Cable Avoidance Training

EZiSYSTEM

# 7 Top Tips

Below are 7 top tips that enable you to locate buried cables and pipes safely and easily.

- **Don't** assume that cable locators find buried utilities. They find signals. Use the locator in all modes of operation to detect all the signals.

- Use utility plans to identify where buried utilities may be located.

- Mark outside the excavation area. Once the top layer has been removed within the excavation area so have all reference marks.

- **Don't** assume all utilities radiate or give off signals.

- Use the signal transmitter to verify the presence of all utilities. Even if the services have been found in power and radio modes, be sure and check by using the transmitter as well.

- Repeat the sweep process at regular depth intervals during the excavation. This will allow you to identify any additional utilities that might be there.

- **Don't** assume once a shallow cable or pipe is excavated that this is the only utility there. Use the locator and check to make sure there are no additional buried utilities.

Application & Mode Guide

The table below is a guide on what you are likely to detect in each mode, but this is not guaranteed, for example:

➢ The signal from an electric cable can apply itself to a metallic pipe. This can then be detected by the cable locator whilst in Power mode and give the impression that the utility is a cable.

Mode	Icon	Electric	Data/ Telecomms	Conductive Pipes (Steel, Cast Iron etc)	Non-Conductive Pipes (Clay, Concrete etc)
Power		✔			
Radio		✔	✔	✔	
Auto	AUTO	✔	✔	✔	
8kHz	8 kHz	✔	✔	✔	✔**
33kHz	33 kHz	✔	✔	✔	✔**
512Hz*	512Hz	✔	✔	✔	✔**
640Hz*	640Hz	✔	✔	✔	✔**

* Only available on EZiSYSTEM xf cable locators.

** Need to use accessories and or EZiTEX signal transmitter with these frequencies to pick up non-conductive pipes.

Pinpointing Buried Cables & Pipes

This process can be used to identify utilities within the work area. Pinpointing will indicate where the utility is, but not the type, depth or size of the utility.
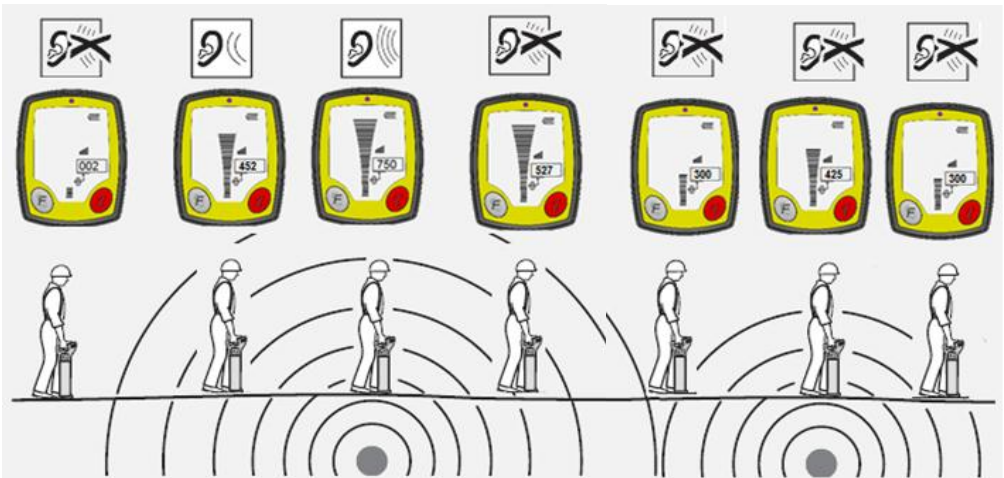
1. Once you have pinpointed a utility continue with the process.

2. Additional utilities will be indicated on the locator's display.

3. The sweep process must be conducted in POWER and RADIO modes as a minimum.

Tip: **Separation between utilities and differing signal strengths will influence the outcome. It's important to watch the locators display as an audible tone may not be emitted over every utility.**

Identify the Direction of a Utility

Utility direction helps you to ascertain the direction in which the utility is running, helping you to trace it through the work area.
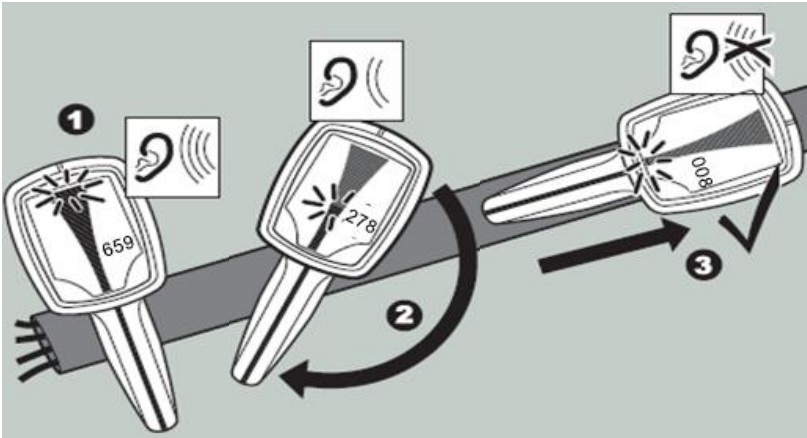
1. Pinpoint the utility

2. Hold the locator upright and rotate it on its axis. The graphic and the numeric signal strength indicator on the display will decrease.

3. Utility direction is indicated when the graphic and numeric strength indicator drop to a minimum.

Tip: Trace the utility through the work area as indicated by the locator. Mark the utility with marker paint or similar. Take care to avoid utility damage if using pegs, flags or similar.

Sweep Search

This is most reliable way of detecting and pinpointing any buried cable or pipe.

A sweep search is used to verify and mark the presence of buried utilities within a defined work area. This must be conducted in **POWER** (⌐) and **RADIO** (⚟) modes as a **minimum**. Using the signal transmitter to verify the utilities found in power and radio will help to reduce the risk of striking a utility.

1. In **POWER** mode cross the site from "top to bottom", keeping the locator upright. **DO NOT SWING the locator.**

2. Mark any responses with marker paint or similar. **Take care to avoid utility damage if using pegs, flags (or similar).**

3. Make sure you mark outside the excavation area. Once the top layer has been removed within the excavation area so have all reference marks.

4. Turn through 90° and repeat

5. Repeat process in **RADIO** mode.

6. The sweep process should be repeated at regular depth intervals (approx 30cm) when excavating, because shallow utilities can mask deeper utilities.
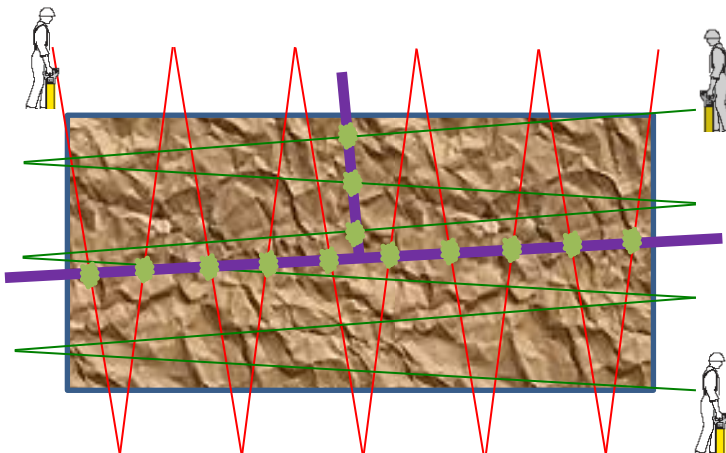
Using a Signal Transmitter

The transmitter applies a distinct signal onto buried utilities, enabling them to be traced and identified by the locator.

Induction Mode   A quick and simple way to apply a signal to a utility without the need to make any physical connection.

Connection Mode   The most efficient way of applying a signal to a utility and should be used whenever possible (especially when estimating the depth).

Frequency	Mode of Operation	Description
33kHz	Induction & Connection	Standard tracing frequency, used for everyday site use.
8kHz	Induction & Connection	Mid-range distance tracing.
Combined 8kHz & 33kHz	Connection	Used to ascertain which tracing frequency works better at a local level.
512Hz *	Connection	Enables long range tracing.
640Hz *	Connection	Enables long range tracing.

* Only available on EZiSYSTEM xf cable locators.

Using a Signal Transmitter

Induction Mode

1. Place the transmitter over the utility with the arrows on top of the case lid running in line with the suspected direction of the utility.

2. Switch the transmitter on and observe the battery level. Change batteries when indicated.

3. Select 33kHz or 8kHz mode, adjust output if required. The tracing signal is induced directly onto the utility.

4. Trace the path of the utility using the cable locator, set to the same frequency. Ensure the locator is used a minimum of 10 metres from the transmitter.
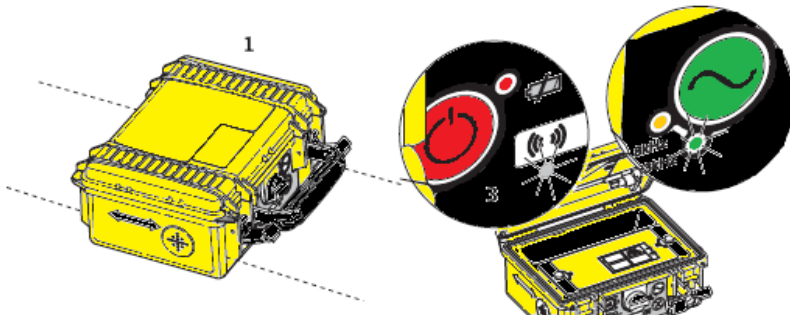
Using a Signal Transmitter

Connection Mode

1. Plug the transmitter's cable set into the connection socket.

2. Connect the black cable to the earth pin, ensuring that no utilities are below and push the earth pin into the ground, ensuring it's located as far as possible and at 90º degrees from the suspected direction the target utility is running in.

3. Connect the red cable to the service.

4. Switch the transmitter on. Observe the connection mode LED is illuminated and the battery level is adequate. Change batteries when indicated.

5. Select the required power output level and frequency output. A good level of tracing signal is indicated when the power output LED and audible tone changes from pulsed to continuous.

6. Trace the signal using the cable locator set to the same operating mode.
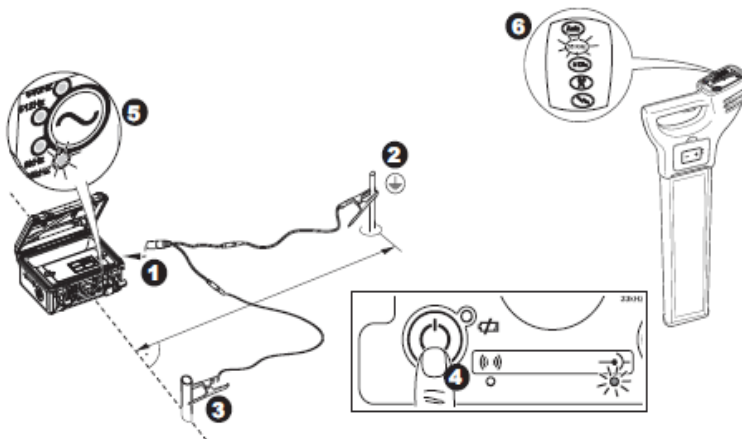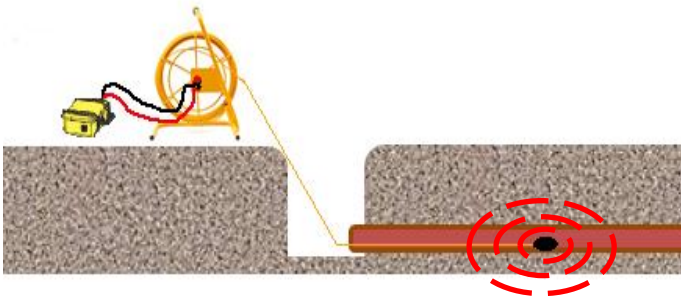
Using Accessories

Locate and trace non-metallic utilities, even small diameter ones.

Non-metallic pipes cannot be detected using standard locating methods or sweep search because they don't give off a detectable signal. Therefore you will need to insert an accessory into the utility to trace its location.

In order to apply a signal to the utility, so it can be located, you can use a sonde or trace rod, which act like a signal transmitter.

Using a Trace Rod

The trace rod is better for use on small diameter pipes, up to 110mm. It has two modes of operation, line and sonde modes. Depending on the application will depend on the mode used.
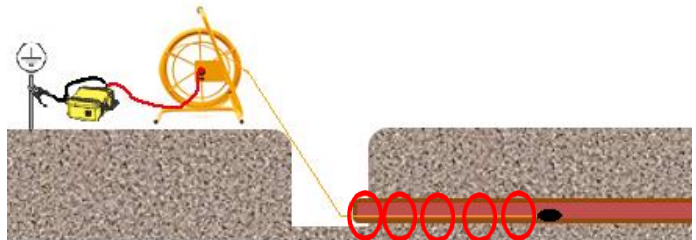

Sonde Mode
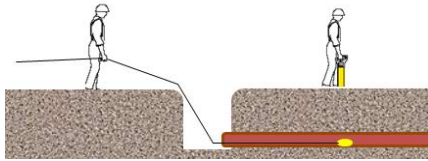Used to pinpoint a blockage within the utility.

Line Mode
Used for tracing the path of a non-conductive utility.

Using Accessories

Using a Sonde

Sondes are better for locating blockages of collapses in drains. They are used for tracing the path of larger utilities, 50mm or more, and finding blockages in larger utilities.

1. Set the sonde to the required frequency and connect to drain rods, or similar.

2. On the cable locator set the Numeric Signal Strength Indicator (SSI) to on.

3. Walk in-line with the suspected direction of the utility, observing the display. The SSI will rise and fall as you pass over the ghost signal at the back of the sonde, the peak signal directly over the sonde and the ghost signal at the front. The SSI will display its highest value when detecting the peak signal.

4. Re-trace your steps and position the locator directly over the peak signal. Move the locator left and right until the highest numeric reading is obtained. This reading will indicate the sonde's location.
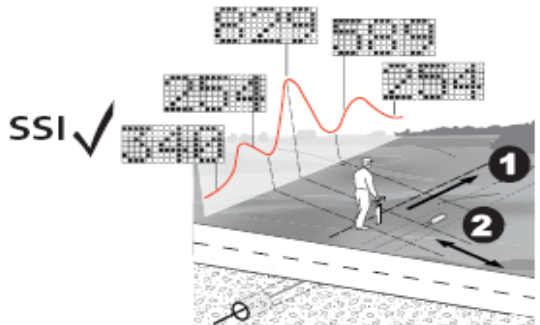
Using Accessories

Using a Signal Clamp

In areas where buried utilities are highly congested (i.e. city centre) this method is a safe and easy method to identify what utility is running where and in what direction. Standard locating methods will tell you where there are buried cables and pipes in your excavation area, but won't tell you what the type of utility it is. This method helps to overcome this issue.

1. Plug the signal clamp into the transmitter.

2. Place the clamp around the required service.

3. Switch the transmitter on, check the connection mode LED is lit up and the battery level is adequate.

4. Trace the service using the cable locator set to the same frequency.

Tip: Work's best in 33 kHz mode and you need to ensure the clamp jaws are fully engaged.

Tip: The clamp should be connected to the transmitter before clamping around a live service.

Using Accessories

Using a Property Connection Set

In areas where the mains power cable must be found leaving a property, this method is a safe, easy and gives confirmation of the power cable. Standard locating methods will tell you where there are buried cables and pipes in your excavation area, but won't tell you what type of utility it is. This method helps to overcome this issue.

1. Plug the property connection set into the transmitter.

2. Insert the mains plug into a live wall socket and switch on, if required.

3. Switch the transmitter on, observe the connection mode LED is illuminated and the battery level is adequate.

4. Trace the service using the locator set to the same frequency.

Tip: Works best in 33 kHz
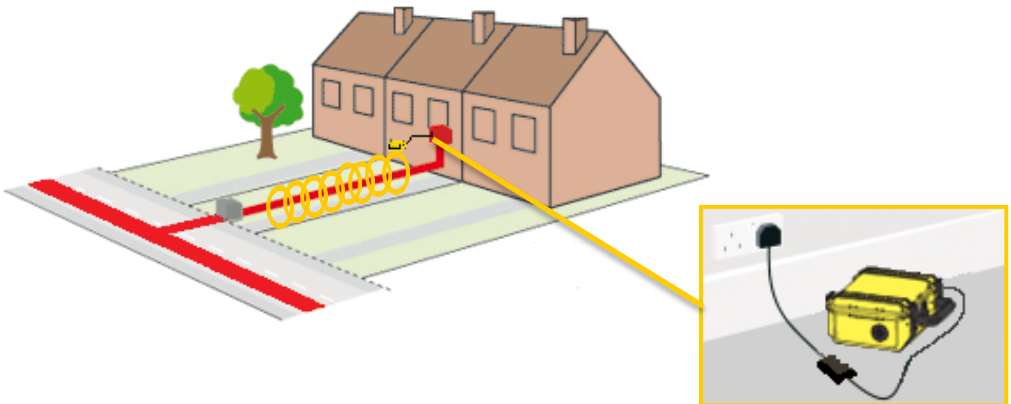
EZiSYSTEM Locator Range

Benefits

- Easy to use
- Reduce cable strikes
- Reduce human error
- Avoid costly and time consuming repairs

i700 Series

The highly intelligent i700 Series Locators have fully integrated GPS technology and data logging capability, providing you with information on how, when and importantly where the locator has been used.

i600 Series

The intelligent i600 Series locators have fully integrated data logging capability, providing you with information on how and when the locator has been used.

i500 Series

Robust locators engineered for ease of use. Packed full of well-known, beneficial features, making avoiding and locating buried utilities an easy and efficient task.

EZiSYSTEM Training Courses

Product Familiarisation

This training is often seen as a 'Tool Box Talk'.

It's intended to familiarise experienced operators in the use of EZiSYSTEM cable location equipment.

Duration: Approx 2 hours

Cable Avoidance – User Training

Intended for all users of cable locators.

It delivers a comprehensive insight to the use of the EZiSYSTEM cable location equipment, covering both theoretical and practical knowledge on the use of the equipment.

Duration: Approx 4 hours

Train the Trainer

Intended for all instructors or supervisors who deliver training.

It delivers an in-depth knowledge in the use of the EZiSYSTEM cable location equipment, covering both theoretical and practical knowledge. In addition to this training mechanisms are discussed enabling the instructor to develop a style suited to their work environment.

Duration: Approx 6 hours

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For more information on cable avoidance tools visit **www.cabledetection.co.uk**