begins by activating the horn output circuit for approximately one second.

The operator should therefore check that the horn sounds for this short period.

Immediately after this half-second period, if the Omni30 is functioning correctly, the following visual indication will occur:

The display will begin a "marching light" sequence, with each display window illuminating and then extinguishing, one at a time, starting with the display point 1 (left-hand window) and ending with the display point 8 (right-hand window). All display windows will then remain extinguished for a brief moment.

The "marching" sequence will then begin again, and this procedure of "marching" sequence followed by the brief "blank" display period will be repeated continuously until the ACCEPT pushbutton is depressed, or until an input changes state.

This marching sequence indicates that the alarm annunciator has passed all its own internal tests and is functioning correctly. If the lamp display exhibits any other pattern then a fault has been detected, and the unit should be returned for service.

To exit the test mode and begin normal operation, the ACCEPT pushbutton should be pressed.

The pushbuttons may also be tested in this mode:

If the ACCEPT button is depressed - the annunciator reverts to normal operation.

If the RESET button is depressed - lamp No. 3 flashes continuously.

If the TEST button is depressed - lamp No. 4 flashes continuously.

If any other lamp flashes continuously, then the unit has detected a fault and must be returned to the factory for service.

If a new alarm occurs while the Omni30 is in this test routine, the unit will immediately revert to its normal mode of operation and will deal with the alarm state according to the pre-selected alarm sequence.

It is possible under some circumstances to continue to operate the Omni30 even after a fault has been detected. The table below will assist in diagnosing the fault found.

Table 5-1 Fault diagnosis during Circuit Test

Display Window No.	FAULT SYMPTOM		POSSIBLE CAUSE
1	FLASHING	during "Marching Sequence"	SIL input (serial port) stuck in ON state
	STEADY ON	during "Marching Sequence", and stays ON during "Blank" display period.	Window No. 1 has lamp output circuit fault.
	STEADY OFF	during "Marching Sequence", and stays OFF during "Blank" display period.	Window No. 1 has lamp failure or output circuit fault.
2	FLASHING	during "Marching Sequence"	ACC pushbutton held down, or stuck in ON state (this condition must have been present BEFORE the CCT. TEST mode was initiated)
	STEADY ON	during "Marching Sequence", and stays ON during "Blank" display period.	Window No. 2 has lamp output circuit fault.
	STEADY OFF	during "Marching Sequence", and stays OFF during "Blank" display period.	Window No. 2 has lamp failure or output circuit fault.
3	FLASHING	during "Marching Sequence"	RESET pushbutton held down, or stuck in ON state.
	STEADY ON	during "Marching Sequence", and stays ON during "Blank" display period	Window No. 3 has lamp output circuit fault.
	STEADY OFF	during "Marching Sequence", and stays OFF during "Blank" display period	Window No. 3 has lamp failure or lamp output circuit fault.
4	FLASHING	during "Marching Sequence"	TEST pushbutton held down, or stuck in ON state.
	STEADY ON	during "Marching Sequence", and stays ON during "Blank" display period.	Window No. 4 has lamp output circuit fault.
	STEADY OFF	during "Marching Sequence", and stays OFF during "Blank" display period.	Window No. 4 has lamp failure or lamp output circuit fault.
ANY OTHER LAMP	STEADY ON	during "Marching Sequence", and stays ON during "Blank" display period	Window has lamp output circuit fault.
	STEADY OFF	During "Marching Sequence", and stays OFF during "Blank" display period.	Window has lamp failure or lamp output circuit fault.
1,2,3,4,6	STEADY ON	During "Blank" display period but OFF during "Marching Sequence"	Fault detected on one of the INPUT logic circuits
1,2,3,4	STEADY ON	During "Marching Sequence"	Fault detected on the SPI bus OR all pushbuttons stuck ON
1,2,3,4,5,6	STEADY ON	During "Blank" display period but OFF during "Marching Sequence"	Fault detected on the SPI bus
1,2,3,4,7	STEADY ON	During "Blank" display period but OFF during "Marching Sequence"	Fault detected with the on-board EEPROM

6. SPECIFICATIONS

Power Supply Options	
Voltage	24Vdc
Isolation PSU to inputs	None
Max dc Ripple	10% pk. to pk.
Current Consumption	See Section 3.7 of this manual

Alarm/Display Inputs - Non Isolated		
Type	Potential Free Contacts	Switch to +24volts for NC Switch to 0V for NO
Contact Sense	User Selectable Normally Open or Closed on rear of unit on DIP switch and by wiring of each iput.	
Max. open circuit voltage	28Vdc	
Max. closed circuit current	5mA per input circuit	
Max. Loop Resistance to detect closed contact	1000 ohms	
Min. Loop Resistance to detect open contact	200 kohms	
Input Scan Rate	4 milliseconds with 8millisecond filter. Inputs must be stable for at least 8 milliseconds for a change of state to be detected.	
Wire size	1.5mm^2 (17SWG/15.5SWG) max.	
Connections	Via plug-in Terminals	

Alarm Sequences	
Quantity	: 27 (user selectable by set-up switches)
ISA types	M-1, A-1, A-1-4, R-1-10, F2M-1, F2A-1, F3A-1-3, F1M-1, F1A-1
Other types	See sequence diagrams for full selection.

Flash Rates	
Fast Flash Rate	140 flashes per minute
Slow Flash Rate	35 flashes per minute

Window Display	
Types	Back-lit LED or Incandescent Lamp
Window Size	24mmx53mm
Legend Area	21mmx49mm
Legend Type	User printed on film with laser/inkjet using software provided.

Group Output (Alarm Modules only)	
Type	Open Collector Transistor switch to 0V
Rating	30Vdc max 80mA max

Repeat Lamp Outputs (Alarm Modules only)	
Type	Open Collector Transistor switch to 0V
Rating	30Vdc max 80mA max

Temperature Range	
Operating Temperature	0°C – 50 °C (+32°F – 122°F)
Storage Temperature	-10°C – 70 °C (+14°F – 158°F)

Weight	
Unpacked	1.8kg approx.
Packed	2.2kg approx.

Compliance to Standards	
CE	Meets requirements for CE marking.
Safety	EN 60950
Emissions	EN 55011 and EN50081-2 Group I, Class A
Immunity – ESD	IEC 61000-4-2, level 3
Immunity – RF Fields	IEC 61000-4-3, level 3
Immunity – Fast Transients	IEC 61000-4-4 2 kV – DC power port 1 kV – input/output lines
Supply Variations	IEC 61000-4-7; 24 V dc +15% -10%

Accessory Ordering Information

ORDER CODE	DESCRIPTION
C1650	Red Back-lit LED Lamp Board
C1651	Yellow Back-lit LED Lamp Board
C1652	Green Back-lit LED Lamp Board
C1653	Blue Back-lit LED Lamp Board
C1654	Orange Back-lit LED Lamp Board
C1655	White Back-lit LED Lamp Board
C1161	Incandescent Lamp replacement 10 pack
C1162	Incandescent Lamp replacement 100 pack
C1663	Assorted Back-lit Colour Filter Kit

7. ALARM SEQUENCE DIAGRAMS
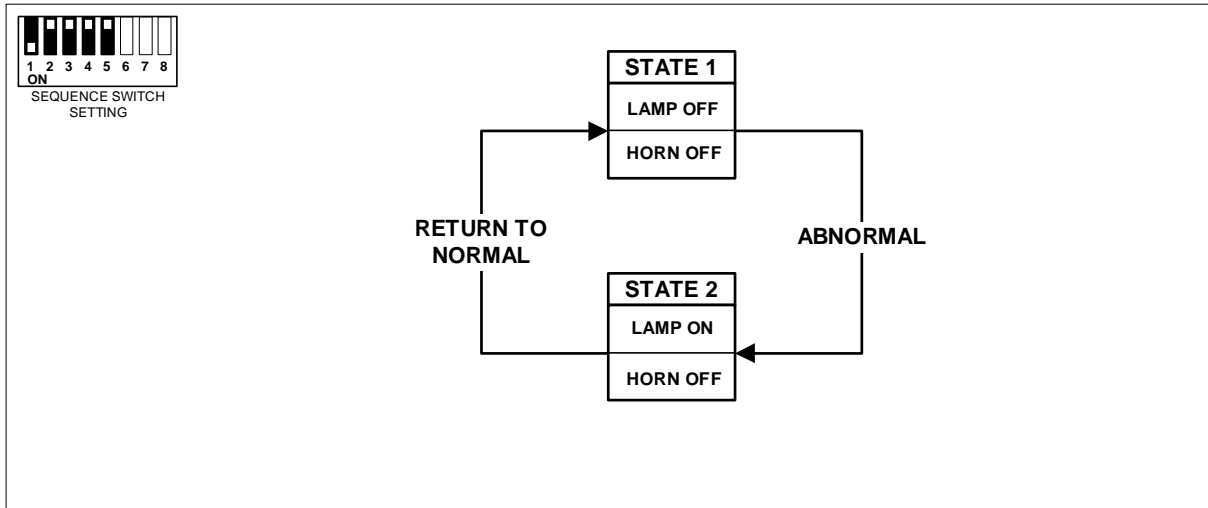
Sequence 1 - Lamp Follows Input
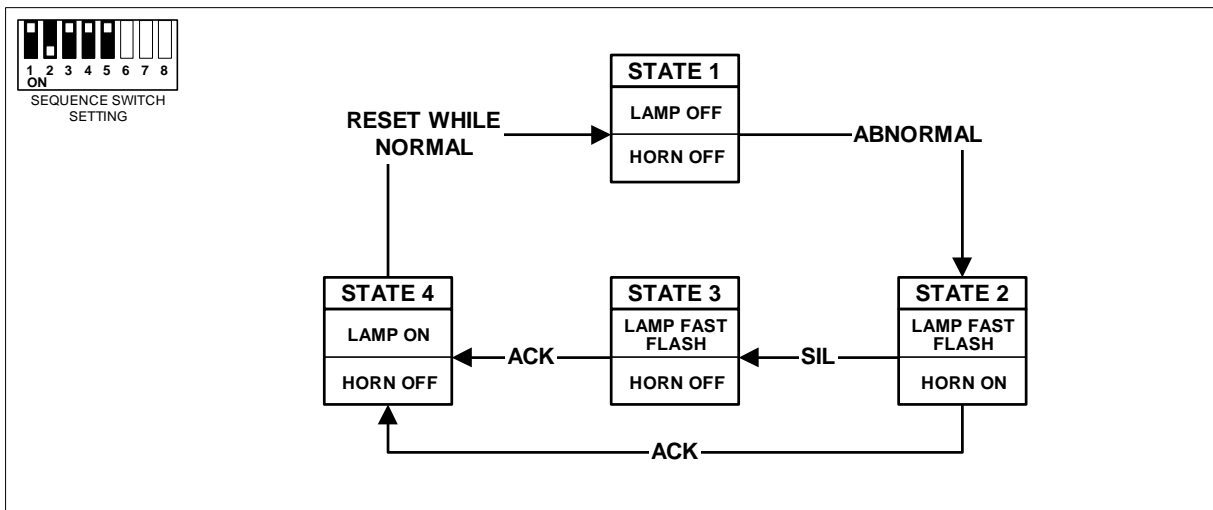
Sequence 2 - Momentary (Fleeting) Alarm, Manual Reset, Timer option off

SEQUENCE SWITCH SETTING
1 2 3 4 5 6 7 8 ON

T

RESET WHILE NORMAL

STATE 1
LAMP OFF
HORN OFF
TIMER OFF

ABNORMAL →

STATE 5
LAMP OFF
HORN OFF
TIMER RUNNING

← RETURN TO NORMAL

TIME OUT

STATE 4
LAMP ON
HORN OFF
TIMER OFF

← ACK —

STATE 3
LAMP FAST FLASH
HORN OFF
TIMER OFF

— SIL —

STATE 2
LAMP FAST FLASH
HORN ON
TIMER OFF

— ACK —
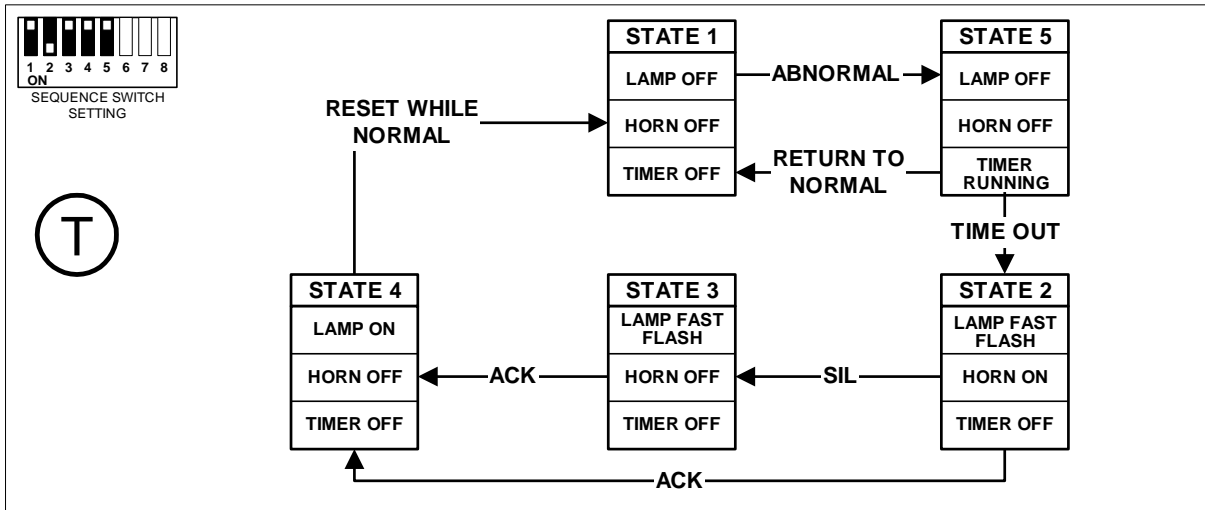
Sequence 2 - Momentary (Fleeting) Alarm Manual Reset with Time Delay on Inputs

SEQUENCE SWITCH SETTING
1 2 3 4 5 6 7 8 ON

RETURN TO NORMAL

STATE 1
LAMP OFF
HORN OFF

← RETURN TO NORMAL

ABNORMAL →

RETURN TO NORMAL

STATE 4
LAMP ON
HORN OFF

← ACK —

STATE 3
LAMP FAST FLASH
HORN OFF

— SIL —

STATE 2
LAMP FAST FLASH
HORN ON

— ACK —
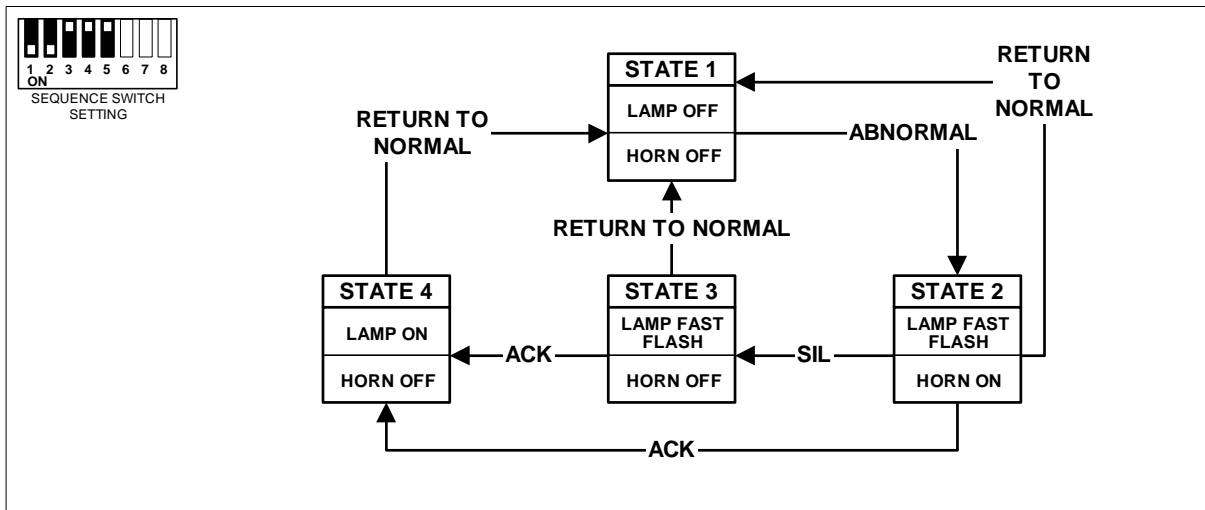
Sequence 3 - Alarm Only (No Lock-in), Auto Reset, (Timer option off)

SEQUENCE SWITCH SETTING
1 2 3 4 5 6 7 8 ON

T

RETURN TO NORMAL

STATE 1
LAMP OFF
HORN OFF
TIMER OFF

ABNORMAL →

STATE 5
LAMP OFF
HORN OFF
TIMER RUNNING

← RETURN TO NORMAL

RETURN TO NORMAL

TIME OUT

STATE 4
LAMP ON
HORN OFF
TIMER OFF

← ACK —

STATE 3
LAMP FAST FLASH
HORN OFF
TIMER OFF

— SIL —

STATE 2
LAMP FAST FLASH
HORN ON
TIMER OFF

— ACK —
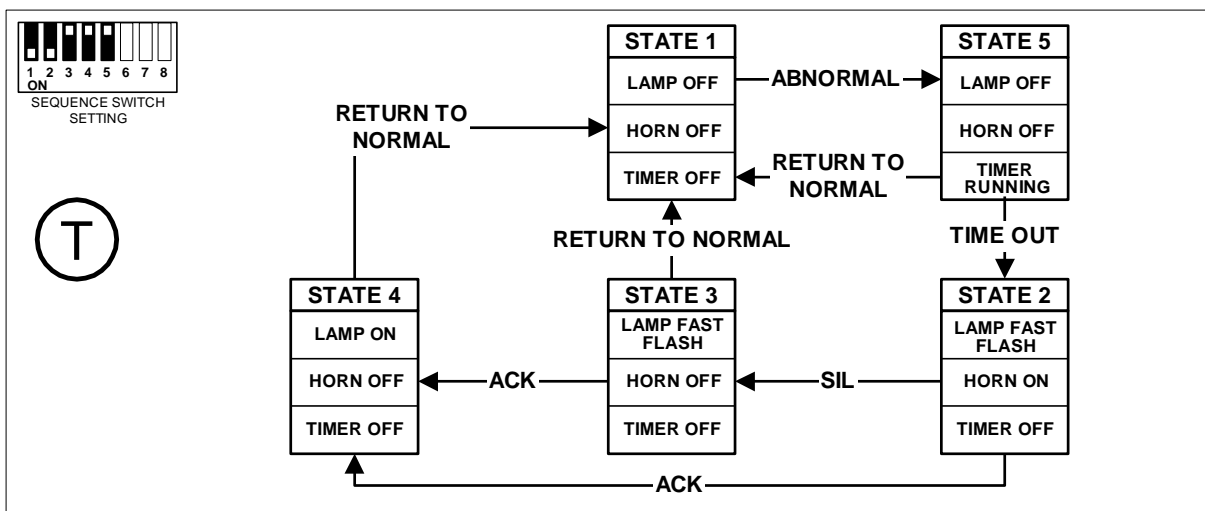
Sequence 3 - Alarm Only (No Lock-in) Auto Reset with Time Delay on Inputs
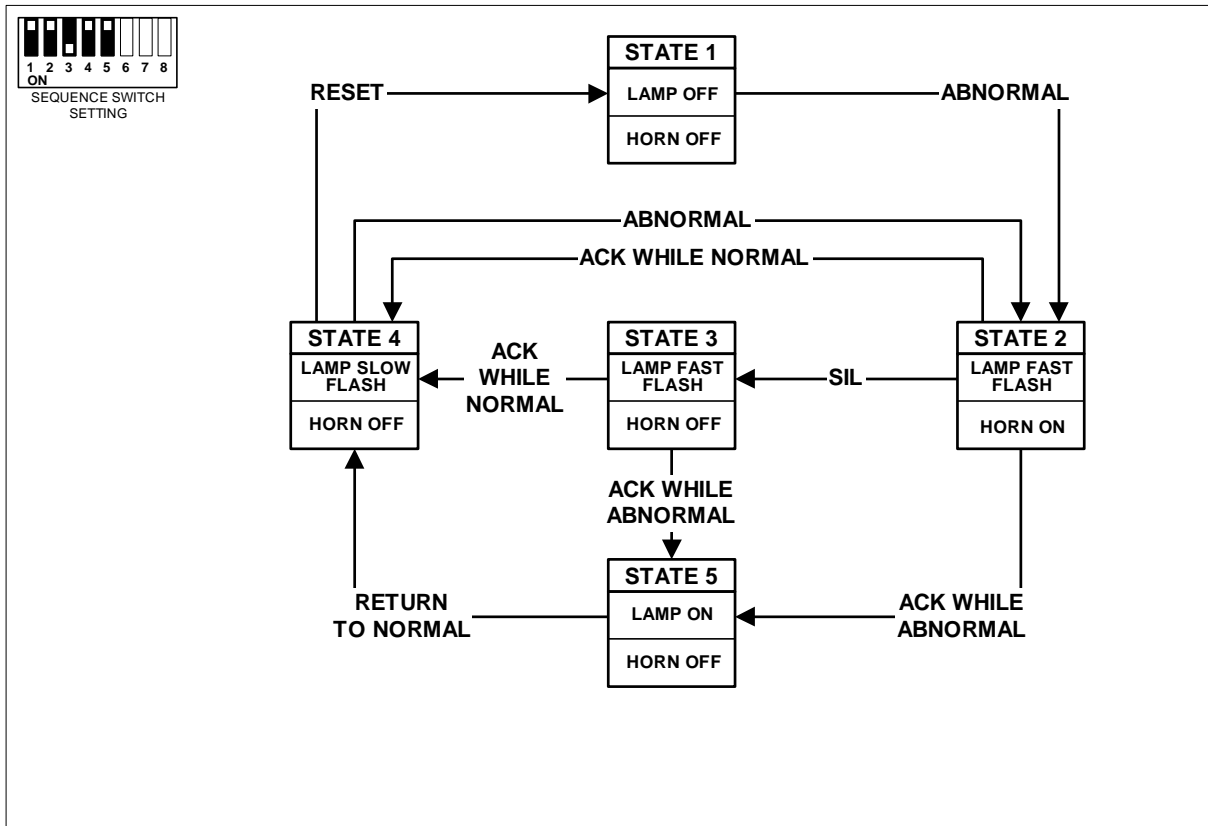
Sequence 4 - Momentary Alarm, Manual Reset, with Ringback, (Timer Option Off)
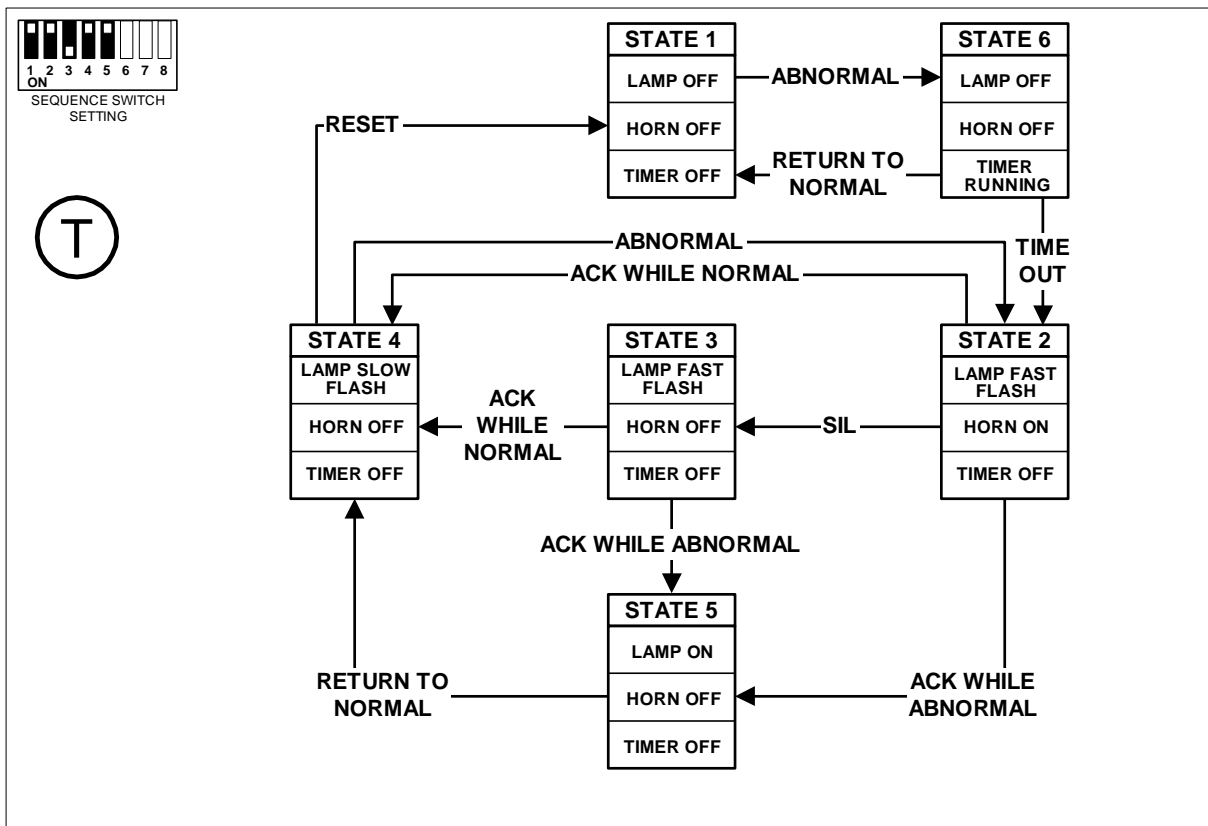
Sequence 4 - Momentary (Fleeting) Alarm, Manual Reset, with Ringback, Timer Delay on inputs.

SEQUENCE SWITCH SETTING
1 2 3 4 5 6 7 8 ON

STATE 1
LAMP OFF
HORN OFF
FIRST OUT INACTIVE

RESET WHILE NORMAL

RESET WHILE NORMAL

ABNORMAL SUBSEQUENT

ABNORMAL FIRST OUT

ACK

STATE 7
LAMP ON
HORN OFF
FIRST OUT INACTIVE

STATE 6
LAMP ON
HORN OFF
FIRST OUT INACTIVE

STATE 5
LAMP ON
HORN ON
FIRST OUT INACTIVE

ACK

SIL

ACK

STATE 4
LAMP ON
HORN OFF
FIRST OUT INACTIVE

STATE 3
LAMP FAST FLASH
HORN OFF
FIRST OUT ACTIVE

STATE 2
LAMP FAST FLASH
HORN ON
FIRST OUT ACTIVE

ACK

SIL

Sequence 5 - Momentary (Fleeting) Alarm, First Out Multiple Groups, Manual Reset, with Ringback.

SEQUENCE SWITCH SETTING
1 2 3 4 5 6 7 8 ON

STATE 1
LAMP OFF
HORN OFF
FIRST OUT INACTIVE

RETURN TO NORMAL

ABNORMAL SUBSEQUENT

ACK WHILE NORMAL

ACK WHILE NORMAL

RESET WHILE NORMAL

ABNORMAL FIRST OUT

STATE 7
LAMP ON
HORN OFF
FIRST OUT INACTIVE

ACK WHILE ABNORMAL

STATE 6
LAMP FAST FLASH
HORN OFF
FIRST OUT INACTIVE

STATE 5
LAMP FAST FLASH
HORN ON
FIRST OUT INACTIVE

SIL

ACK WHILE ABNORMAL

ACK

RESET WHILE ABNORMAL

STATE 4
LAMP SLOW FLASH
HORN OFF
FIRST OUT ACTIVE

STATE 3
LAMP INT. FAST/SLOW
HORN OFF
FIRST OUT ACTIVE

STATE 2
LAMP INT. FAST/SLOW
HORN ON
FIRST OUT ACTIVE

ACK

SIL

Sequence 6 - Momentary (Fleeting) Alarm, First Out Manual Reset, Auto Reset on subsequent Alarms

SEQUENCE SWITCH SETTING

```
1 2 3 4 5 6 7 8
ON
```

STATE 1
| LAMP OFF |
| HORN OFF |
| FIRST OUT INACTIVE |

RESET WHILE NORMAL

RESET WHILE NORMAL

ABNORMAL SUBSEQUENT

ABNORMAL FIRST OUT

ACK

STATE 7
| LAMP ON |
| HORN OFF |
| FIRST OUT INACTIVE |

STATE 6
| LAMP ON |
| HORN OFF |
| FIRST OUT INACTIVE |

STATE 5
| LAMP ON |
| HORN ON |
| FIRST OUT INACTIVE |

ACK   **SIL**

ACK WHILE ABNORMAL

ACK

STATE 4
| LAMP SLOW FLASH |
| HORN OFF |
| FIRST OUT ACTIVE |

STATE 3
| LAMP FAST FLASH |
| HORN OFF |
| FIRST OUT ACTIVE |

STATE 2
| LAMP FAST FLASH |
| HORN ON |
| FIRST OUT ACTIVE |

ACK   **SIL**

Sequence 7 - Momentary (Fleeting) Alarm, First Out Single Group, Manual Reset, First Out Continuous Flash

---

SEQUENCE SWITCH SETTING

```
1 2 3 4 5 6 7 8
ON
```

RESET WHILE NORMAL

STATE 1
| LAMP OFF |
| HORN OFF |
| FIRST OUT INACTIVE |

ABNORMAL FIRST OUT

ABNORMAL SUBSEQUENT

ACK

STATE 4
| LAMP ON |
| HORN OFF |
| FIRST OUT INACTIVE |

STATE 3
| LAMP FAST FLASH |
| HORN OFF |
| FIRST OUT ACTIVE |

STATE 2
| LAMP FAST FLASH |
| HORN ON |
| FIRST OUT ACTIVE |

ACK   **SIL**
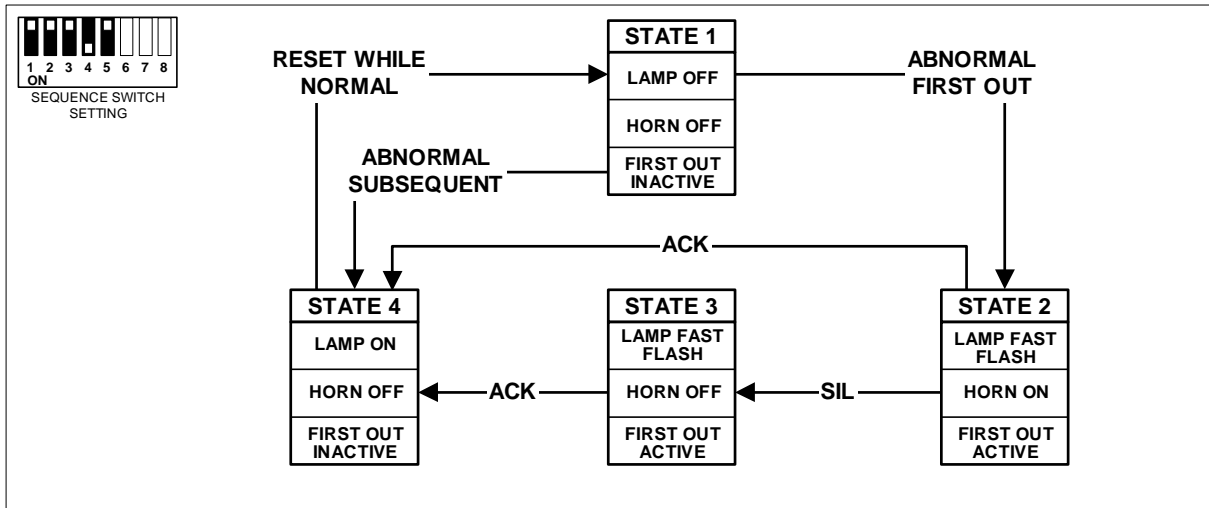
Sequence 8 - Momentary (Fleeting) Alarm; First Out Multiple Group; Manual Reset; No horn for subsequent alarms.

Sequence 9

SEQUENCE SWITCH SETTING

RESET WHILE NORMAL	→	**STATE 1**	→ ABNORMAL
		LAMP OFF	
		HORN OFF	
		TIMER OFF	

STATE 4
LAMP ON
HORN OFF
TIMER OFF

← **ACK** —

STATE 3
LAMP FAST FLASH
HORN OFF
TIMER OFF

← **SIL** —

STATE 2
LAMP FAST FLASH
HORN ON
TIMER RUNNING

← **TIME OUT** —

— **ACK** —

Sequence 9 - Momentary (Fleeting) Alarm; Manual Reset; Auto Silence after Time Delay.

Sequence 10

SEQUENCE SWITCH SETTING

RESET WHILE NORMAL → **STATE 1** → ABNORMAL
LAMP OFF
HORN OFF
TIMER OFF

TIME OUT WHILE ABNORMAL →

TIME OUT WHILE ABNORMAL

STATE 4
LAMP ON
HORN OFF
TIMER RUNNING

← **ACK** —

STATE 3
LAMP FAST FLASH
HORN OFF
TIMER RUNNING

← **SIL** —

STATE 2
LAMP FAST FLASH
HORN ON
TIMER OFF

— **ACK** —

Sequence 10 - Momentary (Fleeting) Alarm; Manual Reset; Re-alarm after time-out if still abnormal.

Sequence 11

SEQUENCE SWITCH SETTING

RESET WHILE NORMAL → **STATE 1** → ABNORMAL
LAMP OFF
HORN OFF

STATE 4
LAMP SLOW FLASH
HORN OFF

← **ACK** —

STATE 3
LAMP FAST FLASH
HORN OFF

← **SIL** —

STATE 2
LAMP FAST FLASH
HORN ON

— **ACK** —

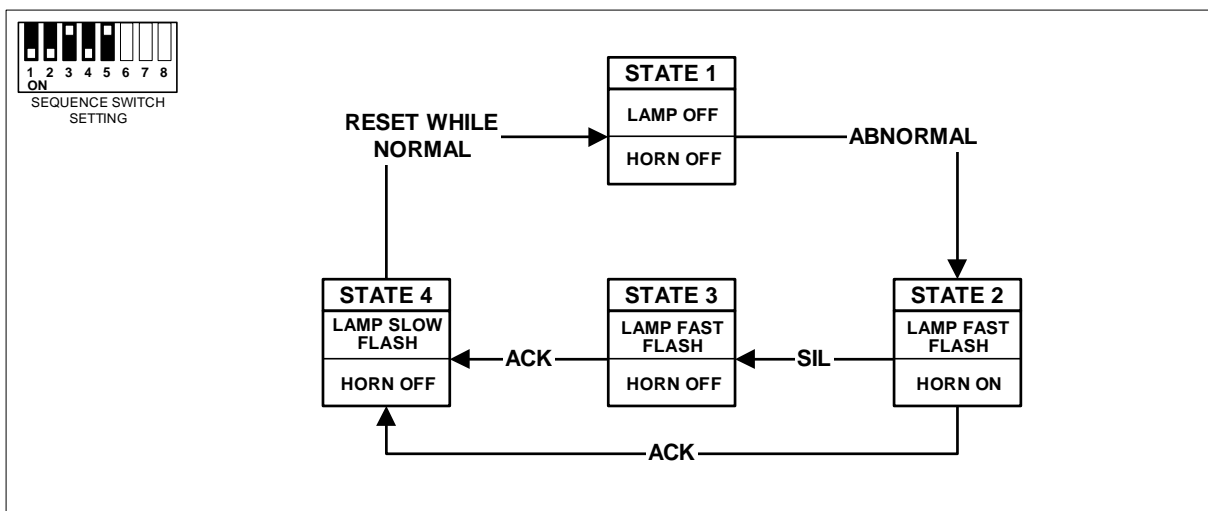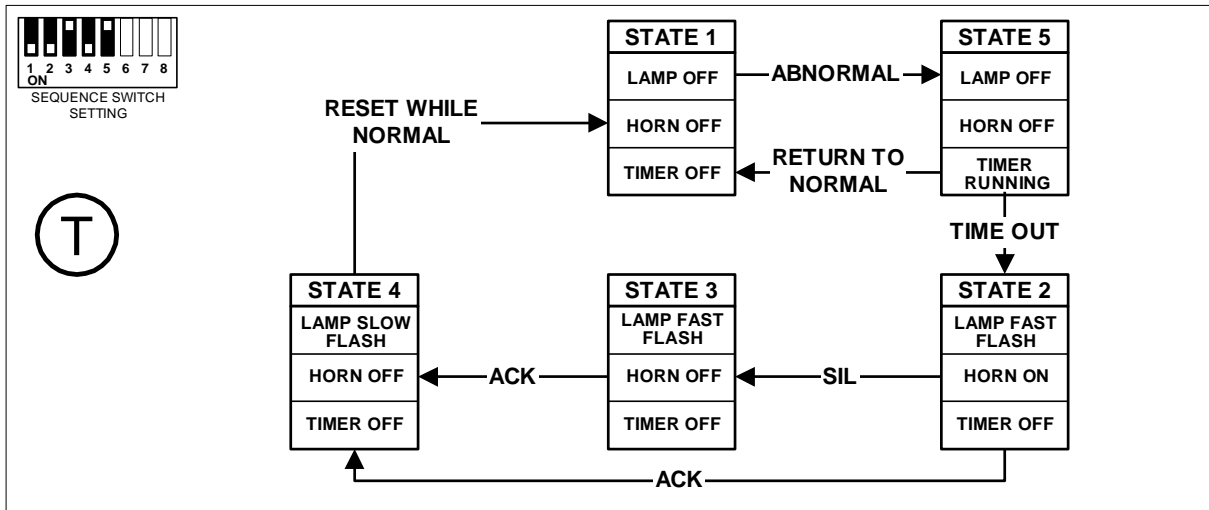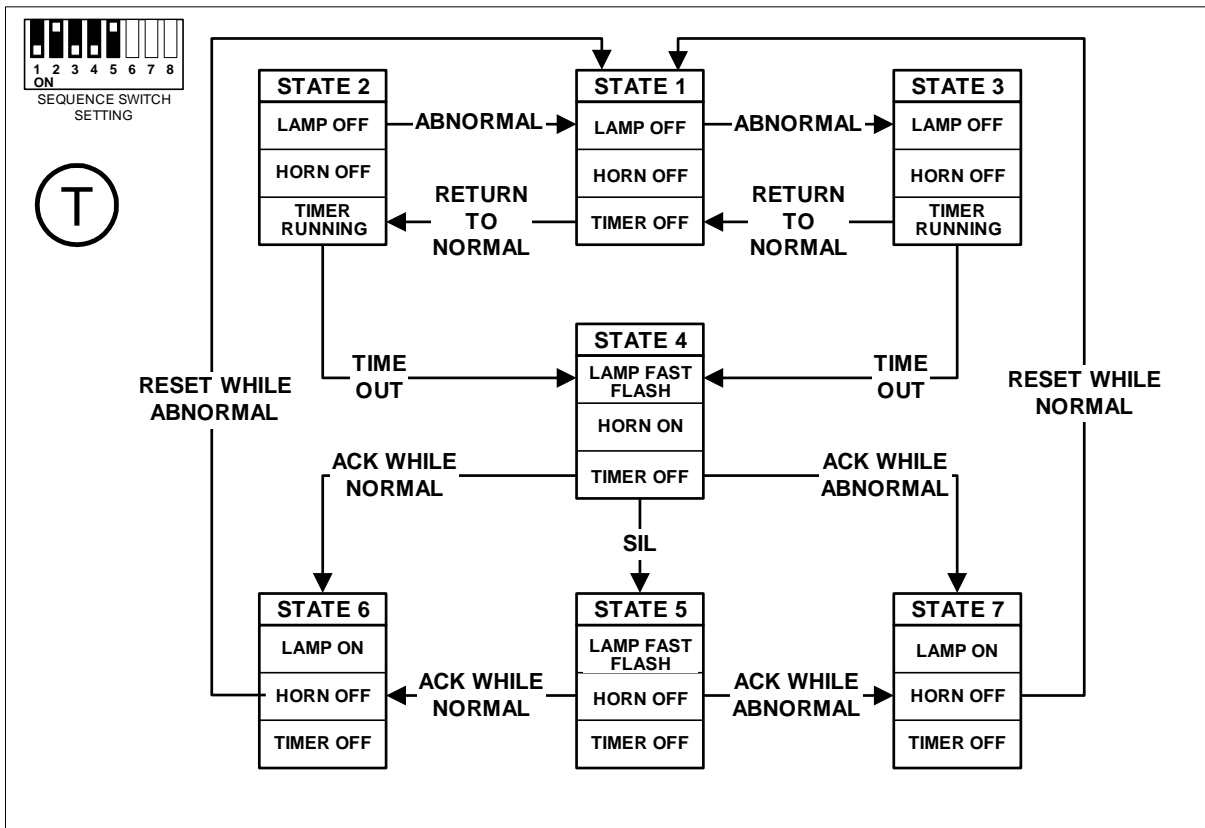Sequence 11 - Momentary (Fleeting) Alarm, Manual Reset, for Motor Alarms (Timer option off)

Sequence 11 - Momentary (Fleeting) Alarm; Manual Reset; for Motor Alarms; with Time Delay on Inputs
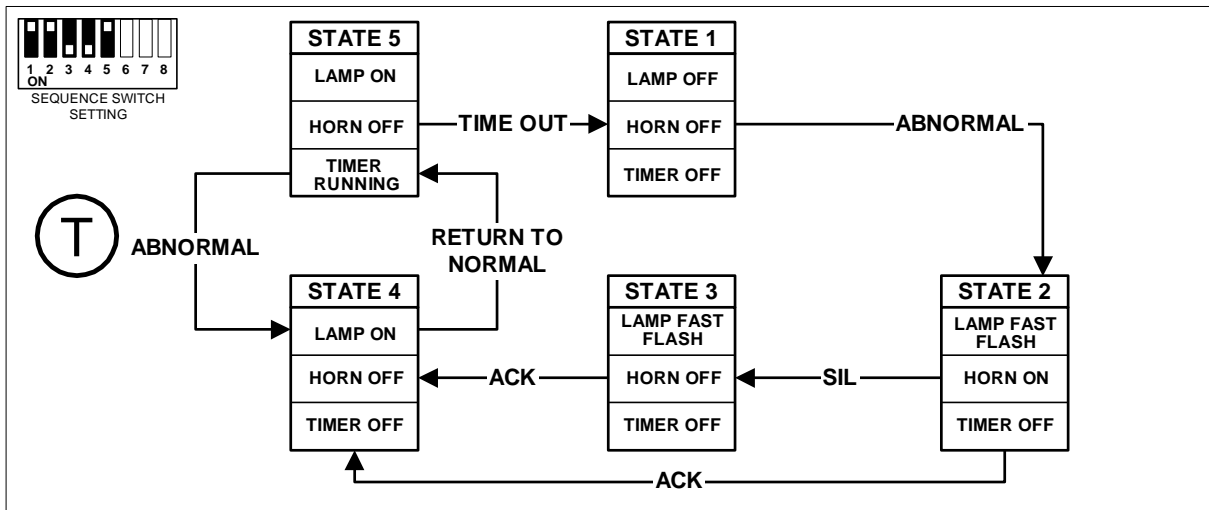
Sequence 12 - Momentary (Fleeting) Alarm; Auto Reset; with Time Delay on Return to Normal.

Sequence 13 - Pulse Monitoring Alarm, Manual Reset
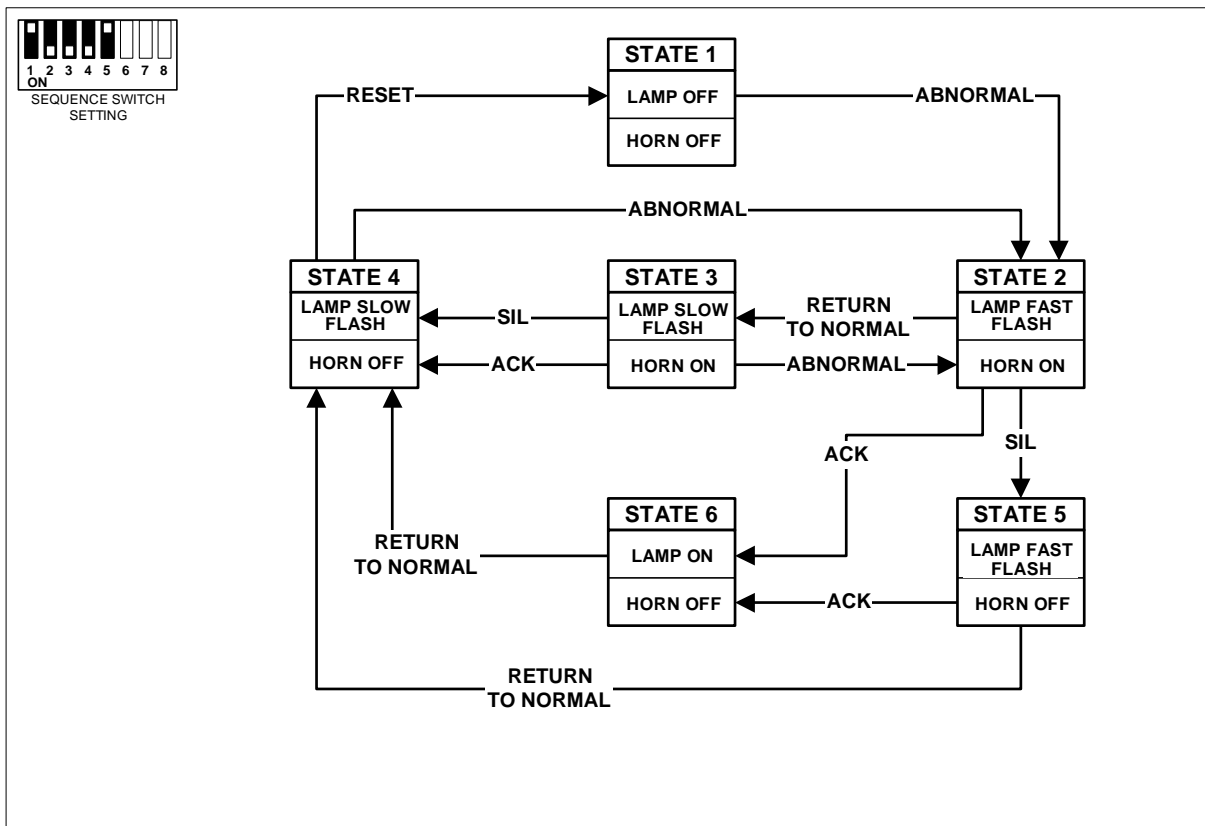
Sequence 14 - Momentary (Fleeting Alarm), Manual Reset, with Ringback.
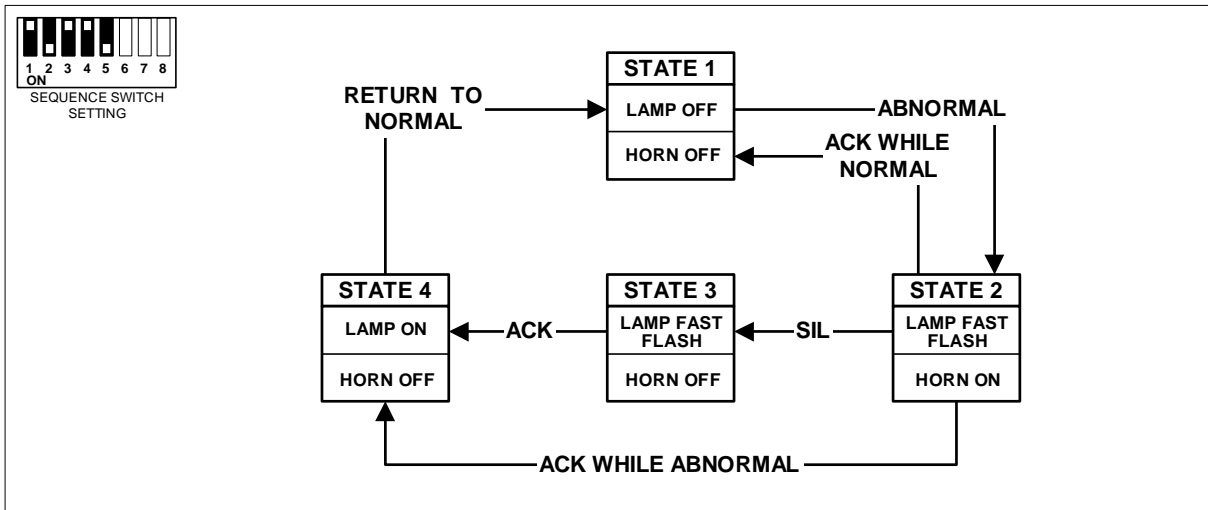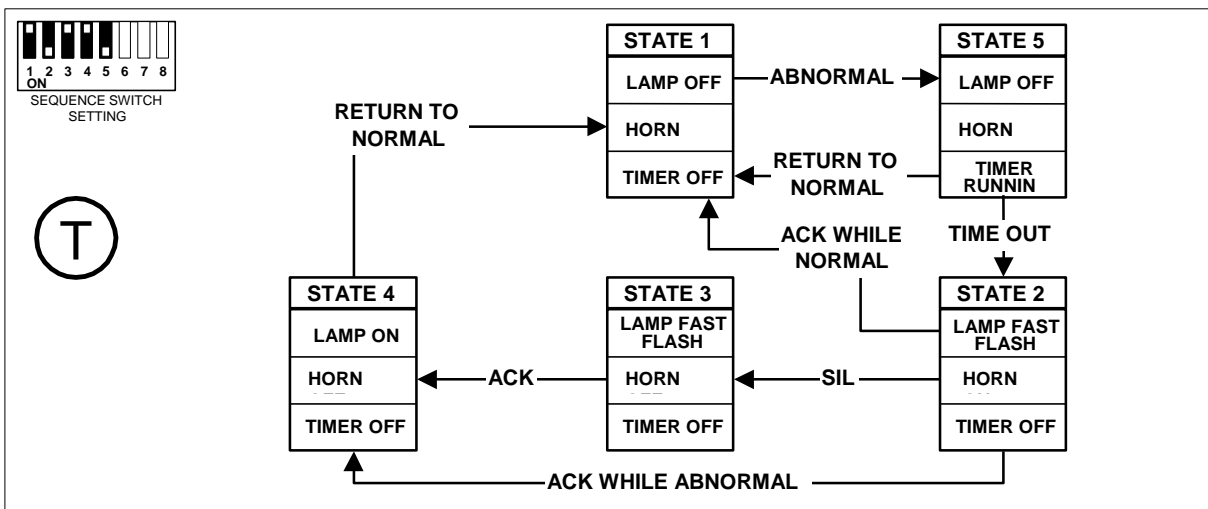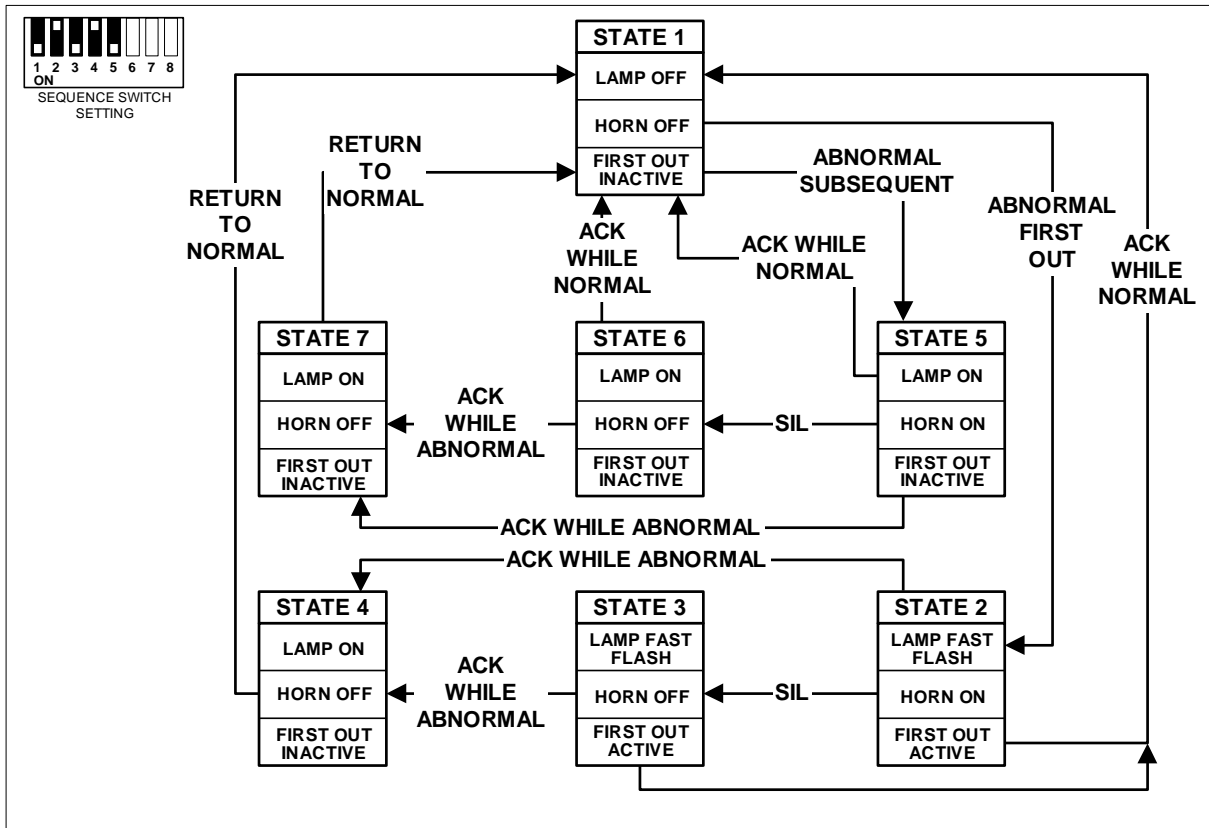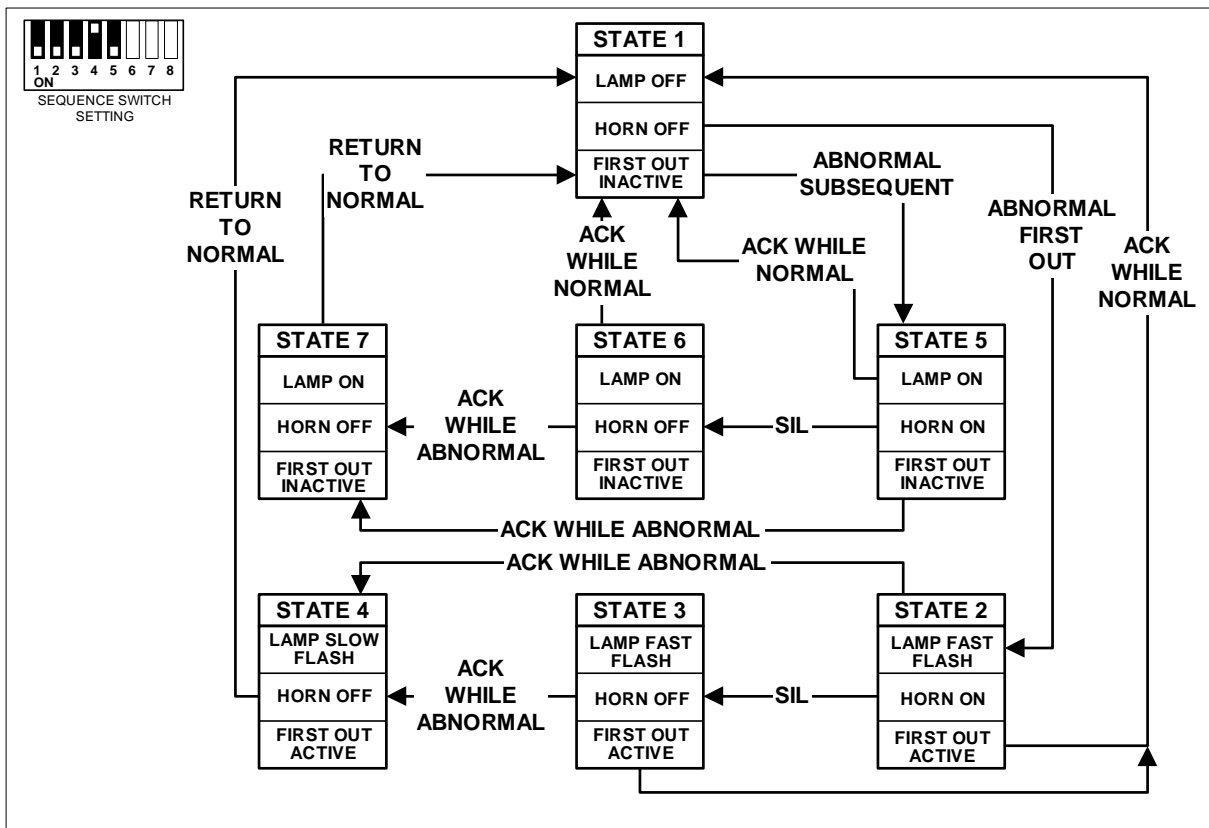
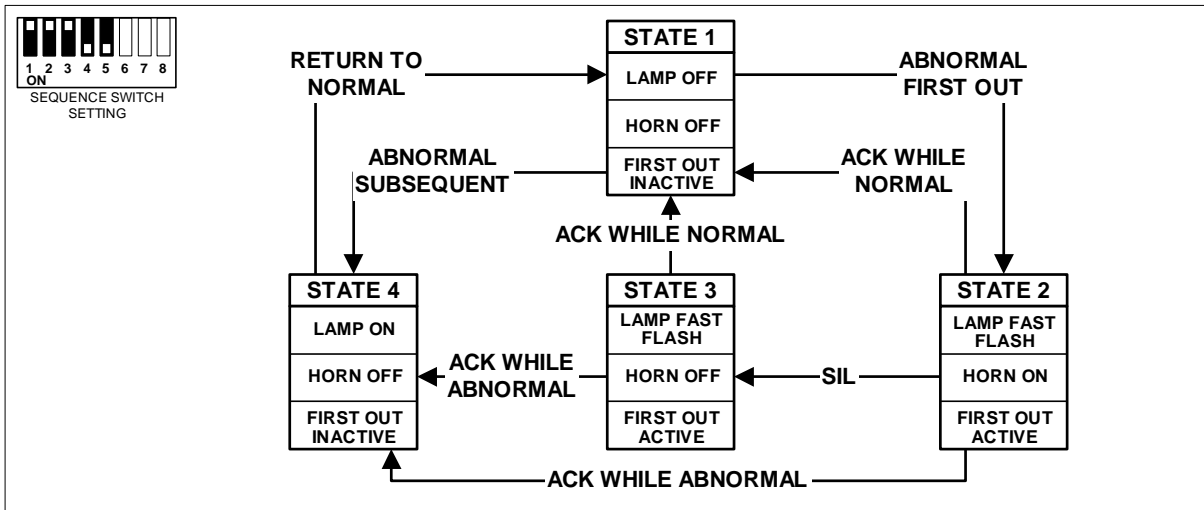Sequence 18 - Momentary (Fleeting) Alarm, Auto Reset, (Timer option off)

Sequence 18 - Momentary (Fleeting) Alarm; Auto Reset; with Time Delay on Inputs

SEQUENCE SWITCH SETTING

1 2 3 4 5 6 7 8 ON

STATE 1
LAMP OFF
HORN OFF
FIRST OUT INACTIVE

RETURN TO NORMAL

RETURN TO NORMAL

ABNORMAL SUBSEQUENT

ABNORMAL FIRST OUT

ACK WHILE NORMAL

ACK WHILE NORMAL

ACK WHILE NORMAL

STATE 7
LAMP ON
HORN OFF
FIRST OUT INACTIVE

ACK WHILE ABNORMAL

STATE 6
LAMP ON
HORN OFF
FIRST OUT INACTIVE

SIL

STATE 5
LAMP ON
HORN ON
FIRST OUT INACTIVE

ACK WHILE ABNORMAL

ACK WHILE ABNORMAL

STATE 4
LAMP ON
HORN OFF
FIRST OUT INACTIVE

ACK WHILE ABNORMAL

STATE 3
LAMP FAST FLASH
HORN OFF
FIRST OUT ACTIVE

SIL

STATE 2
LAMP FAST FLASH
HORN ON
FIRST OUT ACTIVE

Sequence 21 - Momentary (Fleeting) Alarm, First Out Multiple Groups, Auto Reset.

SEQUENCE SWITCH SETTING

1 2 3 4 5 6 7 8 ON

STATE 1
LAMP OFF
HORN OFF
FIRST OUT INACTIVE

RETURN TO NORMAL

RETURN TO NORMAL

ABNORMAL SUBSEQUENT

ABNORMAL FIRST OUT

ACK WHILE NORMAL

ACK WHILE NORMAL

ACK WHILE NORMAL

STATE 7
LAMP ON
HORN OFF
FIRST OUT INACTIVE

ACK WHILE ABNORMAL

STATE 6
LAMP ON
HORN OFF
FIRST OUT INACTIVE

SIL

STATE 5
LAMP ON
HORN ON
FIRST OUT INACTIVE

ACK WHILE ABNORMAL

ACK WHILE ABNORMAL

STATE 4
LAMP SLOW FLASH
HORN OFF
FIRST OUT ACTIVE

ACK WHILE ABNORMAL

STATE 3
LAMP FAST FLASH
HORN OFF
FIRST OUT ACTIVE

SIL

STATE 2
LAMP FAST FLASH
HORN ON
FIRST OUT ACTIVE

Sequence 23 - Momentary (Fleeting) Alarm, First Out Single Group, Auto Reset, First Out Continous Flash.

Sequence 24

SEQUENCE SWITCH SETTING

| RETURN TO NORMAL | **STATE 1** LAMP OFF / HORN OFF / FIRST OUT INACTIVE | ABNORMAL FIRST OUT |

ABNORMAL SUBSEQUENT → FIRST OUT INACTIVE ← ACK WHILE NORMAL

ACK WHILE NORMAL

| **STATE 4** LAMP ON / HORN OFF / FIRST OUT INACTIVE | ← ACK WHILE ABNORMAL ← | **STATE 3** LAMP FAST FLASH / HORN OFF / FIRST OUT ACTIVE | ← SIL ← | **STATE 2** LAMP FAST FLASH / HORN ON / FIRST OUT ACTIVE |

ACK WHILE ABNORMAL

Sequence 24 - Momentary (Fleeting) Alarm; First Out Multiple Group; Auto Reset; No horn for subsequent alarms.

Sequence 25

SEQUENCE SWITCH SETTING

T

| RETURN TO NORMAL | **STATE 1** LAMP OFF / HORN OFF / TIMER OFF | ABNORMAL |

ACK WHILE NORMAL

ACK WHILE NORMAL

| **STATE 4** LAMP ON / HORN OFF / TIMER OFF | ← ACK ← | **STATE 3** LAMP FAST FLASH / HORN OFF / TIMER OFF | ← SIL ← / ← TIME OUT ← | **STATE 2** LAMP FAST FLASH / HORN ON / TIMER RUNNING |

ACK WHILE ABNORMAL
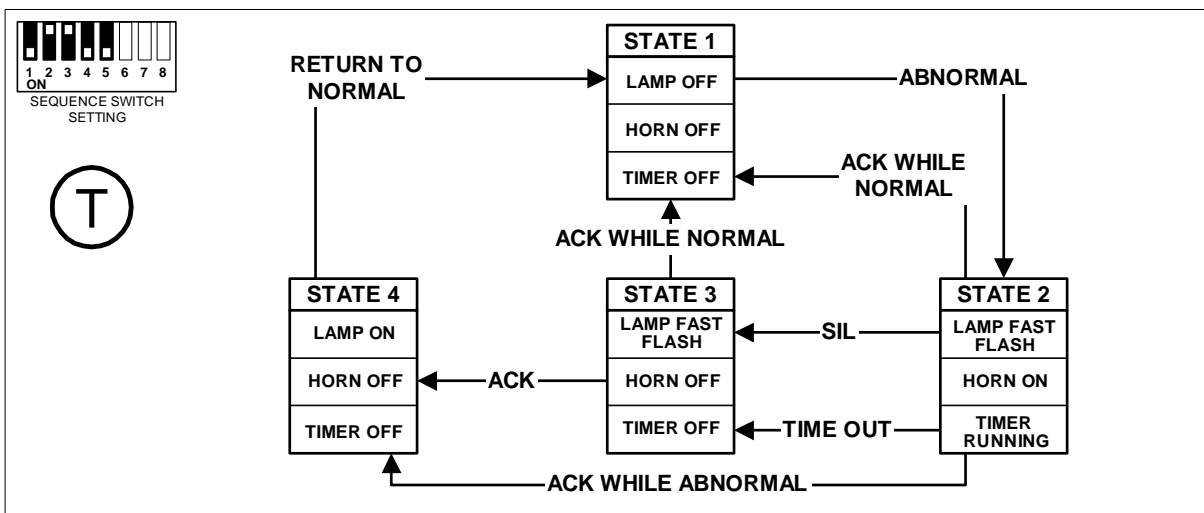
Sequence 25 - Momentary (Fleeting) Alarm; Auto Reset; Auto Silence after Time Delay.

Sequence 26

SEQUENCE SWITCH SETTING

T

| RETURN TO NORMAL | **STATE 1** LAMP OFF / HORN OFF / TIMER OFF | ABNORMAL |

TIME OUT WHILE ABNORMAL →

ACK WHILE NORMAL

TIME OUT WHILE ABNORMAL

| **STATE 4** LAMP ON / HORN OFF / TIMER RUNNING | ← ACK ← | **STATE 3** LAMP FAST FLASH / HORN OFF / TIMER RUNNING | ← SIL ← | **STATE 2** LAMP FAST FLASH / HORN ON / TIMER OFF |

ACK WHILE ABNORMAL

Sequence 26 - Momentary (Fleeting) Alarm; Auto Reset; Re-alarm after time-out if still abnormal.

Sequence 27 - Momentary (Fleeting) Alarm, Auto Reset, for Motor Alarms (Timer option off)

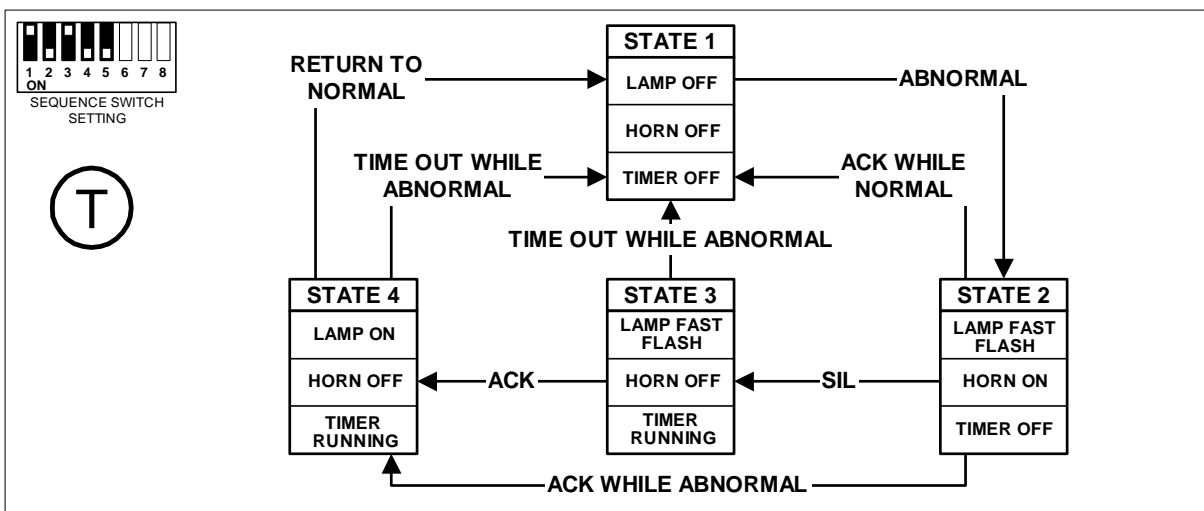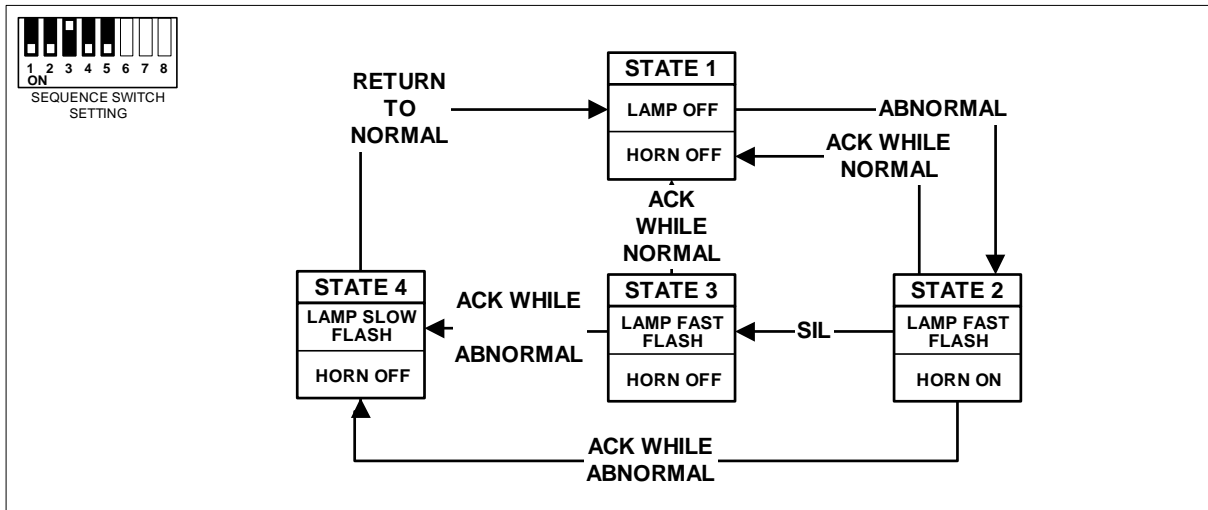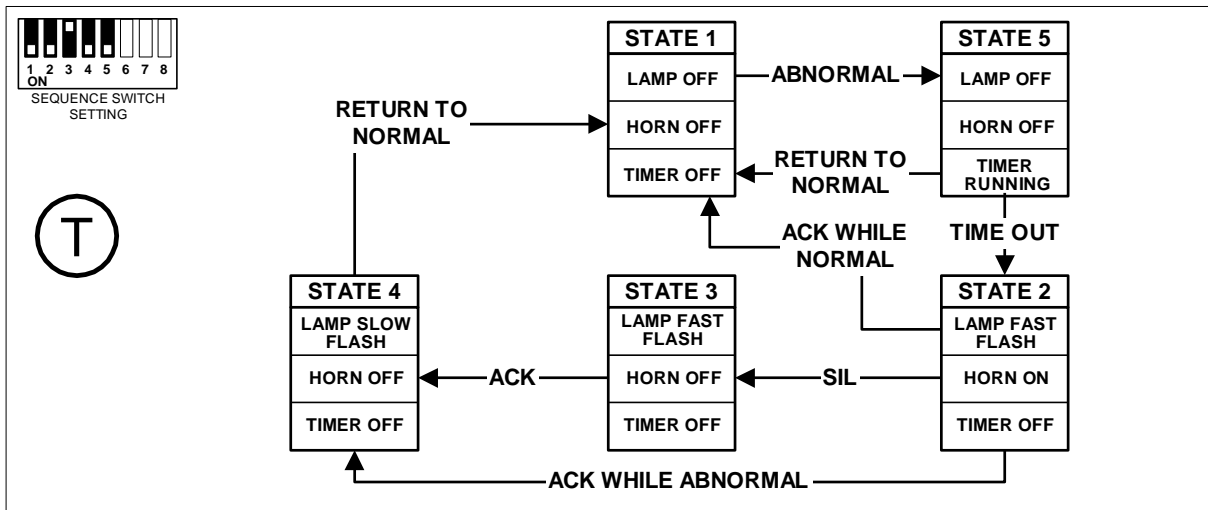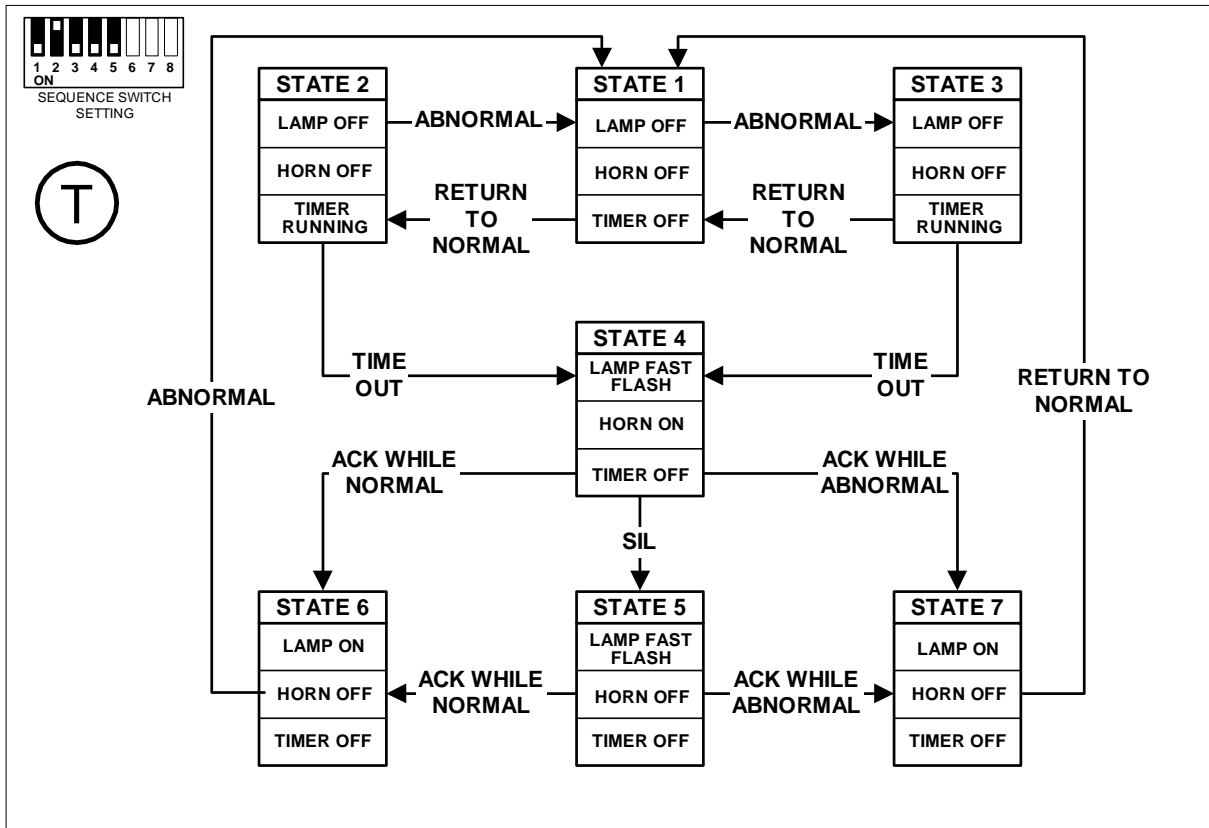Sequence 27 - Momentary (Fleeting) Alarm; Auto Reset; for Motor Alarms; with Time Delay on Inputs

SEQUENCE SWITCH SETTING		

T

STATE 2
LAMP OFF
HORN OFF
TIMER RUNNING

STATE 1
LAMP OFF
HORN OFF
TIMER OFF

STATE 3
LAMP OFF
HORN OFF
TIMER RUNNING

ABNORMAL

ABNORMAL

RETURN TO NORMAL

RETURN TO NORMAL

STATE 4
LAMP FAST FLASH
HORN ON
TIMER OFF

TIME OUT

TIME OUT

ABNORMAL

RETURN TO NORMAL

ACK WHILE NORMAL

ACK WHILE ABNORMAL

SIL

STATE 6
LAMP ON
HORN OFF
TIMER OFF

STATE 5
LAMP FAST FLASH
HORN OFF
TIMER OFF

STATE 7
LAMP ON
HORN OFF
TIMER OFF

ACK WHILE NORMAL

ACK WHILE ABNORMAL

Sequence 29 - Pulse Monitoring Alarm - Auto Reset

8. MODBUS REGISTER LAYOUT

The following table provides the contents of the registers available through the programming port and the serial port using the Modbus protocol.

The Omni30 supports the following Modbus functions:

Modbus Function 1 – Read Coil Statuses

Modbus Function 2 – Read Input Statuses

Modbus Function 3 – Read Holding Registers

Modbus Function 4 – Read Input Registers

Modbus Function 5 – Write Single Coil

Modbus Function 6 – Write Single Holding Register

Modbus Function 16 – Write Multiple Holding Registers

Note:

Maximum Number of Holding Registers to read or write: 4

16 coils or input status to be read at a time, starting from positions1,17,33,49 only.

Note that the Table below refers to Modbus Holding registers without any starting offset. If a third party Modbus Master is being used to poll the Omni30, add the offset for that device to the register addresses below. For example, some Modbus Master devices, Holding registers start at address 40 001. Therefore to read the status of the Omni30 inputs, read Holding register 40101.

 (Using the optional Configuration Software, this data is presented in easy-to-use pull-down menus enabling the data to be accessed without needing to know the specific register numbers):

Holding/ Input Register No.	Coil/ Input Status.	DIT No.	DESCRIPTION	Read/ Write
1-100		0-99	PRODUCT INFORMATION	
1	N/A	0	Product Code Product Code that reflects the product range/ family. For the Omni30 family, the product code is 0501.	R
2	N/A	1	DIT Revision Number Version number of the DIT Layout used by the Omni30 Kernel. The formal is BCD with major revision number in the MSB and minor revision in the LSB.	R
3	N/A	2	Kernel Version Number Version number of the Omni30 Kernel. The value is stored in BCD format with major revision number in the MSB and minor revision in the LSB.	R
4	N/A	3	Supported Services Flags This register shows what network related services are supported by the Omni30 Kernel: Bit 0: DIT service Bit 1,2: Reserved Bit 3: Datagram Service Bits 4,5: Reserved Bit 6: Programming Service Bit 7: Presentation Layer Management Service Bits 8-15: Reserved The Omni30 currently supports the DIT service. The value read is 1.	R
5	N/A	4	User Tag 1 Name or Model number of the product in ASCII format, 2 characters per register.	R
6	N/A	5	User Tag 2	R
7	N/A	6	User Tag 3	R

Holding/ Input Register No.	Coil/ Input Status.	DIT No.	DESCRIPTION	Read/ Write
8	N/A	7	User Tag 4	R
9 - 23	N/A	8 – 22	Reserved	
24	N/A	23	Alive Counter Counter incremented frequently by the Omni30 Kernel to indicate it is running.	R
25 – 100	N/A	24-99	Reserved	
101- 200		100-199	STATUS DATA	
101	1-16	100	Input Status 16 Inputs as individual bits – bit 0 (lsb) = input 1 etc. Note that any Change of State to "1" will remain latched until read by a Modbus Poll. This will ensure that any fleeting abnormal input is never missed by the Modbus Master. **Omni30 only uses first 8 inputs**. These status bits can also be written to the unit for serial display. When using Modbus Coil writes (Modbus Function 5) the coil mapping is as follows: Coil Number : Input Number 1 : 1 2 : 2 3 : 3 4 : 4 5 : 5 6 : 6 7 : 7 8 : 8 9 : 9 10 : 10 11 : 11 12 : 12 13 : 13	R/W

Holding/ Input Register No.	Coil/ Input Status.	DIT No.	DESCRIPTION	Read/ Write
			14 : 14 15 : 15 16 : 16	

102	17-32	101	Common Service Input Status
			If any bit below is 1 then the input is ON.
			Bit 0: INH (Inhibit input – NOT used in Omni30)
			Bit 1: TST (Lamp Test input)
			Bit 2: ACK (Accept/Acknowledge input)
			Bit 3: SIL (Silence input – NOT used in Omni30)
			Bit 4: RES (Reset input)
			Bit 5: FS (Flash Sync input - this bit is READ ONLY)
			Bit 6: FO (First Out input - this bit is READ ONLY)
			Bits 7-15: Reserved
			NOTE: The SIL, ACK and RES bits are automatically reset to 0 after 3 seconds when set by the Modbus Master. All other bits must be reset by the Modbus Master.
			When using Modbus Coil writes (Modbus Function 5) the coil mapping is as follows:
			Coil Number : Control Input
			    17 : INH (Inhibit input – NOT used in Omni30)
			    18 : TST (Lamp Test input)
			    19 : ACK (Acknowledge input)
			    20 : SIL (Silence input – NOT used in Omni30)
			    21 : RES (Reset input)
			    22-32 : Reserved
				R/W

103	N/A	102	Alarm Status 1 bit for every input where "1" means the input is in alarm and "0" means the input is in the normal condition. Bit 0 (lsb) = alarm status of input 1.	R
104	N/A	103	Common Service Output Status If any bit below is 1 then the output (Relay) is energised Bit 0: – not used Bit 1: – HORN output Bit 2: – GP output Bit 3: – not used	R

Holding/ Input Register No.	Coil/ Input Status.	DIT No.	DESCRIPTION	Read/ Write
			Bits 4-15: Reserved	
105	N/A	104	Lamp Status: Lamp 2 (high byte) : Lamp 1 (low byte) The current lamp status for a given lamp can be read or written to here. Status for two lamps is provided per Modbus register, one lamp per byte. Status is as follows: 0 = OFF 8 = FAST FLASH 16 = SLOW FLASH 24 = INTERMITTENT FAST FLASH 56 = STEADY ON	R/W
106	N/A	105	Lamp Status: Lamp 4 (high byte) : Lamp 3 (low byte)	R/W
107	N/A	106	Lamp Status: Lamp 6 (high byte) : Lamp 5 (low byte)	R/W
108	N/A	107	Lamp Status: Lamp 8 (high byte) : Lamp 7 (low byte)	R/W
109	N/A	108	Not Used	R/W
110	N/A	109	Not Used	R/W
111	N/A	110	Not Used	R/W
112	N/A	111	Not Used	R/W
113-115	N/A	112 – 114	Reserved	
116	N/A	115	Fault Status If the unit discovers a fault it is reflected in this register. The error codes are as follows: NO fault found: 0 INPUT fault: 47 SPI fault: 63 EEPROM fault: 79	R
117-200	N/A	116 – 199	Reserved	
201-250		200 – 249	SETUP DATA	
201	N/A	200	Setup Sequence Number: Input 2 (high byte) : Input 1 (low byte) Select Sequence number from Table 4-1. DIP switches must be set to Sequence 31 on SW1 for this register to	R/W

Holding/ Input Register No.	Coil/ Input Status.	DIT No.	DESCRIPTION	Read/ Write
			be recognised, otherwise the DIP switch setting is used. If an invalid setting is written into these registers, the relevant sequence is set to Sequence 1.	
202	N/A	201	Setup Sequence Number: Input 4 (high byte) : Input 3 (low byte)	R/W
203	N/A	202	Setup Sequence Number: Input 6 (high byte) : Input 5 (low byte)	R/W
204	N/A	203	Setup Sequence Number: Input 8 (high byte) : Input 7 (low byte)	R/W
205	N/A	204	Not Used	R/W
206	N/A	205	Not Used	R/W
207	N/A	206	Not Used	R/W
208	N/A	207	Not Used	R/W
209	N/A	208	Setup Timer Setting: Input 2 (high byte) : Input 1 (low byte) Input delay timer set per input. One input per byte. The data format for an input is as follows: Most significant bit: 1 = Use the slow timer, 0 = Use the fast timer (1/10 s) Least significant 7 bits: time delay in multiples The fast timer counts time in units of tenths of a second (i.e. 1/10 s). The slow timer counts in multiples of the fast timer and is programmable. Refer to DIT 135 to configure it. The default setting is 10 which makes is a seconds counter. Fast timer example: To delay Input 1 by 20 seconds, enter 200 (or C8 hex) Slow timer example: If DIT 135 is set to 10 then to delay Input 1 by 20 seconds, enter 148 (94hex) Set to **255** to use timer setting set by SW2.	R/W
210	N/A	209	Setup Timer Setting: Input 4 (high byte) : Input 3 (low byte)	R/W
211	N/A	210	Setup Timer Setting: Input 6 (high byte) : Input 5 (low byte)	R/W
212	N/A	211	Setup Timer Setting: Input 8 (high byte) : Input 7 (low byte)	R/W
213	N/A	212	Not Used	R/W
214	N/A	213	Not Used	R/W
215	N/A	214	Not Used	R/W
216	N/A	215	Not Used	R/W
217-219	N/A	216-218	Reserved	

Holding/ Input Register No.	Coil/ Input Status.	DIT No.	DESCRIPTION	Read/ Write

220	N/A	219	Setup Output (Relay) Function *(Soft-Set Mode only)*
			
			Setup the function of each output (relay) as follows
			
			Pair of bits 1:0: 00 = Reserved
			                      01 = Reserved
			                      10 = Reserved
			                      11 = Reserved
			Pair of bits 3:2: 00 = Output 2 not Configured
			                      01 = Output 2 drives HORN
			                      10 = Reserved
			                      11 = Reserved
			Pair of bits 5:4: 00 = Output 3 not Configured
			                      01 = Reserved
			                      10 = Relay Output 3 drives GP
			                      11 = Reserved
			Pair of bits 7:6: 00 = Reserved
			                      01 = Reserved
			                      10 = Reserved
			                      11 = Reserved
				R/W

221	N/A	220	Setup Relay Output 1 Alarm Members Not applicable in Omni30	R/W

Holding/ Input Register No.	Coil/ Input Status.	DIT No.	DESCRIPTION	Read/ Write
222	N/A	221	Not applicable in Omni30	R/W
223	N/A	222	Not applicable in Omni30	R/W
224	N/A	223	Not applicable in Omni30	R/W
225	N/A	224	Setup Group Alarm 1 Type If an output has been configured as a GA (GP) output, then the operation is setup as follows: 0 = follows input 1 = follows alarm 2 = acts as ring back 3 = set to multiple reflash	R/W
226	N/A	225	Setup Group Alarm 2 Type	R/W
227	N/A	226	Setup Group Alarm 3 Type	R/W
228	N/A	227	Setup Group Alarm 4 Type	R/W
229	N/A	228	Setup Lamp Sense 65535 = All Lamps Normal Sense. 0 = All Lamps Reversed Sense. **Note:** This setting only applies when SW1-8 is ON.	
230	N/A	229	First Out Group Split Enter a number between 1 and 16 to decide the split between First Out Group 1 and 2. For example: A value of **4** will arrange input 1 to 4 into First Out Group 1 and inputs 5 to 16 into First Out Group 2.	

Holding/ Input Register No.	Coil/ Input Status.	DIT No.	DESCRIPTION	Read/ Write
231	N/A	230	Setup System Operation Bit 0: Pushbutton Edge/#Level: 　　　1 – Edge, 0 – Level Bit 1: Auto ACK on Startup: 　　　1 – NO Auto ACK on Startup, 0 - Auto ACK on Startup Bit 2: Inhibit Input operation: 　　　1 – Close to Inhibit, 0 – Open to Inhibit 　　　**Note:** This setting only applies when SW1-8 is ON. This input can be set only through serial port Bit 3: Repeat Output operation (these repeats can be read only through serial port): 　　　1 – Repeat Input status, 0 – Repeat Alarm status Bit 4: Repeat Sense operation (these repeats can be read only through serial port): 　　　1 – Normally de-energised, 0 – Normally energised (fail safe) Bit 5-15: Reserved	
232	N/A	231	Setup Slow Timer The slow timer counts in multiples of the fast timer. This is configurable to allow the most flexible use of timers. Some examples are given below: To count in seconds:　　　　　set to 10 To count in 10s of seconds:　　set to 100 To count in 20s of seconds:　　set to 200	
233-250	N/A	232 – 249	Reserved	