Surveyor 2000

Fire Alarm Control Equipment

Installation, Commissioning and Operating Manual

IMPORTANT

See specification change on inside of front cover

MASTER MANUAL

M2000-01 Issue 2.0 July 1999

SURVEYOR 2000

IMPORTANT NOTICE :- SPECIFICATION CHANGE

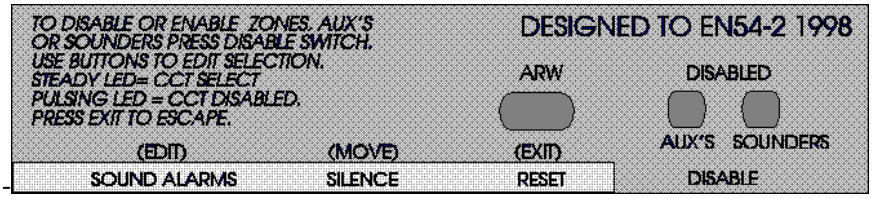
CHANGES

As from JUNE 1999 the 2000 series control panel has been enhanced to provide easier disablement of detection zones and sounder circuits . These changes have been made in conjunction with the new BSEN54-2 standard for fire detection control equipment.

RECOGNITION

A modified control panel can be identified by the new style of facia label which includes a new section

THUS:-



The display circuit board has a small modification to split the operation of the disabled LED's.

SOFTWARE

The software for the new enhancements will be V8.0 for master PCB's . V6.0 for slave PCB's and V4.0 for repeaters all other PCB's in the 2000 range remain unchanged.
This software is not compatible with previous versions and must not be mixed. If you require advice regarding compatibility with older equipment please contact our technical dept. with details of current software version.

UPGRADING

It is possible to upgrade an existing 2000 series panel to the new style by use of an upgrade kit consisting of software, display PCB. and add on overlay label.

OPERATION

TO DISABLE OR ENABLE ZONES,AUX. OR SOUNDER CIRCUITS

- Press **DISABLE** button- the fault led on zone 1 will illuminate.
- Pressing the **SOUND ALARMS (EDIT)** button will toggle between ''disabled'' and ''enabled'' status for that zone. A pulsing led indicates that the circuit is disabled, a steady led that the circuit is enabled (normal).
- Pressing **SILENCE (MOVE)** will move the indication through all the zones in turn and finally the aux., and sounder's indicators which can be edited in the same way.
- **On panels greater than 12 zones, pressing the DISABLE button will shift the indication via each group of 12 zones**.
- When you have selected the required ''disablement's'', **Press RESET (EXIT)** to return to normal operation. Disabled circuits are indicated by pulsing led and buzzer tone (mutable). If (EXIT) is not selected, the function will drop out after a short time delay.

ENABLING of circuits is the same procedure as above, but by selecting a steady led when in edit mode.

CAUTION: A '' Disablement'' is only software controlled and so circuits may still have voltage applied. Please disconnect wiring when working on these circuits.

If a '' disabled'' zone is alarmed, then the zonal fire red led will be illuminated only. This warns that a fire condition could still exist on the zone and therefore should be checked by '' resetting'' before ''enabling'' the circuit back to normal.

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Surveyor 2000 Series Fire Alarm Control System

Introduction

The Surveyor 2000 Series is a micro-processor controlled, conventional fire alarm control system comprising modular components providing flexibility of size and operational functions.

Control panels are available from 2 to 84 zones in a range of wall-mounting enclosures, and there are complementary repeat indicators and sounder extenders which can be configured to suit site conditions and design requirements.

The panels comply with the requirements of BS 5839: Part 4: 1988, but include integral facilities to enable the connection of older systems which may not fully comply with current standards. Flexibility is achieved by the programming options which enable an engineer to determine the operation of sounders and auxiliary functions without additional equipment or wiring. Programming can be carried out off site via the PC configuration software.

Control panels and repeaters are identical in appearance and have a removable zone chart for site specific information. Repeaters and sounder extenders communicate with the control panel via a two-wire circuit and can be located up to 1000m from the main control.

Accessories include a liquid crystal display (LCD) which can be mounted on the panel or remotely, and a hand-held device for engineering functions.

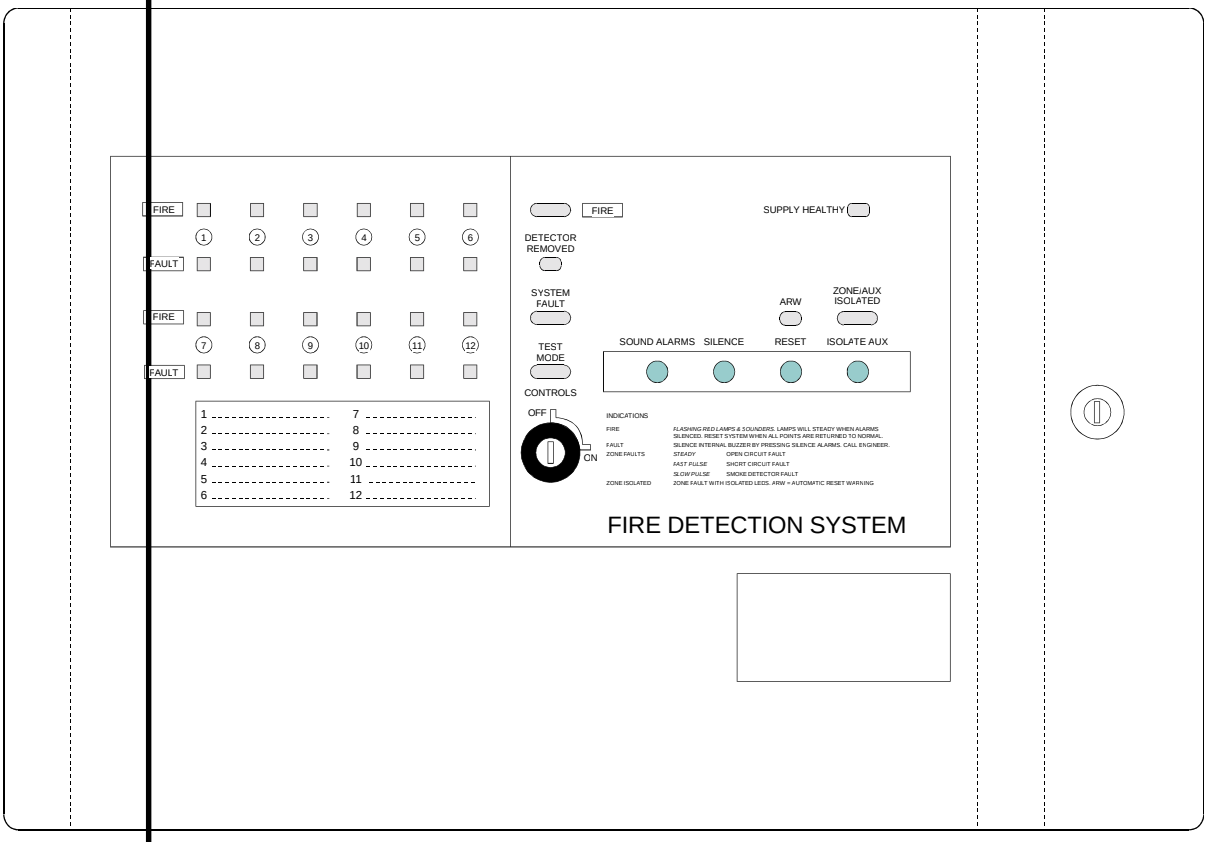


Figure 1 - 12 Zone Control Panel Fascia

About this Manual

This manual (ref. 2000-01) is a comprehensive guide to the 2000 Series control equipment and optional items in the range. It provides information to enable a contractor to install, commission, and, if necessary, configure the system.

Installation of the equipment is straightforward and the instructions generally apply to control panels, repeaters and bell/auxiliary panels, except where stated. For convenience, schematics and PCB drawings are included in Appendix A and should be referred to for additional information. If the installer is unfamiliar with the 2000 Series it is recommended that the manual is read from the beginning so that the commissioning and configuration process is understood, especially where several panels are involved. A panel can be a control panel, a repeater, or a bell/auxiliary module.

There are instances in the manual where it is not possible to provide a full explanation or cover all available options. In these cases the supplier should be consulted for advice.

System Overview

The system is based on the use of 12-zone printed circuit boards (PCBs) which are linked together to provide the required number of zones in 12 zone increments. For less than 12 zones, the same PCB is used but is not fully equipped. This method ensures that the minimum number of different components is employed, simplifying assembly and spares requirements. It also provides a uniform platform for the system operation.

The main control panel comprises a 'master' 12-zone PCB (PC2000/B). For each additional 12 zones a 'slave' PCB is added up to a maximum of six, i.e. 84 zones in total. Each 12-zone PCB has two sounder circuits and two auxiliary outputs.

An optional 4-way sounder circuit PCB (PC1005) can be added to each 12-zone module increasing the number of sounder circuits to six for each 12 zones. Various configuration options are available for determining the operation.

Also, an optional input/output PCB (PC1007) is available which further enhances the flexibility and provides conventional repeat indication if only a simple lamp and buzzer arrangement is required.

Control panels and repeaters in the series have identical controls and common indicators and are housed in attractive wall-mounted cabinets. The size of the panel is determined by the number of zones and there are five standard cabinet sizes available. The modular construction of the system allows for non-standard accommodation of the control circuitry if necessary. Panels above 12 zones are fitted with a hinged, glazed, lockable door protecting the controls. Panels of less than 12 zones can be provided with this facility as an option. A range of bezels is available for flush-mounting applications.

Further sounder and/or auxiliary outputs are provided by the Bell/Auxiliary Module (BAM). This is a 12-way PCB (PC1002) which can be mounted in or adjacent to the main panel (subject to space), or located elsewhere on site and networked to the main panel via the RS 485 communications bus. The BAM can also be

configured to provide a number of output options and operating functions, e.g. zonal alarm, two-stage alarm, etc.

Repeat indication and control is provided by a range of repeater panels. Repeater panels are identical in appearance to the corresponding control panel and are fully functional, i.e. the system can be silenced, reset or evacuated from the repeater position. Repeaters comprise a main PCB (PC2000/B) and the requisite number of 12-zone display boards, but are not equipped with zone inputs, i.e. all detection zones are connected to the main panel only. However, repeaters are fitted with two sounder circuits and two auxiliary outputs, increasing the system capability and flexibility. Repeaters are connected to the main control panel via a two-wire RS 485 communications bus, and up to seven can be installed on a system (see drg. no. 2000/01).

Control panels up to 12 zones have an integral 3 amp powersupply/battery charger. Panels with more than 12 zones require a remote power supply/battery charger, selected from the standard range to suit the panel capacity and alarm load. For panels above 36 zones the supplier should be consulted for advice on selecting the correct unit. Repeater panels up to 36 zones have an integral 2 amp power supply/battery charger, and larger repeaters require a remote unit. Bell/Auxiliary Modules require a 24V DC supply which can be derived from the main panel supply or, preferably, from a local power supply/battery charger unit.

System Features

The Surveyor 2000 Series conventional fire alarm system controllers are micro-processor based and comply with BS 5839: Part 4: 1988. The panels incorporate a comprehensive range of features which allow the system to be configured for the required operation, including the facilitity to accept existing wiring circuits and system components.

The panels are supplied with standard (default) operating and engineering functions which are suitable for many applications. For those applications where existing equipment or operational requirements necessitate non-standard operation, a range of configuration options is included and can be implemented via the panel controls, or a PC software program which is downloaded to the panel.

Standard features include:

- Detector removal monitoring
- Compatibility with most makes of detector
- Common Fire and Fault outputs
- Auxiliary outputs
- Engineer's zone test
- Sounder walk test
- Detector removal walk test
- Two sounder outputs per 12 zones
- Precinct/class change input
- Low battery protection.

Programmable options and functions include:

- Latching fault
- Non-latching fire zones
- Short circuit = Fire (old systems)
- Detector removal disabled
- Selective sounder operation
- Sounder pulsing options
- Auxiliary output programming
- Zone isolate
- Service alarm

Additional features are accessible vai the PC software program and/or the hand-held Data Logger as follows:

- Setting the real time clock
- Displaying/printing the event log
- Setting the service alarm.

The above features are described in detail the appropriate sections of the manual.

Controls and Indicators

General

The common control switches and indicators on control panels and repeaters are identical (see figure 1). The number of zone indicators obviously varies depending on the capacity of the panel, but the overall appearance is the same.

All indicators are light emitting diodes (LEDs), either single or twin, and should not normally require replacing during the life of the panel. Fire LEDs are red, fault/ auxiliary LEDs are yellow, and the 'Supply Healthy' LED is green. LEDs are illuminated steady or pulsed depending on the condition (see below).

On panels with a protective glazed door (standard above 12 zones), the door is opened to gain access to the controls. A common key is provided for the door lock and the 'Controls' keyswitch.

Control Enable

Before any controls are operable, the CONTROLS keyswitch must be in the ON position, where the key is retained. The switch should be turned to the OFF position and the key removed when procedures are complete. It is not possible to shut the protective door with the controls key in place.

Zone Indicators

For each zone there is a FIRE (red) LED and a FAULT (yellow) LED.

The FIRE LED flashes on the activation of the zone and goes steady when the alarms are silenced. It is extinguished when the system is reset.

The FAULT LED is either pulsed or steady as follows:

Open circuit fault on the zone	Steady
Short circuit fault on the zone	Fast pulse
Smoke detector removed from the zone	Slow pulse

The FAULT LED is also illuminated in other conditions, e.g. zone isolated, to indicate the affected zone. It is extinguished when the fault is cleared (default), or the panel is returned to normal.

Common FIRE

The common FIRE LEDs flash in conjunction with the relevant zone FIRE LED in a fire condition, and go steady when the alarms are silenced. They are also activated when SOUND ALARMS is operated. They are extinguished when the system is reset.

Supply Healthy

The SUPPLY HEALTHY LED is normally illuminated to indicate that the panel supply is present and the panel is operating correctly.

Detector Removed

The DETECTOR REMOVED LED is illuminated in conjunction with the relevant zone LED to indicate that a detector on the zone has been removed. It is also lit in test mode to confirm detector removal. It is extinguished when the detector is replaced, or the panel is returned to normal.

System Fault

The SYSTEM FAULT LEDs are illuminated whenever a fault on the system is detected. If the fault is on a particular zone, the relevant zone LED is also lit. Internal LEDs are provided to identify other system faults. They are extinguished when the fault is cleared (default).

Test Mode

The TEST MODE LEDs are illuminated to indicate that the engineer's test mode has been selected. They are extinguished when the panel is returned to normal.

ARW

The ARW (automatic reset warning) LED is illuminated when the panel detects a configuration watchdog error and resets the processor. It is also lit when power is applied to the panel. The system must be reset to extinguish the LED.

Zone/Aux Isolated

The ZONE/AUX ISOLATED LEDs are illuminated when the auxiliary fire output is isolated via the ISOLATE AUX push button, or to indicate an isolated zone in conjunction with the relevant zone FAULT LED. They are extinguished when the auxiliary output is restored by operating the ISOLATE AUX push button again, or when the zone is returned to normal operation.

Sound Alarms

Pressing the SOUND ALARMS push button causes all sounder circuits on the system to energise. It can be used to re-energise sounders after they have been silenced in a fire condition, or to energise the sounders when no alarm condition exists (evacuate). Sounders are de-energised by operating the SILENCE push button, followed by RESET.

Silence

The SILENCE push button is operated to silence the sounders in a fire condition, or after the SOUND ALARMS has been operated. It is also used to mute the internal sounder in fault conditions and test modes.

Reset

The RESET push button is operated to restore the panel to normal after the sounders have been silenced.

The RESET control also performs a 'lamp test' when operated and illuminates all the panel LEDs (except ZONE/AUX ISOLATED and ARW).

***Note**. It is not possible to reset the system until SILENCE has been operated, or if the cause of an alarm has not been cleared.*

Isolate Aux

Pressing the ISOLATE AUX push button inhibits the operation of the auxiliary outputs in a fire condition and may be used for system testing, etc. The ZONE/AUX ISOLATED LEDs are illuminated to indicate the condition. A further operation of the push button is required to return the system to normal.

Internal Buzzer

The internal buzzer has the following active conditions:

Two-tone	Fire Alarm
Steady	When sounders have been silenced following a fire condition. Cannot be muted.
Fast pulse	Fault/abnormal condition.
Intermittent	Pulses every 30 seconds when SILENCE has been pressed in a fault/abnormal condition.
Warble	Loss of communications, e.g. repeater or BAM.
Slow pulse	Program mode (cannot be muted).

Installation

General

Installation of the Surveyor 2000 Series control equipment is straightforward and should cause no difficulties providing the basic precautions are observed and the recommended commissioning steps are followed.

These installation instructions refer generally to control panels, repeaters and bell/ auxiliary modules. Specific reference is made to a particular panel where appropriate.

The installation process consists of mounting the control equipment, cabling and connecting the field devices, and identifying the wiring in the control panels in readiness for commissioning.

Field devices are supplied with installation instructions and these should be followed. Specific details regarding the fitting of diodes in the base for detector removal monitoring are included in Appendix A. Any doubts regarding the compatibility of any field device should be referred to the control equipment supplier.

Select a location for the panel that is clean and dry, and not subject to any extremes of temperature, vibration, etc. Ensure that the panel will be clearly visible and easily accessible, and that account is taken of any subsequent builders or fitting out works that may affect the chosen position.

The installation should be carried out in accordance with BS 5839 Part 1 and any other relevant standard or specification. It is assumed that the installation is undertaken by comptent fire alarm engineers with experience of such systems and the relevant regulations.

On receipt of the equipment, carefully unpack the items and identify the various panels (if applicable). Check that the consignment agrees with the order and that all materials have been delivered. Remove loose items from panels and store securely until required. Ensure that main panels and repeaters are correctly identified, as their external appearance is identical.

Precautions

Warning*. The electronic components of the panel use CMOS devices which can be damaged by static charge. Suitable precautions must be taken when handling circuit boards or working on the panel. Equipment returned to the supplier must be suitably protected in anti-static packing material.*

Ensure that all high voltage testing of cables is completed before any field device or panel connections are made. Once connections are made, testing for continuity, earth faults, etc. should only be carried out using a multimeter.

Take care whilst installing the panel and cables to ensure that no swarf or other debris is allowed to come into contact with the printed circuit boards (PCBs).

Mounting the Cabinet

The panel should be mounted on a flat, vertical wall at a height where the indicators can be seen without difficulty.

Unlock the outer glazed door, where fitted, open the door and remove it by lifting it off the hinge pins. Before removing the panel fascia, open the door and disconnect the ribbon cable from the display board, and the earth lead by unplugging the midway connector. Remove the door by lifting it from the hinge mounting. Protect and store until required. Protect the main PCB in the cabinet from brick dust and swarf.

Check the position of the required terminals and select appropriate knockouts for the cable entry. Carefully remove the knockouts before mounting the cabinet. Do not drill into the cabinet and do not bring cables into the rear of the cabinet.

Offer the panel up to the wall at the chosen location and mark the position of the keyhole fixings. Drill and plug the wall and part insert screws on which to hang the panel. Hang the panel on the screws via the keyhole fixings, check that the panel is level, and mark the position of the other fixing holes. Remove the panel.

Drill and plug the wall, re-hang the panel and secure using all four fixings.

Cabling

It is recommended that a minimum of 1.5mm^2 MICC or similar approved cable is used for all circuits. Where heavy sounder loads and/or excessive cable runs are experienced, suitably sized cables should be used to avoid volt drop.

When connecting repeaters and/or bell modules via the RS 485 communications bus, a 2 core, screened cable, e.g. MICC, should be used. Ensure a dedicated cable is installed and that segregation with other services is maintained.

If batteries are to be mounted in the cabinet, ensure that the base of the cabinet is kept free for this purpose.

Install the cables into the cabinet using the appropriate metal glands. Ensure that a good earth connection is made and that any earth/drain wires brought into the cabinet are kept as short as possible. Tails should be long enough to reach the relevant terminals and great care should be taken to avoid damaging the PCB.

Test the cable in accordance with BS 5839 or other applicable standard before making any connections to the panel or field devices.

Zone Circuit Wiring

Up to 30 detectors may be connected to each zone of the control panel, depending on the manufacturer, although in practice 20 is more likely when compliance with BS 5839 is required. Refer to Equipment Suitability in Appendix B.

The default panel setup is detector removal monitoring enabled, therefore each detector base must incorporate a diode as indicated in drawing no. 2000/08.

***Note**. For retrofit systems where diode bases are not fitted, the panel parameters must be changed via the configuration options - see Programming.*

Detectors must be wired in parallel with no spurs or tees, and the circuit terminated with a 4K7 end-of-line (EOL) resistor.

***Note**. The default operation is that open and short circuit conditions are indicated as faults. If an existing circuit includes devices not compatible with short circuit monitoring, e.g. call points without a 470R series resistor, then the system parameters must be changed via the programming options.*

Sounder Circuit Wiring

Control panels have two sounder circuits for each 12 zones, e.g. a 36 zone panel has 6 sounder circuits. Repeaters have two sounder circuits, irrespective of the number of zones. BAMs have up to 12 circuits on a single PCB, and 12 circuits on all subsequent PCBs.

Ensure that the supplied panel/s is equipped with the required number of sounder circuits. Additional circuits can be provided via an add-on PCB (see PC1005).

Sounders are connected in parallel with no spurs or tees, and the circuit is terminated with a 4K7 EOL resistor. Sounders must be polarised and suppressed.

The rating of each circuit is 2.5A, but the combined total of each pair of sounder circuits must not exceed 2.5A, i.e. the maximum load on a 12 zone panel is 2.5A, and 5A on a 24 zone panel, etc., subject to the appropriate power supply being used.

The panel can accept three-wire circuits, however, the EOL resistor is retained in the panel terminals (see Commissioning).

Communication Circuit

The communications circuit feeding repeaters and bell/aux modules can be spurred or teed if required, but the polarity must be maintained (see drg. no. 2000/01). The maximum distance between the control panel and repeaters is 1000m.

Auxiliary Circuits

The following inputs/outputs are provided for auxilary functions. Information on typical applications and connection details can be found in the Commissioning section.

Control panels and repeaters

ZP+	Control panel only. This terminal can be used as the common terminal of a three-wire system.
28V-/28V+	Auxiliary supply can be used for light current applications, e.g. operating relays. Maximum output 500mA.

CFT	Common fault anywhere on the system; switched -ve output; can be used for light current signalling. Maximum load 100mA.
CF	Common fire anywhere on the system; switched -ve output; can be used for light current signalling. Maximum load 100mA.
Output 1 and 2	Programmable outputs - maximum load 100mA (see Programming).
12V +	Auxiliary supply can be used for light current applications, e.g. operating relays or remote signalling devices. Maximum output 200mA.
P-	Precinct - applying 0V to this input causes all sounder circuits on the whole system to energise, without generating a fire alarm. Typical uses are linking with other systems, and for class change signalling in schools.
Aux 1 and 2	Auxiliary relays with volt-free changeover contacts operating in a fire condition (subject to configuration). Can be used for control and signalling functions. Maximum load 800mA @ 50V DC.

Bell/auxiliary module

Each output on a BAM can be configured as an auxiliary output, as opposed to a sounder circuit - see Programming.

Three-wire Circuits

Existing three-wire circuits may be connected to the panel. It should be noted that the sounders are not monitored, and that the panel parameters need to be changed - see Programming.

Power Supply

The 240V AC mains supply to the control panels and chargers (where fitted) should be in accordance with BS 5839 with regard to cable type, source of supply, and labelling.

Where a remote power supply/battery charger is installed, four cores are required between the panel and the PSU. Two cores are required for the nominal 24V DC supply and should be sized to take account of the total alarm load and the distance between the units (to avoid volt drop).

Two signal cables are required for the fault monitoring.

To comply with BS 5839, the cable between remote power supply/charger units and the panel should be fire resistant.

***Note**. Panels above 24 zones are fitted with an integral remote PSU monitoring circuit which is activated at commissioning.*

Commissioning

General

The commissioning procedure should be completed one step at a time as described below to avoid unnecessary problems. By following a logical sequence any faults that may occur can be quickly identified and rectified before moving on to the next step.

Before connecting external circuits to the control panel it is recommended that the panel is powered up and tested, and any faults cleared before proceeding.

Ensure that 4K7 resistors are fitted into zone and sounder circuit terminals (see drg.no. 2000/01) before applying power.

To clear the battery fault indication when the mains is connected, a battery must be connected to the battery terminals; it is not possible to inhibit the battery fault by the insertion of a resistor.

The system may be operated on the battery supply, i.e. if the mains supply is not available, by operating the Battery Start switch (see Running on Batteries).

If there are repeaters and/or bell/aux modules on the system it will be necessary to set the correct address on each device; however, it is recommended that the control panel is powered and tested, and the operating parameters changed if necessary, before connecting the communications cable. (See Programming).

Powering the Panel (integral charger)

Remove the fuse from the mains input. Connect the supply wiring to the terminal block as shown in figure 2. Check that all connections are sound, e.g. ribbon cable to display board, and that 4K7 EOL resistors are fitted to zone and sounder circuits.

Switch on the mains supply and refit the fuse. The panel LEDs are illuminated momentarily, the ARW LED remains lit and a battery fault is indicated. The internal buzzer sounds.

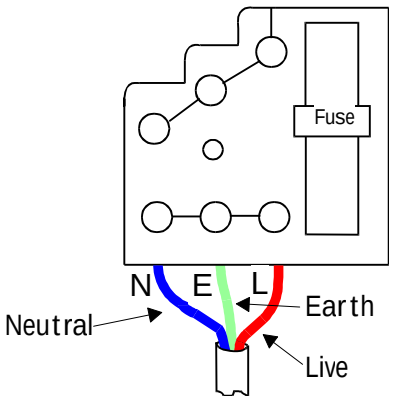


Figure 2 - Mains connection detail

Connecting the Battery

The standby battery comprises two 12V cells of a capacity suitable for the required standby period and total alarm load.

Batteries may be located in the panel or remote power supply/battery charger unit, or in a separate cabinet depending on the battery size.

Battery leads are provided, including a battery link, and should be connected as shown in drg. no. 2000/01.

The SUPPLY HEALTHY LED should now be illuminated. The ARW LED should be illuminated and the internal buzzer pulsing.

Turn the CONTROLS keyswitch to ON, and press and release RESET.

All the LEDs are lit momentarily, the ARW LED should extinguish and the buzzer should be silent. The panel is now operating correctly in the quiescent mode.

Any faults that are indicated at this stage should be investigated and cleared before proceeding. If necessary refer to the fault location chart on page 44 for further information.

If unfamiliar with the Surveyor 2000 Series equipment, it is a good idea to explore the panel operation and become conversant with the controls before proceeding. Faults can be simulated by open and short circuiting zone and sounder circuits, fire alarms can be generated by shorting the zone terminals with a 470R resistor. Refer to the Operation section if required. Examine the main PCB and by referring to drg. no. 2000/02 locate the various internal controls and indicators used for system configuration and fault identification.

Zone Circuits

The default mode of operation assumes that the zone circuit is configured for open and short circuit fault monitoring, and detector removal monitoring, i.e. detector bases are fitted with a diode as shown in drg. no. 2000/08.

If these conditions do not apply, e.g. when connecting a circuit from an existing system, the operating parameters for each affected zone must be changed. Refer to the Programming section for details.

It is recommended that each zone is connected in turn and its operation proved before moving on the the next zone.

Check that all detectors are fitted into their bases and that a 4K7 has been fitted to the last device. Remove the 4K7 resistor from the selected zone terminals and connect the zone pair, observing polarity.

If a zone fault is indicated, investigate and clear before proceeding to the next circuit. If necessary refer to the fault location chart on page 44.

Continue to connect each zone circuit until all are connected and fault free.

It may be preferable to test the operation of zone devices before proceeding with the connection of sounders.

Sounder Circuits

Each 12-zone PCB has two sounder circuits that by default operate steadily on the activation of any zone. A pulsing output can be achieved by changing the operating parameters. Refer to the Programming section.

Sounders must be polarised and suppressed and connected in a parallel circuit with no spurs or tees. Ensure that the load of the sounders is within the individual circuit limits, and that the total load does not exceed the panel limits, taking into account any additional load imposed by auxiliary circuits, repeaters, etc.

Remove the 4K7 resistor from the relevant sounder circuit terminals and connect the circuit pair, observing polarity. Ensure that a 4K7 resistor is fitted in parallel with the last device on the circuit.

Clear any faults before proceeding - refer to the fault location chart on page 44 if necessary.

Sounders can be tested by operating the SOUND ALARMS push button.

See BAM Sounder/Auxiliary connections for details of circuit wiring to bell/aux modules.

Three-wire Circuits

A typical connection for a three-wire circuit is shown in drg. no. 2000/01; however, the following modifications need to be made for the circuit to function correctly:

1 The detector zone used for the three-wire circuit must have its Detector Removal Monitoring turned OFF. Refer to Programming.

2 The detector zone must be configured for Short = Fire, unless the circuit is compatible with open and short circuit monitoring, i.e. detectors with an alarm impedance of >100 ohm and < 700 ohm are fitted, and call points are fitted with a 470 ohm series resistor. Refer to Programming.

3 The zone power (ZP+) fuse F6 should be changed to 1.6 amps.

4 The sounder circuit is not monitored, therefore, a 4K7 resistor must be fitted at the sounder circuit terminals.

Power Supplies

Control panels up to 12 zones and repeaters up to 24 zones are fitted with an integral power supply/battery charger and are connected/commissioned as described above.

For larger panels and repeaters, and bell/aux modules a remote power supply/ battery charger is required. Control panels of 24 zones and above are fitted with a remote supply monitoring circuit complete with rechargeable battery.

The mains supply to the remote unit should be to the same standard and specification as the integral charger supply.

Connect the 24V supply, the charger fault (CF) and the battery fault (BF) from the PSU to the relevant terminals in the panel (see drg. no. 2000/01). When the units are powered the control panel monitoring circuit can be activated and tested.

The monitoring circuit is switched on by a switch located on the top edge of the master display PCB, adjacent to the buzzer. Slide to the right for ON.

To test, remove one of the 24V input supply cables and confirm that the ARW LED and the buzzer pulses. The fault indication should clear automatically when the supply is reinstated.

Bell/Aux Module

The 24V supply and fault monitoring cables are connected to the PCB as indicated in drg. no. 2000/03. The terminal block at the top of the PCB (28V Aux Power) is for an additional supply where particularly high loads are anticipated. The supplier should be consulted for further information regarding the suitablility of power supplies and maximum load capacity.

All Panels/Chargers

Test the charger and battery fault indications by separately disconnecting the mains supply and battery from the power supply.

Check the battery charging voltage at the battery terminals on the PCB with the battery disconnected. This should be 27.6V +/- 0.2V. Adjust if necessary via the '28V Adj' potentiometer on the PC2000/B PCB, or the corresponding adjuster in the remote charger.

Running on Batteries

If the mains supply is not available, the panel can be operated via the battery supply.

Connect the battery supply to the battery terminals, observing polarity, and operate the Battery Start switch located on the PCB (see drg. no. 2000/02) to energise the low voltage protection relay. The system will automatically resume normal operation when the mains is applied.

The relay is provided to automatically disconnect the battery at a pre-set voltage in a mains fail condition to prevent total discharge of the battery.

Auxiliary Circuits

The requirements for auxiliary outputs are many and varied. Auxiliary voltages, switched outputs and volt-free contacts are provided to facilitate most remote control and indicating requirements.

The function of auxiliary input/outputs is described below, and typical applications are shown in drg. no. 2000/01.

***Note**. It is important to ensure that relays operated via the auxiliary outputs are suppressed by fitting a doide across the coil, see figure 3, to prevent possible damage to the panel circuitry.*

ZP+ (Zone positive)

This +ve output is used as the common supply in three-wire systems. Open and short circuit monitoring is maintained, but detector removal and sounder circuit monitoring is disabled. Refer to the Programming section for details of the parameters that must be changed to facilitate this option.

12V + (Auxiliary supply)

This is a 12 +ve auxiliary supply which can be used in conjunction with the volt-free contacts to energise an auxiliary relay or remote signalling device. The maximum load is 200mA, and the aux 28V -ve is used as the common. The load applied by auxiliary functions should be included in the battery calculations.

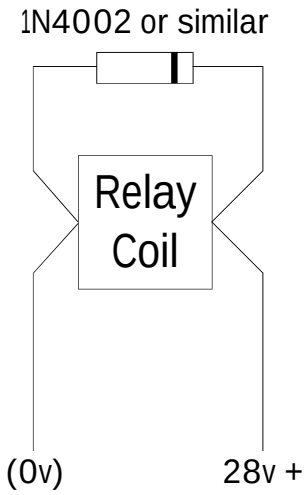


Figure 3 - Aux. relay connection detail

Comms +/- (Communications terminals)

These terminals are used for the connection of repeaters, bell/aux modules, etc. to the control panel. Network panels can be spurred or teed but correct polarity must be observed. Repeaters and bell/aux modules must be addressed for the system to function correctly. Refer to System Setup.

CFT (Common fault)

Switched -ve output that operates whenever a fault is detected anywhere on the system. Can be used for remote fault indication by activating a relay or LED. The maximum load is 100mA, and inductive loads must be suppressed.

CF (Common fire)

Switched -ve output that operates whenever a fire is detected anywhere on the system. Can be used for remote fire indication by activating a relay or LED. The maximum load is 100mA, and inductive loads must be suppressed.

Output 1/2 (Programmable outputs)

These outputs do not operate by default. They can be programmed to operate in conjunction with specified zones, and are also used in conjunction with the 4-way additional sounder circuit board (PC1005) to determine sounder operation. Refer to the Programming section.

P- (Precinct)

This input is activated by the application of the panel auxiliary -ve supply via a remote switch or relay contact, and causes all sounder circuits on the system to be energised whilst the input is active. A fire alarm is not generated and removing the input cancels the sounders. A suitable 28V -ve supply terminal is provided

Typical applications are class change and linking panels, e.g. in shopping centres (precinct). The auxiliary relay outputs do not operate in this condition.

Precinct connections should be made to the master PCB only in systems above 12 zones.

Aux 1/2 (Auxiliary relays)

These are volt-free changeover contacts that operate in a fire condition, and remain operated until the system is reset. They can be used for control and indicating purposes (see drg. no. 2000/01) and are rated 800mA @ 50V DC. Do not use to switch high voltages (240V AC); a remote heavy-duty relay should be used for switching mains voltages.

Auxiliary outputs can be programmed to operate with specified zones - refer to Programming.

28V +/28V - (Auxiliary supply)

This is a 28V auxiliary supply which can be used in conjunction with the volt-free contacts to energise an auxiliary relay or provide a remote indication. The maximum load is 500mA and the output should not be used for permanently energising items such as door holders or dampers. The load applied by auxiliary functions should be included in the battery calculations.

BAM Sounder/Auxiliary Connections

The outputs on the BAM can be configured as reverse polarity (sounder), voltage output, or volt-free output via links on the BAM PCB (PC1002) in conjunction with the programming options.

Refer to drg. no. 2000/03 for connection detail, and 'Programming a Bell/Aux Module' for programming options and link settings.

Operation

Normal Operating Mode

In the normal operating (quiescent) mode the SUPPLY HEALTHY LED is illuminated; there should be no other indicators lit or buzzer sounding.

Fire Alarm

When a zone is activated by the automatic operation of a detector, or the manual operation of a call point, the following actions occur:

- Common FIRE LEDs flash
- Relevant zone LED flashes
- Sounders operate*
- Internal sounder emits a two-tone sound
- Auxiliary outputs operate*

* A non-standard mode of operation of sounders and auxiliaries is determined by the programming functions.

Silence Alarm

Sounders are silenced by first turning the CONTROLS keyswitch to ON, and then pressing the SILENCE push-button.

The flashing LEDs go steady and the buzzer changes to a continuous tone (which cannot be muted).

A subsequent alarm on another zone will cause the sounders to be re-energised, and a further operation of the SILENCE push-button will silence them.

The sounders may be re-energised manually by operating the SOUND ALARMS push button, and silenced by pressing SILENCE.

Reset

The system should not be reset before the cause of the alarm has been investigated and established. Furthermore, it is not possible to reset the system until the SILENCE control has been operated.

To reset the system, press the RESET push-button. The panels LEDs are illuminated momentarily (not Zone/Aux Isolated or ARW), following which the panel reverts to the normal operating mode.

If the cause of the alarm has not been removed, e.g. broken glass in a call point, the panel is re-energised in alarm condition. Clear the alarm and repeat the procedure.

Evacuate

To energise the sounders at any time, turn the CONTROLS keyswitch to ON and press the SOUND ALARMS push-button.

The common FIRE LEDs flash and the buzzer sounds.

To silence the sounders, press SILENCE followed by RESET.

Lamp Test

A lamp test can be performed at any time by turning the CONTROLS keyswitch to ON and pressing the RESET push-button.

***Note**. The ZONE/AUX ISOLATED and ARW LEDs are not illuminated.*

If RESET is held operated the LEDs pulse. Repeater panels on the system are tested simultaneously.

System Fault

A fault on the system is indicated by the SYSTEM FAULT LEDs illuminating and the internal buzzer sounding.

If the fault is on a zone, the relevant zone LED is also lit.

If the mains supply has failed, the SYSTEM HEALTHY LED is extinguished.

The buzzer tone can be changed to intermittent (every 30s) by turning the CONTROLS keyswitch to ON and pressing SILENCE.

Additional fault indicators are located within the panel. Refer to the fault location chart on page 44 for further information.

ARW (Automatic Reset Warning)

This indication is cleared by resetting the system. If the condition occurs regularly, the cause should be investigated and if necessary the supplier consulted.

Configuration

General

As supplied, the Surveyor 2000 Series control panels comply with the requirements of BS 5839: Part 4: 1988 and can be used without any additional programming or configuration if the application does not warrant it.

There are occasions however when the standard operating mode does not provide the facilities and functions demanded by the specification. It may simply be a case of providing additional sounder circuits or repeaters, or a more complex system of zoned and/or pulsing alarms, etc.

There are two parts to the configuration process. The first part consists of physically setting up the system hardware to provide the number of zone and sounder circuits, repeater panels, etc. required, and involves setting the addresses of the various modules to enable them to communicate with each other.

The second part is programming the system components to provide the required operation. This can be achieved via the individual panel controls, or via a PC software program which is used to program the EEPROM storing the operating parameters.

System Setup

As outlined in the System Overview, a system comprises a main control panel with the requisite number of zones, bell/aux modules if additional distributed sounder circuits are needed, and repeaters where additional control and/or indication is called for.

A control panel of more than 12 zones comprises a 'master' 12-zone PCB plus additional 12-zone PCBs up to the required number of zones, i.e. a 24 zone panel has one master PCB and one 'slave' PCB. Within the panel the PCBs are connected via the communication (comms) circuit and have a unique address to identify them. When the panel is supplied the addresses are pre-set and do not require any adjustment. If, however, it is necessary to replace a PCB at any time, the address must be set correctly for the panel to function.

Additional units on the system must be similarly addressed. Up to seven repeaters, and up to seven bell/aux modules can be connected to a control panel and each has a unique address.

Finally, the control panel must be 'told' how many units are connected to it so that it can monitor for device loss (comms failure).

Address setting is achieved via a DIL switch on the PCBs in each unit in accordance with the following tables.

Control Panel

The DIL switch on the PCB has switches labelled ADD2, ADD1 and ADD0 and these are set according to the position of the PCB. In a 12 zone panel (one PCB) all the switches are off. In a 24 zone panel the slave PCB comprises zones 1 to 12 and the master PCB zones 13 to 24, etc. The master PCB always provides the last 12 zones.

The addresses for the master PCB in each panel in the range are as shown in table 1.

Master Address	ADD2	ADD1	ADD0
FCP 2012 - 12 zones	OFF	OFF	OFF
FCP 2024 - 24 zones	OFF	OFF	ON
FCP 2036 - 36 zones	OFF	ON	OFF
FCP 2048 - 48 zones	OFF	ON	ON
FCP 2060 - 60 zones	ON	OFF	OFF
FCP 2072 - 72 zones	ON	OFF	ON
FCP 2084 - 84 zones	ON	ON	OFF

Table 1 - Master PCB addresses

Slave PCBs are addressed in accordance with table 2

Slave PCB	ADD2	ADD1	ADD0	ZONE
First slave	OFF	OFF	OFF	1 to 12
Second slave	OFF	OFF	ON	13 to 24
Third slave	OFF	ON	OFF	25 to 36
Fourth slave	OFF	ON	ON	37 to 48
Fifth slave	ON	OFF	OFF	49 to 60
Sixth slave	ON	OFF	ON	61 to 72

Table 2 - Slave PCB addresses

Repeaters

Up to seven repeaters can be connected to the main control panel and are addressed in accordance with table 3.

***Note**. There is only one main PCB in a repeater, irrespective of the number of zones.*

Repeater Address	ADD2	ADD1	ADD0
First repeater	OFF	OFF	OFF
Second repeater	OFF	OFF	ON
Third repeater	OFF	ON	OFF
Fourth repeater	OFF	ON	ON
Fifth repeater	ON	OFF	OFF
Sixth repeater	ON	OFF	ON
Seventh repeater	ON	ON	OFF

Table 3 - Repeater addresses

It is possible to set repeaters for full control functions whereby the fascia controls will perform the same function as the main panel, or to disable the controls and retain a buzzer silence facility only.

To activate the repeater controls, set DIL switch ADD3 to ON.

Before the repeater/s are operational the main panel must be programmed to recognise them. Refer to programming.

Bell/Auxiliary Module

Up to seven BAMs can be connected to the main control panel and must be individually addressed as shown in table 4.

BAM Address	ADD0	ADD1	ADD2
First BAM	OFF	OFF	OFF
Second BAM	ON	OFF	OFF
Third BAM	OFF	ON	OFF
Fourth BAM	ON	ON	OFF
Fifth BAM	OFF	OFF	ON
Sixth BAM	ON	OFF	ON
Seventh BAM	OFF	ON	ON

Table 4 - BAM addresses

Before the BAMs are operational the main panel must be programmed to recognise them. Refer to programming.

Programming

General

The Surveyor 2000 Series control equipment can be programmed to provide alternative operating parameters.

The following elements can be programmed:

- System operating parameters
- Number of repeaters and/or BAMs

Panel programming is achieved by first entering an access code and then entering instructions via the fascia push-buttons, or internal push-buttons (BAM). A similar programming method is used for control panels, repeaters and bell/aux modules, although the facilities provided by each are different and are described separately.

Programming can also be achieved via a PC program which is downloaded to an EEPROM. The advantages of this method are that programming can be carried out off-site, and a permanent record of the program can be maintained.

Control Panel Programming

Operating Parameters

The 2000 Series control panel has a default operation which complies with BS 5839 Parts 1 and 4. For certain applications it may be necessary to provide alternative operating parameters, for instance, to suit site conditions, accept existing equipment, etc.

There are currently eleven parameters which can be changed as follows.

***Caution**. Changing the operating parameters may result in the system not complying with BS 5839. It is the operator's responsibility to check the operation of the system thoroughly, and to document deviations from the standard.*

***Note**. It is recommended that this section is read and understood before attempting to alter the operating parameters.*

Parameters	Options	Default setting
System Fault (common)	Latching/non-latching	Non-latching
Fire Zones	Latching/non-latching	Latching
Zone short circuit =	Fire/fault	Fault
Det. removal monitoring	Zonal operation	All zones
Sounder output 1	Zonal operation	Active for all zones
Sounder output 1	Continuous/pulsing	Continuous
Sounder output 2	Zonal operation	Active for all zones
Sounder output 2	Continuous/pulsing	Continuous
Auxiliary relays	Zonal operation	Active for all zones
Output 1	On/off/sounder operation	Off for all zones
Output 2	On/off/sounder operation	Off for all zones

Understanding the Parameters

The following paragraphs provide a brief explanation of each of the parameters and why they may need to be altered.

Fault latch

This is a global option and determines whether faults clear automatically when the cause is rectified (default), or whether they latch requiring the system to be reset once the fault is cleared. This option can be applied if, for example, spurious faults are being reported and have cleared before they can be identified.

Zone latch

This is a zone option and allows a selected zone or zones to be made non-latching. This can be useful where, for example, the input is from another panel and a latching zone (default) would make resetting difficult.

Short circuit response

The current BS 5839 specifies that open and short circuit conditions on detection zones should be reported as faults (default). On older systems the requirement was for open circuit fault monitoring only, with a short circuit generating a fire condition. When interfacing with such a system, the field devices, particularly call points, may not incorporate the necessary component (470R series resistor) to discriminate between a fire condition and a short circuit. In this situation the relevant zone can be programmed to indicate a short circuit as a fire rather than a fault.

As a safeguard against an alarm condition not being reported as a fire, an additional feature is included which ensures that all zones will treat a short as a fire condition in the unlikely event of a major software failure within the panel. This option is enabled by operating the DIL switch labelled BSSW to ON.

It is recommended that the option is enabled if any zone is programmed to short circuit = fire.

Selection of this parameter constitutes a deviation from BS 5839 and should be documented and agreed.

Detector removal monitoring

By default the removal of a detector from its base will generate a fault condition but not interrupt the continuity of the zone circuit, thereby maintaining subsequent devices (particularly call points) in operation, as required by BS 5839.

This facility is achieved by the use of detector bases incorporating a special diode, which should be fitted on all new installations. When interfacing with an existing installation, the detector bases may not have this facility, in which case it is necessary to turn the detector removal monitoring off.

Selection of this parameter constitutes a deviation from BS 5839 (unless the operation of call points on the zone is unaffected by detector removal) and should be documented and agreed.

Sounder outputs

There are two sounder outputs on each 12-zone PCB and limited programming can be applied to their operation.

Each output can be programmed not to operate when a selected zone is active, and the output from active sounder circuits can be programmed to be continuous (default) or pulsing. See also Programming Considerations.

Auxiliary outputs

By default the auxiliary (volt-free) outputs operate when any zone is in alarm. This parameter enables the auxiliaries to operate in conjunction with selected zones only.

Outputs 1 and 2

By default outputs 1 and 2 do not operate in any condition. They can be individually programmed to operate in conjunction with selected zones, providing an 0V output rated at 100mA. In addition, they can be programmed to mimic the sounder operation when the additional 4-way sounder PCB is installed (see PC1005).

Programming Considerations

The following limitations on programming should be understood before altering the parameters on larger panels.

Each 12-zone PCB is programmed separately and therefore, generally, the parameters only apply to that PCB, i.e:

i Programmable outputs (1 and 2) can only be programmed to respond to one or more of the 12 zones on the particular PCB.

ii Auxiliary outputs can only be programmed to respond to one or more of the 12 zones on the particular PCB. If they are programmed to function from all 12 zones, then they respond to a common fire signal on any zone (default).

iii Sounder circuits on all PCBs normally respond to a common fire signal, irrespective of the activated zone. If a zone is programmed not to activate the sounders on its own PCB, the sounder outputs do not operate on any PCB unless another zone is programmed to operate them.

Programming Mode

Before any of the parameters can be changed the panel must be put into programming mode as follows:

1 Turn the CONTROLS switch to ON.

2 Locate the DIL switch at the bottom of the PCB to be programmed.

3 Put the PMOD switch to ON.

The SYSTEM FAULT LEDs pulse and the internal buzzer sounds.

The panel control push-buttons are used to select and alter parameters and are assigned a numerical value which is referred to in the following instructions. The four controls are assigned as follows:

Control	Number	Function
SOUND ALARMS	1	Change status
SILENCE	2	Select zone
RESET	3	Enter instruction/exit
ZONE/AUX ISOLATE	4	Select parameter

***Note**. Push-buttons should be operated firmly and deliberately. Do not 'stab' at the push-buttons - an operating rate of around one push per second is recommended. A 'beep' is emitted to acknowledge the operation.*

It is now necessary to enter the access code for changing operating parameters, 1234, which is done by pressing the appropriate push-buttons as indicated above.

When the code is successfully entered the SYSTEM FAULT LEDs extinguish and the buzzer is muted. The panel is now in programming mode and set at the first parameter.

The currently selected parameter is indicated by the zone fire LED being illuminated steady, i.e. fire zone 1 LED = fault latch, fire zone 2 LED = fire zone latch, etc. The required parameter can be selected by pressing 4. Each press increments the parameter up until zone 11, and then reverts to 1.

The status of each parameter is indicated by the zone fault LED, either on, off or pulsing in accordance with table 5.

Zone selection is indicated by a flashing zone fire LED.

For each parameter the procedure is the same, i.e.

- ☐ Press 4 to select the parameter
- ☐ Press 2 to select the zone (if applicable)
- ☐ Press 1 to toggle the status
- ☐ Press 3 to exit the parameter
- ☐ Press 3 again to exit the programming mode.

Example

Objective - To make fire zone 3 non-latching (parameter 2).

1 Enter the programming mode (zone 1 FIRE LED steady)

2 Press 4 to select parameter (zone 2 FIRE LED steady)

3 Press 2 to select zone (zone 3 FIRE LED flashing)

4 Press 1 to toggle the option (zone 3 FAULT LED off)

5 Press 3 to exit the parameter

6 Select another parameter (4), or press 3 to exit the programming mode.

Zone FIRE LED	Parameter	Option	Zone FAULT LED
1	Fault	Latching Non-latching	ON PULSING
2	Fire	Latching Non-latching	ON OFF
3	Short on zone =	Fire Fault	ON OFF
4	Detector Removal Monitoring	On Off	ON OFF
5	Sounder output 1	On Off	ON OFF
6	Sounder output 1	Pulsing Continuous	ON OFF
7	Sounder output 2	On Off	ON OFF
8	Sounder output 2	Pulsing Continuous	ON OFF
9	Fire to operate aux output	Yes No	ON OFF
10	Fire to operate output 1	Yes No	ON OFF
11	Fire to operate output 2	Yes No	ON OFF

Table 5 - Control Panel Engineering Parameters

***Note**. Programmable outputs 1 and 2 (parameters 10 and 11) can be set to respond as sounder outputs for use with the additional sounder circuit PCB (PC1005). If this option is required, each output is programmed by turning the output on as described above, and then pressing button 4 before pressing 3 to exit the parameter. The DETECTOR REMOVED LED is lit to confirm the selection of 'sounder operation'.*

When the parameter programming is complete, press 3 to exit the programming mode, and turn the PMOD switch off.

Three-wire System

Zones used for three-wire circuits must be modified as follows:

- Detector Removal Monitoring (parameter 4) to be turned OFF.
- Short = Fire (parameter 3) unless field devices are compatible with open and short circuit monitoring (see Commissioning).

Programming the Number of Repeaters/BAMs

When repeaters and/or bell/aux modules are installed on the system they must be correctly addressed as decribed previously, and the control panel must be programmed for the number of each unit installed.

***Note**. If the repeaters/BAMs have not been powered up, a 'comms' fault will be indicated when the number of units is programmed. When the unit/s are commissioned communications will be established and the fault cleared. If the fault persists, the address setting and programming information should be checked and verified.*

With the CONTROLS keyswitch ON, put the PMOD switch to ON.

Enter code 1334.

If the code is successfully entered the SYSTEM FAULT LED is extinguished and the buzzer is silent.

The zone FIRE LEDs indicate the unit to be programmed, i.e.

- Zone 1 FIRE LED = Repeaters
- Zone 2 FIRE LED = BAMs

Press 2 to select the required unit.

The number of units is indicated by the zone FAULT LED.

Press 1 to increment the units until the correct number is displayed, e.g. if there are three repeaters, zone 1 FIRE LED and zone 3 FAULT LED should be lit.

Repeat for BAMs (or vice versa) if required.

Press 3 to exit the programming mode.

Turn the PMOD switch off.

Programming a Repeater

General

The 2000 Series repeater utilises the same main PCB (PC2000/B) as the control panel, but does not have any zone inputs. Sounder and auxiliary outputs are identical to the master and slave PCBs in the control panel and can be progammed to provide a zonal response using a similar method. Each repeater on a system is separately programmed to provide the required response from its outputs.

There is only one main PCB in a repeater which means that the programmable parameters can be changed for any of the repeater zones, e.g. output 1 can be programmed to operate with all or any of the 12 zones in a 12 zone system, or all or any of the 84 zones in an 84 zone system.

The following options apply to repeater panels:

Parameters	Options	Default setting
Sounder circuit 1	Cont/Pulsing/Off	Continuous
Sounder circuit 2	Cont/Pulsing/Off	Continuous
Output 1	On/Off	Off
Output 2	On/Off	Off
Auxiliary outputs	On/Off	On

The fascia controls are used for programming as for the control panel, i.e.

Control	Number	Function
SOUND ALARMS	1	Change status
SILENCE	2	Select zone
RESET	3	Enter instruction/exit
ZONE/AUX ISOLATE	4	Select parameter

Changing the Parameters

Turn the CONTROLS switch ON

Locate the DIL at the bottom of the PCB and put the PMOD switch ON.

Enter the access code 1124 using the control buttons.

The selected parameter is indicated by the steady zone FIRE LED, e.g. zone 1 = parameter 1, zone 2 = parameter 2, etc. Press 4 to scroll through the parameters.

Press 2 to select a zone, the zone FIRE LED flashes to indicate the selected zone. The current status is indicated by the zone FAULT LED, i.e.

Fault LED	Status
On	ON
Pulsing	Pulsing (Sounder circuits)
Off	OFF

Press 1 to change the status.

Press 3 to exit the parameter.

Press 3 again to exit the programming mode.

Switch the PMOD switch off.

Default Mode

A previously programmed repeater can be returned to the default mode as follows:

Turn the CONTROLS switch ON.

Put the PMOD switch to ON.

Enter code 1114.

Press 3 to exit.

Turn the PMOD switch off.

Repeater Controls

To activate the repeater controls, ADD 3 switch must be ON. With ADD 3 switch off, the only control function is buzzer silence.

Programming a Bell/Aux Module (BAM)

General

The bell/aux module is a 12-way PCB (PC1002) providing up to 12 additional individually configured sounder circuits or auxiliary outputs. The BAM communicates with the control panel via the RS 485 communications bus and can be located wherever additional circuits are required. A greater degree of flexibility is provided by the BAM and complex sounder patterns can be programmed if necessary.

The BAM must be correctly addressed in accordance with table 4.

The method of programming the BAM is similar to the control panel and repeater but, because there are no user controls, the programming push-buttons are located on the PCB. The PCB also incorporates 12 fire and fault LEDs for circuit status indication, and a small 7-segment display to indicate the parameter codes and selected zones.

Each output can be separately programmed to respond to any of the possible 84 zones on a system, and can provide a reverse polarity output (sounder), voltage output, or volt-free output.

Operating Parameters

The BAM operating parameters are selected by entering a code for the required setting. When the code is entered and access to the parameter is achieved, the display shows a number which identifies the parameter, i.e.

No.	Parameter	Code	ID
1	Monitored circuits	1114	11
2	Active in evacuate	1124	12
3	Active in precinct	1134	13
4	Bell or Aux operation	1214	21
5	Zonal response	1234	1 - 84
6	Zone of origin only	1334	1 - 84 (auto)
7	Two stage	2114	1 - 84 (auto)
8	Default parameters	1314	31
9	Engineer's Test	1324	32 (see Eng Mode)

The four buttons on the PCB are used to program the parameters as follows:

Description	Number	Function
SCROLL	1	Select option/zone
ACCEPT	2	Select zone
EXIT	3	Exit
NEXT	4	Display circuit status

Understanding the Parameters

The following paragraphs provide a brief explanation of the operating parameters:

Monitored circuits

Determines whether or not the outputs are monitored. Normally bell circuits are monitored and auxiliary outputs are not; however, it allows the option of unmonitored sounder circuits if required. Default setting is monitoring on, i.e. 4K7 EOL resistor required.

Active in evacuate

Determines whether or not an output responds to the activation of the SOUND ALARMS push-button on the control panel or a functional repeater. Each output can be individually programmed, and the default setting is for all outputs to respond.

Active in precinct

Determines whether or not an output responds to the activation of the Precinct (P) input on the control panel or a repeater. Each output can be individually programmed, and the default setting is for all outputs to respond.

Bell or Aux operation

Determines the output operation, i.e. sounder circuit or auxiliary output, and is programmed in conjunction with the link settings for each output (see Link Settings).

Under bell operation the output is turned off when SILENCE is pressed on the control panel or functional repeater.

Under Aux operation the output is not turned off until RESET is pressed on the control panel or functional repeater.

The default setting is Bell operation.

Zonal response

Enables each output to be individually assigned to a selected zone or zones in the range 1 to 84. By default all outputs operate on a fire signal from any zone (general alarm).

Zone of origin only

This parameter facilitates a single command that programs outputs only to operate with the corresponding fire zone, e.g. a fire in zone 3 activates output 3.

For this parameter to be viable there should be the same number of outputs as zones, e.g. a 36 zone system should be equipped with three BAMs providing 36 outputs. BAMs are automatically assigned in 12 zone steps as they are addressed, i.e. the first BAM is zoned 1 to 12, the second 13 to 24, and so on.

If this criterion is not met it is possible that an output would not operate in a fire condition, e.g. in a 24 zone system with only one BAM, the activation of zones 13 to 24 would have no effect. In this case the 'zonal response' parameter should be used to assign the outputs to the relevant zones.

Two stage

This parameter is similar to the above except that the output corresponding to the active fire zone provides a continuous output, and all other outputs are pulsed. The same precautions should be observed when selecting this parameter.

Default parameters

This option provides a simple method of returning the BAM to its default operation.

Programming Considerations

Complex output operation can be achieved via the programming options available with the bell/aux module and great care should be taken when configuring outputs. The system should be thoroughly checked for correct operation on the completion of commissioning.

On large systems where outputs are operated by a number of different zones it is often quicker to initially select the 'zone of origin' option and then amend the programming to suit the application, rather than assigning each output separately.

Programming Procedure

Turn the CONTROLS keyswitch ON. Locate the DIL switch on the PCB and put the PMOD switch (2) to ON.

The SYSTEM FAULT LEDs pulse and the buzzer sounds.

Enter the code for the required parameter. The buzzer is silenced and the internal PROG MODE LED is illuminated.

***Note**. Buttons should be pressed firmly and deliberately until a 'beep' is heard.*

Parameters 1 to 4

The response to the entry of the code for options 1 to 4 is the same, i.e. the FIRE LED for circuit 1 is illuminated steady to indicate the currently selected output, and the FLT LEDs show the status of each output. An illuminated LED indicates that the parameter is active, i.e.

1	Circuit is monitored
2	Output responds to evacuate
3	Output responds to precinct
4	Bell operation

The display indicates the ID of the selected parameter, e.g. parameter 1 = 11.

Press 2 (ACCEPT) to select the circuit (output), and press 1 (SCROLL) to toggle the option (on/off).

Press 3 (EXIT) to leave the current parameter and return to the parameter selection mode. Enter the appropriate code to select another parameter to program.

Zonal Response

Parameter 5 (Zonal response) is slightly different in that the zone required to activate the output must be selected.

When the code (1234) has been entered, all the FIRE and FLT LEDs are off and the display shows '1' for zone 1.

Use buttons 1 (tens) and 2 (digits) to select the zone to be programmed in the range 1 to 84.

When the required zone is displayed, press 4 (NEXT) to display the status of the outputs. The display flashes to confirm that the second level of programming has been entered.

The FIRE LED indicates the currently selected output, and the FLT LEDs indicate the status of all outputs, i.e.

ON	Output active in continuous mode in fire for the selected zone
OFF	Output will not respond to a fire in the selected zone
PULSING	Output active in pulsing mode in fire for the selected zone

Press 1 to scroll through the options and select the required response.

Press 2 to select the next or subsequent output and program as required.

Press 3 to leave this parameter.

Zone of Origin/Two Stage

When the relevant code for either of these parameters is entered, the display automatically scrolls rapidly through the zones from 1 to 84. During this time the buzzer warbles, and then silences automatically when the procedure is complete.

Press 3 to leave the parameter.

Default mode

To restore the default settings, enter code 1314. The PROG MODE LED flashes during this process and the display indicates the ID (32). No buttons should be pressed whilst this option is active.

Press 3 to leave the parameter, and 3 again to exit the programming mode.

Turn the PMOD switch off.

Link Settings

Setting the links for each output must be carried out in conjunction with the programming otherwise a fault condition may ensue.

The links determine the physical configuration of the output, e.g. if an output is programmed to respond as an auxiliary, it must be configured to provide the appropriate output, i.e. voltage or volt-free contact.

The links are located below each output, above the relay. There are eight links for each output and they are numbered 1 to 8 from the left. It is advisable to power down the BAM when changing links, to avoid inadvertent short circuits which may damage the PCB.

The link positions for the output options are screened on the PCB and are as follows:

Sounder circuit	1, 3, 4, and 6 fitted
Voltage auxiliary	2, 5, 7, and 8 fitted
Volt-free auxiliary	3, 5, and 7 fitted

See drg. no. 2000/03 for output connection details.

Clear Configuration

If extensive programming is carried out with frequent amendments it is posible to 'lose track' of the current parameter settings, and in extreme cases the program memory may become corrupt. If this occurs, or if you simply wish to re-initialise the memory and restore the defaults, there is a procedure for this.

Note*.This procedure applies to control panels, repeaters and bell/aux modules.*

1 Power down the panel.

2 Remove the memory EEPROM (see drg. nos. 2000/02 and 04 for location).

3 Re-power the panel without the EEPROM fitted.

4 Insert the EEPROM and turn the PMOD switch ON for 10s.

5 Turn the PMOD switch off.

6 Power down the panel.

7 Re-power the panel.

All configuration should now be cleared and the defaults reinstated.

Engineering Functions

General

There are various facilities incorporated into the 2000 Series equipment which are provided to enable an engineer to isolate zones and test the system. These options are accessed via internal controls and/or code entry and are not intended for end-user use.

Some of the advanced facilities require the use of an optional item of equipment known as a Data Logger. This is a hand-held device which enables the real-time clock to be set and the event log to be displayed, etc. These functions can also be carried out via the PC programming option by uploading and downloading data to the EEPROM containing the operating program (see PC Program).

The 2000 Series equipment provides comprehensive fault monitoring, and additional indicators are located within the panels to aid fault identification.

Zone Isolation

To isolate zones it is necessary to go into the programming mode. With the CONTROLS keyswitch ON, put the PMOD switch to ON and enter code 1114 (refer to Programming if necessary).

A flashing FIRE LED indicates the currently selected zone. Press 2 to increment the zone selection until the zone to be isolated is indicated.

The zone FAULT LED indicates the status of the zone, i.e.

- ON Zone isolated
- Off Zone active

Press 1 to change the status.

Continue to select and isolate zones as required. Press 3 to exit, and turn the PMOD switch off.

The activation of a device in an isolated zone illuminates the relevant FIRE LED but does not generate a fire alarm.

The SYSTEM FAULT LEDs flash, and the ZONE/AUX ISOLATED and zone FAULT LEDs pulse. The buzzer pulses and cannot be muted.

To reinstate isolated zones repeat the procedure by selecting each isolated zone and changing the status.

Engineer's Test

General

The 'ENG TEST' button located on the main PCB (control panels only) is operated to access the engineer test functions as follows:

- Detection zone test
- Sounder test
- Detector removal test

On larger systems the tests are applied separately to each 12-zone PCB, i.e. on a 24 zone system, to test a zone in the range 1 to 12, the ENG TEST button on the slave PCB is operated (zones 13 to 24 are on the master PCB).

Detection Zone Test

The engineer's detection zone test facility (walktest) enables an engineer to select a zone for test and activate devices in the zone, which are then automatically reset after a few seconds allowing further devices to be tested.

To initiate a test turn the CONTROLS keyswitch to ON, and press the ENG TEST button located on the control panel PCB once to select zone 1.

The TEST MODE and the zone 1 FAULT LEDs flash to indicate the selected zone. Each subsequent press of the ENG TEST button increments the selection by one zone and is indicated by the relevant FAULT LED flashing. The buzzer pulses and cannot be silenced.

Note*. It is only possible to place one zone at a time into test.*

When a device in a test zone is activated, the common FIRE LEDs flash and the sounder outputs are energised for 1-2 seconds. After a further 2-3 seconds the panel attempts to reset. If the device is normal it is reset and the sounder outputs are energised again for 1-2 seconds.

Continue to test devices and/or select other zones as required.

Press RESET to exit from the engineer's test mode.

Sounder Test

The sounder test feature activates the sounders on the system for a short pulse every seven seconds enabling an engineer to walk the site and confirm the operation of each sounder.

The sounder test option is accessed by pressing the ENG TEST button and scrolling through the detection test zones. After the last zone the next press enters the sounder test mode, i.e the 7th press on a 6 zone system or the 13th press on a 12 zone system.

The sounder test mode is indicated by Bell 1 and 2 LEDs illuminated on the PCB.

The sounder outputs are energised briefly every seven seconds until the test is cancelled by pressing RESET.

Detector Removal Test

The detector removal test enables an engineer to test the integrity of the detector

removal monitoring by automatically energising the sounders each time a detector is removed and replaced.

The detector removal test option is accessed by a further press of the ENG TEST button, i.e. the 8th press in a 6 zone system and the 14th press in a 12 zone system. The test condition is indicated by the DETECTOR REMOVED LED flashing.

Each time a detector is removed from its base the sounders are pulsed, and are then pulsed again when it is replaced.

Note 1. *Up to 10 seconds can elapse before the removal/replacement is acknowledged due to the detector polling time.*

Note 2. *Detectors may only be removed one at a time.*

Press RESET to exit from the test mode.

Bell/Aux Module Testing

The outputs on the BAM are energised in conjunction with the other sounder circuits on the system in the various test modes, but can be tested independently if required.

Select the programming mode and enter code 1324 (refer to Programming if necessary).

Note. *The control panel buzzer warbles during this procedure to indicate loss of communications.*

The FLT LED indicates the currently selected output. Press 1 (SCROLL) to activate the output, and 2 (ACCEPT) to toggle between continuous or pulsed.

Press 4 (NEXT) to select the next output.

Press 3 (EXIT) to exit the test mode.

DL2000 Data Logger

Introduction

The DL2000 Data Logger is an optional device for use with the 2000 Series control panels. It enables event data from the panel to be viewed and/or printed, and facilitates additional programming options.

The unit comprises a small hand-held enclosure with a liquid crystal display (LCD) and a parallel printer interface. The unit is connected to the control panel via a ribbon cable (supplied) and requires no external power supply.

There are no user controls on the unit, but there is an LED to indicate the status of the printer port.

The unit is supplied with operating instructions including the connections for the printer cable.

Some of the functions duplicate the programming options described in the Programming section, other functions can only be carried out via the Data Logger or the PC program. Functions are as follows:

- Isolate zones
- Set real time clock
- Set service alarm
- Print/display event log
- Clear event log
- Set quantity of active units
- Set zonal parameters

Only those options not available via the panel controls are described, in order not to duplicate information provided in the Programming section.

Connecting the DL2000

The ribbon cable from the DL2000 plugs into a port on the display board located on the front door of the control panel. The port is accessed from the side of the PCB and is situated on the right hand side (nearest the door hinge).

Note*. If the optional input/output PCB (PC1007) has been installed it is plugged into this port. To connect the DL2000, the panel should be powered down and the PC1007 disconnected. The panel is re-powered and the DL2000 connected and used as described. When complete, the panel should be powered down again to reconnect the PC1007. Finally, re-power the panel.*

When the cable is connected the DL2000 LCD backlight is turned on. To initialise the DL2000, turn the panel CONTROLS keyswitch to ON and press RESET. The following is displayed, e.g:

```
HAES      SYSTEMS
14:30     27/09/97
```

If there is no printer connected, or a printer is connected but not available, the 'Printer Busy' LED is illuminated.

Setting the Real Time Clock

The control panel incorporates a real time clock which is used to time and date stamp events, and to enable a 'service' time to be set. The clock is not battery backed and does not maintain its time if the panel is powered down.

To set the clock, put the PMOD switch ON and enter code 1124 via the panel controls as described in the Programming section. The following is displayed, e.g:

```
      Set   clock
14:30       27/09/97
```

Press 1 (SOUND ALARMS) to increment the digits starting on the left, e.g. if the time is 08:00 scroll through the digits until 0 is displayed.

Press 2 (SILENCE) to advance to the next digit, and press 1 to increment the value.

Continue to work through the time and date until the correct data is displayed.

Press 3 (RESET) to exit the clock setting routine.

Enter another code, or turn the PMOD switch off to exit the programming mode.

Setting the Service Alarm

The service alarm alarm is a useful feature which enables the engineer to preset a date when the SYSTEM FAULT LEDs and buzzer will become active automatically.

This can be used as a service reminder, but individual companies may find this feature can be utilised in other ways. The service alarm does not affect the normal panel operation or inhibit the reporting of fire or faults on the system.

To set the alarm. put the PMOD switch ON and enter code 1134 via the panel controls as described in the Programming section. The following is displayed, e.g:

```
      Set   alarm
00:00       24/09/00
```

The alarm is pre-programmed to operate at 10:10 hours on the set date and in the current year, therefore only the day and month can be programmed.

Press 2 to scroll from left to right.

Press 1 to increment the digits.

To clear an existing alarm setting, i.e. turn the alarm off, press 4.

When the required day and month are displayed, press 3 to exit.

Enter another code, or turn the PMOD switch off.

To cancel the alarm, the code (1134) must be entered, after turning on the PMOD switch.

Print/Display Event Log

The DL2000 enables the panel's event log to be viewed and/or printed. The panel stores the last 256 events with the time and date that they occurred (assuming the clock is correct).

If a print-out of the log is required, a suitable printer should be connected to the 25-pin 'D' connector prior to entering the access code.

***Note**. Certain printers, e.g. laser printers, may not be compatible and the results may not be as expected. A dot matrix or inkjet type printer is recommended.*

To print/display the event log, turn the PMOD switch ON and enter code 1224. The log is printed immediately if a printer is connected, and is displayed, e.g.

```
     Zone  5  Isol
13:23      24/09/97
```

The events are scrolled automatically. Press 1 to stop the automatic scrolling and increment the log sequentially, starting from the most recent event.

Press 2 to scroll automatically.

Press 3 to exit. Enter another code, or turn the PMOD switch off.

Clearing the Event Log

To clear the event log, turn the PMOD switch ON and enter code 1314.

The PROG MODE LED flashes as the log is being erased.

Turn the PMOD switch off.

Control Panel Parameters

The DL2000 can be useful when programming panel parameters by displaying the currently selected parameter by name, rather than relying on the zone FIRE LED.

Internal Controls and Indicators

In addition to the programming and test controls described elsewhere in this manual, the following controls and indicators are provided internally to enable an engineer to make adjustments and locate faults.

Control panel/Repeater

Fault/condition indicators

At the bottom of each PCB (PC2000/B) in control and repeater panels there is a row of LEDs to indicate the following conditions:

BELL 2	Sounder circuit 2 open circuit (steady) or short circuit (pulsing)
BELL 1	Sounder circuit 1 open circuit (steady) or short circuit (pulsing)
MAINS FLT	240V AC supply voltage disconnected
VOLTS FLT	System voltage (27.6V) low/high
EARTH FLT	One or more cables in contact with earth
BATTERY FLT	Battery disconnected, or cell open circuit
REG FLT	Regulator failed
PROG MODE	Panel in programming mode

Engineer's Test (Control panel only)

Used to select test options - see Engineer's Test section

DIL Switch

Used to set PCB addresses (see Configuration) and access the programming mode (see Programming).

BSSW switch (control panel only) - see page 24.

Volume Adjust

Internal buzzer volume adjustment.

Battery Start

Used to energise the battery cut-off relay if it is necessary to operate the panel on Battery supply only, e.g. during commissioning if the mains supply is not available.

28V Adjust

Voltage adjustment - adjust to 27.6V +/- 0.2V if necessary.

PL2 (Test 1)

Do not use.

PL3 (Test 2)

Connection for sounder circuit expander board (PC1005).

LD10 and LD9 LEDs

Indicate that communications is in progress (see page 45).

Bell/Aux Module

Circuit LEDs

FIRE	Indicates that the corresponding fire zone is active
FAULT	Steady = short circuit, Pulsing = open circuit

Fault/condition indicators

PROG MODE	Panel in programming mode
REGUL	Remote charger supply fault
BATT	Remote battery fault
EARTH	Earth fault
ARW	Automatic reset warning (processor crash)
SUPP OK	Indicates healthy supply to panel
AUX ISOL	Auxiliary isolate operated at main panel
FAULT	General system fault

LD1 and LD2 LEDs

Indicate that communications is in progress.

Fault Location

General

A fault is indicated by the illumination of the SYSTEM FAULT LEDs and a buzzer tone. Specific faults are identified by additional fascia indicators, e.g. zone fault, and/or internal LEDs. The buzzer tone varies depending on the fault and may or may not be silenceable.

The following chart identifies the indications that may be displayed, with the possible cause and the recommended action. Fault location should be tackled logically by isolating fault paths until the source is apparent, e.g. disconnecting zone and sounder circuits to prove if the fault is on the circuit or in the panel, etc. Faults on external circuits can be traced by breaking down the circuit, e.g. placing the EOL at the mid point of the circuit and determining which half is affected.

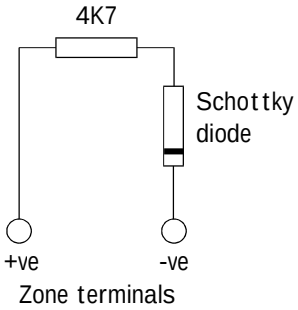
Panel Indication	Internal LED	Possible Cause	Action
System Fault (System Healthy extinguished)	Mains Flt Battery Flt Reg. Flt Voltage Flt	Mains failure/fuse failure Battery disconnected or open circuit. Fuse F7 failed Regulator failed Voltage too high (>30V) or too low (<19V)	Check supply/fuse Check battery/fuse Replace regulator Adjust to 27.6V
System Fault	Earth Flt	One or more cables in contact with earth	Disconnect ext. cables until fault clears. Investigate circuit and rectify. If fault persists with all circuits disconnected, then fault is on PCB. Replace.
System Fault	Bell 1/2	Sounder circuit open circuit (LED steady) or short circuit (LED pulsing)	Check circuit integrity/EOL Sounder not polarised or reverse polarity - correct
System Fault + Zone Fault	N/A	Zone open circuit (LED steady) Zone short circuit (LED pulsing)	Confirm fault is on external circuit by fitting 4K7 in zone terminals. Check EOL and circuit connections.
System Fault + Zone Fault + Detector Removed	N/A	One or more detectors removed Base/s wired incorrectly Incompatible detector/s Panel faulty See Note 1	Replace detector/s Check wiring/diodes Consult supplier

continued...

Fault Table continued...

Panel Indication	Internal LED	Possible Cause	Action
Test Mode + Zone Fault or Detector Removed	N/A	System in Test Mode	Reset system to exit test mode
ARW	N/A	Internal micro-processor automatically reset Power applied to panel	Reset panel. If condition persists, consult supplier
Zone/Aux Isolated	N/A	Zone Isolated	Reinstate zone (refer to Programming if necessary)
System Fault + buzzer warbling	L10 only	Loss of communication with repeater or BAM caused by cable fault or incorrect address See Note 2	Check connections - if OK confirm address setting is correct
System Fault + ARW and warbling buzzer	N/A	Program memory corrupt (system defaults apply) See Note 3	Attempt to reprogram panel. If this fails consult supplier.

Table 6 - Fault Location



Note 1. *To verify that the detector removal monitoring is functioning, disconnect the zone circuit and fit a 4K7 and a diode as shown in the sketch. A 'detector removed' fault should be indicated. Short out the diode and the fault should clear.*

Note 2. *LEDs L9 and L10 are the communications indicators. The red LED pulses rapidly whenever the panel is powered to indicate that data are available to be transmitted to the comms line. When devices are connected, the yellow LED pulses to show that data are being received by the PCB.*

Note 3. *The program memory is constantly checked for integrity in accordance with BS 5839. In the unlikely event of programming data corruption the control panel displays a SYSTEM FAULT and the buzzer emits a 'broken' warbling tone. The panel defaults to the factory settings. If the BSSW switch is ON, the panel defaults to short = fire on all zones. This is a desirable safeguard even if only one zone is set to 'old BS'.*

Sounder Extension PCB (PC1005)

Introduction

The PC1005 can be fitted to a master and/or slave PCB (PC2000/B) in a control panel to provide an additional four sounder circuits.

Via DIL switches on the PC1005 it is possible to configure the outputs to operate from various inputs providing total flexibility of sounder operation.

The PC1005 is fully monitored and interfaces with the panel fault monitoring to annunciate sounder circuit faults, fuse failure, etc. The PCB requires a 28V supply which is derived from the panel's auxiliary supply, or a remote supply.

A volt-free relay output, active in a fault condition, is provided for remote signalling.

The PC1005 is simple to install, requiring no additional cables or tools.

Installation

Unpack the kit and check that in addition to the PCB there are mounting pillars and 28V supply and fault connection leads.

***Note**. Do not remove the pillars from the bottom fixing holes, if fitted. These are used to space the PCB from the mother board.*

Power down the panel before installation and observe anti-static precautions when working in the panel.

Remove the top left and top middle fixing screws from the PC2000/B (see figure 4). Fit the nylon pillars to the vacant holes, and mount the PC1005 onto the pillars.

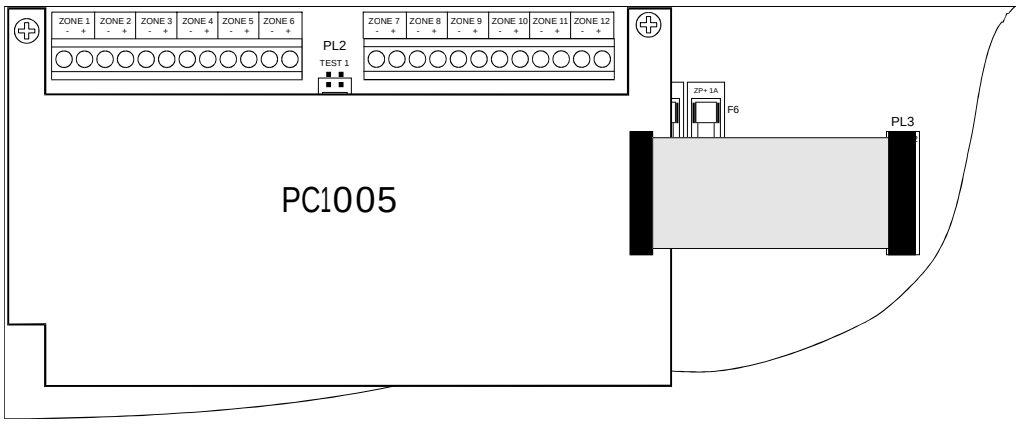


Figure 4 - PC1005 Mounting detail

PC1005 Connection Detail

The ribbon cable on the PC1005 connects to PL3 on the PC2000/B. Note the position of pin 1 and observe polarity when connecting (see drg. no. 2000/05).

Connect the 28V DC supply to the 28V I/P terminals, either from the panel's auxiliary supply or a suitable remote battery-backed supply.

Connect the fault lead between the CF terminal on the PC1005 to the CF terminal on the bottom of the PC2000/B.

Connect the sounder circuits to the Bell 1 to Bell 4 output terminals observing polarity. Sounders must be polarised and suppressed and a 4K7 EOL resistor must be fitted to the last device, or in the PCB terminals if the circuit is not used.

Each circuit is rated at 1 amp, and the total additional load must be within the capacity of the panel's power supply/battery charger if the auxiliary supply is used. The additional sounder load should be included in a revised battery standby calculation to confirm that the existing battery is adequate.

When all the connections are made, re-power the panel and set the DIL switches for the required operation.

PC1005 Configuration

There are two DIL switches on the PC1005 that are used to determine the operation of the four sounder circuits (see diagram).

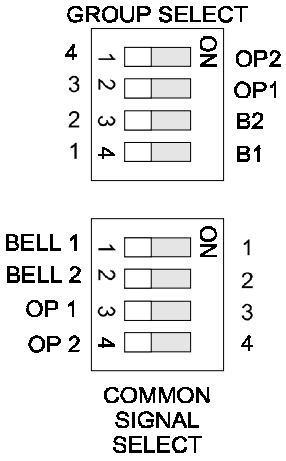
The top switch enables the outputs to be activated separately in conjunction with a selected input as follows:

SW4 connects Bell 1 to Bell 1 on PC2000/B

SW3 connects Bell 2 to Bell 2 on PC2000/B

SW2 connects Bell 3 to OP 1 on PC2000/B

SW1 connects Bell 4 to OP 2 on PC2000/B



***Note**. The PCB numbers beside this DIL switch refer to the Bell circuit numbers.*

The bottom switch controls the operation of all circuits from selected inputs, e.g if all circuits are to operate when programmable output 1 on the PC2000/B is active, switch 3 is set to ON. If all outputs are to operate when any of the panel outputs are active, then all switches should be ON.

There are many combinations of sounder circuit activation enabling the required operation to be achieved when used in conjunction with the programming options.

***Note**. Programmable outputs 1 and 2 are OFF by default and must be configured to operate in an alarm condition. For the additional sounder outputs to function correctly, the panel outputs must be programmed as Sounders - see Programming.*

PC1005 Auxiliary Functions

Precinct

The four sounder circuits can be activated by applying 0V to the Precinct (P) input. This must be the same -ve as fed to the 28V supply on the board.

***Note**. For the sounder circuits to be activated from the precinct input on the panel PCB, they must be programmed to respond to a bell circuit activation.*

Individual sounder circuits can be activated by applying 0V to the relevant input 1, 2, 3, or 4.

Fault Signalling

A fault relay with a volt-free changeover contact output is provided and responds to a fault on the PC1005 only. Each circuit is monitored for open and short circuit condition which is indicated by LEDs on the board.

Contacts are rated 800mA @ 50V DC and should not be used to switch high voltages or to operate unsuppressed relays.

Installing a PC1005 in a Repeater

In theory, the PC1005 can be installed in a repeater to increase the sounder circuits from 2 to 6. However, it is not currently possible to program outputs 1 and 2 to respond as sounders, therefore, extender sounder circuits would not be silenceable.

Providing the four outputs are linked to Bell 1 and/or 2, they will function correctly.

PC1007 Input/Output PCB

Introduction

The PC1007 is an optional 'add on' PCB for the 2000 Series control panels with version 7.0 software (master) and v5.0 (slave).

It provides 16 outputs comprising 12 zonal outputs and 4 common outputs, plus 8 inputs which initiate panel functions. Typical usage is for 'conventional' repeat indication and interfacing with other systems.

The PC1007 can be mounted within the control panel via the installation kit supplied, or up to one metre away via the ribbon cable.

Replacement software for panels prior to version 7.0 is available. Contact the supplier for details.

Installation

The PC1007 is mounted in the bottom right-hand side of the control panel cabinet via the supplied kit, and connects to the display board on the panel door.

Power down the panel.

Install the board in the selected location. Connect the 10-way ribbon cable connector to the port on the right-hand side of the display PCB (nearest hinge). This is the same port that is used to connect the DL2000 Data Logger.

Connect a 28V auxiliary supply from the panel 28V -ve and 28V +ve into the 28V terminals on the bottom of the PC1007 (see drg. no. 2000/07).

Re-power the panel.

Commissioning

The following outputs are available (all 0V):

Outputs 1 to 12	These are zonal outputs supplying a switched, continuous 0V when the corresponding zone is active in a fire alarm. The output remains active until the panel is reset. The output is not isolated via the ISOLATE AUX control, unless input F is grounded.
Output 13	Isolatable common fire signal (active until reset).
Output 14	Silenceable common fire signal.
Output 14	Maintained common fault signal - 0V is normally present and is removed when a fault is present.
Output 16	Activates for 1 second when the panel is reset.

***Note**. A fused 28 +ve supply is provided for the 'common' supply to devices activated via the outputs. Relays must be suppressed.*

The following inputs are available and are activated by applying 0V from the 0V output terminals on the PC1007 via a remote switch or contact (see drg. no. 2000/07):

Input A	Remote sound alarm
Input B	Remote silence alarm
Input C	Remote reset
Input D	Remote auxiliary isolate
Input E	Alert sound alarm (1.5s on/1.5s off)
Input F	Enable auxiliary isolate
Input G-H	Spare

***Note**. Inputs must be activated by switching 0V from the PC1007 via a volt-free switch or contact. Cables should be kept a minimum of 50mm from mains cables.*

Data Logger

The panel must be powered down before disconnecting the PC1007 ribbon connector from the display PCB prior to connecting the DL2000, and again before re-connecting the PC1007.

See DL2000 section.

LCD 2000 Display Module

Introduction

The LCD 2000 is an accessory to the Surveyor Series 2000 Control Equipment. It provides a real time display of events on the system and can output the data to a printer for a hard copy event log. Each zone on the system can be allocated a text description of up to 40 characters which is displayed via the LCD when the zone is active. The unit incorporates a battery-backed clock which is used to time and date stamp events.

The unit is supplied as a stand-alone panel or can be integrated into a control panel, repeater or bell module. It can be mounted up to 1000m from the control panel via the RS 485 network, and up to twelve units can be fitted to a system.

The time and date is set via the integral keypad, and the text messages are configured via the keypad or the NOVRAM PC program. Data created via the PC program is downloaded to an EEPROM enabling messages to be created off site if required. Existing data can be uploaded for editing via the same facility.

Installation

Stand-alone units connect to the communications RS 485 network via a 2 core screened cable. The connection can be made to the control panel or to any point on a network.

Each unit requires a nominal 24V DC supply which can be derived from the control panel auxiliary supply, or a suitable local supply. It should be noted that if a printer is connected the load when operating can be up to 2 amps.

Commissioning

Connect the 2 core communications cable between the comms + and - terminals on the LCD 2000 and the comms terminals in the control panel, or any other point on the network, observing polarity (see drg. no. 2000/09).

Check that switch 3 is ON to connect the on-board clock battery. When connected the battery maintains the clock setting when the LCD 2000 is not powered. The battery life is five years.

Apply power to the unit. The following message is displayed:

```
HAES      SYSTEMS
PRINTER   2000   V1.0
```

The LCD backlight is initially illuminated and will extinguish after one minute if no events are present.

The yellow RX LED pulses to indicate that data are being received (red LED is not used). If data are not being received, i.e. the comms network is not connected or fails, the unit emits a warbling tone after about 30 seconds.

Setting the Time and Date

The time and date is set via the keypad, with DIL switch 3 ON.

Enter code 1111 via the keypad and press the # key to enter it. The current time and date is displayed and is adjusted as follows:

Enter the hours, minutes, (24 hour format), day, month and year, pressing # after each entry, e.g. to set the following time and date press the keys indicated, 11:35 5/11/97:

Hours	11#
Mins	35#
Day	05#
Month	11#
Year	97#

To store the new setting it is necessary to press RESET on the control panel.

If the setting is incorrect, repeat the procedure.

Programming Zone Text Messages

Text messages are programmed via the keypad or the NOVRAM PC program. The following procedures are used to assign messages via the keypad, and the PC option is described in the PC Programming section.

Enter code 1234 via the keypad and press #.

The display then prompts for a zone number (initially 00). Enter the required zone number, e.g. 01, via the keypad and press #.

A cursor is displayed at the left of the display. The message is composed using the following keys:

Key 5 selects the character set, e.g. upper case, lower case, etc.

Key 2 moves up the alphabet

Key 8 moves down the alphabet

Key 4 moves the cursor left

Key 6 moves the cursor right

Example

Create message: FIRST FLOOR

First, press 5 until the required character set is displayed, e.g. A. Then press 2 to advance the characters to F.

Press 6 once to move the cursor to the right.

Press 5 to select the character set, then press 2 to advance to I.

Continue to enter characters as described, remembering to select the required character set for each character. Select and scroll until the desired message is displayed.

Press # to save the message.

Repeat the complete procedure, including entering the access code, to create a new message.

Initialise Text

To delete all messages and revert to the default text, enter code 4321 and press #.

***Note**. All current settings are lost if this option is invoked.*

Operation

Events that occur on the system are displayed via the LCD. Zone related events display the zone text that has been programmed, or simply display the zone number if no text has been entered.

Subsequent events occurring before the system is reset are stored in chronological order up to a maximum of 128. Events can be viewed by pressing the scroll button, and an 'end of log' message is displayed when all events have been viewed. If a printer is connected, events are printed out as they occur.

All major system events are displayed, e.g. fires, faults, isolates, etc., with the time and date.

When the system is reset, all events are cleared.

Printer

A printer can be connected to the LCD 2000 via the centronics printer port on the PCB, using a standard parallel printer cable.

Desk top printers of the inkjet or dot matrix type are compatible units and the supplier should be consulted for confirmation that the proposed printer is suitable.

PC Software Program - EEPROM Programmer

Introduction

The operation of the Surveyor 2000 Series may be programmed via the PC (Personal Computer) configuration software. The PC program duplicates the functions of the panel programming options but allows a configuration program to be created off site. There is also the added advantage of being able to maintain a record of the configuration.

The configuration program is supplied on a 3.5" floppy disk. The program is used to configure a 16K EEPROM via an EEPROM Programmer supplied as part of the package. A standard 36-pin centronics printer lead is used to transfer data from the PC to the programmer. The EEPROM is then simply plugged into the relevant panel. EEPROMs storing existing data can be read and the program edited, and the data saved to a file if required.

The program allows reasonably complex cause and effects to be created and the operator is responsible for ensuring that the system operation is in accordance with the specification and relevant British Standards. It is essential that the system operation is thoroughly tested when a configuration file is created and downloaded, or existing parameters are edited.

It is assumed that users of the configuration program are competent fire alarm engineers with an understanding of operational requirements and appropriate standards, and possess basic computer operating skills.

System Requirements

The program will operate correctly on any true IBM Compatible PC running DOS V3.1 or later, with at least 512Kb of free RAM, a floppy disk drive, and a parallel port. A colour screen makes programming slightly easier, but is not mandatory.

Printing

If printouts of configuration data are required, a printer should be connected to the parallel port of the computer. A standard FX80 compatible printer is required, e.g. dot matrix or inkjet type. A laser printer is not suitable.

Before You Begin

Check that you have the disk, the EEPROM Programmer and a lead.

Make a back up copy of the original disk and store the original in a safe place. Use standard DOS commands, e.g. Diskcopy, to copy the master disk (consult the computer manual if in doubt).

The program can be run from the floppy disk, but it is recommended that it is installed on the hard disk of the computer. Use standard DOS commands to copy the program file, 'novram.exe', to an appropriate directory.

Before attempting to create a configuration file make sure that you have details of the system components, e.g. the number and type of panel, the location details of each zone, the function of output devices, etc.

Starting the Program

From the floppy disk

Switch the computer on and ensure the C:\ > command prompt is displayed (exit from Windows if necessary). Insert the program disk into the floppy disk drive (A) and type a: and press ENTER.

At the A:\> prompt type **novram** and press ENTER. After a few seconds the main menu is displayed.

From the hard disk

Change to the directory where the program is located (cd command). Type **novram** and press ENTER. After a few seconds the main menu is displayed.

Procedures

A separate program is created for each 12-way PCB in the system, i.e. in a 24 zone system with a repeater and 24 additional bell/auxiliary outputs, there is a total of six EEPROMs which may need programming to produce the required operation. A standard 16K EEPROM is used in all cases, but the operating parameters stored on each one are different. The parameters are as described in the Programming section of this manual.

The PC program incorporates menu options to configure each of the panel types, and the appropriate option is selected to program the relevant panel EEPROM. When downloading the data to the EEPROM any existing data are overwritten, therefore if the wrong EEPROM is inadvertently inserted into the programmer, the stored data are lost. Care should be taken to correctly identify EEPROMs where several are involved in a system.

When reading stored data from an EEPROM, the appropriate program option should be selected, i.e. if the EEPROM is from a control panel and it is read into the Repeater programming option, an error message is displayed indicating that the data are invalid.

EEPROMs plug into a socket on the relevant PCB and the location is identified on the schematic drawings in Appendix A. It is not necessary to power down the panel when fitting or removing an EEPROM, but care should obviously be taken not to bend the pins or create a short circuit on the PCB. The EEPROMs are polarity conscious and must be inserted correctly. An indent at one end of the device indentifies the polarity and this should be noted when removing it.

Once stored in memory, the programming information is retained by the EEPROM even when not plugged into a panel. The memory can be cleared when the EEPROM is plugged in by either overwriting the data with new data, or initialising the system as described on page 35.

PC Program Overview

The PC program is used to create a configuration file that is downloaded to an EEPROM, which is then installed in the relevant panel to determine its operation.

Control panel master and slave PCBs, repeaters and bell/aux modules can be programmed to operate as required. The following are the main features of the program:

- Program operating parameters
- Read data from panels to view or edit the operating parameters
- Save programs as files for record purposes and future use
- Facility to add system information and notes to saved files
- Printout of configuration information
- View and/or print of event logs (master only)
- Set real time clock and service alarm (master only)

Main Menu

Start the program to display the main menu:

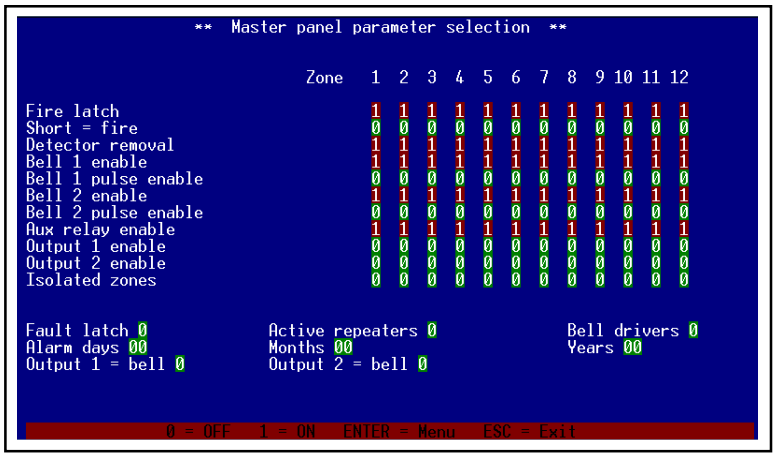
The main menu comprises a list of the available options. Options 1 to 4 enable the operating parameters for the appropriate panel to be programmed. Each option constitutes a separate file, so that on larger systems there may be several separate files containing the operating parameters for a panel's PCBs.

Options 5 and 6 are only relevant to the control panel master PCB. Option 5 enables the event log to be read from an EEPROM inserted into the reader, and option 6 enables the real time clock which is used to time and date stamp events, to be set. The panel counts from this time when the EEPROM is installed.

Option 7 determines the zone information that is displayed by the optional LCD2000.

Programming the Master PCB

Press 1 on the keyboard to select the Program Master option. The following screen is displayed:



A blank template file is opened and 12 zones are displayed with a list of options (parameters) for each zone. Because this is the master PCB there are common options at the bottom of the screen, i.e. the number of repeaters and BAMs on the system can be programmed, and the service alarm time set.

Bear in mind that in a panel of more than 12 zones the master PCB always contains the last 12 zones, e.g. in a 36 zone panel, the master PCB is zones 25 to 36.

There are several ways in which to proceed as follows:

New configuration

Create a configuration file from the blank template. Save the file and/or download it to an EEPROM.

Existing configuration

Open an existing configuration file for editing, or read the data from an EEPROM. The amended data can then be saved to file, under a new name if required, and/or downloaded to the EEPROM for insertion in a panel.

Create a New File

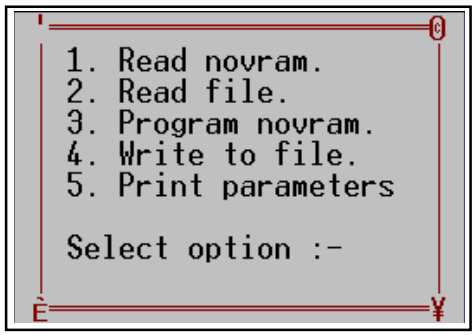
Select the required parameters for each zone. Refer to the Programming section of this manual for an explanation of the parameters. Instructions are provided at the bottom of each screen for selecting and altering options.

The factory default settings are displayed, i.e. 1 = On and 0 = Off and, in the case of a sounder output, 2 = pulsing, and are selected by pressing the corresponding keyboard key. A flashing cursor indicates the selected parameter. Parameters are selected by scrolling with the left/right arrow keys. It is not possible to move up and down the screen, only left and right. Once a selection is made the cursor

automatically steps to the next parameter, either alter the parameter or scroll to the next parameter to be changed.

Continue to set up the zone parameters until the required result is achieved.

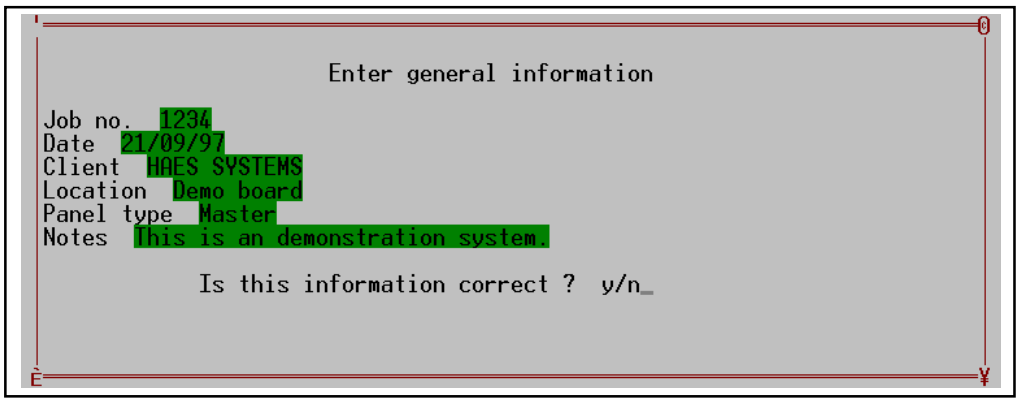
Press ENTER (Return) to display a sub-menu of options, i.e.



The newly created file can be downloaded to an EEPROM (3), or it can be saved to file (4). It is recommended that the file is first saved, and then downloaded if required. Once saved it can be retrieved at a future time for editing and/or downloading.

Saving a Configuration File

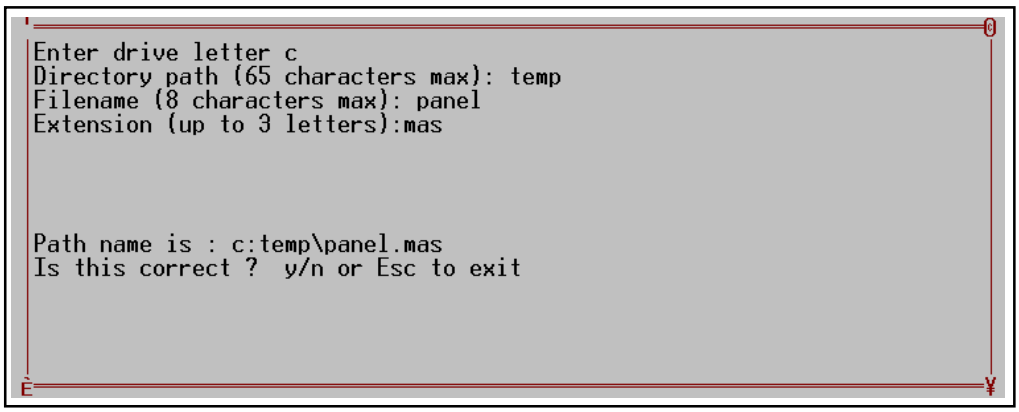
Press 4 to display the save options screen:



The first screen to be displayed enables job information to be included. It is not mandatory and simply pressing ENTER at each prompt and answering Yes to the final prompt clears the screen and displays the file information screen. Enter information if required; the 'Panel type' field is already completed and cannot be edited.

Press N (No) to clear the fields if the information is not correct. Press Y (Yes) when satisfied with the results.

The file information screen is then displayed:



The first prompt is for the drive letter. Type **c** to save the file to the hard disk (or appropriate drive if not c). Type **a** to save the file to a floppy disk, e.g. for engineer's use (ensure there is a formatted disk in the drive and it is not write-protected). Press ENTER.

The second prompt is the directory path which can be up to 65 characters, e.g. projects\myfiles\demo. If a directory is not relevant, i.e. on a floppy disk, simply press ENTER.

The third prompt is the file name which can be up to eight characters. It is recommended that the file name bears some relationship to the project to aid subsequent retrieval, e.g. demo. Press ENTER.

The fourth prompt is the file name extension which can be up to three characters. This could be used to identify the particular file from others on the same project, e.g. mas for master, or sla for slave, etc. Press ENTER.

The path and file name is then displayed and the option to accept the data or exit without naming the file. Press Y to confirm the data, N to edit it, or ESC to exit.

The file has now been saved and can be retrieved in future editing sessions by selecting the Read File (2) option from the sub-menu.

Program Novram

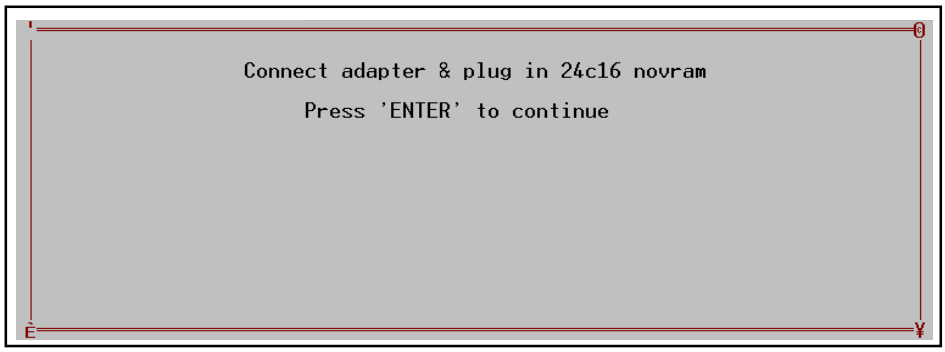
To program the novram (EEPROM) the relevant file must be open, either a new file, or an existing file retrieved from disk or novram.

The EEPROM Programmer should be connected to the PC's parallel printer port via the lead.

There should be an EEPROM plugged into the programmer.

***Note**. Downloading data overwrites existing data, which are irretrievably lost.*

Select Program novram (3) from the sub-menu.



A series of asterisks is displayed to indicate the progress of the download. When complete, after a few seconds, a message is displayed indicating that the transfer was successful or failed.

If an error message is received, check the connections between the PC and the programmer. If OK, try another EEPROM. If that fails consult the supplier.

Once the EEPROM is successfully programmed it can be inserted in the relevant panel.

Printing the File

A hard copy can be made of the file for record purposes. Ensure a suitable printer is connected before selecting this option (see DL2000 information).

***Note**. If this option is selected with the programmer connected to the parallel port, the program shuts down and must be restarted to continue.*

Closing the File

To close the file press ESC. Any data that has not been saved are lost. Select another option from the main menu or press ESC again to close the program.

Editing an Existing File

An existing EEPROM can be edited, or a file can be retrieved and edited, and downloaded to a new or existing EEPROM and plugged in to the appropriate panel.

To upload the data from an existing EEPROM it must be plugged into the programmer, and the programmer connected to the PC.

Start the program and select the relevant panel option, e.g. if the EEPROM is from a repeater, select 'Program repeater' from the main menu. If the wrong program is selected an error message is displayed when the EEPROM is read.

***Note**. Downloading a file to an already programmed EEPROM overwrites the existing data, irrespective of the origin of the EEPROM.*

Press ENTER to display the sub menu and select Read Novram (1).

If the transfer is successful, the open file is updated to display the settings from the EEPROM.

View or edit the data as required. When complete, the file can be downloaded to the EEPROM and/or saved as described previously.

***Note**. If there is an existing file, saving the data with the same name overwrites the file, or it can be saved as a separate file by giving it a different name, thereby retaining the original.*

To edit an existing file, select Read file (2) from the sub menu.

You are prompted to enter the file path and name in the same format used for saving a file. Therefore, the path (location) and name of the file to be edited must be known in order to select it.

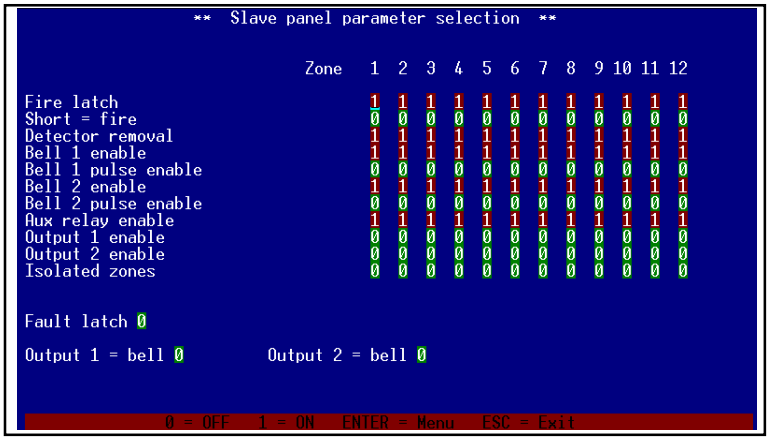
Enter the required file location information and the open file is updated to display the settings from the saved file.

Edit the file as required and either save it with the same name, or give it a new name to retain the original.

If required, download the file to an EEPROM.

Programming a Slave Panel

The same procedure is used to create or edit a configuration file for a slave panel. When the option (2) is selected from the main menu, the programming screen is displayed, e.g.

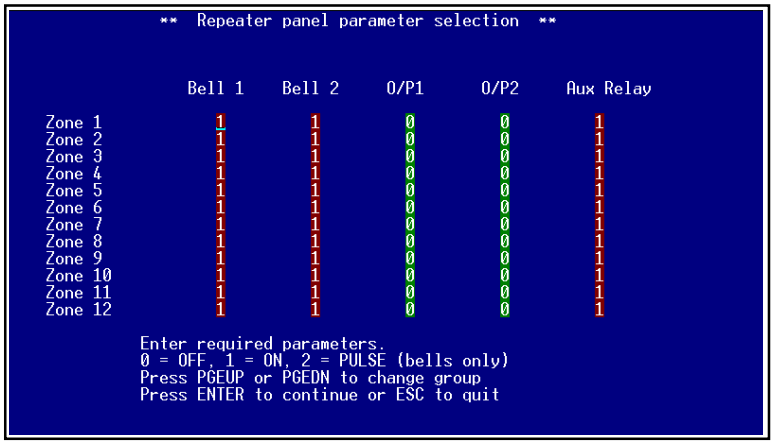


Remember, when programming a control panel with more than 12 zones, the master panel is always the last 12 zones, e.g. in a 36 zone panel the first slave is zones 1 to 12, the second zones 13 to 24, and the master zones 25 to 36.

Programming a Repeater

To program a repeater, select the option (3) from the main menu to display the programming screen, e.g.

In a repeater, the two sounder circuits, output 1 and 2, and the auxiliary output can be programmed.



The repeater is different because there is only ever one PCB irrespective of the number of zones. Therefore, the outputs can be assigned to any of a possible 84 zones. Each screen displays 12 zones and by using the Page Up and Page Down keys the other zones are displayed in blocks of 12.

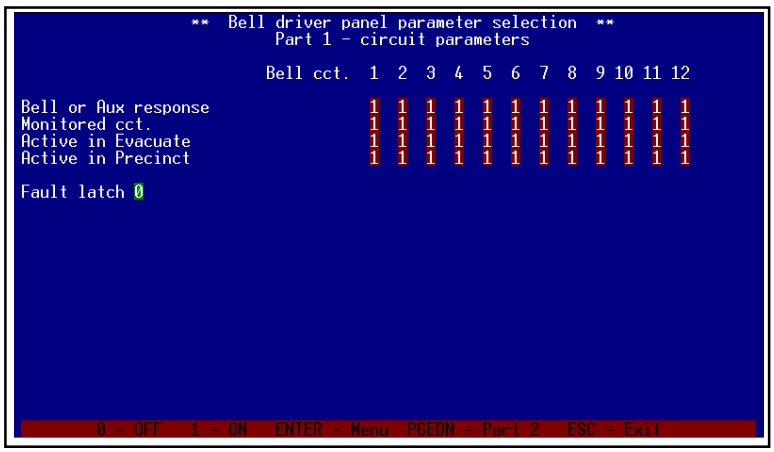
An output assigned to zone that does not exist, e.g. zone 25 in a 24 zone system, will obviously not respond. Therefore, care should be taken when programming sounder outputs to ensure that they operate as expected.

The options for sounder circuits are 0 = Off, 1 = On, and 2 = Pulsing. Outputs and auxiliaries are either on or off.

Repeater files are downloaded and saved as described previously.

Programming a Bell/Aux Module

To program a BAM select the option (4) from the main menu to display the programming screen, e.g.

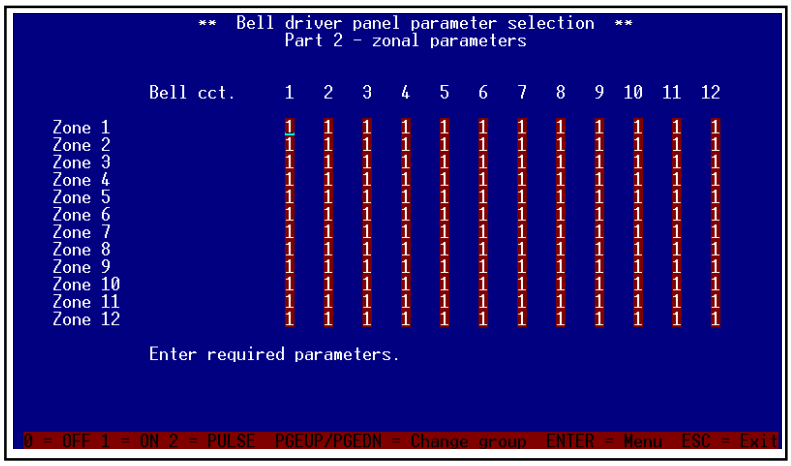


The BAM program is in two parts. Part 1 (above) enables general parameters to be applied to the 12 outputs on the PCB being programmed, e.g.

- Whether the output responds as a bell or auxiliary
- Whether the output is monitored
- Whether the output is active in evacuate
- Whether the output is active when the precinct input is active.

Complete Part 1 and press Page Down to select Part 2.

Part 2 enables each output to be assigned to any one or more of a possible 84 zones



Each output can be programmed as follows: 0 = Off, 1 = On and, in the case of sounder operation, 2 = Pulsing.

Use the Page Up and Page Down keys to access the other zones in blocks of 12.

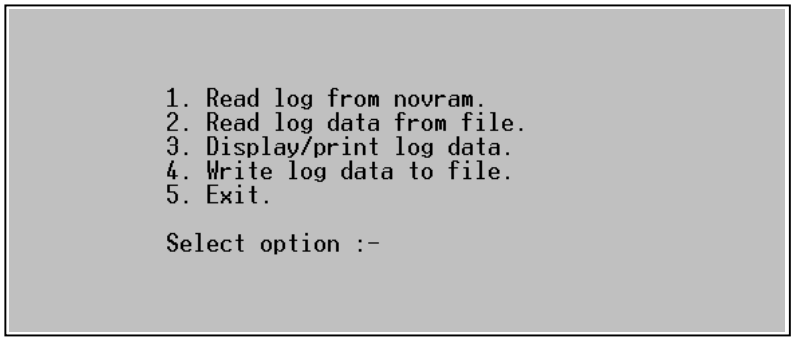
Outputs assigned to zones that do not exist, e.g. zone 13 in a 12 zone system, will obviously not respond. Therefore, care should be taken when programming sounder outputs to ensure that the results are as expected.

BAM files are downloaded and saved as described previously.

Processing the Event Log

The master PCB EEPROM in the control panel stores the last 256 events and the data can be retrieved for viewing and/or printing.

Press 5 in the main menu to display the following screen:



The options enable the event log to be read from the novram, read from an existing file, and saved to file. When the log is retrieved it can be viewed and/or printed.

If option 1 is selected you are prompted to connect the programmer to the PC. The EEPROM must be from the master PCB, otherwise an error message is displayed. Events are time and date stamped, assuming the real time has been set and the panel has not been powered down in the meantime.

Option 2 enables an existing log to be retrieved from file. You are prompted for the file path (location) and name as described previously.

Option 3 either displays the log for viewing, or sends it the printer. The printer must be connected to the PC and on line.

***Note**. If the EEPROM programmer is connected to the PC's parallel port when the Display/Print option is selected, the program shuts down and must be restarted to continue. Ensure that either a printer is connected, or the programmer is disconnected if viewing only is required.*

The data is displayed and printed in the following format, e.g:

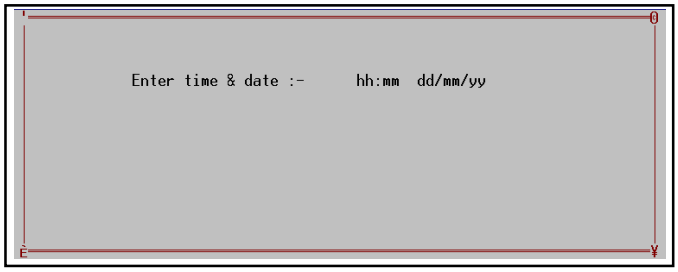
```
Zone 1          Fire                 Time  17:02 20/09/97
Zone 4          Isolated             Time  18:00 20/09/97
Master          Program mode entered Time  09:35 25/09/97
Master          Reset (ARW)          Time  11:45 25/09/97
```

Option 4 enables a log retrieved from an EEPROM to be saved to file for future reference or record purposes. The file is saved in the same format as the configuration file and the procedure is the same. To identify the file, the 3-character extension to the file name could be .log or .txt.

Pre-setting the Clock

This option enables a preset value to be programmed into the EEPROM as a reference for the data log, and also the service alarm.

Select 6 from the main menu to display the following screen:



Enter the time as prompted and press ENTER.

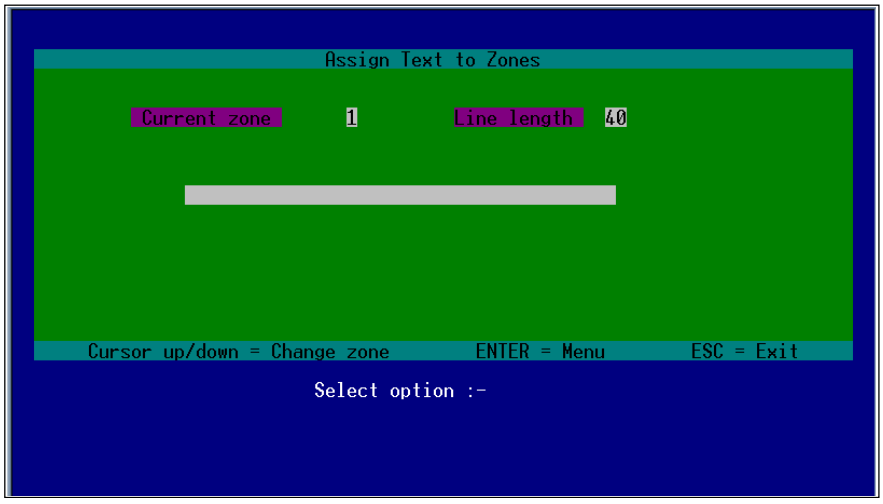
Note. The clock does not start until the EEPROM is fitted and the panel is powered up (if applicable). Therefore, for accurate timing, the setting should be at a time in the future to coincide with the EEPROM installation.

You are prompted to connect the programmer. Press ENTER when ready to update the time.

Program Printer Text

This option is used in conjunction with the LCD 2000 to program the zone text that is displayed on the unit.

Select option 7 'Program printer text' from the main menu to display the following screen:



Select a zone in the range 1 to 84 via the up/down arrow keys and type in the appropriate zone text using either upper or lower case characters.

Continue to select zones and enter messages as required.

Press ENTER to access the drop-down menu with the available options.

Set Line Length

By default the line length is 40 characters. If required the line length can be amended to any number between 1 and 40, e.g. if only short messages are required.

Select option 1 from the menu and type in the required number of characters.

Press ESC to clear the menu. The revised number of characters (line length) is now displayed.

***Note**. Any existing messages longer than the revised line length will be reduced to the maximum number of characters and may be incomplete.*

Initialise Text Strings

This option (2) clears all existing text messages and reverts to the default text, i.e. Zone 01, Zone 02, etc.

To clear all messages from the LCD 2000, the amended program must be downloaded to the EEPROM (see below), or the option invoked via the unit's keypad (see page 53).

Read Text from Novram

This option enables the existing data from an LCD 2000 EEPROM to be uploaded for editing and/or saving.

Ensure that the relevant EEPROM from the LCD 2000 (see drg. no. 2000/09) is inserted into the Programmer, and that the Programmer is connected to the PC's parallel printer port.

Select option 3 from the drop-down menu. The data from the EEPROM is read into the current file, which may take several minutes depending on the amount of data.

The resultant file can be edited and downloaded, or saved as described previously.

Write Text to Novram

This option (4) enables the currently open file to be downloaded to an EEPROM for subsequent insertion in the LCD 2000.

Ensure that the EEPROM is in the Programmer and that the Programmer is connected, and select the option. The program is then downloaded to the EEPROM, which may take several minutes depending on the amount of data.

Read Text from File

This option (5) enables data from a previously saved file to be displayed. When the option is selected you are prompted for the file path and name as described previously. The correct details corresponding to the appropriate file must be entered.

The file can then be viewed and/or edited, and downloaded and/or saved.

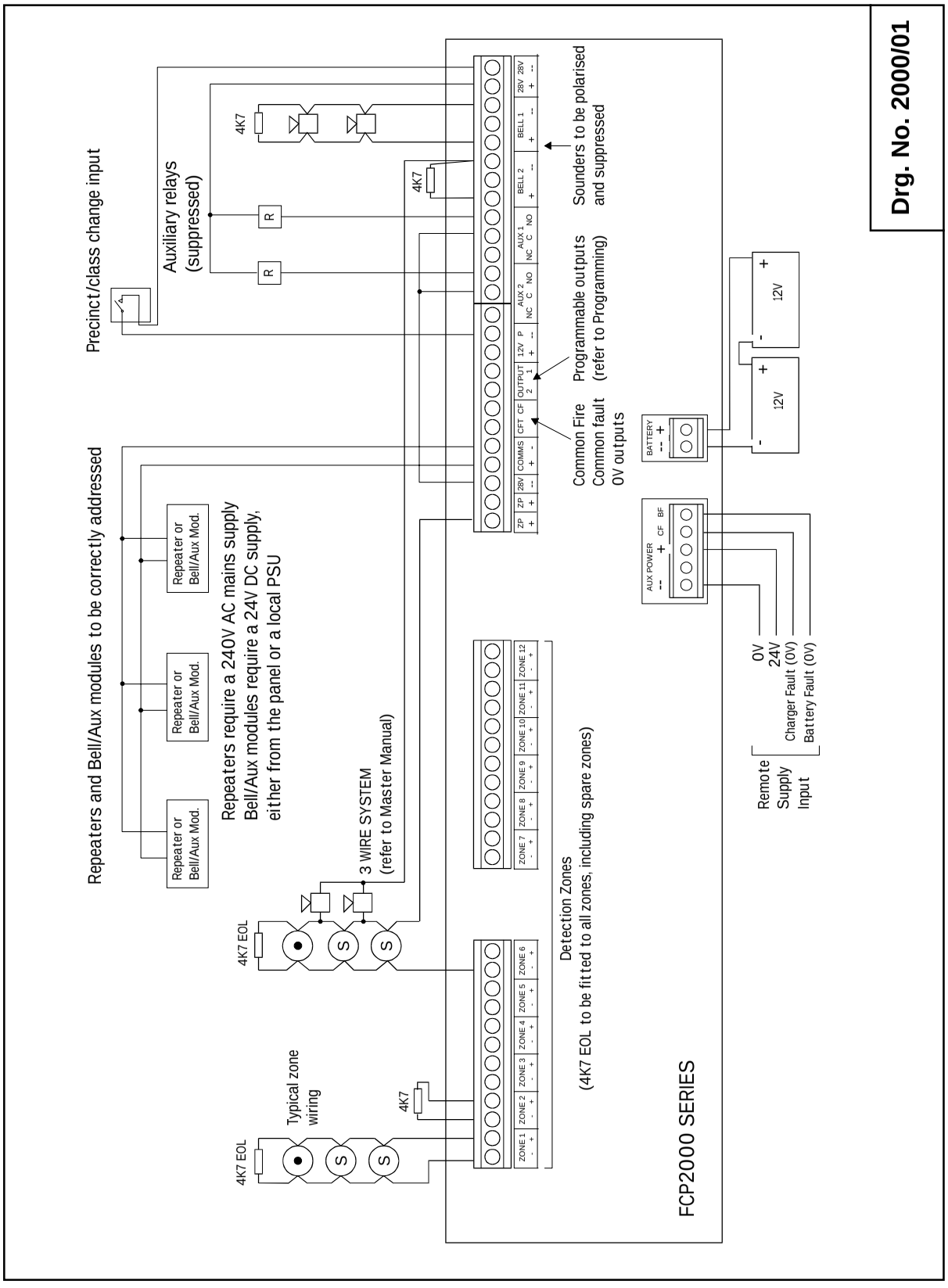
Write Text to File

This option (6) enables a new or existing file to saved for subsequent use or record purposes.

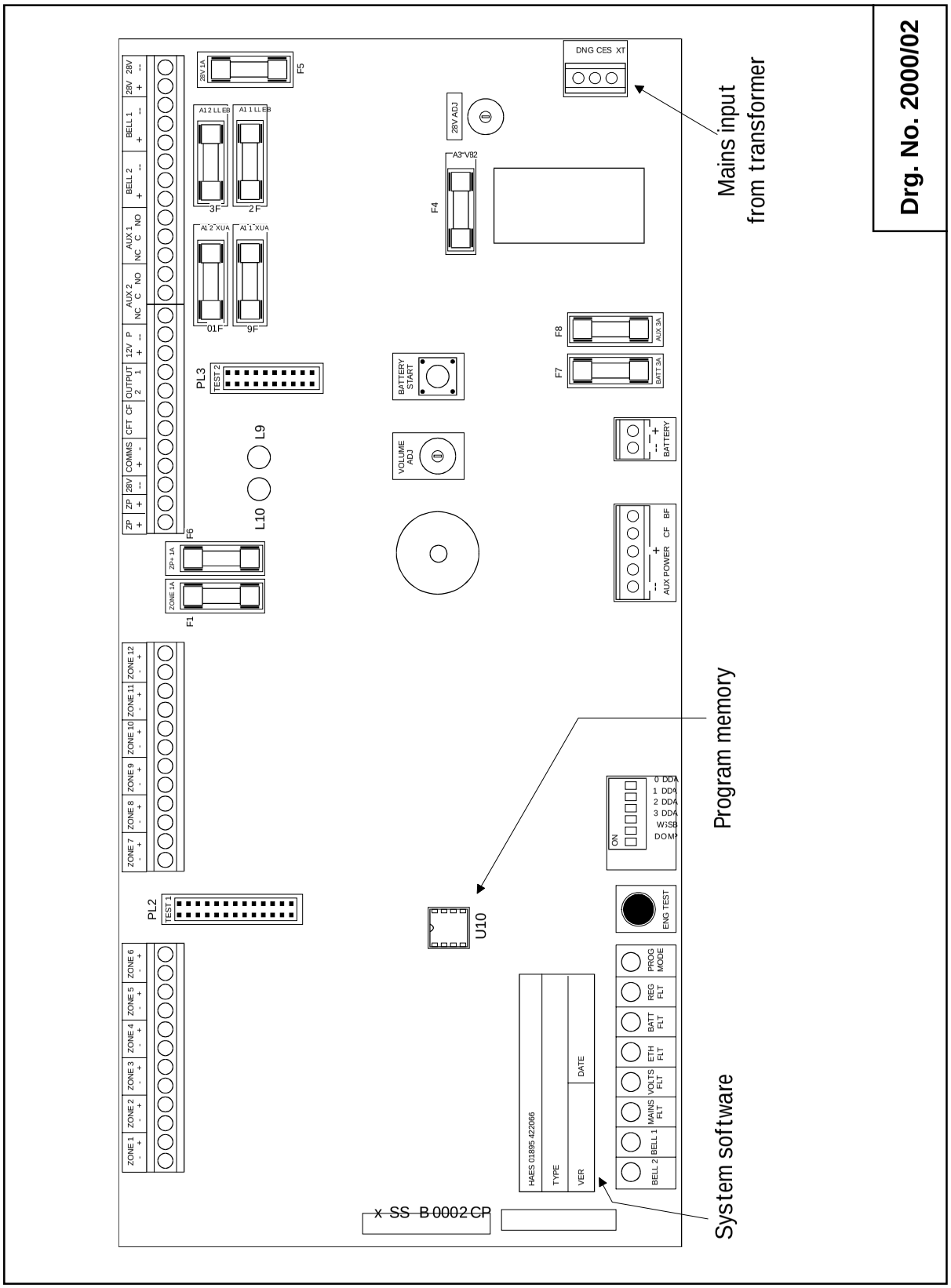
To save the currently open file select the option and follow the prompts for the drive, directory, filename, etc. An existing file with the same name will be overwritten by this action.

Appendix A

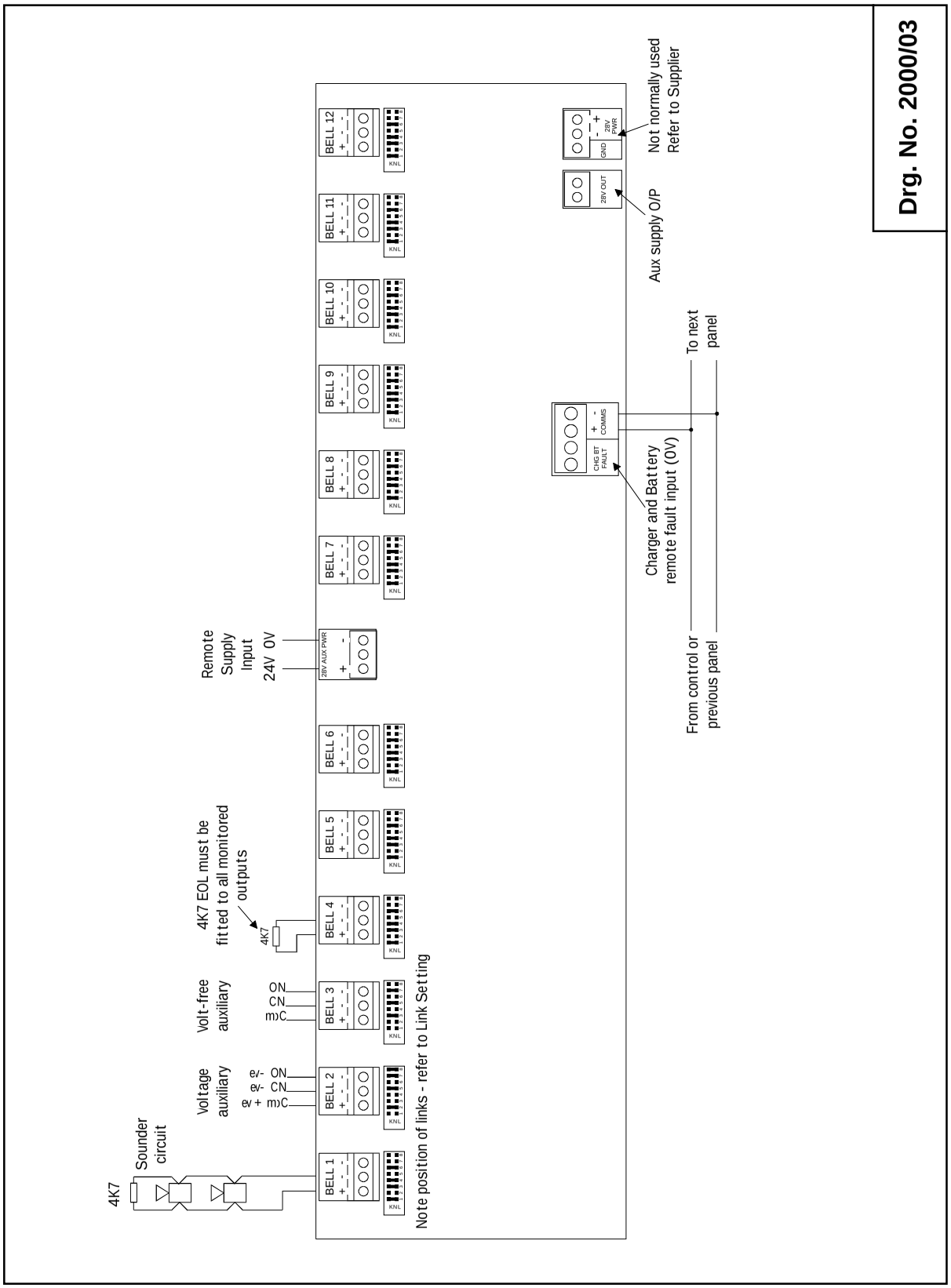
Surveyor 2000 Series Typical Schematic



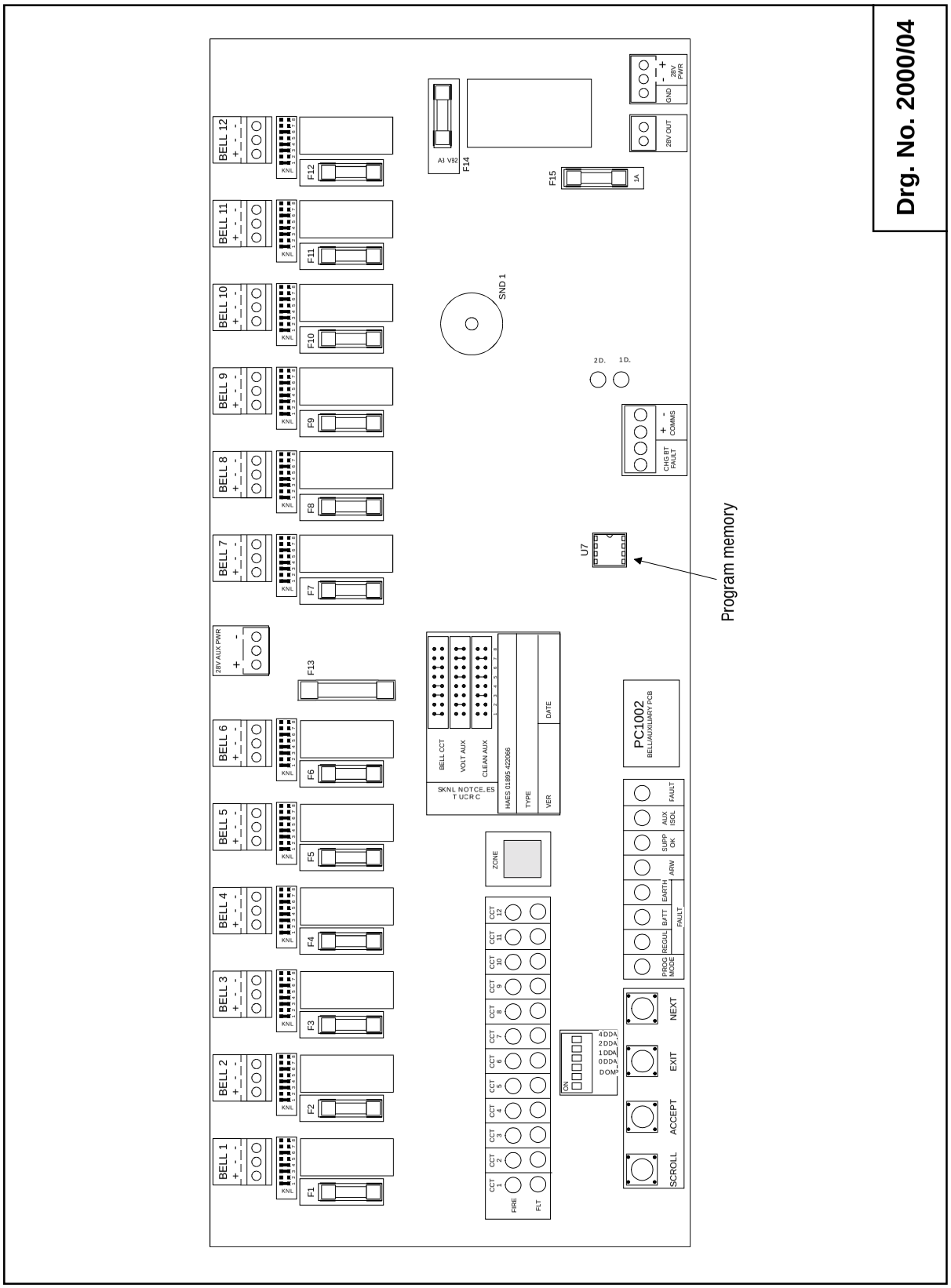
Control Panel PCB (PC2000/B)



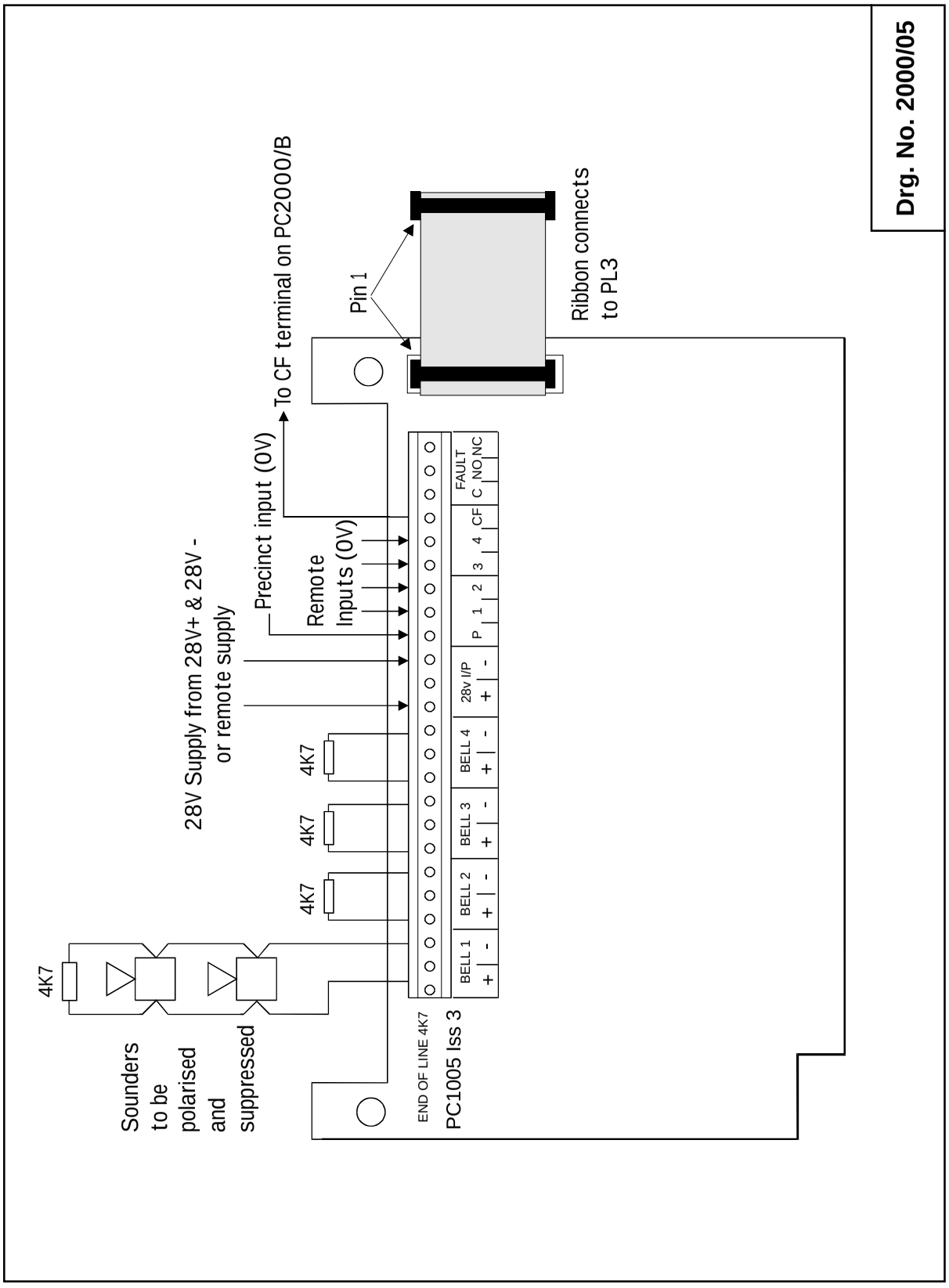
Bell/Aux Module Schematic



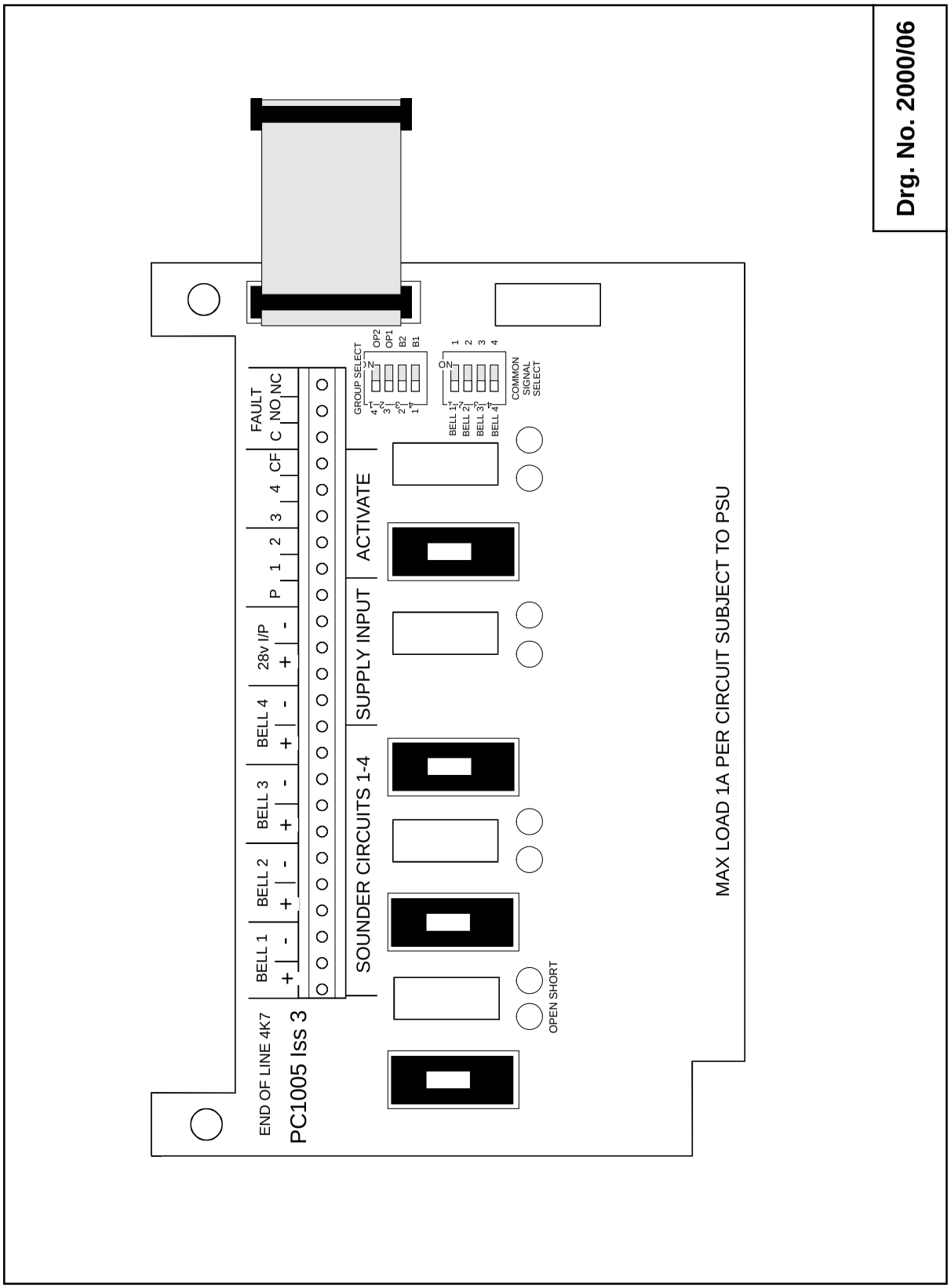
Bell/Aux Module PCB (PC1002)



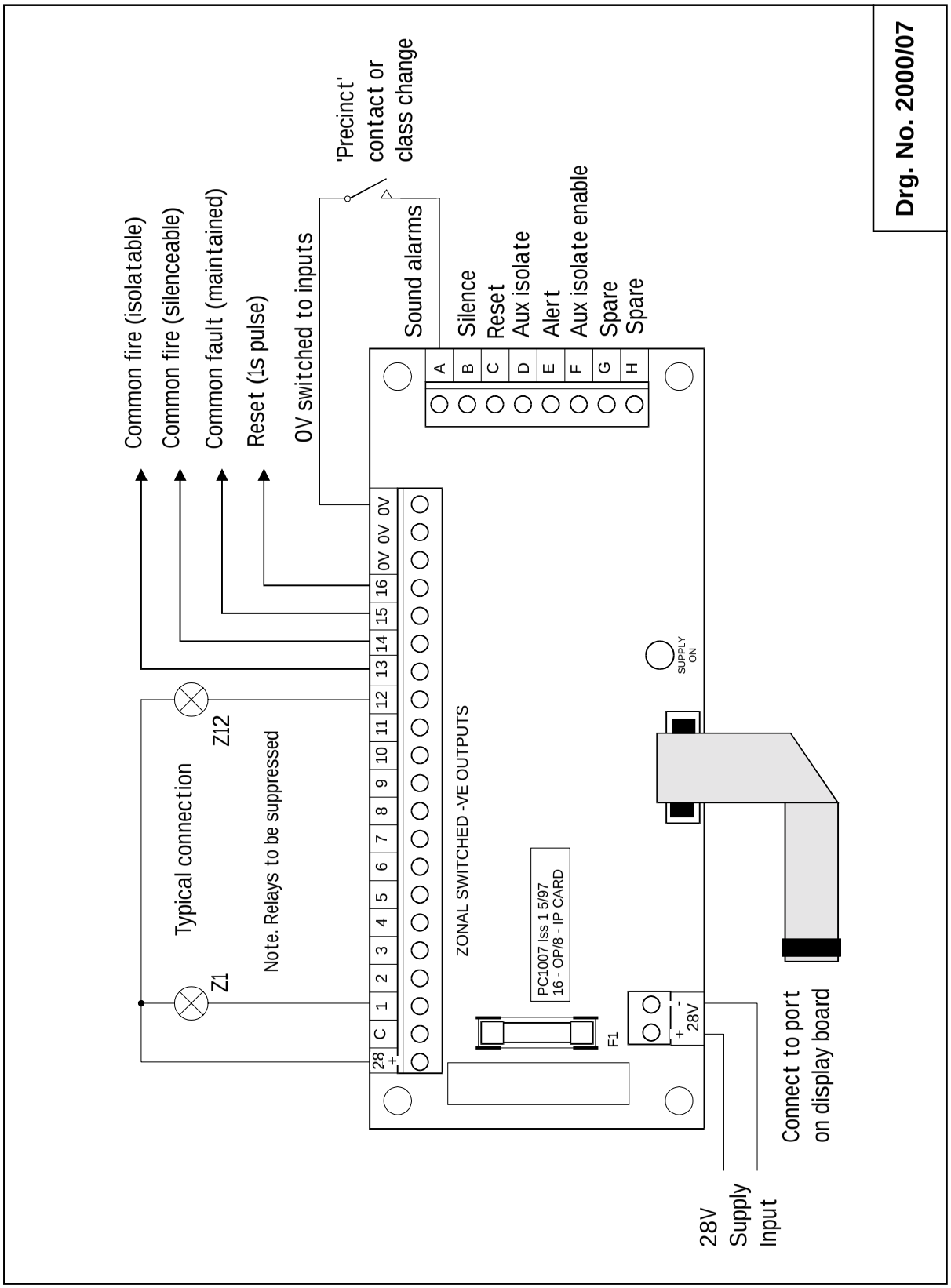
PC1005 Sounder Extender Typical Schematic



PC1005 PCB


Drg. No. 2000/06
END OF LINE 4K7
PC1005 Iss 3
BELL 1
BELL 2
BELL 3
BELL 4
28v I/P
P
1
2
3
4
CF
FAULT
C NO NC
SOUNDER CIRCUITS 1-4
SUPPLY INPUT
ACTIVATE
GROUP SELECT
OP2
OP1
B2
B1
BELL 1
BELL 2
BELL 3
BELL 4
COMMON SIGNAL SELECT
OPEN SHORT
MAX LOAD 1A PER CIRCUIT SUBJECT TO PSU

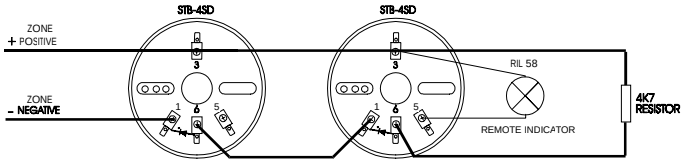
PC 1007 Input/Output PCB Typical Wiring



Detector Base Connection Details

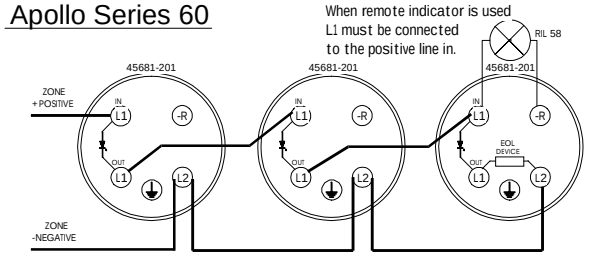
Nittan *SENSORTEC (CONVENTIONAL)*

SUITABLE FOR CONTROL PANELS FROM 9000, 2000 & LEVEL SERIES



Zone Wiring Showing Head Removal Monitoring Diodes Fitted

Apollo Series 60

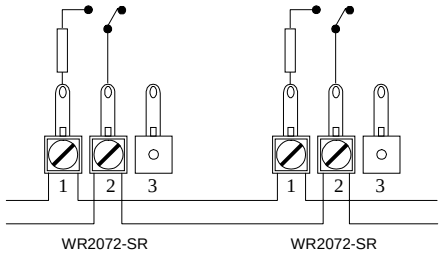


L2 is a line in & line out connection

The Diode Shown across L1 IN & L1 OUT should be a Schottky BYV-10-60 or Equivalant.

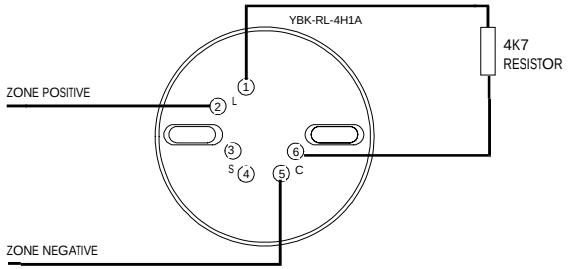
Correct Folarity of all cables is important and should be as shown. End of Line resistor. 4K7

Detector Head Removal will be monitored for a maximum of 30 Ionization Smoke / Heat Detectors or 20 Optical Detectors per zone.



Standard Break Glass Call Point Connection Details
With 470 OHM Resistor Fitted.

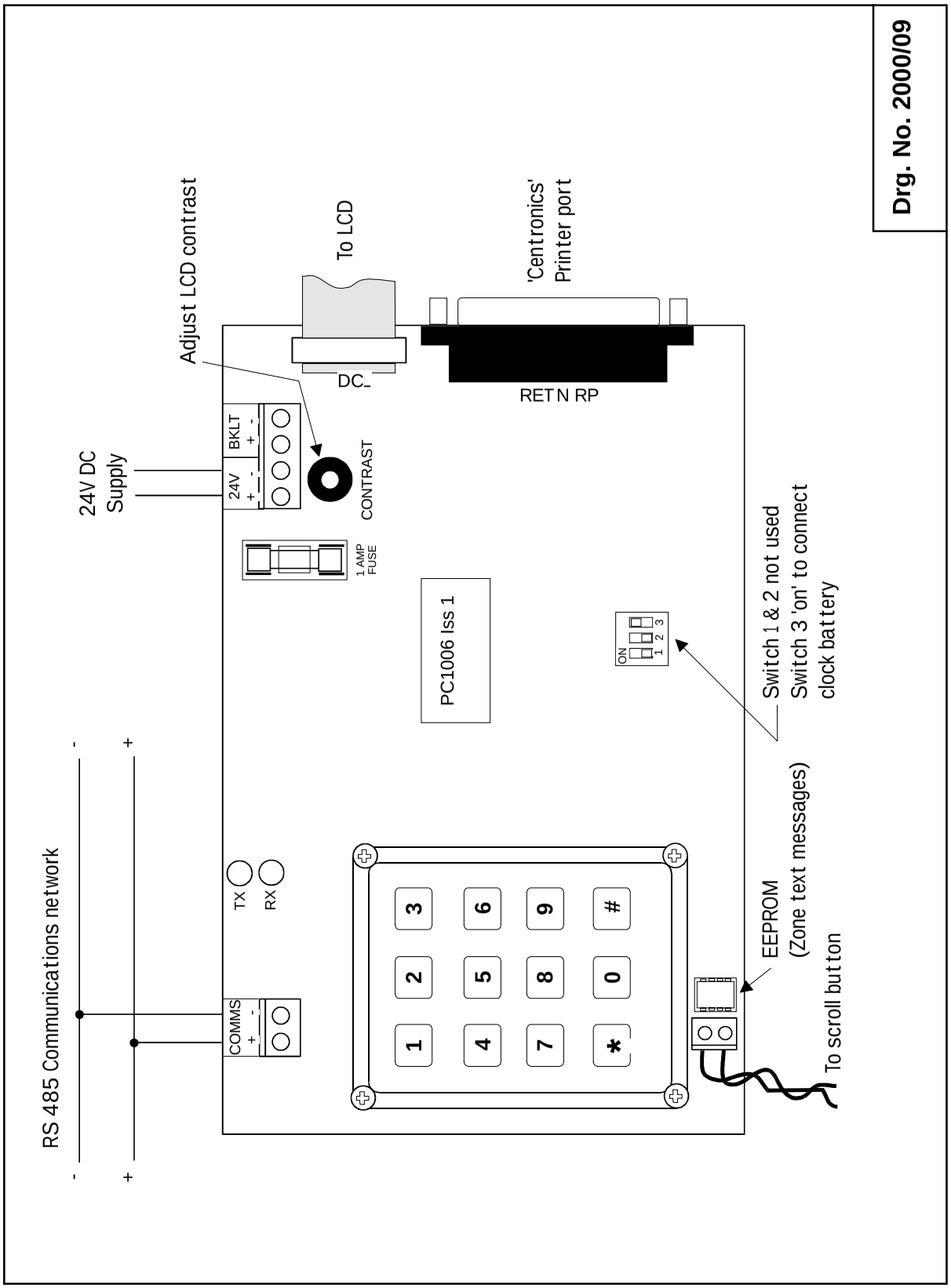
Hochiki



Hochiki "Safeline" Base YBK-RL-4H1A Should Be Used To Achieve Head Removal Monitoring With Haes 2000 & LEVEL Series Control Panels.

Drg. No. 2000/08

LCD 2000 PCB and Schematic Detail



Appendix B

Equipment Suitability

Control Equipment:	Surveyor 2000 Series
Charger:	2 to 12 zones integral, 13 zones and above remote charger selected from the PSU 2000 range.
Batteries:	Sealed lead-acid of sufficient capacity to provide required standby period and support total alarm load - see Specification for details of panel quiescent currents.
Call Points:	Use KR70 or any call point fitted with a 470R series resistor.
Sounders:	24V DC bells or electronic sounders. Must be polarised and suppressed, preferably low current and non-solenoid type (special attention required when existing sounders are used). Recommended type: Synchrobell T6D/24, Banshee, etc.
3-wire systems:	Provision made for the connection of 3-wire zones. Detector removal monitoring is inoperable and sounders are unmonitored.
Repeaters:	Must be selected from the FCRP2000 range. Two-wire signalling via RS 485 communications bus.
Detectors:	Most modern smoke and heat detectors are suitable, but if detector removal monitoring is required only the following devices have been tested and approved for use:

Detector	Max per zone	Base Diode
Nittan 2KH, 2KC, NID58, 21C, NHD	40	A
Apollo Series 30	30	B
Apollo Series 20	20	B
Apollo Series 60 Ionisation	30	A
Apollo Series 60 Optical	20	A
Hakuto SIH-E	18	B
Hakuto SLK-E	18	B
Hakuto SIF-E	40	B
Hakuto SIG-E	25	B

A - requires one Schottky diode (BYV-10-60 or equivalent)

B - requires one Schottky diode plus a polarising diode (1N4002 or similar)

Refer to drg. no. 2000/08 for base connection detail.

The supplier should be consulted regarding the suitability of any detector not listed above.

Many retrofit systems do not require detector removal monitoring, which may be switched off zonally, and so the range of suitable detectors is increased, but the supplier should still be contacted for confirmation.

Specification

2-12 zones

Model:	FCP2002/4/6/12
Zones:	2/4/6/12
Charger:	Integral 3 amp (alarm load 2.5 amp)
Sounder circuits:	2
Auxiliary outputs:	2
Dimensions (mm):	430W x 300H x 90D
Batteries:	2 x 7AH

24-36 zones

Model:	FCP2024/36
Zones:	24/36
Charger:	PSU24-50-2000 (remote)
Sounder circuits:	4/6
Auxiliary outputs:	4/6
Dimensions (mm):	450W x 450/600H x 90D
Batteries:	2 x 15AH

48-84 zones

Contact supplier for details.

Accessories

PCK2012	Perspex window conversion (2 to 12 zones)
FMK2012/24, etc.	Flush mounting kit
BAM6/12-2012	6 or 12 way Bell/Auxiliary Module (can be added in 12 way modules up to the required number of outputs - 84 max.)
DL2000	Data Logger
LCD2000	Liquid Crystal Display option
PC1005	4-way output extender (1 per 12 zones)
PC1007	16 Output/8 lnput PCB
PC Program Kit	EEPROM Programming software and accessories

Repeaters

Model	Zones	Sounder Circuits	Auxiliary Outputs	Dimensions (mm)
FCRP2012	12 zone	2	2	430W x 300H x 90D
FCRP2024	24 zone	4	4	430W x 450H x 90D
FCRP2036	36 zone	6	6	430W x 600H x 90D

12, 24 and 36 zone repeaters have an integral 3 amp charger and space for 2 x 7AH sealed lead-acid batteries.

For repeaters above 36 zones contact the supplier.

Power Supply/Battery Charger Units

Model	Max recommended battery size (AH)	Max load (A)	Max cont.(A)
BCU24-15-2	7	1.5	0.75
BCU24-30-2	7	3	1.5
BCU24 50-2	24	5	2.5
BCU24-100	38	10	5
BCU24-200	65 *	20	10

* Separate battery enclosure required.

Standby Current (Fault indication and buzzer sounding)

Cat. no.	Model	Current (mA)
FCP2002	2 zone control panel	109
FCP2006	6 zone control panel	127
FCP2012	12 zone control panel	145
FCP2024	24 zone control panel	400
FCP2036	36 zone control panel	600
FCP2048	48 zone control panel	800
FCP2060	60 zone control panel	1000
FCP2072	72 zone control panel	1200
FCP2084	84 zone control panel	1400
FCRP2000	All repeaters	200
BAM6-2012	6-way Bell/Aux module	75
BAM12-2012	12-way Bell/Aux module	90
BAM24-2024	24-way Bell/Aux module	180
Each additional 12-way BAM		90

Fuse Data

Control panel/Repeater (PC1000/B) - all 20mm glass

Fuse	Rating (A)	Function
F1	1	Zone circuits (no function on repeater)
F2	3.15	Sounder circuit 1
F3	3.15	Sounder circuit 2
F4	3	28V System
F5	1	28V Auxiliary supply output
F6	1	Zone +ve
F7	3	Battery
F8	3	Auxiliary power supply
F9	1	Auxiliary output 1
F10	1	Auxiliary output 2

Bell/Aux Module (PC1002)

Fuse	Rating (A)	Function
F1 to F12	3.15	Outputs 1 to 12
F13 (1.25")	10 (variable)	Auxiliary supply input
F14	3	28V Supply
F15	1	Auxiliary 28V

Output Expander (PC1005)

Fuse	Rating (A)	Function
F1 to F4	1	Outputs 1 to 4

lnput/Output PCB (PC1007)

Fuse	Rating (A)	Function
F1	1	Auxiliary 28V