EZiCAT
Product Awareness

Presented by: Paul Seamans

Who are we?

Cable Detection Ltd is a Hexagon company. Manufacturing and servicing buried service location equipment is our sole focus. Using our in house expertise we are pushing the boundaries of the buried service location sector and discovering new ways to improve on traditional methods of underground data capture.

Cable Detection, located in Staffordshire (UK) has a customer base stretching right around the world. Our customers believe that we should let technology help us to reduce the risk of human error on-site by allowing advances in technology drive the products available to them.

Our History

Cable Detection's history stretches back to over 125 years ago when it was originally founded in 1880 under the name of Hall Brothers. Manufacturing and servicing of surveying instruments was always the specialty of the company. In 2005 Cable Detection became part of the Hexagon group of companies.

Why do we use Cable Locators?

- Avoid damage to cables and pipes buried underground
- Avoid disruption
- **Avoid injury to your employees**
- To survey and map hidden utility assets

UK Legislation

- The Health and Safety at Work Act 1974

HS(G) 47

"The position of any service in the vicinity of any excavation should be pinpointed as accurately as possible by means of a locating device.

Should the plans to hand indicate that no services are laid in the area, the locator must be used to confirm or otherwise"

"Avoiding dangers from underground services and safe systems for work"

Evolution

From this (C 1910)

To this (2013)

i-Series

EZiSYSTEM from Cable Detection

What does the i500 Series consist of?

EZiCAT i500

Rugged cable avoidance tool, designed to locate and trace buried conductive services which radiate electromagnetic signals.

EZiCAT i550

All the same functionality as the EZiCAT i500, with the added benefit of service depth estimation, when used in conjunction with the EZiTRACE Signal Generator or Sonde in 8 & 33 kHz mode.

What does the i600 Series consist of?

Data Capture Locators

- EZiCAT i600 Data Capture
- EZiCAT i650 Data Capture
- LOGiCAT Software

The EZiCAT i600 and i650 make locating underground cables and pipes a simple and efficient task, increasing your onsite safety and ultimately saving time and money.

Product Overview

EZiCAT i-Series Basic Controls

Operating Mode Display

Light Sensor

Battery Indicator

Signal Strength Indicator

Dynamic Display Area

for service depth & numeric Sonde location

Depth Button

also used for product menu

Function Control Key

quickly cycles through operating modes

High Contrast LCD

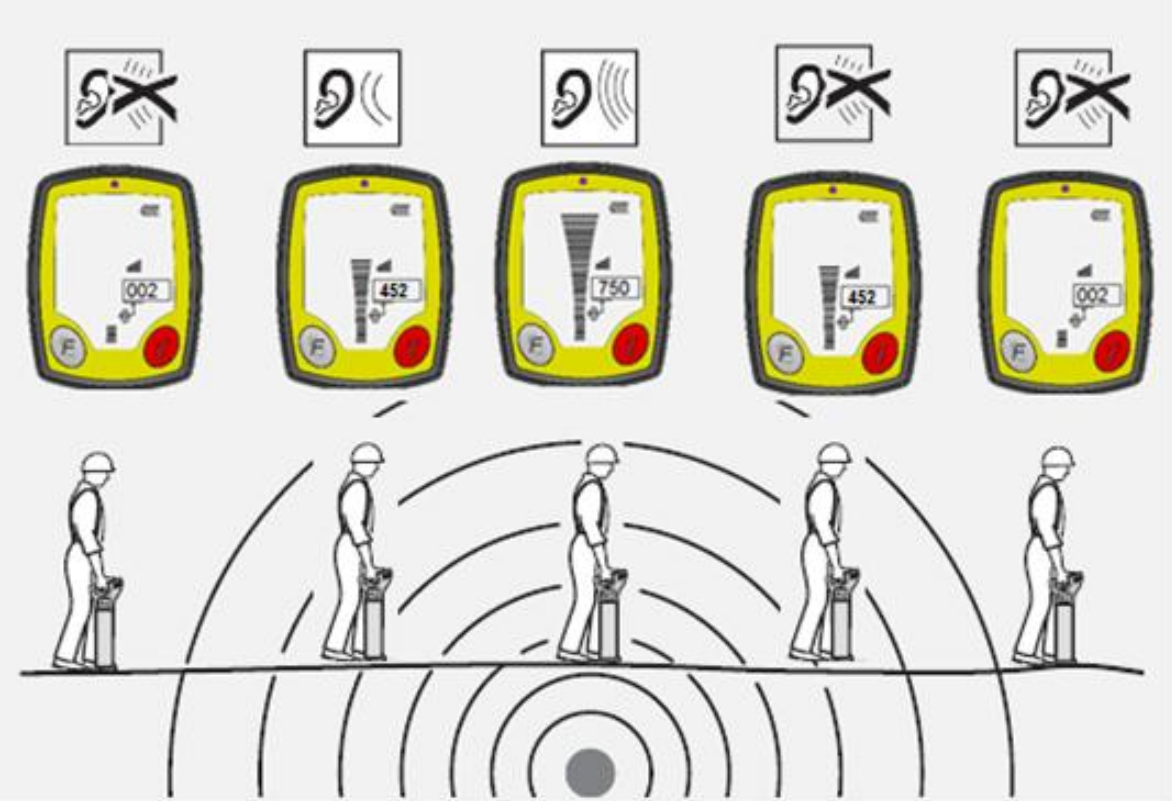
with automatic backlight for low-light conditions

Dual Speakers

On/Off Trigger

Battery Hatch

EZiCAT i-Series - Pinpointing a Service



Automatic pinpointing - No manual adjustment required

Location Equipment – i-Series Locators

Operating Modes

Passive Modes

Power Mode
Locates power signals radiated by energised cables which pose the most significant risk to excavation teams.

Radio Mode
Traces signals originating from distant radio transmitters. These signals penetrate the ground and are reradiated by buried conductive services.

Auto Mode
Automatically locates power or radio signals, helping to confirm the presence of services upon initial site occupation making cable detection easier and safer.

Active Modes

33 kHz
Standard tracing frequency on avoidance locators, used for everyday site use

8 kHz
Mid-range distance tracing

Product Overview

- **Starts in Power mode -** Ensuring the most potentially dangerous current carrying services are detected first for maximum operator safety.
- **In-built test function -** Allowing operators to test the hardware and software functionality of the EZiCAT before use.
- **Service due indicator -** Supporting customer planned maintenance schedules or quality systems by displaying a wrench icon after 12 months.
- **Hazard zone -** The new feature which indicates the presence of a shallow buried service in power, 8 & 33 kHz modes, (within approximately 30cm) alerting users to the increased risk.
- **Depth indication -** (Available on the i550 & i650 model only) When using the EZiCAT in conjunction with the EZiTEX or Sonde in 8 or 33 kHz modes, operators can determine the depth of the buried utility, providing a clear advantage when conducting ground surveys.
- **Signal Strength Indication (SSI)-** EZiCAT i-Series feature numeric signal strength readout, specifically designed for easy Sonde location and use with signal generator.
- **Pinpoint assist -** Maintains the highest peak reading obtained on the signal strength indicator for a period of time, allowing the operator to quickly and accurately pinpoint the service position.

i-Series Service Information

The i-Series locators can be customised to display a range of fleet management information. The content can be your business details or that of the customers.

Displays Company Name or Contact Details

Displays Business/Contact Telephone Number

Displays Fleet number or User Identification Details

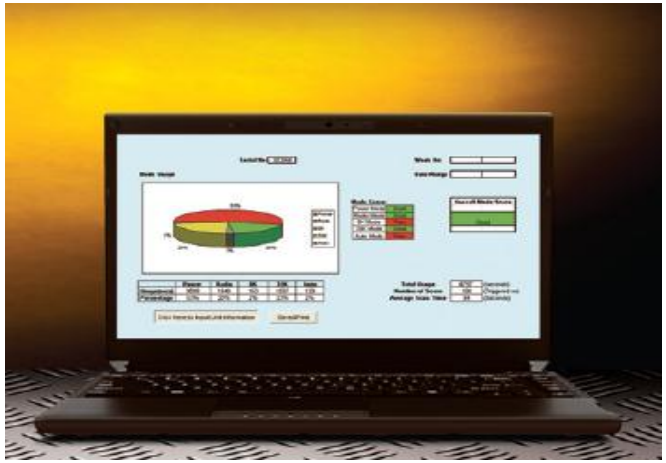
These settings, along with the '**Cal Due Date**' are displayed on the locator, accessed via the **red i button** *(as shown in diagram)*.

EZiSYSTEM

Software & Data Analysis

LOGiCAT Software
Allows you to upload stored records from locators with a data capture facility to view the locators use.
Simply upload all records or search by date.

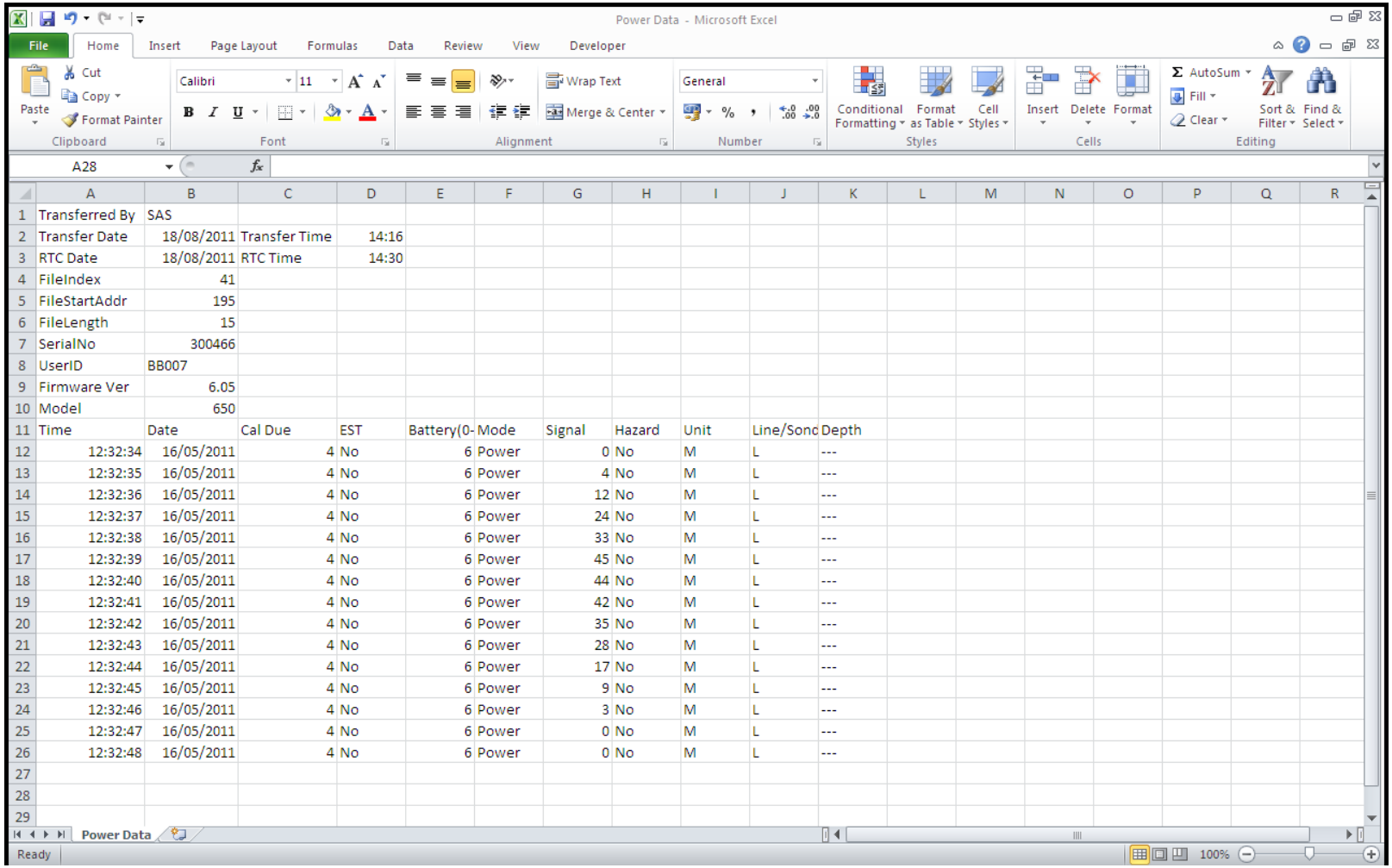
The LOGiCAT Software package consists of:
LOGiCAT CD-ROM, Bluetooth Dongle and Software User Manual



"Dashboard Analysis allows you to review individual usage and skills performance. Date selection allows you to pinpoint key events to report back information from specific user groups."

EZiCAT Analysis

Data from a survey in Power mode

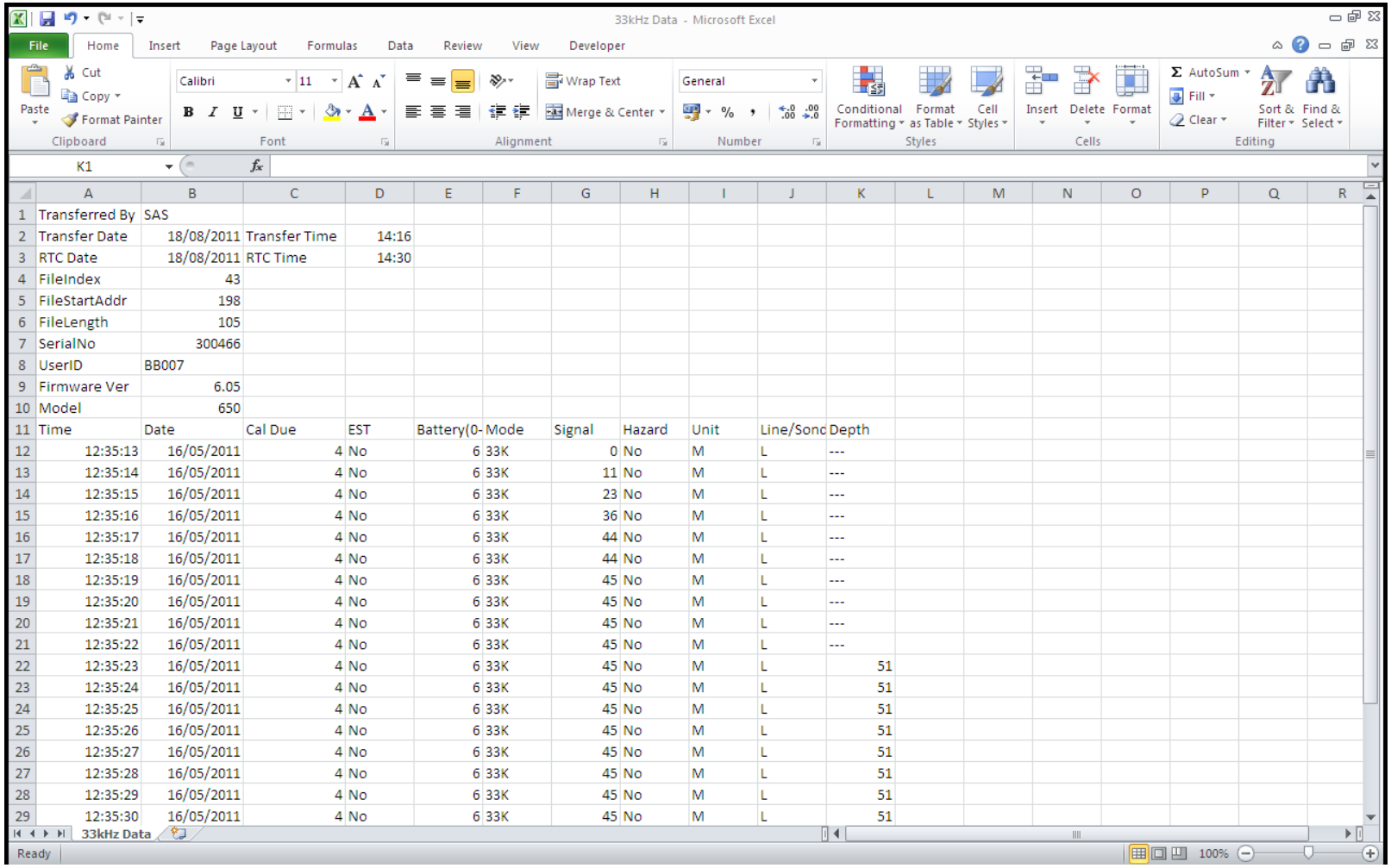


Power Data - Microsoft Excel

	A	B	C	D	E	F	G	H	I	J	K
1	Transferred By	SAS									
2	Transfer Date	18/08/2011	Transfer Time	14:16							
3	RTC Date	18/08/2011	RTC Time	14:30							
4	FileIndex	41									
5	FileStartAddr	195									
6	FileLength	15									
7	SerialNo	300466									
8	UserID	BB007									
9	Firmware Ver	6.05									
10	Model	650									
11	Time	Date	Cal Due	EST	Battery(0-	Mode	Signal	Hazard	Unit	Line/Sond	Depth
12	12:32:34	16/05/2011	4	No	6	Power	0	No	M	L	---
13	12:32:35	16/05/2011	4	No	6	Power	4	No	M	L	---
14	12:32:36	16/05/2011	4	No	6	Power	12	No	M	L	---
15	12:32:37	16/05/2011	4	No	6	Power	24	No	M	L	---
16	12:32:38	16/05/2011	4	No	6	Power	33	No	M	L	---
17	12:32:39	16/05/2011	4	No	6	Power	45	No	M	L	---
18	12:32:40	16/05/2011	4	No	6	Power	44	No	M	L	---
19	12:32:41	16/05/2011	4	No	6	Power	42	No	M	L	---
20	12:32:42	16/05/2011	4	No	6	Power	35	No	M	L	---
21	12:32:43	16/05/2011	4	No	6	Power	28	No	M	L	---
22	12:32:44	16/05/2011	4	No	6	Power	17	No	M	L	---
23	12:32:45	16/05/2011	4	No	6	Power	9	No	M	L	---
24	12:32:46	16/05/2011	4	No	6	Power	3	No	M	L	---
25	12:32:47	16/05/2011	4	No	6	Power	0	No	M	L	---
26	12:32:48	16/05/2011	4	No	6	Power	0	No	M	L	---
27											
28											
29											

EZiCAT Analysis

Data from a survey in 33kHz mode



33kHz Data - Microsoft Excel

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Transferred By	SAS																
2	Transfer Date	18/08/2011	Transfer Time	14:16														
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4	FileIndex	43																
5	FileStartAddr	198																
6	FileLength	105																
7	SerialNo	300466																
8	UserID	BB007																
9	Firmware Ver	6.05																
10	Model	650																
11	Time	Date	Cal Due	EST	Battery(0-	Mode	Signal	Hazard	Unit	Line/Sond	Depth							
12	12:35:13	16/05/2011	4	No	6	33K	0	No	M	L	---							
13	12:35:14	16/05/2011	4	No	6	33K	11	No	M	L	---							
14	12:35:15	16/05/2011	4	No	6	33K	23	No	M	L	---							
15	12:35:16	16/05/2011	4	No	6	33K	36	No	M	L	---							
16	12:35:17	16/05/2011	4	No	6	33K	44	No	M	L	---							
17	12:35:18	16/05/2011	4	No	6	33K	44	No	M	L	---							
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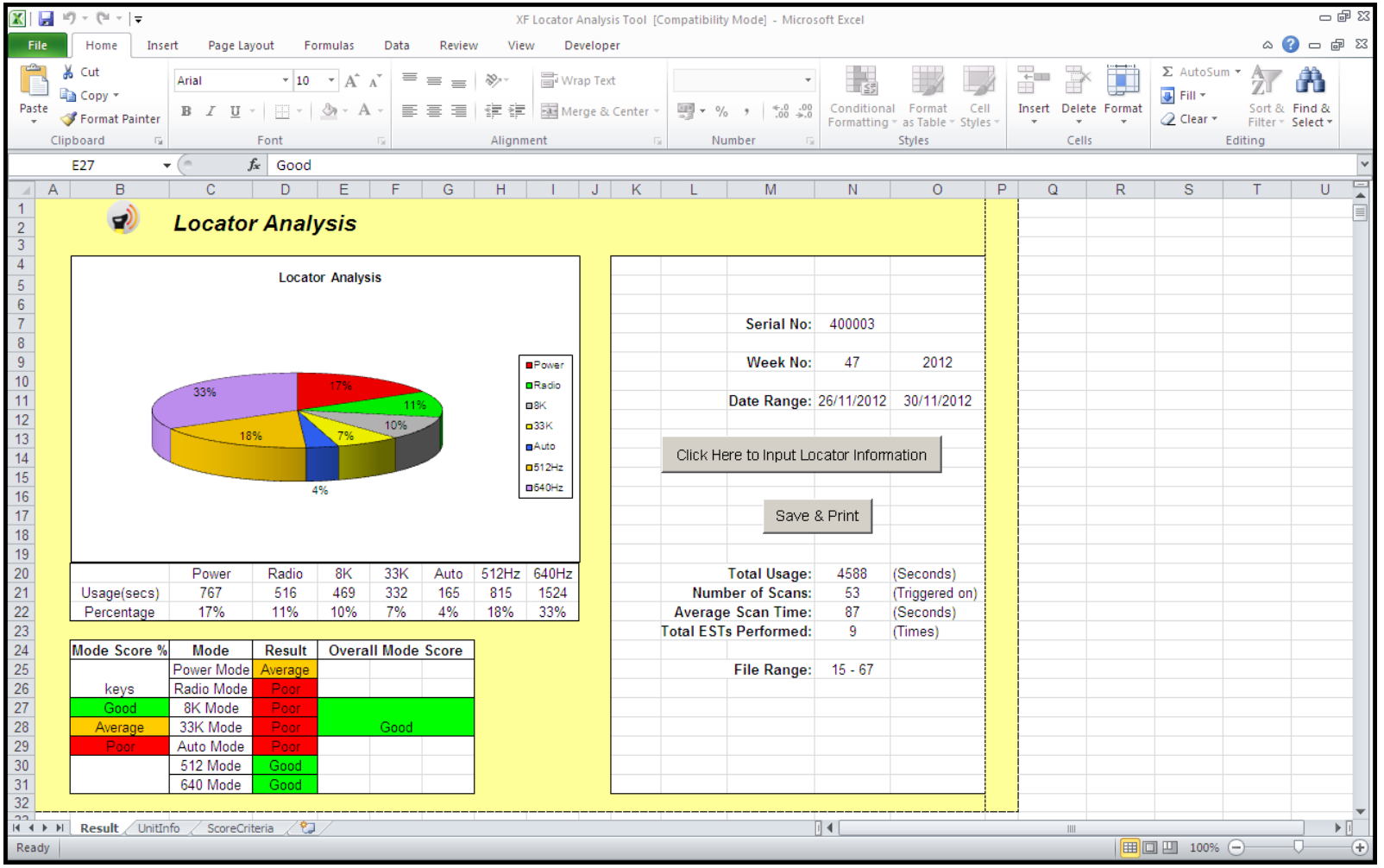
19	12:35:20	16/05/2011	4	No	6	33K	45	No	M	L	---							
20	12:35:21	16/05/2011	4	No	6	33K	45	No	M	L	---							
21	12:35:22	16/05/2011	4	No	6	33K	45	No	M	L	---							
22	12:35:23	16/05/2011	4	No	6	33K	45	No	M	L	51							
23	12:35:24	16/05/2011	4	No	6	33K	45	No	M	L	51							
24	12:35:25	16/05/2011	4	No	6	33K	45	No	M	L	51							
25	12:35:26	16/05/2011	4	No	6	33K	45	No	M	L	51							
26	12:35:27	16/05/2011	4	No	6	33K	45	No	M	L	51							
27	12:35:28	16/05/2011	4	No	6	33K	45	No	M	L	51							
28	12:35:29	16/05/2011	4	No	6	33K	45	No	M	L	51							
29	12:35:30	16/05/2011	4	No	6	33K	45	No	M	L	51							

EZiCAT Dashboard Analysis

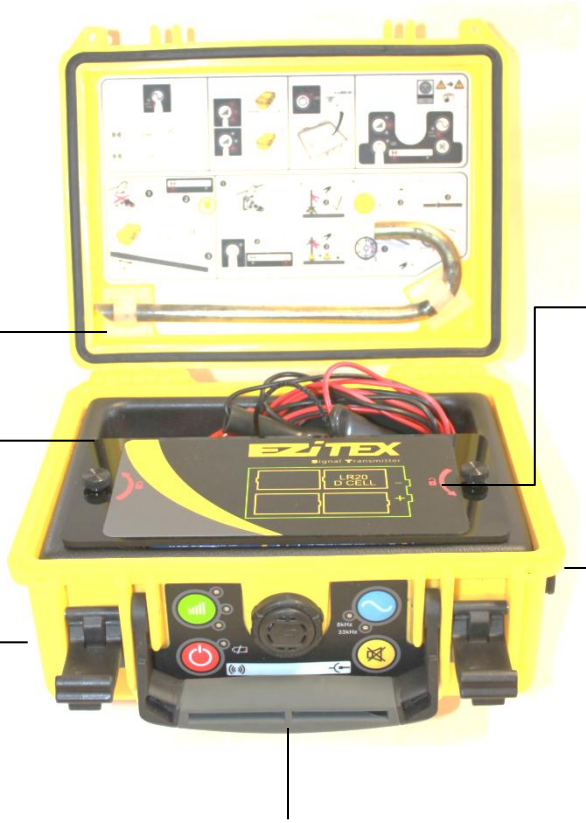


	Power	Radio	8K	33K	Auto	512Hz	640Hz
Usage(secs)	767	516	469	332	165	815	1524
Percentage	17%	11%	10%	7%	4%	18%	33%

Mode Score %	Mode	Result	Overall Mode Score
	Power Mode	Average	
keys	Radio Mode	Poor	
Good	8K Mode	Poor	Good
Average	33K Mode	Poor	
Poor	Auto Mode	Poor	
	512 Mode	Good	
	640 Mode	Good	

t- Series Signal Transmitter

Location Equipment – t-Series Transmitters Layout



Earth Pin
Provides an earth point when using the connection cable set

Accessory Compartment
Stores the connection cable set

Speaker
Provides an audible output

Battery Cover
Access to Power supply.
4 off D type (LR20) batteries or
Rechargeable battery pack

Connection Socket
Used to connect accessories

Control Panel
Used to switch on and adjust the transmitters settings

EZiTEX t100 – Product Features

- **Improved Power Output -** Enables operators to trace over greater distances and improving signal application onto difficult services.
- **External controls -** For ease of use. No need to open the transmitter case set improving the IP rating against water ingression
- **In-built test function -** Provides a function test on the hardware and software prior to use.
- **External Accessory port -** For ease of use when using the cable set or transmitter's accessories.
- **Four power output settings -** Full flexibility for improved battery performance or signal application.
- **Dual Frequency outputs -** Industry standard 33kHz avoidance output plus an 8kHz output for additional tracing capabilities.

EZiSYSTEM Accessories

EZiSYSTEM – Accessories
EZiROD

Used in conjunction with the Transmitter to trace non conductive ducts (plastic etc) up to 100mm diameter.

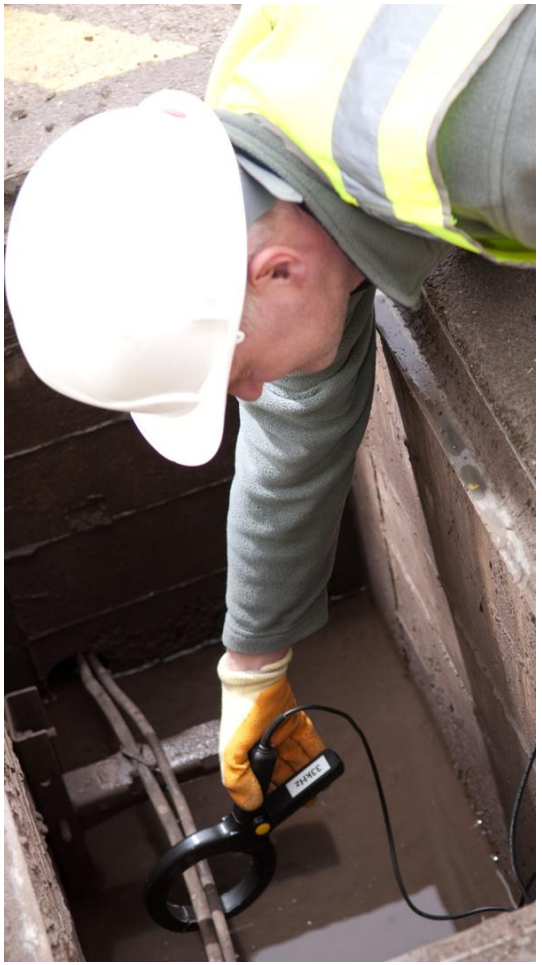
Tip diameter is 13mm, with rods available in 30M, 50M and 80M lengths.

Sonde Mode (Tip)
Used to accurately pinpoint the end point of the rod.

Line Mode (Yellow Rod)
Used to trace the length of the rod, and duct it is in.

EZiSYSTEM – Accessories
Signal Clamp

Connects the transmitter to electrical services, telecommunication or other utility lines which need tracing (useful in congested areas for specific line tracing). Access to the utility is required.



Note:
A hazardous signal may be present on the connection plug of the Signal Clamp when clipped over a live service.

Precautions:
The clamp should be connected to the Transmitter before clamping around a live service.

Works best at 33kHz

EZiSYSTEM – Accessories
Property Connection Set

Connects the Transmitter to the mains electricity supply enabling the operator to trace the mains cable.

Access to a mains socket is required.

The mains supply must be live and switched on for correct operation.

Works best at 33 kHz

EZiSYSTEM – Accessories
Dual Frequency Sonde

Commonly used to trace non conductive ducts or blockages in drains.

Powered by a AA alkaline battery (does not require the EZiTEX).

The Sonde's maximum diameter is 38mm and is typically used in ducts over 50mm.

Transmits an 8kHz or 33kHz signal.

8kHz indicated by an **amber** LED.

33kHz indicated by a **green** LED.

EZiSYSTEM – Accessories

Extension Reel - Provides an additional 10m of cable used to extend either the red or black cables of the cable connection set**.**

Carry Bag - Carries the main components of the System (EZiCAT, EZiTEX & Sonde) & accessories. Constructed from rugged fabrics and complete with shoulder strap.

EZiCAT xf Series

EZiSYSTEM xf Series - Overview

The xf series of location equipment is designed with an emphasis on long distance tracing and the detection of sewer and camera inspection systems. It should therefore be of interest to specialist utility contractors as well as our established construction market.

Two additional tracing frequencies, 512Hz and 640Hz, have been added to both the Locators and Transmitters.

In addition to the EZiTEX 1 watt transmitter, a 3 watt version is available which increases power output for more effective long distance tracing.

Locator Range:

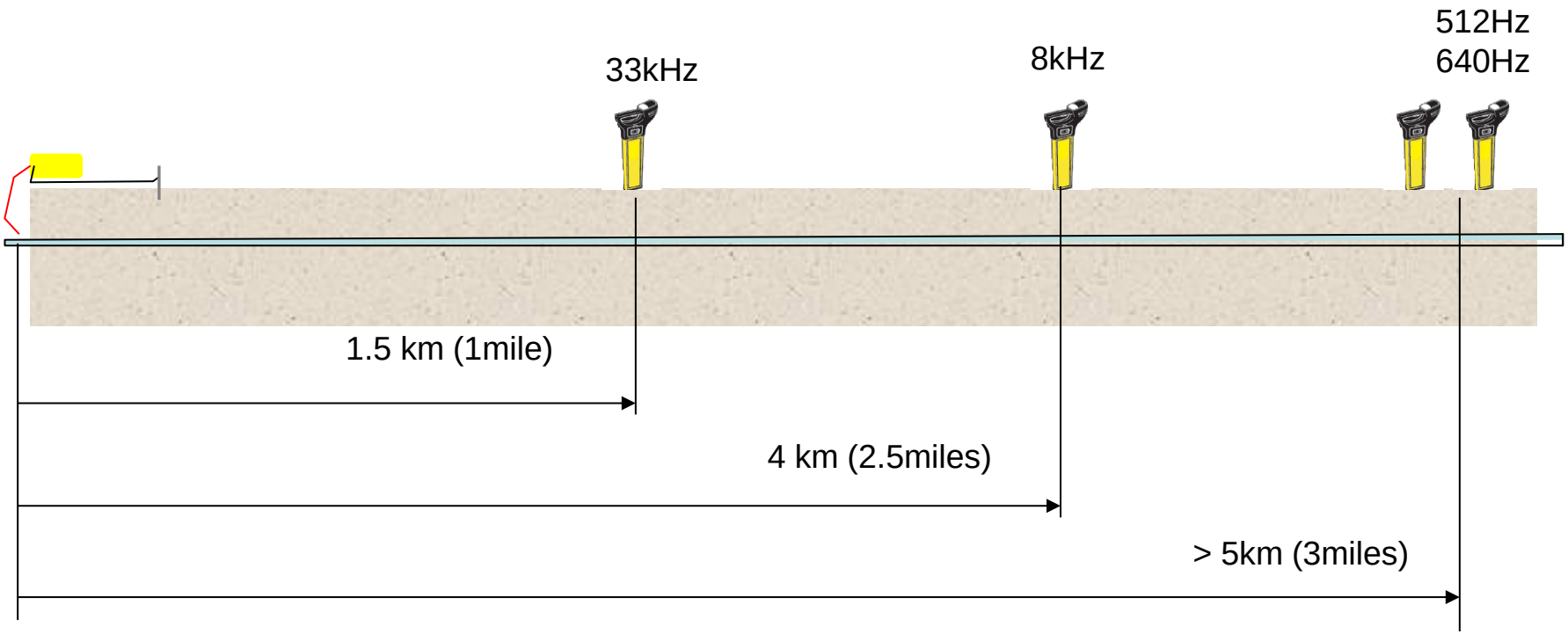
EZiCAT i500 xf
EZiCAT i550 xf
EZiCAT i600 xf
EZiCAT i650 xf

Transmitter Range:

EZiTEX t100 xf
EZiTEX t300 xf

EZiSYSTEM xf Series - Long Distance Tracing

The added benefit of low frequencies to tracing distance is shown below



Tracing distance will vary depending on the quality of the earth point, the connection onto the pipe or cable and the type of pipe or cable the transmitter is attached to.

Figures are based on the EZiTEX t300 xf transmitter connected to a 300mm (12inch) iron pipe buried at approx 1.75m (5ft 8 inches) – 2m (6ft 6inches).

EZiSYSTEM xf Series - Locators
New Features

Mode Lock
The EZiCAT xf Series will start in the last mode of operation. This will suit the needs of a surveyor or drain tracer who is using the transmitter modes regularly.

Current Measurement
Allows user to identify the pipe or cable the EZiTEX is connected to with ease.

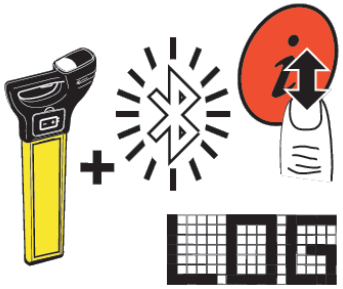
Increased Sonde Depth Range
Allows the operator to trace none metallic ducts to greater depths.
Provides the operator with greater depth estimation capabilities when using the EZiCAT i550 xf and i650 xf. New depth range is now 9.9 metres.

512Hz or 640Hz Tracing Frequencies
Provides the operator with an increased tracing distance.
Improves tracing lock in a congested environment.
Allows the operator to trace sewer camera inspection systems and Sondes.

EZiSYSTEM xf Series - GIS Data Capture

The EZiCAT i550 xf and i650 xf locators can be used to capture the depth and geographical position of buried pipes or cables using Bluetooth connectivity.

Use the EZiCAT transfer tool to connect the EZiCAT xf Series to a handheld mapping device such as the Leica Zeno 10 or Zeno 15 field controller. The geographical position and additional site information can then be added to the survey.



EZiSYSTEM xf Series - Transmitters

EZiTEX t100 xf

EZiTEX t300 xf - Long Distance Tracing

A powerful long range signal transmitter with a choice of 4 frequencies,

512Hz, 640Hz, 8kHz and 33kHz

- Improved depth estimation when using a depth locator.
- Improved service detection in areas of high signal interference.
- 4 x adjustable output levels to select from dependent on site conditions.
- Fully weatherproof to IP65.
- User self test using cable set supplied.

The addition of the 512Hz and 640Hz frequencies to the xf Series signal transmitters will allow operators to trace buried pipes and cables over greater distances when used in conjunction with an EZiCAT xf Series cable locator.

New Product Launch
EZiCAT i700 Series

cable detection
delivering expert technology

i700 Series Locators

EZiCAT i700
Locator with memory, Bluetooth and GPS.

EZiCAT i750
Locator with memory, Bluetooth, GPS and Depth estimation.

EZiCAT i750xf
Locator with memory, Bluetooth, GPS, Depth estimation and additional 512Hz & 640Hz tracing frequencies.

Overview

- **Data logging -** The i700 Series locators record and store information whilst they are in use. The locators start to record information every second after completion of the initial start-up routine. These records (logs) are stored in the locators memory and can be retrieved and transferred via Bluetooth to a PC for analysis.

- **Bluetooth Connectivity AS STANDARD-** All of the i700 Series locators have the added benefit of Bluetooth wireless connectivity. It allows the EZiCAT to integrate seamlessly with mobile mapping technology to log survey data, in addition to enabling wireless Bluetooth data transfer.

LOGiCAT

Smartworx

Zeno Field

EZiCAT i700 Series – GPS Technology

Features	GPS Technology
GPS Technology	**Chipset:** MediaTek MT3329, WAAS/EGNOS capable (1) . Type: L1 frequency, C/A code (SPS), Channels: 22 tracking + 66 search channels **Position** (2) 1.8m (CEP95), Velocity 0.1m/s, Time +/-50ns (RMS). **Start time** Cold 12 min max (34s typical), Warm 34s typical, Hot 1s typical

(1) WAAS available in North America only, EGNOS available in Europe only.

(2) Accuracy is dependent upon various factors including atmospheric conditions, multipath, obstructions, signal geometry and number of tracked satellites.

EZiSYSTEM Locators

Example GPS Positioning

Locator Report

Company Information
Registered Owner:
Cable Detection Ltd

Registered Address:
Blythe Park
Creswell
S.O.T
ST11 9RD

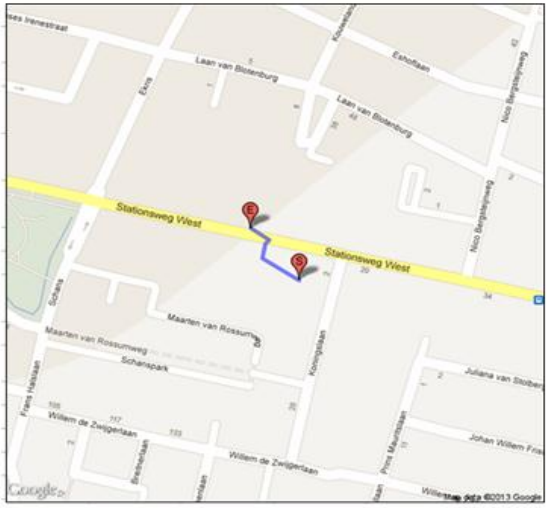
Telphone No:
Email:

Product Details
Locator Model No: i750
Serial No: 123345
Cal Months: 10

Log Details
File Path:
C:\My Documents\logfiles

Log From: 101
Log To: 150

Mode Usage %:
Power : 50 Radio : 25 Auto: 5
8kHz : 1 33kHz: 20
512Hz: 2 640Hz : 2



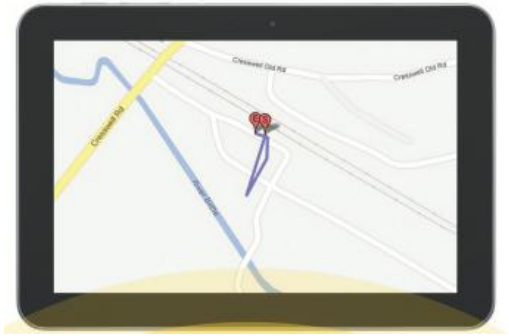
	DATE	TIME	Longitude	Latitude
START	18/10/2012	13:04:49	52.080793	5.423193
END	18/10/2012	13:07:27	52.081233	5.42258

Example Log file

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Transferred By	A Other											
2	Transfer Date	22/11/2012	Transfer Time	10:58									
3	RTC Date	22/11/2012	RTC Time	10:57									
4	FileIndex	212											
5	FileStartAddr	495											
6	FileLength	33											
7	SerialNo	700001											
8	UserID												
9	Firmware Ver												
10	Model	750											
11	Time	Date	Cal Due	EST	Battery(0-9)	Mode	Signal	Hazard	Unit	Line/Sonde	Depth	Latitude	Longitude
12	09:37:22	22/11/2012	14	No	8	Power	0	No	M	L	---	5245.444	-143.112
13	09:37:23	22/11/2012	14	No	8	Power	0	No	M	L	---	5245.444	-143.112
14	09:37:24	22/11/2012	14	No	8	Power	0	No	M	L	---	5245.444	-143.112
15	09:37:25	22/11/2012	14	No	8	Power	0	No	M	L	---	5245.444	-143.112
16	09:37:26	22/11/2012	14	No	8	Power	0	No	M	L	---	5245.444	-143.112
17	09:37:27	22/11/2012	14	No	8	Power	16	No	M	L	---	5245.444	-143.112
18	09:37:28	22/11/2012	14	No	8	Power	11	No	M	L	---	5245.444	-143.112

LOGiCAT

Allows you to upload the stored records to view the locators use, simply upload all records or search by date.



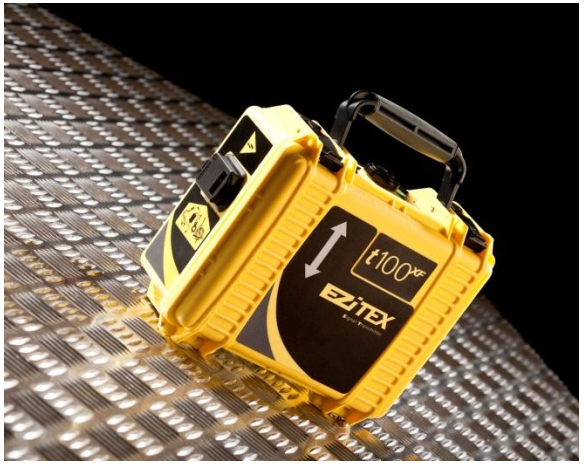
The LOGiCAT Software package consists of:

- LOGiCAT CD-ROM
- Bluetooth Dongle
- Software User Manual

Information extracted:

- **GPS Positioning** – Identifies where the ground survey took place. - **NEW**
- **Time & Date Information** – Identifies when and at what time ground surveys were conducted.
- **Usage Duration** – Determines how long survey teams searched for buried utilities and discovers actual product utilisation.

All our products are fully Network Rail approved



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