

PCM PLUS⁺



Pipeline Current Mapper



Radiodetection[®]
AN SPX COMPANY

Locate

Accurately find buried pipes, establish centerline depth, then troubleshoot coating defects

Record

Stores up to 1000 PCM and Location measurements in Flash memory

Upload

Saved receiver data is uploaded in realtime to a PDA or PC via Bluetooth® for GPS synchronization

Review

All uploaded data displayed in graphical format for immediate or post survey analysis

Fast locate and effective measurement of pipeline coating defects

The location and measurement of pipeline corrosion using electromagnetic detection devices (Locators) are increasingly being linked with GIS systems and GPS information, to provide an accurate record of the condition of pipes and the position and time co-ordinates for post mapping analysis – this requirement is the basis of the PCM⁺.

As part of Radiodetection's commitment to protecting the environment the PCM⁺ enables the pipeline technician to carry out preventative maintenance on pipelines giving them a longer life and identifying corrosion at an earlier stage.

The PCM⁺ System consists of a portable transmitter and a hand held receiver. The transmitter connected at the CPS station or test post, applies a special signal to the pipeline. The receiver locates this unique signal at distances up to 30km (19 miles) identifying the position and depth of the pipe.

Once the pipe has been located the technician can map the leakage currents along the pipe in magnitude and direction allowing coating defects to be quickly identified.

Once the segment of pipeline where the defect lies has been identified, by using an A-frame, the defect position and depth can be further pinpointed to within 1 meter (3 feet).

The PCM⁺ using its powerful feature set including Automatic Signal Attenuation (ASA), accurately and easily locates and maps the pipeline even in areas where there is contact with other metallic structures, electrical interference, or congestion, providing simultaneous measurement of PCM current (ACCA) and Voltage Gradient (ACVG).

This eliminates the need for the operator to perform 'current spans' and manual calculations to determine CP currents along a pipeline that would usually require a direct connection.

Each time the PCM⁺ maps in any of the modes, as well as storing and displaying the information on the receiver, all the data gathered can be sent via Bluetooth® to either a PC or an optional PDA (with GPS), and displayed in a number of graphical formats for fast analysis.

The PCM⁺ and its accessory equipment provide any pipeline technician with the latest in accurate, fast and reliable pipeline current mapping tools.

PCM⁺ Receiver features

- Precision locator and PCM in one unit
- Unique features to improve data integrity
 - ASA Maintains performance in strong magnetic fields such as Power sub-stations
 - Depth of utility in Power Mode
- Current mapping
 - Quicker 3 second ACCA mapping
 - Up to 1000 data records
- Real time upload of mapped data via Bluetooth® to PDA or PC
 - Integrates GPS data
- Downloadable analysis software for PDA and PC
 - Integrates with standard GIS software
 - 5 key graph mapping modes including locate depth, current and phase
- Low power for full day survey
- Backlight / Real sound

PCM-Tx Transmitter features

- High power 150 Watt
- 30km (19 miles) range @ 4Hz

PCM+ Receiver

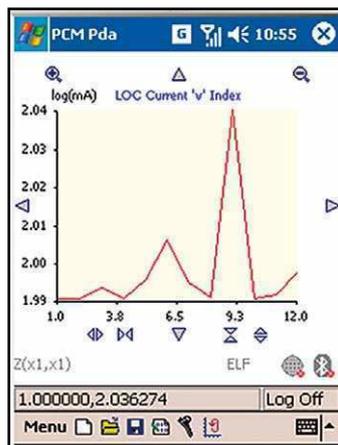
The hand held receiver unit is used to locate the pipeline, even in heavily congested areas such as conduits, and then provides the operator with a measurement of depth current strength and signal direction applied by the transmitter to quickly pinpoint corrosion related problems.

The receiver makes the required calculations and instantaneously displays the results. This provides the operator with an improved method that accurately troubleshoots the CP system by pinpointing metallic contacts and locating areas of coating defects.



Real time mapping analysis (PDA or PC) using Radiodetection GML Survey software

To provide faster analysis of mapped information, the PCM+ connects wirelessly with a PDA or PC, uploading all the information immediately and linking it with GPS into a database using the Radiodetection Survey software. The database is updated after each mapping and can be seen immediately on the PC or PDA in either a database or a choice of graphical formats. The information can then be imported into most of the standard post processing software programs available.



The Radiodetection Survey software incorporates GPS information and shows the mapped data in a variety of formats as well as allowing comparisons between new and old mapping surveys.

For more details go to www.radiodetection.com

PCM-Tx Transmitter

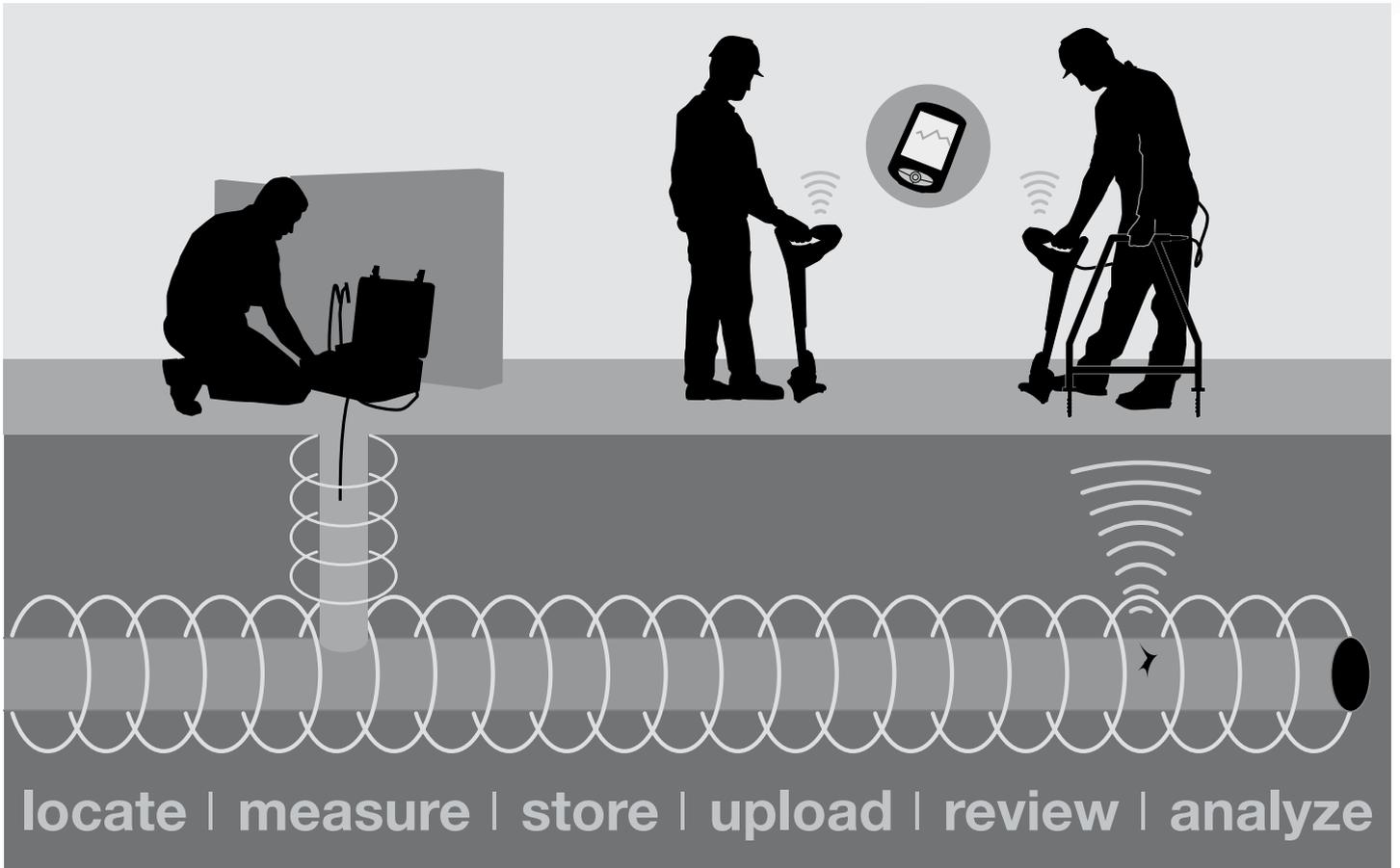
The PCM⁺ system's specialized constant current high-power transmitter allows for long range signal detection of up to 30km (19 miles). Significantly fewer pipeline connection points are needed thereby reducing the time required to evaluate a section of pipeline.

The transmitter has three operating modes that enable both distribution and transmission pipeline systems to be effectively mapped.

Connecting the PCM⁺ is straightforward, and the transmitter's current reading DISPLAY and power indicating LED's help the operator to choose the best settings for the specific pipeline application.

A-Frame

The A-Frame is used with the PCM⁺ receiver to precisely pinpoint coating defects and isolation faults. The PCM⁺ receiver display indicates direction to the fault, using the CD arrows, and this makes fault position easy to locate. The PCM⁺ also displays the dB microvolts reading across the A-Frame spikes, and this allows a comparison to be made between different faults to determine the most severe. This numeric value is stored in the PCM's datalogging facility, and uploaded via Bluetooth[®] to a PDA or PC.



Pipeline Current Mapper

Fast location with accurate mapping, minimizes unnecessary excavations

Data upload

Bluetooth® link to PDA/PC for real time logging with GPS into Radiodetection GML Application

Interference rejection

DSP based algorithms enable filtering of false signals even in areas where there is contact with other metallic structures

High power Tx 30 km (19 miles)

Fewer connection points speeds up survey time over long distances

Technical Specifications

PCM+ Receiver

MAPPING MODES

| | | |
|------|--|----------------|
| ELF | Extra Low Frequency | 4Hz+128Hz/98Hz |
| LF | Low Frequency | 640Hz/512Hz |
| 8kHz | Standard locate frequency from battery powered Radiodetection transmitters | |

NB: Current Direction (FF) arrows are displayed only with the PCM measurement, and not in locate modes, unless the PCM is supplied with CD frequency.

LOCATE MODES

| | |
|------|--|
| ⚡ | Detects 50Hz/60Hz from power cables |
| CPS | Detects 100Hz/120Hz ripple from CP transformer rectifier |
| 8kHz | Standard locate frequency from battery powered Radiodetection transmitters |

- **Dynamic Range:** 140dB
- **Selectivity:** 120dB/Hz
- **Range from Tx:** 30km (19 miles)
- **Depth accuracy:** ± 5% to 3 meters (10ft); ± 7.5% to 5 meters (16.5ft) – in good conditions
- **Current accuracy:** ± 5%
- **Locate accuracy:** ±5% of depth
- **Weight:** 3.3kg (7.2lb)
- **Batteries:** 2 x LR20 D cells (Alkaline or NiMH)
- **Environmental:** IP54
- **Approvals:** CE, Bluetooth® compliant

Peak/Null

- **Used to pinpoint target line**
- **Selectable peak & null response**
- **Gain control:** Via keypad auto & manual

PCM-Tx Transmitter

Frequency Select

Current Direction (CD) provides a positive identification of the 'out-going' current and provides a method of locating pipe faults using the A-Frame. The three position switch selects the following mapping frequencies:

| | |
|------|--|
| ELF | Maximum range for Current Logging 4Hz + 98Hz/128Hz |
| ELCD | Standard Current Logging with CD (4Hz + 8Hz) CD + 98/128Hz |
| LFCD | Improved depth, position and current logging accuracy with respect to ELCD. Shorter range operation (4Hz + 8Hz) CD + 512Hz/640Hz |

*The 4Hz mapping frequency is always present and the current is shown on the LCD. The operator has a choice of selecting the locate frequency and current direction indication if required for identification in congested areas or for fault finding.

- **Case construction:** High impact engineered plastics
- **Weight:** 15.2kg (34lb)
- **Size:** 47 x 37 x 19cm (18.5 x 14.5 x 7.5 inch)
- **Environmental:** NEMA 3R and IP55 – lid open; NEMA 6 and IP67 – lid closed
- **Approvals:** CE

Current Select

The six position (current select) rotary switch selects the following 4Hz current settings:

100mA, 300mA, 600mA, 1A, 2A, 3A. When the PCM Transmitter is in operation, the selected current will remain at a constant level, unless the input power supply limit is reached.

PCM Attachment (A-frame)

A-frame for detection of sheath faults on buried pipes and cables (includes PCM+ connection cable).

- **Weight:** 1.55kg (3.4lb)
- **Size:** 8.5 x 59 x 4.5cm (33 x 39.3 x 1.7 inch)

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