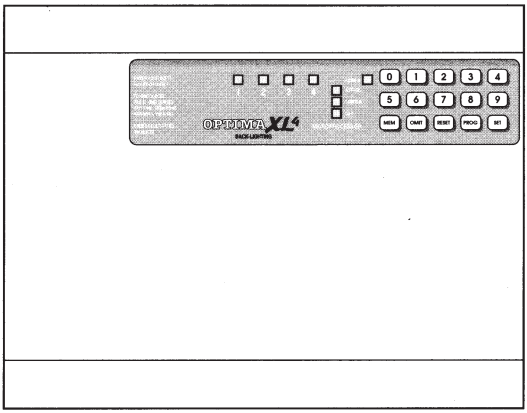
OPTIMA™ XL4

Intruder Alarm Control System - Engineering Information



1 2 3 4 5 6 7 8 9	Illuminated on board keypad
4z	4 zones plus PA and tamper
	Built-in internal sounder with control of low volume tones
OMIT	User may omit any zone
MEM 1	Memory recall for last alarm
1'–99'	Programmable timers including bell cut off
NVM	NVM for protection of engineer programme
Q SET	Quick set feature
	Intelligent auto reset and re-arm

Engineering Information

Specifications

Indicators	ZONES 1-4, DAY, TAMPER, ATTACK, POWER
4 Zones	Positive loop, dedicated functions
Tamper	Negative loop, internal sounders in Day Full alarm in Set
PA	Positive loop, always active
Bell Output	12V, adjustable timer (1-99 mins) or continuous
Strobe Output	12V latching
Extension Speaker	16Ω (2 max) 130mA each
Exit/entry Timers	Programmable 10 - 990 seconds
Zone Input Delay	250mS
Set +Ve Output	0V in Day (Sinking 30mA) 12V in Set (Sourcing 1mA)
Current Consumption	Standby 100mA Alarm 250mA
Low Voltage Output	13.8V dc stabilised (+/- 5%) up to 350mA
Rechargeable Battery	1.2 - 6Ah
Charge Voltage	13.8V dc (+/- 5%)
PCB Fuses	1.6A 20mm quick blow
Mains Input Fuse	160mA
Total Current Output	1 Amp
Mains Supply Voltage	240V ac
Cabinet Construction	3mm Polycarbonate
Dimensions	H 230mm W 290mm D 80mm

Installation Log

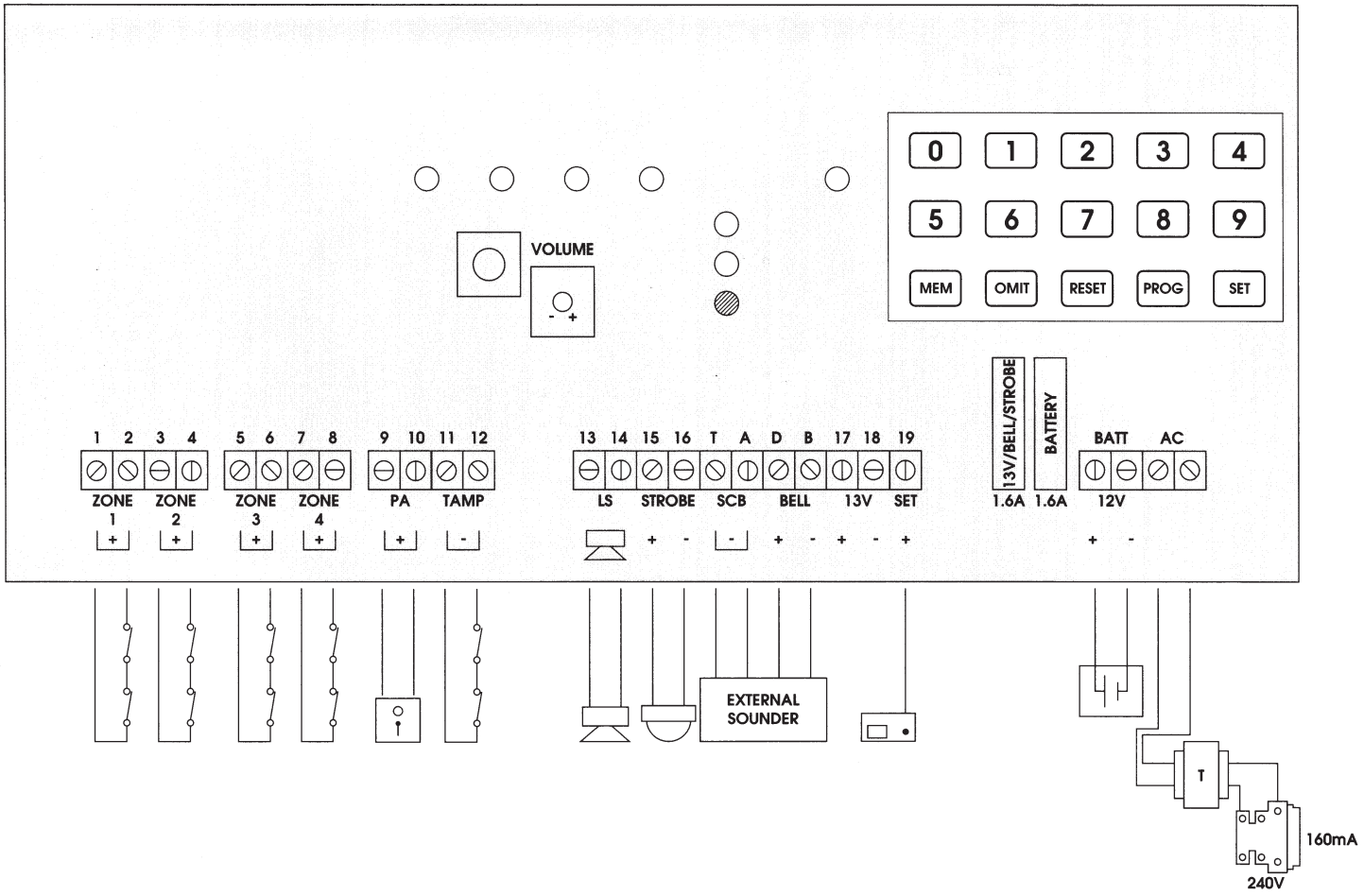
Site Address .....

.....

Contact Name .....

Telephone..... Date of Installation .....

	RESISTANCE	PROTECTION AND EQUIPMENT USED
ZONE 1		
ZONE 2		
ZONE 3		
ZONE 4		
PA		
TAMP		


0
1
2
3
4
5
6
7
8
9
MEM
OMIT
RESET
PROG
SET
VOLUME
1 2 3 4
ZONE 1
ZONE 2
5 6 7 8
ZONE 3
ZONE 4
9 10 11 12
PA
TAMP
13 14 15 16 T A D B 17 18 19
LS
STROBE
SCB
BELL
13V
SET
13V/BELL/STROBE
1.6A
BATTERY
1.6A
BATT AC
12V
EXTERNAL SOUNDER
T
160mA
240V

1. INTRODUCTION

The Optima XL4 is a microprocessor based, intruder alarm control system designed to comply with the installation requirements of BS 4737 1986/87.

Housed in a white polycarbonate case, the control panel is operated and programmed via an onboard 15 button keypad, which is illuminated for use at night or where the control panel is installed in an area of poor visibility.

A 4 digit user code is used to access the system. Any code number between 0000 and 9999 may be chosen and the code may be changed as often as required.

Please read through this manual and the Operating Instructions carefully before beginning any planning or installation work, checking that you fully understand every function of the system and its operation.

2. INSTALLATION

2.1 Installation Design

Carefully plan the position of each part of the alarm system and the cable runs. Detectors should be carefully sited with particular regard to the degree of coverage required and the function of each of the zones.

The control panel should be sited in a position which is out of sight but convenient for the user, and usually within the entry/exit route.

The location of the panel will depend on the overall layout of the building, but it is worth taking time to consider the convenience of a mains supply and the ease of access for alarm cables coming from various parts of the installation.

Finally note that the total current output of this control system (in alarm condition) is 1 Amp. Carefully calculate the total current consumption of every part of the system including the bell, sounders, strobes, and detectors to ensure that this rating is not exceeded.

2.2 Fixing

Remove the front cover from the control panel and unscrew the speaker wires from the LS terminals 13 & 14 and the transformer wires from the AC terminals. Carefully remove the Printed Circuit Board (PCB) by gently pushing down the holding clips and withdrawing it from the base.

Fix the base to the wall in a horizontal position using appropriate screws and wall plugs.

Note that the thin wall sections around the edges of the base may be cut away to allow cable entry, and large cable holes are also provided in the rear of the base.

On re-assembling the unit note that the LS and AC wires are not polarity conscious and may be connected either way round.

2.3 Wiring - Power Up

1) Check that the 7 factory fitted links are fitted into the PCB terminals at the positions marked.

2) Carefully fit the battery wires to the BATT terminals at the far right of the PCB, Red to + and Black to -.

3) Connect the battery. The system will now go in to alarm condition.

4) Enter the customer code (factory set at 0123). The alarm condition will cease and the TAMPER indicator will show.

5) Depress and hold down the tamper spring in the centre of the PCB and the system will go to Day mode. Press PROG and immediately enter the customer code (0123). The DAY and TAMPER indicators will now show and the tamper spring may be released.

6) The system is now in customer programming mode and it may now be carefully and systematically wired. Connect each of the zones, the PA, and the tamper circuits (series wired into the TAMP terminals 11 & 12). Finish by wiring any additional internal sounders, external bell/sounder, strobe and the 13V supplies.

7) Connect the mains supply following the recommendations listed and then refer to the commissioning section.

2.4 Mains Connection

The mains power should be connected using a 3 core cable of not less than 0.75mm^2 between the mains connector block at the right hand side of the base and a fused spur outlet mounted outside the control panel.

Use a 2 Amp fuse in the spur or at the distribution board.

WARNING

The mains supply should only be connected by a technically competent person and according to the current IEE wiring regulations.

2.5 Final Commissioning

When all wiring is complete and the mains supply has been connected, the red POWER indicator should be showing. Replace the front cover and press the RESET key. The system should go to Day mode, showing the green DAY indicator.

If any faults are present, refer to section 5 of this manual.

On completion of the installation and programming, the system should be thoroughly tested to ensure correct operation. Fill in the Installation Log at the front of this manual and retain it for future reference.

Finally explain the operation of the system to the end user, completing the Engineer Details section of The Operating Instructions.

2.6 Power Up Reset - Clear NVM

If the customer code has been lost or forgotten or in extreme circumstances, where a software crash has occurred, it will be necessary to clear the Non Volatile Memory (NVM) and return to factory set conditions.

1) Remove the mains supply and cause an alarm condition by removing the front cover.
2) Disconnect the battery. If self contained, the external sounders will now operate.
3) Remove all wires from terminal 9 (PA) and 19 (SET +).
4) Fit a wire link between terminals 9 and 19 and apply power.
5) The system will now power up with no alarm condition. Remove the wire link and replace the original wiring, checking that the ATTACK indicator goes off.
6) The indicators will now show in response to each of the zones and circuits as they operate. Refit the front cover checking that the TAMPER indicator goes off.

   When ALL of the zones and circuits become clear the system will go to Day mode and at that moment the NVM will be cleared and factory set conditions will apply.
7) The system may now be programmed, tested and re-commissioned.

3. PCB LAYOUT

The Connection Diagram at the front of this manual may be opened out for reference to the PCB information below.

3.1 Zones

As supplied, wire service links are fitted across each of the zones to represent a closed circuit. These are removed during installation as the zone wiring is connected, but their positions are marked for future reference with a ⌊⌋ symbol.

The majority of detection devices use normally closed contacts. These are connected together in a series loop across the required zone input. There are also a small minority of sensors that use normally open contacts (typically pressure mats). These should be connected in parallel together and finally wired between the required zone and the tamper circuit.

3.2 Zone 1 (Terminals 1 & 2)

This zone is *timed* and used to protect the main entry/exit door. Activating zone 1 whilst the system is Set will cause the entry timer to start and allow time to Unset the system.

The entry and exit timers are both separately programmable.

3.3 Zone 2 (Terminals 3 & 4)

Zone 2 is for protection of the route between the main entry/exit door and the control panel. When the system is Set the zone will activate the alarm, but it also has a *time inhibit* function.

This means that the zone will not operate during entry to the building after the entry timer has been started, and will allow access through detectors in order to reach the control panel.

Note that when zone 2 is not to be used as part of a prescribed entry route, and where the *time inhibit* function is not required, it should either be left linked or used for lower security areas e.g. perimeter protection.

3.4 Zone 3 & 4 (Terminals 5 & 6, 7 & 8)

These zones are *immediate* and will cause a full alarm condition if activated whilst they are Set.

As they have no dependency on entry/exit routes these zones should be used for protecting the most vulnerable areas of the property.

3.5 PA (Terminals 9 & 10)

Any quantity of normally closed type personal attack sensors may be wired in series and then connected to the PA circuit.

Operational in Day and Set, the PA circuit will cause a full alarm condition when activated. PA is indicated on the control panel as ATTACK.

3.6 Tamper Network (Terminals 11 & 12, T & A)

The tamper circuit is used to protect all cables and detectors on the system from unauthorised access including the control panel front cover.

The zone and PA tampers should be series wired and connected to the TAMP terminals 11 & 12. Terminals T & A are for the external bell/sounder tamper.

Tamper alarms which occur in the Day mode operate internal sounders only. Tamper alarms in Set cause a full alarm condition.

Tamper is indicated on the panel by the TAMPER indicator.

3.7 Internal Sounder (Terminals 13 & 14)

Mounted in the rear of the cabinet, the loudspeaker produces high volume alarm tones and low volume entry/exit fault tones.

Up to two 16 Ω extension speakers may also be wired across the LS terminals 13 & 14. Mounted in convenient positions within the installation the extension speakers will reproduce all of the alarm tones generated by the control panel.

A control marked VOLUME in the centre of the PCB may be used to adjust the low volume entry/exit tones to suit environmental conditions.

3.8 Strobe Output (Terminals 15 & 16)

Activated by all types of alarm condition, the STROBE output will continue to operate after automatic reset of the external sounders.

The output will also remain active after entry of the customer code and will not stop until the RESET key is pressed.

The strobe output is a 12V supply. Terminal 15 is permanently +Ve and terminal 16 is switched -Ve in alarm.

3.9 Bell Output

Terminals T A D B are for connection to the external bell or sounder. These terminals provide a power/hold-off supply, sounder trigger and tamper circuit to protect the external sounder housing.

The terminals are summarised as follows;

T - -Ve tamper return

A - -Ve supply (0V)

D - +Ve supply (12V)

B - -Ve sounder trigger

Where self contained/powered sounders are used, carefully follow the manufacturers instructions, matching each of the terminals to those above. ease of installation, ADE sounders and modules use the same T A D B terminals.

Where a discrete bell or sounder is used, it should be connected to terminals D & B. Terminals T & A are then used for tamper protection for the sounder housing.

3.10 13v Supply (Terminals 17 & 18)

The 13V output is to power detectors which require a voltage supply (PIR detectors etc). The supply is present at all times and may be used to supply a total load of up to 350 mA.

3.11 Set + (Terminal 19)

This output, marked SET + is used in conjunction with latching type detectors. The output becomes positive on correct Set of the system and is removed at the commencement of entry time or entry of the customer code.

3.12 Fuses

There are two fuses mounted on the PCB, both are 1.6A 20mm quick blow.

The fuse to the left protects the STROBE +Ve terminal 15, the BELL +Ve terminal D and the 13V +Ve terminal 17.

The fuse to the right is in the -Ve battery line and prevents excessive current being drawn from the battery. The fuse will also blow if the battery is inadvertently reverse polarity connected during installation.

3.13 Battery Back Up

It is essential that this control system is used with a rechargeable 12V battery. Any rechargeable battery in the region of 1.2 to 6Ah may be used, but the capacity should be chosen to suit the installation.

The BATT terminals should be connected to the system battery only, and must not be connected to any other battery or used for any other form of power supply or distribution.

4. SYSTEM DESCRIPTION

4.1 Operating The System

Day Mode This is generally considered as the period when the system is turned off, with only tamper and PA circuits being active. Day mode is indicated on the control panel by the green DAY indicator.

To Set the System From the Day mode, enter the four digit customer code. The sounder will produce a beep tone and the building can be exited. The system will Set as the tone stops.

Faults During Setting Faults are shown by the zone indicators, accompanied by a broken beep tone, one beep for zone 1, two beeps for zone 2 etc.

To Omit Zones Any of the zones may be omitted when Setting the system. After entering the customer code press the OMIT button, followed by the zone number(s) to be omitted. Selected zones will show their indicators. When selection is complete press SET and the exit tone will continue. A maximum of 3 zones may be omitted in this way.

To Quick Set Pressing SET during the exit period will cause the exit tone to stop and the system to Set within about 5 seconds.

To Unset the System Enter the customer code and the system will return to Day mode. If the alarm has been activated then entering the code will stop the alarm and the cause of the alarm will be displayed.

Press RESET to clear the indication and return to Day mode.

4.2 Keypad Tamper

During the Set and entry periods, attempts to incorrectly enter the customer code will operate the keypad tamper. Nineteen incorrect keypushes will result in a full alarm activation.

Factory Set Conditions

Customer Code	0123
Exit Time	30 seconds
Entry Time	30 seconds
Bell Duration	20 minutes

4.4 Auto Reset and Re-arm

In alarm condition the sounders will operate for the programmed bell duration. The sounders will then shut down but the strobe will continue to operate.

Each circuit is then scrutinised and if clear will be re-armed. Any circuit in fault condition is automatically omitted.

4.5 Non Volatile Memory (NVM)

The Optima XL4 uses an NVM circuit to retain all programmed information in the event of power fail, disconnection or system faults. And thereby provides the system with a high degree of security.

Where the customer code has been lost or forgotten it will be necessary to clear the NVM. This procedure is given in section 2.6.

Note that the 1 event alarm memory is not held in NVM.

5. FAULTS

Fault conditions are often the result of minor installation errors or misinterpretation of the equipment being installed. The following points outline the most common installation and commissioning faults.

1) As supplied and after an NVM clear, the customer code is 0123 and must be used during initial access to the system, programming etc.

   The engineer code is fixed at 9999 and can not be changed.

2) The Engineer Programme cannot be accessed directly from Day mode. It can only be accessed through the Customer Programme.

3) If a tamper or PA fault is present on the system, it will go to a lock out condition (showing the appropriate indication). The keypad will not produce any audible responses and the system will not operate until the fault has been found and rectified.

4) The most common cause of a zone not responding to detectors is incorrect wiring. Normally closed detectors must be wired together in a series loop before connecting into the appropriate ZONE terminals. Tampers are series wired in the same manner.

5) Where a permanent zone fault is showing and the loop resistance is found to be in order, the most probable cause is a short circuit between the zone wiring and the tamper wiring.

   When measured with a meter the resistance between the zone and tamper wiring should be infinitely high.

6) If totally lost as to the cause of a fault, remove ALL wiring from the PCB. Re-fit the 7 service links and test the system. Never fit links to any positions other than those marked on the PCB.

7) Before testing or replacing any fuses, ALL power must be removed. Fuses which fail continually are almost certainly the result of a short circuit or low resistance across the 13V supply (terminal 17), strobe output (terminal 15) or the external bell supply (terminal D).

   Remove all wiring and test for low resistances with a multimeter, by cross checking between each wire. Blown fuses are very seldom caused by faulty equipment.

8) Finally, whenever working close to the mains supply or connector, you should exercise extreme caution. Whenever possible isolate the mains supply before removing the control panel cover.

6. PROGRAMMING

The control system uses two distinct programmes. The Customer Programme is entered from the Day mode. The Engineer Programme is then progressively entered from the Customer Programme. The chart below shows the tests and changes available in each programme. After entering programming, each section may be accessed in any order, and as each is completed the system will return to programming again.

Customer Programming

TO BEGIN

From Day mode	DAY indicator showing.
Press PROG	All indicators show.
Enter the customer code	DAY and TAMPER indicators show.

The system is now in customer programming mode.

CODE CHANGE

Press [8]	ZONE indicators 1, 2, 3 and 4 show.
Enter new code (4 digits)	System bleeps twice and the DAY and TAMPER indicators show.

ALARM MEMORY RECALL

Press MEM	The last alarm will now be displayed for 5 seconds. The system will then bleep and the DAY and TAMPER indicators show again.

ALARM TESTS

Press [0]	DAY, TAMPER and ATTACK indicators show.

The system is now in the test routine

STROBE TEST

Press [2] [0] to stop

EXTERNAL BELL/SOUNDER TEST

Press [3] [0] to stop

LOW VOLUME INTERNAL SOUNDER TEST

Press [4] [0] to stop

HIGH VOLUME INTERNAL SOUNDER TEST

Press [2] [4] [0] to stop

WALK TEST

Press [5] [0] to stop

The internal sounder will now beep as each circuit is opened.

Press RESET to return to programming.
Press RESET again to return to Day mode.

Engineer Programming

TO BEGIN

From Day mode	DAY indicator showing.
Press PROG	All indicators show.
Enter the customer code	DAY and TAMPER indicators show.
Press PROG and enter 9999	DAY and ATTACK indicators show.

The system is now in engineer programming mode.

EXIT TIME

Press [1] ZONE 1 and ZONE 2 indicators show.

Enter the time required in 10 second increments, divided by10.
Eg. 10 seconds ÷ 10 = 1, so enter 01
20 seconds = 02
30 seconds = 03 etc
after entering the two digits the DAY and ATTACK indicators show.

ENTRY TIME

Press [2] ZONE 1 and ZONE 2 indicators show.

Enter the time required as with EXIT.
After entering the two digits the DAY and ATTACK indicators show.

EXTERNAL BELL/SOUNDER TIMER

Press [3] ZONE 1 and ZONE 2 indicators show.

Enter the time required in minutes
01 = 1 minute
20 = 20 minutes
99 = maximum 99 minutes
00 = continuous sounder operation
After entering the two digits the DAY and ATTACK indicators show.

Press RESET twice to return to Day

RESET TO FACTORY CONDITIONS

From engineer programming, pressing the SET button returns the system to Day mode and re-instates all factory set conditions.

Due to continuous product development, ADE reserve the right to change specifications as and when required without prior notice.

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