Surveyor Excel-K

Fire Alarm Control Equipment

Installation, Commissioning and Operating Manual

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SURVEYOR – EXCEL-K

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SURVEYOR – EXCEL-K

2 – 16 ZONE CONVENTIONAL & TWIN WIRE

Designed to EN54 Parts 1 & 4

INTRODUCTION

This manual is intended as a complete guide to the 2 to 16 zone range of conventional EXCEL-K fire alarm control panels. User operating instructions are provided in the first part of the manual with the following sections dealing with installation, commissioning procedures, and full technical details. A separate Log Book is also provided.

SYSTEM DESIGN AND PLANNING

It is assumed that the system, of which this control panel is a part, has been designed by a competent fire alarm system designer in accordance with BS 5839 Part 1: 1988 and with regard to BS EN 54 parts 2 and 4 in the case of control equipment and power supplies. Design drawings should be provided to clearly show the position of any field devices and ancillary equipment.

GENERAL

The control panel is a micro-processor controlled, conventional fire alarm control system, comprising two PCBs up to 8 zones and with an additional PCB for 9 – 16 zones.

Control panels are available from 2 to 16 zones, in two sizes of wall-mounted enclosures.
There are complementary repeater indicator panels and sounder extender units that can be configured to suit site conditions and design requirements.

These panels are designed to comply with the requirements of BS EN 54 part 2 1998, but include integral facilities to enable connection to older systems, which may not comply with current standards. Flexibility is achieved by the programming options, which enable the engineer to determine the operation of sounders and auxiliary functions, without additional equipment or wiring. Programming can be carried out on site with use of the integral panel keypad.

Control panels and repeaters are identical in appearance and communicate via a 2 wire (RS 485) circuit. Repeaters can be located up to 1000 metres from the main control.

The control panels are compatible with a wide range of detection and alarm devices. Refer to technical specification for details. The panel is available in two formats, CONVENTIONAL with separate detection and alarm circuits or TWIN wire, with detectors and sounders on the same circuits. The TWIN is identified by a label fitted to the facia, as well as additional relays fitted to the internal circuit board. Both varieties of control panel have integral detector removal monitoring and no special active end of line units are required. On the conventional type, either schottky diode, or zener diode, monitoring can be selected on a zonal basis. The TWIN type requires the use of specific detectors and alarm devices.

EXCEL-K control panels are simple to install and operate. Control functions are enabled by keyswitch. Engineers Programming is via a 4-digit code. The panel facia is retained by a security cam lock . No internal access is required under normal usage.

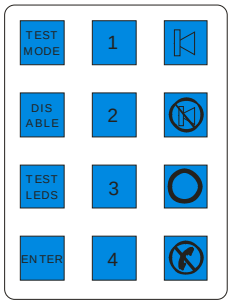
EXCEL-K USER OPERATING INSTRUCTIONS

FIRE ALARM PROCEDURES

In accordance with BS 5839 Part 1 1988, written procedures should be laid down for dealing with alarms of fire, fault warnings, and the isolation of any part of the system.
The responsible person should ensure that users of the system are instructed in its proper operation and are familiar with the procedures.

ACTIVATE CONTROLS

To enable the four buttons on the keypad labelled: Evacuate, Silence, Reset and Isolate Remote, first turn the "Activate Controls" keyswitch to 'ON' then:



EVACUATE

SILENCE

RESET

ISOLATE REMOTE

Control Panel Keypad

To 'Silence alarms':

Having first carried out a thorough investigation into the cause of the alarm, with the resulting action, as recommended by the appropriate authorities, the alarms sounders can be silenced by pressing the 'Silence' symbol.

To 'Reset' the system:

Ensure any detection device has been cleared of its initiating condition (i.e. replace glass in call point etc.). **Note: Alarms must be Silenced before Reset will function.**

Press the 'Reset' symbol.

To 'Isolate Remote'

The Isolate Remote can be activated to prevent signalling of certain specified devices (i.e. remote fire and fault signalling, release of vents or door retainers etc.) while testing of the alarm system occurs.

Press 'Isolate Remote': To 're-instate', press button once more (with keypad enabled).

To 'Evacuate' the premises:

Press the 'Evacuate' button. Silence alarms as above.

WHEN FINISHED

Return 'Activate' keyswitch to 'OFF' position to protect the control buttons from misuse.

EXCEL-K USER OPERATING INSTRUCTIONS

FIRE ALARM PROCEDURES (contd)

Fault indication:

If the control panel indicates a Fault condition, enter details of all illuminated indicators in the log book provided and contact your Service Provider.

A comprehensive Fault Location chart is provided in the Installation Section of this manual, which is intended for use by your Service Provider.

Routine Testing

In order to **ensure** that the system is fully operational and to comply with the requirements of BS 5839 Part 1: 1988, the following routine attention is recommended:

Daily	Check the panel to ascertain that it indicates normal operation. If any fault is indicated, check that it has been recorded in the log book and that the appropriate actions have been taken, e.g. informing the service provider.
Weekly	Test at least one detector, or call point, to confirm the operation of the panel and the audible alarms. Test a different zone each week and, if possible, a different device. Keep a record of the device and zone tested each week. Record and report any malfunction.
Quarterly/ Half Yearly	The responsible person should ensure that every three months the system is checked by a competent person who shall:
	Check the log book entries and any action taken.
	Check the standby batteries and the charger voltage. Test at least one device in each zone, to check the panel functions.
	Check the operation of the audible alarms and any link to a remote manned centre, Central Station, etc. Carry out a visual inspection of the installation to, check for alterations or obstructions, and issue a certificate of testing.
Annually	The responsible person should ensure that, in addition to the quarterly checks, each device on the system is tested and that a visual inspection is made of the cable fittings and equipment.

Note: The control panel case should be cleaned periodically by wiping with a soft, damp cloth. Do **not** use any solvents.

EXCEL-K USER OPERATING INSTRUCTIONS

Controls and Indicators

FIRE Red Common Fire Indicator, which is pulsed when an alarm condition is detected and will remain on until the system is reset.

Zone in Alarm Red Fire Indicator (per zone), which is pulsed when the relevant zone is in alarm condition, or illuminated steadily in the Silenced position and will extinguish when the system is reset.

Common Fault Amber Common Fault Indicator, which is pulsed when a monitoring circuit in the panel detects a fault condition. This indicator is steady when the internal sounder is muted.

Supply Healthy Green Indicator, which is constantly illuminated when a mains supply is connected to the panel.

Zone Fault/Test/ Disabled Amber Indicator (per zone), which is illuminated when the relevant zone is in fault condition and extinguished when the fault condition clears. The indicator is illuminated steadily when the relevant zone is open circuit, or in test mode and will pulse when, either disabled, or if a detector is removed and is also used during Programing mode.

ARW Amber Indicator which is illuminated steadily if there is, or there has been, a failure by the processor to execute its software correctly**.** It is only extinguished when the unit is reset. A pulsing ARW indication, with a fast warbling sound, is an indication of an internal memory corruption.

Disabled Amber Indicator which is pulsed when one or more zones are isolated, or if sounders or remote contacts are disabled.

Detector Removed Amber Indicator which will pulse in tandem with any zone fault indicator where a detector has been removed. The indicator will also pulse when the system is in detector removal test mode.

Test Mode Amber Indicator which is illuminated when the system is in test mode. The circuit under test will also have a fault indicator pulsing.

Sounder fault Amber Indicator which is pulsed when one or more sounder circuits has a short circuit fault. The Indicator will illuminate steadily if a sounder circuit has an open circuit fault. This indicator will also pulse in sounder walk test mode and if the sounder circuits are disabled.

Program Mode Amber Indicator which is illuminated when the control panel is in programming mode.

Earth Amber Indicator which is illuminated when any of the control panel wiring has an incorrect connection to the building earth.

PSU Amber Indicator which is illuminated if there is a fault with the power supply.

Controls and Indicators (contd)

Remote Signals Red and amber Indicators which show the status of the remote signal output circuits. When illuminated, the fire or fault signals are active.

Remote Signals Faulty / Disabled Amber indicators which are illuminated if there is a fault on the remote signal circuits, or if they are disabled.

Any internal indications and controls are provided for the use of a qualified engineer only and for this reason are included in the Instruction Manual.

EXCEL-K CIRCUIT DESCRIPTIONS AND WIRING DETAILS

1. MAINS CONNECTIONS

Cabling should be in accordance with BS 5838 Part 1 :1988 and should be routed into the cabinet through the 20mm knockouts provided at the bottom of the enclosure, nearest the mains terminal block.

If this is not possible, then measures should be taken to ensure that the mains cable is segregated by at least 50mm from any low voltage cable and secured with suitable clips and ties. Ensure that the mains supply is derived directly from the main bus bar and not from a secondary circuit and is isolated by a red, lockable, fused, isolator, suitably identified. Ensure that a suitable earth termination is made to the mains terminal block, this is classed as the main safety earthing point. A brass earthing block is provided for termination of earth conductors from low voltage circuits i.e. zones & bells etc.,

2. POWER SUPPLY PCB (EXCEL-K PSU ISS2)

AC The transformer secondary connects to the AC input terminals at the bottom of the PCB, this is nominally 28V AC at 3amps load. i.e. 84VA. The transformer has an internal temperature safety fuse rated at 130 degrees C. Failure of this fuse will require replacement of the transformer.

EARTH The psu has an earth connection point provided. This is not a safety earth, but a reference point for the earth fault monitoring circuit. The earth monitoring will normally detect both positive and negative leakage to earth from the 28V DC supply to a value of about 30 Kilo-ohms.

BATT The battery connections provide output to charge 2 x 12V sealed lead acid batteries up to 7Ahr capacity, connected in series to provide 24V DC. Due to the intelligent monitoring of the power supply, no voltage will appear at these terminals without a battery connected. To set the charging voltage the battery should be disconnected and the voltage should be checked at the 28V DC Output terminals with all normal loads connected. The voltage should be set to 27.6V +/- 0.2V.

If a mains supply is not available, press the battery start button to power up the panel on batteries only. If a mains supply is present batteries will be connected automatically. The battery is fused via a 5 amp 20mm glass quick blow fuse.

OUTPUTS

1 and 2 Independently fused 3 amp outputs, nominally 28V DC, to provide power to the main alarm circuit board. 2 outputs are provided to comply with EN54 requirements if used as a remote power supply. Fuses are 3.15 amp 20mm glass quick blow.

PSD & PSC Power supply data and clock outputs, which provide intelligent fault signal data.

12V 12V DC supply output 500mA rated (unfused) for auxiliary purposes.

EXCEL-K CIRCUIT DESCRIPTIONS AND WIRING DETAILS

3. MAIN DETECTION CONTROL PCB (PCEXCEL-KM ISS 2)

Terminal Connections

ZONE 1 TO 8 Terminations for fire alarm detection zones (and alarm sounder circuits in the case of the TWIN version). On the conventional version, detector removal monitoring is selectable via programing, either by schottky diode or by zenner clamp method. Standard default will revert to schottky diode method. Refer to your detector data for details. The zone circuits are designed to be compatible with a wide range of detection equipment and operate at a nominal 24V DC. The end of line resistor value is 4k7 Ohms.

Zone parameters. Short circuit = 0 to 60 ohms. Fire = 61ohms to 1k0 (nominal 470R). Quiescent (normal) = 1K3 - 5k0. Open circuit = 5k0 to infinity. Each zone will monitor up to a detector load of 3.5mA before compromising the open circuit threshold.

On Conventional and "Twin" type circuits a 500mA fuse is fitted ,this is a quick blow nanofuse. A small pair of pliers should be used to lift out this fuse element. Replacement elements are supplied with the panel and are also available from the supplier ref. FNANO-0.5, from R.S. Components ref. 843-352 or Farnell ref. 508-688.

Refer to drawing no S1590 for connection details of Twin zone.

COMMS Connections for RS 485 network. To include repeater and sounder driver circuits.

IP1 P Precinct or class change input. Short to ground (0V) to activate all sounders.

IP2 S Remote silence alarms input. Short to ground (0V) to silence sounders.

IP3 R Keyswitch input. Short to ground (0V) to activate control buttons.

OP1 FLT Switched negative output, common fault signal (programable)

OP2 CFR Switched negative output, common fire signal (programable)

OP3 0V Switched negative output (programable)

OP4 0V Switched negative output (programable)

Aux1 / Aux2 Double Pole Auxiliary relay contacts, fused at 1 amp quick blow nanofuse. Use a small pair of pliers to lift out the fuse element. Replacement elements are supplied with the panel and are also available from the supplier ref. FNANO-1.0 or from R.S. Components ref. 843-374 or Farnell ref. 508-690. The aux. contacts may be programmed for specific responses as required.

REM FR Remote fire output, monitored. Reverse polarity sounder output type circuit for use in signalling remote apparatus. Short and open circuit monitored and fused at 1amp. This circuit is isolated by the remote isolate function. It can also be re-programed as a conventional bell circuit if required.

REM FLT Remote fault output, monitored. Reverse polarity sounder output type circuit for use in signalling remote apparatus. Short and open circuit monitored and fused at 1amp. This circuit is isolated by the remote isolate function. It can also be reprogrammed as a conventional bell circuit if required.

EXCEL-K CIRCUIT DESCRIPTIONS AND WIRING DETAILS

SNDR1/ SNDR2. Reverse polarity sounder output type circuits. Short and open circuit monitored. Fused at 1amp. These circuits are isolated by the sounder isolate function and can also be programmed for any required operation..

Installation

The control panel is simple to install and commission, if the following precautions are observed. Do not attempt to install or commission the panel until this manual has been read and understood.

It is assumed that the system, of which this control panel is a part, has been designed by a competent fire alarm system designer, in accordance with BS 5839 Part1: 1988 and any other local codes of practice that are applicable. The design drawings should clearly show the positions of the field devices and the control equipment.

The panels, like all electronic equipment, may be adversely affected by extreme environmental conditions. The position chosen for the installation should therefore be clean and dry, and not subject to high levels of vibration and shock. In general, ambient temperatures should be in the range of 5°C - 40°C and the relative humidity below 95% (non condensing).

Note: The control equipment circuit boards contain static sensitive devices. Suitable precautions must be taken when handling circuit boards or components. Use of static shielded bags is recommended for handling of loose circuit boards.

Cabinet

Ensure that the enclosure is fitted to a flat surface. Packing washers may be required to ensure that the box is not distorted.

The lid may be removed by withdrawing the hinge screws and disconnection of earth link wire and the key-switch wires. Take care to note the terminal connections of the key-switch wires for reconnection.

20mm knockouts are provided, which may be removed by carefully tapping out with a hammer and drift. The use of cabling glands is recommended.

Hold the back box assembly in the required position against the wall and mark the position of the two upper fixing holes, which are provided with keyhole slots for ease of fixing.

Fixing centers are 330mm wide by 235mm high. There are 4 fixing holes. The bottom two fixings must be fitted after the enclosure is supported on the upper two.

Cables and Field Devices

Before connecting panel or devices, the wiring should be tested for insulation and continuity. Once any components are connected, a high voltage tester, such as a megger, must not be used on any circuitry but low voltage multimeters may be used.

EXCEL-K CIRCUIT DESCRIPTIONS AND WIRING DETAILS

Commissioning

Warning: The control panel may be damaged by removing and/or inserting circuit boards, modules or interconnecting cables, while the unit is energised. Switch off all power if carrying out such operations **i.e.** mains supply **and** batteries.

It is recommended that the control panel is powered up and tested before connection of field devices as follows. Ensure all end of line resistors (4k7) are fitted to all circuits in the panel (as supplied). Do not connect batteries at this stage. Apply mains power and check output voltage of power supply at "28V DC Output" is at 27.6V DC +/- 0.2VC. Connect batteries. Enter code 1234E to enable keypad, then press Reset to clear ARW fault. Supply Healthy indication should be on. If a battery fault is present, this should clear within 1 minute. If any abnormal faults are indicated, investigate and rectify before connecting the external wiring.

Commissioning Mode

The panel can be placed into a one man walk test commissioning mode. With "Keyswitch Enabled", place P.MOD switch 'ON'. Enter user code 1234E and then press 'Test Mode' button. All zone fault lamps will pulse. Any alarm on any zone will cause the sounders to sound briefly. The panel will attempt to reset the zones. When successful a second brief pulse on the sounders will occur to show all clear. Press reset to exit mode. Switch P.MOD switch 'OFF'.

INTERNAL INDICATIONS

Batt. Amber Indicator which is illuminated if there is a fault with the system batteries.

Mains Amber Indicator which is illuminated if the AC mains voltage is not present.

Volts Amber Indicator which is illuminated if the power supply voltage is incorrect.

Rx / Tx Red and Amber Indicators which show status of communications when the control panel is connected to network devices. The Tx led shows that data is being sent and Rx led shows that data is being received.

INTERNAL CONTROLS

ADJUST VOLUME Adjust volume of fault tone by rotating small potentiometer.

PMODE Switch on to enter engineer programing mode.

PROGRAM Factory use only do not switch on.

Battery Start Press switch to first energise control panel from batteries when mains supply is absent.

EXCEL-K CIRCUIT DESCRIPTIONS AND WIRING DETAILS

ADJUST VOLTAGE Adjust voltage of power supply to 27.6V by rotating small potentiometer.

Earth Amber Indicator which is illuminated when any of the control panel wiring has an incorrect connection to the building earth.

PSU Amber Indicator which is illuminated if there is a fault with the power supply.

Remote Signals Red and Amber Indicators which show the status of the remote signal output circuits. When illuminated, the fire or fault signals are active.

Remote Signals Faulty / Disabled Amber indicators which are illuminated if there is a fault on the remote signal circuits, or if they are disabled.

Any internal indications and controls are provided for the use of a qualified engineer and for this reason are included in the Instruction Manual.

THREE WIRE CIRCUITS (Not for 'Twin Wire' panels)

A typical 3 wire circuit is shown on Dwg No. S1594A, connected into zone 8. This method of wiring does not meet current standards for new systems, but may be suitable for upgrading existing certain installations.

'Twin Wire' control panels are not suitable for 3 wire operations.

Three wire circuits may contain 'old', or relatively unsuitable equipment so care should be taken when connecting in these circuits.

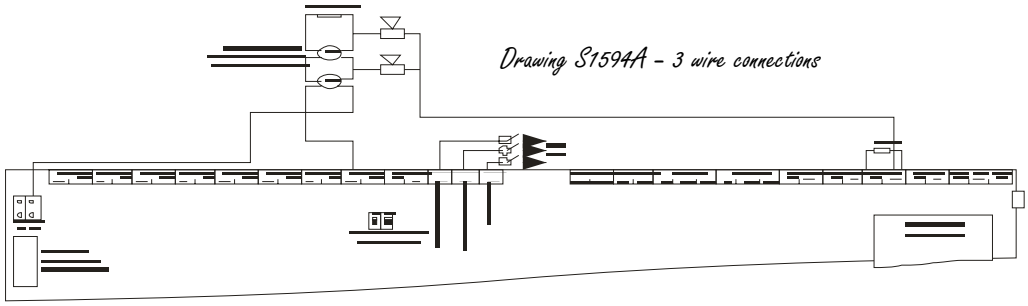
CAUTION: Ensure all solenoids, relays and sounders fitted to the circuits are polarised and suppressed with back EMF diodes. It is recommended that old heavy current sounders are changed to light current. Maximum sounder load on the total 3 wire system is 1 Amp.

The following modifications must be made for the circuit to function correctly:

1. The detector removal monitoring must be turned off on the zone used for the 3 wire circuit. **Refer to Programming.**

2. The detector zone must be configured for **short = fire unless** the circuit is compatible with short circuit monitoring i.e. call points are fitted with a 470 ohms series resistor. **Refer to Programming to change if necessary.**

3. The sounder circuit is not monitored, therefore a 4K7 resistor must be fitted to the sounder circuit terminals in the panel.



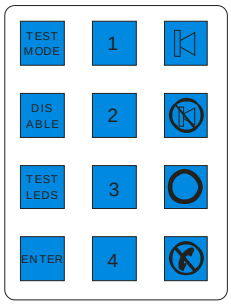
Drawing S1594A – 3 wire connections

EXCEL-K OPERATING INSTRUCTIONS

EXTERNAL CONTROLS : KEYPAD OPERATION

NORMAL USER MODE LEVEL 1-2

TO ENABLE (ACTIVATE) KEYPAD SWITCH ACTIVATE CONTROLS KEYSWITCH TO "ON"



EVACUATE

SILENCE

RESET

ISOLATE REMOTE

Control Panel Keypad

EVACUATE, SILENCE, RESET: All function immediately when pressed (providing the keypad is enabled).

ISOLATE REMOTE: Press to disable remote fire fault outputs as well as auxiliary contacts. To re-enable contacts and outputs, press Isolate Remote again, when keypad enabled.

TEST MODE: ONE MAN WALK TEST: Ensure “Activate Controls” is ‘ON’ and press ‘Test Mode’ button. Zone 1 fault LED will illuminate to indicate its selection for test mode. When a zone is in Test Mode, activating a call point or detector will cause a brief pulse on the alarm sounders to confirm activation. The panel will attempt to reset the device. When successful, the alarm sounders will pulse again to indicate all is clear. Subsequent pushes of the ’Test Mode’ button will shift the test to the next zone. Only 1 zone may be tested at a time. When the last zone is passed, the panel will go to Detector Removal test. This verifies whether Detector Removal is functioning correctly. If a detector is removed from any circuit the sounders will give a brief pulse and then pulse again when detector is replaced. **Note:** Due to special filtering routines, removal detection can take up to 20 seconds. Finally the panel will enter bell walk test mode. This pulses the bells every 10 seconds to allow verification of sounder operation throughout the installation. **If you need to disable the sounders during testing the Disable Sounders function needs to be selected before the Test Mode is selected.**

If a fire signal is received on any zone, other than the detection zone under test, then the alarms will sound as normal.

DISABLE: Press to enter disablement edit mode (providing keypad is enabled). Disablement of zones and sounders is possible.

When disable is pressed a fault light will appear on zone 1 and the PMODE LED will illuminate. This indicates that you are in edit mode.

To isolate (disable) a circuit move the indication to the required circuit using the disable button.

When you reach the desired circuit press ‘Enter’ to disable it. The zone Fault LED will now pulse rapidly. Press the reset button when all circuits for disablement have been selected.

To Re-enable a circuit press ‘Enter’ when at a fast pulsing Fault LED. The indication will return to steady when the circuit is normal. A slow pulsing Fault LED indicates any circuits currently disabled.
To exit edit mode press ‘Reset’

EXCEL-K FAULT FINDING

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 Fault Battery Fault	Mains failure/fuse failure Battery disconnected or open circuit. Fuse F7 failed Voltage too high (>30V) or too low (<19V)	Check supply/fuse Check battery/fuse Adjust to 27.6V
System Fault	Earth Fault	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	Sounder Fault	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
Test Mode + Zone Fault or Detector Removed	N/A	System in Test Mode	Reset system to exit test mode
ARW	N/A	Illuminates when panel is first powered up. Internal microprocessor has auto Reset due to spurious power surge/interference	Reset panel. If condition persists, consult supplier
Zone Disabled	N/A	Zone isolated	Re-instate zone (refer to Programing if necessary)
System Fault + buzzer Warbling	L10 only	Loss of communication with Repeater 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 re-program panel. If this fails consult supplier

EXCEL-K FAULT FINDING

General (contd)

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 Rx and Tx 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 programing data corruption the control panel displays a SYSTEM FAULT and the buzzer emits a ‘broken’ warbling tone.

EXCEL-K TECHNICAL DATA

Mains input voltage; 230V AC 50-60 Hz (Harmonised) +10% to -15% compliant with BSEN54-4: 1997 for fire alarm power supplies.

Nominal system voltage 24V DC

Batteries sealed lead acid up to 7Ahr 24V

CURRENT CONSUMPTION FIGURES

CONTROL PANEL	**CONVENTIONAL**		**TWIN TYPE**	
EXCEL-K size	**Standby**	**Alarm**	**Standby**	**Alarm**
2 zone	115mA	210mA	91mA	224mA
4 zone	125mA	220mA	99mA	238mA
6 zone	135mA	230mA	107mA	252mA
8 zone	145mA	240mA	115mA	266mA
12 zone	165mA	270mA	135mA	286mA
16 zone	175mA	270mA	143mA	300mA

Detector zones
Voltage 17- 28V DC
Quiescent Current 3.5 mA each
End of line value 4k7 Ohm
Schottky diode or zenner clamp detector removal monitoring

Sounder circuits
17-28V DC reverse polarity monitored.
Sounders must be polarised and suppressed
End of line 4k7 Ohm
Output current Main circuits 1 amp per circuit
'Twin' 500mA per circuit
Max shared sounder load 2.5 amps
Note: Remote power supply can be used when greater sounder loads are required. Maximum shared load per PCB: 8 amps.

Fuses
Mains 2A ceramic (HBC)
Battery 5A 20mm glass, quick blow
Supply 3.15 20mm glass, quick blow
Zones 500mA nanofuse, fast acting
Sounders 1A nanofuse, fast acting
Auxiliary contacts 1A nanofuse, fast acting

Outputs
Switched negative outputs 200mA @ 28V DC

SUITABILITY
Conventional:
Smoke/Heat Detectors : Nittan - Sensortec, STB-4D schottky base
: Apollo - Series 60, 45681-201 schottky base
: Hochiki - CDX range, YBN-R-4SK schottky base
: " - CDX range, YBO-R-5ZD zenner base
Call Point : KAC - WR2072-SR 470
Sounders : Use polarised and suppressed, light current 24V DC electronic sounders or bells (Besson, Fulleon Synchrobell etc.)

EXCEL-K TECHNICAL DATA

SUITABILITY (contd)

'Twin Wire':

Smoke/Heat Detectors	: Apollo - Series 60, 45681-202 Base
	: Hochiki - CDX range, YBO-R-5PA Base
Break Glass Call Points	: WR2013-SR polarised, 470 Ohms
Sounders	: Use polarised and suppressed, light current 24V DC electronic sounders or bells (Besson, Fulleon Synchrobell etc.)

SURVEYOR – EXCEL-K REPEATER PANELS

INSTRUCTIONS

GENERAL

Up to 8 Repeater Units may be connected to an EXCEL-K Control Panel. The Repeaters utilise an RS.485 data comms link. The link is via a 2-core cable which may be up to 1000 metres in length. It is recommended to wire in a 3-core screened cable i.e. Belden type or a fire resistant cable if the sounder circuits in the Repeater are to be used. The Repeater is available with 8 additional sounder circuits, if required.

OPERATION

A Repeater Panel has full controls which operate via the keypad (**see** pages 2–5 of manual). The test mode and disable functions are not available at the Repeater Panel. All engineering program functions for the outputs are available on the Repeater Panel (**see** pages 11–5 of manual).

INSTALLATION AND COMMISSIONING

The Repeater Panels are installed in exactly the same way as the main Control Panel (**see** pages 6–9 of manual). Obviously no zone circuits apply, unless the sounder circuits are fitted. Once the Panel is installed, a setting up procedure is required to ensure correct operation of the 'comms'.

SETTING UP

Prior to connecting the 'comms' it is necessary to ensure that each Repeater is set with a unique "address". Power up a Repeater and without any 'comms' connected set up the Repeater "address" as described on page 5 of the Programing Instructions. This must be done to each Repeater on the system. When all units are programed the system should be powered down and all 'comms' cables connected. Then power up the Master followed by each Repeater in turn. A maximum of 8 Repeaters can be addressed by the Master Panel. The Master Panel requires no programing to accept the Repeater.

Note: The first repeater will be address '0' which is the default setting for repeaters and thus no further programing is required. If further repeaters are used, then they must each be set with a unique address. The first is '0', the second is '1', the third is '2' etc.

REPEATER INSTRUCTIONS (contd)

TO SET A REPEATER ADDRESS:

On Repeater:

a) Activate Panel controls keyswitch

b) Switch P.Mode (Dil switch 2 'ON'

c) Enter Engineer's Code (1 2 3 4 E)

d) Enter Panel Options Code (2 1 2 3 E)

e) Zone 1 indicates address of repeater

f) Increment address in binary to required setting using key 1

g) Press 'Reset' to enter and turn P.Mode 'OFF'

Once all settings are correct, the Panels should fall quiet and Tx and Rx LEDs illuminate (pulse) to show communications are in order. Indications and controls will function correctly.

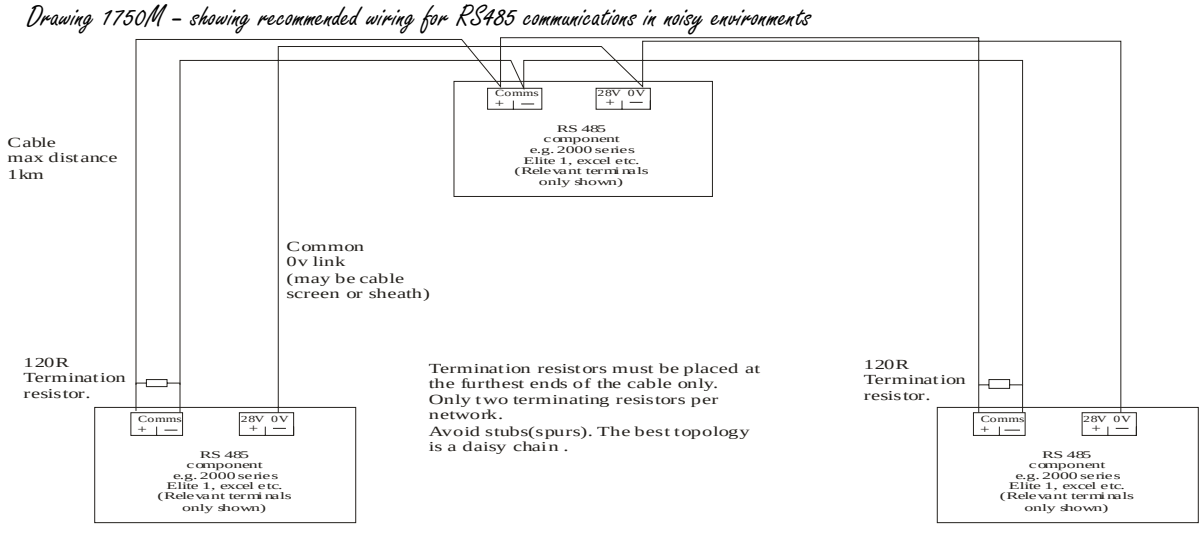
INDICATIONS

A fault on the Master Panel will be displayed on all Repeaters as 'Common Fault' and zonal indication as relevant. All local faults are displayed on the panel of origin. If a 'System Fault' and no other indications are present, it will be necessary to visit each unit to discover the origin of the fault. A communications error is given by a pulsed warbling 'tone' and may be caused if a unit is switched 'OFF' or addressed incorrectly.

PROGRAMING

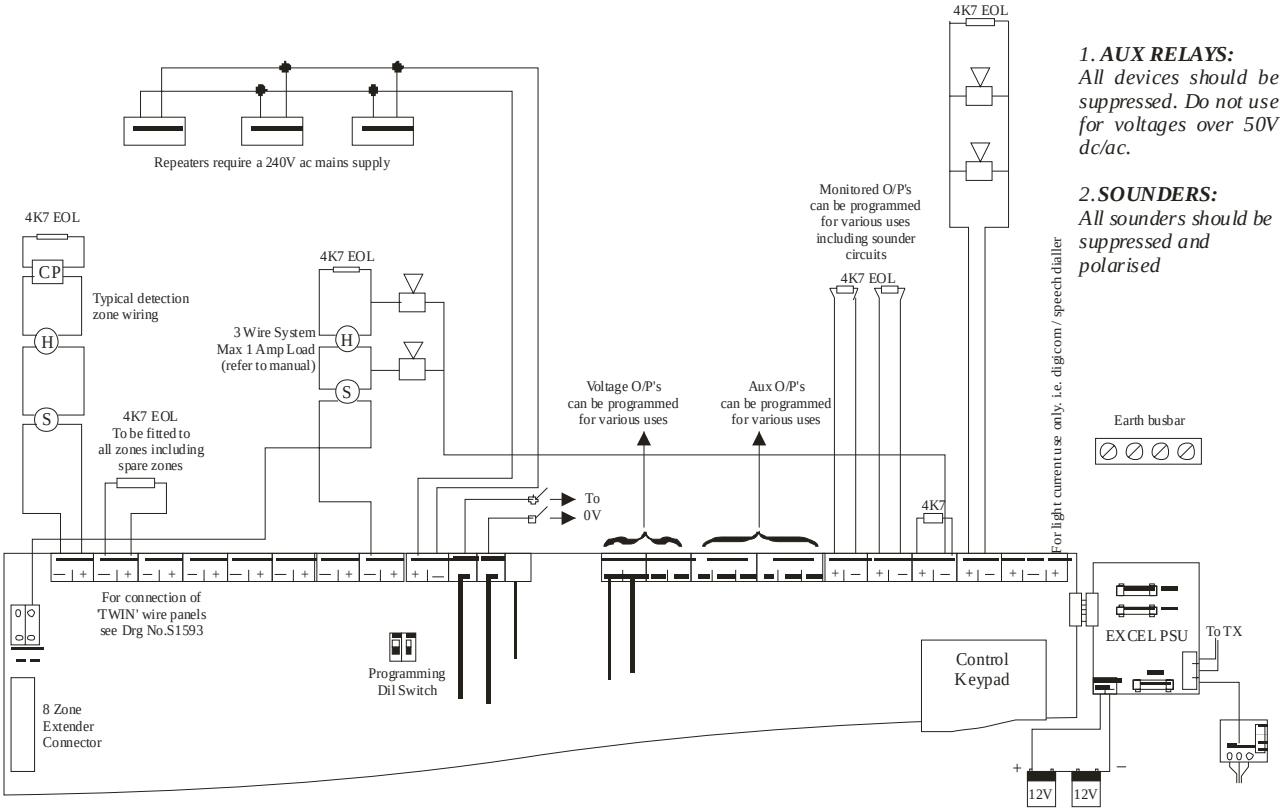
Programing of Repeater outputs and sounder circuits is identical to the programing of the Main Panel. See relevant chapter in programing manual.

Drawing 1750M – showing recommended wiring for RS485 communications in noisy environments



Recommended cables in order of preference
1) Beldon 9842 (using 1 pair as 0v link)
2) Beldon 9841 (using drain wire as 0v link)
3) 3 core Fp200 cable (using 3rd wire as 0v link)
4) 2 core Fp200 cable (using earth wire as 0v link)

Drawing S1594B - showing general wiring schematic for FCPXLK-2 to FCPXLK-16



*1. **AUX RELAYS:***
All devices should be suppressed. Do not use for voltages over 50V dc/ac.

*2. **SOUNDERS:***
All sounders should be suppressed and polarised

Drawing S1593 - showing Twin Wire zone connections