# Electric Fence Station Setup Guide

**PTE2500**

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# Introduction

The JVA Electric Fence Station is designed for monitored exclusion fencing. JVA recommends it be used to power and monitor two sections of multi-wire boundary fence of up to 10km each, accurately detecting breaks or shorts independently in each section. It can send notifications directly to a mobile phone by SMS or email. Using JVA's patented monitoring technology, shorts can be detected even at the end of very long fences. With built in Cellular Gateway and Cloud Router® technology, the fences can be turned on or off, their voltage checked, at any time directly from a smart phone. It is powered by a 250W solar panel for worry free remote operation.

This setup guide contains information to set up the PTE2500. For more information on the MB16, ZM monitors, PTE0320 gateway or other products contained within the cabinet, please refer to the respective manuals which can be found in the document wallet on the inside of the door. More information on the entire JVA range can be found online at http://www.jva-fence.com.au.

# Getting Started

The recommended sequence for installation is:

- Read the manuals
- Design the fence
- Construct the fence
- Install the ground rods and warning signs
- Choose cabinet position and concrete the pole
- Mount the cabinet and solar panel on the pole
- Install the batteries
- Wire the solar panels and batteries to the cabinet
- Turn 12V power on and check the cabinet
- Arm the system (turn the energizer on) and check the fence
- Install a SIM card in the gateway and check the signal
- Optionally mount an extended antenna
- Register on the Cloud Router® website
- Check online fence control and monitoring

# Fence Design

The cabinet powers two section of fence, each up to 10km long.
Additional cabinets can be placed at 20km intervals along a long fence line.

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The fence must be made up of 1 or more live wires and 1 or more ground wires. The ground wires need to be connected to the energiser earth. I.e. live and ground wires need to be taken under every gate.

**JVA recommends that the lowest live be at least 200mm off the ground.** This will reduce the likelihood of echidnas getting trapped. Also grass growth will be less of an issue. It is okay to have an earth wire lower than that. If you want to provide the most effective barrier to untrained animals (exclusion fencing), we strongly suggest putting at least one  live offset wire on the outside of the fence 300mm off the ground.

**The live wires should be joined with line clamps on both sides of each strainer post.**

This parallels up the power feeding out and increases the voltage at distant point on the fence. JVA recommends that the top two wires be ground wires, this will reduce the likelihood of kangaroos causing a short when they get their toes caught in the top wires as they jump over.

Suggested fence set-up:

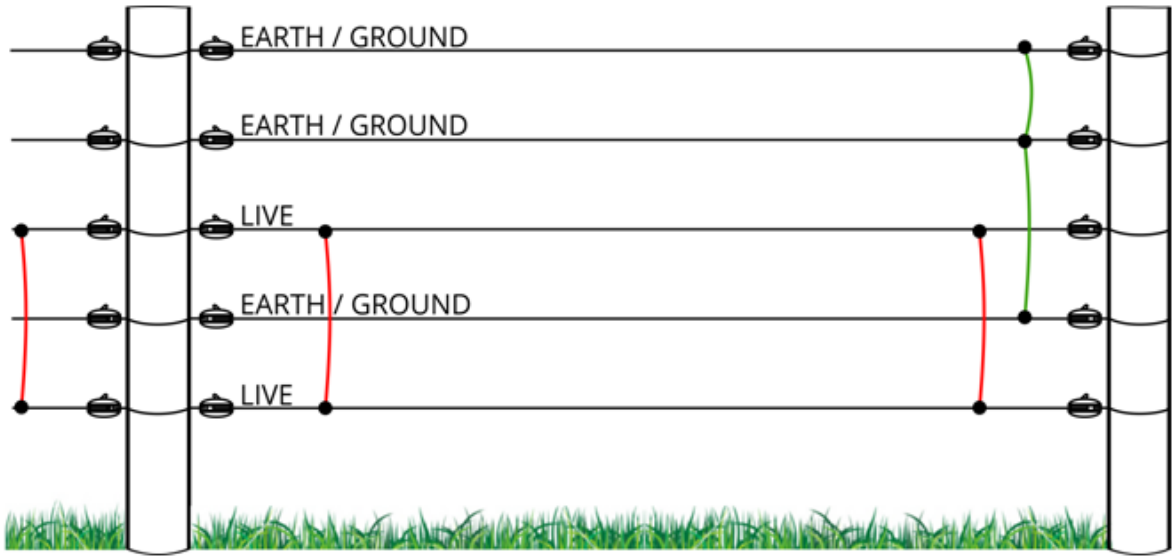


**Figure 1**

## Grounding

For the energizers to work properly there must be a good ground connection. The words ***earth*** and ***ground*** mean the same thing in electric fencing

**Use at least 4 ground rods, 1m deep, spaced at 2-3m intervals along the fence line.**
If the ground is particularly dry you may need more or longer ground rods.

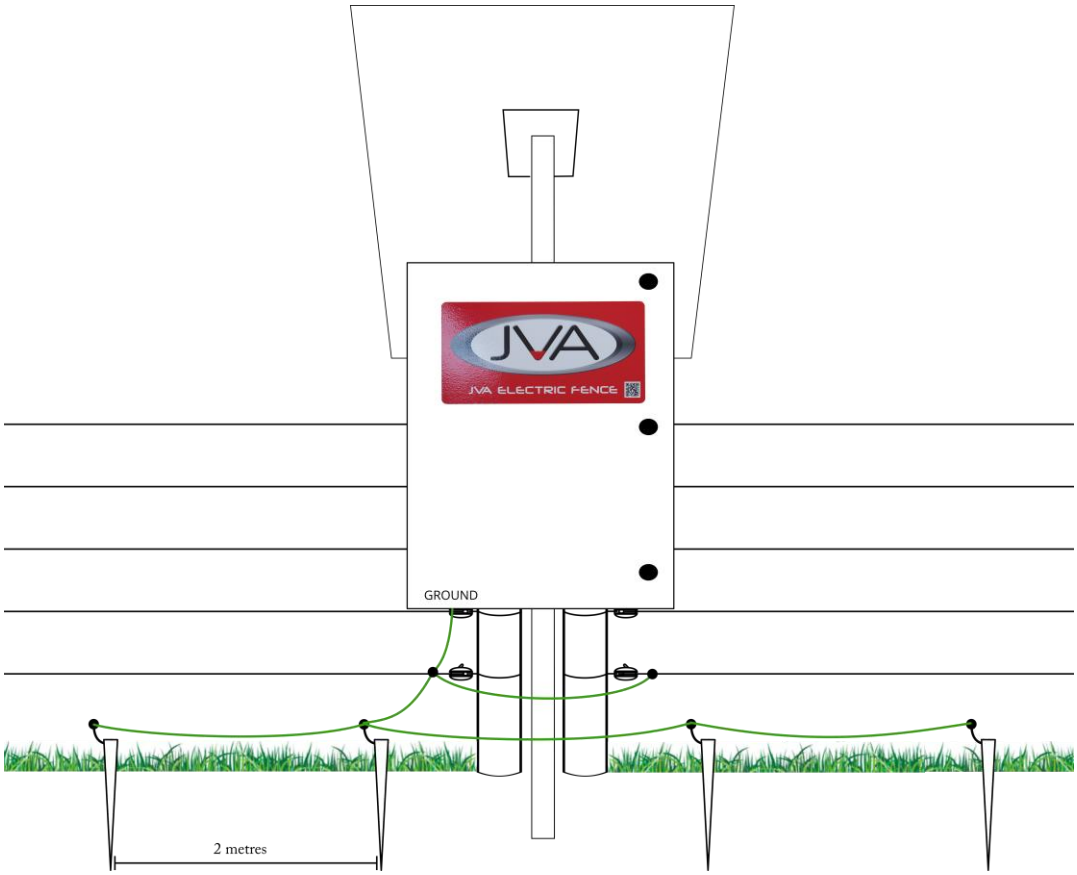


**Figure 3**

The fence must contain ground wire(s) that connect all the way back to the energizer. **Connect all ground wires to 1m deep ground rods at least every 1km**. This is more critical if the ground wires are not touching metal posts such as star pickets.

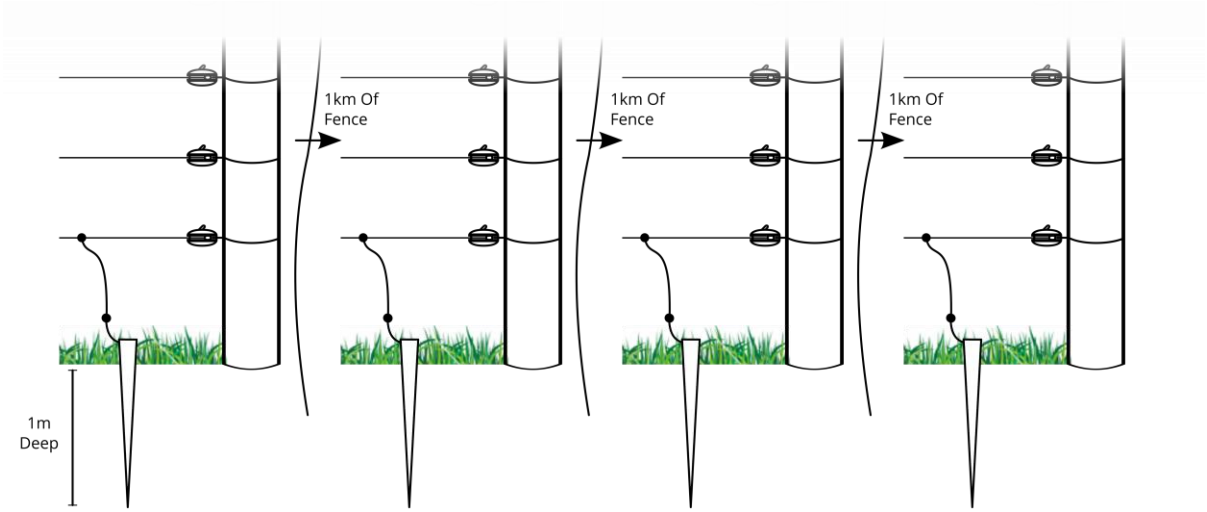


**Figure 4**

## Gates

**PTE2500: At each gate a live wire and ground wire must be taken under the gate.**

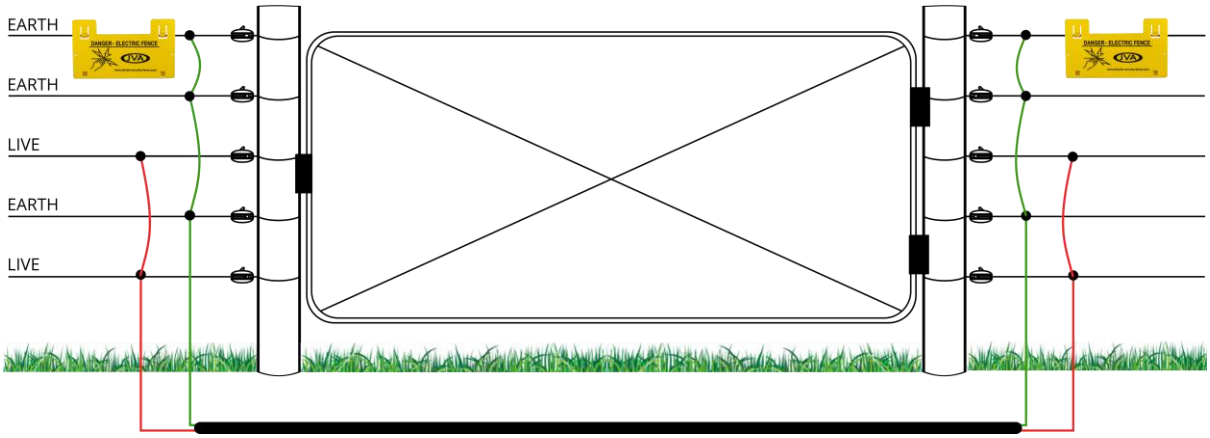


**Figure 5**

Use electric fence under-gate cable in poly pipe with the ends folded down to prevent water from entering the pipe.

## Signage

Warning signs are required at regular intervals on the fence at each gate and fence corner. See the energizer manual for details.

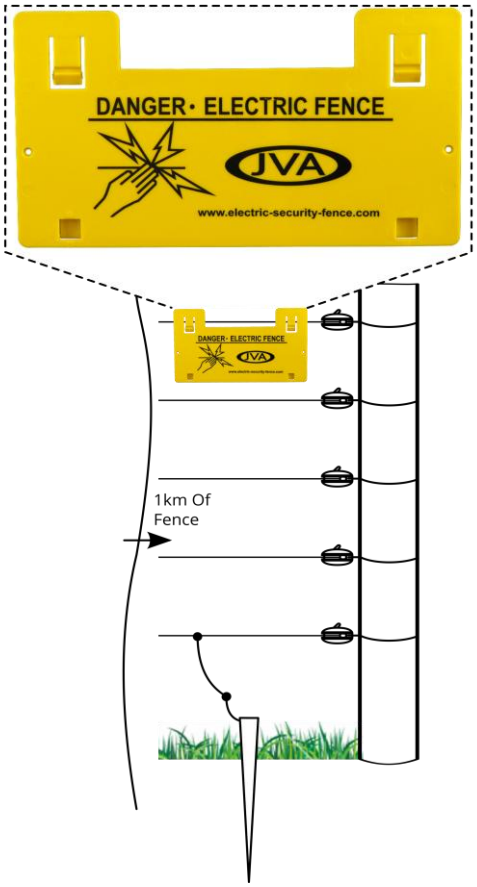


**Figure 7**

# Cabinet Mounting

**Choose a location permanently in the sun**, close to the fence starts.
Use a **thick walled galvanized pole, 60mm outside diameter**. Cement it into the ground. It should be at least 2m high.

Mount the cabinet to the pole, **facing south**. This is so it is best shaded by the solar panel.

Clamp mounting is as following:

1. Slide clamps into the cabinet rail from either side of the pole.
2. Bolt the clamps together.

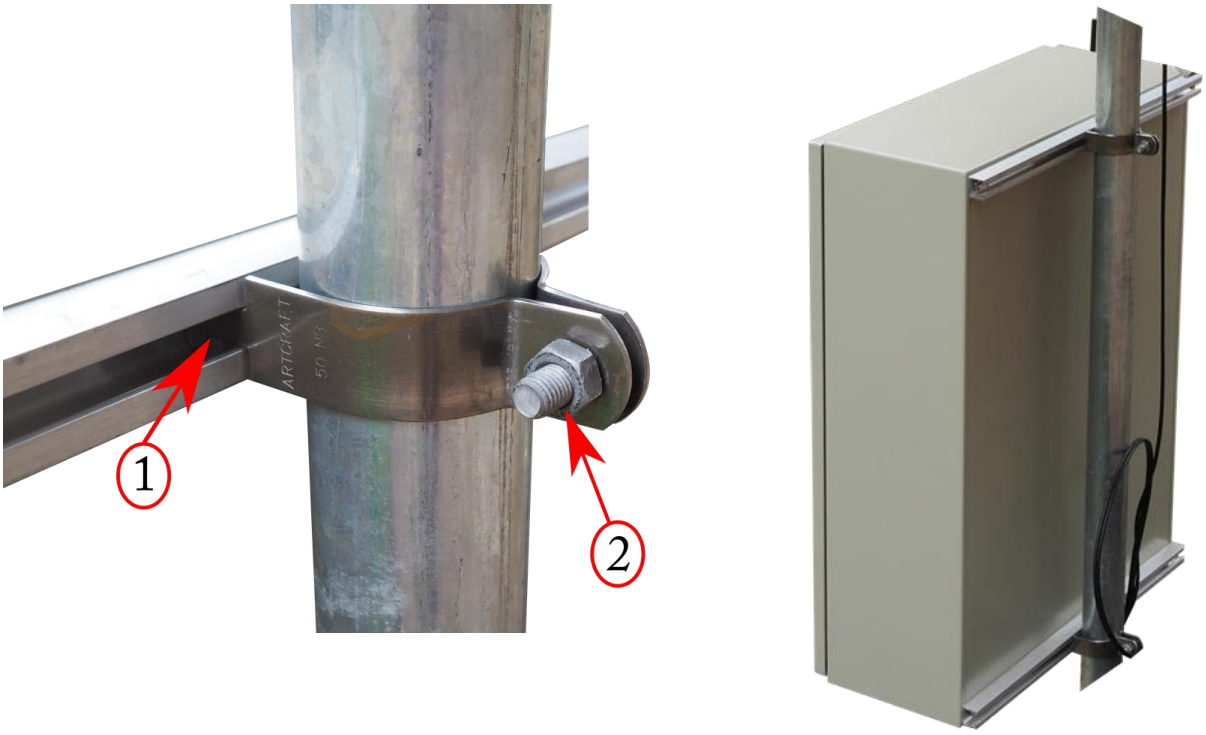


**Figure 8**

Mount the solar panel on top of the pole, **facing north**. This is so it gets the most sun all year round.

Put the batteries under the cabinet, off the ground.

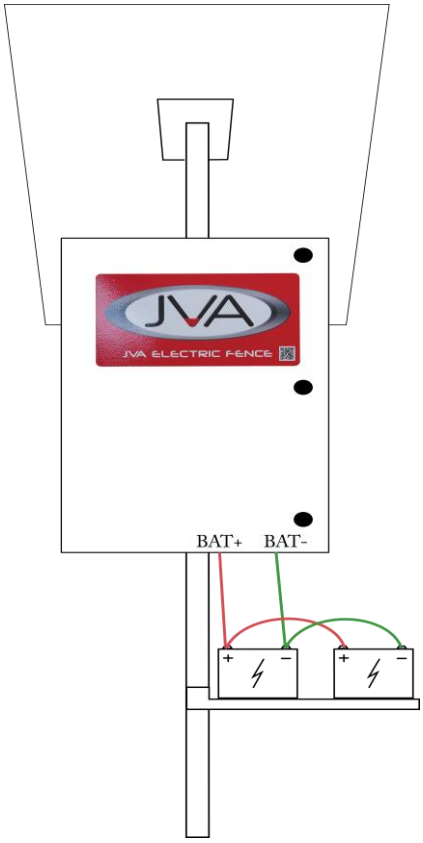


**Figure 9**

# Solar and Battery wiring

The cabinet comes pre-wired with battery and solar leads.

Connect the solar lead plugs together.

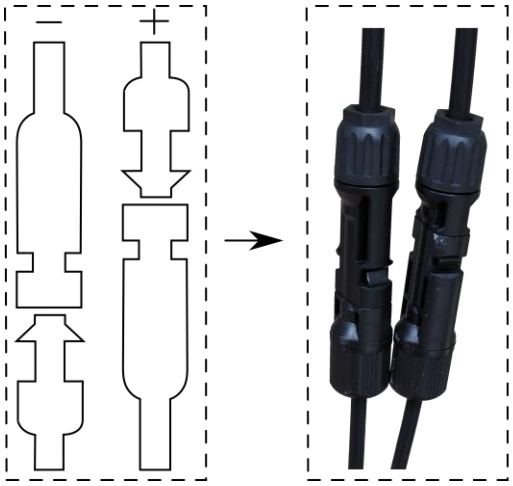

**Figure 10**

Connect both battery **positive terminals together**. Connect both battery **negative terminals together**. Connect the cabinet positive lead to one battery positive terminal. Connect the cabinet negative lead to one battery negative terminal.

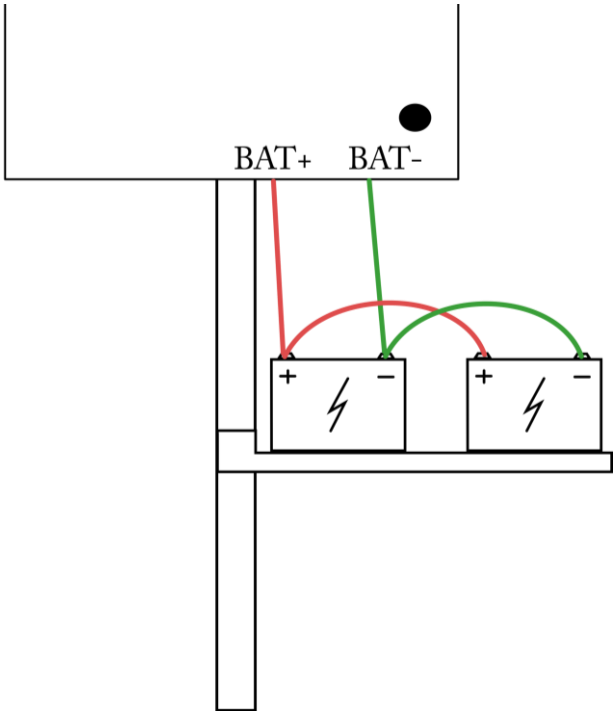


**Figure 11**

# Siren wiring

Optional lights or sirens can be connected to the monitors, which will be triggered when a section of fence gets a short or break. Use the Siren 1 and 2 + and - terminals and glands in the lower right of the cabinet. Refer to the monitor manual for information.

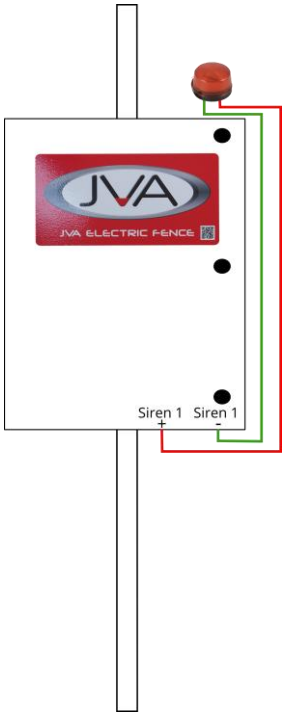


**Figure 12**

# Fence Wiring

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Three fence wires are required from the cabinet. Use 4mm insulated fence lead-out wires, through the glands in the bottom left of the cabinet.

The ground wire goes to the ground rods. The Feed 1 wire goes to the left-hand fence run, the Feed 2 wire goes to the right-hand fence run.

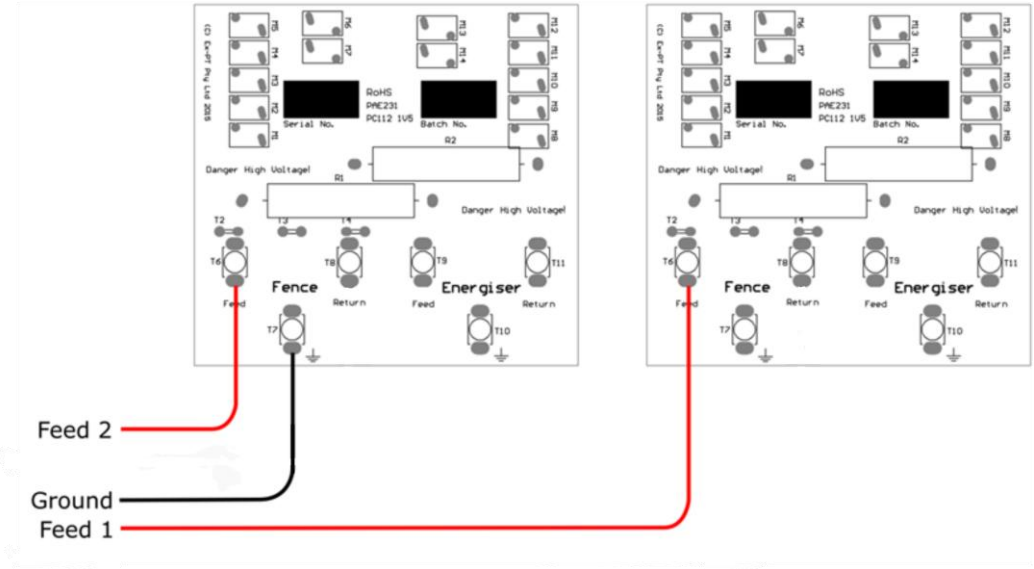


**Figure 13**

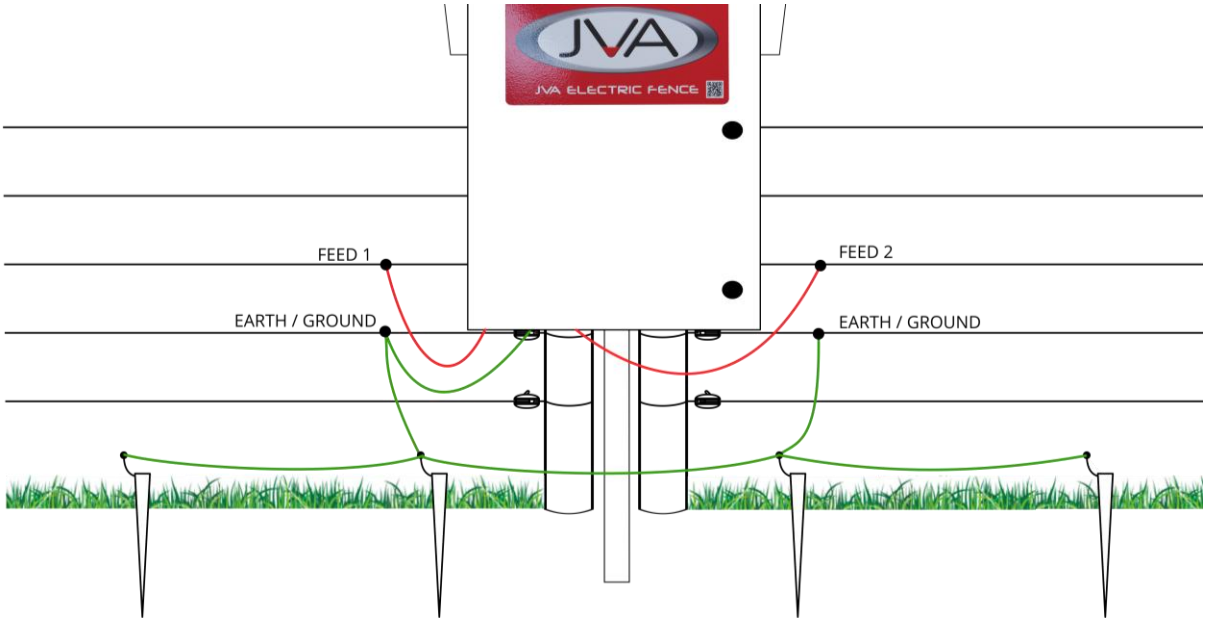


**Figure 14**

# Power On

The system is now ready to be switched on.  Make sure no-one is working on or touching the fence.

Turn on the battery circuit breaker. You should see the energizer, monitors, keypad and GSM gateway turn on. The energizer will not be armed yet.

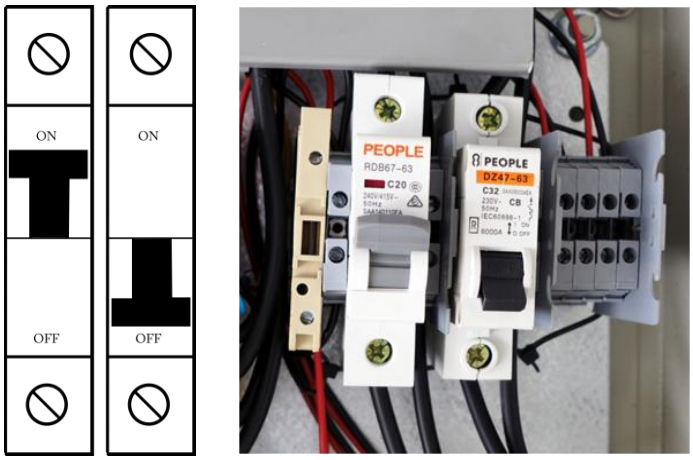


**Figure 17**

Turn on the solar circuit breaker. Check the solar regulator shows the batteries are charging.

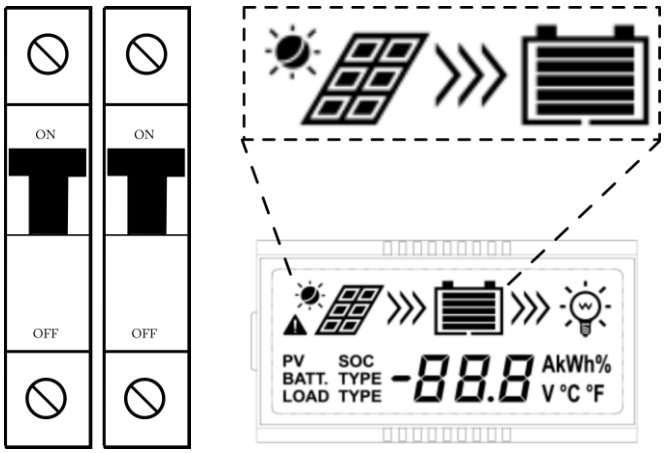


**Figure 18**

# Checking the Fence

Arm the system by typing 1234# into the keypad.

If there is an alarm, you can stop the keypad from beeping by pressing the # key.

If the energizers fail to arm please contact JVA for support.

The fence must be completely free of shorts or open circuits before proceeding to the next section. Check the MB16 display - the 'kV' should be above 6.0kV and the 'Joules' should be below 20J.


**Figure 19**

Even if the display shows good voltage, the fence should be checked for breaks. Use a Power Probe to check the fences and make certain that they are free from shorts or breaks. Refer to the Power Probe for fault finding tips.

If there were problems with the fence, clear any alarms by entering *1# on the keypad. Wait for 2 minutes. If there are still no alarms showing then the fence is clear.

# Cellular Gateway Setup

Screw on the antenna to the connector on the left side of the cabinet.

Unclip the front of the Cellular Gateway. Unplug and unclip the circuit board by the top clip. Insert a micro-SIM card of a network that gives the best reception in that location. **Test the SIM in your phone first**, to make sure it has reception and can connect to the internet.

Plug the circuit board back in and ensure the GSM light turns on after a few minutes. Refer to the Troubleshooting section of the Cellular Gateway manual if the error light is flashing.

Log onto the Cloud Router® website from your phone and configure the site as per the online help page.

# Advanced short detection

Once the fence is working correctly and there are no shorts or open circuits the system should be checked for its advanced short detection features. This can be done after GSM Gateway set-up for easy remote control and monitoring.

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Arm the system. Go to the end of each fence and attach short out leads between live and ground wires. Confirm the fence goes into alarm and the ZM1 current increased.

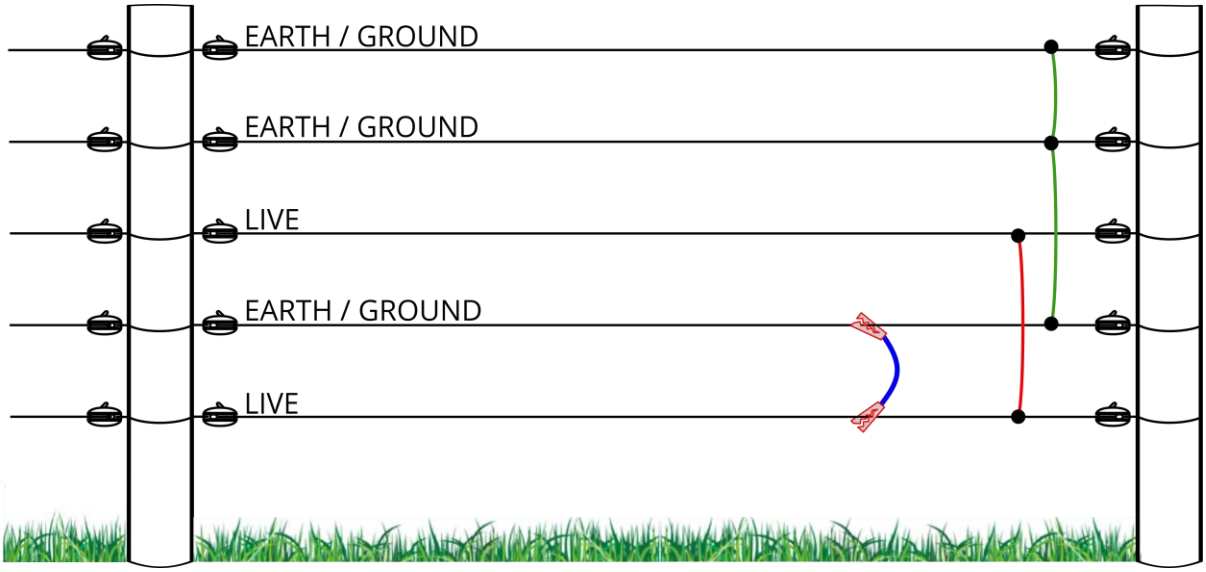


**Figure 20**

If the current did not rise and cause a fence alarm then there are a number of possibilities.

- Ground system is inadequate
- Fence is too long
- Existing short or break

# Maintenance

Once the system has been properly commissioned it will report any fence or system faults via Cloud Router®. There should be no need to visit the fence unless an alarm is reported to you by email or SMS. If the batteries get low due to overcast weather, a low battery notification will be sent. Any breaks or shorts in the fence will cause an alarm to be sent. If the GSM gateway loses signal or runs out of credit, a notification will be sent.

You can always check the status of the system through the Cloud Router® website. Live wires that are close to the ground can develop shorts caused by grass. If voltages have dropped or currents increased over time, consider controlling the grass to restore full fence power.