

THE SENTINEL 4

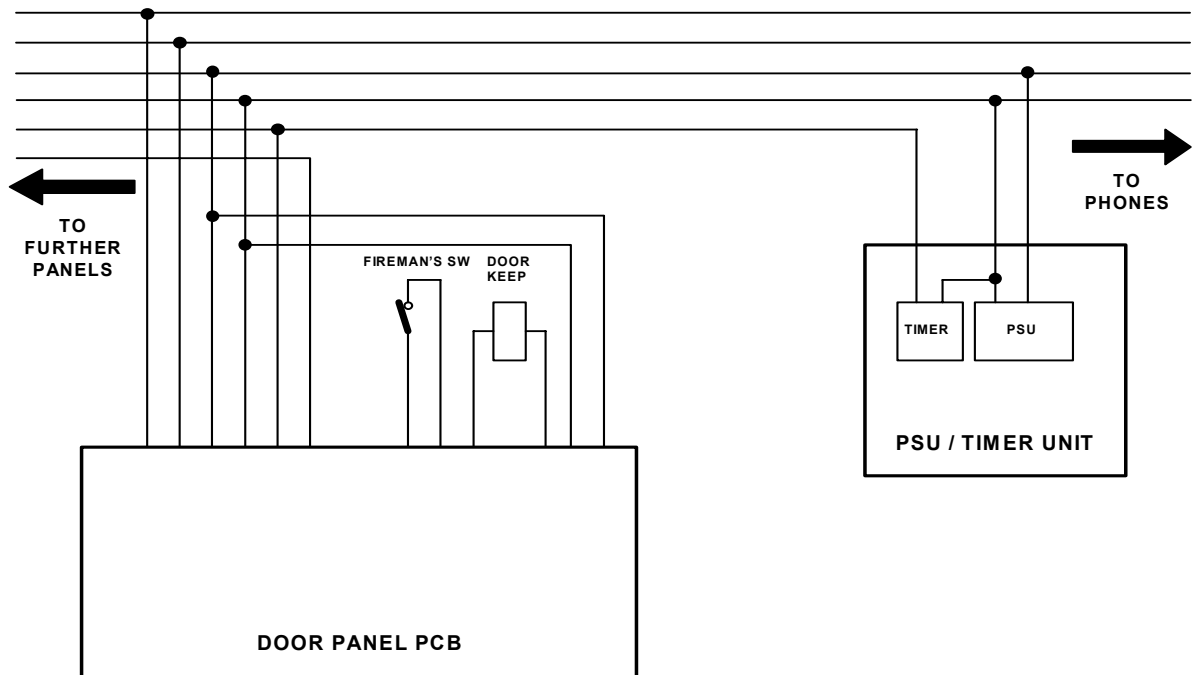
Introduction

The Sentinel 4 is a modern, microprocessor controlled door entry system providing a flexible set of features within an economical, easy to install design.

Main Features

- Digital systems of up to 1000 phones or functional systems of up to 14 phones.
- Any number of door panels.
- Full line isolation option available.
- Simple door panel and phone wiring (without use of 'private' wires). Ideal for system upgrades.
- Large alphanumeric display, standard on digital systems, optional on functional systems.
- Compact power supply/timer unit.
- Alphanumeric capability. Numbers can include the letters A to F.
- Simple 'Concierge' facility.
- Flexible trades entry options.
- Door Open Indicator capability.
 - Audio and video phone options.

Typical System Connections.



A complete installation consists of three (or four) main units :-

1. A Power Supply/Timer Unit (P.T.U.).
2. One or more door panels.
3. The phones.
4. One or more line isolation units (optional)

Power Supply/Timer Unit

A 5A fused 240V mains supply is required. Should timed trades entry facilities be required, the timer, a TS365 BST/GMT self correcting 24 hour / 7 day / 5+2 day LCD clock is contained within this unit.

The 12Vdc power supply unit is available as a 1, 2, 3, 5 or 7 amp output versions all with back-up battery facility. The correctly rated unit must be used according to the size and loading of the system to be powered.

Door Panel Wiring

Each door panel has two main connector blocks. 'System Connections' carries all the connections common to all panels and 'Lock Connections' all the connections specific to each door. Some of these connections are optional, depending on the system requirements. A detailed description of each connection follows.

0V	Power supply common.
12v	12V nominal positive power supply.
Up	Audio signal from panel to phones.
Down	Audio signal from phones to panel.
Trades	Trades enable. Optional. Connected to 0V by the timer in the Power Supply/Timer Unit (P.T.U.) if timed trades entry facilities are required. For more details see the section on Option Switches.
S. In Use	System In Use. When a call is made, the panel being used pulls this line low. This signals to any other panel on the system that the system is busy. Other panels show 'BUSY' if they have indicators and no further calls can be made until first one is finished.
Conc.	Concierge. Optional. When this line is connected to 0V by a switch, all calls on the system are routed to one special phone. The switch is normally fitted on this phone, but it can be fitted to the P.T.U. if required.
D.O.I.	Door Open Indicator. Optional. If D.O.I. option phones are used then a 0V connection to this line will indicate on each phone that an access door is open. The connection to 0V is made by wiring on the 'Lock Connections' block, see below.

- Door Open Sw Optional. If the D.O.I. option is required then these two pins must be wired to a switch in the door frame. This switch needs to be o/c when the door is closed and s/c when open.
- Fireman's Sw Optional. If emergency services key access is required then a normally closed switch should be connected to these two pins. This switch is normally fitted in a special box near the panel, to which the emergency services hold a key. When the switch goes o/c, a normal timed door open period is triggered. If this facility is not required, these two pins may be left o/c.
- Emergency open Optional. This connection provides another method of opening the door in an emergency e.g. a fire alarm. While this line is held at 0V the door will be unlocked. If this facility is used on more than one door panel then the power supply used must be rated to operate all the door keeps continuously.
- Fail Safe Lock If the door is fitted with a fail safe lock, i.e. one that needs to be de-energised to open, it should be connected to these two pins.
- Fail Secure Lock If the door is fitted with a normal fail secure lock, i.e. one that has to be energised to open, it should be connected to these two pins.
- Lock Supply These are the connections to the PSU for the lock. The PSU should be of the correct voltage and current rating for the door keep used. Often a 12V keep is used and the PSU can be the same as that used by the rest of the system. It is normally advisable to use a separate cable pair back to the P.C.U. but with low current keeps and short cable runs it may be possible to link these two pins to the supply pins on the system connectors.
- Note. **All** DC locking devices should have standard back emf suppression diodes fitted across the coils.
- Aux Connector. Proximity data pair from the reader to the controller and a coaxial connection from the on-board camera to the remote monitor/s.

Phone Wiring

Each phone has 4 connections, 0V, 12V, Up and Down (DOI optional 5th) and they should be simply connected in parallel with each other and back to the door panels. Either 'star' or 'chain' methods may be used to achieve this unless line isolation is used which will then require all entryphone cables (typically 6 core alarm cable) to be run back to the isolation card. Telephone style IDC connectors are used for speed of installation.

If DOI option is used then a fifth parallel connection needs to be made to the terminal marked 'DOI'.

The phones also have the capability of operating a 'strobe', typically a flashing xenon lamp, when the phone rings. This is connected to the 12V and Strobe terminals if required.

Phone Coding

Each phone needs to be 'coded' with its number by cutting links on the PCB. The method of coding depends on whether the system is 'functional' or 'digital'.

Digital Systems

Each phone is allocated a 3 digit number, consisting of a hundreds, a tens and a units digit. Each digit has a group of 4 links cut according to the following table.

	8	4	2	1	
0	I	I	I	I	where I = intact link X = cut link
1	I	I	I	X	
2	I	I	X	I	
3	I	I	X	X	
4	I	X	I	I	
5	I	X	I	X	
6	I	X	X	I	
7	I	X	X	X	
8	X	I	I	I	
9	X	I	I	X	
A	X	I	X	I	
B	X	I	X	X	
C	X	X	I	I	

For example:- Flat number 107

Hundreds = 1
Tens = 0
Units = 7

H T U
XXXI III XIII

Flat number 53

Hundreds = 0
Tens = 5
Units = 3

 : :
 I I I I : I X I X : I I X X
: :
 H T U

Flat number 21B

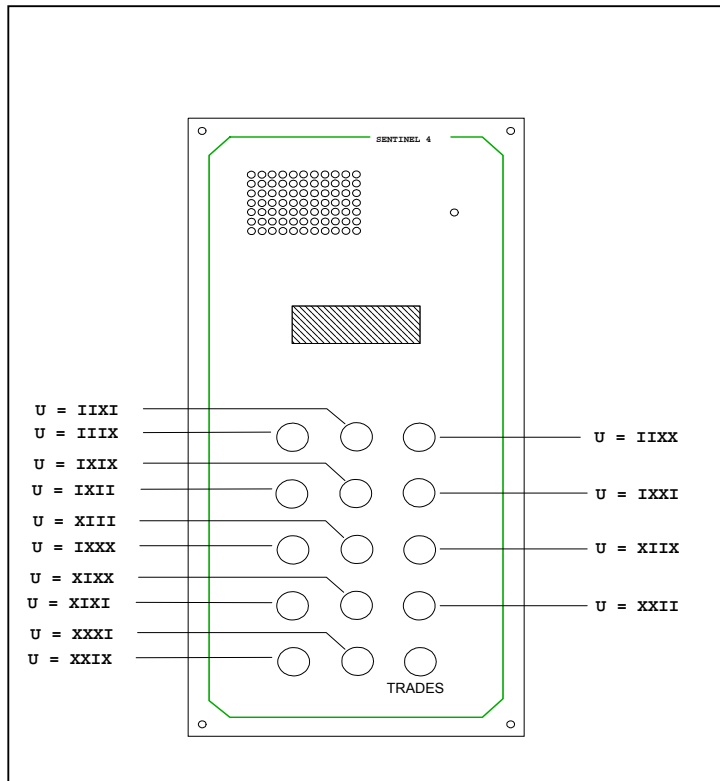
Hundreds = 2
Tens = 1
Units = B

 : :
 I I X I : I I I X : X I X X
 : :
 H T U

Functional Systems

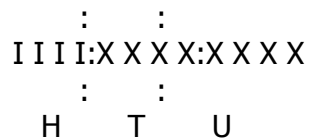
All the hundreds and tens links are left uncut. The remaining 4 unit links (U) are cut **according to the button position for that phone on the panel as indicated on the following diagram.** Note that this is not related to the number engraved on the panel.

Note also that the number of buttons on a functional panel varies from system to system. The diagram above shows the maximum possible.



Concierge Phone

If a concierge phone is used it should have its links cut as follows: -



Panel Option Switches

Each door panel PCB has an eight way DIP switch used to select the following: -

ring duration	10-40 seconds	switches 3/4
speech duration	10-40 seconds	switches 5/6
door open duration	5-20 seconds	switches 7/8
'trades' options		switches 1/2

Switch 1 - trades option

The way a door panel responds to a press of its trades button depends on the setting of this switch and the state of the trades enable line from the PTU according to the following table.

	trades enable o/c i.e. trades enable off	trades enable = 0V i.e. trades enable on
trades option = 0	No action. Display, if fitted, shows 'OFF'	Display, if fitted, shows 'codE'. The door will open only if the correct code is then entered.
trades option = 1	Display, if fitted, shows OFF, but the door will open if the correct code is then entered.	Door opens immediately

Switch 2 - code option

Two different code numbers are programmed in the panel. This switch simply selects which one is to be used.

One of the codes is a set firmware code while the other is a user programmable code of between 0 and 8 digits

The programming of this feature is as follows:

- 1 Set switch 1 to ON**
- 2 Set switch 2 to OFF**
- 3 Switch the power to the panel off and on or press the reset.**
- 4 When LED display shows d3.0 / f3.0 (or greater), press and hold the trades button. 'PROG' will be displayed.**
- 5 Enter your code of 0 to 8 digits. Nothing is displayed while you do this.**
- 6 Press the trades button, the display will momentarily read 'SET'.**
- 7 Privacy detect procedure. See below.**

To test the code, press the trades button and 'OFF' will be displayed. Enter your code. On the correct entering of the last digit the door will release. To remove the access code completely omit item 5 above.

Switches 3 & 4 - ring duration

Switches 5 & 6 - talk duration

These two parameters can each be set to 10, 20, 30 or 40 seconds according to the following table.

10 secs = 0,0 where 1 = switch up
 20 secs = 0,1 0 = switch down
 30 secs = 1,0
 40 secs = 1,1

Switches 7 & 8 - door open duration

As above but can be set to 5, 10, 15 or 20 seconds.

5 sec = 0,0
 10 secs = 0,1
 15 secs = 1,0
 20 secs = 1,1

For example if the requirement is for a 10 sec ring, a 30 sec talk time and a 15 sec door open time then switches 3 to 8 should be set as follows :-

3 4 5 6 7 8
 0 0 1 1 1 0

Note that the panel only checks these settings when it is powered up or reset. So if the settings are changed with the panel powered up it is necessary to press the RESET button on the panel for these new settings to take effect.

Privacy detect programming.

All panels can detect whether the entryphone is switched on or off. If the phone has privacy off, then it will operate as normal but if the phone has privacy on and is called from any panel, the panel will display 'OFF' and emit a different, broken "engaged" tone via the panel loudspeaker. Privacy detect will only work with entryphones pcb issue 1.5 or later and panel software revision 3.5 or later and requires enabling or disabling as required via a simple programming procedure at the panel as follows;

Follow code number programming procedure 1 to 6 as above.

- 7. Display will show "phon det"**
- 8. Press any key on the panel keypad to toggle the display between 'Y' and 'N'.**
- 9. Press the trades button and the display will show "SET", to store the setting.**
 Y (yes) will install the privacy detect function and N (no) will not.
Please note that the privacy detect feature will not work with entryphone pcb issue older than 1.5. The default 'N' setting at the panel must be used.

Panel Operation

When switched on (or manually reset) the panel will produce a warble tone for a few seconds to check that the audio amplifier is working. Simultaneously the display, if fitted, will show 8.8.8.8. to check that all the LED segments are working. When the warble tone stops and the display clears the panel is available for use. Any button press will be confirmed to the user by a beep.

The right-hand decimal point of the display is used to show the status of the Trades Enable timer. If illuminated it shows the Trades Enable is on.

The method of making a call depends on whether the system is 'functional' or 'digital'.

Functional

Simply press the button engraved with the required flat number. The call is immediately initiated and a ringing tone will be heard. The display will also flash 'CALL'. Any further button press of that number will restart the ring duration timer. Any other button press will cancel the call.

Digital

The required number is entered digit by digit and the display shows the number as it builds up, shifting from right to left. If a wrong number is entered, it can be corrected by pressing 'CLEAR' and starting again. To enter a letter in the number (i.e. 29C) press the 'alpha' button until the required letter is displayed. When the display shows the required number, the call is initiated by pressing the 'CALL' button. The ringing tone will then be heard and the display will alternate between 'CALL' and the number entered. At any time pressing 'CLEAR' will end the call.

Once a call is initiated the phone in the called flat will ring. When the handset is lifted two way audio is established between the phone and the calling panel and the display will show 'thru'. If the person answering the call decides to admit the caller they press the key button on the phone. The door keep solenoid is then activated to unlock it and a sounder in the panel signals that it is unlocked. Two way audio is maintained until the end of the 'door open' timed period.

If either the 'ring time' or the 'talk time' exceed the times set by the option switches then the call is terminated. Also on digital systems the display will clear if no button has been pressed for approximately 30 seconds.

On multi door systems a call initiated on one panel will prevent a call being initiated from another panel. If they are fitted with displays they will show 'BUSY'. Also a button press at one of these panels will cause it to make a short beep every few seconds until the system is no longer 'busy'.

Both functional and digital panels can be programmed to recognise whether the entryphones have privacy switched on or off. Should you try and ring a phone with the privacy switched on the panel display will say 'OFF' and the reassurance tone will change to an engaged tone.

Phone Operation

When the phone rings lift the handset and talk to the caller. To admit the caller press the key button. Audio is maintained with the panel until the door is locked again. The

handset should then be replaced. If it is not replaced then the system can still be used, but that phone will not ring when called again.

The phones have a timed privacy facility. If the privacy button is pressed, a red LED will illuminate. With this on no calls can be received. To revert to normal operation press the privacy button again. If the entryphone is left switched off (i.e. privacy on) for an indefinite period then the privacy timer will automatically switch the phone back on (i.e. privacy off). This timed period is variable via a small jumper link located to the top right of the phone pcb and can be set to operate for 0.5, 1, 2, 4, 8 or 16 hours. Should you not require timed privacy at all, do not fit the jumper link.

Flashing beacons can be driven from the STB screw terminal found at the top left hand side of the phone pcb. This terminal drives to 0V when the entryphone rings, the other side of the beacon is connected directly to 12Vdc.

The DOI wire connects to the screw terminal labelled DOI. This wire is driven to 0V by the main entrance door contacts and when connected will illuminate the green LED on the phone.

Apartment Station Operation.

When the apartment station rings, speech can be obtained and controlled by pressing the 'talk' button on the unit. Speech is half duplex and is individually amplified within the station to produce a high output. Door release is obtained by pressing the 'door' button and audio remains latched on until the door is locked again. These operations can also be controlled with the optional infra-red remote control.

The station also has a timed privacy facility and terminals for driving flashing beacons and DOI LED's as the entryphone. This unit can be mixed and matched with the entryphone.

Connection to a standard telephone.

Interfacing to a standard BT type telephone can also be arranged via the TIU interface unit. This is particularly useful where hands-free operation is required by a disabled user and the entryphone system calls can be intercepted and controlled by the existing telephone or a cordless (preferably dect type) telephone.

Line Isolation Option

The optional line isolation cards are fitted between the panels and the phones. Each card will operate up to 8 phones. The cards may be fitted in any convenient location, either in a central location or distributed throughout the system. The cards continuously monitor each phone for faults. If a fault is identified then the responsible phone is disconnected and a red LED on the card will illuminate to show that there is a problem on one of its outputs. Should the fault clear then that phone is automatically re-connected. Also the 12V to each phone is supplied via resettable fuses. The cards have the following connections :-

Eight 4 way IDC blocks for the connections to the phones.

A six terminal block 'LOOP IN' for the connections from the door panel(s). The required signals from the panels are :- 0V, 12V, Up, Down, Busy and DOI. (The DOI connection is only required on systems with phones fitted with the door open indicator option.)

A six way terminal block 'LOOP OUT' to enable the 0v, 12v, Up, Down, Busy and DOI signals to be fed to the next line isolation card.

A 4 way IDC block for distribution of the DOI signal to the phones if required. Two wires may be fitted to each terminal.

Panel Fuses

Each panel is fitted with three fuses:-

1. Panel fuse. This fuse supplies the panel circuitry. The current consumption of a panel is approx. 70mA when idle, rising to 120mA during a call on a panel without a display or 200mA on a panel with a display. However the display automatically adjusts to the ambient light intensity, so in bright sunlight this current may increase to as much as 500mA.
2. Phone fuse. This fuse supplies 12V to the 'Phones' IDC connector. This connector provides a convenient point to start the 4 wire cable run to the phones. Each phone draws approx. 6mA quiescent, 100mA when ringing and 45mA during a call. If a strobe is used on a phone then its current should be added as well. Note that the connections to the phones can be taken from the panel 'system connections', but then there is no separate fuse for the phone network 12V supply.
3. Lock fuse. This fuse should be of a suitable rating for the type of lock solenoid used.

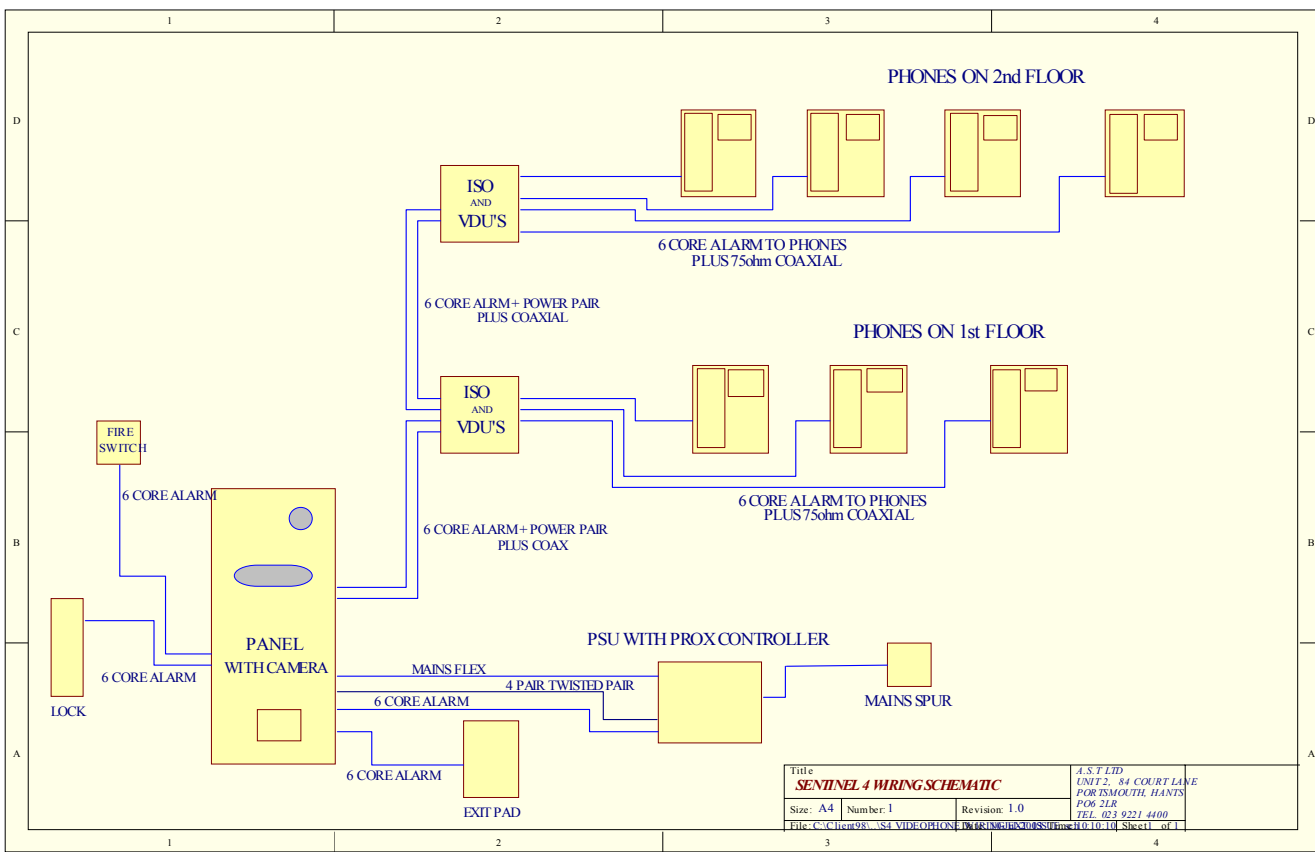
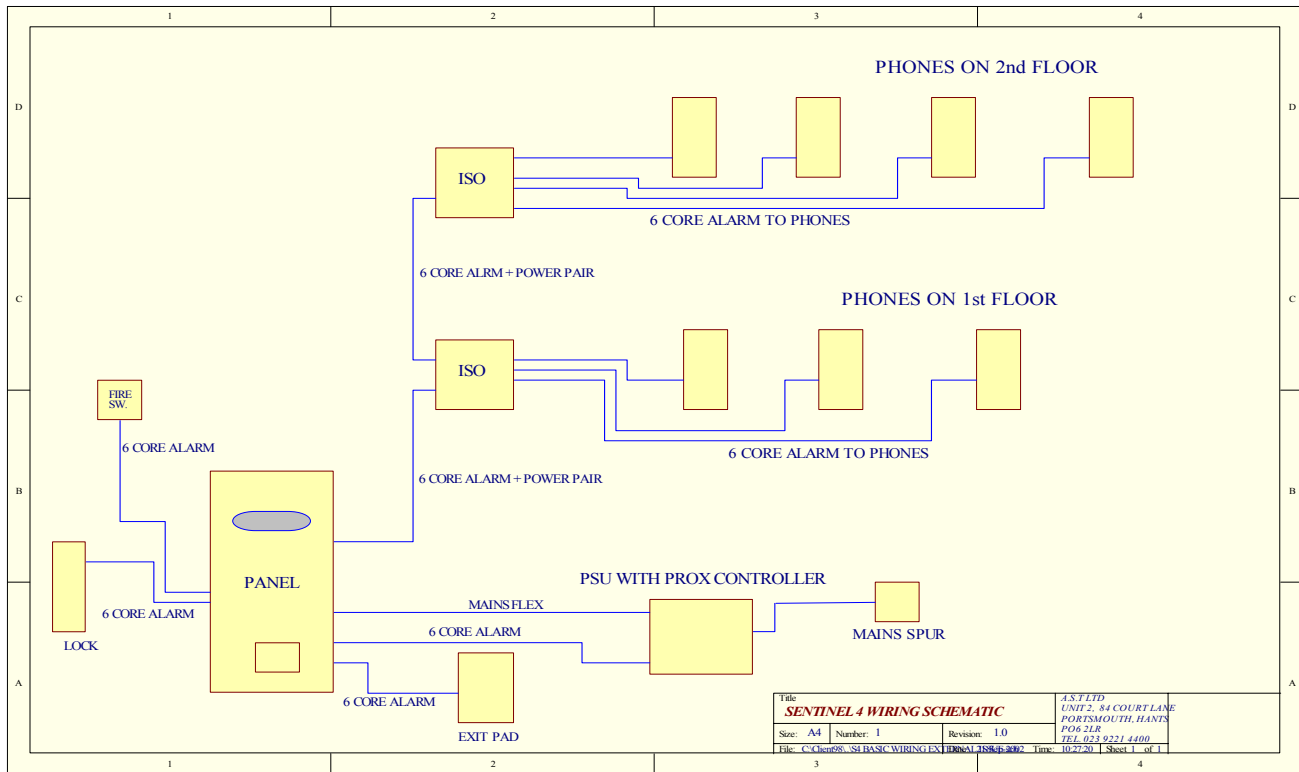
Theory Of Operation

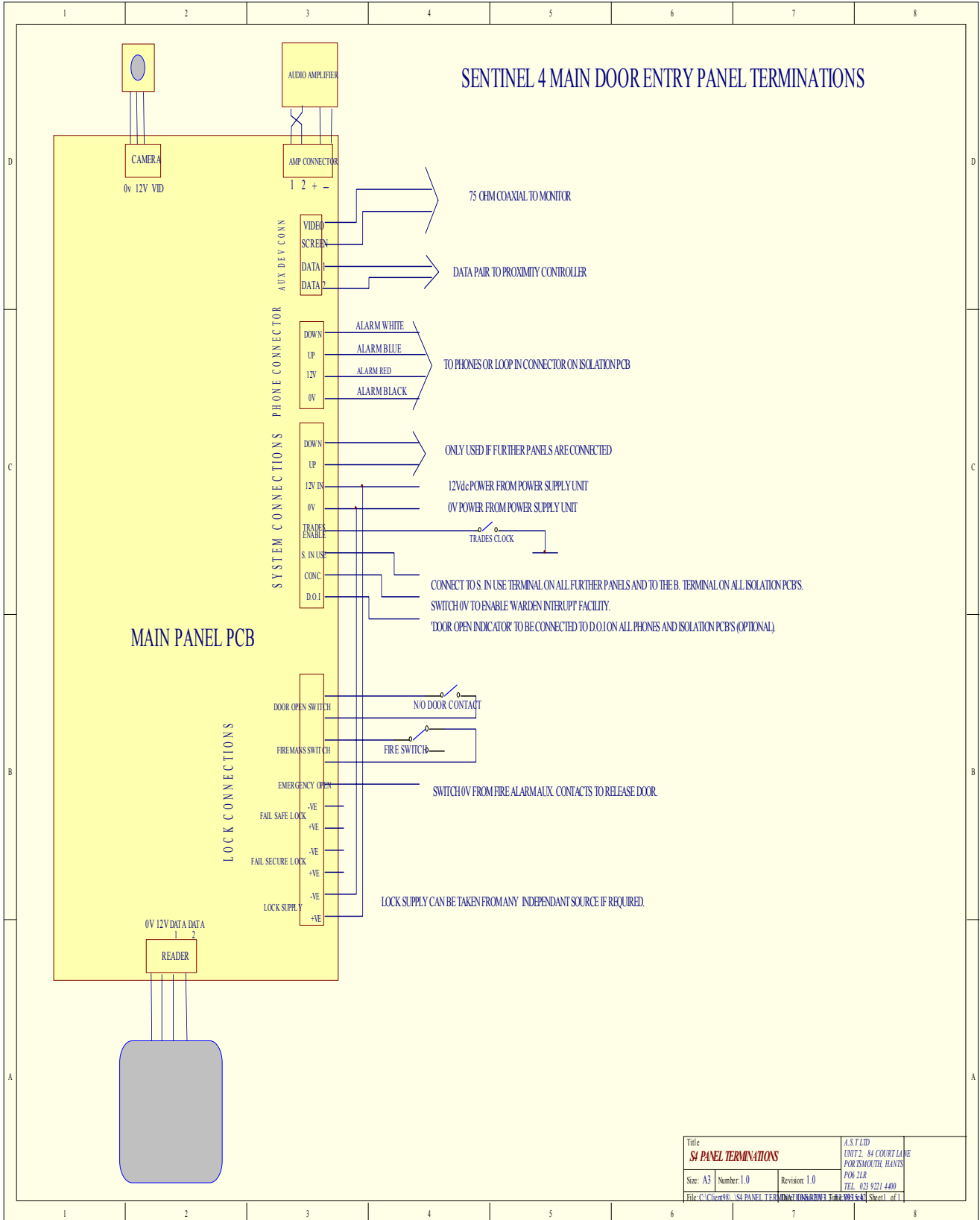
The audio system used requires separate wires for the signals from the panel to the phone (up) and from phone to panel (down). The phones also require a 12V supply and a common 0V connection. When a panel puts a call on the system it generates a 12 bit serial data word from the number entered, AC couples this onto a 12V DC bias and puts it on the audio up line. At the same time the ring tone is put on the audio down line.

Circuitry in each phone monitors the audio up signal for serial data. If a phone detects its own number it routes the ringing tone on the audio down line to its handset speaker, so the phone rings. If the handset is now lifted the speaker is connected to the audio up line instead, hence stopping the ringing. Also, as the speaker has a low resistance, the dc level of the up line drops. This is detected by the panel which stops sending the serial data and connects the panel audio amplifier, hence providing two way audio.

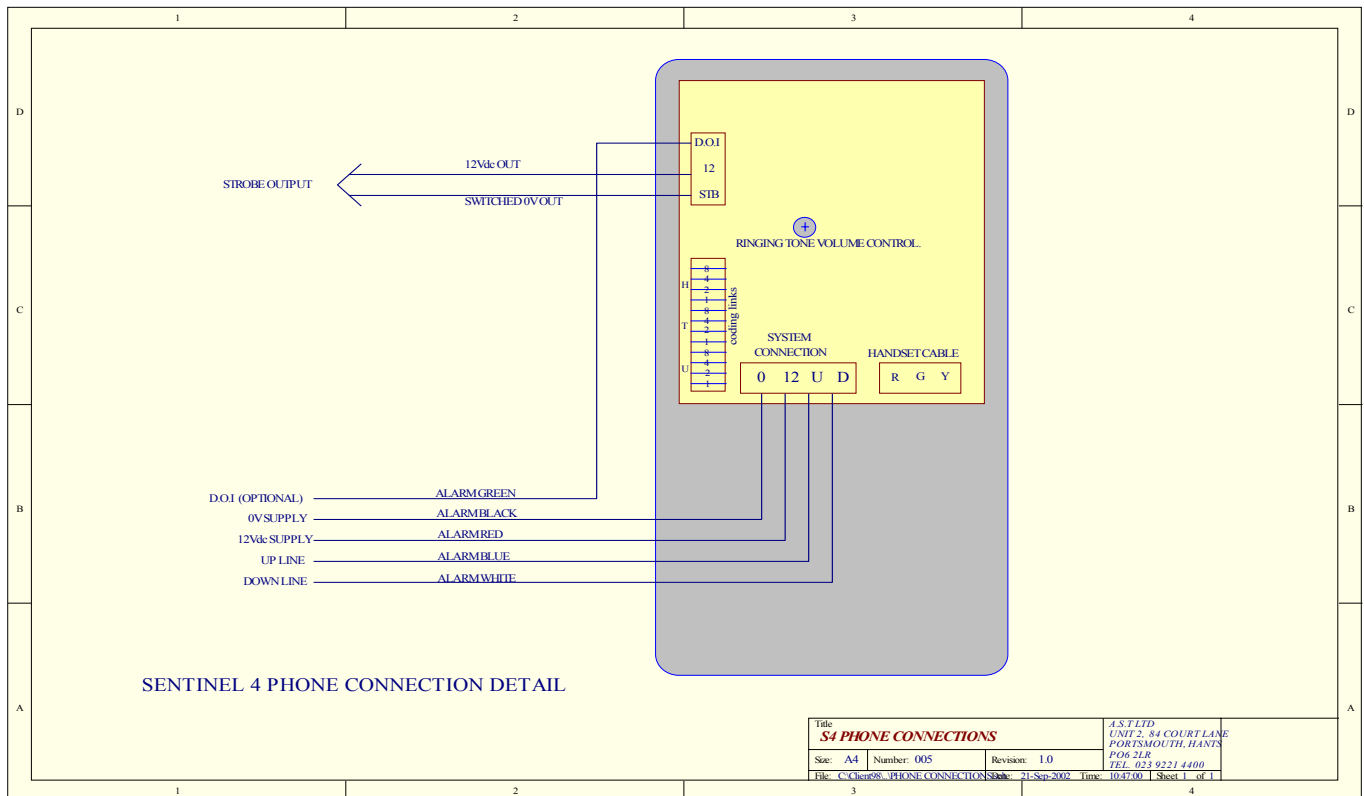
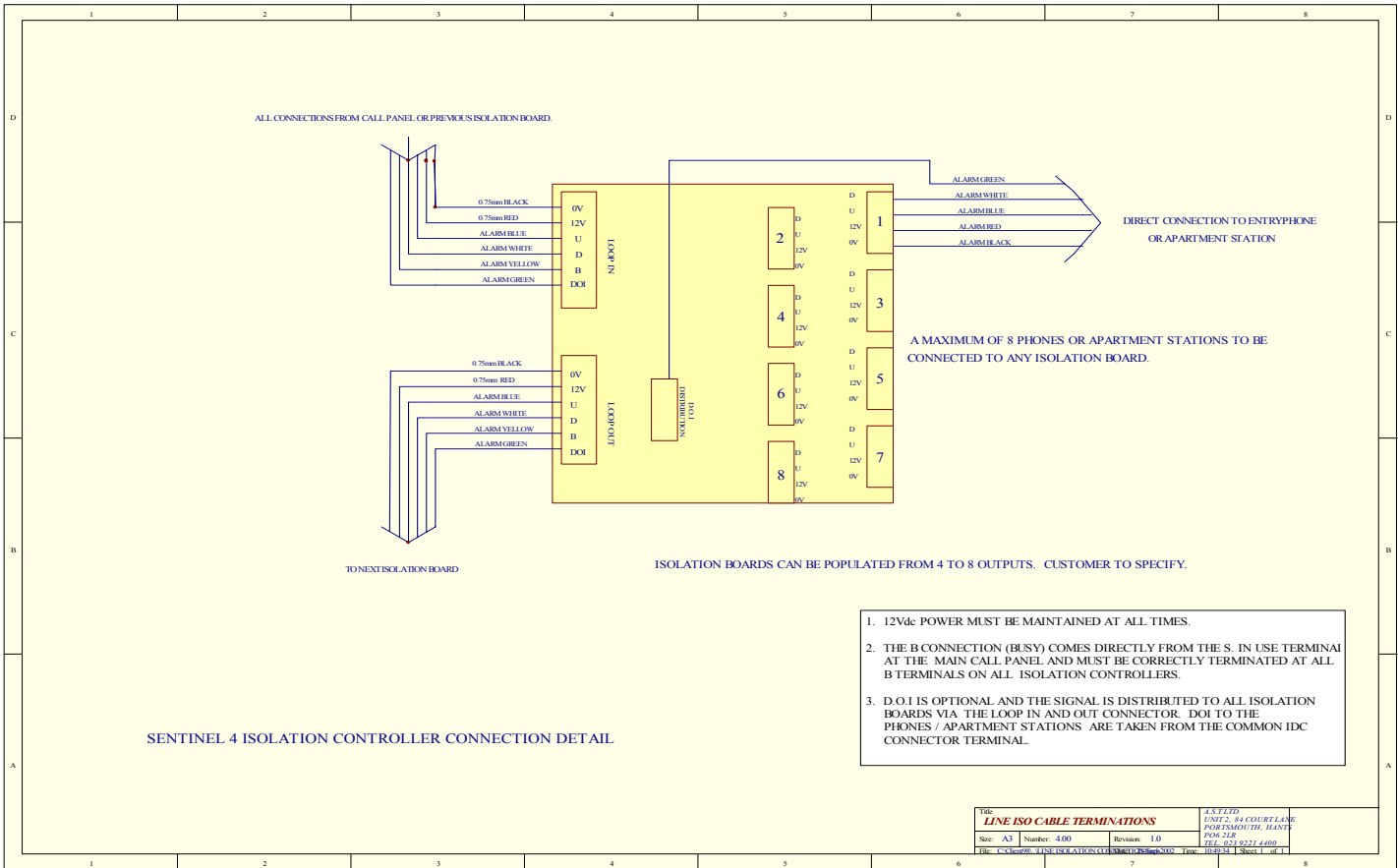
To admit the caller the 'key' button on the phone is pressed. This shorts the audio down line to 0V and the panel, when it sees this, opens the door. The software on the panel prevents a jammed 'key' button on the phone from opening the door. The 'key' button press must be for >100mS.

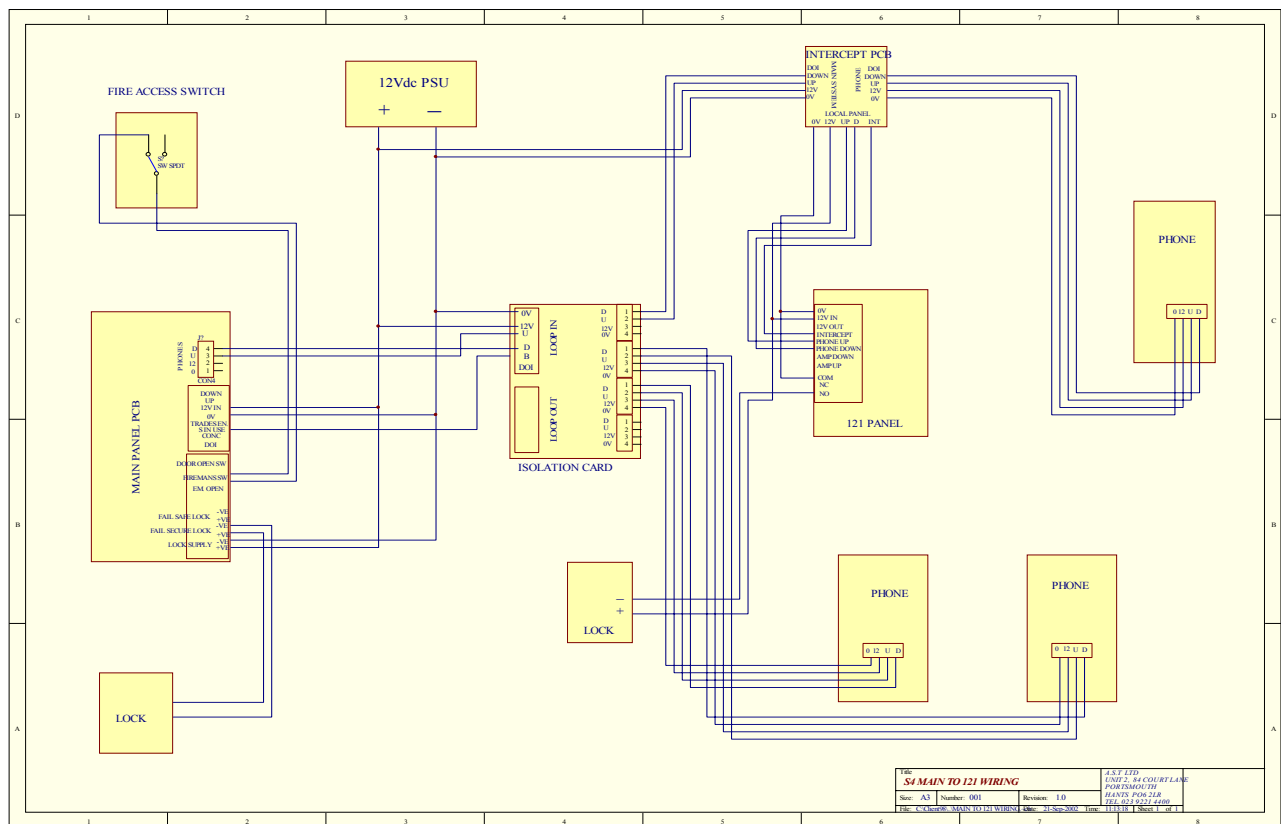
If the concierge facility is required then the 'conc' connection on the panels system connector should be tied to 0V. Panels will now send all calls to a phone coded as OFF in hex, whatever the number entered by the caller. Apart from this rerouting, calls proceed as normal.





Title SENTINEL 4 PANEL TERMINATIONS		A.S.T LID UNIT 2, 84 COURT LANE FORSMOUTH HANTS PO6 2LR TEL: 013 9221 4400	
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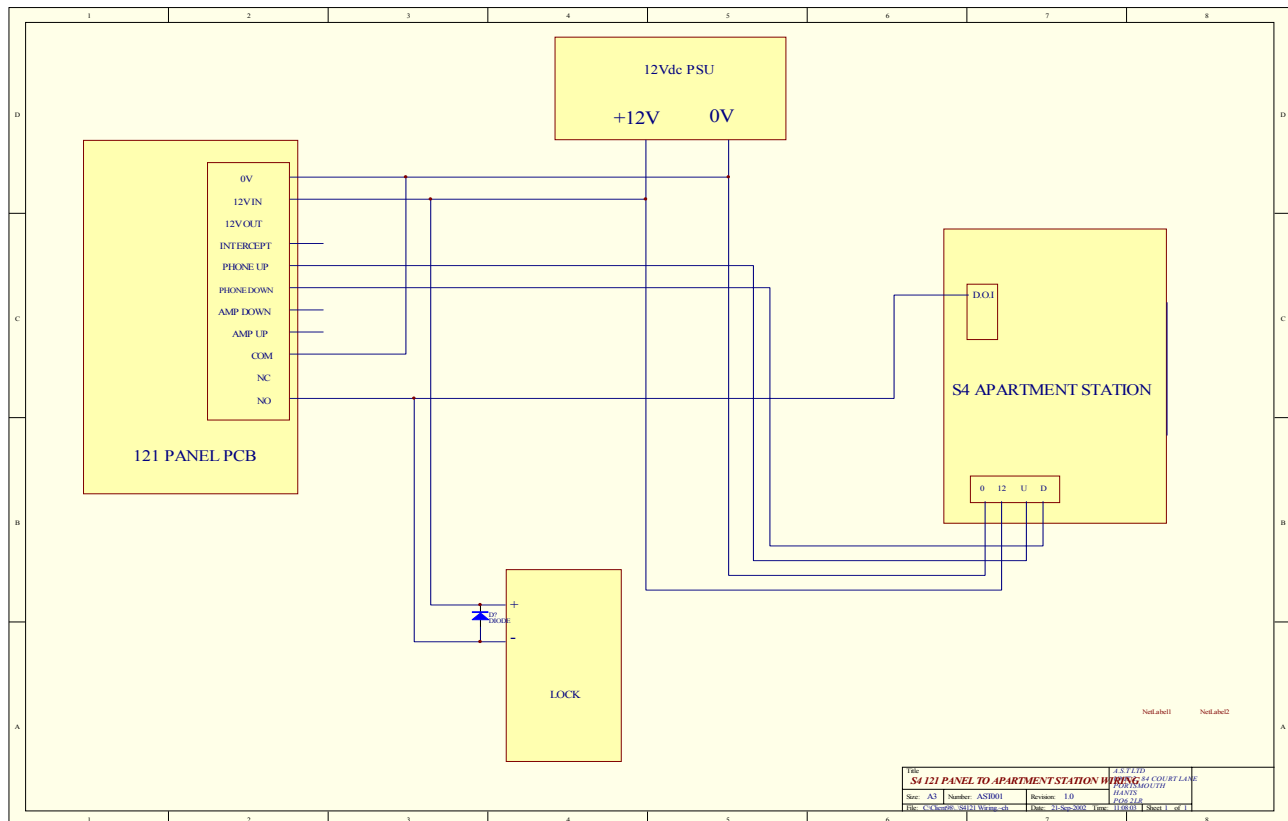
Sentinel 4 single button entry system.

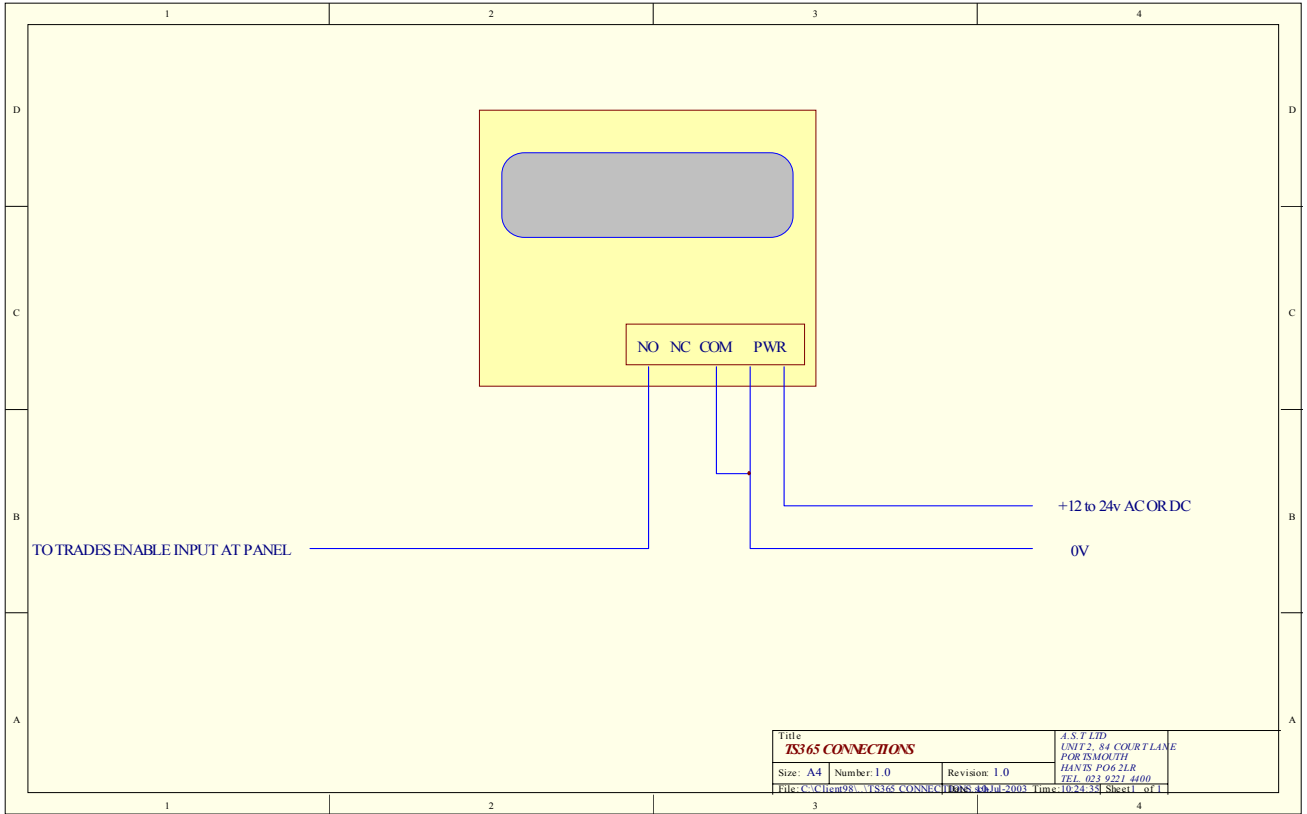
The single button call panels share the same technology as the main digital or functional panels and are manufactured from 316 grade stainless steel with flush fit or surface mount backbox options. All entryphones, apartment stations and/or telephone interface units can be used with all the same features and options as

previously mentioned. The single button unit has an internal sounder to give audible reassurance of ringing and door release and has 3 green LED's

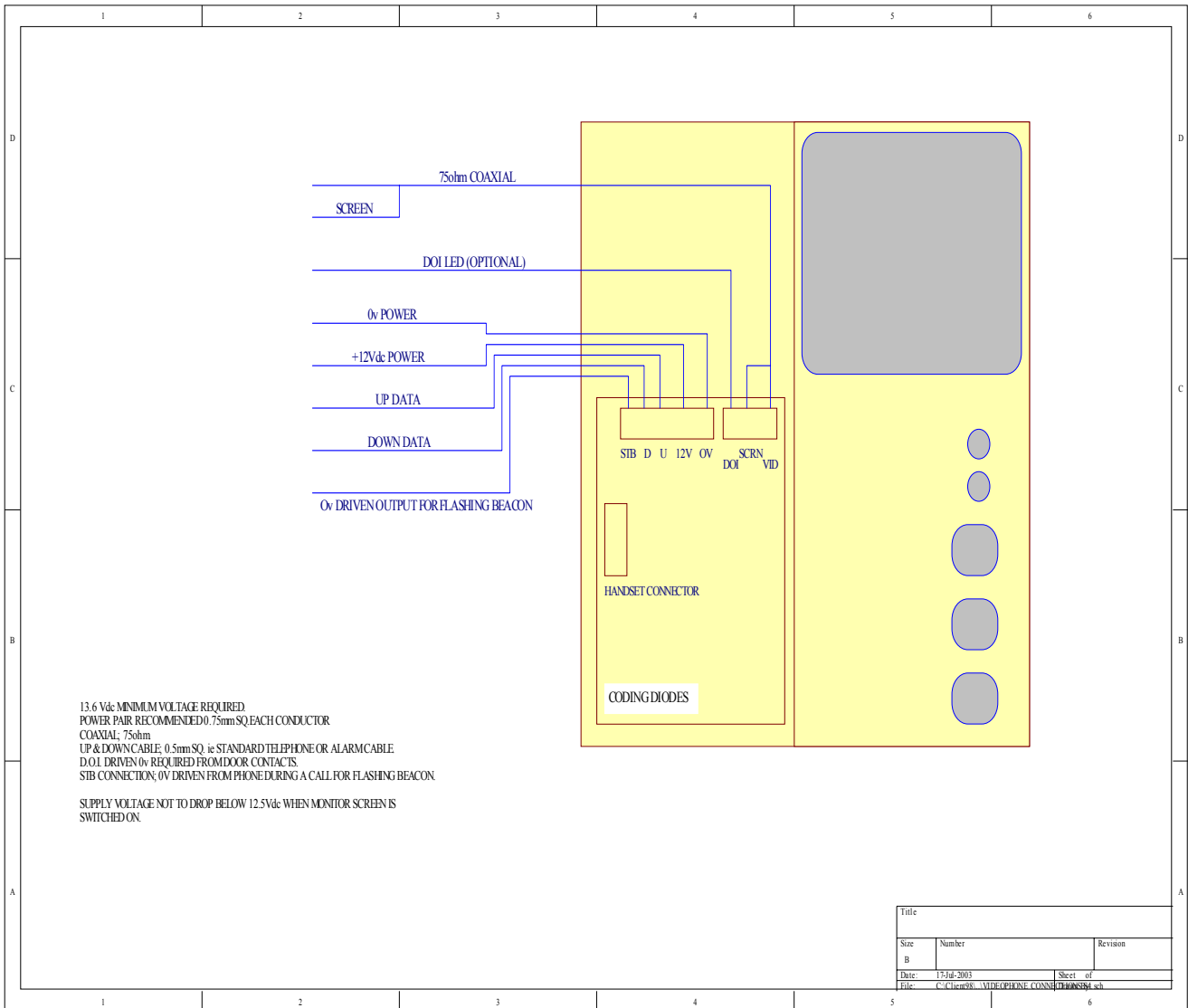
which illuminate when i. The entryphone is ringing, ii. The audio channels have been opened and iii. The door has been released. This unit can be interfaced to any main Sentinel 4 system to offer an individual sub-entry which will share the same entryphone / apartment station etc or can be installed as a totally separate stand-alone system. It is also available with the video-entry option.

Wiring is still based on the four common conductors 0, 12, U and D and can be configured as a multi-entrance system if required.





Title		A.S.T LTD	
TS365 CONNECTIONS		UNIT 2, 84 COURT LANE	
Size: A4	Number: 1.0	Revision: 1.0	FOR ISMOUTH
		HAVES POC-LR	
		TEL: 023 9221 4100	
File: C:\client\985\TS365 CONNECTIONS.dwg Date: 2003-10-24 Time: 10:43:33 Sheet 1 of 1			



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