NEMTEK
GROUP OF COMPANIES

DRUID LCD 1xx   Electric Fence Energizer

Installer Manual

DRUID ENERGIZER™

NEMTEK
www.nemtek.com

FENCE CONDITION
EXCELLENT - 9
GOOD - 6
POOR - 2

FENCE MODE
LOW VOLTAGE - lo
OFF - O

FENCE VOLTAGE
LOW - !
BAD - X

FENCE ALARM
ACTIVE - ·))
BYPASSED - ⌐⌐
PAST EVENT - ☉

ENERGIZER
⊷ - SERVICE
t - TAMPERED
s - SILENT ALARM

GATE
i - INSTANT ALARM
O - OPEN

GATE ALARM
·)) - ACTIVE
⌐⌐ - BYPASSED
☉ - PAST EVENT

POWER
⌂ - MAINS POWER
☉ - MAINS FAIL PAST
🔋 - BATTERY GOOD
▯ - LOW
▯ - FLAT

DRUID ENERGIZER™

Revision 1.0
1 March 2010

INTRODUCTION

The DRUID LCD is a battery (12V 7AH nominal) operated energizer suitable for connection to mains (230V 50Hz nominal).

The batteries to be used are rechargeable lead-acid batteries. Non-rechargeable batteries must not be used. The lead-acid batteries require venting and it is imperative that the energizer be situated in a well-ventilated area.

Electric fencing can be lethal. Please avoid entanglement\entrapment hazards (See APPENDIX at the end of this manual) and warn the user to avoid head contact with the fence.

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 the Appendix.

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.

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FOREWORD

The DRUID LCD energizer should ideally be operated by means of a remote keypad to obtain access to the many energizer features and receive the greatest protection. It can however be operated by means of a Nemtek tab or external switch.

The energizer display will be lit with a blue (OFF), green (all is OK), yellow (alarm in history or other medium priority event) or red (active alarm condition exists) background to indicate the energizer's state at a glance and from a distance.

The gate input is functional even when the energizer is not energizing the fence. Use the Gate Alarm Bypass function if this input is to be ignored.

The DRUID LCD energizer has many user and installer settings. These settings will be retained even in the event of a total power failure, i.e. the battery runs flat during a prolonged mains failure.

A new battery with a full charge will typically provide in excess of 24 hours backup. Backup time will vary with fence condition though.

The DRUID LCD energizer incorporates an advanced and patented fence voltage regulation, arc detection and avoidance system. What this means is that the fence energy is maintained at a higher level than would normally be achievable using a conventional energizer on the same fence, when factors such as poor or damaged insulators, wet insulators after a rain storm, or salt build up on insulators (at the coast) prevent the fence from supporting a high voltage. A conventional energizer will push all available energy through any arcing that may occur across the insulator, thus reducing the fence's effectiveness. The DRUID LCD energizer however will detect the arcing and then attempt to operate the fence at a voltage just below that at which arcing occurs, thus maintaining higher energy levels on the fence and improving the effectiveness of the fence. Nemtek is the inventor and patent holder of this innovative technology.

MOUNTING AND BATTERY REPLACEMENT

STEP 1:
Disconnect mains. Open the lid after removing the two cap screws. Unplug the battery terminals if connected.
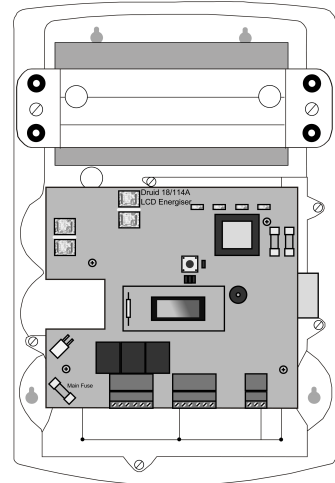
STEP 2:
 Remove screws and battery bracket

STEP 3:
Remove battery
*Dispose of old battery according to legal requirements. Do not replace with a 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.
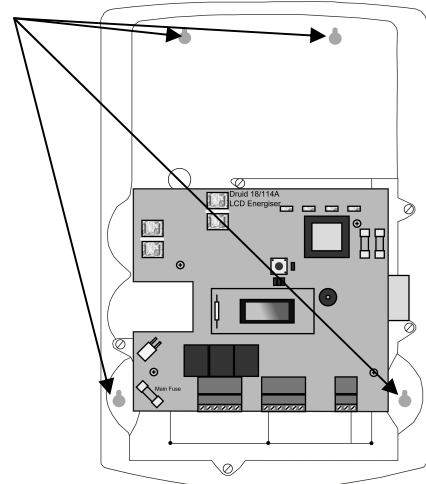
NB: Always insert the plastic sleeve from the inside of the box!

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 into place.

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 power to the unit.
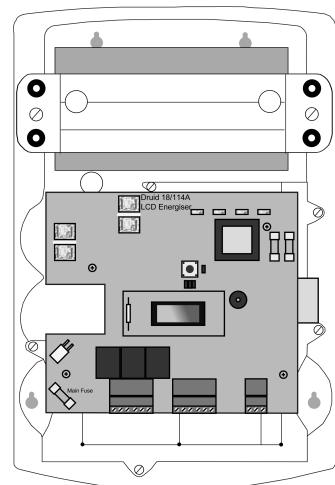
Note:
Energizer to be mounted vertically against a flat surface, in a well ventilated area.
Avoid prolonged exposure to direct sunlight.

PC BOARD REPLACEMENT

STEP 1:
Disconnect mains power and the battery terminals if connected.

STEP 2:
Remove all four connectors, C1 - C4.

STEP 3:
Remove the four screws, S1 – S4.

STEP 4:
To remove the PC Board, gently pull the PC Board away from the mounting plate, unplugging it from the connectors beneath it. There are four spade connectors beneath the PC Board at the top of the board and a box connector beneath near the bottom of the board.

STEP 5:
To replace the PC Board, first align the box connector near the bottom of the PC Board and then align the four spade connectors at the top of the PC Board, and gently press the PCB down into place.

STEP 6:
Re-insert and tighten the four screws.

STEP 7:
Reconnect the four connectors to the PC Board.

STEP 8:
Reconnect the battery terminals and apply mains power.
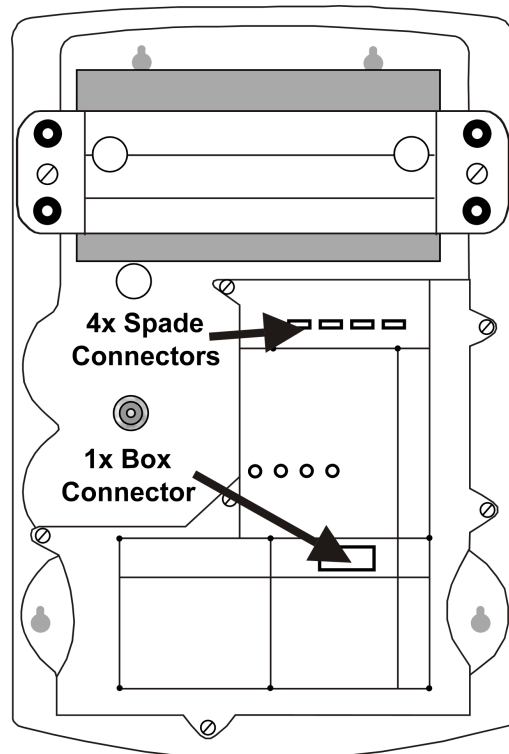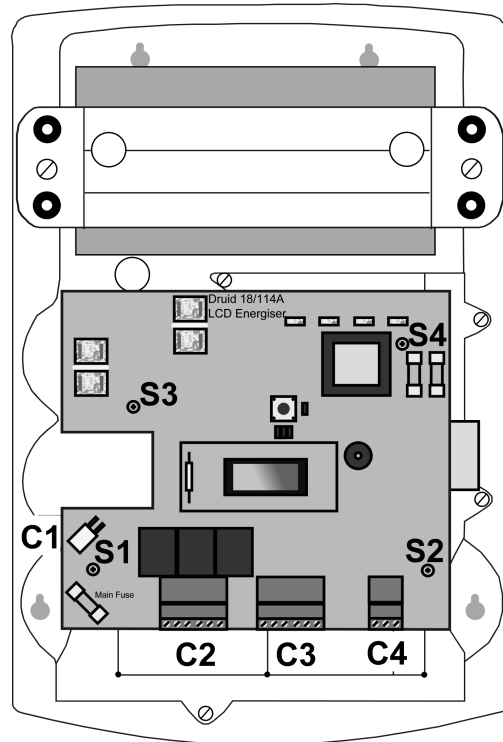
CONNECTIONS

See "OUT1 RELAY FUNCTION", later on in this manual, for more information on the OUT1 relay.

12V DC Strobe Light
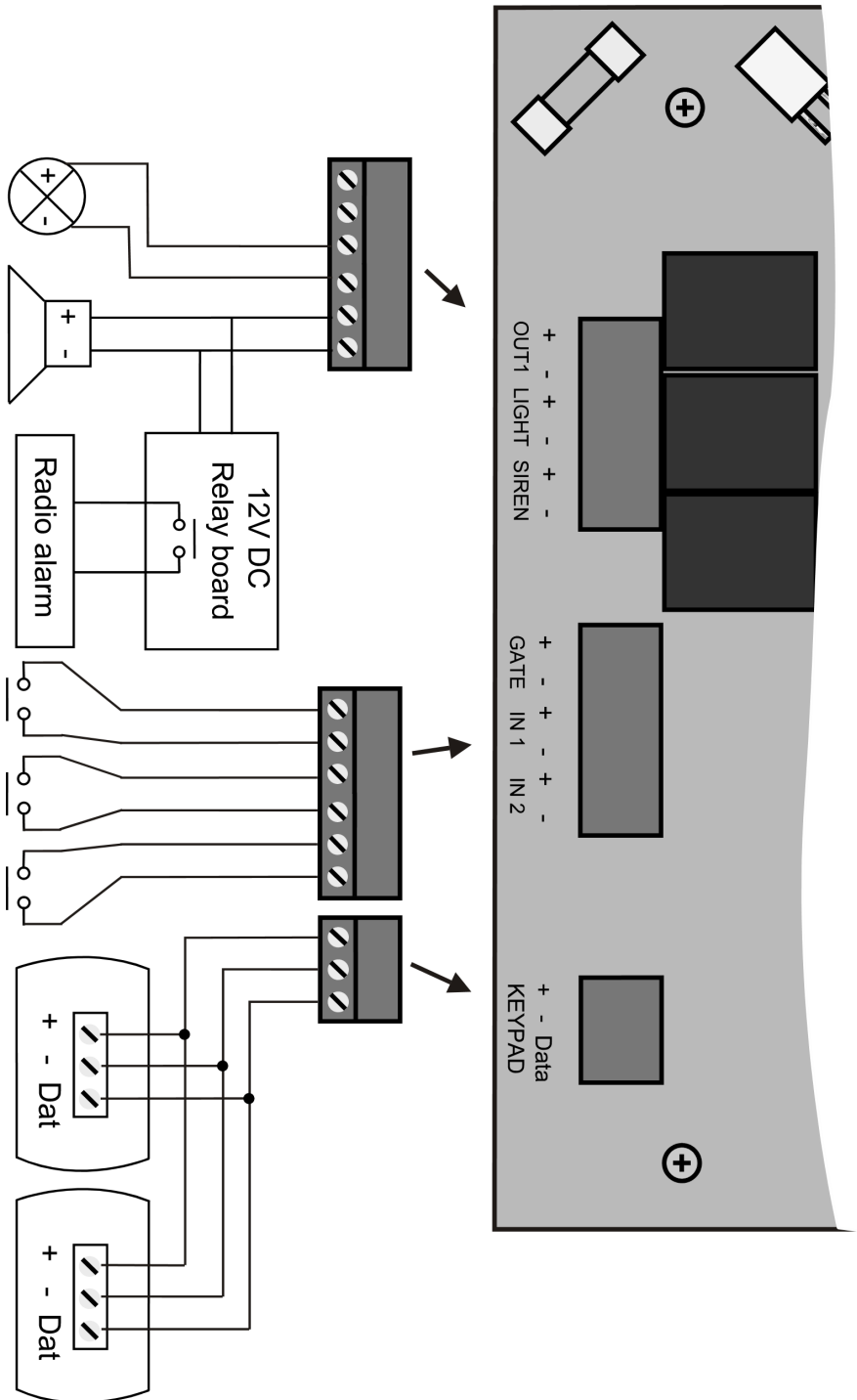
20W max 12V DC Siren

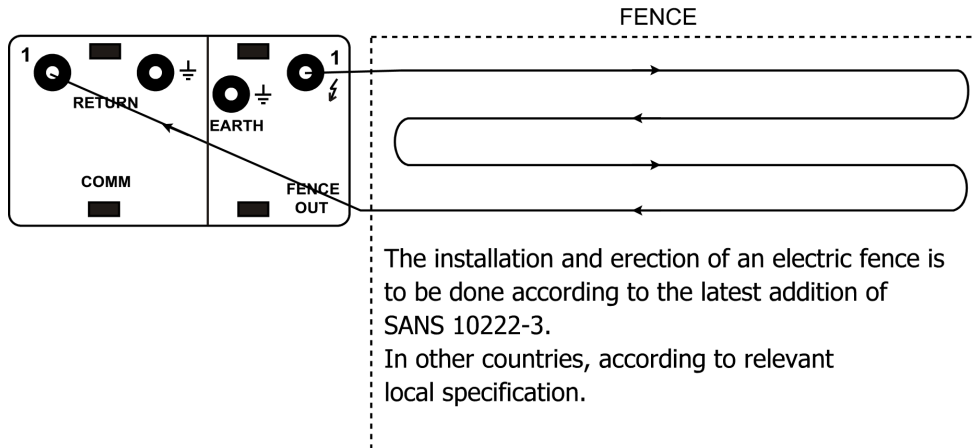Note: Radio alarm not to be powered from energizer

Gate Switch or Panic Switch

External On/Off Switch or Panic Switch

High/Low Switch or Panic Switch

A maximum of two Nemtek Druid LCD keypads and 100m of comms cable can be connected

Radio alarm

12V DC Relay board

OUT1   LIGHT   SIREN

+ - + - + -

GATE   IN 1   IN 2

+ - + - + -

+ - Data
KEYPAD

+ - Dat

+ - Dat

FENCE WIRING DIAGRAMS

Live wire connection

FENCE

The installation and erection of an electric fence is to be done according to the latest addition of SANS 10222-3.
In other countries, according to relevant local specification.

Earth wire connection with earth loop monitoring (preferred)

FENCE

Fence earth wire to be connected to the main earth spike and not directly to the energizer.

Earth spikes are connected to one wire of the fence only, and this one wire is connected to the rest of the fence at the main earth spike only.

Main earth spikes installed close to the energizer.
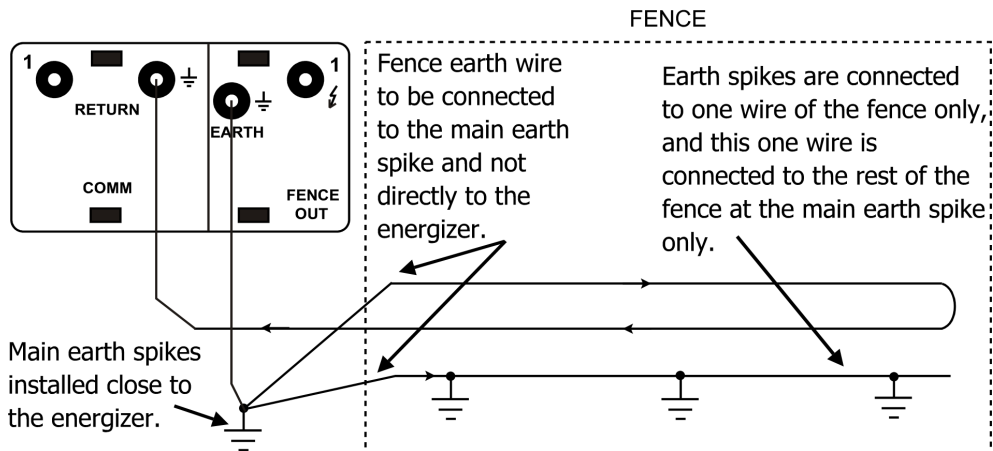
Earth wire connection with no earth loop monitoring

FENCE

Fence earth wire to be connected to the main earth spikes and not directly to the energizer.

Main earth spikes installed close to the energizer.
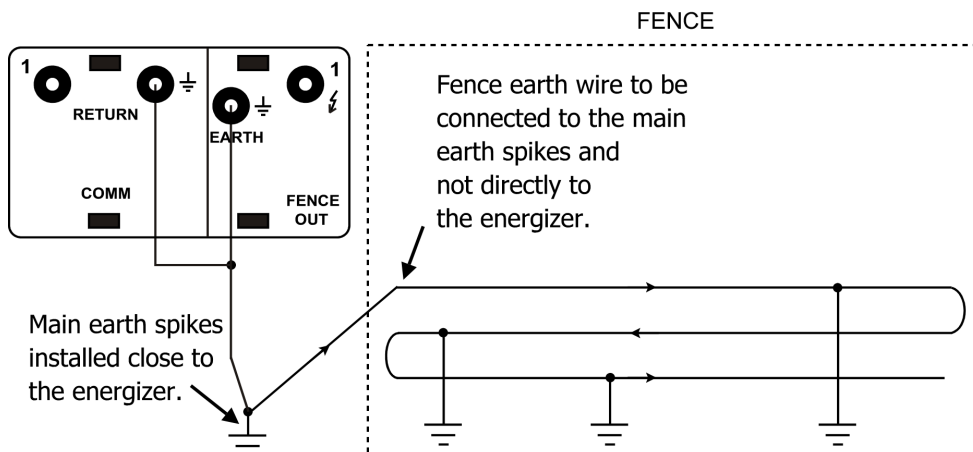
DETAILED SERVICE INDICATORS

When the energizer front cover is opened while displaying a service �֍ condition, if the service condition is still present, further information will be displayed indicating the cause of the service indicator as listed below.

A = Aux fuse blown
I = Fence interference detected
S = HV Charging circuit fail, SCR fail or rapid triggering
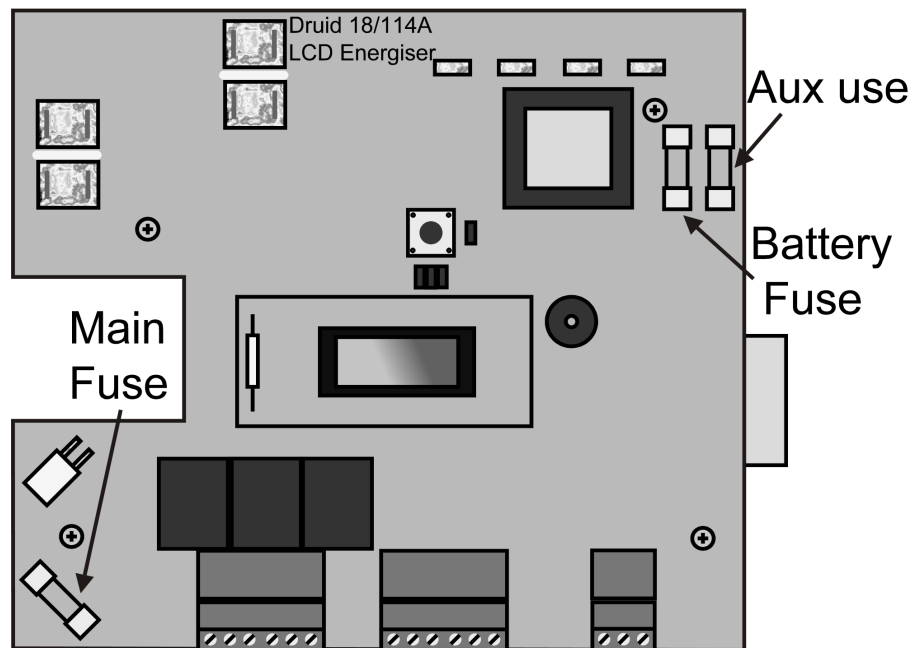B = Battery fuse blown, battery fault or not connected
T = Temperature of internal battery charging circuitry too high for too long
V = Output high voltage sense error
X = Incorrect output transformer fitted to energizer

FUSE DESCRIPTION AND FAULT SYMPTOMS

All fuses are of the "fast blow" type with the Main fuse having a 4A rating and the Battery and Aux fuses a 2A rating.

Main Fuse:
Energizer displays 🔋, 🔋 or 🔋 instead of the mains present symbol ✹.
Battery Fuse:
Energizer does not operate when mains power is disconnected.
Aux Fuse:
Siren, strobe, keypad and LCD backlight do not function.

INSTALLATION NOTES

- Keep the wires to the fence separate from the keypad, gate, siren, strobe and mains wiring.

- Do not try and modify the energizer. Any unauthorized modifications will null and void the warranty and possibly render the unit illegal.

- If the external On/Off facility is used, the wire between the remote switch and the energizer can be up to a 100m in length. The switch contact must be closed for the fence to be energized. For security reasons it is better to use an intelligent FOB on the keypad bus.

- 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.

- The siren and strobe light together must not draw more than 1.75Amps.

- To connect a radio alarm transmitter or alarm panel to the energizer, use an isolation relay between the strobe light output and the panel. Never use the energizer battery to power a radio alarm transmitter or alarm panel.

- The wire between the magnetic gate switch and the energizer can be up to a 100m in length, but must not run parallel with any fence wires. The gate switch must be open circuit if the gate is open.

- The remote keypad cable must not exceed 100m in total length. Avoid running this cable parallel with any fence (high voltage) wires.

- You may connect a total of two keypads or FOB units to one energizer. Each must have a unique address setting.

- Use HT (high voltage) wire between the fence and energizer, including the earth wire. Never run these wires in the same conduit or through the same hole as the low voltage wiring.

- Always use ferrules or line clamps to connect two high voltage wires together. Avoid using dissimilar materials for connections like copper on steel.

- The fence must be earthed properly with three earth electrodes close to the energizer. The distance between the fence earth electrode and any other earth systems shall be not less than 2m for a security fence installation. (Typically a suburban property installation) , and 10m for an agricultural fence installation. (Typically a rural property installation.)

- When replacing the front of the energizer, 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.

- Always test the fence after installation for correct short and open-circuit alarming at various points along the fence. Activate the fence installation test mode, (see ALARM SENSOR MODE later in this manual) and then perform the test. Do not forget to disable the mode after testing has completed.

- Do not use the energizer with non-rechargeable batteries.

- The energizer contains a sealed lead-acid battery that will vent to the atmosphere under certain conditions. For this reason it is imperative that the energizer be installed in a well ventilated area.

- Refer to the applicable laws concerning the installation of electric fences in your area.

PROGRAMMABLE OPTIONS

RESTORE FACTORY DEFAULTS   2 3 8 9

Returns the energizer configuration, including all PINs to their factory default values

Enter this code within 60s of powering the energizer on after complete power removal, i.e mains and battery power removal simultaneously.

ENTER PROGRAMMING MODE   _ _ _ _ _ _ INSTALLER PIN _ * 0

Enables programming mode

Programmable options can only be changed once the energizer is placed into programming mode. The keypad will beep three times if the code is accepted. The factory default installer PIN is **012345**. Programming mode will timeout and exit after five minutes or upon entering the ***#** exit code.

CHANGE INSTALLER PIN   0 0 NEW INSTALLER PIN

Changes the factory default six digit installer PIN to a new six digit PIN

SIREN ON TIME   0 1 m s *

Sets the siren on (active) time
m = minutes, s = x10 seconds
Programmable range is **0101*#** (10s) to **0141*#** (4m:10s)
Factory default value is **0120*#** (2m:0s)

Siren active time is the amount of time that the siren will sound before automatically turning off, if not reset by the user.

SIREN OFF TIME   0 2 m s *#

Sets the siren off (inactive) time
m = minutes, s = x10 seconds
Programmable range is **0201*#** (10s) to **0241*#** (4min:10s)
Factory default value is **0230*#** (3min:0s)

Siren off time is the amount of time that the siren will be forced to remain off after having automatically timed out (siren on time) from a previous alarm condition.

EVENTS BEFORE RE-ARM TIMEOUT   0 3 0 ? *#

Sets the total unacknowledged events before the re-arm time comes into play
? = total events before re-arm time
Programmable range is **0301*#** (1 event) to **0307*#** (7 events)
Factory default value is **0303*#** (3 events)

See SIREN RE-ARM TIME below.

SIREN RE-ARM TIME   0 4 d h h m m *

Sets the sirens re-arm time period
d = day, hh = x10 hours + hours, mm = x10 minutes + minutes
Programmable range is **0400001*#** (1min) to **0471402*#** (7d:14h:02min)
Factory default value is **0410000*#** (1d:00h:00min)

The re-arm time comes into play after the siren has sounded for the set number of events without being manually reset by the user. This is required by law to prevent an alarm from sounding indefinitely while the owner is not home to correct the alarm condition.

SIREN RELAY ACTIVE OPEN   0 0 6 ? *

Sets the active state of the siren relay.
? = 0 (relay closed is alarm active) or 1 (relay open is alarm active)
Factory default value is **0060*#** (relay normally open and closed on alarm)

Typically used when the energizer is connected to an alarm system requiring a normally closed input.

ALARM SENSOR MODE   4 0 8 ? *

Enable or disable the energizer alarm sensor mode.
When this mode is active, the display will indicate "AlmSensr"
? = 0 (conventional energizer mode) or 1 (alarm sensor mode)
Factory default value is **4080*#** (conventional energizer mode)

When in alarm sensor mode, the energizer siren relay is active only as long as the alarm condition is present. Alarm conditions are, gate, tamper, fence, and service conditions. The keypad panic code **91#** will also activate the relay momentarily. This mode is typically used when the energizer is connected to an alarm system and no user interaction with the energizer will take place. The energizer is thus treated as simply another alarm detecting sensor for the alarm panel.
This mode is also useful to walk test a system, typically after completing a new installation.

STROBE LIGHT RELAY FUNCTION 0 0 1 <u>?</u> *

Selects between strobe light or fence on/off indication
? = 0 (strobe light) or 1 (fence on/off indication)
Factory default value is **0010*#** (strobe light function)

The strobe light relay can be assigned to be active when an alarm is triggered (0) or to indicate when the fence is energized (1)

OUT1 RELAY FUNCTION 0 0 3 <u>?</u> *

Selects between fence on/off indication, keypad controlled and timer controlled relay function.
? = 0 (fence on/off indication), 1 (keypad controlled), 2 (timer controlled)
Factory default value is **0030*#** (fence on/off indication)

The OUT1 relay can be assigned to be active when the fence is energized (0), or to be controlled manually from the keypad (1) (See 'OUT1 RELAY CONTROL' in the user manual), or can be assigned to cycle on and off repeatedly (2) with the on period defined by the installer code **1HHMMSS*#** and the off period defined by the installer code **2HHMMSS*#**.

OUT1 RELAY ON TIME 1 <u>h</u> <u>h</u> <u>m</u> <u>m</u> <u>s</u> <u>s</u> *

Sets the OUT1 relay active time period, when set to 'timer cycled' mode
hh = x10 hours + hours, mm = x10 minutes + minutes, ss = x10 seconds + seconds
Programmable range is **1000001*#** (1s) to **1181215*#** (18h:12m:15s)
Factory default value is **1000001*#** (00h:00m:01s)

See OUT1 RELAY FUNCTION above.

OUT1 RELAY OFF TIME 2 <u>h</u> <u>h</u> <u>m</u> <u>m</u> <u>s</u> <u>s</u> *

Sets the OUT1 relay inactive time period, when set to 'timer cycled' mode
hh = x10 hours + hours, mm = x10 minutes + minutes, ss = x10 seconds + seconds
Programmable range is **2000001*#** (1s) to **2181215*#** (18h:12m:15s)
Factory default value is **2000009*#** (00h:00m:09s)

See OUT1 RELAY FUNCTION above.

GATE SWITCH INPUT FUNCTION　　　　1 1 0 ? *

Sets the function assigned to the gate switch input.
? = 0 (gate), 1 (panic button)
Factory default value is **1100*#** (gate input)

As a gate switch input, open circuit represents the gate is open.
As a panic button input, the alarm will sound if the input is open circuited.

GATE ALARM DELAY TIME　　　　　　1 0 m s *

Sets the gate alarm delay time
m = minutes, s = x10 seconds
Programmable range is **1001*#** (10s) to **1041*#** (4min:10s)
Factory default value is **1010*#** (1min:0s)

The gate alarm will only sound once the gate has remained open for longer than the GATE ALARM DELAY time. The GATE ALARM INSTANT user code can be used to temporarily override this delay period, and the GATE ALARM BYPASS user code can be used to temporarily disable the gate alarm function.

IN1 SWITCH INPUT FUNCTION　　　　1 1 2 ? *

Sets the function assigned to the IN1 switch input.
? = 0 (external on/off), 1 (panic button)
Factory default value is **1120*#** (external on/off input)

As an external on/off input, the fence is activated and deactivated as detailed in INPUT TOGGLE SELECT function.
As a panic button input, the alarm will sound if the input is open circuited.

IN2 SWITCH INPUT FUNCTION　　　　1 1 4 ? *

Sets the function assigned to the IN2 switch input.
? = 0 (fence high/low power), 1 (panic button)
Factory default value is **1141*#** (panic button function)

As a fence high/low power input, the fence will run in high power mode when the input is open circuit and in low power mode when the input is closed circuit.
As a panic button input, the alarm will sound if the input is open circuited.

INPUT TOGGLE SELECT   1 1 1 ? *

Selects toggling or direct on/off control of the fence, when the IN2 switch input is assigned the external on/off function.
? = 0 (direct control) or 1 (toggle control)
Factory default value is **1111*#** (toggle control)

With direct control, the fence is energized when the switch input is open circuit.
With toggle control, the fence operating state is toggled each time the switch input changes from a closed to open circuit.

FENCE CONDITION CHECK LEVEL   2 0 1 ? *

Sets the value at which the CHECK message will be displayed should the fence condition indicator reduce to or below this set value.
? = check level between 3 and 6
Programmable range is **2013*#** (3 = fair to poor) to **2016*#** (6 = good)
Factory default value is **2014*#** (4 = fair)

FENCE STATE AT POWER ON   2 0 2 ? *

Sets the operating state that the fence is returned to after a complete power failure has ended.
? = 0 (off), 1 (on) or 2 (fence returns to on/off state at power loss)
Factory default value is **2022*#** (fence returns to on/off state at power loss)

A complete power failure occurs when the energizer shuts down due to the internal battery running flat during a prolonged mains power failure.

FENCE INTERFERENCE ALARM   2 0 3 ? *

Enables or disables the fence interference detected alarm function.
? = 0 (disabled), 1 (enabled)
Factory default value is **2031*#** (enabled) for DRUID_18
Factory default value is **2030*#** (disabled) for DRUID_114

Fence interference may occur when a neighboring fence comes into contact with the fence been driven by this energizer or when criminals attempt to defeat the energizer fence alarm detection mechanism.

FENCE HIGH POWER VOLTAGE   2 1 _k_ _v_ *

Sets the energizer output voltage during high power operation.
k = kilo volts, v = x100 volts
Programmable range is **2160*#** (6.0kV) to **2196*#** (9.6kV)
Factory default value is **2196*#** (9.6kV) for DRUID_18
Factory default value is **2190*#** (9.0kV) for DRUID_114

The fence condition indication value is affected by this value. Setting this value to a lower voltage will cause the fence condition indication to increase towards 9 (excellent) as the energizer works less hard to maintain the lower set voltage on the fence.

FENCE HIGH POWER CHECK LEVEL   2 2 _k_ _v_ *

Sets the value at which the CHECK message will be displayed should the fence return voltage reduce to below this set value when operating in high power mode.
k = kilo volts, v = x100 volts
Programmable range is **2230*#** (3.0kV) to **2260*#** (6.0kV)
Factory default value is **2240*#** (4.0kV)

The check level must always be set above the alarm level for the new setting to be accepted.

FENCE HIGH POWER ALARM LEVEL   2 3 _k_ _v_ *

Sets the value at which the BAD message will be displayed, and at which the alarm will sound should the fence return voltage reduce to or below this set value when operating in high power mode.
k = kilo volts, v = x100 volts
Programmable range is **2320*#** (2.0kV) to **2350*#** (5.0kV)
Factory default value is **2330*#** (3.0kV)

The alarm level must always be set below the check level for the new setting to be accepted.

FENCE ALARM DELAY   2 5 _?_ _?_ *

Sets the number of violating fence pulses that have to occur before the alarm is activated.
?? = number of pulses before alarm occurs
Programmable range is **2501*#** (1 pulse) to **2515*#** (15 pulses)
Factory default value is **2503*#** (3 pulses) for DRUID_18
Factory default value is **2507*#** (5 pulses) for DRUID_114

FENCE LOW POWER VOLTAGE   2 7 k v *

Sets the energizer output voltage during low power operation.
k = kilo volts, v = x100 volts
Programmable range is **2710*#** (1.0kV) to **2730*#** (3.0kV)
Factory default value is **2715*#** (1.5kV)

FENCE LOW POWER ALARM LEVEL   2 8 k v *

Sets the value at which the BAD message will be displayed, and the alarm will
sound should the fence return voltage reduce to or below this set value when
operating in low power mode.
k = kilo volts, v = x100 volts
Programmable range is **2805*#** (0.5kV) to **2825*#** (2.5kV)
Factory default value is **2808*#** (0.8kV)

FENCE CONTROL ALGORITHM   3 0 1 ? *

Sets the fence control algorithm.
? = 0 (conventional) or 1 (arc detection and avoidance)
Factory default value is **3011*#** (arc detection and avoidance)

Conventional control will output a maximum of 8kV onto the fence to reduce the risk of arcing
across insulators. Setting the FENCE HIGH POWER VOLTAGE to a value greater than 8kV will
not raise the output voltage beyond 8kV when using conventional control. For more
information on arc detection and avoidance control, read the FOREWORD at the front of this
manual.

MAGNETIC SWITCH   4 0 1 ? *

Enables or disables the magnetic switch.
? = 0 (disabled) or 1 (enabled)
Factory default value is **4011*#** (enabled)

When using a keypad, disable the magnetic switch to increase the level of security offered.

TAMPER ALARM   4 0 3 ? *

Enables or disables the tamper alarm function.
? = 0 (disabled) or 1 (enabled)
Factory default value is **4031*#** (enabled)

When enabled, the tamper alarm will sound if the energizer front is opened while the fence is energized. The tamper symbol **t** will always be shown on the display, regardless of whether the tamper alarm is enabled or disabled.

SERVICE ALARM   4 0 4 ? *

Enables or disables alarming during a service condition.
? = 0 (disabled) or 1 (enabled)
Factory default value is **4041*#** (enabled)

DISPLAY INSTALLER TEL NUMBER   4 0 5 ? *

Enables or disables the displaying of the installers telephone number during a service condition.
? = 0 (disabled) or 1 (enabled)
Factory default value is **4050*#** (disabled)

When enabling this function, don't forget to set a new telephone number using the (10 digit new telephone number)# code below.

SHOW KEY PRESSES ON LCD   4 0 6 ? *

Enables or disables the displaying of keypad key presses on the energizer display.
? = 0 (disabled) or 1 (enabled)
Factory default value is **4061*#** (enabled)

For increased security when the energizer and keypad are far apart, it may be desirable to disable this function and so prevent the user PIN being read from the energizer display.

SOLAR POWER INSTALLATION   4 0 7 ? *

Modifies the energizer operation for permanent battery operation.
? = 0 (disabled, requires mains power) or 1 (solar installation)
Factory default value is **4070*#** (disabled)

If the energizer is to be run permanently from battery power, which is typically the case when running a solar powered site, then enabling this function will prevent the energizer from reacting to mains power loss as an error condition.

SET INSTALLER TEL NUMBER   _ _ _ _ _ _ _ _ _ _
                                      10 Digit Installer Tel Number

Sets the telephone number to be displayed during a service condition.

The telephone number must be exactly 10 digits long and the displaying of this number must be enabled, as the factory default is to not display this number. (See code **4051*#**)

EXITING PROGRAMMING MODE   *

Exits programming mode.

APPENDIX

Basic definitions

- Electric Fence:
A barrier which includes one or more electric conductors, insulated from earth, to which electric pulses are applied by an energizer

- Connecting Lead:
An electric conductor, used to connect the energizer to the electric fence or the earth electrode

- Electric Security Fence:
A fence used for security purposes which comprises an electric fence and a physical barrier electrically isolated from the electric fence

- Public Access Area:
Any area where persons are protected from inadvertent contact with pulsed conductors by a physical barrier

- Pulsed Conductors:
Conductors which are subjected to high voltage pulses by the energizer

- Secure Area:
An area where a person is not separated from pulse conductors below 1,5m by a physical barrier

General requirements for electric security fences

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

Electric fence constructions which are likely to lead to the entanglement of animals or persons shall be avoided, as entrapment can be lethal.

An electric fence shall not be supplied from two different energizers or from independent fence circuits of the same energizer.

For any two different electric fences, each supplied from a different energizer with independent timing, the distance between the wires of the two electric fences shall be at least 2.5m. If this gap is to be closed, this shall be affected by means of electrically non-conductive material or an isolated metal barrier.

Barbed wire or razor wire shall not be electrified by an energizer or placed physically close to an electric fence as these circumstances can create a lethal entanglement/entrapment hazard.

Any part of an electric fence which is installed along a public road or pathway shall be identified at frequent intervals by prominently placed warning signs securely fastened to the fence posts or firmly clamped to the fence wires. The size of the warning signs shall be at least 100mm x 200mm. The background colour of both sides of the warning plate shall be yellow. The inscription on the plate shall be in black.

The warning sign shall typically appear as depicted in the figure below. The inscription shall be indelible, inscribed on both sides of the warning plate and have a height of at least 25mm.

Warning signs shall be placed at;
- each gate
- each access point
- intervals not exceeding 10m
- adjacent to each sign relating to chemical hazards for the information of emergency services.

Gates in electric security fences shall be capable of being opened without the person receiving an electric shock.

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.

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 external factors.

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

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

Mains supply wiring shall not be installed in the same conduit as signaling leads associated with the electric security fence installation.

Where an electric security fence passes below bare power line conductors, the highest metallic element shall be effectively earthed for a distance of not less than 5m on either side of the crossing point.

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.

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

Power Line Voltage	Clearance
Equal or less than 1kV	3 meter
Greater than 1kV, but equal or less than 33kV	4 meter
Greater than 33kV	8 meter

If connecting leads and electric fence wires are installed near an overhead power line, their height above the ground shall not exceed 3m.

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
- 2m for power lines operating at a nominal voltage not exceeding 1kV
- 15m for power lines operating at a nominal voltage exceeding 1kV

Electric security fences and their ancillary equipment shall be installed, operated and maintained in a manner that minimizes danger to persons, and reduces the risk of persons receiving an electric shock unless they attempt to penetrate the physical barrier, or are in a secure area without authority. Exposed conductive parts of the physical barrier shall be effectively earthed.

A spacing of 2.5m shall be maintained between non insulated electric fence conductors or non insulated connecting leads supplied from different energizers. This spacing may be less where conductors or connecting leads are covered by insulating sleeving, or consist of insulated cables, rated to at least 10kV.

This requirement need not apply where the separately energized conductors are separated by a physical barrier, which does not have any openings greater than 50mm.

A vertical separation of not less than 2m shall be maintained between pulsed conductors fed from different energizers.

Ensure that all ancillary equipment connected to the electric security fence circuit provides a degree of isolation between the fence circuit and the supply mains equivalent to that provided by the energizer. Protection from the weather shall be provided for the ancillary equipment unless this equipment is certified by the manufacturer as being suitable for use outdoors, and is of a type with a minimum degree of protection IPX4.

PROGRAMMABLE OPTIONS SUMMARY

RESTORE FACTORY DEFAULTS	**2 3 8 9 #**
ENTER PROGRAMMING MODE	(6 digit installer PIN) *** 0 #**
CHANGE INSTALLER PIN	**0 0** (new 6 digit installer PIN) **#**
SIREN ON TIME	**0 1** m s *** #**
SIREN OFF TIME	**0 2** m s ***#**
EVENTS BEFORE RE-ARM TIMEOUT	**0 3 0** ? ***#**
SIREN RE-ARM TIME	**0 4** d h h m m *** #**
SIREN RELAY ACTIVE OPEN	**0 0 6** ? *** #**
ALARM SENSOR MODE	**4 0 8** ? *** #**
STROBE LIGHT RELAY FUNCTION	**0 0 1** ? *** #**
OUT1 RELAY FUNCTION	**0 0 3** ? *** #**
OUT1 RELAY ON TIME	**1** h h m m s s *** #**
OUT1 RELAY OFF TIME	**2** h h m m s s *** #**
GATE SWITCH INPUT FUNCTION	**1 1 0** ? *** #**
GATE ALARM DELAY TIME	**1 0** m s *** #**
IN1 SWITCH INPUT FUNCTION	**1 1 2** ? ***** #
IN2 SWITCH INPUT FUNCTION	**1 1 4** ? ***** #
INPUT TOGGLE SELECT	**1 1 1** ? *** #**
FENCE CONDITION CHECK LEVEL	**2 0 1** ? *** #**
FENCE STATE AT POWER ON	**2 0 2** ? *** #**
FENCE INTERFERENCE ALARM	**2 0 3** ? *** #**
FENCE HIGH POWER VOLTAGE	**2 1** k v *** #**
FENCE HIGH POWER CHECK LEVEL	**2 2** k v *** #**
FENCE HIGH POWER ALARM LEVEL	**2 3** k v *** #**
FENCE ALARM DELAY	**2 5** m s *** #**
FENCE LOW POWER VOLTAGE	**2 7** k v *** #**
FENCE LOW POWER ALARM LEVEL	**2 8** k v *** #**
FENCE CONTROL ALGORITHM	**3 0 1** ? *** #**
MAGNETIC SWITCH	**4 0 1** ? *** #**
TAMPER ALARM	**4 0 3** ? *** #**
SERVICE ALARM	**4 0 4** ? *** #**
DISPLAY INSTALLER TEL NUMBER	**4 0 5** ? *** #**
SHOW KEY PRESSES ON LCD	**4 0 6** ? *** #**
SET INSTALLER TEL NUMBER	(10 digit installer tel number) **#**
EXITING PROGRAMMING MODE	*** #**

DOCUMENT REVISION HISTORY

1 Mar 2010, Rev 1.0   First release.