Installation & User Manual

PTE1000 Series
Security Energisers

Electronic Design & Manufacture

PAKTON

1.0 Table of Contents

2.0   Introduction

How it works

Electric fences are an excellent perimeter security option. They operate on 3 levels:

- They instil fear of electrocution in the minds of potential intruders
- They can give a nasty shock to anyone who attempts to breach the fence
- The fence can be monitored to give an alarm if it is cut or shorted.

A security electric fence consists of one or more sets of live wires around a secure area. The live wires are powered by the "energiser" and monitored so that if the live wires are shorted to ground or cut an alarm is sounded.

The energiser places a very short, very high voltage pulse on the fence live wires approximately once every second. The fence is 'safe' in that the pulse is too short to cause electrocution. The PTE1000 monitors the fence (via the return or feedback wire) to check that the high voltage makes it all the way around the fence and hasn't been shorted.

OTHER PRODUCTS FROM PAKTON

- PTE0050 Lightning Diverter
- PTE0110 Electric Fence Power Probe ®

3.0   Features

PTE1000 Features

1. LED and LCD display.
2. 3 joules stored energy.
3. Stylish wall mountable enclosure.
4. Operates from 16Vac via a plug pack.
5. Optional internal rechargeable back up battery.
6. AC fail, Low Battery and Bad Battery detection.
7. External connectors for fence, siren, keypad etc, no need for the installer to open the unit.
8. Separate access to the backup battery via a panel in the front of the case.
9. Full remote control via optional keypad.
10. May be connected to a building alarm.
11. Many digitally adjustable parameters including fence voltage alarm level via optional user keypad.
12. Adjustable energiser power output level.
13. Single (PTE1013) or Dual zone (PTE1023).
14. Low Power Mode, reduced power for "daytime" operation.
15. Designed and manufactured in Australia.

Optional Features

1. LED Keypad for remote control.
2. Higher power option, up to 5 Joules stored energy.

Note: it is advised that lightning diverters (PTE0050) be fitted to all high voltage inputs and outputs.

4.0 Specifications

PTE1000 PCB version 4.3 or higher. Software (firmware) version 5.0 or higher.

Specification Name	Specification
Energiser output voltage – PTE102x	8.5kV peak no load, 0.9J at 500R per channel.
Energiser output voltage – PTE101x	+/-5kV peak no load. 2.0J at 500R
Pulse rate	Crystal locked at 0.8 Hz
AC power input	16-18 Vac 1A recommended
12V DC Power consumption	Energiser On - 275mA (PTE101x) Energiser Off - 75mA
Internal Battery charger	Float voltage 13.8V, 300mA short circuit protected.
Control inputs PTE102x *	Suitable for potential free (dry) contacts or switched 5-12V. See input table.
Control inputs PTE101x *	Suitable for potential free (dry) contacts.
Enclosure	IP4x ABS Plastic
Siren Output	12V switched, 1A max
Strobe output	12V switched, 1A max.
Alarm Relay Outputs #	Isolated dry contact, Change over, Relay rated at 1A 30V.

Table 1 - PTE1000 Specifications

Notes:

- Specifications subject to change without notice.
- * The switches on the cabinet are internally wired to the control inputs, these may be disconnected by a technician to allow the inputs to be wired to a remote control device.
- # The alarm relays are internally connected to the siren and strobe outputs, these may be disconnected by a technician to allow the outputs to be wired to another device.
- The firmware version is displayed on the LCD at power up (from both AC and battery off).

DANGER:

- There are potentially lethal voltage inside the PTE1000, refer to qualified service personal for repair.
- The high voltage capacitors inside the PTE1000 may take a long time to discharge.
- Before working on the wiring of an electric fence it is recommended that the energiser be turned off and an intentional short circuit is placed from the fence live wires to earth. This is a sensible precaution against the energiser being turned on by others while you are working on the fence.

5.0   Description

Parts of the PTE1000

Status Lights

Voltage Display

DANGER High voltage

PAKTON

Electric Fencing Security
PTE 1013

Battery Access Cover

Fence Terminals

Output terminals   Return (monitor) terminals

Status Lights

Power – On whenever the unit has power.

OK (armed) – On when the unit is armed (pulsing), will flash when in low voltage mode.

Fence – On when there is a fence alarm (either channel). Mimics the state of the Fence alarm output below.

Energizer – On with a general alarm like AC Fail or Low battery. Mimics the state of the Energizer output below.

Error – Flashes an error code for energiser (service) errors. See the table in chapter 9.

Energiser Base parts

AC Power Cord On Off switch Keypad Connector Alarm Outputs High / Low Power switch
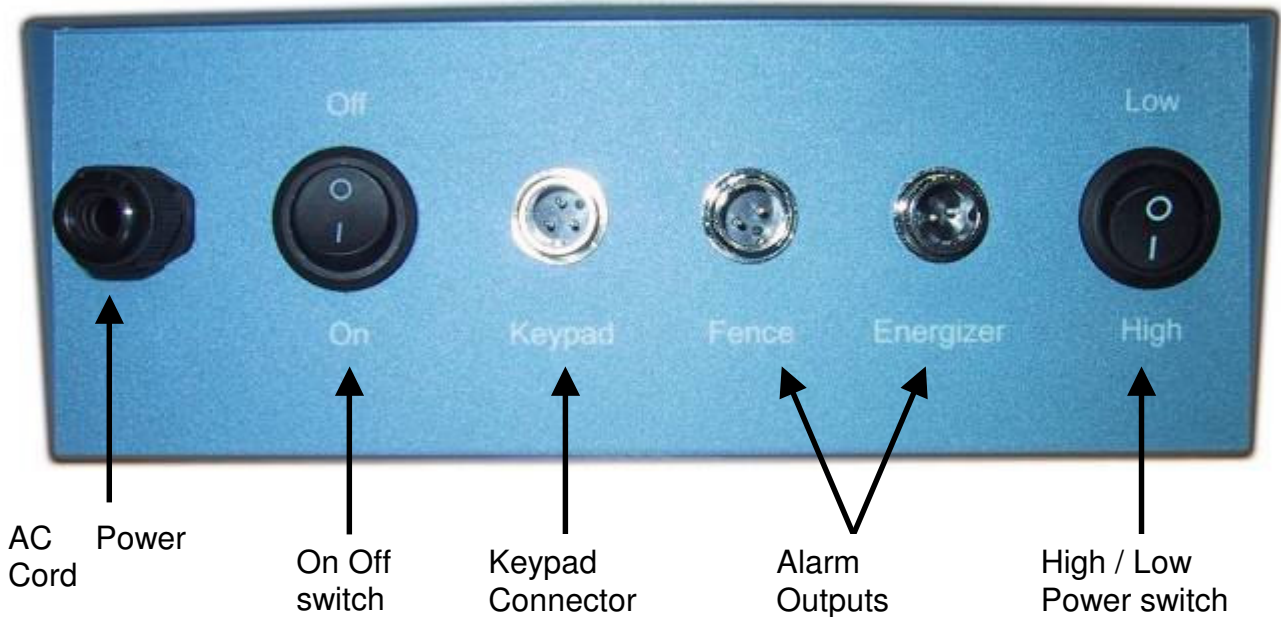
Low Voltage connections

AC Power in – 16Vac via a pre-wired plug pack. (May be 220Vac in some countries)

On / off switch – Local switch for arming the energiser.

Keypad connector – Wired to the optional remote control keypad.

Fence and Energiser alarm outputs. Switched 12V 1A for local sirens and strobes.

Low / High Power switch. Changes from high to low power mode. NOTE: on the PTE102x this is the Channel 2 On/Off switch.

Socket pin wiring

Looking into the sockets on the base of the energiser.

Keypad: Left = Data, Top = 0V, Right = +12V.

Alarm outputs: Left = 0V, Right = +12V switched by relay.

Keypad (optional)

Keypad Lights (LEDs)

Power – On with AC power, flashes on low battery.
Service – On with any Energiser fault (like low batter).
Arm – On when the energiser is armed (pulsing), flashes when in low power mode.
1 – On when there is a fence fault on Channel 1.
2 – On when there is a fence fault on Channel 2.
3,4,5 and 6 – Not used.

NOTE: there is no panic function.

Models

The PTE1013 is a single channel security energiser. The PTE1013 is capable of conventional or Bi-polar operation. In Bi-polar operation the PTE1013 display both the positive and negative voltages on the LCD. The control switches on the base of the PTE1013 are on / off and high / low power mode.

The PTE1023 is a dual channel conventional security energiser. It has two independent output channels so it is equivalent to having two energisers in one enclosure. Each channel has a high voltage output and a monitor return input. There is a separate control on/off switch for each channel.

Internal Beeper / Keypad Beeper

The internal beeper and keypad beeper will sound when there is either a fence alarm or a general alarm (Like AC fail or low battery).

Bi-Polar

The Bi-polar system has been used for many years in agricultural electric fences in Australia. The Bi-polar fence is made up of alternating positive (+ve) and negative (-ve) wires instead of live and earth. Bi-polar has the benefit for security purposes in that all wires on the fence are live with respect to earth, so every wire gives a shock, and anything touching both wires receives a larger shock. The trade off is that the voltage on each set of wires to earth is approximately half that of a conventional fences live wires. The voltage between the wires is the same as for a conventional fence. To set a PTE1013 to bi-polar mode simply set the CH2 alarm threshold above 0, since in conventional mode the Ch2 alarm is not used.

For diagrams showing how to connect the PTE1000 to a fence see chapter 7.

Synchronised Groups of PTE1000's

PTE1000 series energisers may be linked to form a "group" to power multiple sectors. Using Pakton's Simultaneous Pulse technology. See appendix B.

Cabling

High voltage cabling (fence lead out and returns) should be run using suitably rated cable. Double insulated electric fence "underground" cable is suitable. High Voltage Cables should never be run within the same conduit as Low Voltage Cables. A minimum distance of 30mm should be kept between High Voltage and Low Voltages Cables.

Lightning protection

Although the PTE1000 contains internal lightning protection elements external lightning protection elements such as the PTE0050 are recommended.

Monitor Earth

The PTE1000 has two fence earth terminals, in most installations these may be joined and only one wire use to connect to the earth. If, however there is any risk of the earth connection being lost then the monitor earth should be connected to a separate earth.

Noise and interference

The PTE1000 contains a microprocessor. Extreme electrical noise can upset microprocessors. The most likely cause of such noise is the high voltage output from the unit itself. In the event of erratic behaviour check that the high voltage wiring is firmly connected to the terminals and that no sparking is seen. The PTE1000 is designed to self-recover from interference, powering off (both AC and battery) should not be necessary.

Programmable options

The PTE1000 has many programmable options. These are also known as setup parameters. To alter these options a keypad may be used. The options are explained in chapter 9. Each parameter has a factory set default.

Low Power mode

PTE1000 series energisers are able to be switched into low power mode. Low Power mode may be used in situations where the fence is not required to be a deterrent but is still required to actively detect intrusion. In Low Power mode the fence live wires operate at a much lower voltage, typically 500V peak. The PTE1013 has a low power switch, while the PTE1023 can only be switched to low power mode via the keypad, unless a special version is ordered.

Battery compartment

Connecting the LCD display
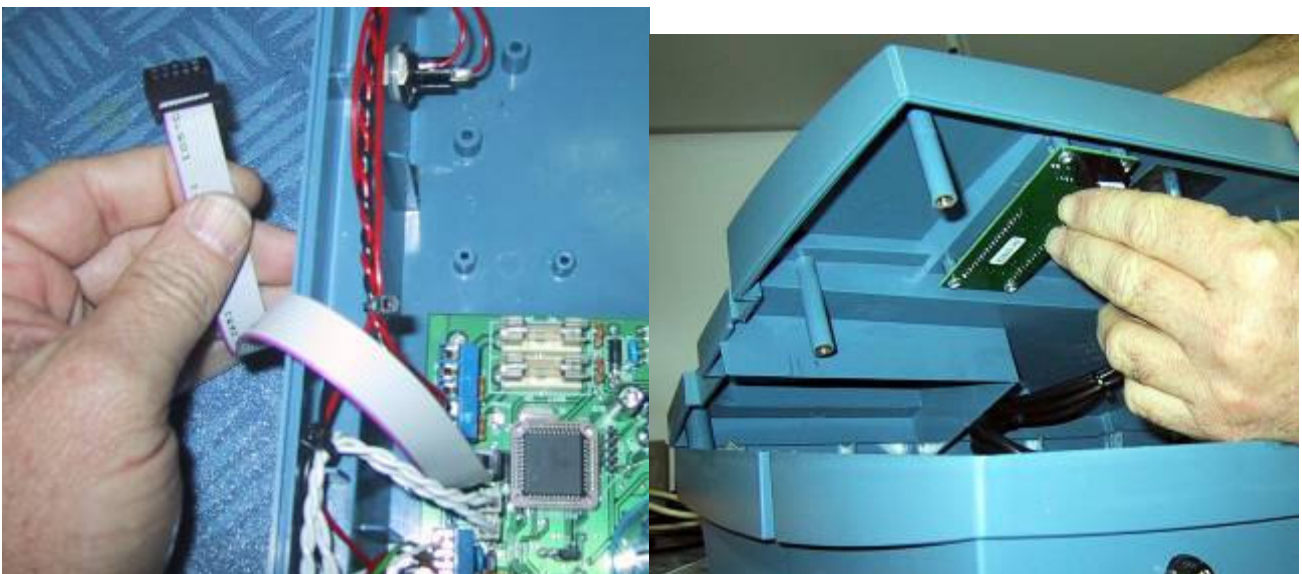
6.0   Installation

Installation Steps.

1   Read the entire manual first!
2   Design and build the fence (beyond the scope of this manual), ask your distributor for help if required.
3   Decide where the PTE1000 is to be mounted. It should be inside, under cover. If on an external wall it should be within a wiring box and definitely not in direct sunlight.
4   Mount the enclosure to the wall. Use two screws 121mm apart.
5   Run the cables to the enclosure, ensure high voltage and low voltage cables are kept at least 30mm apart at all points.
6   The high voltage output terminals must be tight, if they are loose and spark it could cause erratic behaviour.
7   Ensure that the unit is switched off at the switches (or remote device if one is connected).
8   Connect battery.
9   Turn AC power on.
10   Turn the energiser on.
11   If a LCD display PCB or Keypad is fitted it should now show that the unit is armed and there is voltage on the fence.
12   The unit is now ready for operation.
13   Check the fence is live using an Electric Fence Power Probe ®
14   Place an intentional short on the fence and check that the energiser shows an alarm.

See Sections 6 and 7 for connections and wiring diagrams. For information on creating a suitable electric fence earth refer to an agricultural electric fence manual such as the Daken Electric Fencing Manual (website www.daken.com.au). The mains electrical earth should not be used.

7.0   High Voltage Wiring

Example Wiring Diagrams
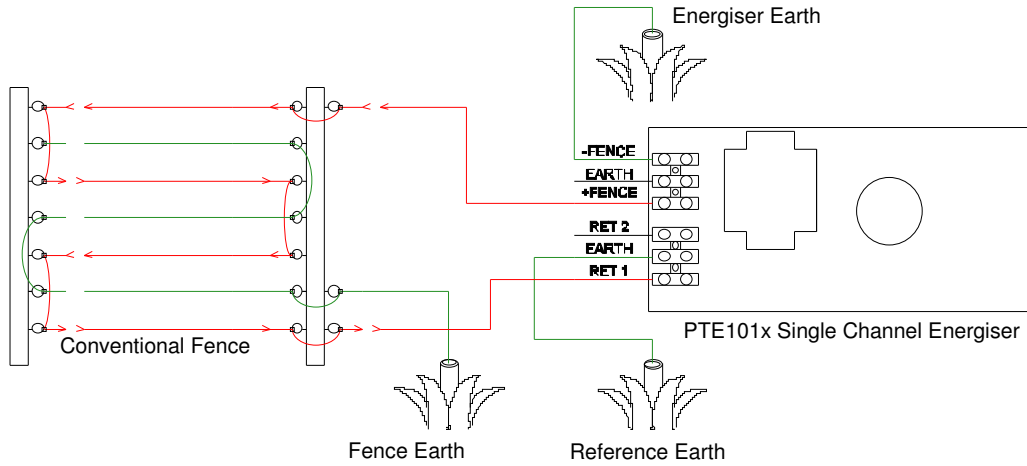
PTE101x Single Channel Energiser configured for conventional fence operation.
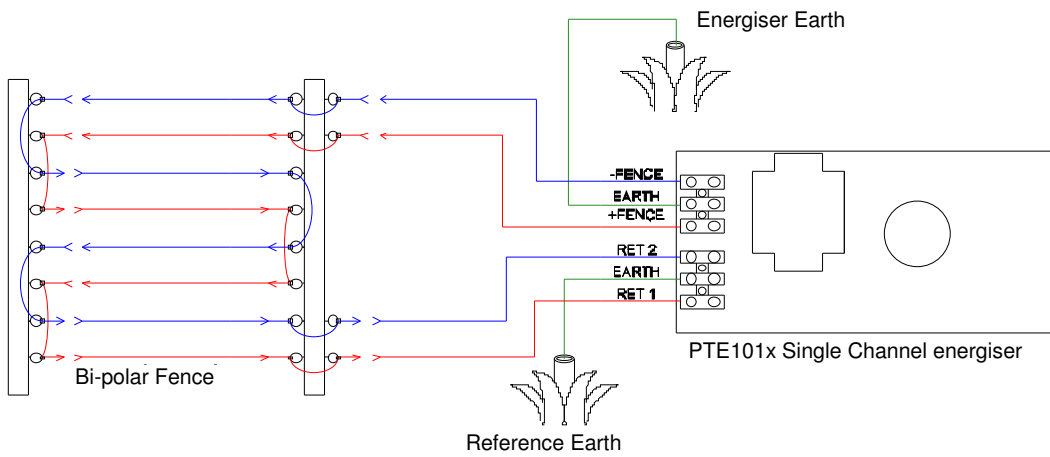
PTE101x Single Channel Energiser configure for bi-polar fence operation.
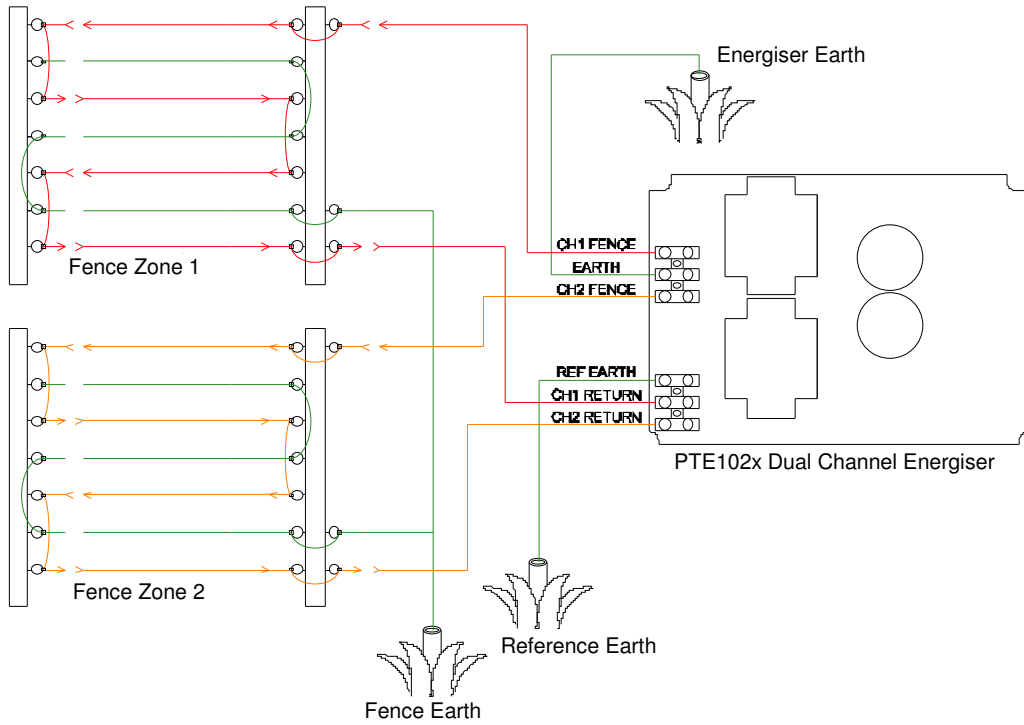
PTE102x Dual Channel Energiser showing two zones in operation.

Below are two example "Energiser to Fence to Earth" wiring diagrams that include the PTE0050 Lightning Diverters. The first example shows the Lightning Diverters fitted at the Energiser, while the second shows them fitted at the fence. Note in the second example the Energiser and Fence earths may be connected together by wire.
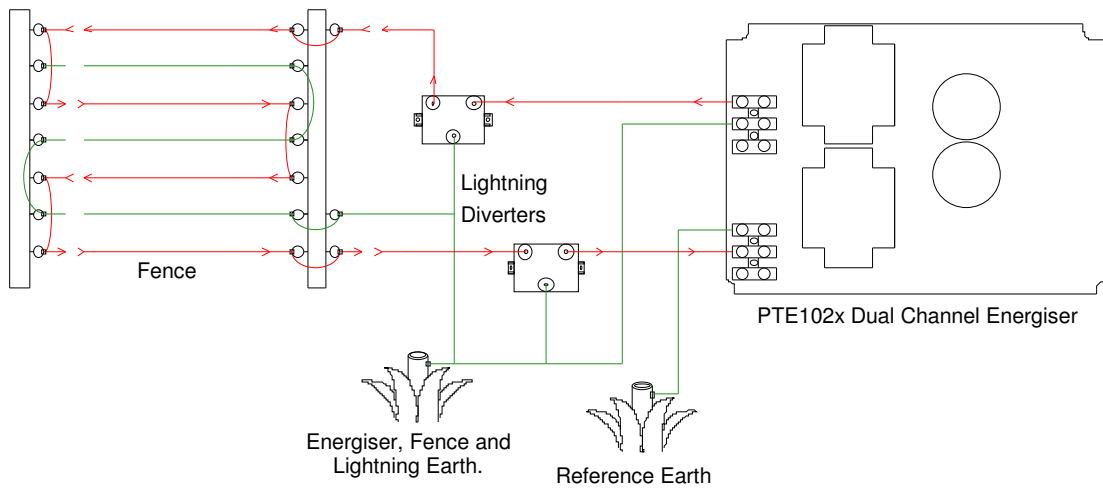
Lightning Diverters fitted at the energiser.
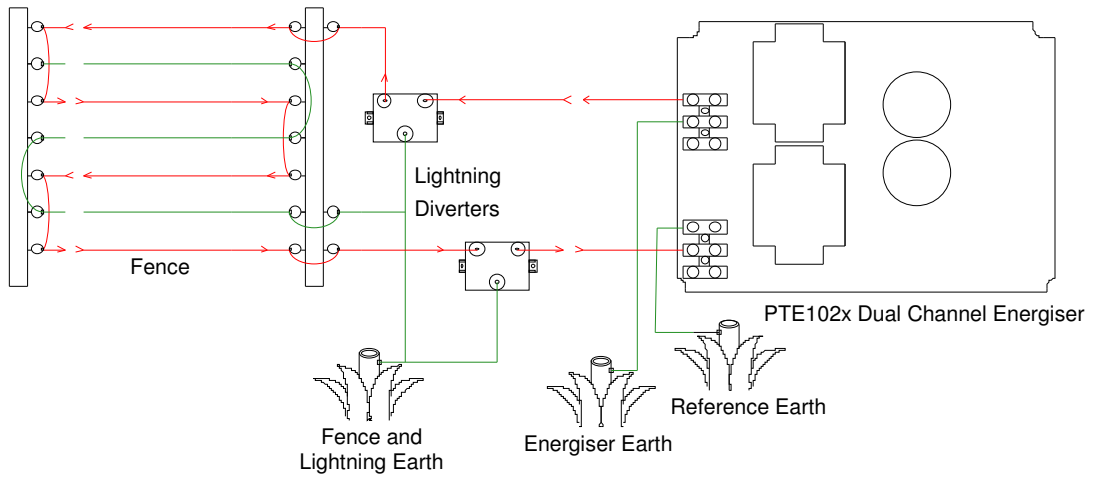
Lightning Diverters fitted at the fence.

8.0   Users Guide

TECHNICAL STUFF

Your PTE1000 security energiser has been designed to be easy to control. In it's simplest form it is operated by the on / off switches at the base of the unit. If the Keypad has been installed it can be remotely controlled from the keypad, the keypad also allows instant audiovisual indication of the state of the energiser and therefore the fence it is powering.

If the keypad is connected then the local switches (at the base of the unit) may not be operational, they may have been disconnected by your installer. It is also possible that the controls of the energiser are permanently wired into you home alarm system so that the energiser starts and stops under the control of that system.

If there are two ways to control the energiser both connected at once, i.e. keypad and local switches, then the last change will determine the result. I.e. if the unit is turned on via the keypad and then off at the local switch it will turn off.

If in doubt ask your installer.

When you first see the LED keypad the system will probably be off.

The only light on will be the POWER light.

SWITCHING THE FENCE ON (ARMING)

Enter your **PIN** number (four digits long) and push the **#** key.

Make sure the red ARM light comes on.

The keypad will beep twice to confirm that the system is armed.

The fence will power up and if all is well (no faults) the system will be ready to deter and detect.

If there is a fault on the fence and it cannot achieve full voltage zone 1 or 2 LIGHT's will flash.

To switch off (disarm) the system Enter your **PIN** and press **#**, this will also clear any fault lights and zone lights which may have been on.

TURNING ONE ZONE (FENCE) ON ONLY (PTE102X ONLY).

Enter your **PIN** and press ***21#** to turn zone 1 on but leave zone 2 off (if it was off).

Enter your **PIN** and press ***22#** to turn zone 2 on but leave zone 1 off (if it was off).

TURNING TO LOW POWER MODE

Enter your **PIN** and press ***41#** to switch to low power mode. In low power mode the fence will still be on and any breach will be detected but the voltage will be much lower than normal operation. The ARM light will flash in Low Power mode.

Enter your **PIN** and press ***42#** to switch back to full power mode

WHEN AN ALARM OCCURS

If the system is armed and the fence is tampered with the corresponding zone light will flash and then light. A siren or strobe connected to the unit will turn on. If the energiser is connected to a building alarm system for monitoring then follow the procedure as set down in the building alarm system manual.

TO SILENCE THE ALARM.

Enter your **PIN** and press **#**. This will silence the alarm **but not disarm** the system, the armed light will still be on.

The zone lights on the keypad will flash to show where the breach occurred.

The siren and strobe are ready to respond again if needed.

To disarm the system Enter your **PIN** and press **#** again, this will also clear the zone light.

CHANGING YOUR PIN NUMBER.

Enter the old **PIN** and press ***0#,** this enters user programming mode.

Enter your new PIN (must be 4 digits) and them #.

Press ***#** to exit user programming mode.

Make sure your new PIN works by using it to arm the energiser.

The default PIN is 1234.

STANDBY BATTERY

Should there be a loss of mains power the Power light on the keypad will go out. If the loss of power is prolonged the battery may go flat. The Power light will start to flash indicating a flat battery.

If the standby battery requires replacement the Power LIGHT will flash and the Service light will light.

SERVICE LIGHT

If the energiser develops an internal fault the service light will come on. Call the installer for service.

KEYPAD CONTROL IN BRIEF

Action	Press Keys
Turn on (ARM)	**XXXX# (where XXXX is your 4 digit PIN)**
Turn off (DISARM)	**XXXX#**
Silence an alarm	**XXXX#**
Switch on Zone 1 (PTE102x models only)	**XXXX*21#**
Switch on Zone 2 (PTE102x models only)	**XXXX*22#**
Switch to low power mode	**XXXX*41#**
Switch to high power mode	**XXXX*42#**

9.0   Technical information (technicians section)

Relay Output 2

Relay Output 1

Error LED

Keypad Bus

Jumpers J3 / J4

Control input

Expansion Port

Power LED

12V DC Battery

2A M205 Glass Fuse

16V AC Power

2A M205 Glass Fuse
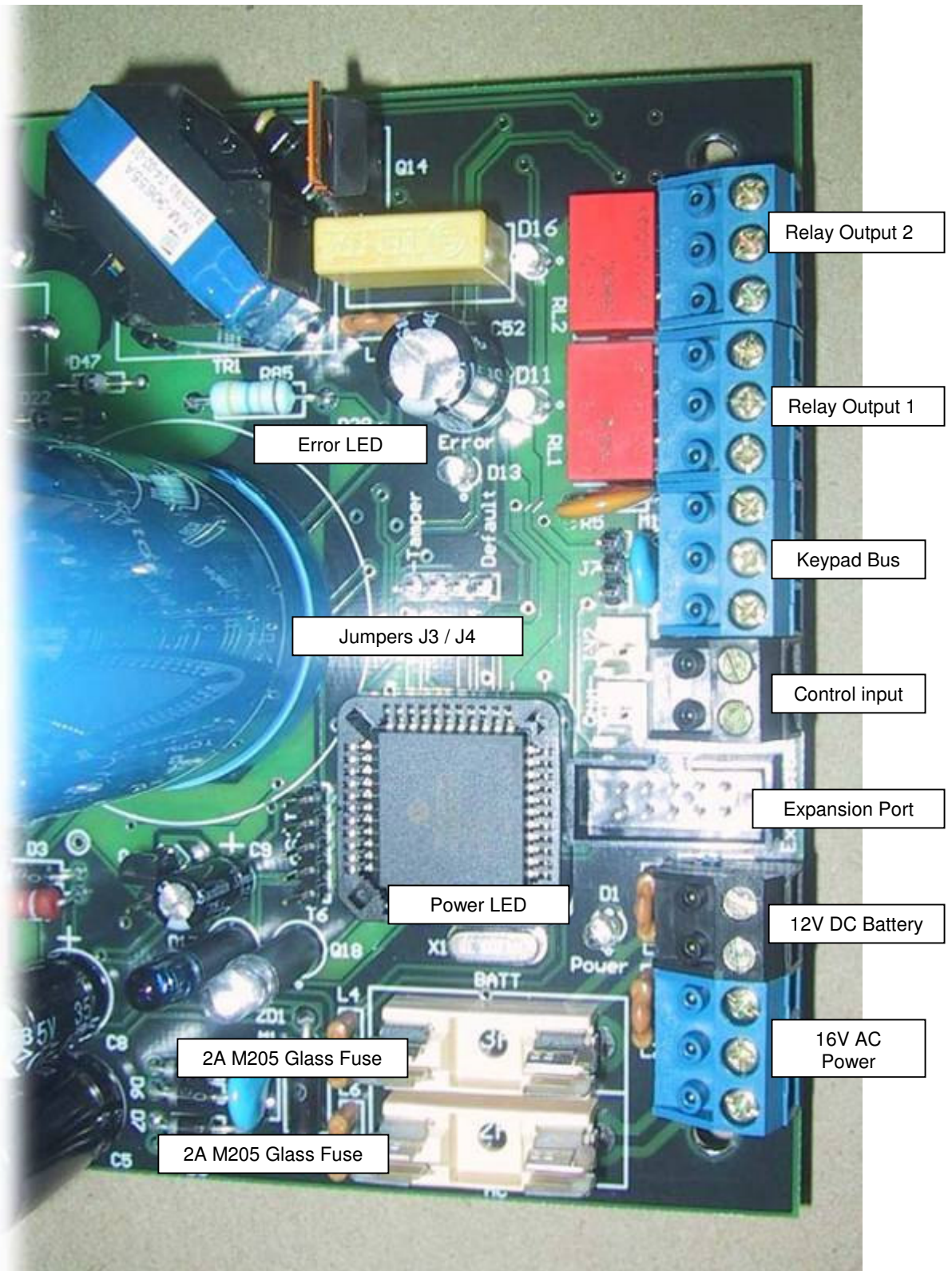
Figure 1 - PTE101x Low Voltage Wiring Diagram
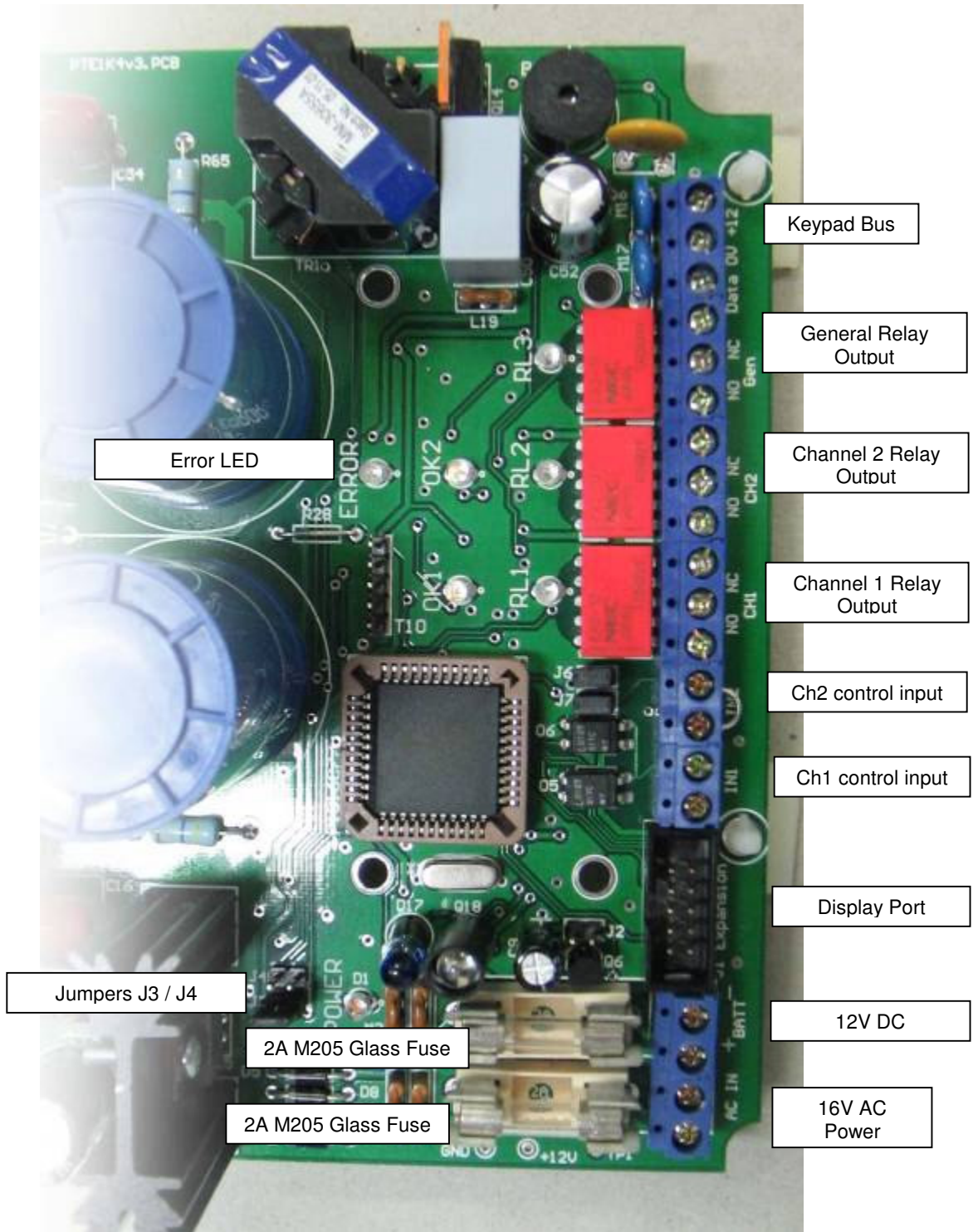
Figure 2 - PTE102x Low Voltage Wiring Diagram

Label	Type	Description
AC IN	3 Way	AC Power input. 16-18Vac via F2 (2 Amp fuse).
Batt	2 Way	12V dc or Battery connection via F1 (3 Amp fuse).
Display	10 Way	Expansion header.
IN1	2 Way	PTE101x: Energiser control input (dry contact). See programming option 11. PTE102x: Channel 1 Energiser control input (dry contact or switched positive voltage 12V to left hand of input pair). Links J6,7 must be fitted to use dry contacts into these inputs and MUST NOT BE FITTED if using switched voltage. See programming option 11.
IN2	2 Way	Channel 2 Energiser control inputs (PTE102x only). As above.
RLY1	3 Way	Relay 1 – Defaults to Channel 1 fence alarm relay output. Relay will go into alarm state if the channel 1 voltage is below the alarm level for longer then the preset delay. Relay is fail safe.
RLY2	3 Way	Relay 2 – Defaults to Channel 2 fence alarm relay outputs, or to general alarm functions on PTE101x units.
RLY3	3 Way	Relay 3 (PTE102x only) – Defaults to General alarm relay output. Changes to alarm state on AC fail, Flat Battery or PCB error.
Keypad	3 Way	Supplies power and data lines for an external keypad. Can also be used to network multiple energisers. The +12 source on these terminals is "fused" with 0.9A poly switch. Note PTE101x Keypad input terminals may be configured for a second control input for low power mode. See section on low power mode.

Table 2 - Low Voltage Terminals

Power Options

The PTE1000 requires 16Vac to run, this is via a plug pack transformer and is usually supplied with the unit. In some markets the energiser has the transformer inside.

PTE1000 energisers from versions PTE101x 5.3 and PTE102x 4.3 onwards will run without a battery if required.

IMPORTANT NOTE:

Use only rechargeable batteries. Always ensure adequate ventilation is given to the enclosure if it houses a battery. Lead Acid batteries may emit explosive gases while charging!

LEDs

The PTE102x has seven (7) status LEDs, while the PTE101x has two. These are listed in the table below

LED	Meaning
Power	On with AC or DC power
Error	Flashes error code ,See table below
OK1	Flashes Green if channel 1 is operating and voltage is good.
OK2	As above for Channel 2
RL1	Will be on (RED) if the relay is in the alarm condition.
RL2	As above
RL3	As above

Table 3 – Status LEDs

Error LED Flashes	Meaning
1	Tamper (lid open)
2	AC fail
3	Low battery, bad battery
4	PCB service fault

Table 4 - Error Status

On any error the relay assigned to general alarm will go into alarm state. Minor errors will self clear if the error condition is removed. AC fail will not stop the energiser, nor will low battery. However, without AC power, the battery will eventually be depleted and the energiser will stop. Once AC power has been restored and the battery has recovered, the energiser will re-arm itself automatically. A tamper or a PCB fault will stop the energiser. If an error stops the energiser the general and fence alarms will be activated.

If an error has stopped the energiser turning the unit off will clear the error.

Should a PCB fault occur, power the unit down completely (remove AC and battery) then restart. Should the error recur return the unit for service.

Jumpers

The PTE1000 has five (5) special purpose jumpers (links). These are listed in the table below, those marked (2) are on the PTE102x only, Those marked (1) are for PTE101x only.

Jumper	Function
J3	On to disable Tamper alarm.
J4	On to return programmable options to factory defaults on power up.
J5 (2)	Link to reset the processor. Factory use only.
J6 (2)	Links +12 to drive input optos from

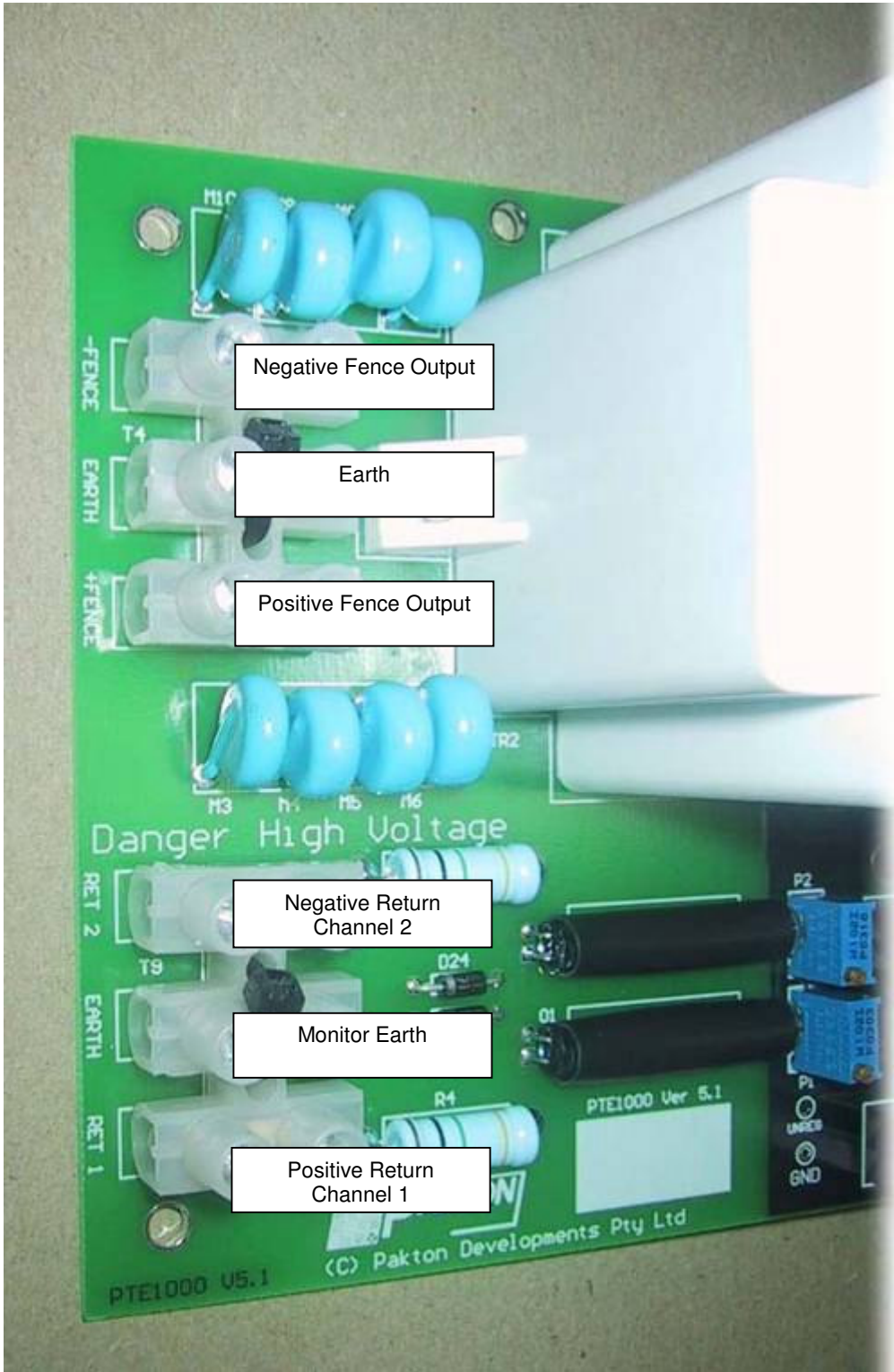|	
	dry contacts for IN1 and IN2. Do not use unless the control signal is coming from a voltage free contact i.e. a relay.
J7 (2)	As above.
J8 (1)	Links IN2 to Keypad screw terminals for Low Power mode control.

Table 5 – Jumpers

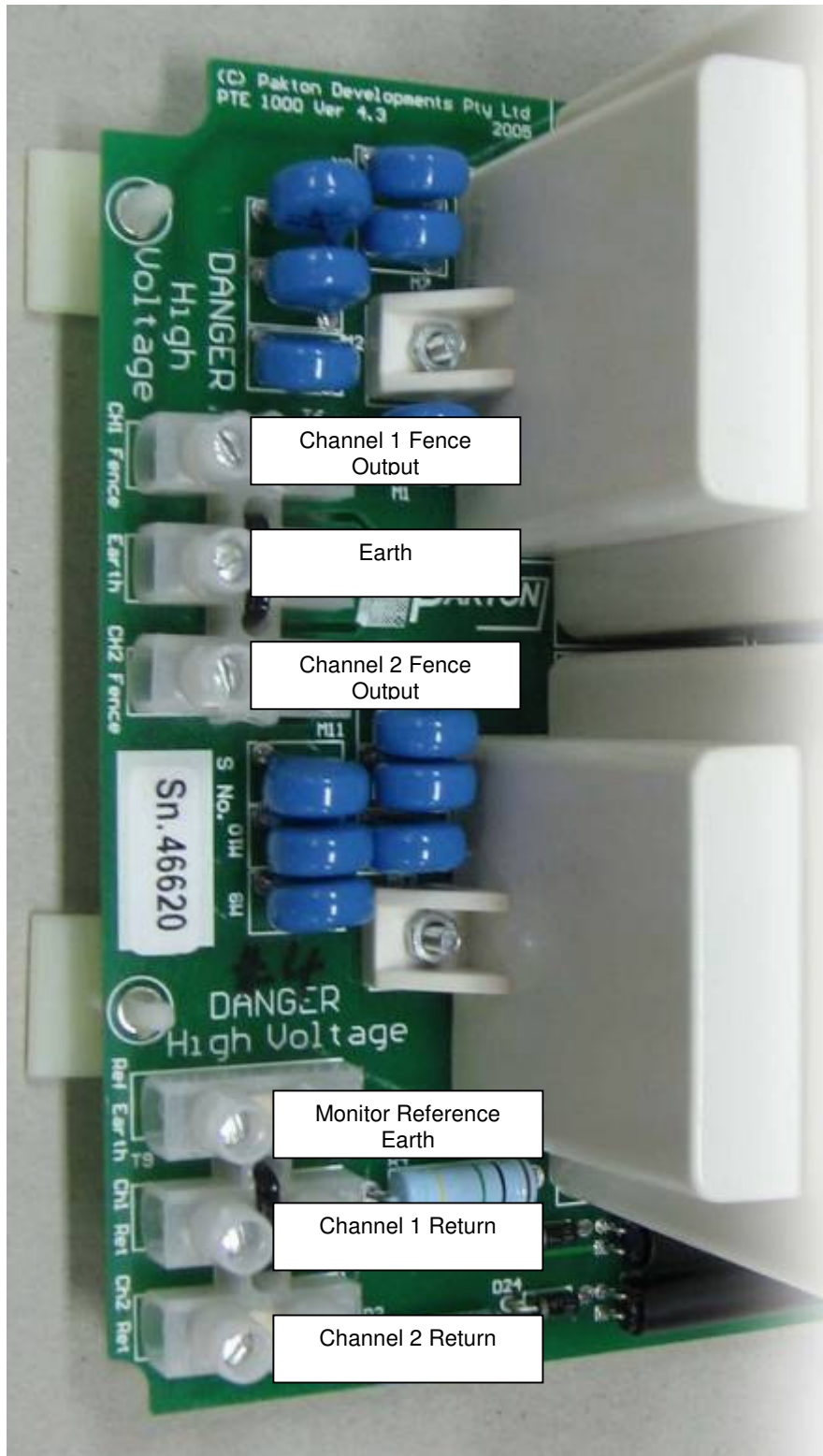**Figure 3 - PTE101x High Voltage Wiring Diagram**

Figure 4 - PTE102x High Voltage Wiring Diagram

NOTE: The order of the return terminals is different to that of the output terminals.

10.0 Installation Programming Options

The PTE1000 series has non-volatile memory in which are held programming options (setup parameters). These are factory pre-set but can be field programmed using a keypad or a PC serial cable (from Pakton) and suitable software. This is similar to programming a standard alarm panel.

The following guide assumes you are using a C&K or Honeywell 236 LED keypad.

Programming mode

To enter programming mode enter the 6 digit installer PIN followed by ***0#** keys. The keypad will beep twice to indicate that the command was accepted. If the PIN was incorrect the keypad will beep 3 times. If the unit is fitted with an LCD it will now show the first programming option and it's current setting.

Pressing the # key will cycle through all the options on the LCD. Note: not all numbers are used.

The default Installer PIN is **012345**.

To exit programming mode

After programming press ***#** to exit, if left unattended the unit will time out and auto exit after about 5 minutes.

Change the installer PIN

The installer PIN may only be changed while in programming mode.

To enter a new installer pin, press 00 followed by the new 6 digit PIN.

If you cannot remember your installer or user PIN, return the units memory to default. To do this, remove power (AC off and disconnect the battery) open the energiser, fit a jumper over J4 and reconnect the battery for about 10 seconds. Remove power and removed J4.

This will return all options to the factory set defaults.

Changing an Option

Most of the options have possible values in the range of 0 to 9.

To change any option first check the option number (see table below) and then the table of values for that option. Then press the option number followed by the required value.

For example to change the power level to maximum press **059#**, the keypad will beep twice to indicate that the command was successful. The LCD will immediately show the updated value.

Programming Options in brief

Option	Meaning	Description
01	Siren On Time	Sets the time that the siren (and keypad beeper) will stay on for after an alarm.
03	Siren Cycles	The number of times the siren will sound for the "on time" above. After this many cycles the siren will automatically mute.
05	Power Level	Sets the output power levels (for both channels of the PTE1023)
06	Low Power mode power level	Sets the output power levels used in low power mode (for both channels of the PTE1023)
07	Low power alarm level	Sets the voltage threshold below which the fence alarm will occur.
11	Input type	Allows the energiser inputs to be changed from normally open to closed.
13	Missed pulse count	Sets the number of pulses which may be missed (bad) before the alarm is activated.
14	Fence alarm level Channel 1	Sets the voltage threshold below which the fence alarm will occur.
15	Fence alarm level Channel 2	Sets the voltage threshold below which the fence alarm will occur.
16	Battery Alarm Voltage	Sets the battery voltage threshold below which the general alarm will activate.
21	Relay 1 function	Assigns a function to relay 1
22	Relay 2	Assigns a function to relay 2
23	Relay 3	Assigns a function to relay 3
24	Relay 4	Assigns a function to relay 4
25	Relay 5	Assigns a function to relay 5
26	Group Mode	Allows the energiser to be set as a Master or slave in a synchronised group.

Table 6 – Programming Options

Programming options in detail

Siren on time (01x#)

This option sets the time that the siren relay and keypad beeper will be on for after a fence alarm occurs. After this time the siren will turn off for the same amount of time and depending on the siren cycles setting will turn on again etc.

The default is 5 Minutes.

Value	Time
0	10 Seconds
1	30 Seconds
2	1 Minute
3	2 Minutes
4	3 Minutes
5	4 Minutes
6	5 Minutes
7	6 Minutes
8	7 Minutes
9	8 Minutes

Siren Cycles (03x#)

The number of times the siren will sound for the "on time" above. After this many cycles the siren will automatically mute.

Value	Cycles
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

Power level, both channels (05x#)

The power level option allows the shocking power of the fence to be adjusted. For example: To change the power level to maximum enter the following **0 5 9 #.** The keypad will beep twice to indicate that the new setting was accepted.

The normal fence voltage depends on the amount of fence wire, the losses and the power level.

This setting effects the average power drain and therefore backup battery time.

Value (x)	Power
0	55%
1	60%
2	65%
3	70%
4	75%
5	80%
6	85%
7	90%
8	95%
9	100%

Power level, both channels (06x#)

Same as above, but for low Power mode.

Value (x)	Power
0	0.5%
1	1.0%
2	1.5%
3	2.0%
4	2.5%
5	3.0%
6	3.5%
7	4.0%
8	4.5%
9	5.0%

Low Power Alarm Level (07x#)

Sets the voltage threshold below which the fence alarm will occur.

The default Fence Alarm Voltage is 500 Volts.

Value (x)	Voltage
0	300 Volts
1	500 Volts
2	700 Volts
3	900 Volts
4	1100 Volts

Input Type (11x#)

The PTE102x inputs can be driven from 0-12V or dry contacts (if J6,J7 are fitted). PTE101x are dry contact only. This option allows the polarity to be inverted.

Value (x)	Input type
0	Normal
1	Reverse

Normal = Turn ON with 12V or Open contact

Reverse = Turn ON with 0V or Closed contact

Be careful when changing this parameter, be aware that the energiser could start up unexpectedly.

Missed Pulse count (13x#)

Enables the pulse count to be varied from the default (3). This is the number of bad or missing pulses are counted before the alarm occurs. Note: The lower this option is set the more likely you are to get false alarms

Value (x)	Missed Pulses
0	1
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

Fence Alarm Voltage, Channel 1 (14x#)

Sets the voltage threshold below which the fence alarm will occur. The default Fence Alarm Voltage is 3 kV.

Value (x)	Voltage
0	1.5kV
1	1.8kV
2	2.1kV
3	2.4kV
4	2.7kV
5	3.0kV
6	3.3kV
7	3.6kV
8	3.9kV
9	4.2kV

Fence Alarm Voltage, Channel 2 (15x#)

Sets the voltage threshold below which the fence alarm will occur for channel 2. The default Fence Alarm Voltage is 3 kV.

The default Fence Alarm Voltage is 3 kV.

* If using a PTE101x in conventional (non Bi-polar) mode set this option to 0 to disable Ch2 otherwise the siren and strobe functions will not operate properly.

Keypad number	Voltage
0	1.5kV or Disabled *
1	1.8kV
2	2.1kV
3	2.4kV
4	2.7kV
5	3.0kV
6	3.3kV
7	3.6kV
8	3.9kV
9	4.2kV

Battery Alarm Voltage (16x#)

Sets the battery voltage threshold below which the general alarm will activate.

The default Battery Alarm Voltage is Low = 11.0 Volts and Alarm = 10.0 Volts

Keypad number	Low	Alarm
0	9.0 V	8.0 V
1	9.5 V	8.0 V
2	10.0 V	9.0 V
3	10.5 V	10.0 V
4	11.0 V	10.0 V
5	11.5 V	10.0 V
6	12.0 V	11.0 V
7	12.5 V	11.0 V
8	13.0 V	11.0 V
9	13.5 V	11.0 V

Relay Functions

All relays can be set to any of the available functions (user assignable).

Relay 1 is **(21x#)**

Relay 2 is **(22x#)** etc.

The modes are explained in the table below.

The defaults for the PTE101x are:

Relay 1 Fence Bi-polar.

Relay 2 General.

Relay 3 N/A.

Relay 4 (daughter board) Armed 1

Relay 5 (daughter board0 Armed 2

The defaults for the PTE102x are:

Relay 1 Fence 1.

Relay 2 Fence 2.

Relay 3 General.

Relay 4 (daughter board) Armed 1

Relay 5 (daughter board) Armed 2

Value (x)	Mode
0	Fence 1
1	Fence 1 or off
2	Armed 1
3	Fence 2
4	Fence 2 or off
5	Armed 2
6	Fence Bi-Polar
7	General
8	Siren
9	Strobe

Relay function details.

Function	Logic for alarm state (opposite of normal state)
Fence x	Channel x is on AND the fence voltage has fallen below the programmed fence alarm voltage for more pulses than the missed count setting. Not latched.
Fence x alarm or off	Channel x is off OR the fence voltage has fallen below the programmed fence alarm voltage for more pulses than the missed count setting. Not Latched.
Fence Bi-polar	Unit is on AND the fence voltage on **either** Bi-polar return line has fallen below the programmed fence alarm voltage for more pulses than the missed count setting. Not latched.
Armed x	Channel x is off
Armed all	Both channels are off
General	Ac fail OR Tamper OR Low battery OR internal error. Latched for internal errors only.
Siren	Fence alarm 1 OR fence alarm 2 OR Tamper, will time out after the siren time out time. This function is latched.
Strobe	As per siren but does not time out, will remain on until both channels are switched off. This function is latched.

Table 7 – Relay options

Group Mode (26x#)

A group must have only 1 master. The other units in the group are slaves. Group Voltage display units require each slave to have a different number. Since the keypad bus is common among the group one keypad can be used to program all units for all options except this one (for obvious reasons).

The procedure is:

Connect the keypad to each unit in turn, before linking all units into a group. Set this option, one unit as master the other as slaves.

Value (x)	Mode
0	No Group
1	Master
2	Slave 1
3	Slave 2
4	Slave 3
5	Slave 4
6	Slave 5
7	Slave 6
8	Slave 7
9	Slave 8

Connect the group using the keypad bus as per the diagram.

At this time groups are limited to a master and 4 slaves.

11.0 Sector Setup Tests and Adjustment

With a single sector system there are three considerations for the electric fence monitor voltage level.

1. The monitor **should** go into alarm if one of the live wires is shorted to ground.
2. The monitor **should** alarm if one of the live wires is cut.
3. The monitor **should not** go into alarm when dew forms on the insulators, it rains, grass touches the wires, spider webs, dust etc. etc.

For multi sector fences there is a fourth:

4. That if one sector is shorted other sectors **should not** go into alarm (as it is then difficult to tell where the problem is).

Use common sense and turn the energiser off when making changes to the fence, then turn the energiser back on to check the effects.

Basic fence tests.

1. Energise the newly completed fence.
2. Use an Electric Fence Power Probe to find any construction faults.
3. Check that there is voltage on all live wires (continuity) and that there is no shorts from live to earth, or between live circuits (Bi-polar).
4. Check the electric fence earth (see electric fence manuals) One method is to: make an intentional short from live wire to earthed metal (not +ve to -ve if using Bi-polar). The voltage at the earthed point should be less then a few hundred volts, the voltage on the earth stake with respect to any nearby earthed metal should be less then a few hundred volts.
5. Record the start and end of fence live wire voltages, note Bi-polar systems should have approximately equal voltages with respect to earth.
6. Record the live wire currents going out from the energiser to the fence.

At this point you must have a reasonable voltage on all parts of the fence. To be an effective barrier the Power Probe (or voltmeter) readings between wires (live to earth or +ve to -ve for Bi-polar) must be greater then 3.0kV. If it is not then you may require a larger energiser.

Fault condition tests

1. To simulate a break. Disconnect a joint(s) in the live wires at some convenient point on the fence, making sure that the wires do not short to ground or between +ve and -ve wires.
2. Check that the monitor goes into alarm. If not check the voltage (using a electric fence voltmeter) at the inputs to the monitor. Set the fence alarm voltage level higher than this voltage. If there is still considerable voltage you may have induced voltage in the feed back wires. If so, reduce the induced voltage by placing a 3000 ohm 10 watt resistor across the live to earth terminals (or from +ve to -ve in a Bi-polar system) at the monitor.
3. Reconnect the live wires (from step 3).
4. Place a short on the fence live wires.
5. Check that the monitor goes into alarm.
6. Remove the short (from step 6).

12.0 Warranty

The PTE1000 Series Electric Fence Energiser is covered by a 24 month warranty against defective parts or workmanship. If you have any problems, return the Energiser to Pakton Technologies Pty Ltd along with your proof of purchase, or contact the store of purchase or distributor.

For assistance

If you have any operational problems, difficulties etc. call our FREE HELP LINE: 1800 249 642 (within Australia only and not from mobile phones)

Alternatively, phone fax or email your questions or comments to Pakton:

Phone   (07) 3888 3793   International 61 7 3888 3793
Fax   (07) 3888 4330   International 61 7 3888 4330

E-mail: sales@pakton.com.au

Mailing address:
PO Box 1068
BURPENGARY DC QLD 4505
Australia

Street address:
16 Ferrier Road
NARANGBA Qld 4504
Australia

More help is available at the WEB site: www.pakton.com.au

Disclaimer

Whilst every effort has been made to check that the
information contained is accurate, Pakton Technologies Pty
Ltd will not be liable to loss or damage resulting from
construction, operation or failure of any installation or system.
Installation of security electric fences should be made by
trained professionals with regard to the relevant Australia
Standards and local work place health and safety
requirements.

Appendix A: AS3350.2.76 Requirements for Security Electric Fences

Definitions

Connecting lead

> an electric conductor, used to connect the **energizer** to the **electric fence** or the **earth electrode**

Electric animal fence

> an **electric fence** used to contain animals within or exclude animals from a particular area

Electric fence

> a barrier which includes one or more electric conductors, insulated from earth, to which electric pulses are applied by an **energizer**

Electric security fence

> a fence used for security purposes which comprises an **electric fence** and a physical barrier electrically isolated from the **electric fence**

General requirements for electric fences

3. **Electric fences** shall be installed and operated so that they cause no electrical hazard to persons, animals or their surroundings.

4. **Electric fence** constructions which are likely to lead to the entanglement of animals or persons shall be avoided.

5. An **electric fence** shall not be supplied from two different **energizers** or from independent fence circuits of the same **energize**r. For any two different **electric fence**s, each supplied from a different **energizer** independently timed, the distance between the wires of the two **electric fences** shall be at least 2 m. If this gap is to be closed, this shall be effected by means of electrically non-conductive material or an isolated metal barrier.

6. Barbed wire or razor wire shall not be electrified by an **energize**r.

7. Any part of an **electric fence** which is installed along a public road or pathway shall be identified at frequent intervals by warning plates securely fastened to the fence posts or firmly clamped to the fence wires.

   1. The size of the warning plates shall be at least 100 mm x 200 mm.
   2. The background colour of both sides of the warning plate shall be yellow. The colour on the plate shall be black and shall be either:
      1. the symbol of Figure 5, or
      2. the substance of TAKE CARE - ELECTRIC FENCE.
   3. The inscription shall be indelible, inscribed on both sides of the warning plate and have a height of at least 25 mm.
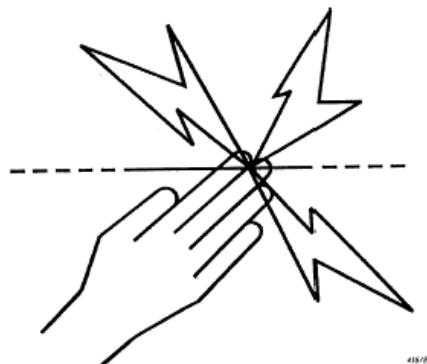
Figure 5 – Warning plate symbol

8. The **energizer earth electrode** shall penetrate the ground to a depth of at least 1 m.

9. **Connecting leads** that are run inside buildings shall be effectively insulated from the earthed structural parts of the building. This may be achieved by using insulated high voltage cable.

10. **Connecting leads** that are run underground shall be run in a conduit of insulating material or else insulated high voltage cable shall be used. Care shall be taken to avoid damage to the **connecting leads** due to the effects of animal hooves or tractor wheels sinking into the ground.

11. **Connecting leads** shall not be installed in the same conduit as the mains supply wiring, communicating cables or data cables.

12. **Connecting leads** and **electric fence** wires shall not cross above overhead power or communication lines.

13. Crossings with overhead power lines shall be avoided wherever possible. If such a crossing cannot be avoided, it shall be made underneath the power line and as nearly as possible at right angles to it.

14. If **connecting leads** and **electric fence** wires are installed near an overhead power line, the clearances shall be not less than those shown in table 3.

Power line voltage V	Clearance m
<=1 000	3
>1 000 <=33 000	4
>33 000	8

Table 8 – Minimum Clearances from Power Lines

15. If **connecting leads** and **electric fence** wires are installed near an overhead power line, their height above the ground shall not exceed 2 m. This height applies either side of the orthogonal projection of the outermost conductors of the power line on the ground surface, for a distance of

- 2 m for power lines operating at a nominal voltage not exceeding 1,000 V
- 15 m for power lines operating at a nominal voltage exceeding 1,000 V.

Particular requirements for electric animal fences in Australia

16. A distance of at least 10 m shall be maintained between the **energizer earth electrode** and any other earthing system such as the power supply system protective earth or the telecommunication system earth.

17. **Electric fences** intended for deterring birds, household pet containment or training animals such as cows need only be supplied from low output **energizers** to obtain satisfactory and safe performance.

18. In **electric fences** intended for deterring birds from roosting on buildings, no **electric fence** wire shall be connected to the **energizer earth electrode.** A warning plate, as described above, shall be fitted to every point where persons may gain ready access to the conductors.

19. A non-electrified fence incorporating barbed wire or razor wire may be used to support one or more off-set electrified wires of an **electric animal fence.** The supporting devices for the electrified wires shall be constructed so as to ensure that these wires are positioned at a minimum distance of 150 mm from the vertical plane of the non-electrified wires. The barbed wire and razor wire shall be earthed at regular intervals.

20. Where an **electric animal fence** crosses a public pathway, a non-electrified gate shall be incorporated in the **electric fence** at the point or a crossing by means of stiles shall be provided. At any such crossing, the adjacent electrified wires shall carry warning plates as described above.

Installation of electric security fences

GENERAL

An electric security fence should be installed so that, under normal conditions of operation, persons are protected against inadvertent contact with pulsed conductors.

Note 1: This requirement is primarily intended to establish that a desirable level of safety is present or is being maintained in the physical barrier.

Note 2: When selecting the type of physical barrier, the likely presence of young children should be a factor in considering the size of openings.

LOCATION OF ELECTRIC SECURITY FENCE

The electric fence should be separated from the public access area by means of a physical barrier.

Where an electric fence is installed in an elevated position, such as a window or skylight, the physical barrier may be less than 1,5 m high where it covers the whole of the electric fence.

PROHIBITED ZONE FOR PULSED CONDUCTORS

Pulsed conductors shall not be installed within the shaded zone shown in Figure 2.

Key

A = Secure area
B = Public access area
☐ Physical barrier
▨ Prohibited area
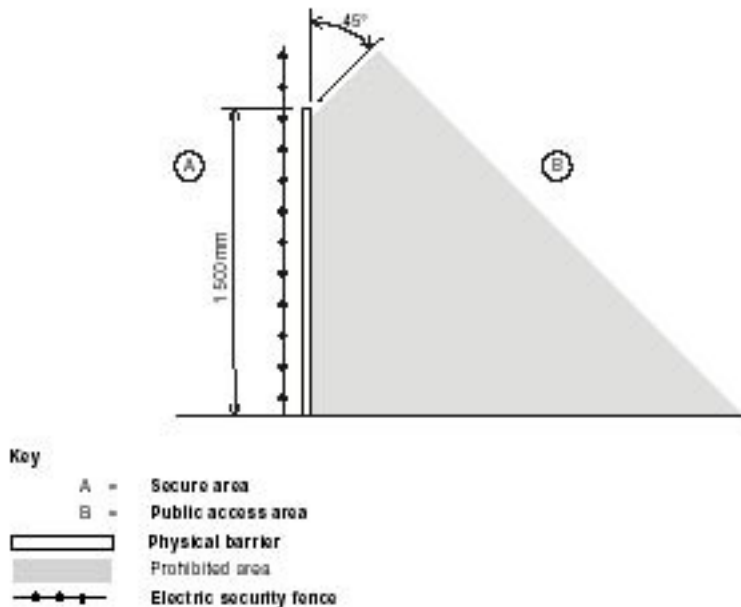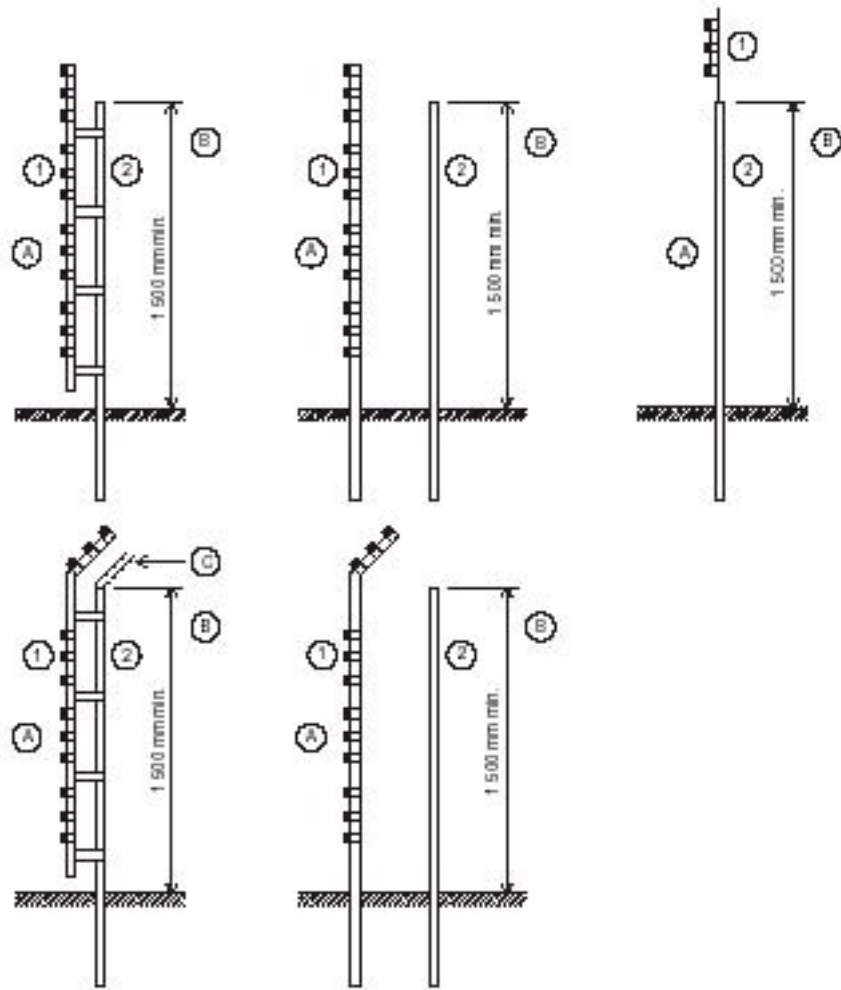╾━◆━◆╾ Electric security fence

**Figure 6 – Prohibited Area for Pulse Conductors**

Note 1: Where an electric security fence is planned to run close to a site boundary, the relevant government authority should be consulted before installation begins.

Key
A = Secure area
B = Public access area
C = Barrier where required
1 = Electric security fence
2 = Physical barrier

Figure 7 – Typical Constructions where an Electric Security Fence is

Exposed to the Public

Note 2: Typical electric security fence installations are shown in Figure 9 and Figure 10.
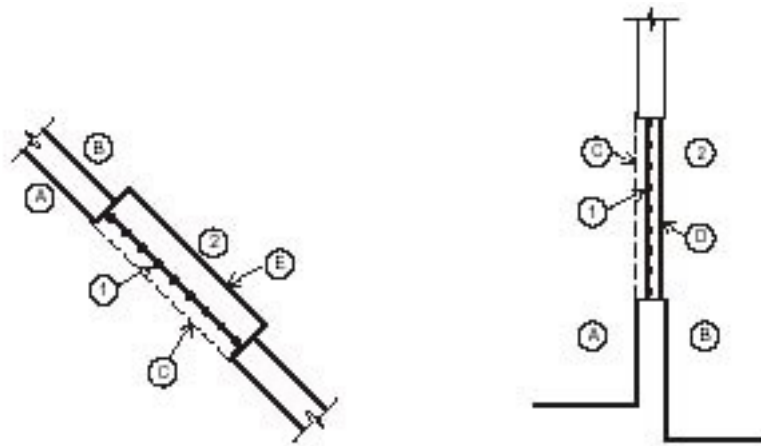
Key
A = Secure area
B = Public access area
C = Barrier where required
D = Glass window pane
E = Skylight in roof
1 = Electric security fence
2 = Physical barrier

Figure 8 – Typical fence constructions where the electric security fence is

installed in windows and skylights

SEPARATION BETWEEN ELECTRIC FENCE AND PHYSICAL BARRIER

Where a physical barrier is installed in compliance with 3 at least one dimension in any opening should be not greater than 130 mm and the separation between the electric fence and the physical barrier should be

– within the range of 100 mm to 200 mm or greater than 1 000 mm where at least one dimension in each opening in the physical barrier is not greater than 130 mm;

– greater than 1 000 mm where any opening in the physical barrier has all dimensions greater than 50 mm;

– less than 200 mm or greater than 1 000 mm where the physical barrier does not have any openings.

Note 1: These restrictions are intended to reduce the possibility of persons making inadvertent contact with the pulsed conductors and to prevent them from becoming wedged between the electric fence and the physical barrier, thereby being exposed to multiple shocks from the energizer.

Note 2: The separation is the perpendicular distance between the electric fence and the physical barrier.

PROHIBITED MOUNTING

Electric fence conductors should not be mounted on a support used for any overhead power line.

OPERATION OF ELECTRIC SECURITY FENCE

The conductors of an electric fence should not be energized unless all authorized persons, within or entering the secure area, have been informed of its location.

Where there is a risk of persons being injured by a secondary cause, appropriate additional safety precautions should be taken.

Note: An example of a secondary cause is where a person may be expected to fall from a surface if contact is made with pulsed conductors.

In some Industrial Installations it may be preferable to provide the ability to link multiple units into a group. When linked the individual PTE1000's become a "Group". Members of a group have simultaneous high voltage output pulses and act as is they are one energiser with multiple outputs. This is designed so that no possible combination of individual outputs can be dangerous. [1]

Group linking via the Keypad "bus".

The keypad terminals on all units in the group are linked, see Figure 5. Since only one unit needs to power the keypad 3 wires are linked from one unit to the keypad (optional) and 2 wires to every other unit in the group. Do not connect the + lines between PTE1000's as this could result in some strange behaviour and possibly damage. Note the connections can be a star or daisy chain or any mixture. If required the bus can be split using an opto isolator module, this is necessary in noisy (EMF) environments or if the bus is longer then 100m. It is also possible for a PC to be added to the group using a keypad to RS232 bridge.

Notes:

1. Members of a group can be individually switched on and off, even the master can be turned off via input or key switch.
2. A slave will alarm if the keypad bus is broken between it and the group master.
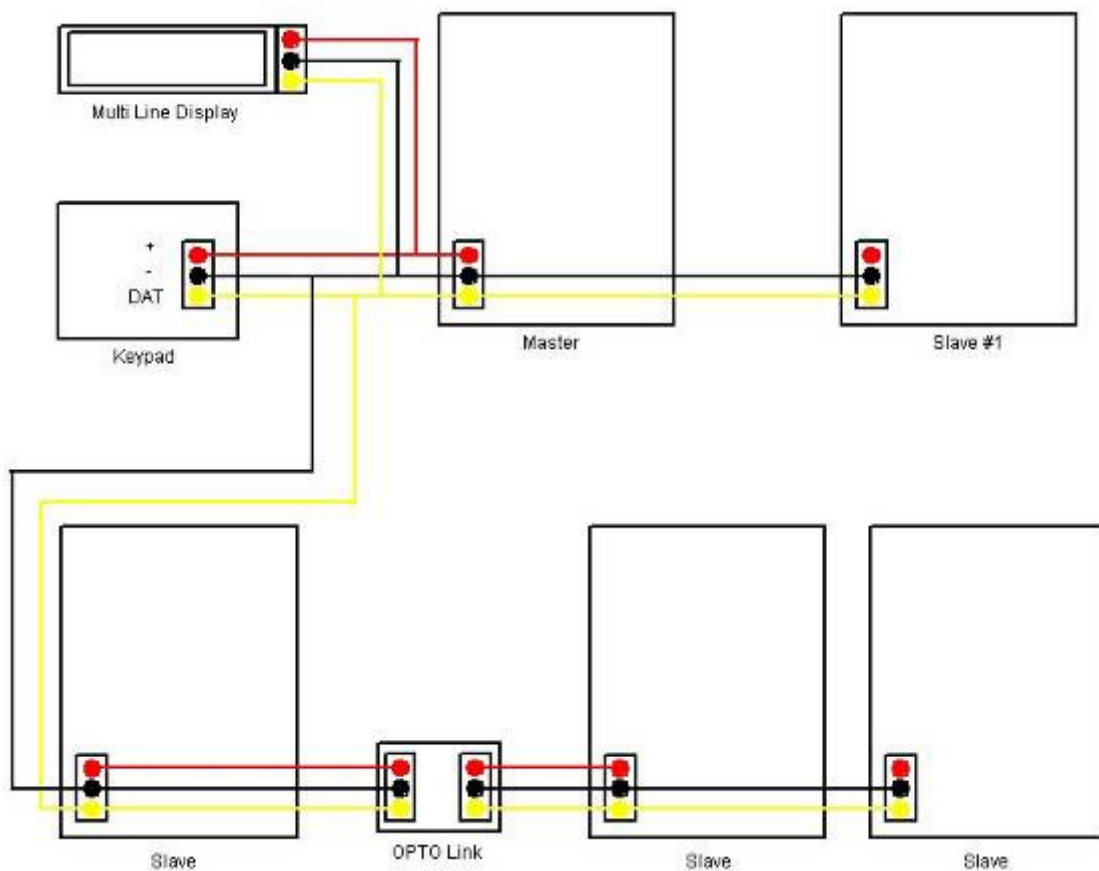3. After programming the Keypad may be disconnected, it is not required for group operation.

Figure 9 – Group Mode Linking

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[1] Patent Applied For.

Group Installation notes

1. All PTE1000's need an appropriate high voltage circuit earth connection.
2. Each unit must have it's own AC supply (charger) and battery.
3. Allow for the heat load of multiple units mounted inside a cabinet, approx. 5W each, 10W if the AC plug pack is also in the enclosure.
4. Use shielded or twisted pair cable for the group keypad wiring.
5. You will need to program the group mode option on each of the units before operating as a group. Do this by connecting a keypad to each unit, one at a time, removing the lid (tamper jumper off), then wait till the slave enables the keypad before programming it.
6. Each slave in the group must have a different number set in option 21. Record the ID on the unit. PTE102x dual channel units count as 2 slaves. I.e. if the unit is Slave 2 then channel 1 is Slave 2 and channel 2 is Slave 3.

Appendix C: PTE0321 Perimeter Patrol Software

The Pakton PERIMETER PATROL software package enables one or more PTE1000 energizers to be monitored and controlled from a PC.

It features:

- User definable mimic screen background (map)
- Ability to place the Zone mimics anywhere over the map
- User and administrator PIN numbers
- Support for PTE101x or PTE102x Energisers.
- PTE101x in Bi-polar or conventional mode.
- Upper and lower alarm thresholds
- Zone configuration
- Compatible with an LED keypad

The Lite version is limited to 6 zones and does not support:

- Group Controller (Relay Output board)
- Event Log
- LCD keypad
- Alarm Messages via SMS
- Earth Monitors

Thus it is ideal for a stand alone system where the owner is interested in a visual representation of an electrified enclosure (mimic screen) and the ease of operation that a Windows compatible GUI application can provide.