

RADIODETECTION® 

RD5100™ H₂O+

Multifunction precision
cable and pipe locator

User Guide

Bedienungsanleitung

Gebruikershandleiding

Guide d'utilisation

用户指南

PART NO. 90/UG113INT/02



SPX® 

Preface

About this guide

CAUTION: This guide provides basic operating instructions for the RD5100H₂O+ locator and transmitter. It also contains important safety information and guidelines and as such should be read in its entirety before attempting to operate the RD5100H₂O+ locator and transmitter.

This guide is intended as a quick reference guide only. For detailed instructions, including the use of accessories, please refer to the RD5100H₂O+ locator operation manual, which is available for download from www.radiodetection.com.

Certificates of conformity for the RD5100H₂O+ locator and transmitter can be found at www.radiodetection.com.

⚠ WARNING: Direct connection to live conductors is POTENTIALLY LETHAL. Direct connections to live conductors should be attempted by fully qualified personnel only using the relevant products that allow connections to energized lines.

⚠ WARNING: The transmitter is capable of outputting potentially lethal voltages. Take care when applying signals to any pipe or cable and be sure to notify other technicians who may be working on the line.

⚠ WARNING: Reduce audio level before using headphones to avoid damaging your hearing.

⚠ WARNING: This equipment is NOT approved for use in areas where hazardous gases may be present.

⚠ WARNING: When using the transmitter, switch off the unit and disconnect cables before removing the battery pack.

⚠ WARNING: The RD5100H₂O+ locator will detect most buried conductors but there are some objects that do not radiate any detectable signal. The RD5100H₂O+, or any other electromagnetic locator, cannot detect these objects so proceed with caution. There are also some live cables which the RD5100H₂O+ will not be able to detect in Power mode. The RD5100H₂O+ does not indicate whether a signal is from a single cable or from several in close proximity.

⚠ WARNING: Batteries can get hot after prolonged use at full output power. Take care while replacing or handling batteries.

3 Year Extended Warranty

The RD5100H₂O+ locator and transmitter are covered by a 1 year warranty as standard. Customers can extend their warranty period to a total of 3 years by registering their products within 3 months of purchase.

Visit <https://portal.radiodetection.com/> to create your company portal account, and use the Product page to register your locator or transmitter.

Information on how to create a company account can be obtained from: <https://support.radiodetection.com>

From time to time Radiodetection may release new software to improve the performance or add new functionality to its products. By registering, users will benefit from email alerts advising about new software and special offers related to its product range.

Users can opt-out at any time from receiving software and technical notifications, or just from receiving marketing material by contacting Radiodetection.

eCert and Self-Test

The RD5100H₂O+ locator is safety equipment which should be regularly checked to ensure its correct operation.

eCert¹ provides a thorough test of the RD5100H₂O+'s locating circuitry, and supplies a Radiodetection Calibration Certificate when a positive test result is obtained.

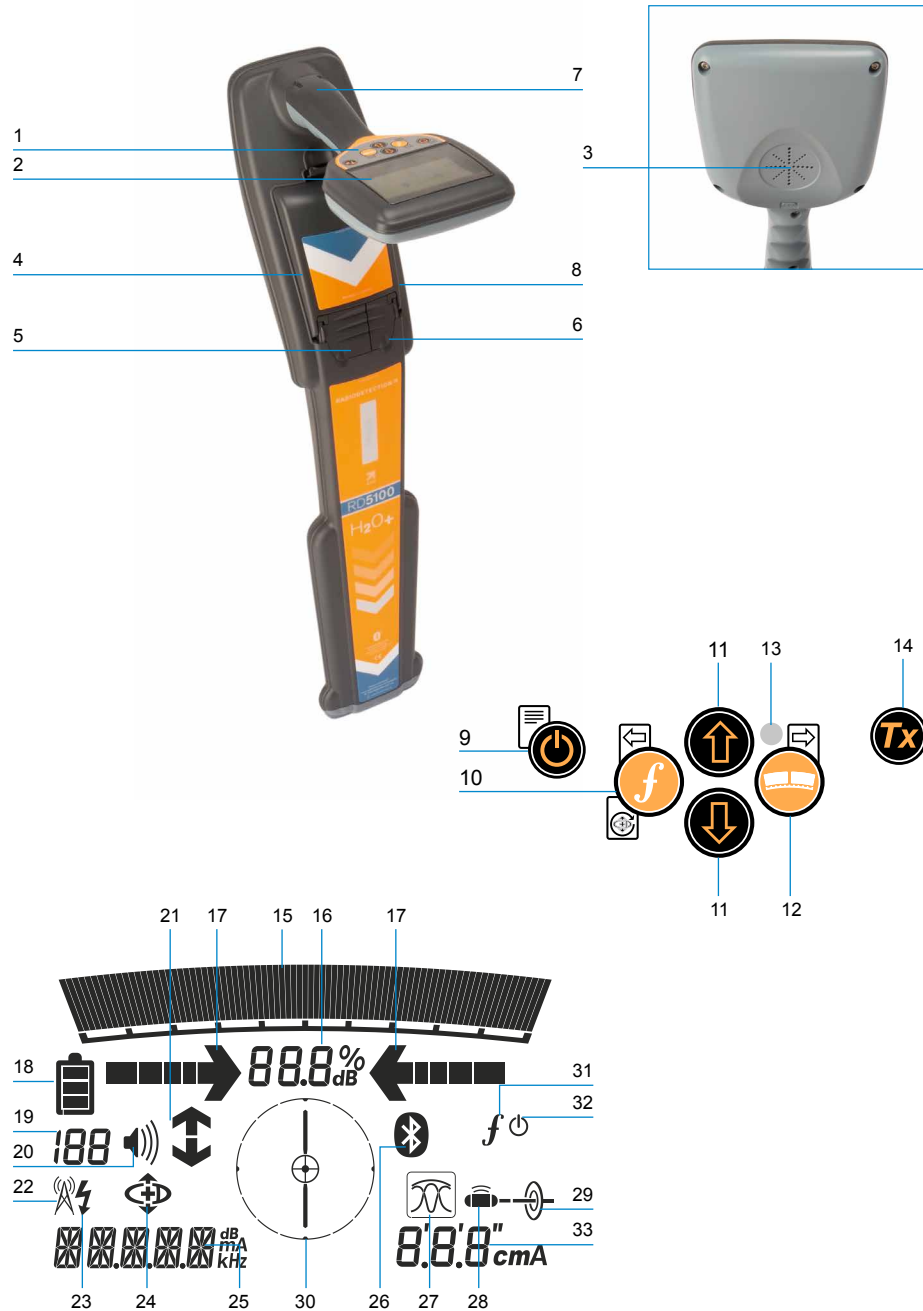
Refer to the RD5100 Manager¹ operation manual for further details. Additional purchase may be required.

RD5100H₂O+ locators incorporate an Enhanced Self-Test feature. In addition to the typical checks for display and power functions, the RD5100H₂O+ applies test signals to its locating circuitry during a Self-Test to check accuracy and performance.

We recommend that a self-test is run at least weekly, or before each use.

¹ Contact Radiodetection for eCert and RD5100 Manager availability.

RD5100H₂O₊ locator



Locator features

1. Keypad.
2. LCD with auto backlight.
3. Speaker.
4. Battery compartment. (Optional Lithium-Ion battery pack).
5. Accessory connector.
6. Headphone connector.
7. Bluetooth® module antenna.
8. Mini USB-B port (inside battery compartment).
22. Radio Mode icon.
23. Power Mode icon.
24. CD Mode icon.
25. Frequency / current / menu readout.
26. Bluetooth status icon: Flashing icon means pairing is in progress. Solid icon indicates a connection is active.
27. Antenna mode icon: Indicates antenna mode selection: Peak / Guidance.
28. Sonde icon: Indicates that a sonde signal source is selected.
29. Line icon: Indicates that a line signal source is selected.

Locator keypad

9. Power key.
10. Frequency key.
11. Up and down arrows.
12. Target Position Indicator key.
13. Backlight sensor.
14. Transmitter key.
28. Sonde icon: Indicates that a sonde signal source is selected.
29. Line icon: Indicates that a line signal source is selected.
30. Compass: Shows the orientation of the located cable or sonde relative to the locator.
31. Transmitter communication status – confirms successful iLOC™ communication.

Locator screen icons

15. Signal strength bargraph with peak marker.
16. Signal strength readout.
17. Null / Proportional Guidance arrows.
18. Battery level.
19. Sensitivity readout.
20. Volume level.
21. Current Direction arrows.
22. Radio Mode icon.
23. Power Mode icon.
24. CD Mode icon.
25. Frequency / current / menu readout.
26. Bluetooth status icon: Flashing icon means pairing is in progress. Solid icon indicates a connection is active.
27. Antenna mode icon: Indicates antenna mode selection: Peak / Guidance.
28. Sonde icon: Indicates that a sonde signal source is selected.
29. Line icon: Indicates that a line signal source is selected.
30. Compass: Shows the orientation of the located cable or sonde relative to the locator.
31. Transmitter communication status – confirms successful iLOC™ communication.
32. Transmitter standby indicator.
33. Depth readout.

RD5100H₂O₊Tx transmitter



Transmitter features

1. Keypad.
2. LCD.
3. Bluetooth module.
4. Removable accessory tray.
5. Accessories.
6. Side support tab.
7. D-cell battery tray.
8. Optional Lithium-Ion battery pack.
17. Clamp icon: Indicates when a signal clamp or other accessory is connected.
18. DC Power connected indicator.
19. Induction mode indicator.
20. A-Frame: Indicates when the transmitter is in Fault-Find mode.
21. CD Mode: Indicates that the transmitter is in Current Direction Mode.


Transmitter keypad

9. Power key.
10. Frequency key.
11. Up and down arrows.
12. Measure key.



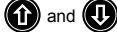


Transmitter screen icons

13. Battery level indicator.
14. Operation mode readout.
15. Standby icon.
16. Output level indicator.
17. Clamp icon: Indicates when a signal clamp or other accessory is connected.
18. DC Power connected indicator.
19. Induction mode indicator.
20. A-Frame: Indicates when the transmitter is in Fault-Find mode.
21. CD Mode: Indicates that the transmitter is in Current Direction Mode.
22. Voltage WARNING: indicator: Indicates that the transmitter is outputting potentially hazardous voltage levels.
23. Volume level indicator.
24. Pairing icon: Appears when the transmitter and locator are connected via iLOC.
25. Bluetooth icon: Indicates status of Bluetooth connection. Flashing icon means pairing is in progress.







Keypad actions and shortcuts



Switch the locator or transmitter on by pressing the  key. Once powered up, the keys function as follows:

Locator keys

KEY	● SHORT PRESS	▬ LONG PRESS
	Enter the menu	Switch power off
	Scroll through locate frequencies from low to high	–
	Increase and decrease gain in power and radio modes. RD5100H ₂ O+ automatically sets gain to mid-point when pressed	Rapidly increase and decrease gain steps in 1dB increments
	Turn Target Position Indicator mode ON/OFF	–
	Send an iLOC command to a paired transmitter	Enter the Transmitter power setting menu for use over iLOC

Transmitter keys

KEY	● SHORT PRESS	▬ LONG PRESS
	Enter the menu	Switch Power off
	Scroll through locate frequencies from low to high	–
	Take voltage and impedance measurements using the currently selected frequency	Take voltage and impedance measurements at a standardized frequency
	Adjusts the output signal	Select standby  / maximum standard power 

Tip: to scroll through frequencies from high to low, hold  while pressing the  button (applies to both locators and transmitters).

Before you begin

IMPORTANT

This guide is intended to be a quick reference guide. We recommend you read the full operation manual before you attempt to operate the RD5100H₂O+ locator.

First use

The RD5100H₂O+ locator and transmitter can be powered by D-cell alkaline batteries, D-cell NiMH batteries, or by an accessory Lithium-Ion (Li-Ion) battery pack.

To fit the D cell batteries in the locator, open the battery compartment and insert two D-Cell Alkaline or NiMH batteries, taking care to align the positive (+) and negative (-) terminals as indicated.


To fit the D cell batteries in the transmitter, unlatch the accessory tray. The battery compartment is located underneath the transmitter body. Use the turnkey to unlatch the battery compartment. Insert eight D-Cell Alkaline or NiMH batteries, taking care to align the positive (+) and negative (-) terminals as indicated.

Alternatively, you can power the transmitter from a mains or vehicle power source using a Radiodetection supplied optional accessory adapter.

Rechargeable battery packs

Lithium-Ion battery packs are available for both locators and transmitters, providing superior performance over traditional alkaline batteries. To fit these rechargeable packs, follow the instructions provided with each pack.

Checking your system software version

If you wish to check which version of software is running on your locator, press and hold the  key when switching the locator on. This information may be asked for when contacting Radiodetection or your local representative for technical support.





Transmitters automatically show their software version on startup.

System setup









It is important that you set up the system according to regional / operational requirements and your personal preferences before you conduct your first survey. You can set the system up using the menus as described below.

Setting up your system

The RD5100H₂O+ locator and transmitter menus allow you to select or change system options. Once entered, the menu is navigated using the arrow keys. Navigation is consistent on both the transmitter and the locator. When in the menu, most on-screen icons will temporarily disappear and the menu options will appear in the bottom left-hand corner of the display. The right arrow enters a submenu and the left arrow returns to the previous menu.


Note that when browsing the locator menu, the  and  keys act as left and right arrows. When browsing the transmitter menu, the  and  keys act as left and right arrows.

To navigate menus:

1. Press the  key to enter the menu.
2. Use the  or  keys to scroll through the menu options.
3. Press the  key to enter the option's submenu.
4. Use the  or  keys to scroll through the submenu options.
5. Press the  key to confirm a selection and return to the previous menu.
6. Press the  key to return to the main operation screen.

NOTE: When you select an option and press the  key, the option will be enabled automatically.

Locator menu options

- VOL: Adjust the speaker volume from 0 (mute) to 3 (loudest)
- BT: Enable, disable, reset or pair Bluetooth connections.
- CDR: Performs a Current Direction (CD) Reset. (Alternatively press and hold the  key when in CD mode)
- INFO: Run a Self-Test, display the date of the most recent service recalibration (CAL) or the most recent eCert calibration
- LANG: Select menu language
- FREQ: Enable or disable individual frequencies
- ALERT: Enable or disable StrikeAlert™
- COMPA: Enable or disable display of the Compass feature.

Transmitter menu options






- VOL: Adjust the speaker volume from 0 (mute) to 3 (loudest)
- FREQ: Enable or disable individual frequencies
- BOOST: Boost transmitter output for a specified period of time (in minutes)
- LANG: Select menus language
- OPT F: Run SideStep^{auto}™ to auto-select a locate frequency for the connected utility
- BATT: Set battery type: ALK, NiMH or Li-ION and enable / disable Eco mode
- MAX P: Set the transmitter maximum power (W) limit
- MODEL: Match the transmitter setting to the model of your locator
- MAX V: Set the output voltage to maximum (90V)
- BT: Enable, disable or pair Bluetooth connections.

Examples of using the menu, selecting options and making changes:

Locator compass enable or disable

The locator compass can be enable or disabled.






To disable the compass:

1. Press the  key to enter the menu.
2. Scroll to the COMPA (compass) menu using the  or  arrows.
3. Press the  key to enter the COMPA menu.
4. Scroll up or down to select the compass status to OFF or ON.
5. Press the  key twice to accept your selection and return to the main operation screen.

Transmitter batteries











It is important to set the system to match the currently installed battery type to ensure optimal performance and correct battery level indication.

To set your battery type:

1. Press the  key to enter the menu.
2. Scroll to the BATT menu using the  or  arrows.
3. Press the  key to enter the BATT menu.
4. Scroll up or down to select the correct battery type (Alk: Alkaline, NIMH: Nickel-metal Hydride or LIION: Lithium-Ion). Lithium-Ion is automatically selected when a Li-Ion pack is connected to a Locator.
5. Press the  key twice to accept your selection and return to the main operation screen.

Transmitter Eco mode

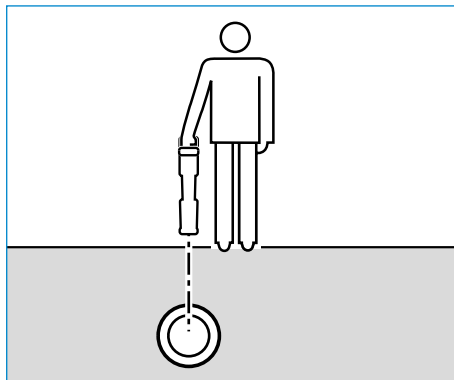
When using alkaline batteries, Eco mode can be selected to maximize run time. When Eco mode is selected the transmitter automatically reduces its maximum power output as battery levels run low. Eco mode is switched off by default. To Enable Eco Mode:

1. Press the  key to enter the menu.
2. Scroll to the BATT menu using the  or  arrows.
3. Press the  key to enter the BATT menu.
4. Select the ALK Battery type using the  or  arrows.
5. Press the  key to enter the ECO sub menu
6. Select ECO using the  or  arrows.
7. Press the  key three times to accept your selection and return to the main operation screen.

Locating pipes and cables










For more detailed descriptions of using the locator and transmitter, and for detailed locate techniques, refer to the Operation Manual.

The RD5100H₂O+ locator is designed to operate with the 'blade' of the locator perpendicular to the path of the cable or pipe being located.



Running a Self-Test

We recommend that a Self-Test is run at least weekly, or before each use. As the Self-Test tests the integrity of the locate circuitry, it is important that it is carried out away from larger metallic object such as vehicles, or strong electrical signals. To run a Self-Test:

1. Press the  key to enter the menu.
2. Scroll to the INFO menu using the  or  arrows.
3. Press the  key to enter the INFO menu.
4. Select TEST using the  or  arrows.
5. Press the  key to select YES.
6. Press the  key to begin the Self-Test.
7. Once the Self-Test is completed, the result (PASS or FAIL) will be displayed.
8. Restart the locator using the  key.

Locating with Active Frequencies

Active frequencies are applied to the target pipe or cable using the transmitter, and provide the most effective way of tracing buried pipes or cables.

Generally speaking, it is better to use a low frequency on larger, low impedance utilities, and move to a higher frequency on smaller, high impedance utilities.

The lowest power setting required to trace the target utility should always be used to minimize the risk of false trails.

The transmitter can apply a signal using three different methods:

Direct connection

In direct connection, you connect the transmitter directly to the pipe or cable you wish to survey using the red Direct Connect lead supplied. The black lead is generally connected to earth using the supplied ground stake.

The transmitter will then apply a discrete signal to the line, which you can trace using

the locator. This method provides the best signal on an individual line and enables the use of lower frequencies, which can be traced for longer distances.

⚠ WARNING: Direct connection to live conductors is POTENTIALLY LETHAL. Direct connections to live conductors should be attempted by fully qualified personnel only using the relevant products that allow connections to energized lines.

Induction

The transmitter is placed on the ground over or near the survey area. You select the appropriate frequency. The transmitter will then induce the signal indiscriminately to any nearby metallic conductor. In induction mode, using higher frequencies is generally recommended as they are induced more easily onto nearby conductors.

Transmitter Clamp

An optional signal clamp can be placed around an insulated live wire or pipe up to 215mm (8.5") in diameter to transfer the transmitter signal to the utility. This method of applying the transmitter signal is particularly useful on insulated live wires and removes the need to disconnect the supply to the cable.

⚠ WARNING: Do not clamp around uninsulated live conductors.

⚠ WARNING: Before applying or removing the clamp around a power cable ensure that the clamp is connected to the transmitter at all times.

Locating with Passive Frequencies

Passive frequency detection takes advantage of signals that are already present on buried metallic conductors. The RD5100H₂O+ supports two types of passive frequencies: Power and Radio signals. You can detect these frequencies without the aid of the transmitter.

Locate Modes


The RD5100H₂O+ simplifies the locate mode choice by automatic selection. The required locate mode has been designed and optimized to meet the specific use balanced against the required task. Locate modes are selected by the system dependent on the frequency in use.

The locate mode is shown by symbols as follows:



PEAK: For accurate locating, the peak bargraph provides a visual readout of the signal strength. The peak signal is found directly over the buried utility. Peak mode is automatically selected in power or radio modes.



GUIDANCE: Proportional arrows and a ballistic 'needle' combine with audio left/right indication for rapidly tracing the general path of a buried utility. Switch the Target Position Indicator ON/OFF by holding the  key. Guidance mode is automatically selected with active frequencies (512Hz/640Hz, 4096Hz, 8kHz, 9.8kHz, 33kHz, 65kHz, 83kHz and 131kHz).

Depth, current and compass readouts

⚠ WARNING: Never use the depth measurement readout as a guide for mechanical or other digging activity. Always follow safe digging guidelines.

The RD5100H₂O+ locator can measure and display the utility depth, locate signal current and the relative orientation of the cable or pipe to the locator. This helps you to make sure that you are following the right cable or pipe, especially when other utilities are present.

The RD5100H₂O+ locator features TruDepth™, a feature that helps you to ensure the accuracy of your locates or Survey Measurements. The depth and current are automatically removed from the display when the locator is at an angle of more than 7.5° from the path of the cable or pipe being located, or when the locator determines that signal conditions are too poor for reliable measurements.

Current Direction (CD)

The RD5100H₂O+Tx transmitter can apply a unique CD signal onto a pipe or cable. This signal can be used to identify an individual pipe or cable amongst a number of parallel utilities, ensuring operators follow the right line. A CD signal clamp or direct connection leads can be used to apply the unique signal to the pipe or cable and a CD locator clamp or CD stethoscope can be used to identify individual pipes or cables.

Using accessories

The transmitter is compatible with a range of accessories. For detailed information on using any of the accessories below please refer to the RD5100H₂O+ locator operation manual.

Transmitter signal clamps

When it is not possible to connect directly onto a pipe or cable, or induction mode is unsuitable, a transmitter signal clamp may be used. The clamp is plugged into the output of the transmitter and provides a means of applying a locate signal to an insulated live wire. This is particularly useful with live insulated cables as it removes the need to disable the power and break the line.

⚠ WARNING: Do not clamp around uninsulated live conductors.

⚠ WARNING: Before applying or removing the clamp around a power cable ensure that the clamp is connected to the transmitter at all times.

Sondes, Flexrods and FlexiTrace

Sondes are battery powered transmitters that are useful for tracing non-metallic pipes. They can be fixed to Flexrods to allow them to be pushed through pipes or conduits, and some are suitable for blowing through ductwork. The RD5100H₂O+ can detect a range of sonde frequencies, including those transmitted by flexiprobe™ pushrod systems and flexitrax™ crawlers.

For a detailed guide on locating sondes, please refer to the operation manual.

A FlexiTrace is a traceable fiberglass rod incorporating wire conductors with a sonde at the end. It is connected to the output of the transmitter and is typically used in small diameter, non-metallic pipes. The user has the option of locating the entire length of the cable or choosing to locate only the tip of the cable.

The FlexiTrace has a maximum power rating of 1W. When using the FlexiTrace with a Radiodetection RD5100H₂O+Tx transmitter, the output limit must be set to 1W in the MAX P menu and the output voltage limit set to LOW in the MAX V menu.

Plug / Live cable connector

The plug connector is connected to the output of the transmitter and is used to put a signal onto a line and trace it from a domestic mains plug to the service cable in the street.

The live cable connector can be used to apply a signal to a live cable. Only suitably qualified personnel should use this equipment.

Bluetooth wireless connection







RD5100H₂O+ locators feature a Bluetooth wireless module, as standard, providing the ability to connect to the RD5100H₂O+Tx model transmitter with iLOC.

NOTE: RD5100H₂O+ locator wireless features may be subject to national and or local regulations. Please consult your local authorities for more information.

⚠ WARNING: Do not attempt any wireless connection in areas where such technology is considered hazardous. This may include: petrochemical facilities, medical facilities or around navigation equipment.

Switching Bluetooth on

By default RD5100H₂O+ locators and Bluetooth enabled transmitters are shipped with the Bluetooth wireless connection module disabled.

1. Press the  key to enter the menu.
2. Scroll to the BT menu using the  or  keys.
3. Press the  key (locator) or the  key (transmitter) to enter the BT menu.
4. Scroll up or down to the ON option.
5. Press the  key to switch Bluetooth ON and return to the previous menu.

You can switch Bluetooth off to conserve battery life, or to comply with regulations in areas where wireless communications are considered hazardous. To do this, follow the above process, selecting 'OFF' in the BT menus.

iLOC

iLOC lets you control the transmitter remotely using your RD5100H₂O+ locator. With iLOC you can adjust the output frequency, power settings and use SideStep. iLOC commands are sent over a Bluetooth module that can operate at distances of up to 450m (1400ft) in direct line of sight.

iLOC is a standard feature of RD5100H₂O+ locators, and requires a Bluetooth equipped transmitter (RD5100H₂O+Tx).






NOTE: Operating in built up areas and in areas with high electromagnetic interference may reduce iLOC's performance.

Pairing to a transmitter

To pair to a transmitter you require an RD5100H₂O+Tx transmitter.





Before you begin, you should switch off all nearby Bluetooth equipment as they may interfere with the locator and transmitter's pairing process.

Preparing the locator:



1. Press the  key to enter the menu.
2. Scroll to the BT menu using the  or  keys.
3. Press the  key to enter the BT menu.
4. Scroll to the PAIR menu and press the  key to enter it.
5. Scroll to the BT-TX option.


NOTE: You must complete the pairing process within 90 seconds to prevent the locator's Bluetooth connection from timing out.

Preparing the transmitter:

6. Press the  key to enter the menu.
7. Scroll to the BT menu using the  or  keys.
8. Press the  key to enter the BT menu.
9. Scroll to the PAIR option.

Starting the pairing process:

10. Press the  key on the transmitter followed by the  key on the locator.
11. The transmitter and the locator will now attempt to pair.

When pairing is in progress, the transmitter and locator will display a flashing Bluetooth icon. Pairing can take up to a minute. If the pairing process is successful, the transmitter will display the  icon and the locator will display a persistent Bluetooth icon for the duration of the connection.

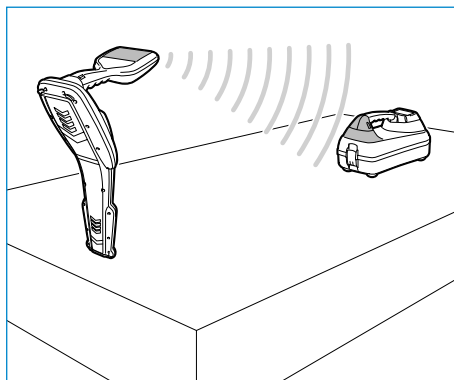
If pairing fails, ensure that any nearby Bluetooth devices are switched off or invisible then repeat the process.

Once the locator and transmitter have successfully paired you can use iLOC to change the transmitter's output frequency and power levels remotely from the locator.

Using iLOC

The locator and transmitter need to be paired to use iLOC. For optimum performance:

- Try to minimize obstructions in line of sight
- If possible, raise the transmitter off the ground by 30-60cm (1-2ft)
- Face the rear end of the transmitter towards the locator
- Point the screen of the locator towards the transmitter.



NOTE: If any iLOC commands fail, move closer to the transmitter and repeat the process.

Changing frequencies

Once the transmitter and the locator are paired, you can change the transmitter's output frequency remotely using the locator:

1. On the locator, select the frequency you want by pressing the **F** key until the frequency is displayed on screen.
2. Press the **Tx** key to send the new frequency to the transmitter.
3. The locator will display SEND momentarily and then OK if the transfer is successful.
4. If the transfer is unsuccessful, the locator will display a bluetooth error code error code (see operation manual for details).

If the process fails, you may be out of range or there may be an error in the connection. Move closer to the transmitter and retry the procedure. If the connection continues to fail, return to the transmitter and reset the connection.

Adjusting power

iLOC lets you adjust the transmitter's power output remotely; you can also put the transmitter into standby mode and then wake it remotely.

1. Transmitter power options are located in the TXOUT menu on the locator. Press and hold the **Tx** key to display the TXOUT menu.
2. Press the **⏪** key to enter the power level menu.
3. Scroll up or down through the power output options using the **⬆** or **⬇** keys:
 - **STDBY**: Transmitter standby mode, the connection is still active but the output is disabled – use to prolong battery life.

- **LOW**: Low power output
- **MED**: Medium power output
- **HIGH**: High power output
- **BOOST**: Temporarily boosts transmitter power output to its maximum level.

4. Once you have selected the mode you want, press the **⏩** key to confirm.
5. Press and hold the **Tx** key to select the new setting and exit the menu.
6. Press the **Tx** key once to send the settings to the transmitter.

NOTE: When changing the transmitter frequency using iLOC, the chosen transmitter power setting will be retained.

Training

Radiodetection provides training services for most Radiodetection products. Our qualified instructors will train equipment operators or other personnel at your preferred location or at Radiodetection headquarters. For more information go to www.radiodetection.com or contact your local Radiodetection representative.

Care and maintenance

The RD5100H₂O+ locator and transmitter are robust, durable and weatherproof. However you can extend your equipment's life by following these care and maintenance guidelines.

General

Store the equipment in a clean and dry environment.

Ensure all terminals and connection sockets are clean, free of debris and corrosion and are undamaged.

Do not use this equipment when damaged or faulty.

Batteries and power supply

Only use the rechargeable battery packs, chargers and power supplies approved by Radiodetection.

If not using rechargeable packs, use good quality Alkaline or NiMH batteries only.

Batteries should be disposed of in accordance with your company's work practice, and/or any relevant laws or guidelines in your country.

Cleaning

⚠ WARNING: Do not attempt to clean this equipment when it is powered or connected to any power source, including batteries, adapters and live cables.

Ensure the equipment is clean and dry whenever possible.

Clean with a soft, moistened cloth. Do not use abrasive materials or chemicals as they may damage the casing, including the reflective labels. Do not use high pressure jets of water to clean the equipment.

If using this equipment in foul water systems or other areas where biological hazards may be present, use an appropriate disinfectant.

Software upgrades

From time to time, Radiodetection may release software upgrades to enhance features and improve performance of the RD5100H₂O+ locator or transmitter. Software upgrades are free of charge and provided through a software manager Personal Computer (PC) application.

E-mail alerts and notification of new software releases are sent to all registered users.

Disassembly

Do not attempt to disassemble this equipment under any circumstances. The locator and transmitter contain no user serviceable parts.

Unauthorized disassembly will void the manufacturer's warranty, and may damage the equipment or reduce its performance.

Service and maintenance

Regularly check your equipment for correct operation by using the Self-Test function and eCert.

The locator and transmitter are designed so that they do not require regular recalibration. However, as with all safety equipment, it is recommended that they are serviced and calibrated at least once a year either at Radiodetection or an approved repair center.

NOTE: Service by non-approved service centers may void the manufacturer's warranty.

Details of Radiodetection offices and distribution partners can be found at www.radiodetection.com.

Radiodetection products, including this guide, are under continuous development and are subject to change without notice. Go to www.radiodetection.com or contact your local Radiodetection representative for the latest information regarding the RD5100H₂O+ locator or any Radiodetection product.

序言

关于本指南

小心：本指南提供了 RD5100H₂O+ 定位仪和发射机的基本操作说明。本指南中包含重要的安全信息和指导，在操作 RD5100H₂O+ 定位仪和发射机前应完整阅读本指南。

本指南仅用作快速参考指南。如需了解包括附件使用在内的详细说明，请参阅 RD5100H₂O+ 定位仪操作手册，可从 www.radiodetection.com 下载。

RD5100H₂O+ 定位仪和发射机的合格证书请见 www.radiodetection.com。

警告：和带电导体直连可能具有致命危险。与带电导体的直连仅可由具有充分资质的人员操作，并仅使用允许和通电线路连接的相关产品。

警告：发射机能输出具有可致命的电压。将信号引用于管道或线缆时应注意，要确保通知可能在线路上工作的其他技术人员。

警告：使用耳机前，应降低音量，避免损伤您的听力。

警告：在可能存在有害气体的区域不得使用本设备。

警告：使用发射机时，取下电池组之前，关闭设备并断开电缆。

警告：RD5100H₂O+ 定位仪可探测到大部分埋设导体，但有部分物体并不发射出任何可探测的信号。由于 RD5100H₂O+ 或任何其它电磁定位仪无法探测到这些物体，因此在操作时要小心谨慎。还存在一些 RD5100H₂O+ 在电力模式无法探测到的带电线缆。RD5100H₂O+ 无法表明信号是来自单个线缆还是来自紧密靠近的若干线缆。

警告：在全功率输出下长时间使用后，电池可能变热。在更换或处理电池时要小心谨慎。

3 年延长质保

RD5100H₂O+ 定位仪和发射机的标准质保期为 1 年。客户可以在购买产品后 3 个月内，通过产品注册将质保期延长至 3 年。

请访问 <https://portal.radiodetection.com/> 创建公司登入账户并在产品页注册您的定位仪和发射机。

如需了解如何创建公司账户，请访问：
<https://support.radiodetection.com>

雷迪可能不时发布新的软件，来提升这些产品的性能或增加新功能。通过产品注册，用户可获得电邮订阅提醒，了解产品相关的新软件和特别优惠及服务。

用户可以随时选择停止接收软件和技术通知，或通过联系雷迪选择停止接收营销材料。

eCert 与自检

RD5100H₂O+ 定位仪是一种安全设备，应定期进行检查，确保其正常运行。eCert¹ 可对 RD5100H₂O+ 定位电路进行全面测试，如果测试结果合格，将提供雷迪标定证明。

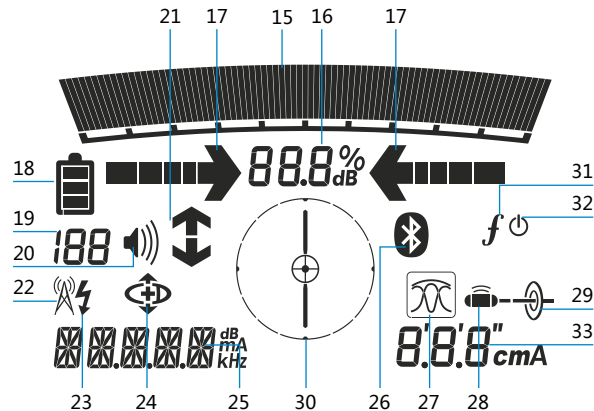
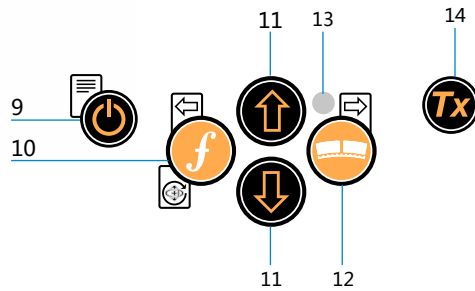
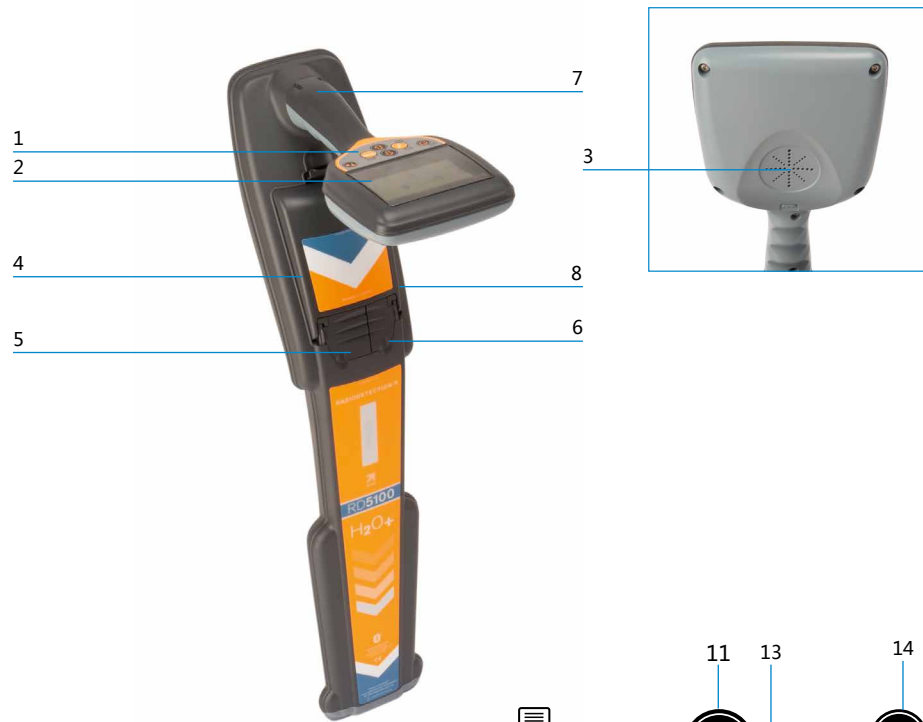
有关更多信息，请参考 RD5100 Manager¹ 操作手册。该软件可能需要另外购买。

RD5100H₂O+ 定位仪包含增强自检功能。除了对屏显与电源功能的必要检测外，RD5100H₂O+ 在自检中还会将信号施加在定位电路上，以检查设备精度和性能。

建议至少每周或每次使用之前对设备进行一次自检。

¹ 联系雷迪公司获取 eCert 和 RD5100 Manager。

RD5100H₂O+ 定位仪



定位仪功能

1. 键盘。
2. 含自动背光的 LCD 显示屏。
3. 扬声器。
4. 电池盒。
(可选锂电池组)。
5. 配件连接器。
6. 耳机连接器。
7. Bluetooth® 模块天线。
8. 迷你 USB 端口
(位于电池盒内部)。
23. 电源模式图标。
24. CD 模式图标。
25. 频率/电流/菜单读数。
26. 蓝牙状态图标：
图标闪烁则表示正在进行配对。若图标常亮，则表示已经建立连接。
27. 天线模式图标：
表示天线模式选择：
峰值 / 导向。
28. 探头图标：表示已经选定一个探头信号源。
29. 管线图标：表示已经选定一个管线信号源。

定位仪键盘

9. 电源键。
10. 频率键。
11. 上下箭头。
12. 目标位置指示器键。
13. 背光传感器。
14. 发射机按键。
30. 罗盘：表示定位管线或探头与定位仪的相对方向。
31. 发射机通信状态——确认 iLOC™ 通信成功。
32. 发射机待机指示器。
33. 深度读数。

定位仪屏幕图标

15. 带峰值标识的信号强度图表。
16. 信号强度读数。
17. 谷值/比例导向箭头。
18. 电量图标。
19. 灵敏度读数。
20. 音量图标。
21. 电流方向箭头。
22. 无线电模式图标。

RD5100H₂O+Tx 发射机



发射机功能

1. 键盘。
2. LCD。
3. 蓝牙模块。
4. 可拆卸附件托盘。
5. 附件
6. 侧面支持标签。
7. D型电池托盘。
8. 可选锂电池组。
16. 输出电平指示器。
17. 夹钳图标：指示信号夹钳或其他附件何时连接。
18. 直流电源连接指示器。
19. 感应模式指示器。
20. A字架：指示发射机何时处于故障查找模式。
21. CD 模式：指示发射机处于电流方向模式。

发射机键盘


9. 电源键。
10. 频率键。
11. 上下箭头。
12. 测量键。

发射机屏幕图标

13. 电池电量指示器。
14. 运行模式读数。
15. 待机图标。

22. 电压警告：指示器：指示发射机有可能正在输出有害电压电平。
23. 音量大小指示器。
24. 配对图标：发射机和定位仪通过 iLOC 连接时出现。
25. 蓝牙图标：指示蓝牙连接状态。图标闪烁则表示正在进行配对。

键盘事件处理和快捷键

按  键开启定位仪或发射机。一旦启动，各键功能如下：

定位仪键

按键	● 短按	▬ 长按
	进入菜单	关闭电源
	在定位频率上从高到低滚动	-
 并且 	增加和减少电源和无线电模式下的增益。 按下按键时，RD5100H ₂ O+ 自动将增益设置为中间点	快速增加和减少 1dB 增量中的增益步骤
	打开/关闭目标位置指示器模式	-
	向配对发射机发送 iLOC 命令	进入发射机功率设置菜单，以在 iLOC 上使用。

发射机按键

按键	● 短按	▬ 长按
	进入菜单	关闭电源
	在定位频率上从高到低滚动	-
	采用当前所选频率测量电压和阻抗	采用标准频率测量电压和阻抗
 并且 	调整输出信号	选择待机  / 最大标准功率 

提示：从高到低滚动频率，按住  同时按住  键（定位仪和发射机均适用）。

在您开始之前

重要提示

本指南仅作为快速参考指南使用。我们建议您在操作 RD5100H₂O+ 定位仪前，先阅读完整的操作手册。

首次使用

可采用D型碱性电池、D型镍氢电池或附加锂电池组为 RD5100H₂O+ 定位仪和发射机供电。

如要将D型电池安装在定位仪中，打开电池盒并插入两块D型碱性电池或镍氢电池，注意按指示对齐正负极。


如要将D型电池安装在发射机中，拉开附件托盘。电池盒位于发射机机身下方。按下转动键拉开电池盒。插入八块D型碱性电池或镍氢电池，注意按指示对齐正负极。

或者，您可以利用雷迪可选附件适配器通过市电供电或车载电源为发射机供电。

可充电电池组

锂电池组对于定位仪和发射机均适用，性能优于传统碱性电池。如要安装此类可充电电池组，请按照各电池组说明进行安装。

检测您的系统软件版本

如需检测您的定位仪上运行的软件版本，请打开定位仪并按住  键。还可在联系雷迪或您当地的技术支持代表时询问版本信息。

发射机启动后会自动显示软件版本。

系统设置

进行首次操作之前，您可以根据区域/操作要求和您的个人偏好来设置系统，这一点很重要。您可以使用下面的菜单来设置系统。

设置您的系统

您可通过 RD5100H₂O+ 定位仪和发射机菜单选择或更改系统选项。进入菜单后，会有箭头键来导航菜单。导航始终显示在发射机和定位仪上。在菜单中，屏幕上的大部分图标会暂时消失，在显示屏左下角会出现菜单选项。点击右箭头，将进入子菜单，点击左箭头则会返回到上一级菜单。


请注意，在浏览定位仪菜单时， 键和  键将作为左右箭头使用。请注意，在浏览发射机菜单时， 键和  键将作为左右箭头使用。

导航菜单：

1. 按下  键进入菜单。
2. 使用  或  键在菜单选项中滚动。
3. 按下  键进入选项的子菜单。
4. 使用  或  键在子菜单选项中滚动。
5. 按下  键确认选择并返回上一个菜单。
6. 按下  键返回主操作屏幕。

注意：当您选择某一选项，并按下  键时，将自动启用该选项。

定位仪菜单选项

- VOL：在 0（静音）和 3（最高）之间调节扬声器的音量
- BT：启用、禁用、重设或配对蓝牙连接。
- CDR：电流方向（CD）重设。（处于 CD 模式时，按住  键）
- INFO：进行自检、显示最近重新标定（CAL）或最近 eCert 标定的日期。
- LANG：选择菜单语言
- FREQ：启用或禁用单个频率
- ALERT：启用或禁用 StrikeAlert™
- COMPA：启用或禁用罗盘功能的显示。

发射机菜单选项






- VOL：在 0（静音）和 3（最高）之间调节扬声器的音量
- FREQ：启用或禁用单个频率
- BOOST：增加特定时间段（以分钟计）的发射机输出
- LANG：选择菜单语言
- OPT F：运行侧边 Stepauto™ 为所连公用设施自动选择定位频率
- BATT：设置电池类型：ALK、NiMH 或 Li-ION 和启用 / 禁用节能模式
- MAX P：设置发射机最大功率（W）限值
- MODEL：让发射机设置与您的定位仪型号相匹配。
- MAX V：将输出电压设置为最大（90V）
- BT：启用、禁用或配对蓝牙连接。

菜单使用、选项选择以及更改操作示例：

定位仪罗盘启用或禁用

可启用或禁用定位仪罗盘。






如要禁用罗盘：

1. 按下  键进入菜单。
2. 使用  或  键滚动至 COMPA（罗盘）菜单。
3. 按下  键进入 COMPA 菜单。
4. 向上或向下滚动，以将罗盘状态选择为关闭或打开。
5. 按两次  键以确认您的选择，然后返回到主操作屏幕。

发射机电池


使系统设置与当前所安装的电池类型相匹配，以确保获得性能并正确显示电池电量，这一点很重要。

设置您的电池类型：

1. 按下  键进入菜单。
2. 使用  或  键滚动至 BATT 菜单。
3. 按下  键进入 BATT 菜单。
4. 向上或向下滚动，以选择正确的电池类型（ALK：碱性，NIMH：镍氢或 LIION：锂离子）。当锂离子电池组连接至定位仪时会自动选择锂离子电池组。
5. 按两次  键以确认您的选择，然后返回到主操作屏幕。

发射机节能模式

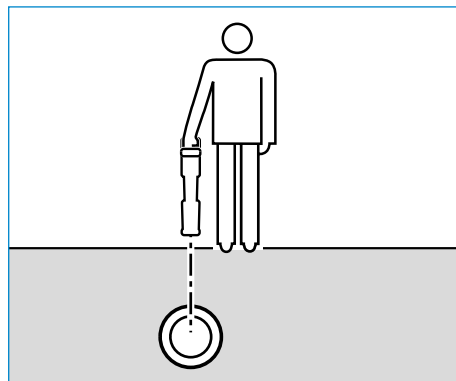
使用碱性电池时，可选择节能模式，以使运行时间最大化。如果选择节能模式，当发射机电量低时，最大功率输出会自动减少。节能模式默认关闭。如要启用节能模式：

1. 按下  键进入菜单。
2. 使用  或  键滚动至 BATT 菜单。
3. 按下  键进入 BATT 菜单。
4. 使用  或  箭头选择 ALK 电池类型。
5. 按下  键进入 ECO 子菜单。
6. 使用  或  箭头选择 ECO。
7. 按三次  键以确认您的选择，然后返回到主操作屏幕。

定位管道和电缆

如需进一步了解定位仪和发射机使用详细说明以及详细定位技术，请参阅操作手册。

RD5100H₂O+ 定位仪旨在利用垂直于定位电缆或管道道路的定位仪“叶片”来运行。



运行自检

建议至少每周或每次使用之前对设备进行一次自检。自检主要检测定位电路的完好性，因此自检时应远离大型金属物体，例如车辆或强电力信号，这一点尤为重要。若要运行自检功能：

1. 按下 键进入菜单。
2. 使用 或 键滚动至 INFO 菜单。
3. 按下 键进入 INFO 菜单。
4. 使用 或 箭头选择 TEST。
5. 按下 键选择“YES”。
6. 按下 键开始自检。
7. 一旦完成自检，结果（通过或失败）将显示在屏幕上。
8. 使用 键重新启动定位仪。

采用有源频率定位

有源频率适用于采用发射机定位的目标管道或电缆，是追踪埋地管道或电缆最为高效的方式。

一般来说，对于较大、低阻抗公用设施，最好使用低频率；对于较小、大阻抗公用设施，则换为高频率。

追踪目标公用设施所需的最低功率设置应始终用于使故障线路风险降到最低。

发射机可通过三种不同方式发出信号：

直接连接

就直接连接而言，您直接利用所提供的直接连接红色导线将发射机连接至您想要探测的管道和电缆。黑色导线一般通过接地棒连接至接地。

之后发射机会向可采用定位仪追踪的线路发送离散信号。这种方法可提供单线最佳信号，可使用较低频率，可用于较长距离的追踪。

警告：和带电导体直连可能具有致命危险。与带电导体的直连仅可由具有充分资质的人员操作，并仅使用允许和通电线路连接的相关产品。

感应

将发射机放置在探测区域上方或附近的地面上。选择恰当频率。之后发射机会将信号随意散发至附近任意金属导体上。在感应模式中，通常建议采用较高频率，因为其更容易被附近导体所感应。

发射机夹钳

可将可选信号夹钳置于直径长达 215mm (8.5") 的绝缘通电电缆或管道周围，以便将发射机信号传送至公用设施。这种发送发射机信号的方法对于绝缘通电电缆特别有用，无需断开电缆电源。

警告：请勿夹在非绝缘通电导体周围。

警告：在将夹钳放置在电缆周围或取下之前，确保夹钳始终与发射机相连。

采用无源频率定位

无源频率检测充分利用埋地金属导体上已有的信号。RD5100H₂O+ 支持两种类型的无源频率：电源和无线电信号。您可以在无需借助发射机的情况下检测此类频率。

定位模式

RD5100H₂O+ 通过自动选择简化定位模式选择。所需定位模式已经设计和优化，以满足所需任务的相应特定需求。通过依赖于所用频率的系统选择定位模式。

定位模式以下列符号显示：

峰值：对于精确定位，峰值柱状图可提供信号强度的可视化读数。峰值信号可直接出现在埋地公用设施上。在电源或无线电模式下，自动选择峰值模式。

导向：成比例箭头和发射“探针”结合音频左/右指示，快速追踪埋地公用设施的一般路径。按住 键，打开/关闭目标定位指示器。采用有源频率 (512Hz/640Hz、4096Hz、8kHz、9.8kHz、33kHz、65kHz、83kHz、131kHz) 自动选择导向模式。

深度、电流和罗盘读数

警告：请勿采用深度测量读数引导机械或其他挖掘活动。始终依据安全挖掘准则。

RD5100H₂O+ 定位仪可测量和显示公用设施的深度，定位信号电流及电缆或管道与定位器的相对定向。这有助于确保电缆或管道追踪线路正确，尤其是有其他公用设施存在时，这就特别有用。

RD5100H₂O+ 定位仪具有 TruDepth™ 功能，该功能可以确保您的定位或探测测量值的准确性。当定位仪与目标定位电缆或管道路径所呈角度大于 7.5° 时，或者当定位仪确定信号条件太差无法进行可靠测量时，深度和电流会从显示器中自动清除。

电流方向 (CD)

RD5100H₂O+Tx 发射机可将独特的 CD 信号发送至管道或电缆上。此信号可用于确定多个平行公用设施中的单个管道或电缆，确保操作人员追踪正确线路。CD 信号夹钳或直接连接导线可用于将独特信号发送至管道或电缆上，CD 定位器夹钳或 CD 听诊器可用于确定单个管道或电缆。

利用附件

发射机与一系列附件兼容。如需进一步了解如下附件使用相关信息，请参阅 RD5100H₂O+ 定位仪操作手册。

发射机信号夹钳

如果无法直接连接至管道或电缆上，或者感应模式不适用，则可以使用发射机信号夹钳。将夹钳插入发射机输出中，可通过这种方式将定位信号发送至绝缘通电电缆。这对通电绝缘电缆特别有用，因为无需禁用电源和切断线路。

警告：请勿夹在非绝缘通电导体周围。

警告：在将夹钳放置在电缆周围或取下之前，确保夹钳始终与发射机相连。

Sondes、Flexrods、FlexiTrace

Sondes 是电池供电型发射机，用于追踪非金属管道。可安装在 Flexrods 上，以便通过管道或导管推动，一些适用于通过管道系统吹送。RD5100H₂O+ 可检测一系列探头频率，包括由 flexiprobe™ 推杆系统和 flexitrax™ 爬行器所发射的频率。

如需了解定位探头相关详细指南，请参阅操作手册。

FlexiTrace 是一种导线导体和末端探头结合在一起的追踪玻璃纤维杆。它与发射机输出相连，一般用于小直径非金属管道。用户可以选择定位全场电缆或者只定位电缆端头。

FlexiTrace 最大功率为1W。当 FlexiTrace 和 雷迪 RD5100H₂O+Tx 发射机配合使用时，须在 MAX P 菜单中将输出限值设为1W，在 MAX V 菜单中将输出电压限值设为 LOW。

插塞/带电电缆接头

插塞接头连接至发射机输出，用于将信号发送到线路上，从内部电源插塞到道路上的服务电缆，进行追踪。

通电电缆接头可用于将信号发送至通电电缆上。只有合格人员才能使用此设备。

蓝牙无线连接







RD5100H₂O+ 定位仪具有蓝牙无线模块功能，能够将 RD5100H₂O+Tx 典型发射机和 iLOC 连接起来。

注意：PRD5100H₂O+ 定位仪无线功能需要遵守本国或当地规定。请咨询您当地部门了解更多信息。

警告：不要在无线连接技术可能存在危险的区域使用该连接。这些区域可能包括：石化设施，医疗场所或导航设备周围。

打开蓝牙

默认情况下，RD5100H₂O+ 定位仪和蓝牙型发射机一同装运，蓝牙无线连接模块处于禁用状态。

1. 按下  键进入菜单。
2. 使用  或  键滚动至 BT 菜单。
3. 按下  键（定位仪）或  键（发射机）进入 BT 菜单。
4. 上下滚动至 ON 选项。
5. 按下  键，打开蓝牙，返回上一个菜单。

您可以关闭蓝牙以延长电池寿命，或在将无线连接视为危险的区域遵守相关规范。要关闭蓝牙，请遵照上述操作过程，在 BT 菜单中选择“OFF”按钮。

iLOC

借助于 iLOC，您可使用 RD5100H₂O+ 定位仪远程控制发射机。借助于 iLOC 您可以调整输出频率、功率设置并使用 SideStep。iLOC 命令被发送至蓝牙模块，可在远达 450m (1400ft) 的直线距离操作。

iLOC 是 RD5100H₂O+ 定位仪的标准功能，需要一个配备蓝牙的发射机 (RD5100H₂O+Tx)。

注意：在建成区和电磁高度干扰区操作，可能会降低 iLOC 的性能。

配对至发射机

为了配对至发射机，您需要 RD5100H₂O+Tx 发射机

开始之前，您应该关闭附近所有的蓝牙设备，因为它们可能会干扰定位仪和发射机的配对过程。

配对定位仪：



1. 按下  键进入菜单。
2. 使用  或  键滚动至 BT 菜单。
3. 按下  键进入 BT 菜单。
4. 滚动至 PAIR 菜单并按下  键进入。
5. 滚动至 BT-TX 选项。


注意：您必须在90秒之内完成配对过程，以防止定位仪的蓝牙连接超时。

准备发射机：

6. 按下  键进入菜单。
7. 使用  或  键滚动至 BT 菜单。
8. 按下  键进入 BT 菜单。
9. 滚动至 PAIR 选项。

开始配对过程：

10. 按下定位仪上的  键，之后按下发射机上的  键。
11. 发射机和定位仪现在可以尝试配对。

配对过程中，发射机和定位仪会显示一个闪烁的蓝牙图标。配对可能会花费一分钟。如果配对过程成功，连接期间，发射机会显示  图标，定位仪会显示恒亮的蓝牙图标。

如果配对失败，确保附近蓝牙设备均已关闭或不可见，之后重复这一过程。

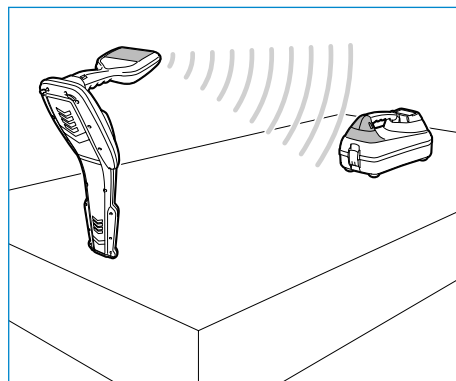
一旦定位仪和发射机配对成功，您可使用 iLOC 通过定位仪远程更改发射机的输出频率和功率电平。

使用 iLOC

定位仪和发射机需要配对来使用 iLOC。为了获得最佳性能：



- 尝试最大程度地减少视线范围内的障碍物
- 如可能，将发射机抬高地面30-60厘米（1-2英尺）
- 让发射机后端朝向定位仪
- 将定位仪屏幕指向发射机。

注意：如果 iLOC 命令失败，移近发射机并重试。



更改频率








一旦发射机和定位仪配对，您可以使用定位仪远程更改发射机的输出频率：

1. 在定位仪上，按下  键，直至频率显示在屏幕上，选择您想要的频率。
2. 按下  键，向发射机发送新频率。
3. 定位仪会立刻显示 SEND，之后如果传输成功，则会显示 OK。
4. 如果传输失败，定位仪会显示蓝牙错误代码（详情请参阅操作手册）。

如果过程失败，您可能不在范围内，或者更正出错。移近发射机并重试。如果依然连接失败，返回发射机，重置连接。

调整功率

借助于 iLOC，您可远程调整发射机的功率输出；您也可以将发射机设置成待机模式，之后远程启动。

1. 发射机功率选项位于定位仪上的 TXOUT 菜单。
按住  键显示 TXOUT 菜单。
2. 按下  键进入功率电平菜单。
3. 使用  或  键在功率输出选项中向上或向下滚动：
 - **STDBY:** 发射机待机模式，连接依然有效，但是输出禁用-目的在于延长电池寿命。
 - **LOW:** 低功率输出
 - **MED:** 中功率输出
 - **HIGH:** 高功率输出
 - **BOOST:** 暂时将发射机功率输出增加到最大水平。
4. 一旦选择好您想要的模式，按下  键确认。
5. 按住  键选择新设置并退出菜单。
6. 按下  键一次，向发射机发送设置。

注意：当使用 iLOC 更改发射机频率时，会保留所选发射机功率设置。

培训

雷迪公司提供大部分雷迪产品的培训服务。我们具有相关资质的讲师将在贵方选择的地点或雷迪总部对设备操作员或其他人员进行培训。如需了解更多信息，请访问 www.radiodetection.com 或联系您当地的雷迪代表。

维护和保养

RD5100H₂O+ 定位仪和发射机功能强大、持久耐用，并不受气候影响。但您还可以通过遵循以下维护与保养指南，来延长您设备的使用寿命。

一般

将该设备存放在清洁干燥的环境中。

确保所有终端和连接插座清洁、无污物、无腐蚀且未损坏。

当本设备受损或有故障时请勿使用。

电池和供电

仅允许使用雷迪公司批准的可充电电池组、充电器以及电源。

若未使用可充电电池组，则仅允许使用优质的碱性电池或镍氢电池。

应根据贵公司的工作规范，以及/或贵国家的相关法律或准则来处理电池。

清洁

⚠ 警告：当本设备通电或连接到任何电源时，包括电池、适配器以及带电线缆，不要尝试清洁本设备。

尽可能确保本设备清洁、干燥。

请使用柔软湿润的布料清洁本设备。不要使用研磨材料或化学物质，因为这些物质可能损坏外壳，包括反光标签。不要使用高压水流清洗设备。

若在污水系统中或可能存在生物风险的其它区域内使用本设备，请使用恰当的消毒剂。

软件升级

雷迪公司可能会不时发布软件升级以增强功能，并提高 RD5100H₂O+ 定位仪和发射机的性能。软件升级是免费的，且软件的升级将通过软件管家个人电脑应用提供。

新软件版本的电子邮件提醒和通知会发送给所有注册用户。

拆卸

在任何情况下都不要试图拆卸本设备。定位仪和发射机不包含用户可维护零件。

未经批准的拆卸将导致制造商的质保失效，并且可能会损坏设备或降低设备性能。

维修和维护

使用自检功能和 eCert 定期检查您的设备是否运转正常。

定位仪和发射机在设计上是不需要定期标定的。然而，和所有安全设备一样，建议每年至少在雷迪公司或其批准的维修中心对设备进行一次维修和校准。

注意：若由未经批准的维修中心维护，可能导致制造商的质保失效。

雷迪公司办公室和经销合作伙伴的详细信息可登录 www.radiodetection.com 进行查找。

雷迪公司的产品（包括本指南）均在不断的开发之中，因此会在不预先通知的情况下作出变更。有关 RD5100H₂O+ 定位仪或任何雷迪产品的最新信息，请访问 www.radiodetection.com 或联系您当地的雷迪公司代表。

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