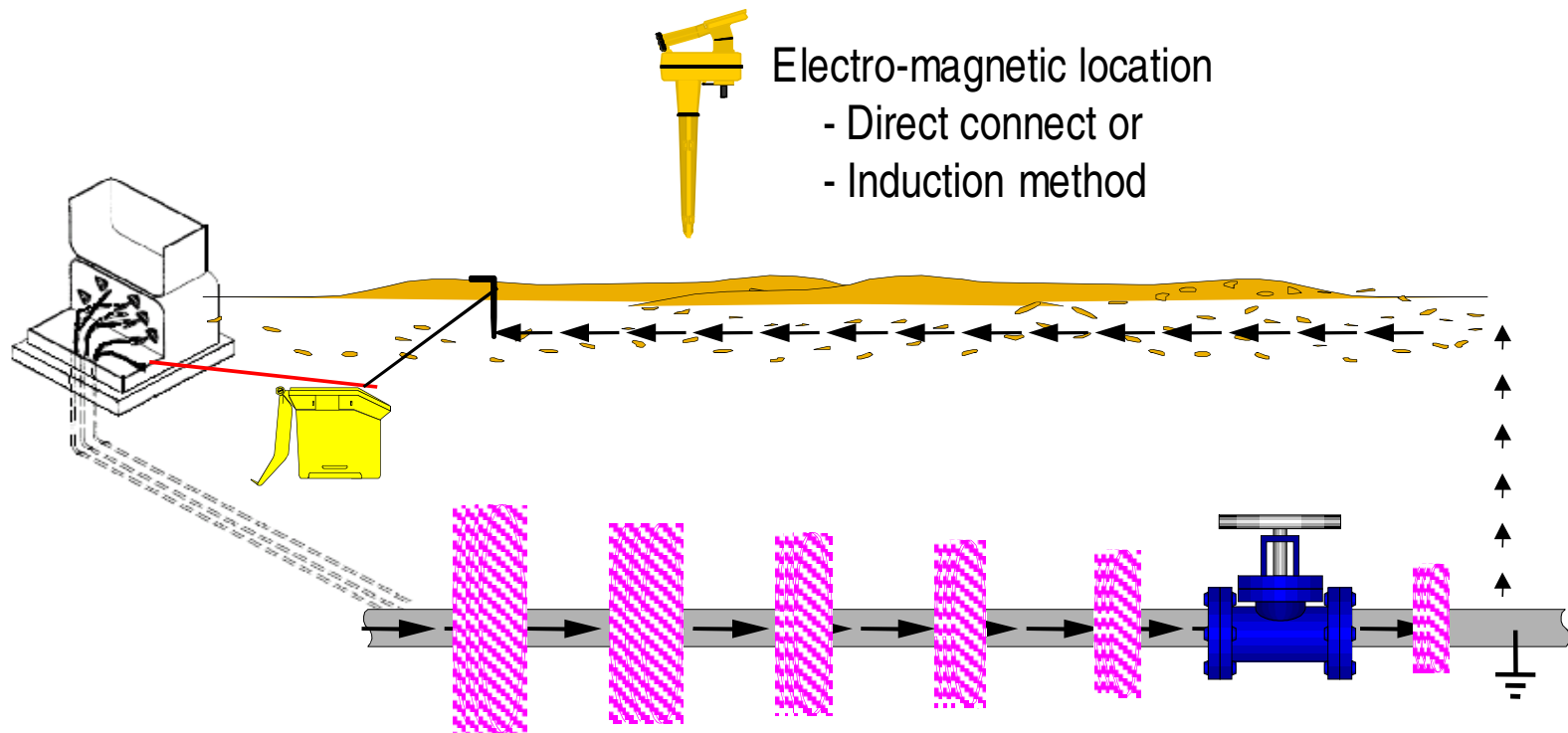




3M™ Dynatel™ Locating and Marking Technologies

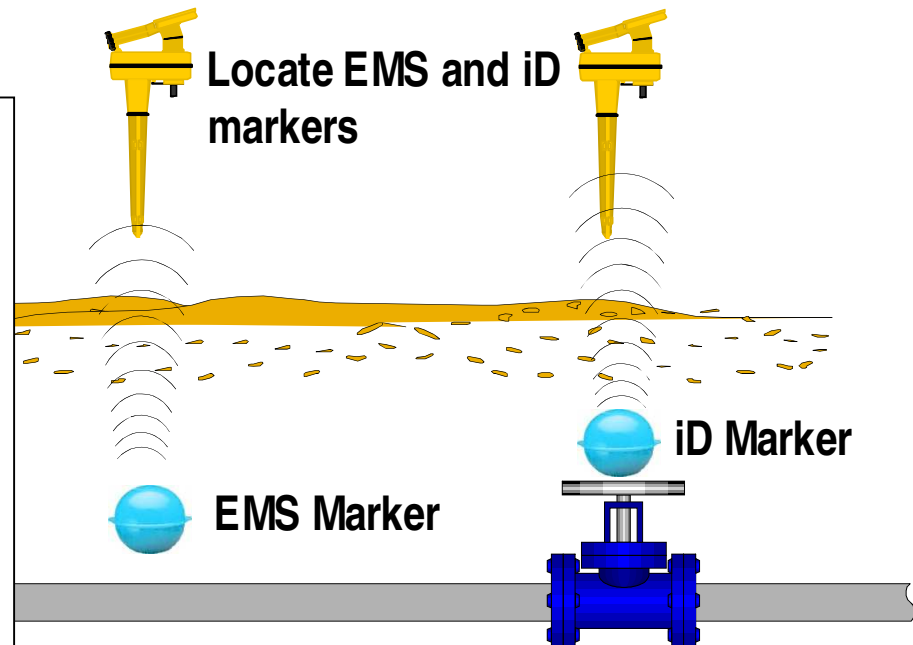
Dynatel Pipe and Cable Locators (Electro-magnetic)



- 30 + years of experience and innovation.
- Range of analogue and digital locators.
- Best in class for ground fault locating accuracy.
- Reliable, rugged and ergonomically designed.

Electronic Marker System Overview

- Markers are passive devices. (no battery)
- Area 'swept' with locator.
- Markers within 'read range' respond.
- Locator powers up marker.
- Marker is 'read' by locator.



- 1420-iD Locator – Electronic markers only (EMS and iD markers)
- M-iD range – All in one locator: pipe, cable, fault and marker locator

Electronic Marking - Three top applications

- Construction Access
 - Points that need to be accessed for future construction / facility expansion needs eg service stub connection points.
- Maintenance
 - Points needed for future maintenance
- Damage Avoidance
 - Indicate presence of key infrastructure e.g. non conductive plastic pipes or fibre optic cables, or the location of a lateral or tee where the direction of the facility may change or branch out.

3M offer two types of electronic markers

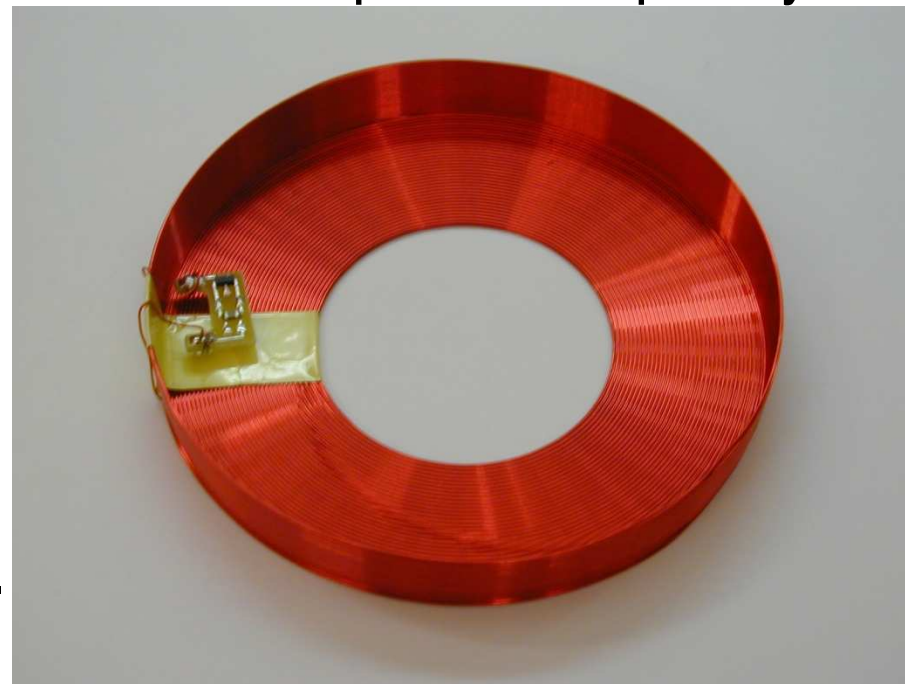
- 3M EMS markers
 - Identifies type of underground facility - Power, Telephone, Water, Gas, Waste water, CATV, General Purpose.
 - Each marker responds at different frequency.
 - Tells locator '**here I am**' plus 'I am xyz utility' e.g. water, power.
- 3M iD markers
 - Contains microchip.
 - Provide same feedback as EMS marker **plus** '**what I am**' - asset and owner specific information - eg branch splice, conduit stub, owned by ABC organisation.

3M EMS Markers – How they work



The specific frequency is unique to the utility it marks.

EMS Markers contain a coil, tuned to a specific frequency.



3M EMS Markers – Placement

- Placed on top of facility during construction, repair or maintenance.
- 3M have recommend guidelines on placement



- Engineered for narrow trench applications up to 1.5m in depth.
- Ball markers have a unique, patented self-levelling feature that ensures an accurate, horizontal position regardless of how it is placed in the ground.
- Warranted for life of utility.

Finding EMS Markers

- User selects particular utility eg power, telephone, gas etc and sweeps area.
- The locator emits the utility's unique frequency (eg Power).
- Locator frequency energises the EMS marker coil in the power markers.
- It detects the power marker's 'reflection' of that signal.
- Strong 'reflection' means close proximity to marker.



Range of iD Markers

<p>Near Surface 0.6m depth</p>  <p>iD Option</p>	<p>Ball Marker 1.5m depth</p>  <p>iD Option</p>	<p>Disk Marker 1.5m depth</p>  <p>iD Option</p>	
		<p>Full Range 2.4m depth</p>  <p>iD Option</p>	



Telephone



Gas



CATV



Power



Water



Wastewater



Gen Pur.

iD Markers

- iD markers contain a microchip which has a unique 10 digit serial number.
- Serial number also displayed on a barcode label.
- Marker programmed by user to include specific information
 - Customer information
 - Facility data
 - Type of application
 - Material type and size
 - Placement date
 - Other details relevant to asset owner



Construction of iD Markers

Coil Antenna

Disk Housing

Microchip

Color Code by Utility

Disk inside Ball Housing

A.S.I.C

Enhanced Marker

AC/DC

User Data

ID Data

Protection

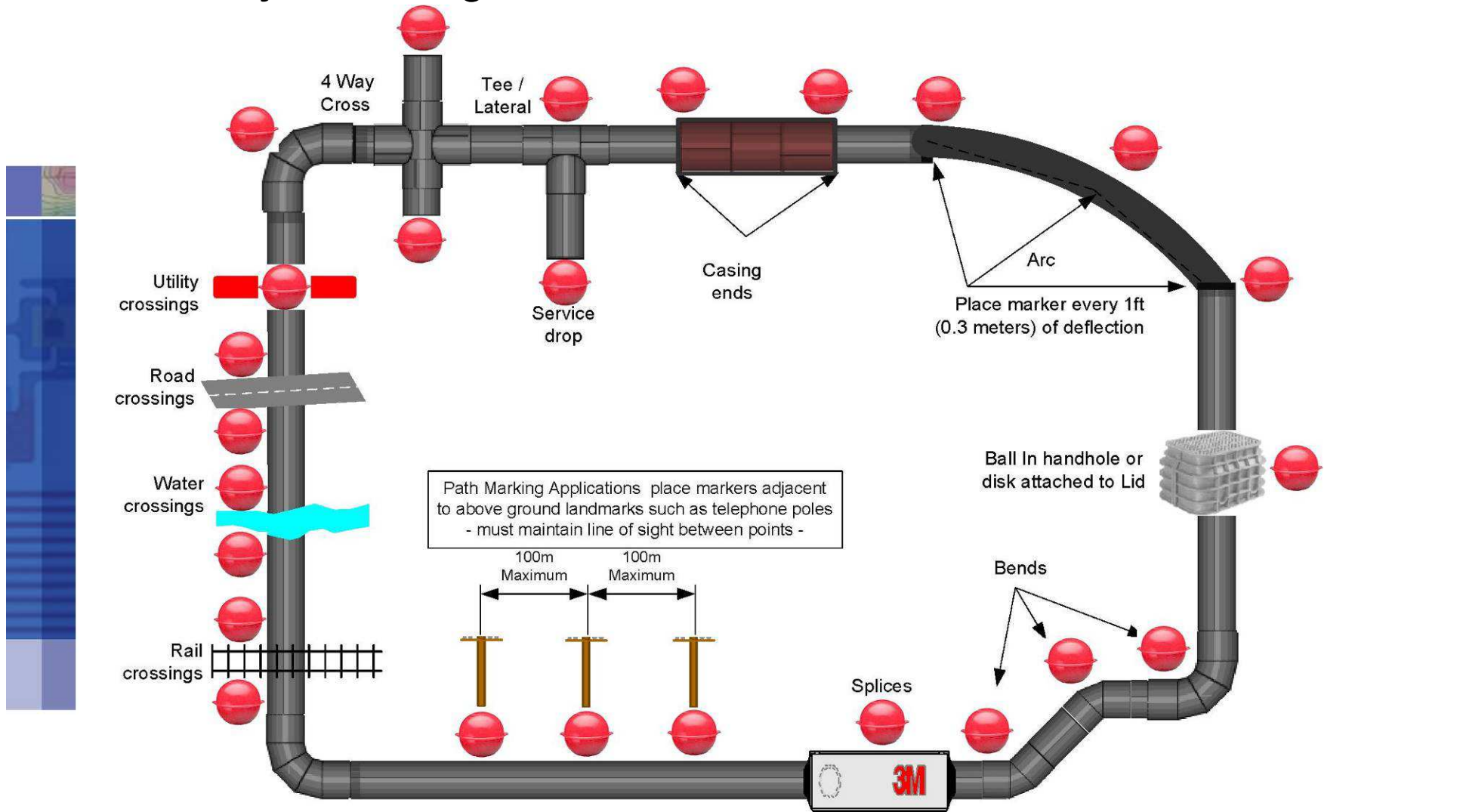
Modulator

Demodulator

Central Control Unit

The diagram illustrates the internal components of the A.S.I.C. chip, which is used in the iD markers. The chip is divided into several functional blocks: AC/DC, User Data, ID Data, Protection, Modulator, Demodulator, and a Central Control Unit. The chip is shown in a close-up view, highlighting its role in the marker's operation.

Gas Utility Marking – EMS and iD markers



Crossings
 - Water
 - Major roads
 - Rail

Service Stubs & Drops
 Primary & Secondary Splices
 Repair Splices
 Transition Splices

Laterals & Tees
 Empty Conduit Banks
 Conduit Openings
 Handholes and Manholes

3M Electronic Markers in use



Installing 3M iD markers

Step 1: Set up customer specific templates using PC tools (once off) and downloads to locator

User defined data

- 6 lines
- 8 character label per line
- 14 character description per line.
- Data locking option

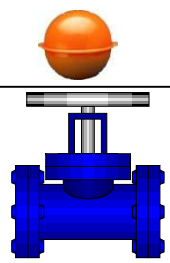
The screenshot shows the 'ID Marker Utility' window. At the top right, there is a 'Glossary Language' dropdown menu set to 'English'. Below this is a menu bar with options: 'Set up Favorite User List', 'Create/Edit Templates', 'Xfer Read/Written Mkr data', and 'Help'. The main area contains two dropdown menus: 'Template Name' (set to 'untitled.utl') and 'Favorite User List' (set to 'W&WW'). Below these are two columns of dropdown menus: 'LABELS' and 'DESCRIPTIONS'. The 'LABELS' column includes 'Company', 'Descrptn', 'Size', 'Type', 'Person', and 'Directn'. The 'DESCRIPTIONS' column includes 'CCU', 'TEE', '6 IN', 'C900', '15', and 'N/5'. At the bottom of the main area, it says 'Memory usage for this template : 0 % Remaining'. There are three buttons: 'Clear', 'Save As', and 'Download Template(s)'. At the very bottom of the window is an 'Exit' button.

How it works

Step 2: Installer selects predefined template on locator based on asset type and programs asset specific information to iD marker.



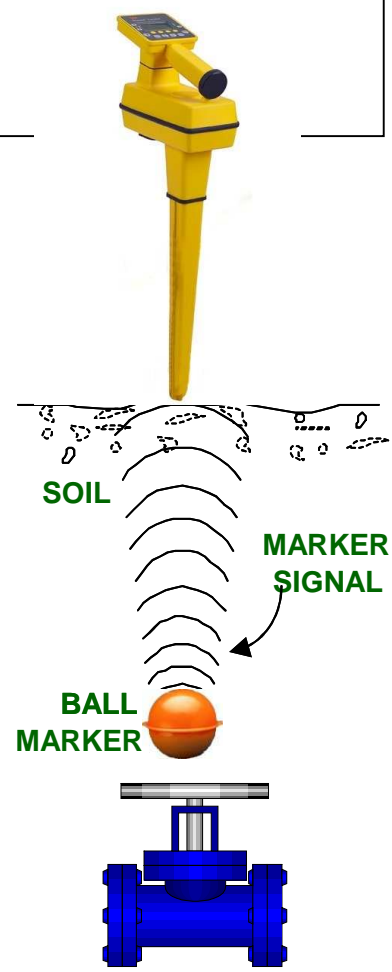
Step 3: iD marker placed on point of interest



Step 5: Recorded data exported from locator to GIS (via Trimble GPS)



Step 4: Locator reads and records information stored on iD marker



Step 6: GPS Interface - delivering added benefits



iD marker data and GPS coordinates saved on GPS with press on a button

Export GPS data to GIS/CAD system



- iD # 000-001-6710
- Marker:1425-XR-ID Water
- Company: XYZ
- Description: Valve

- Type: Steel
- Size: 100mm
- Direction: CW-Close-4T
- Lat: 30° 23' .65N
- Longitude: 97' 50.34W

Data saved to GIS mapping system

View information on GIS System

The screenshot displays the Google Earth Pro interface. On the left, the 'Places' and 'Layers' panels are visible. The 'Places' panel shows a hierarchy of folders, with 'GP325' selected. The 'Layers' panel shows various map layers like 'Primary Database', 'Geographic Web', 'Roads', etc. The main view is a satellite image of an industrial area with several 'GP325' markers. A popup window for the selected 'GP325' marker displays the following data:

GP325
Feature = 5
Latitude = 31.1085
Longitude = 121.405
Altitude = 29.5
Num_Sat_ = 5
PDOP = 2.65
Date_Time = 4/10/2006 23:58
Duration = 0:00:04
Correction = Uncorrected
Horizontal_Error_m_ = n/a
Vertical_Error_m_ = n/a
ID_ = 46423
Label1 = 1425-XR/ID Gas ID Ball
Company = SGAS
Descriptn = GP325
Date = 09/09/04 M/D/Y
PSI = 0.4M

At the bottom of the screen, the text 'Google Earth Pro' is displayed in large white font. Below it, there is a copyright notice: 'Image © 2008 DigitalGlobe © 2008 Europa Technologies' and the 'Google' logo.

Electronic Marker Locators

Stand Alone
Marker Locator



1420-iD Locator

Integrated Cable/
Pipe & Marker
Locator



M-iD Range
2250M-iD or 2273M-iD
Locators

- Memory capacity
 - 100 Read/Write records
 - 32 user defined ID templates
- PC software exports read/write history
- Path traces and scans for marker simultaneously
- GPS interface

Benefits of 3M iD markers to facility owners

- Saves time and money- simple and easy to use.
- ID markers offers speed, accuracy and confidence in point locating.
 - Inspection of contractors work is eliminated
 - Markers are clearly identified on maps
 - No Questions about positive identification
- Serial number can be used as an asset tag.
- GPS/GIS/CAD interface - saves up to 80% of time field mapping.
- Single button on locator remotely commands the GPS

**With 3M iD markers you've
got it's number**

