



ELIOT : SOLUCIÓN PARA LA LOCALIZACIÓN
Y LA IDENTIFICACIÓN DE REDES ENTERRADAS

Los daños a la red ya son evitables



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Prevenir los daños a la red: un requerimiento vital

Debajo de nuestras ciudades existen millones de kilometros de redes esenciales a nuestra vida diaria. Agua potable, gas, electricidad, telecomunicaciones, desagües, etc... todas estas redes se entrelazan, se cruzan, se traslapan y algunas de ellas están aquí desde hace tanto tiempo que su ubicación precisa ha sido olvidada.

Entonces excavar una zanja en plena carretera no es una actividad sin riesgo. Cada año, esto causa millones de incidentes y daños a las redes con consecuencias a veces graves. Y no solo económicamente...

Responsible for mapping defects

The absence or mistakes in mapping networks, the inadequacies of traditional detection techniques and human errors are the main causes of these incidents.

Often this could be prevented through reliable technology to detect, identify and geo-reference networks. For this reason, many countries have strengthened their regulations. Companies (operators, owners, communities and contractors) that fail to comply will face sanctions.

New regulations to make sites safer

In France for example, a new regulation has strengthened the role played by the operators and the contractors in making works safe, as well as increasing their obligations in terms of precisely locating networks.

Also, operators must be trained on safety rules with emphasize on the strict new regulations governing the interruption of works in situations considered as hazardous.

ELIOT: Performance comprobada unica en el mundo

ELIOT (Equipamiento para la Localización e Identificación de estructuras Terrestres) utiliza una tecnología patentada: RFID (Radio Frequency IDentification)

Building access badges, toll road electronic collection, hands-free ski lifts, biometric passports or public transit access ... All of these examples are proven benefits of self identification technologies based on the use of radio waves: RFID. Placed at the heart of the ELIOT system, this technology is uniquely positioned in the Geo Reference of buried networks (water, gas, telecom, power, etc.) without the need for trench opening.

A rapid and precise solution

The ELIOT system has undergone multiple tests in real conditions. First on the CEA-LETI site, in Grenoble - our partner in RFID technology research - then at various sites in the region Rhône-Alpes and, finally, on a technological platform.

In all cases, regardless of the weather conditions or the surface conditions (asphalt, sand, soil, stones, dry, wet, etc.), the ELIOT system has demonstrated its ability to locate and quickly identify the networks, with unprecedented precision within centimeters.

A world first designed with the CEA

ELIOT is the result of an extensive collaboration with the LETI, an institute of the CEA, a French research-and-technology organization with global activities in energy, IT, healthcare, defence and security. Six years of research and millions of Euros of investment were necessary to develop this unique system.

Para todo tipo de redes



Scan the QR Codes throughout the following pages to discover videos that demonstrate how ELIOT can help you secure your networks!



ELIOT : For an intelligent modeling of networks

The principle of operation of ELIOT is simple and effective: the RFID chips with embedded useful information to operators (nature of network, type of line, installation date, batch number) are integrated onto the network either during installation or when working on existing networks. From the above, a very intuitive detector is used to locate and instantly categorize each line.

Specifically, the ELIOT system consists of three main elements:

- Passive marker containing data
- Detector, which exchanges data (read/write) with the marker via an antenna and displays them directly on the screen.
- Software used for the processing of data and their import in any type of Geographic Information System (GIS) or software asset management.

ELIOT secures three essential functions

Localization

- Simple and intuitive, the location of the buried marker requires no specific training. The information contained in the marker is instantly and clearly displayed on the detector screen: no interpretation of the signal is required.
- Unprecedented precision in the order of a few centimeters, on three axes: X-Y-Z.
- Efficient localization in all surface types (asphalt, sand, soil, stones, dry, wet soils, etc.), even in aqueous environment (groundwater, for example), regardless of the material type (cast iron, concrete, PEHD...) and the type of networks (water, gas, electricity, telecommunications).

The identification

- Any network equipped with Eliot marker located in the intervention area appears independently and simultaneously: the response time is within thousandths of a second.
- The screen will very precisely identify the detected network, thus avoiding any confusion when in proximity to other services.
- A large data storage capacity of the system offers the possibility to store an extremely fine level of details on the buried marker: line type, use, installation date, serial number, diameter, etc.
- The ability to add information from the surface allows the user to update installed markers and secure them from future intervention.



Encoding remotely with the detector

Integration

- Recovery of the information stored in the RFID marker, then association with GPS coordinates for each point and downstream integration with any type of GIS, via a file .csv.
- Ease of marker data writing and update, thanks to an Android app.
- Ability to lock the added information.



Detection of a buried marker



Depth measurement



Using integrated GPS



Using Differential GPS

ELIOT: the assurance of real security and a measurable ROI*

When added to new or existing networks, ELIOT offers much higher efficiency when compared to all existing detection systems for an investment representing 0.5% to 0.8% of the total cost of a construction site. Significantly less than direct spending (replacement of products, delay in the construction) and indirect costs (insurance, problems legal, dissatisfaction of customers, reputation, etc.) created by damage to networks!

* Return on Investment

Superior to all other methods of detection

	Ground-penetrating radar technology	Pure electro-magnetic technology	RFID ELIOT system
Detection in all types of environments	• No : inoperative in clay soils, saturated or high levels of groundwater. • Calibration of the required antenna depending on the ground	Yes, but detection severely disrupted in the presence of electrical networks or magnetic fields	Yes, without restriction
Use for all types of networks	No: difficulties on pipes of small diameter and networks that are too dense	Yes, but requires a special installation for plastic pipes: tracer wire or insertion of a probe in the pipeline (requiring the line to be out of service)	Yes, without restriction
Identification	No	No	Yes, without restriction
Analysis of the data	• Transmitting/ receiving of electromagnetic signals • Processing of radar echo via embedded software	Generation of a magnetic field with maximum intensity on a particular surface point	Direct reading of the information stored in the RFID TAG



ELIOT: a complete range of solutions adapted to the **realities of sites**

1. ELIOT Marker

The ELIOT marker is a passive RFID tag that is protected by a rigid, watertight, impact resistant polymer case. Installation on the network (gas, water, telecom, sewage, industry, electricity, geothermal, rainwater, district heating) is very simple, using two adhesive strips under the housing. It can be used on curved or flat surfaces. Lasting more than 60 years, it is effective in all types of soil, regardless of the electrical and magnetic environment.



Installation of an EMS enclosure on a metal pipe



Installation of an EMS casing on a pipe plastic

2. ELIOT Detector

Equipped with a 68 cm diameter antenna and a color display offering reading ease, even in strong sunlight, the ELIOT detector is lightweight, manoeuvrable and highly resistant to shocks. It is able to locate and indentify precisely all nearby markers. In addition to the decryption of all the information contained in the RFID tag, it offers the possibility to add information, via two predefined writing fields.

Its embedded memory can store additional attributes and can be selectively or entirely exported to any types of GIS (via USB).

3. ELIOT Mobile for Android Smartphone

ELIOT Mobile is an application dedicated to smartphones equipped with the function NFC (Near Field Communication) to communicate in contact with ELIOT marker, whether sending or receiving data. This application is native on the rugged smartphones ELIOT.



Encoding with a NFC Smartphone

4. Rugged Smartphone ELIOT

Ideal for use on construction sites, the ELIOT mobile telephone is both rugged and waterproof, resistant to the harshest environments and complies with IP67. The mobile ELIOT app is installed by default. Like any smartphone it comes with GPS, an 8 MP camera (a 1.3 MP front-facing camera) and runs on Android 4.1.

Supplied without a SIM card it has a dual SIM slot. It comes with interchangeable casings of different colors.



ELIOT Innovative Solutions : a company dedicated to creating **breakthrough technologies**

Spin-off of the group RYB (specializing in the design and manufacture of tubes and pipes in polyethylene for construction, water and environmental sectors) ELIOT Innovative Solutions is an independent company focused on research in innovative technological solutions dedicated to public works contracts.

Established in 2014 and located in Isère, a department in the Rhône-Alpes region in the east of France, ELIOT Innovative Solutions relies on a network of distributees throughout the national territory, but also internationally. To accompany its expansion, the company recently opened offices in Montreal (Canada) to meet the needs of the North American market and in California (USA). And this is just the beginning ...

International ambitions

« The detection, tracking and identification of drainage networks are at the heart of concerns of communities in terms of safety and cost. There is a global need. We will develop our industrial and distribution partnerships to strengthen our presence in new markets »
Marc-Antoine Blin, CEO of ELIOT Innovative Solutions.

Innovation ELIOT award

The ELIOT system award-winning innovation

- The Innovation 2011 Gold Trophy, awarded by Head of Entreprise magazine
- Winner of the 2011 EXPOGAZ Innovation Competition, Prevention and Safety category
- 1st Prize FIEEC applied research 2011
- The Innovation 2011, industry trophy, awarded by Bref Rhône Alpes
- ELIOT solutions have been selected among the «objects of the new France Industrial», presented in February 2014, during a demonstration organized by the Ministry of Productive Recovery.

ELIOT Innovative Solutions :

- A strong international presence
- A network of subsidiaries : 2 in North America, 1 in Asia and 2 in Europe
- A network of distributors on every continents



ELIOT
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