

NEMTEK
Electric Fencing Products



Merlin 4

Electric Fence Energizer

Installer Manual



www.nemtek.com

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Introduction & company profile

INTRODUCTION

Thank you for choosing our product! The NEMTEK Merlin 4 Electric Fence Energizer is designed and manufactured to provide many years of reliable use, if installed and maintained correctly. The guidelines provided in this manual will assist you with the basic operation and maintenance of your Merlin 4.

Currently this product is designed and manufactured in South Africa for the South African and international markets. More information on our products and general information are available on our web site at: <http://www.nemtek.com>.

COMPANY PROFILE

The NEMTEK Group of Companies manufacture and distribute intelligent electronic agricultural fencing systems, security and perimeter control systems and have been involved in the security industry since 1990.

We have our own research and development team, designing and manufacturing a full range of globally competitive electric fence energizers and related products.

NEMTEK is continually updating its products according to South African and international standards in order to ensure the highest quality products and continuous customer satisfaction.

Guarantee & Disclaimer

GUARANTEE

The Merlin 4 Electric Fence Energizer, manufactured by NEMTEK, is guaranteed for a period of two years from date of sale against defects due to faulty workmanship or materials.

NEMTEK will, at its discretion, either repair or replace a product that proves to be defective.

NEMTEK guarantees that the product, when properly installed and used in line with the specification as determined by NEMTEK from time to time, will execute its function of generating a suitable potential. NEMTEK does not guarantee that the operation of the product will be uninterrupted and totally error free. Faulty units must be returned to one of the NEMTEK Group outlets. The buyer shall pay all shipping and other charges for the return of the product to NEMTEK or NEMTEK Security Warehouse.

DISCLAIMER

NEMTEK Holdings (Pty) Ltd or any of its subsidiary companies does not guarantee that the operation of the product will be uninterrupted or totally error free.

Energizer specifications may be altered without prior notification.

The installer is referred to the definitions and general requirements in Appendix A.

The installer must take into consideration the applicable municipal laws concerning the installation of electric fences. General guidelines are available, or refer to the website: <http://www.nemtek.com>. International standards can be viewed at <http://www.iec.ch> and South African standards on <http://www.sabs.co.za>

EXCLUSIVE REMEDIES

The remedies provided herein are NEMTEK's sole liability and the buyer's sole and exclusive remedies for breach of guarantee. NEMTEK shall not be liable for any special, incidental, consequential, direct or indirect damages, whether based on contract, tort, or any other legal theory. The foregoing guarantee is in lieu of any and all other guarantees, whether expressed, implied, or statutory, including but not limited to warranties of merchantability and suitability for a particular purpose.

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Mounting / battery replacement procedures

*Energizer to be mounted vertically against a flat surface,
in well ventilated area.

*Avoid prolonged exposure to direct sunlight

STEP 1: Disconnect mains. Open the lid
by removing the two cap screws.
Unplug the battery terminals if connected.

STEP 2: Remove screws and battery bracket.

STEP 3: Remove battery

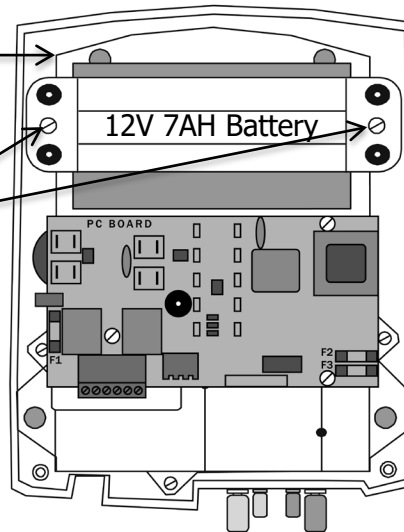
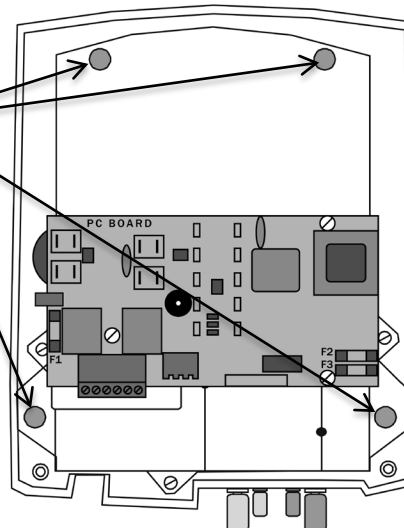
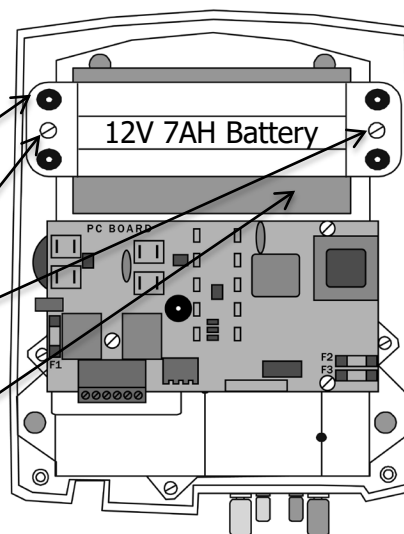
**Dispose of old battery according to legal requirements.
Do NOT replace with non-rechargeable battery!*

STEP 4: Drill 4 x 8mm holes for mounting the unit.
Four nail-in anchors are supplied with the unit.
Insert the plastic sleeve of the nail-in anchor from
the inside of the box and then hammer the screw in
with a screw driver and hammer.
NB: Always insert the plastic sleeve from the inside
of the box.

STEP 5: Insert battery with the
positive terminal to the top.

STEP 6: Place the battery bracket back (with
plastic offsets at the top) and fasten the screws.

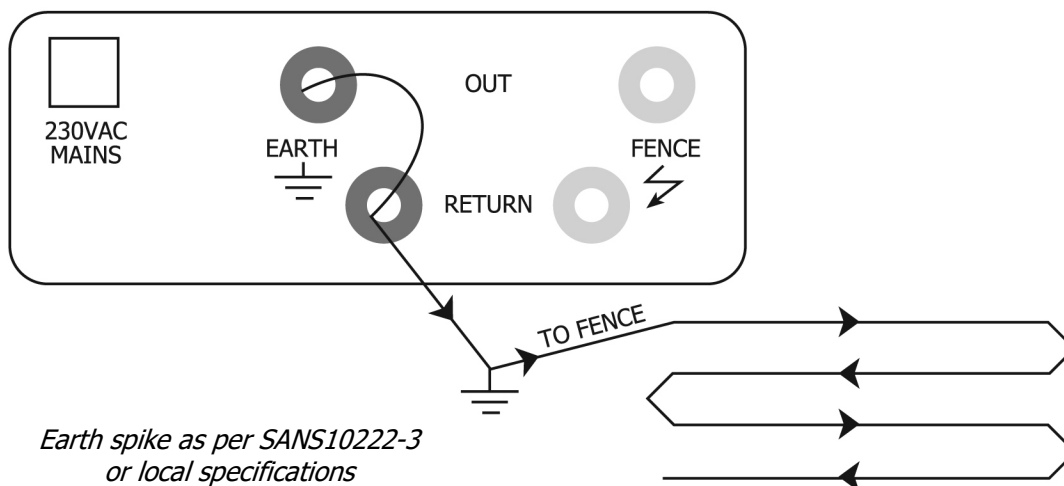
STEP 7: Connect battery wires. Close the lid
by hooking the top of the lid in first and then fasten
the bottom down with the two cap screws. Apply
mains to the unit.



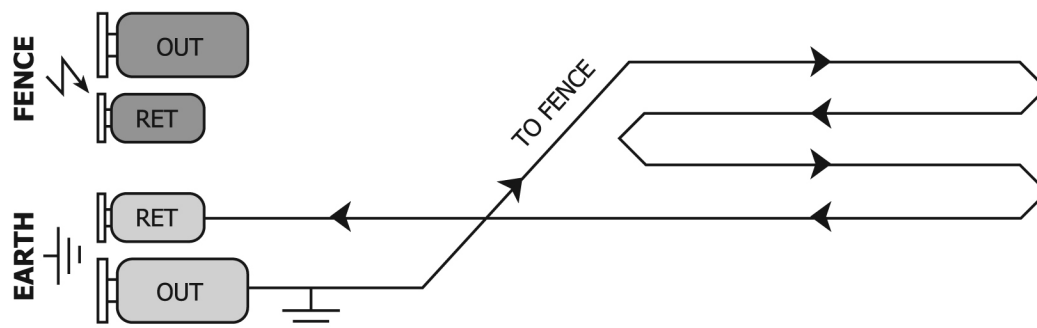
Connection to the fence

Option 1: NO EARTH LOOP MONITORING

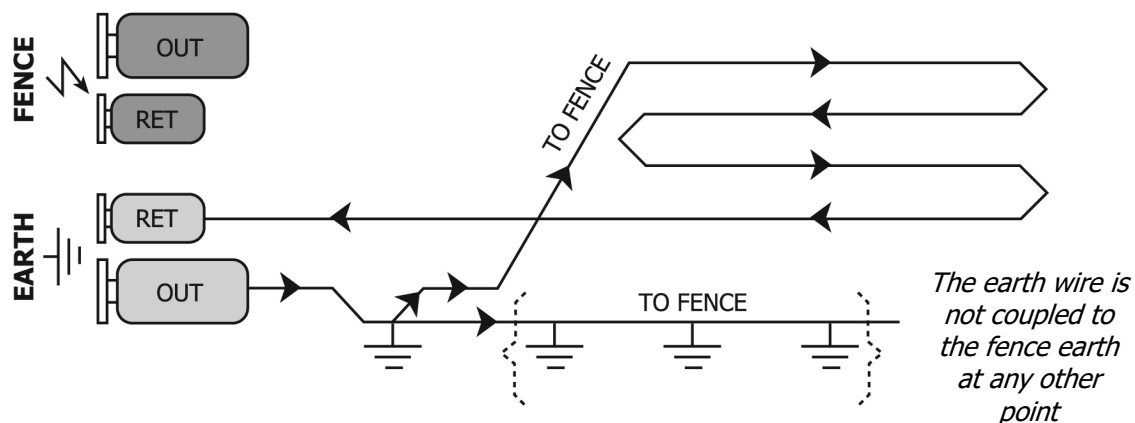
Bridge the earth OUT to earth RETURN. The unit will now function as per the old version WIZORD.



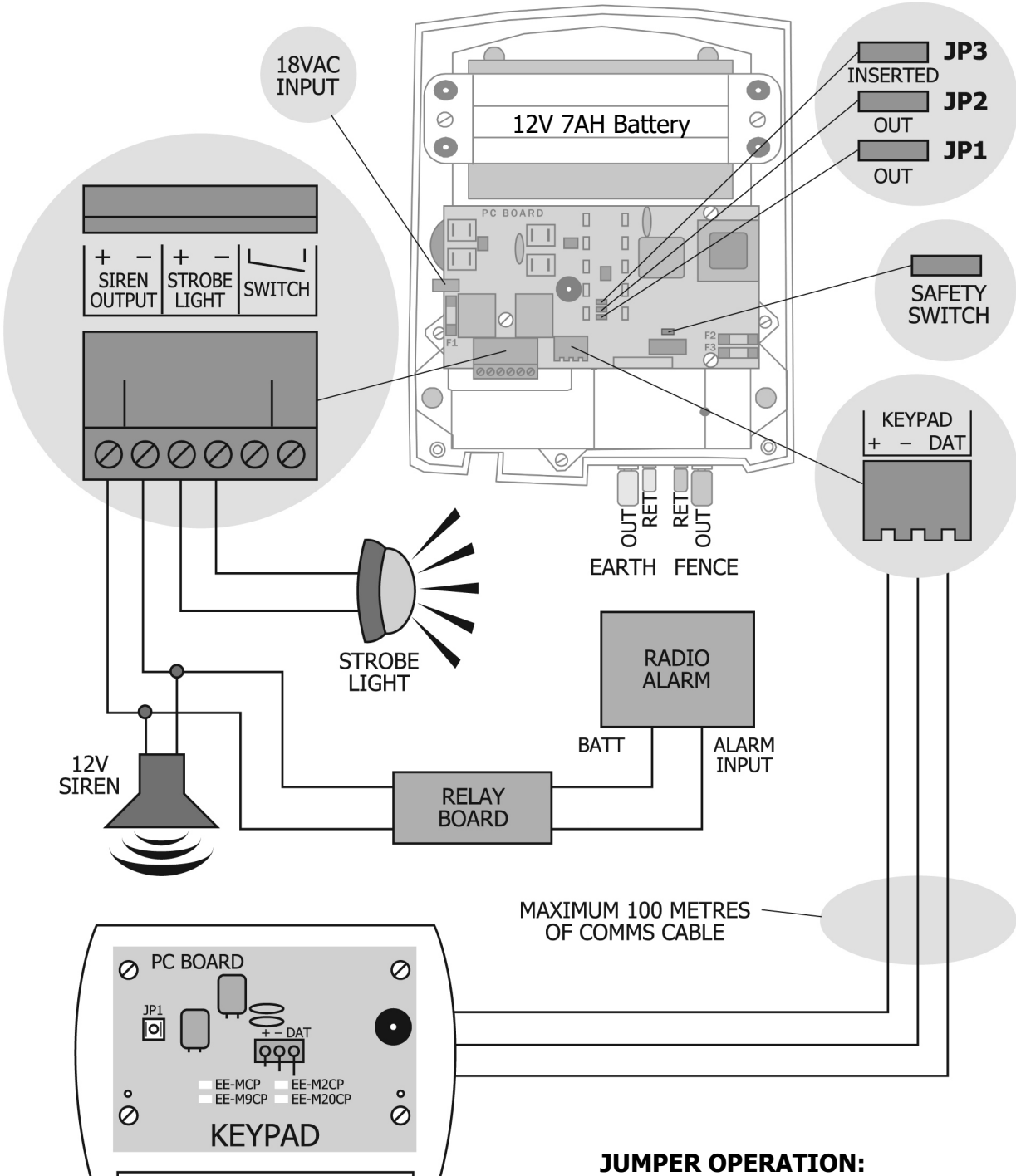
Option 2: EARTH LOOP MONITORING; GOOD SOIL EARTHING



Option 3: EARTH LOOP MONITORING; POOR SOIL EARTHING



Connection / configuration diagram



JUMPER OPERATION:

- * **JP1** – removed
- * **JP2** – removed
- * **JP3** – inserted
- * **SAFETY SWITCH** – removed

PC Board replacement procedures

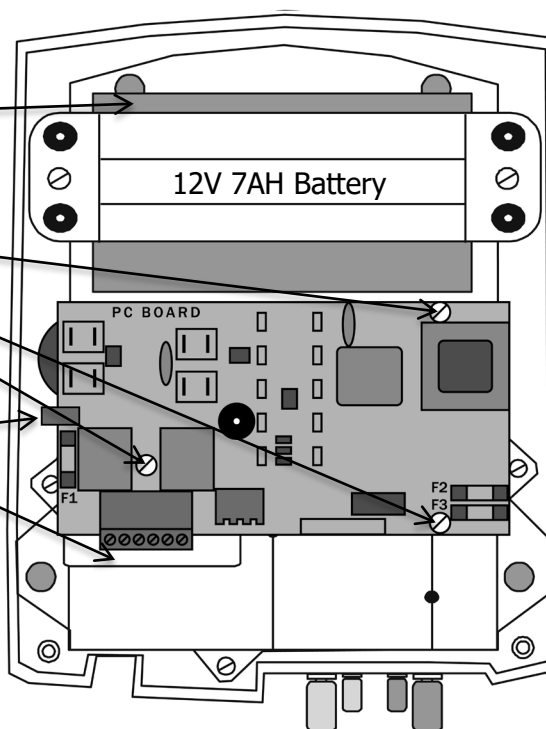
REMOVAL:

STEP 1: Disconnect mains and battery terminals if connected

STEP 2: Remove screws

STEP 3: Remove all connectors from PC Board

STEP 4: Gently pull PC Board straight up to remove (connections on the back)



REPLACEMENT:

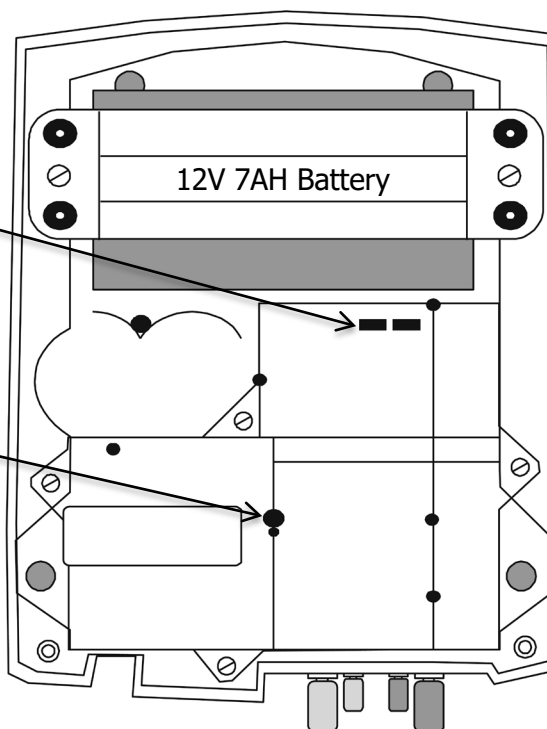
STEP 1: Gently push PC Board back into place

Take care that the spade connectors are correctly positioned before pushing the PC Board into place.

Also ensure that the opto-coupler (looks like an LED) is correctly positioned before pushing the PC Board into place

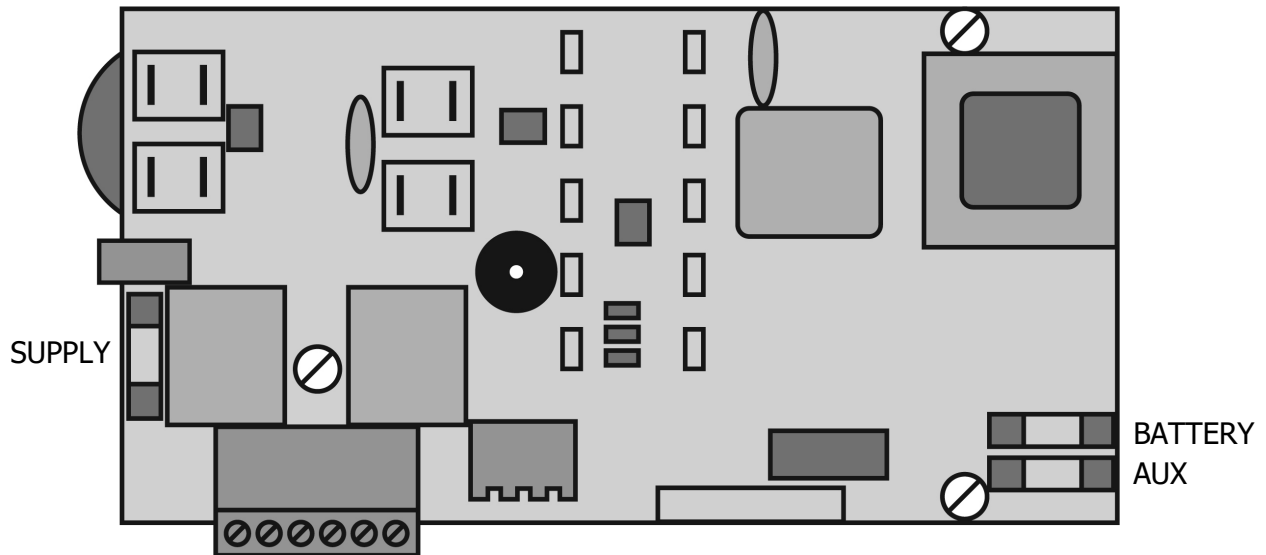
STEP 2: Reconnect all connectors to PC Board

STEP 3: Reconnect mains and battery terminals



Service conditions

FUSE DESCRIPTION & FAULT SYMPTOMS



HOW TO CHECK: (ALL FUSES ARE 2 AMPERE FAST BLOW)

SUPPLY: The power LED does not illuminate when the mains power is present

AUX: The siren and strobe, as well as the keypad, do not function

BATTERY: The energiser switches off in the absence of mains power

Installer options

INSTALLATION NOTES:

1. Keep the wires to the fence **separate** from the keypad/gate/siren/strobe/mains/remote wiring.
2. **Do not try and modify the unit.** Any unauthorised modifications will null and void the warranty and possibly make the unit illegal.
3. If the **remote On/Off** facility is used, the wire between the remote switch and the energiser can be up to a 100m. The switch contact must be closed for the energiser to be off.
4. A **remote receiver** can obtain **12VDC** from the keypad bus. Current consumption must not exceed 0.1 Amps. **This is not sufficient to supply power** for an armed response transmitter.
5. The **siren** and **strobe light** together must not draw more than 1.75Amps.
6. To connect a **radio alarm transmitter** or **alarm panel** to the energiser use an isolation relay between the strobe light output and the panel. Never use the energiser battery to power a radio alarm transmitter or alarm panel.
7. The wire between the **magnetic gate switch** and the energiser can be up to a 100m but must not run in parallel with the fence wires. The gate switch must be open circuit if the gate is open.
8. The **remote keypad cable** must not exceed a 100m in total. Avoid running this cable in parallel with any fence (high voltage) wires.
9. You can connect a total of four keypads to one energiser. Each must have a unique address setting.
10. **Use high voltage insulation wire** between the fence and energiser, including the earth wire. Never run these wires in the same conduit or through the same hole as the low voltage wiring.
11. Always use ferrules or line clamps to connect two **high voltage wires** together. Avoid using different types of material for connections like copper on steel.
12. The **fence** must be **earthed properly** with at least three earth electrodes as close as possible to the energiser. The distance between the fence earth electrode and other earth systems shall be not less than 10 m.
13. When **replacing** the **lid** of the energiser hook the top in first while holding it an angle and then push it closed at the bottom. Fasten the lid down with the two cap screws.
14. Always **test** the **fence alarm** for a short and open-circuit after installation at the furthest point on the fence.
15. Do not use the energiser with **non-rechargeable batteries** and any lead-acid batteries must be placed in a well-ventilated area during charging.
16. The unit contains a sealed lead-acid battery that will vent to the atmosphere under certain conditions. For this reason it is imperative that the energiser be installed in a well ventilated area.
17. Refer to the applicable laws concerning the installation of electric fences.
18. **Electric fencing can be lethal.** Avoid head contact with the fence. When installing please take careful note of the options available for current limiting resistors, the programmable output energy levels as well as the low-voltage operation of the energizer.

Installer options

ENTER PROGRAMMING MODE



Before any of the installer options can be changed, the unit must be in programming mode. To do so, enter the 6 digit installer PIN followed by the * 0 # keys.

- The keypad will beep twice if the PIN was correct. The unit is now in programming mode.
- If no key is pressed for one minute, the system will automatically exit the programming mode.
- The default installer PIN is **0 1 2 3 4 5**

EXIT PROGRAMMING MODE



When finished it is important to exit the programming mode. While in programming mode, you will be unable to access any user functions from the keypad.

INSTALLER PIN



The default installer PIN can be changed by pressing the **0** key twice, followed by the new PIN and the **#** key.

- The new PIN must be 6 digits long.
- If you cannot remember the PIN, default the unit and use **0 1 2 3 4 5** as the PIN. The keypad will beep twice to indicate that it was accepted.

SIREN-ON TIME



The time that the siren will be on for, can be changed by pressing the **0** key, followed by the **1** key. Select the desired time from the table and press the corresponding number from **0** to **4** followed by the **#** key. The keypad will beep twice to indicate that the new setting was accepted.

Example: To change the Siren-On Time to 4 minutes, enter **0 1 4 #**

The default Siren-On Time is **4 minutes**.

0	10 Sec
1	30 Sec
2	1 Min
3	2 Min
4	4 Min

Installer options

SIREN-OFF TIME

0 2 #

The time for the siren to be silent after the Siren-On Time has elapsed, can be changed by pressing the **0** key followed by the **2** key. Select the desired time from the table and press the corresponding number from **0** to **4** followed by the **#** key. The keypad will beep twice to indicate that the new setting was accepted.

Example: To change the Siren-Off Time to 2 minutes, enter **0 2 3 #**

The default Siren-Off Time is 4 minutes.

0	10 Sec
1	30 Sec
2	1 Min
3	2 Min
4	4 Min

NUMBER OF TIMES THE SIREN SOUNDS

0 3 #

The number of times the siren will sound after an alarm is activated, can be changed by pressing the **0** key, followed by the **3** key. Select the desired number of times from the table and press the corresponding number from **0** to **4** followed by the **#** key. The keypad will beep twice to indicate that the new setting was accepted.

Example: To change the Number of Times The Siren Sounds to 10 times, enter **0 3 4 #**

The default Number of Times The Siren Sounds is **3 times**.

0	Once
1	Twice
2	3 Times
3	6 Times
4	10 Times

GATE DELAY TIME

0 4 #

The time delay for the gate to stay open before the alarm is activated, can be changed by pressing the **0** key, followed by the **4** key. Select the desired time delay from the table and press the corresponding number from **0** to **4** followed by the **#** key. The keypad will beep twice to indicate that the new setting was accepted.

Example: To change the Gate Delay Time to 30 seconds, enter **0 4 1 #**

The default Gate Delay Time is **4 minutes**.

0	15 Sec
1	30 Sec
2	1 Min
3	2 Min
4	4 Min

Installer options

HIGH POWER FENCE VOLTAGE

0 5 #

The open circuit fence voltage can be changed by pressing the **0** key, followed by the **5** key. Select the desired voltage from the table and press the corresponding number from **0** to **4** followed by the **#** key.

The keypad will beep twice to indicate that the setting was accepted.

Example: To change the Fence Voltage to 6kV, enter **0 5 3 #**

The default Fence Voltage is **7kV**.

0	3.0 kV
1	4.0 kV
2	5.0 kV
3	6.0 kV
4	7.0 kV

The energizer will only use the High Power Fence Voltage parameter when mains is present. The energizer has a unique algorithm for extending battery life during mains failure conditions and automatically controls the fence voltage.

LOW POWER FENCE VOLTAGE

0 6 #

The open circuit low power fence voltage can be changed by pressing the **0** key, followed by the **6** key. Select the desired voltage from the table and press the corresponding number from **0** to **4** followed by the **#** key. The keypad will beep twice to indicate that the new setting was accepted.

Example: To change the Low Power Fence Voltage to 1900 Volts, enter **0 6 4 #**

The default Low Power Fence Voltage is **1700 Volts**.

0	1500 V
1	1600 V
2	1700 V
3	1800 V
4	1900 V

FENCE INTERFERENCE ALARM

0 7 1 #

The fence interference alarm can be enabled by pressing the **0** key followed by **7, 1** and **#** key.

0	Disabled
1	Enabled

STROBE LIGHT FUNCTION

1 0 #

The strobe light output can be changed by pressing the **1** key followed by the **0** key. Select the desired function from the table and press the corresponding number from **0** to **1** followed by the **#** key. The keypad will beep twice to indicate that the new setting was accepted.

Example: To change the Strobe Light Function so that the strobe light switches on whenever the fence is on, enter **1 0 1 #**

0	Strobe light = Alarm
1	Strobe light = fence ON

The default Strobe Light Function is option **0**. The strobe light switches on when the alarm is **activated**.

Installer options

MAGNETIC SWITCH ENABLE

1 0 #

The magnetic On/Off switch (under the fascia of the energizer) can be enabled by pressing the **1** key, followed by the **0** key. Select the desired state from the table and press the corresponding number from **2** to **3** followed by the **#** key. The keypad will beep twice to indicate that the new setting was accepted.

Example: To enable the magnetic On/Off switch, enter **1 0 3 #**

2	Magnetic switch disabled
3	Magnetic switch enabled

By default the Magnetic switch is **disabled**.

SWITCH FUNCTION (6 WAY TERMINAL STRIP)

1 0 #

The switch input, marked as '**switch**' on the printed circuit board under the removable 6-way green connector block, can be configured as a timed input (typically used for monitoring a gate) or as a remote On/Off input. The switch function can be changed by pressing the **1** key, followed by the **0** key. Select the desired state from the table and press the corresponding number from **4** to **5** followed by the **#** key. The keypad will beep twice to indicate that the new setting was accepted.

Example: To enable the remote On/Off, enter **1 0 5 #**

4	Timed switch input
5	Remote On/Off input

By default the switch is a **timed input**.

KEYPAD DETECT FUNCTION

1 0 #

The energizer can be configured to detect if one or more keypads is present. The keypad detect function can be altered by pressing the **1** key, followed by the **0** key. Select the desired state from the table and press the corresponding number from **6** to **7** followed by the **#** key. The keypad will beep twice to indicate that the new setting was accepted.

Example: To enable the keypad detect function, enter **1 0 6 #** (detection period is 15 seconds)

6	Keypad detect on
7	Keypad detect off

By default the Keypad detect is **off**.

Installer options

FENCE ALARM DELAY



The energizer fence alarm delay can be altered. The fence alarm delay can be altered by pressing the **1** key, followed by the **0** key. Select the desired state from the table and press the corresponding number from **8** to **9** followed by the **#** key. The keypad will beep twice to indicate that the new setting was accepted.

Example: To make the fence alarm delay on pulse, enter **1 0 9 #**

8	3 Pulse count
9	1 Pulse count

By default the fence return voltage must not be present for **three pulses**. **Note that during mains failure and initial turn On, the energizer automatically uses a 3-pulse count delay.**

Programming notes

1. To load factory default settings: Unplug the energizer from the mains and disconnect one of the battery terminals. Reconnect the battery terminal and apply mains to the energizer. Within 38 seconds of reconnecting the battery terminal, the key sequence **2 3 8 9 #** must be entered on the keypad. The energizer will turn off if the default parameters were accepted.
2. After changing the Fence Alarm Voltage setting, make sure that a short and open circuit fault can still activate the alarm.
3. The Fence Voltage setting is measured with no load on the energizer. It is possible that the output voltage is lower or higher than indicated in the table if a fence is connected to the energizer.

Fault finding

General fault conditions:

Condition	Power	On	Service	Siren	Comment
Normal	On	On	Off	Off	Normal no fault
Power Failure	Off	On	Off	Off	Check if charger is plugged in
Battery Low	Off	On	Pulse (5 sec)	Off	Check charger and fuses
Battery Flat	Off		Flash	On	Check charger and fuses
Low Voltage	On	Flash	Off	Off	Fence in low voltage mode
Service			Flash	On	Service fault see next table

Service fault conditions:

There are 5 possible conditions that can cause a service alarm. To determine the cause of the service alarm, open the lid of the energizer box while the service light is flashing. Make sure that Jumper 4 (JP4) is NOT inserted. The following lights will indicate the cause of the service condition:

Condition	LEDS RHS (fence terminals at bottom)	Comments
Comms failure	Closest battery	Only if keypad detect enabled
Fence interference		Mains pickup, second energizer connected
N.C.U.		Not currently used
Energizer faulty		Faulty or tampered with
Battery flat	Bottom energizer	Check fuses/mains/battery