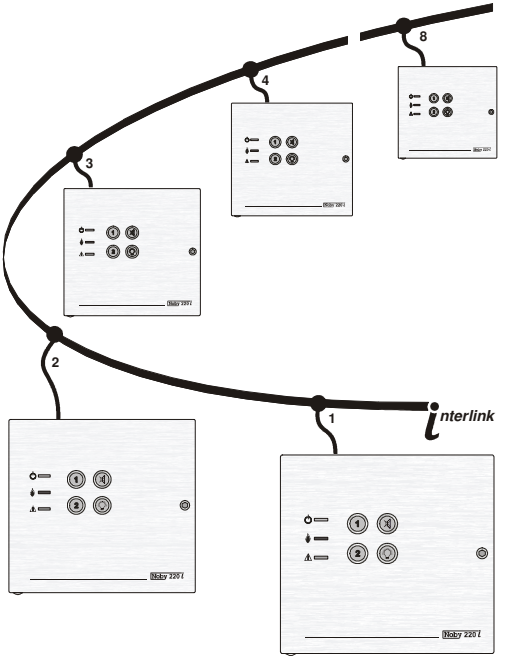
Noby 220 *i*nterlink

Fire Alarm Control Panel



Installation Manual

Please read these instructions carefully and retain them in a safe place for future reference.

Noby-220*i* Overview

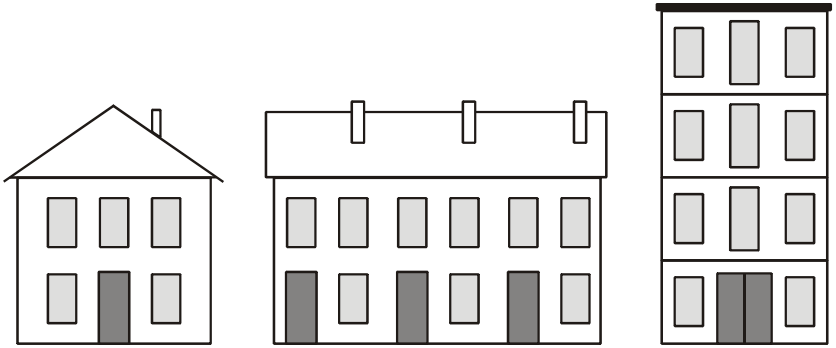
The Noby-220*i* Fire Control Panel is an enhanced version of the standalone Noby-220, fitted with an *i*nterlink data bus for connecting up to 8 control panels. Fire Alarms and Fault Warnings are signalled across the *i*nterlink bus connection to alert neighbouring properties.

Local alarms are audibly signalled with a continuous sounder tone, whilst remotely triggered alarms are differentiated with pulsing sounders. The origin of a fire alarm is identified on the latching LED display at all remotely connected panels. A 60s delay on transmitted fire alarms provides a time window in which to cancel a nuisance false alarm.

Silencing the panel-in-alarm will automatically silence all connected panels, provided that no new alarm has been triggered from another panel. Each property owner can silence their own sounders manually by pressing the [MUTE] pushbutton on *their* panel. All panels will re-sound upon receipt of a new fire alarm. Fire alarm LED indication is latched until a Panel Reset is performed at each individual property.

Fault LED indications remain latched at the local property until the panel is reset. Fault conditions originating from remote properties are displayed in real-time at the local panel, and the LED indications are automatically cleared when the remote panel is reset. Audible fault tones are only provided at the local property.

The Noby-220*i* control panel is fully monitored according to EN54-2 and EN54-4 standards, and the *i*nterlink data connection is securely monitored for physical disconnection and/or data errors.



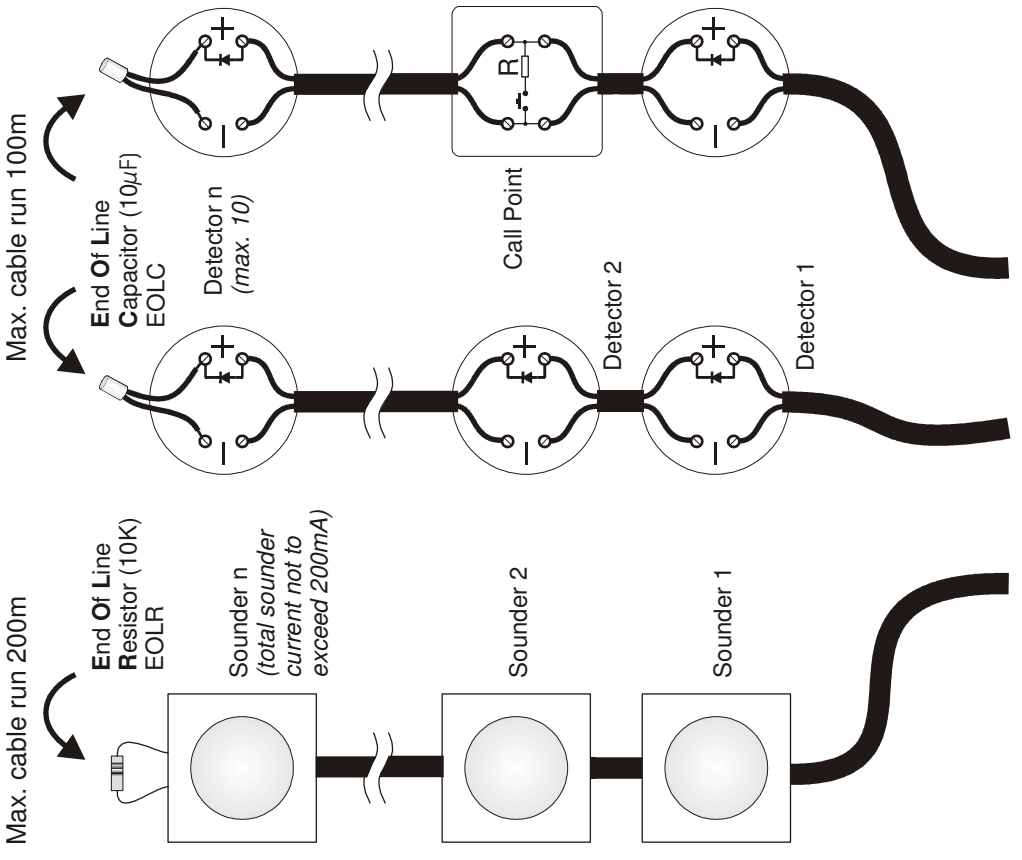


Figure 1: Detector and Sounder Circuits

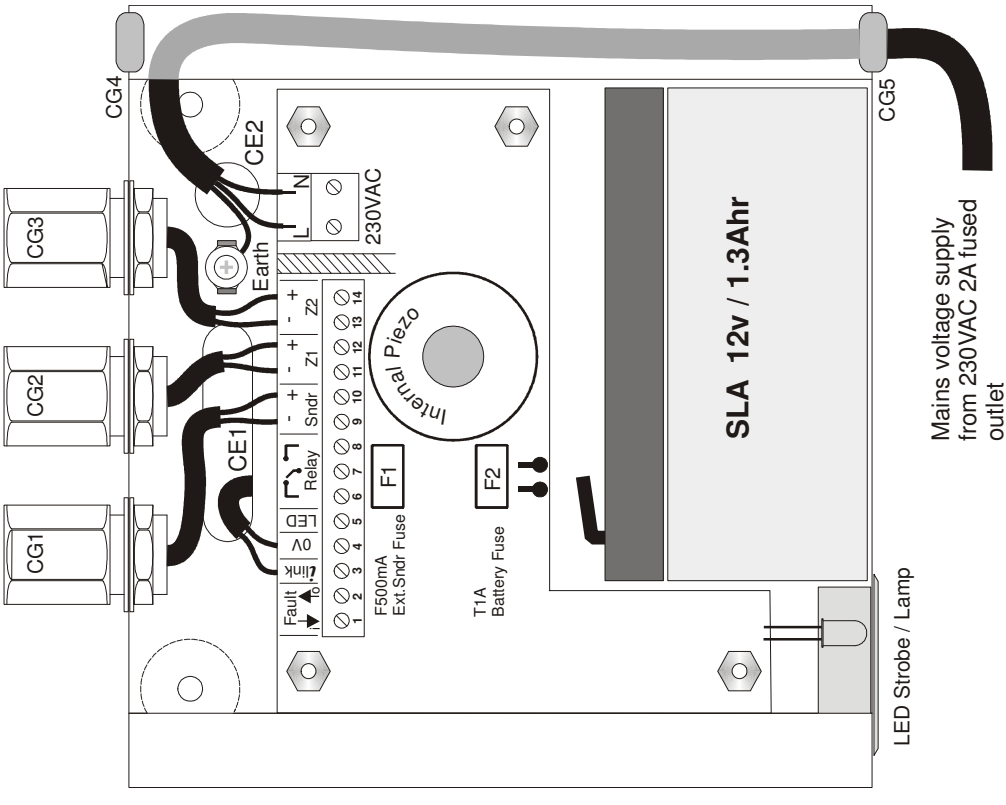


Figure 2: Internal Layout

Installation and Commissioning

Where to site the Noby-220*i*

It is intended that the Noby-220*i* be located in a public space, eg. a hallway or landing area, where the LED Strobe/Lamp is visible and the internal alarm sounder can be clearly heard. Another consideration is to position the panel to make most effective use of the LED Strobe/Lamp, which switches on automatically in the event of a power cut.

Connecting the 230VAC supply

230VAC power should be supplied via a permanently wired cable supplied from a 2A fused spur, and in accordance with local wiring regulations. Feed the cable securely either through the rear cable-entry hole CE2, or via a 20mm cable-gland CG3. Alternatively a 3-core 230VAC flexible cord, fitted with a 2A fused plug, can be fed in through CG4 (top) or CG5 (bottom) using the strain relief bush supplied (suitable for diameters 6.2mm to 7.4mm).

Strip back the outer sheath of the cable no more than 25mm and then strip back each inner core to reveal 6mm bare conductor. In this way the cable's double insulation is preserved inside the box to within 25mm of the screw terminal block.

The Noby-220*i* is Class-1 equipment and must be earthed. Connect the earth core of the incoming cable to the earth point on the box. Note that there is no requirement for (and no provision made) to earth the lid provided the 230VAC cable is terminated in the prescribed manner. Refer to a qualified electrician if there is any doubt concerning electrical safety.

First power up

It is recommended that the Noby-220*i* is first powered up with the End Of Line devices still connected to the screw terminal block at the panel, as supplied from the factory. This will help to establish that the panel is functioning OK before connecting any external devices.

- Switch off or disconnect the 230VAC supply.
- Position the battery as shown in Figure 2, with the -'ve terminal to the rear of the box.
- Connect the battery terminals, observing strict battery polarity.
- The panel springs into life with an audible warning beep.
- The absence of mains power causes the green Power LED to flash every 4 secs.
- The LED Lamp is automatically activated due to there being no 230VAC at this time.
- Now switch on the 230VAC supply to the panel.
- The green Power LED blinks (occults) every 4 secs, indicating that 230VAC has been absent (memory).
- Perform a Panel Reset *(refer to User Operation)*.
- The Noby-220*i* should now be in standby mode with a steady green Power LED and blue backlight.

Connecting the detectors *(Figure 1)*

- Up to a maximum of 10 detectors can be connected to each zone.
- There is no restriction on the number of call-points.
- Ensure that the detectors are within specification at 10.5 volts.
- Use detector bases fitted with a schottky diode.
- Connect the detectors and call-points in a straight daisy-chain manner, with no spurs or loops.
- The recommended maximum cable length on each circuit is 100m.
- Maintain strict polarity from the panel, and from one detector to the next.
- Remove & re-connect the factory fitted EOLC at the outermost detector base.

Connecting the external sounders *(Figure 1)*

- The recommended maximum external sounder circuit current is 200mA.
  e.g. up to 10 sounders can be connected with a current draw of 20mA each.
- The sounders must be polarised i.e. compatible with conventional fault monitoring.
- Ensure that the sounders are within specification at 10.5 volts.
- Connect the sounders in a straight daisy-chain manner, with no spurs or loops.
- The recommended maximum sounder cable length is 200m.
- Maintain strict polarity from the panel, and from one sounder to the next.
- Remove & re-connect the factory fitted EOLR at the outermost sounder.

One-man test

The one-man test is a test facility to aid commissioning and testing of the system, allowing the installer to walk-test the system and trigger each detection device in turn.

- Enter the Engineer Access Code-2 (sounder) (1) (2) (2) (1) (1) (sounder) (bell) followed by (bell).
- Press either (1) and/or (2) to toggle on/off the desired zone/s for testing.
- The selected zone/s are indicated by rotating LED patterns on the corresponding pushbutton/s.
- You now have 90s to trigger the first device, and 90s thereafter to trigger the next device.
- Each triggered device will pulse the sounders and flash the red zone LEDs until the test alarm condition is clear. The panel automatically resets the detectors. Note that the relay output remains unaffected by the one-man test mode.
- Press (sounder) to exit the one-man test mode.

Note: The panel automatically kicks back to normal standby User Mode after 90s of no activity, or if there is a real fire condition detected on a zone not being tested.

Input / Output Terminals

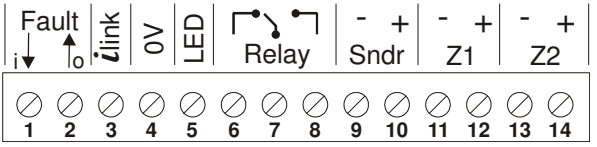


Figure 3: Input / Output Terminal Strip

External Fault Input *(Terminal 1)*

The Fault Input terminal permits a fault signal from external equipment to be indicated on the Noby-220*i* control panel. The LED indication is non-latching i.e. the LED follows the Ext. Fault Input status. The polarity of the input is programmable. The factory setting is for a +12V signal to be applied to the terminal to bring up a fault indication. Note that connecting external equipment also requires a ground reference connection i.e. 0V from the external equipment must be connected to 0V on the Noby-220*i* *(Terminal 4)*.

From normal standby User Mode enter one of the following key sequences:

Engineer Access Code-1	*Select*	*Toggle*	*Fault Input Options*
(🔇) 1 2 1 2 2 (🔇) (💡)	1	1	LEDs Off= +12V applied* LEDs On= +12V removed
(🔇) 1 2 1 2 2 (🔇) (💡)	1	2	LEDs Off= LED indication only* LEDs On= Audible Fault Tone

** Factory Default*

- The green Power LED flashes rapidly upon successfully entering the Engineer Access Code-1.
- The LEDs surrounding buttons 1 and 2 indicate the current option status.
- Toggle button 1 or button 2 to set/unset the desired option.
- Press (💡) to accept **OR** press (🔇) to quit without updating the option.

Fault Output *(Terminal 2)*

A 12V/20ma open-collector output signal. Normally high (12V), it falls to 0V upon detection of any fault originating at the **local panel only** i.e. does **not** include the Ext. Fault Input, *i*nterlink bus faults, or any fault originating at a remote panel. Note that connecting external equipment also requires a ground reference connection i.e. 0V on the Noby-220*i* *(Terminal 4)* must be connected to 0V on the external equipment.

*i*nterlink data bus *(Terminal 3)*

The interlink data bus has been laboratory tested with up to 1km of standard low-grade alarm cable (92mohm/m 160pF/m), connected in different configurations i.e. linear, star, clustered etc.. These tests were conducted in a simulated electrically noisy environment, but we appreciate that real world installations could be more harsh and varied. We therefore specify that the **maximum installed *i*nterlink cable length is 250m,** which provides a four fold safety margin. Installations exceeding 250m are not guaranteed by Noby UK should be undertaken at the installer's risk.

The overiding limiting factor is that the *total* installed cable capacitance must not exceed 100nF i.e. the pF/m multiplied by the *total* length of cable used. Also, the total circuit resistance must not exceed 100ohms (50ohms per leg). Wherever possible avoid running the cable in close proximity to transmitter devices, or in conduits containing potentially noisy electrical cables. Screened cable *may* provide some immunity in excessively noisy environments (e.g. near RF transmitters etc.) - with the screen connected to a good 'clean' earth at one point only on the system.

The data connection is low speed and there is little advantage to be gained in using more expensive high speed data cable, although national regulations *might* stipulate the use of flame retardant cable. The protocol is fail safe, meaning that in the event of a cable burn-out all remote panels will continue performing according to the last signal received.

If this is your first Noby-220*i* installation then it is strongly recommended to familiarise yourself with the system and program the addresses on the work bench, rather than on site with the panels distributed across 8 properties.

*i*nterlink Programming

As supplied from the factory the *i*nterlink is disabled and the Noby-220*i* powers up offline i.e. it operates as a single standalone fire control panel. To enable the *i*nterlink connection each Noby-220*i* panel must be programmed with a UNIQUE address according to the procedure set out below.
The addresses can be programmed with the panels online or offline, whichever is the more convenient. Online 'live' programming guarantees that all addresses are unique since the system seeks free address slots. You may start with just one panel, and then add further panels one by one, each time programming the address at the newly added panel. The system allocates the next available address number, such that the address numbers 1 to 8 are programmed according to the order in which the panels are added.
Offline (manual) programming requires a more methodical approach, with a greater risk of duplicating one or more addresses.

The possibility of duplicating addresses exists where panels are either pre-programmed off-site or swapped from another system. The symptoms of a duplicated address are not always immediately obvious, although in most circumstances a Bus Error Fault will be indicated.

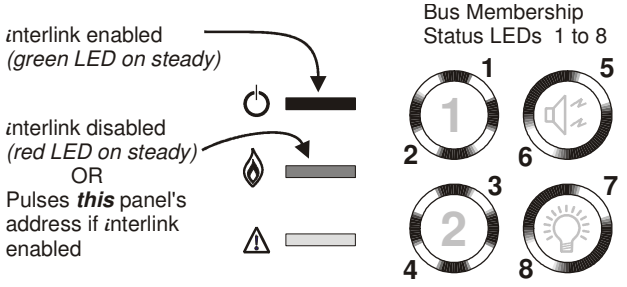


Figure 4: ınterlink Programming LED Display

LED Indications:
A steady green LED indicates that ***this*** panel is ***ı***nterlink enabled.
A steady red LED indicates that ***this*** panel is ***ı***nterlink disabled i.e. no address programmed.
The pulsing red LED indicates the programmed address number 1 to 8 of ***this*** panel.
The 8 yellow pushbutton LEDs indicate the detection of all connected panels on the ***ı***nterlink bus, with ***this*** panel's LED rapidly flashing.

Procedure:

- Enter the ***ı***nterlink Code (🔊) (2) (1) (2) (🔊) (2) (🔊) (💡) .
- Allow 5 seconds for scanning - the 8 yellow pushbutton LEDs cycle around.
- Press (1) to seek the next available address - indicated by a rapid flashing pushbutton LED.

- OR -

- Press (2) to clear the address and disable ***this*** panel's ***ı***nterlink functionality.
- Press (💡) to accept **OR** press (🔊) to quit without updating the option.
- Allow 8 seconds for the system to stabilise before proceeding with other panel operations.

Note: The panel automatically kicks back to normal standby User Mode after 60s if left unattended.

Removing a Noby-220*ı* panel from the *ı*nterlink bus
A panel may be effectively switched offline by clearing its address as described in the above procedure.

LED Strobe / Lamp Output *(Terminal 5)*

An external LED Strobe/Lamp can be connected between Terminal 3 (anode +'ve) and Terminal 4 (cathode -'ve). This 12V open-collector output mimics the internal LED Strobe/Lamp and is current limited to 20mA with an on-board 220ohm resistor.

Relay Output *(Terminal 6,7,8)* - Programmable Option

As supplied from the factory the relay operates as a Fire Alarm relay, but it can alternatively be programmed to operate as a Fault Output Relay by keying the following sequence:

Engineer Access Code-1	*Select*	*Toggle*	*Relay Option*
(Sound) 1 2 1 2 2 (Sound) (Light)	2	1	LEDs Off= Fire Alarm Relay* LEDs On= Fault Relay

** Factory Default*

- The green Power LED flashes rapidly upon successfully entering the Engineer Access Code.
- The LEDs surrounding button 1 indicate the current option status.
- Toggle button 1 to set/unset the desired option.
- Press (Light) to accept **OR** press (Sound) to quit without updating the option.

Note that when programmed as a Fault Output the relay is normally in a de-energised state in order to minimise standby current, such that total power loss will not be signalled to external equipment.

Disablement Options

The Noby-220*i* is supplied as a fully functional fire alarm control panel with comprehensive fault monitoring to meet the requirements of the EN54 standard. The following programmable disablement options are provided as a tool to assist the installer in fault finding, such as compatibility issues with 3rd party detectors and sounders. The installer should be aware that the permanent use of these disablement options may have a bearing on the overall safety and approval status of the system. Any permanent setting of these options is undertaken solely at the risk of the installer.

From normal standby User Mode enter one of the following key sequences:

Engineer Access Code-2	*Select*	*Toggle*	*Disablement Option*
🔇 1 2 2 1 1 🔇 💡	🔇	1	Disable Ext. Alarm Sounder *(internal sounder is quieter)*
🔇 1 2 2 1 1 🔇 💡	🔇	2	Disable Alarm Relay
🔇 1 2 2 1 1 🔇 💡	1	1	Disable Detector S/C Faults (s/c zones => fire condition)
🔇 1 2 2 1 1 🔇 💡	1	2	Detector Head Removal & O/C Fault Monitoring.
🔇 1 2 2 1 1 🔇 💡	2	1	Disable Battery Fault Monitoring
🔇 1 2 2 1 1 🔇 💡	2	2	Disable Sounder Circuit Fault Monitoring

- The green Power LED flashes rapidly upon successfully entering the Engineer Access Code.
- The LEDs surrounding buttons (1) and (2) indicate the current option status.
- LED on = option set; LED off = option cleared (factory default).
- Toggle button (1) or button (2) as required.
- Press 💡 to accept **OR** press 🔇 to quit without updating the option.

Panel Behaviour

Audible alarms, faults & warnings

In the event of a fire alarm the internal piezo sounder emits a loud rapid pulsing tone, and the external sounder circuit is activated, together with the fire alarm relay (if not re-programmed as a fault relay).
All circuit and system faults are accompanied by a fault tone i.e. a double beep every 4 seconds. A warning tone is signified by a double beep every 60s and is most likely to occur when there is loss of the 230VAC supply or a power-cut lasting longer than 90s.

Mute / Silence

All audible alarms, fault and warning tones are silenced by pressing the  button.

Panel Reset

A Panel Reset attempts to reset the detector circuits and clear the latched LED indications. All the panel LEDs are lit during the 3 second reset period. Note that a standing fire alarm or fault condition will immediately re-trigger the sounders following a Panel Reset.

LED Lamp & power-cuts

Under normal circumstances the LED Lamp can be switched on for a self-timed period of 10 minutes, or switched on permanently by means of the [Lamp] button. In the event of a 230VAC power-cut the LED Lamp is automatically activated and self-timed for 60 minutes. The Lamp can be manually re-triggered for a further 60 minute period by pressing the [Lamp] pushbutton. Note that in the interest of conserving battery power it is not possible to switch the LED Lamp on permanently during a power-cut. Also, the blue backlight is automatically disabled to conserve battery power.

Troubleshooting

The green Power LED is not steady
Check that the mains supply is connected and switched on.

The Common Fault LED will not clear
Refer to the LED Indications to determine the cause of the fault.
The Common Fault LED indications are listed in order of priority.

Ooops, I accidentally connected the battery the wrong way round
We've all done it at some time or other! Replace fuse F2 (T1.0A) and try again.

A smoke detector generates a fault instead of a fire
Some (older) detectors and call-points are not compatible with modern panels equipped with short circuit fault monitoring. One remedy is to connect a resistor in series with each affected detector head - any value in the region of 400 to 1000 ohms is suitable. Some detector bases allow spare terminals for this purpose. Care must be exercised not to inadvertently insert this resistor in series with the main cable run, as this will lead to other erratic behaviour.
Another work-around is to set the programmable option Disable Detector S/C Fault Monitoring - see Programmable Options. In this case all detector short circuits are interpreted by the panel as a fire condition.

There's a persistent zone fault that can't be cleared
Check all the detector heads are both present and securely located to their bases.
Check base connections, paying particular attention to correct polarity.
Check that the EOLC is fitted across the final detector.
Check that the detector bases are of the schottky diode type.
Programme the option to Disable Detector Head Removal Monitoring - if this clears the fault then the problem is likely to be related to one or more bad detector base/head connections. Note: setting this option also disables o/c monitoring and is therefore not recommended as a permanent fix - the purpose of the option is to help eliminate one possible cause of a fault.
Failing the above suggestions, it's down to the systematic process of elimination ie. relocate the EOLC to the first device and disconnect the remaining detectors, then move onto the second device etc.. Repeat until the fault shows up.

There's a persistent sounder fault that can't be cleared
Check that the sounders are the polarised type and compatible with conventional fire panel fault monitoring.
Check the cable connections at each sounder for correct polarity, and that the EOLR is connected across the final sounder.

Warnings & Cautions

	Clean external surfaces with a damp cloth and mild detergent. Do not use abrasives, solvents or polish.
	Noby UK have taken every reasonable effort to ensure that the stainless steel facia is delivered in pristine condition. Please inspect the facia prior to installing the product as Noby UK cannot accept responsibility for any flaws or scratches incurred during installation.
	This equipment is to be installed, serviced and maintained by a suitably qualified technical person with the requisite knowledge of electrical and fire safety installations.
	Take care not to accidentally reverse the SLA battery connections during installation. Fuse F2 will blow, but there is a remote possibility of further damage to the electronic circuitry. Such damage is identifiable to Noby UK and is not covered by the warranty.
	The Noby-220*i* is intended to be permanently connected to the 230VAC house wiring via a 2A fused spur and in accordance with local wiring regulations.
	Part of the internal circuitry operates at 230VAC and presents an electrical shock hazard. Do not attempt to open, dismantle, repair or tamper with this equipment without first disconnecting the mains supply voltage.
	This is Class-1 electrical equipment and must be earthed.
	The Noby-220*i* incorporates fault monitoring of all circuits as required by the EN54 standard. It is important that fault indications are investigated at the earliest by a qualified engineer.

Specification

PSU & Battery	Value	Unit	Comment
Supply Voltage	230	VAC	+10% -6% 50Hz/60Hz
Power Rating	3	VA	
Nominal Battery Voltage	12	V	Sealed Lead Acid 12V / 1.3Ah
Regulated PSU Charger	13.68	V	
Fuses: F1 Ext.Sndr	500	mA	F500mA Quick Blow
F2 Battery +'ve	1.0	A	T1A Slow Blow
Standby Battery Current	7.5	mA	
Standby Battery Time	120	hrs	typical, with healthy battery
Low Voltage Monitor	10.5	V	
Battery Monitor Testing	Yes		disconnection & capacity
230V Loss Monitor			off delay=90s; on delay=10s

Detection Circuits	Value	Unit	Comment
No. of circuits (zones)	2		
No. of detectors / circuit	10		limit = 1mA / circuit
End Of Line Capacitor EOLC	10	uF	non-polarised
Head Removal Monitoring	Yes		requires schottky diode bases
O/C Fault Monitoring	Yes		
S/C Fault Detection	<120	ohms	
Fire Alarm Detection	120-1500	ohms	

Sounder Circuit	Value	Unit	Comment
Internal Piezo Alarm	>85	dB	measured at 3.3m, open field
Fault & Warning Tones	>65	dB	
No. External Sounders	10		based on 20mA / sounder
Max. Ext. Sounder current	200	mA	
End Of Line Resistor (EOLR)	10	Kohms	
Open Circuit Detection	>20	Kohms	
Short Circuit Detection	<5	Kohms	
Fire Alarm Relay	1.0	A	SPDT 1A/30V voltage free

*i*nterlink Data Bus	Value	Unit	Comment
Bus Capacity	8	Panels	
Cable Length (max.)	250	m	standard 2 core alarm cable
Cable Capacitance (max.)	100	nF	cable length (m) X capacitance/m
Cable Resistance (max.)	100	ohms	50ohms each leg

Specification *(continued)*

Fault Output	Value	Unit	Comment
Output Voltage Swing	12	V	o/c pnp transistor - normally high
Series Output Resistance	220	ohms	

Fault Input	Value	Unit	Comment
Input Voltage Range (max.)	0-30	V	
Input Resistance	100	Kohms	
Voltage Threshold	7	V	typical

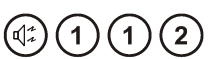
LED Strobe/Lamp Output	Value	Unit	Comment
Output Voltage Swing	12	V	open-collector pnp transistor
Series Output Resistance	220	ohms	

Mechanical	Value	Unit	Comment
Dimensions W x H x D	158x150x50	mm	
Weight	1150	g	

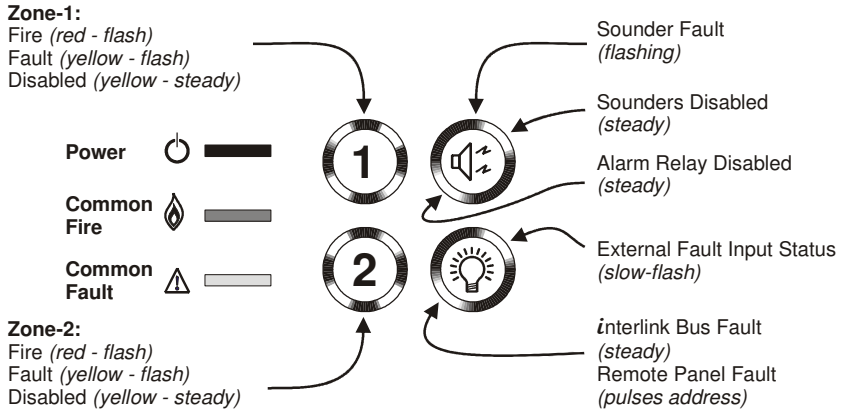
Noby-220*i* User Operation

- The most commonly used functions are accessed by a simple one-touch key operation, whilst other more safety critical functions are accessed via a slightly longer key sequence.
- The acceptance of each command is confirmed with an audible double click.
- When entering the User Access Code, the green Power LED will flash rapidly for 5 seconds signifying that the panel is ready to accept the Command Key.

One-Touch Key	*Momentary Press*	*Press & Hold for 5 secs*
	**Mute Sounders**	Evacuate / Sounder Test *activates sounders & relay*
	LED Lamp: On / Off *timed 10mins if 230V OK* *timed 60mins if no 230V*	LED Lamp permanently on *i.e. not self-timed*
	no action	Disable Zone-1 *self-timed 60mins* *disabled when Z1 yellow LEDs = on*
	no action	Disable Zone-2 *self-timed 60mins* *disabled when Z2 yellow LEDs = on*

User Access Code	*Command Key*	*Action*
		**Panel Reset**
		Evacuate / Sounder Test *activates sounders & relay*
		Permanently Disable or Re-enable Zone-1 (Toggle on/off) *disabled when Z1 yellow LED = on*
		Permanently Disable or Re-enable Zone-2 (Toggle on/off) *disabled when Z2 yellow LED = on*

Noby-220*i* User Mode LED Display Indications



Note: Most LED indications remain latched until the Noby-220i is Panel Reset.

System LEDs	*Status*	*Interpretation*
Power *(green)*	steady on 1 flash / 4s 1 blink / 4s rapid flashing	230V OK 230VAC Absent 230VAC Restored (memory) Code entered - awaiting a command key
Common Fire *(red)*	steady on pulsing	local fire on Zone-1 or Zone-2 fire alarm signalled from a remote panel *the pulse count indicates the address no.*
Common Fault *(yellow)*	steady on 1 flash / 4s 2 flash / 4s 3 flash / 4s 4 flash / 4s slow flash 2Hz	All local panel zone and sounder circuit faults, External Fault Input, remote panel and *i*nterlink bus faults. PSU Low Volts (real time status) PSU Low Volts (latched memory) PSU Battery Capacity Test failed PSU Battery O/C or Fuse F2 CPU Watchdog Fault

*i*nterlink No.	House No.	Contact Name	Telephone No.
1			
2			
3			
4			
5			
6			
7			
8			

Installation Company	Contact Name	Telephone No.