

RADIODETECTION®

# PCM<sup>x</sup> locator specification

Pipeline Current Mapper



# PCMx Pipeline Current Mapper Specification

## 1. Product Summary

1.1 Product Overview:	PCMx is a multi-purpose Pipeline Current Mapper and precision locator. With the magnetometer foot attached the PCMx can be used to conduct pipeline coating surveys including ACCA, ACVG and depth of cover. With the foot removed the PCMx is a precision locator with the functionality of an RD8100PDLG
1.2 Product Descriptions:	Pipeline Current Mapper Multi-purpose Pipeline Current Mapper and Precision Locator Cable and Pipe Precision Locator
1.3 Intended Use:	Detecting and pinpointing coating faults on buried pipes and cables Creating survey records of buried pipes and cable locations Locating the position / path, and centerline depth of buried pipes and cables
1.4 Standard Equipment:	Locator including removable magnetometer foot Li-Ion rechargeable battery pack and mains charger Quick Start User Guide Mini USB 2.0 compliant data cable

## 2. Performance

2.1 Sensitivity:	2mA at 1 meter (4Hz magnetometer) 5 $\mu$ A at 1 meter (33kHz locate)
2.2 Dynamic range	140dB RMS/VHz
2.3 Selectivity	120dB
2.4 Depth measurement precision: <sup>1</sup>	$\pm$ 3% @ 2 meters and $\pm$ 5% @ 3 meters
2.5 Locate accuracy:	$\pm$ 5% of depth
2.6 4Hz current accuracy:	$\pm$ 5% @ 1 meter depth with 1 Amp
2.7 Active locate filter bandwidth:	$\pm$ 3Hz, 0 < 1kHz $\pm$ 10Hz, $\geq$ 1kHz
2.8 Start-up time:	<1 second
2.9 Maximum depth readout <sup>2</sup>	Metric: Cable / Pipe: 30m Sonde: 20m Imperial: Cable / Pipe: 98' Sonde: 65'

## 3. Locate Functions

3.1 Active Locate Modes:	Five: <ul style="list-style-type: none"><li>• Peak</li><li>• Peak+™ (choice of combined Peak &amp; Guidance or Peak &amp; Null)</li><li>• Guidance</li><li>• Broad Peak™</li><li>• Null</li></ul>
3.2 Gain control:	Guidance Mode: Automatic Other modes: Manual gain using "+" or "-" with one touch to return to center (50% of Full Scale)
3.3 Custom locate frequencies:	Up to 5 additional frequencies in the range 50Hz to 1kHz at 1Hz resolution in RD8100 mode

3.4 4Hz survey mapping frequencies:	For conducting ACVG and ACCA surveys		
	Mode	PCM <sub>x</sub>	RD8100 PDLG
	ELF (4Hz + 98Hz/128Hz)	☒	
	ELCD (4Hz + 8Hz + 98Hz/128Hz)	☒	
	LFCD (4Hz + 8Hz + 512/640Hz )	☒	
	8kHz	◆	
◆ Requires a 4Hz signal from a PCM transmitter and an 8kHz boost locate signal from a second transmitter			
3.5 Active locate frequencies:	For locating pipes and cables		
	Mode	PCM <sub>x</sub>	RD8100 PDLG
	Custom frequencies		5
	ELF (98/128Hz)	ELF/ELCD	☒
	512Hz	LFCD	☒
	570Hz		☒
	577Hz		☒
	640Hz	LFCD	☒
	760Hz		☒
	870Hz		☒
	920Hz		☒
	940Hz		☒
	8kHz (8192 Hz)	☒	☒
	9.8kHz (9820 Hz)		☒
	33kHz (32768Hz)		☒
	65kHz (65536Hz)		☒
	83kHz (83077Hz)		☒
	131kHz (131072Hz)		☒
200kHz (200000Hz)		☒	
3.6 Sonde Frequencies:	Use to trace or locate non-conductive utilities		
	Mode	PCM <sub>x</sub>	RD8100 PDLG
	512Hz		☒
	640Hz		☒
	8kHz (8192Hz)		☒
	33kHz (32768Hz)		☒
3.7 Fault Find:	Use to locate and pinpoint coating faults on pipes and cables		
	Mode	PCM <sub>x</sub>	RD8100 PDLG
	ACVG	☒	
	8kHz Fault Find		☒
	CD Fault Find		☒
3.8 Current Direction™ (CD) Signal Pairs:	Identify target pipe or cable amongst a number of parallel utilities		
	Mode	PCM <sub>x</sub>	RD8100 PDLG
	4Hz / 8Hz	☒	
	256Hz / 512Hz		☒
	285Hz / 570Hz		☒
	320Hz / 640Hz		☒
	380Hz / 760Hz		☒
	460Hz / 920Hz		☒
	4096Hz / 8192Hz 4kCD		☒

<p>3.9 Passive Locate Modes:</p>	<p>Use passive signals to locate when an active signal connection is not possible</p> <table border="1" data-bbox="475 153 1495 380"> <thead> <tr> <th>Mode</th> <th>PCM<sub>x</sub></th> <th>RD8100 PDLG</th> </tr> </thead> <tbody> <tr> <td>Power</td> <td style="text-align: center;">☒</td> <td style="text-align: center;">☒</td> </tr> <tr> <td>Radio</td> <td></td> <td style="text-align: center;">☒</td> </tr> <tr> <td>CPS (Cathodic Protection System)</td> <td style="text-align: center;">☒</td> <td style="text-align: center;">☒</td> </tr> <tr> <td>CATV (Cable TV)</td> <td></td> <td style="text-align: center;">☒</td> </tr> <tr> <td>Passive Avoidance (Combined Power + Radio)</td> <td></td> <td style="text-align: center;">☒</td> </tr> </tbody> </table>	Mode	PCM <sub>x</sub>	RD8100 PDLG	Power	☒	☒	Radio		☒	CPS (Cathodic Protection System)	☒	☒	CATV (Cable TV)		☒	Passive Avoidance (Combined Power + Radio)		☒
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<p>3.10 Power Filters™ function</p>	<p>RD8100 PDLG mode only: Switch out of sensitive Power Mode to locate on any of 5 individual mains harmonic frequencies:</p> <table border="1" data-bbox="475 470 1495 699"> <thead> <tr> <th>Harmonic</th> <th>50 Hz regions</th> <th>60 Hz regions</th> </tr> </thead> <tbody> <tr> <td>Primary</td> <td>50 Hz</td> <td>60 Hz</td> </tr> <tr> <td>3rd</td> <td>150 Hz</td> <td>180 Hz</td> </tr> <tr> <td>5th</td> <td>250 Hz</td> <td>300 Hz</td> </tr> <tr> <td>7th</td> <td>350 Hz</td> <td>420 Hz</td> </tr> <tr> <td>9th</td> <td>450 Hz</td> <td>540 Hz</td> </tr> </tbody> </table>	Harmonic	50 Hz regions	60 Hz regions	Primary	50 Hz	60 Hz	3rd	150 Hz	180 Hz	5th	250 Hz	300 Hz	7th	350 Hz	420 Hz	9th	450 Hz	540 Hz
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<p>3.11 Information displayed:</p>	<ul style="list-style-type: none"> <li>• Signal strength - moving bar graph and numeric value</li> <li>• Mode indication (Peak, Null, Guidance, Broad Peak, Peak+ with option of Guidance arrows or Null arrows)</li> <li>• Line or Sonde locate type</li> <li>• Proportional left/right indication</li> <li>• Compass: full 360° line direction indicator</li> <li>• Accessories in use indication</li> <li>• Accessory specific custom screen</li> <li>• Depth and current readout (Line location)</li> <li>• Depth readout (Sonde location)</li> <li>• Gain level (in dB)</li> <li>• Frequency selected</li> <li>• Battery condition</li> <li>• Speaker volume</li> <li>• Operating frequency</li> <li>• Bluetooth® wireless technology status</li> <li>• GPS satellites in view</li> <li>• GPS status</li> <li>• Configuration menu and submenus</li> <li>• Software version</li> <li>• Last calibration date</li> <li>• Survey measurement counter</li> <li>• Current Direction mode indicator</li> <li>• Current Direction arrows</li> <li>• A-Frame indicator</li> <li>• Fault find direction arrows</li> <li>• Fault find dBmV</li> <li>• Transmitter communication status (Tx-5B, Tx-10B)</li> <li>• Transmitter standby status (Tx-5B, Tx-10B)</li> <li>• StrikeAlert™ warning</li> <li>• Overload warning</li> </ul>																		
<p>3.12 Audio output tones:</p>	<p><b>Power / Passive Avoidance / Radio modes:</b> Real Sound™ derived from detected electromagnetic signal  <b>Peak / Peak+ modes and CPS / CATV modes:</b> Synthesized audio tone proportional to signal strength  <b>Guidance mode:</b> Continuous tone when locator is to the left of target, intermittent tone when to the right of target  <b>Null mode:</b> Synthesized Audio tone proportional to signal strength. Low pitch to left of target, high pitch to right of target  <b>StrikeAlert</b> audio warning  Audio feedback for menu navigation</p>																		
<p>3.13 Accessory locate functions: RD8100 mode</p>	<p><b>Locator clamps:</b> Used to identify individual target cable(s) in a bundle or cabinet using signal strength read-out  <b>Stethoscopes:</b> Used to identify individual target cable(s) in a bundle or confined space such as a cabinet using signal strength read-out  <b>CD/CM clamp:</b> Used to measure locate current and to confirm target cable using Current Direction</p>																		

## 4. Locate Function Enhancements

4.1 StrikeAlert RD8100 mode	Audio and visual warning when a cable or pipe less than 30cm deep is detected. Operates in Active and Passive locating modes
4.2 Dynamic Overload Protection™:	40dB, automatic <ul style="list-style-type: none"> <li>Automatically manages the system gain to compensate for strong signals e.g. from mains power or substations, to enable accurate locating</li> </ul>
4.3 Current Direction™ (CD):	<ul style="list-style-type: none"> <li>Measures the direction of current flowing in buried pipes or cables to ensure that an operator is able to identify and follow the target utility</li> <li>Provides operator with arrows indicating the direction of current flowing in the located pipe or cable to confirm that they are following the target utility</li> </ul>
4.4 iLOC™: RD8100 mode (with Tx-5B and Tx-10B)	Metric: Remote transmitter control from up to 450m away <sup>3</sup> Imperial: Remote transmitter control from up to 1400' away <sup>3</sup> Control transmitter frequency, power level and SideStep
4.5 SideStep™: RD8100 mode (with Tx-1, Tx-5 and Tx-10)	Enables locating where other signals are interfering, and without compromising the optimum locate frequency Shifts the locate and transmitter frequency by several Hz, out of the bandwidth of other locate signals that may be interfering with the locate
4.6 Simultaneous depth and current readout:	Both utility depth and locate signal current are displayed simultaneously, giving the operator more information to help them to follow the target utility
4.7 Survey Measurements:	Store up to 10,000 survey points within the locator including data from internal GPS if used. Export data individually or as a batch over Bluetooth
4.8 Fault Find:	Use an accessory A-Frame to detect and pinpoint coating and insulation faults <b>PCMx mode:</b> Apply an ELCD or LFCD signal using a Tx-25 or Tx150 transmitter <b>RD8100 mode:</b> Apply a Fault Find signal with a Tx-5 and Tx-10 transmitter <b>Fault find accuracy:</b> Metric: 100mm Imperial: 4"
4.9 4kHz locate frequency and CD: RD8100 mode (with Tx-1, Tx-5 and Tx-10)	Designed for tracing higher impedance lines such as twisted pair telecoms or street lighting over distance Combine with Current Direction to help trace the target utility through dense or complex infrastructure
4.10 Peak+ mode:	Use the accurate Peak bar graph, and add either proportional Guidance arrows for faster locating, or Null arrows to check for the presence of distortion
4.11 Integrated GPS option:	Faster surveying using integrated GPS – no need for a separate hand-held device

## 5. Configurability

5.1 Option selection:	All options can be enabled or disabled on the locator or using the PCM Manager for Windows PC software
5.2 Languages supported:	Fourteen: English, French, German, Dutch, Polish, Czech, Slovakian, Spanish, Portuguese, Swedish, Italian, Turkish, Russian, Hungarian
5.3 Mains power network options:	50 Hz or 60 Hz
5.4 Mode selection:	All locate modes with the exception of Peak+ Mode can be individually enabled or disabled
5.5 Active frequency selection:	All active frequencies available can be individually enabled or disabled
5.6 Passive mode selection	All passive modes can be individually enabled or disabled
5.7 StrikeAlert	Enable / disable
5.8 Peak+ arrow selection:	Guidance arrows or Null arrows Selected using the locator menu or with a long press of the antenna key
5.9 GNSS ('GPS') settings	Internal / Off / Reset
5.10 Bluetooth:	On / Off
5.11 Data export protocols supported	Choice of 2 ASCII formats. Optionally append positional data
5.12 Time / date setting	Correct or update locator real-time clock using the RD Manager PC software or GNSS signals
5.13 CD Reset	Reset CD phase analysis with a single long press of the frequency key

## 6. Connectivity

6.1 Wireless connections	Bluetooth class 1, Bluetooth Low Energy (BLE)
6.2 Log transfer to mobile app	Transfer of records to mobile app.
6.3 iLOC™ (Tx-10B) remote transmitter control range <sup>3</sup> :	Metric: Up to 450m Imperial: Up to 1400'
6.4 iLOC (Tx-10B) transmitter control functions:	Set transmitter frequency Set transmitter power output level Transmitter standby SideStep
6.5 Wired connections	<p><b>USB Data Port:</b> USB 3.1 Type-C socket – Used as a USB 2.0 slave port connection for data transfer and configuration to a PC. A male USB C to male USB A lead included as standard.</p> <ul style="list-style-type: none"> <li>Rated voltage 48V ac/dc.</li> <li>Rated current per contact 1.25A for power and 0.25A for data signals.</li> <li>Dielectric Strength 100V ac.</li> <li>Insulation resistance &gt;100Mohm.</li> </ul> <p><b>Accessory Port:</b> Neutrik (NeutriCON) RP8 way female – Bespoke connection for Radiodetection locator accessories only.</p> <ul style="list-style-type: none"> <li>Power supply for accessory 6.6V dc (+/- 3.3V dc).</li> <li>Rated voltage 50V ac.</li> <li>Rated current per contact 7.5A (solder), 5A (crimp).</li> <li>Dielectric Strength 1500V dc.</li> <li>Insulation resistance &gt;500Mohm.</li> </ul> <p><b>3.5mm Stereo jack:</b> Connect wired headphones.</p>

## 7. Data capabilities and GNSS ('GPS')

7.1 On-board GNSS ('GPS') module option:	<p>GNSS data automatically added to Survey Measurements every time locate data is saved, and every second on usage-logging data</p> <p>Accurate to 3m CEP with SBAS enhancement available Links to GPS, GLONASS and Galileo networks</p> <p>Positional data enhancement systems (where available)</p> <ul style="list-style-type: none"> <li>WAAS – North America</li> <li>EGNOS – Europe</li> <li>MSAS – Japan</li> <li>SBAS (satellite based augmentation system) SBAS can be enabled or disabled in locator menu</li> </ul>		
7.2 Link to external GNSS ('GPS')	<p>Over Bluetooth</p> <ul style="list-style-type: none"> <li>Connect an external GNSS enabled device to PCM Manager for mobile devices to combine external GPS data with survey measurements</li> </ul>		
7.3 Survey measurement capacity:	Up to 10,000 data records in Survey mode		
7.4 On-board survey measurement data captured:	<p>Log Record</p> <p>Serial Number</p> <p>Schema</p> <p>Log Reference</p> <p>Date</p> <p>Time</p> <p>Updated</p> <p>Master Mode</p> <p>Accessory Enabled</p> <p>Operating Mode</p> <p>Overload Flag</p> <p>Volume</p> <p>Battery</p> <p>Sonde/Line</p> <p>Accessory Type</p> <p>Antenna Mode</p> <p>Left/Right Arrows</p> <p>Compass Angle</p>	<p>Protocol ID</p> <p>Locate Frequency</p> <p>Log ID</p> <p>Signal Strength</p> <p>Depth</p> <p>Current</p> <p>CD Phase</p> <p>FF or CD Arrows Fault Find</p> <p>Phase</p> <p>Fault Find Signal</p> <p>Strike Alert Sounding</p> <p>Gain</p> <p>Temperature</p> <p>DOP Status</p> <p>Audio Indication</p> <p>GPS Mode</p> <p>CD Reset</p> <p>Key Stroke</p>	<p>Menu Active</p> <p>Bluetooth Enabled</p> <p>SideStep Active</p> <p>Language</p> <p>Depth Units</p> <p>Power Setting</p> <p>Compass Enabled</p> <p>Horizontal Dilution</p> <p>Altitude</p> <p>GPS Fix</p> <p>Number of Satellites</p> <p>Latitude</p> <p>Longitude</p> <p>ACVG Magnitude</p> <p>PCMx Current 4Hz</p> <p>PCMx Phase 4Hz</p>
7.5 Survey measurement export options	<p>Bluetooth – 'live,' per measurement export and batch export</p> <p>USB – selectable/batch export</p>		

7.6 Bluetooth survey measurement data protocol options:	ASCII (choice of 2 formats) Optional GPS data appended		
7.7 Usage-logging:	RD8100 mode		
7.8 Usage-logging memory:	4 GB		
7.9 Usage-logging capacity:	Over 500 days, measured at 8 hours use per day		
7.10 Usage-logging capture rate:	1/ second		
7.11 Usage parameters logged	Serial number Log reference and id Operating mode Locate frequency Sonde/line Signal strength Gain setting Depth Current Accessory in use Antenna mode Arrows readout Compass angle CD phase Overload status Dynamic Overload Protection Status	Keys pressed Audio status Volume Menu in use Battery status User warnings status StrikeAlert status Bluetooth status Fault find arrow Sidestep status Language Depth units Power setting Compass setting CD reset status <b>Logging Units:</b> Date and time	<b>With a GNSS fix:</b> Latitude Longitude Altitude GNSS mode GNSS date and time Horizontal Dilution Geoid DGPS Time and ID Geoid Units GNSS fix Number of satellites Altitude units Time reference

## 8. Power options

8.1 Rechargeable battery (standard):	Custom Lithium-Ion (Li-Ion) battery pack		
8.2 Additional battery options:	2 × D-Cell (MN1300 / LR20) alkaline or Nickel Metal Hydride (NiMH) batteries		
8.3 Battery run-time (continuous) <sup>4</sup> :	Li-Ion pack:	35 hours	
	2 × Alkaline D-Cells	13 hours	
8.4 Battery chemistry identification	Lithium-Ion pack:	Automatic sensing	
	NiMH / Alkaline:	Operator set	
8.5 Charging options (Li-Ion pack)	Mains charger:	100-250 Volts AC, 50/60 Hz	
	Automotive charger:	12-24V DC	
8.6 Charging time (Li-Ion pack)	3 hours to 80% from empty with maintenance trickle charging thereafter		

## 9. Physical Characteristics

9.1 Design:	Ergonomic, balanced and lightweight design for comfortable use during extended surveys		
9.2 Construction:	Injection Molded ABS Plastic		
9.3 Weight:	<b>With Lithium-Ion battery pack fitted:</b> Metric: 2.2kg Imperial: 4.8lb		
9.4 Ingress Protection rating:	IP65: Protected against dust ingress and jets of water <sup>5</sup> applied from any direction		
9.5 Display type:	High contrast custom made monochrome LCD		
9.6 Audio options:	Built-in waterproofed speaker 3.5mm headphone socket		
9.7 Operating temperature <sup>6</sup> :	Metric:	-20°C to 50°C	
	Imperial:	-4°F to 122°F	
9.8 Storage temperature:	Metric:	-40°C to 70°C	
	Imperial:	-40°F to 158°F	

9.9 Unit dimensions:	Magnetometer foot attached: Metric: 745mm x 286mm x 134mm Imperial: 29.3" x 11.3" x 5.3" Magnetometer foot removed: Metric: 648mm x 286mm x 125mm Imperial: 25.5" x 11.3" x 4.9"
9.10 Shipping dimensions:	Metric: 700mm x 330mm x 260mm Imperial: 27.6" x 13" x 10.2"
9.11 Shipping weight (including bag and battery):	Metric: 5.0kg Imperial: 11.1lb

## 10. PCM Manager™ Supporting PC Software

10.1 Operating System Compatibility:	Microsoft® Windows® 7, 8, 8.1, 10, 32 and 64-bit versions
10.2 Functions:	<ul style="list-style-type: none"> <li>• Locator configuration</li> <li>• eCert™ remote calibration certification</li> <li>• Factory calibration certificate retrieval</li> <li>• Usage-logging data collation and export</li> <li>• Survey measurements data collation and export</li> <li>• User account management</li> <li>• CALSafe™ maintenance schedule enforcement</li> <li>• Product registration for extended warranty</li> <li>• Locator software update</li> </ul>
10.3 Data export formats:	.kml for Google® Earth .csv/.xls/.xlsx for database and spreadsheet applications
10.4 KML data export options:	Filter usage-logging and survey measurement points on Google® Earth Select data to be tagged. Customize icon type /color, label type /color, line type /color

## 11. PCM Manager™ Supporting Mobile Application

11.1 Operating System Compatibility:	Google Android 5.0 and higher
11.2 Functions:	Live survey graphical view of: ACCA Current mA ACCA Logarithmic Current dBmA ACVG Voltage (surface voltage profile measured with A-frame) Loss millibels/meter or feet Depth to Pipe Centre (m or ft) Depth of Cover (to top of pipe, m or ft) Live Mapping of survey Data logging sounds (device announces with a sound when a record is received from the PCMx) Walk Forward (during a live survey to the next survey position) Walk Back (during a live survey to the last survey position) Walk To (any selected point in a saved survey) Survey Naming (up to 100 characters) Enter Pipe diameter (m or ft) Add Comments (add up to 100 characters to any survey point during live survey) Data Share (selected history points or multiple surveys by email or other available sharing services) Date Delete (delete individual points or completed surveys) Third Party Precision GPS (the App logs external precision GPS coordinates whenever a record is received from the PCMx) Unique record numbering invariant across cross-platform use

11.3 Survey data captured on mobile app: (Augmented log)	Start Symbol Format Version Index PCMx Operating mode Locator Frequency Alpha display LocData Depth to pipe center dB $\mu$ V Locate current A 4 Hz Voltage phase Signal strength Gain (dB) MF Foot attached 4Hz C-V Phase 4Hz Current (A) Current 4-8Hz Phase RTC day RTC month	RTC year UTC RTC Updated flag Int GPS mode Int GPS Latitude Int GPS Longitude Int GPS Fix Int GPS no. of satellites Int GPS dilution Int GPS altitude Ext GPS Latitude Ext GPS Longitude Ext GPS Fix Ext GPS no. of satellites Ext GPS dilution Ext GPS altitude Pipe Diameter Survey name (0-100) COMMENT
11.4 Data export formats:	.csv for database and spreadsheet applications	
11.5 KML data export options:	.kml for Google® Maps	

## 12. Warranty and Maintenance

12.1 Manufacturer's warranty duration:	3 years standard, on registration
12.2 Recommended calibration and maintenance schedule:	Annual, or at the beginning / end of a lease period if earlier
12.3 eCert remote calibration:	<ul style="list-style-type: none"> <li>Remote calibration certification using an internet connection to Radiodetection</li> <li>Recommended schedule: annual, or at the beginning / end of a lease period</li> </ul>
12.4 CALSafe™:	<ul style="list-style-type: none"> <li>Can be enabled to prevent the locator operating when beyond a defined calibration / maintenance schedule</li> <li>Disabled by default</li> <li>30-day countdown to calibration due date</li> </ul>
12.5 Enhanced Self-Test:	On-unit Applies test signals to locate circuitry to confirm correct operation, as well as the typical tests for screen and DSP functions. Recommended schedule: weekly, or before each use.
12.6 Storage recommendation:	Store in a clean and dry environment. Ensure all terminals and connection sockets are clean, free of debris and corrosion and are undamaged
12.7 Cleaning:	Clean with a soft, moistened cloth. Do not use: <ul style="list-style-type: none"> <li>Abrasive materials or chemicals</li> <li>High pressure jets of water</li> </ul> If using this equipment in foul water systems or other areas where biological hazards may be present, use an appropriate disinfectant.

## 13. Warranty and Maintenance

13.1 Standards	<p><b>Safety:</b> EN 61010-1:2010</p> <p><b>EMC:</b> EN 61326-1:2013 EN 300 330-2 (V1.5.1) EN 300 440-2 (V1.4.1) EN 301 489-3 (V1.6.1) EN 301 489-17 (V2.2.1)</p> <p><b>Environmental:</b> EN 60529 1992 A2 2013 EN 60068-2-64:2008 Test Fh ESTI EN 300 019-2-2:1999 (per table 6) EN 60068-2-27:2009 (Test Ea) ESTI EN 300 019-2-2:1999 (per table 6)</p>
13.2 European directives	<p>Radio Equipment 2014/53/Eu Low Voltage Directive: 2014/35/EU EMC Directive: 2014/30/EU ROHS Directive: 2011/65/EU Declaration of conformity is available from <a href="http://www.radiodetection.com">www.radiodetection.com</a></p>
13.3 Radio	FCC, IC
13.4 Environmental	<p>WEEE compliant ROHS compliant Altitude: up to 5000m Outdoor use Wet location</p>
13.5 Manufacturing	ISO 9001:2015

## 14. Compatible Accessories

Accessory	Part description	Part number
14.1 Lithium-Ion battery packs	Li-Ion rechargeable battery mains kit (Includes mains charger) Li-Ion rechargeable battery pack (no charger)	10/RX-MBATPACK-V2-xx 10/RX-BATPACK-V2
14.2 Lithium-Ion battery chargers	Li-Ion automotive charger Li-Ion mains charger	10/RX-ACHARGER-V2-xx 10/RX-MCHARGER-V2-xx
14.3 Alkaline battery trays	2 x D Cell battery tray (MN1300 / LR20)	10/RX-2DCELL-TRAY
14.4 Transportation and storage accessories	Soft Carry Bag Wheeled Flight / Hard Case	10/PCMXBAG 10/PCMXHCASE
14.5 Locator signal clamps – For identification and location of utilities	<p>Metric: 50mm Locator Clamp Imperial: 2" Locator Clamp Metric: 100mm Locator Clamp Imperial: 4" Locator Clamp Metric: 130mm Locator Clamp Imperial: 5" Locator Clamp CD and Current Measurement Clamp</p>	<p>10/RX-CLAMP-50 10/RX-CLAMP-2 10/RX-CLAMP-100 10/RX-CLAMP-4 10/RX-CLAMP-130 10/RX-CLAMP-5 10/RX-CD-CLAMP</p>
14.6 Signal stethoscopes – To locate and identify individual utilities e.g. within walls, congested areas or when cables/utilities are in close proximity to each other	<p>High Gain Stethoscope Large Stethoscope Small Stethoscope CD Stethoscope</p>	<p>10/RX-STETHOSCOPE-HG 10/RX-STETHOSCOPE-L 10/RX-STETHOSCOPE-S 10/RX-CD-STETHOSCOPE</p>

14.7 Sondes <i>Battery powered signal transmitters for tracing or locating non-conductive utilities</i>		<b>Diameter</b>		<b>Range</b>		<b>Freq (Hz)</b>	
		<b>mm</b>	<b>In</b>	<b>m</b>	<b>Ft</b>		
	S6 Microsonde	6	¼	2	6½	33k	10/SONDE-MICRO-33
	S9 Minisonde	9	3/8	4	13	33k	10/SONDE-MINI-33
	S13 Super Small Sonde	13	½	2	6½	33k	10/SONDE-S13-33-USCS
	S18 Small Sonde	18	¾	4.5	14½	33k	10/SONDE-S18A-33
	Standard C-Sonde	39	1½	5	16½	33k	10/SONDE-STD-33
						8k	10/SONDE-STD-8
						512	10/SONDE-STD-512
Sewer Sonde	64	2½	8	26	33k	10/SONDE-SEWER-33	
Super Sonde	64	2½	15	50	33k	10/SONDE-SUPER-33	
Flexi Sonde	23	7/8	6	20	512	10/SONDE-BENDI-512	
14.8 Submersible antennas	512Hz Submersible DD Antenna 640Hz Submersible DD Antenna 8kHz Submersible DD Antenna					10/RX-SUBANTENNA-512 10/RX-SUBANTENNA-640 10/RX-SUBANTENNA-8K	
14.9 FlexiTrace™ <i>– Use with a transmitter to trace small diameter pipes</i>	FlexiTrace 50m / 165' FlexiTrace 80m / 260'					10/TRACE50-GB 10/TRACE80-GB	
14.10 Flexrods <i>– Fibreglass rod used for propelling Radiodetection sondes through pipes to trace the path and locate blockages</i>	<b>Length</b>		<b>Diameter</b>				
	<b>m</b>	<b>Ft</b>	<b>mm</b>	<b>In</b>			
	50	160	4.5	3/16	10/FLEXRODF50-4.5		
	80	260	4.5	3/16	10/FLEXRODF80-4.5		
	50	160	7	¼	10/FLEXRODF50-7		
	100	320	7	¼	10/FLEXRODF100-7		
	150	485	7	¼	10/FLEXRODF150-7		
	60	195	9	3/8	10/FLEXRODF60-9		
120	390	9	3/8	10/FLEXRODF120-9			
14.11 PCMX A-Frame – <i>Used for locating sheath faults on cables and coating defects on pipelines</i>	A-Frame (includes A-Frame Lead) A-Frame Bag					10/PCMX-AFRAME 10/PCMX-AFRAME-BAG	
14.12 Headphones	Recommended for use in noisy environments					10/RX-HEADPHONES	
14.13 Calibration Certificates	Locator Calibration Certificate, per unit (request with initial locator order)					97/RX-CALCERT	
	eCert™ Calibration Credit					10/RX-ECERT	

All specifications are measured in test conditions, at 21°C / 70°F, and fitted with Li-Ion battery unless otherwise noted.

<sup>1</sup> Based on volumetric testing at a known fixed depth. True depth accuracy depends on factors such as ground composition, utility characteristics and the locate frequency / signal strength employed. Always follow local safe digging guidelines.

<sup>2</sup> The PCMX will locate to greater depths in the right conditions, but depth accuracy will be compromised. Depth measurement will not be displayed beyond this depth.

<sup>3</sup> Tested with clear line-of-sight. Range is dependent on electrical environment and weather conditions. For optimum range, face the locator toward the transmitter and raise the transmitter 2' / 60cm from the ground.

<sup>4</sup> To provide repeatable measurements, run-time is measured with GPS and Bluetooth functions switched to 'off'

<sup>5</sup> Water projected by a nozzle at a pressure of 30kPa / 0.3 bar / 4.4 psi in accordance with BS EN 60529 1992 A2 2013

<sup>6</sup> At very low temperatures, battery life will be degraded, LCD screen performance may slow and measurement precision may be reduced

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