Noby 420
Fire Control Panel

Installation & Programming Manual

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GETTING STARTED

We strongly recommend that the Noby-420 is first powered up with all 4K7 End Of Line resistors fitted **at the panel** as supplied by the factory. In this way you can gain confidence that the panel is operating correctly *before* introducing detector and sounder circuits.

Power-Up With Battery

- Connect two 12v SLA batteries in series (+'ve to –'ve) to form a 24 volt battery stack, using the battery jumper link supplied.
- Connect the black battery lead to the battery stack –'ve terminal.
- Connect the red battery lead to the battery stack +'ve terminal. It is normal to see a small spark.
- The Common Fault LED will be continuously lit together with flashing PSU and CPU fault LEDs. These faults are also accompanied by an audible fault tone signified by 4 rapid pips every 4 seconds.
- Press **[3][6][3][6] [1][4][5]** to silence and perform a System Reset – observe a 3 second LED test.
- The panel should then settle to quiescent state with all LEDs off.
- Connect the mains power supply to the fused screw terminal block
- The panel should now be in a standby state with only the green Power LED continuosly lit.

Power-Up With Mains

- Connect the mains power supply to the fused screw terminal block.
  The green Power LED will be continuously lit.
  The Common Fault LED will be continuously lit together with flashing PSU and CPU fault LEDs.
  These faults are also accompanied by an audible fault tone signified by 4 rapid pips every 4 seconds.
- Connect two 12v SLA batteries in series (+'ve to –'ve) to form a 24 volt battery stack, using the battery jumper link supplied.
- Connect the black battery lead to the battery stack –'ve terminal.
- Connect the red battery lead to the battery stack +'ve terminal. It is normal to see a small spark.
- Press **[3][6][3][6] [1][4][5]** to silence and perform a System Reset – observe 3 second LED test.
- The panel should now be in a standby state with only the green Power LED continuously lit.

Notes

1. The panel will persist in reporting a PSU fault after a System Reset if the battery is either not present or the battery fuse F4 has blown.
2. Whilst there is a measure of protection against accidental reverse connection of the battery, such action will blow fuse F4 and may cause permanent damage to the panel.

Power Supply Unit

The Noby-420 has a 27volt regulated PSU, with a continuous current rating of 1.0A, and a 20 minute rating of 1.5A. The PSU is designed to meet the internal standby power requirements of the Noby-420 and also to charge and maintain the SLA standby battery in optimum condition. The battery standby time is dependant upon the overall system current drawn, including any ancillary equipment connected to the Aux 24v. Also it is strongly recommended that the continuous system standby current does not exceed 1.0A, because some 'reserve' PSU current may at times be required to rapidly re-charge the battery (e.g. after an alarm condition or prolonged period of mains loss).

The Noby-420 enclosure can accommodate two 12v/7Ahr SLAs connected in series. Care must be taken when planning an installation that there is sufficient battery capacity to meet the relevant standards regarding battery standby times.

Always ensure that the maximum current drawn in alarm does not exceed the 3.0A battery fuse limit (F4).

The PSU is monitored for :

i)	Mains Absence	Power LED extinguishes when mains absent for more than 90 seconds and flashes once mains restored. Mains absence is accompanied by an intermittent warning bleep every 16s (mutable).
ii)	Low Voltage < 21v	PSU Fault LED continuously lit whilst voltage < 21v and flashes when the voltage is restored to > 23v
iv)	Battery Capacity Test	PSU Fault LED flashes
iii)	Fuse F4 (Battery/Low Volts)	PSU Fault LED flashes
v)	Fuse F1 (Aux 24v)	PSU Fault LED flashes

Note 1: PSU faults are accompanied by a fault tone signified by 4 rapid pips every 4 seconds.
Note 2: The Battery Capacity Test is performed immediately after a System Reset and thereafter at 12 hour intervals.

Inputs

Zone Detector Circuits
The Noby-420 requires that each detector zone is terminated with a 4K7 End Of Line resistor. This EOL resistor is necessary to facilitate open circuit, short circuit and head removal monitoring. The total current drawn by the detectors on each circuit must not exceed 2mA, which means that 20 detectors can be connected to each zone (based on a typical 100uA maximum per detector). Similarly, if the detectors are specified at 50uA maximum current draw, then 40 detectors per zone can be connected.

Class Change Input (Direct Bell Ring)
A positive going input signal to activate on the sounders directly (subject to their isolation status).
The input is non-latching and no indication is given on the display.

Fault Input
An input signal permitting the fault status of remotely connected ancillary equipment (eg. a communication device) to be indicated on the Noby-420 display panel, causing the Common Fault LED to flash. The polarity of the Fault Input signal is programmable – see Engineer Programming.

Outputs

Sounder Circuits
Conventional 4K7 End Of Line resistor monitoring requiring polarised bells or sounders with a combined output current of 1.25A across the 2 sounder ports. Each sounder circuit is individually fused and monitored.

Fire Relay Output
Double pole voltage free contacts, each rated at 1A@30V, activated upon detection of a zone fire or by the keypad operated Evacuate function. It is latched until a System Reset. The relay can be isolated - see User Keypad Functions / Isolation. The Fire Relay Output is *not* triggered by the Class Change (Bell Ring) Input or from any activation of a zone that has been programmed as a non-latching zone. The Fire Relay contacts are NOT mains voltage rated, and any mains voltage switching MUST be done with the addition of a mains rated slave relay.

Panel Sounder (Piezo)
An on-board piezo sounder provides the panel's internal fire and fault warning tones.
Fire tone = continuous rapid pips.
Fault tone = 4 rapid pips every 4 secs.
Warning Tone = 2 pips every 16 secs.

Aux 24v
A 27.3v (nominal 24v) auxiliary supply fused at 1A (Fuse F1), monitored.

Fault Output
Signals real-time status of System Faults from all sources (zone faults, sounder circuit faults, PSU etc.). It is an open collector PNP output normally driven to 24 volts, and dropping to 0 volts during a fault condition. The output has a 470 ohm series limiting resistor.

LED Indications

LED Indications	***Continuous***	***Flashing***
2 Zone Fire LEDs	Zones alarmed	First To Alarm (winking)
Common Fire LED	One or more zones in fire condition	N/A
2 Zone Fault LEDs	Zone/s in fault	Zone/s isolated (slow flash) Head Removed (intermittent 'winking')
Common Fault LED	Any zone fault or system fault	Fault Input terminal active, non-latching
Sounder Fault LED	Sounder fault	Sounders Isolated
PSU Fault LED	Low voltage (< 21 volts), non-latching	Fuses F1 or F4, or Low Volts (latched).
CPU Fault LED	N/A	CPU watchdog warning
Power LED	On=Mains OK. Off=Mains absent	Mains restored
Relay Isolate LED	N/A	Relay isolated
Function LED	Access code successfully entered	N/A
Isolate LED	N/A	One or more zones isolated
Test LED	N/A	7 day fire test reminder

USER KEYPAD FUNCTIONS

General
Each of the following functions must be preceded by the Access Code which is fixed at [3][6][3][6]. Successful entry of the Access Code is confirmed by the red Function LED. Pressing **[5]** to **Quit** at any time will cause the system to revert back to normal standby mode, otherwise the system will automatically revert back after 10 seconds of inactivity.

Mute Sounders **[3][6][3][6] [1]**
Main external sounders switched off.

Mute Panel **[3][6][3][6] [4]**
Panel internal sounders (piezos) switched off.

System Reset **[3][6][3][6] [5]**
All LEDs are tested for 3 seconds.

Quick Reset **[3][6][3][6] [1] [4] [5]**
A Quick Reset is an amalgamation of the first three operations above.
Note that the Main Sounders & Panel Sounder MUST be individually muted before a reset can be accepted.
Reset is acknowledged by a 3 second LED test.

Evacuate **[3][6][3][6] [2]**
The main external and panel internal sounders are switched on. The Fire Alarm Relay is activated.

Zone_Isolate & Relay_Isolate **[3][6][3][6] [3]**
This function is used to Isolate zones and/or the Fire Alarm Relay.
The current isolation status is displayed by any flashing yellow zone LED's and/or the Relay_Isolate LED.
Note that scrolling down automatically wipes any pre-existing isolation status LEDs.
Key **[1]** to **Scroll-Down** and highlight the desired yellow zone LED (or the Relay_Isolate LED) for selection.
Key **[3]** to **Toggle** the selected zone (or the relay) on or off – the LED flashes when isolation is active.
Key **[4]** to **Accept** and update the current isolation status and then revert back to normal standby mode . . .OR
Key **[5]** to **Quit** and revert back to normal standby mode without updating the displayed isolation status.

Once back in normal standby mode any isolated zone (or relay) is confirmed by a flashing zone fault LED (and/or Relay_Isolate LED). Zone_Isolate and/or Relay_Isolate operations should only be performed or authorised by the Installation / Service Company.

One Man Test **[3][6][3][6] [6]**
This function is used to 'one-man' test the system.
Key **[1]** to **Scroll-Down** and highlight the zone for test.
Key **[6]** to **Toggle** the zone selected for test on or off – the yellow zone LED will flash when in test mode.
It is now possible to trigger each detector or call-point in turn on the selected zone.
The sounders are pulsed for as long as a fire condition is applied (provided they are not isolated) and the Zone Fire LED is latched.
The Fire Alarm Relay is not activated.
Key **[5]** to **Quit** to revert back to normal standby mode.

The system will revert back to normal standby mode after 90 seconds of panel inactivity (i.e. no keypad operations or zone activations). Any fire alarm generated from a non-test zone will cause the system to abort the test and give the appropriate fire response.

ENGINEER KEYPAD FUNCTIONS

General
Pressing **[5]** to **Quit** at any time will cause the system to revert back to normal standby mode, otherwise the system will automatically revert back (kickback) after approximately 10 seconds of inactivity.

Sounder Fault Identification **[6][2][5][3] [1][1]**
This function is used to identify which sounder circuit is in fault condition. The sounder circuit in fault is indicated by means of the corresponding yellow zone fault LED.
Key **[5]** to **Quit** and revert back to normal standby mode.

Isolate Sounders **[6][2][5][3] [3][1]**
This function is used to isolate the main sounders. The panel piezo sounder is unaffected.
Key **[3]** to **Isolate** the sounders - a toggle on/off action.
Key **[4]** to **Accept** and update and then revert back to normal standby mode . . . OR
Key **[5]** to **Quit** and revert back to normal standby mode without updating the Sounder Isolate status.
The sounder isolation status is confirmed by a flashing Sounder Fault LED.

15 Event Log Recall **[6][2][5][3] [6][1]**
On entering the Log Recall mode all LED's are initially lit.
Key **[1]** to **Scroll Down** or rather *scroll back* through the last 15 events.
Key **[4]** to **Accept**, clear the log memory and then revert back to normal standby mode . . . OR
Key **[5]** to **Quit** and revert back to normal standby mode without clearing the log memory.
Note: Each time the Noby-420 is reset following a fire or fault condition the LED display is entered into the log. The log holds the 15 most recent LED displays.

ENGINEER PROGRAMMING - System Options 1

Configure Zone-1 Non-Latching **[6][2][5][3] [3][5] [1]**
This option configures Zone-1 as non-latching.
Key **[1]** to **Toggle** the option - the Zone-1 fault LED indicates the current option status.
Key **[4]** to **Accept** and update the configuration option to E2PROM . . . OR
Key **[5]** to **Quit** and revert back to normal standby mode without updating the E2PROM.
The factory default is with the option disabled – i.e. Zone-1 is latching.

Configure Zone-2 Non-Latching **[6][2][5][3] [3][5] [2]**
This option configures Zone-2 as non-latching.
Key **[2]** to **Toggle** the option - the Zone-2 fault LED indicates the current option status.
Key **[4]** to **Accept** and update the configuration option to E2PROM . . . OR
Key **[5]** to **Quit** and revert back to normal standby mode without updating the E2PROM.
The factory default is with the option disabled – i.e. Zone-2 is latching.
Note: A non-latching zone will momentarily activate the sounders (subject to their isolation status), panel sounder, and also display momentary indication on the appropriate zone fire LED.

Configure Latching Zone Faults **[6][2][5][3] [3][5] [3]**
This option configures both zones to latch zone faults.
Key **[3]** to **Toggle** the option - the Isolate LED indicated the current option status.
Key **[4]** to **Accept** and update the configuration option to E2PROM . . . OR
Key **[5]** to **Quit** and revert back to normal standby mode without updating the E2PROM.
The factory default is with the LZF option disabled – i.e. zone faults are non-latching.

Configure Weekly Test Reminder **[6][2][5][3] [3][5] [6]**
This option configures the Weekly Test Reminder function.
Key **[6]** to **Toggle** the option - the Test LED indicated the current option status.
Key **[4]** to **Accept** and update the configuration option to E2PROM . . . OR
Key **[5]** to **Quit** and revert back to normal standby mode without updating the E2PROM.
The factory default is with the WTR option disabled. Once enabled the WTR will cause the Test LED to flash accompanied by an intermittent warning sound (mutable) after 1 week of no fire activity on the panel. The timer is automatically reset after a fire condition has been generated and subsequently cleared (i.e. a manual test cycle).

Configure Fault_Input Polarity **[6][2][5][3] [2][4] [1]**
This option configures the Fault_Input signal to be normally high, going low to initiate a fault condition.
Key **[1]** to **Toggle** the option - the Common Fault LED indicates the current option status.
Key **[4]** to **Accept** and update the configuration option to E2PROM . . . OR
Key **[5]** to **Quit** and revert back to normal standby mode without updating the E2PROM.
The factory default is with the option disabled i.e. the Fault_Input is normally low, going high to initiate a fault condition.

ENGINEER PROGRAMMING - System Options 2

The following options allow various monitoring functions to be disabled, and are intended to make the Noby-420 backwards compatible with detectors and sounders that may be encountered in older installation sites. With each of the following options the corresponding status LED indicates that the monitoring is **disabled** when the status LED is **ON**.

Detector Head Removal Monitor Inhibit **[3] [3] [5] [1] [4] [2] [6] [3] [1]**
This option disables the head removal monitoring.
Key **[1]** to **Toggle** the option - the Zone-1 fault LED indicates the current option status.
Key **[4]** to **Accept** and update the configuration option to E2PROM - then revert back to normal standby mode..OR
Key **[5]** to **Quit** and revert back to normal standby mode without updating the E2PROM.

Zone Short Circuit Fault Monitor Inhibit **[3] [3] [5] [1] [4] [2] [6] [3] [2]**
This option disables zone short-circuit monitoring and forces s/c's to be detected as a fire condition.
Key **[2]** to **Toggle** the option - the Zone-2 fault LED indicates the current option status.
Key **[4]** to **Accept** and update the configuration option to E2PROM - then revert back to normal standby mode..OR
Key **[5]** to **Quit** and revert back to normal standby mode without updating the E2PROM.

Battery Condition Monitor Inhibit **[3] [3] [5] [1] [4] [2] [6] [3] [3]**
This option disables the battery capacity and battery fuse monitoring.
Key **[3]** to **Toggle** the option - the Isolate LED indicates the current option status.
Key **[4]** to **Accept** and update the configuration option to E2PROM - then revert back to normal standby mode..OR
Key **[5]** to **Quit** and revert back to normal standby mode without updating the E2PROM.

Sounder Circuit Fault Monitor Inhibit **[3] [3] [5] [1] [4] [2] [6] [3] [6]**
This option disables the sounder circuit fault monitoring.
Key **[6]** to **Toggle** the option - the Test LED indicates the current option status.
Key **[4]** to **Accept** and update the configuration option to E2PROM - then revert back to normal standby mode..OR
Key **[5]** to **Quit** and revert back to normal standby mode without updating the E2PROM.

TROUBLESHOOTING

Power Supply

The Power LED not illuminated

- Check that the mains supply is connected and switched on.
- Check the mains supply fuse in the terminal block adjacent to the transformer.
- Check the transformer secondary fuse F5 on the main board.

PSU Fault LED continuously illuminated

- The panel is detecting low voltage (< 21V) from the batteries.
- Check the batteries are connected correctly, in series, and observing strict polarity.
- The batteries may be heavily discharged – allow approx. 1hr for a partial re-charge.
  The PSU Fault LED will flash when the battery voltage increases to 23V.
  The PSU Fault will clear when the panel is reset.
- The batteries may be faulty – replace as necessary.

PSU Fault LED flashing

- Check the batteries are connected correctly, in series, and observing strict polarity.
- Check Fuse F4 (Battery).
- Check Fuse F1 (Aux 24V).

Zone Faults

Zone Fault LED continuously illuminated

- Disconnect the relevant zone and replace with the EOL resistor (4K7) at the zone terminal. If the fault can now be cleared then there is a possible wiring error in the zone.
- Check that the correct value EOL resistor is fitted at the end of the zone.
- Check that the wiring and connections at each detector are consistent, and not crossed-over at any point along the cable run.
- Check that all manual call-points in the zone are intact and fitted with an appropriate series resistor, typically 470 ohms.
- If a Zone Fault LED becomes continuously illuminated when a head is removed, then that detector base may be the wrong type. Check that a schottky diode is fitted and correctly connected.
  Replace the suspect detector base if necessary.

Zone Fault LEDs Flashing

- One or more zones are isolated.

Zone Fault LED intermittently winking

- A detector head is either missing or incorrectly connected.
- Check all detector heads on the corresponding zone are fully seated in their bases.
- Some (older) detectors may be incompatible with head-removal monitoring in which case it is recommended to set the Head Removal Monitor Inhibit (System Options 2).

Fire is detected as Zone Fault

- Check all detector heads on the corresponding zone are fully seated in their bases.
- The panel monitors the zone for a short circuit. Some (older) detectors and call points may be incompatible with short circuit monitoring in which case it is recommended to set the Zone S/C Inhibit (System Options 2).

Sounder Faults

Sounder Fault LED continuously illuminated

- Enter the code [6][2][5][3][1][1] to bring up the sounder fault display, shown by the zone fault LEDs.
- Check the corresponding sounder fuses F2 and/or F3.
- Disconnect the suspect sounder circuit and fit a 4K7 EOL resistor at the sounder terminal. If the sounder fault clears then there is a possible wiring fault in the circuit. Check all connections between sounders.
- Check that the correct value 4K7 EOL resistor is fitted in the circuit.
- Some types of sounders may be incompatible with the Noby-420 sounder circuit monitoring function in which case it is recommended to set the Sounder Circuit Fault Monitor Inhibit (System Options 2).

CPU Fault Indication

CPU Fault LED Flashing

- It is normal to see a CPU Fault at power-up, and can be cleared by performing a panel reset.
- Persistent CPU faults may indicate interference from electrical machinery or RF transmitters in the immediate locality.

Common Fault Indication

Common Fault LED Flashing persistently

- Check that the Fault Input polarity is correctly programmed (Engineer Programming – Sysop1), and that the Fault_Input terminal, if used, is in the required state to hold-off the Common Fault LED. Note that the Fault_Input Polarity option should be disabled (factory default) if the Fault Input terminal is unused or not connected to remote equipment.

Alarm Relay

Alarm relay not working

- Check that the relay is not isolated.

User Keypad Operation

Reset command [3][6][3][6] [5] is ignored – nothing happens.

- Both the external sounders and internal panel piezo sounder must first be muted *before* the reset button is acknowledged. This can be performed in one operation by performing a Quick Reset [3][6][3][6] [1][4][5].

NOBY-420 SPECIFICATION

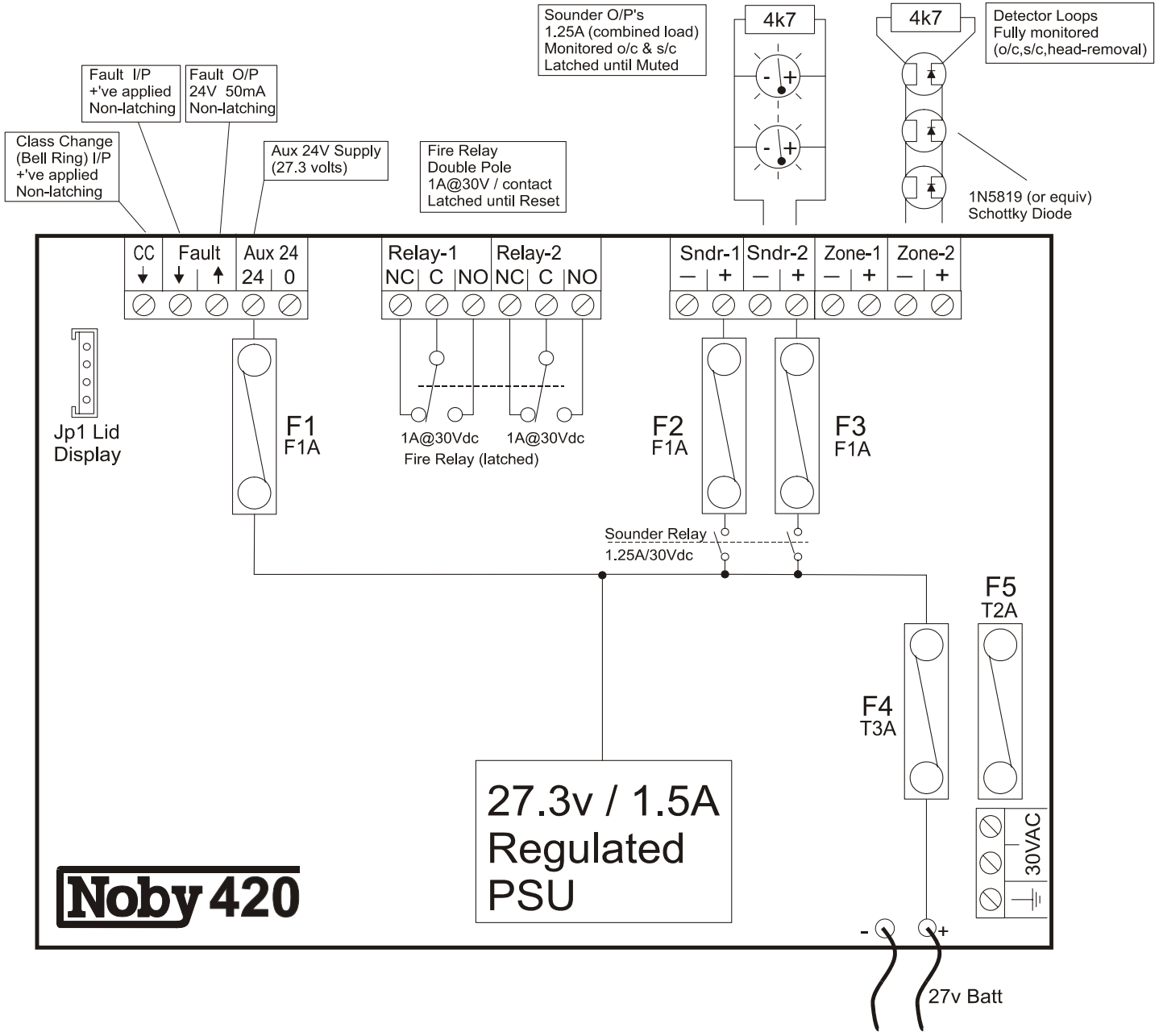
Power Supply Unit	*Value*	*Unit*	*Comments*
Mains Supply Voltage	230 +10% -6%	VAC	
Mains Supply Frequency	50 / 60	Hz	
Mains Power Rating	40	VA	
Nominal Battery Voltage	24	volts	
Regulated PSU charger voltage	27.3	volts	
Regulated PSU charger current • 20 minute rating • continuous	 1.5 1.0	 A A	
Fused Outputs: F1 Aux 24v F2 Sounder 1 Circuit F3 Sounder 2 Circuit F4 Battery +'ve F5 30VAC Transformer Secondary	 1.0 1.0 1.0 3.0 2.0	 A A A A A	 F1A 20mm Quick Blow F1A 20mm Quick Blow F1A 20mm Quick Blow T3A 20mm Slow Blow T2A 20mm Slow Blow
Standby Battery Current:	60	mA	2 zone + 2 sndr EOL resistors fitted
Low Voltage Monitor	21.0	volts	
Battery Capacity Monitor	Yes		10s load test every 12hrs

Zone Circuits	*Value*	*Unit*	*Comments*
Detection Zones	2		
No. Detectors Per Zone	20		based on 100uA per detector
End Of Line (EOL) Resistor	4700	ohms	
Open Circuit Monitoring	R > 10,000	ohms	
Short Circuit Monitoring	R < 150	ohms	
Fire Alarm Detection	150 < R< 1600	ohms	
Head Removal Monitoring	Yes		• requires schottky diode bases • sampled at 60s intervals

Sounder Circuits	*Value*	*Unit*	*Comments*
Sounder Circuits	2		
Maximum No. Sounders Per Circuit	50		based on 20mA per sounder
Maximum No. Sounders Total	62		based on 20mA per sounder
End Of Line (EOL) Resistor	4700	ohms	
Open Circuit Monitoring	> 10,000	ohms	
Short Circuit Monitoring	< 1K	ohms	
Fire Alarm DPDT Relay	1.0	A	rated at 1.0A/30Vdc per contact set

Signal Inputs	*Value*	*Unit*	*Comments*
Class Change "CC"	200	kohm	24volt +'ve going signal
Fault Input	200	kohm	24volt signal (polarity programmable)

Cabinet	*Value*	*Unit*	*Comments*
Dimensions (width x height x depth):	335 x 325 x 75	mm	1.2mm powder coated steel
Shipping Weight	4.2	kg	


Sounder O/P's
1.25A (combined load)
Monitored o/c & s/c
Latched until Muted
4k7
4k7
Detector Loops
Fully monitored
(o/c,s/c,head-removal)
Fault I/P
+'ve applied
Non-latching
Fault O/P
24V 50mA
Non-latching
Class Change
(Bell Ring) I/P
+'ve applied
Non-latching
Aux 24V Supply
(27.3 volts)
Fire Relay
Double Pole
1A@30V / contact
Latched until Reset
1N5819 (or equiv)
Schottky Diode
CC
Fault
Aux 24
24
0
Relay-1
Relay-2
NC
C
NO
Sndr-1
Sndr-2
Zone-1
Zone-2
Jp1 Lid
Display
F1
F1A
1A@30Vdc
1A@30Vdc
Fire Relay (latched)
F2
F1A
F3
F1A
Sounder Relay
1.25A/30Vdc
F5
T2A
F4
T3A
30VAC
27.3v / 1.5A
Regulated
PSU
Noby 420
-
+
27v Batt

KEYPAD FUNCTIONS

USER FUNCTIONS

	4 Digit Access Code	Function LED	Function Key
Mute Sounders	ISOLATE 3 TEST 6 ISOLATE 3 TEST 6	☼	MUTE SNDRS ↓ 1
Mute Panel	ISOLATE 3 TEST 6 ISOLATE 3 TEST 6	☼	MUTE PANEL ✓ 4
System Reset	ISOLATE 3 TEST 6 ISOLATE 3 TEST 6	☼	RESET x 5
Evacuate	ISOLATE 3 TEST 6 ISOLATE 3 TEST 6	☼	EVACUATE 2
Isolate Zone or Relay	ISOLATE 3 TEST 6 ISOLATE 3 TEST 6	☼	ISOLATE 3
One Man Test	ISOLATE 3 TEST 6 ISOLATE 3 TEST 6	☼	TEST 6

Secondary Function Keys (Programming)

Scroll Down	Select	Accept	Quit	Select	
MUTE SNDRS ↓ 1	ISOLATE 3	MUTE PANEL ✓ 4	RESET x 5		
MUTE SNDRS ↓ 1			RESET x 5	TEST 6	

ENGINEER FUNCTIONS

	6 Digit Access Code	Function LED
Sounder Fault Identification	TEST 6 EVACUATE 2 RESET x 5 ISOLATE 3 MUTE SNDRS ↓ 1 MUTE SNDRS ↓ 1	☼
Isolate Sounders	TEST 6 EVACUATE 2 RESET x 5 ISOLATE 3 ISOLATE 3 MUTE SNDRS ↓ 1	☼
15 Event Log Recall	TEST 6 EVACUATE 2 RESET x 5 ISOLATE 3 TEST 6 MUTE SNDRS ↓ 1	☼

			RESET x 5		
	ISOLATE 3	MUTE PANEL ✓ 4	RESET x 5		
MUTE SNDRS ↓ 1		MUTE PANEL ✓ 4	RESET x 5		