

# Leak Spy Quick Install Guide





## 1 General Instructions

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The Leak Spy is designed for use with the R900® or R450™ pit meter interface unit (MIU). Before installing, a Leak Spy unit must be correctly wired to work with the MIU.

## 2 Safety and Preliminary Checks

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- Verify that you are at the location specified on the Site Work Order.
- Check that the site is safe for you and your equipment.
- Confirm and/or update the MIU ID number on the Site Work Order.



Follow any guidelines issued by your company in addition to those presented in this guide. Never perform an installation during a lightning storm or under excessively wet conditions.

## 3 Site Selection

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The following illustration depicts the full Leak Spy assembly.

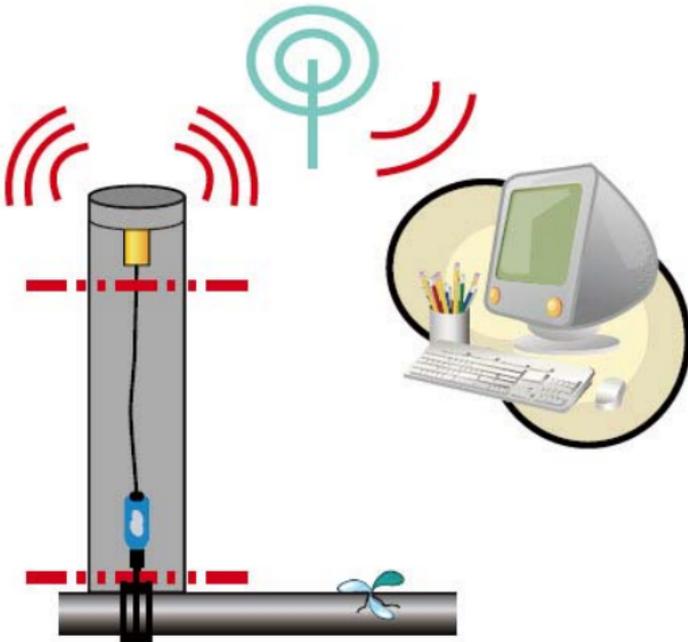


Figure 1 Full Leak Spy Assembly

## R900 and R450 Pit MIUs



Neptune recommends placing the antenna through a hole in the pit lid so that the dome sits above the pit lid.

- Select a location with a direct line-of-sight to the path of the water main valve.
- Avoid installing the MIU behind metal fences or walls.
- Prewire with a Nicor male connector standard as illustrated in Figure 2.



Figure 2 Nicor Male Connector



Neptune recommends use of R900 or R450 MIUs prewired with Nicor female connectors. Part numbers are shown below in Table 1.

Table 1 MIU Part Numbers

Enhanced R900 Pit MIUs	R450 Pit MIUs
6' Nicor Connection 13442-600	6' Nicor Connection 12855-600
25' Nicor Connection 13442-700	25' Nicor Connection 12855-700



If you currently have an R900 or R450 MIU, splice the wires together using the Sensus wiring protocol as shown in Table 2 on page 3.

Table 2 Sensus Wiring Protocol

Leak Spy	Neptune R900/R450
Green	Red
Black	Green
Red	Black

## 4 Preparing the Leak Spy Unit

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Prior to field installation, complete the following steps.

- 1 Program the Leak Spy, using the *Leak Spy User Guide* that comes with the Leak Spy unit.

Programming sets the internal clock which is essential for correct operation.



After programming the Leak Spy, remember to keep the unit magnet side down. If you turn the unit magnet up, you risk turning off the power and clearing out the programming.



- 2 After completing the programming procedure, take the Leak Spy unit and MIU to the location you want to monitor.

Figure 3 Leak Spy Unit

## 5 Connecting the Leak Spy to the R900/R450 Pit MIU

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- 1 Connect the Leak Spy and MIU by lining the connectors up with the arrows pointed toward each other.
- 2 Gently insert the Leak Spy connector into the MIU connector and press together securely as shown in Figure 4.



Figure 4 Leak Spy MIU Connectors

The Leak Spy and MIU are now connected and ready for you to take to the location for installation. See Figure 5.



Figure 5 Leak Spy MIU Connected

## 6 Installing the Leak Spy and the R900/R450 Pit MIU

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- For more detailed information and installation instructions, refer to the *R900® Wall and Pit Installation and Maintenance Guide* (Part No. 12560-001) and the *R450™ Wall and Pit Installation and Maintenance Guide* (Part No. 112857-001).
- Before installing the Leak Spy unit, make sure the cable is long enough. That way, after installation, you can easily remove the valve box with attached MIU without straining the cable.



- 1 Feed the antenna cable and housing through the 1.75 inch hole in the meter valve box. See Figure 6.

**Figure 6 Pit Antenna Cable and Housing**

- 2 Slip the large plastic nut over the antenna cable and thread it onto the antenna assembly to secure it to the pit lid. See Figure 7.



**Figure 7 Large Plastic Nut**



- 3 Make sure the smooth side at the top of the threads on the nut is facing upward. See Figure 8.

**Figure 8 Securing Large Plastic Nut**

Figure 9 shows the completed installation.



**Figure 9 Installation Complete**

- 4 Place the flat black rubber washer on the latch plate around the male coax connection. See Figure 10.



Figure 10 Black Rubber Washer



- 5 Apply a coating of NovaGuard on the "F" connector and connect the coax to the "F" connector if not already applied. See Figure 11.

Figure 11 Coax Cable

- 6 Slide the plastic latch plate cover over the "F" connector. Press down and turn clockwise to secure. See Figure 12.

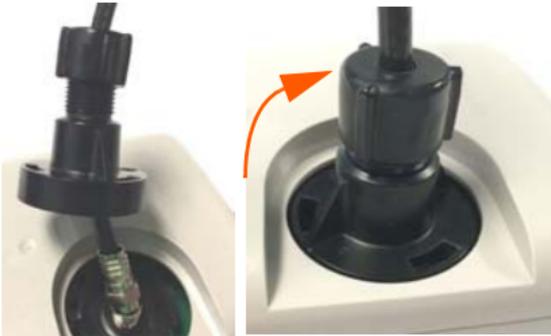


Figure 12 Coax Connection

- 7 Slide the connector nut onto the threads and hand tighten. Do not use pliers. See Figure 13.



Figure 13 Hand Tighten Connection



- 8 Use the included cable tie to hang the MIU from the antenna tube, if the valve box is flooded or is a deep vault installation. See Figure 14.

Figure 14 Cable Tie

## Mounting and Activating the Leak Spy Unit

The Leak Spy is capable of being mounted to a metal or plastic pipe. The powerful magnet allows mounting on metallic pipes; however, for plastic and non-metallic pipes, Metrotech has accessories available.

- 1 Place the Leak Spy unit, magnetically, on top of the main valve stem, exposed pipe, or valve operation nuts of mains and hydrants as shown in Figure 15.



Figure 15 Valve Nuts, Main Valve Stem, and Exposed Pipe



Be careful not to lodge the MIU between the valve box and any components inside the box.

- 2 Position the magnet against the left side of the MIU directly in line with the Neptune logo, as shown.
- 3 Swipe it bringing it from the side and around the corner to the top to activate the MIU. See Figure 16.

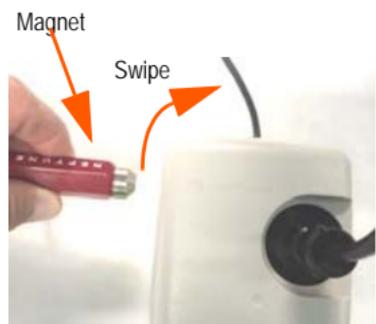


Figure 16 Activation Magnet

## 7 Testing the Leak Spy Unit and R900 MIU Installation

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After the R900 MIU has been installed and wired, follow these steps to verify that the MIU is working properly.

- 1 To start the testing program, power up the handheld unit (HHU) test device.



- If you are using the CE5320 handheld, the receiver is integrated.
- If you are using the Trimble Nomad handheld and the R900<sup>®</sup> Belt Clip Transceiver (BCT), make sure the R900 BCT is powered on before testing.



To avoid RF signal saturation of the HHU, position the receiver at least 2 to 3 feet from the MIU. In a densely saturated area, removing the CE5320 antenna from the handheld can assist with readings. You can operate the R900 BCT normally.

When the MIU is installed correctly, the MIU ID# and Leak Spy reading appear on the HHU's display within one minute.



- All Leak Spy units return 6 digits.
- If the first 3 digits are **111**, the Leak Spy has not been programmed.
  - If the first 3 digits are **255**, the Leak Spy is active with no-data. See Figure 17.

FIRMWARE:		20.0.7		
MIU ID	READ	TYP	TAMPER	AMR
1486854074	111222	2	0-0	Raw
<   III   >				
SCAN DURATION:			INFINITE	
STOP		CLEAR		CLOSE

Figure 17 Leak Spy RF Test

A successful Leak Spy meter reading results in a 6 digit number.

- First 3 digits (level in dB) - indicates distance (depends on pipe material) and is typically less than 90dB.
- Last 3 digits - indicates frequency in Hz
  - 260-500Hz - Large Leak
  - 500-900Hz - Medium Leak
  - 900-2500Hz - Small Leak

The higher the frequency the closer and larger the leak is to the Leak Spy.

Example of actual leak data reading: 015038.

- Level, first three digits: 015 (15dB)
- Frequency, last three digits x 10: 038 x 10 (380 Hz)

- 2 If a Leak Spy does not appear on the HHU's display, complete the following steps.
  - Reactivate the MIU using the magnet.
  - Verify all electrical connections.
  - Test the installation again (repeat steps 1 and 2).



If a problem still exists, contact your Neptune sales representative.

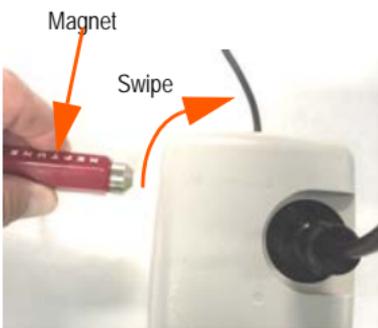
## 8 Testing the Leak Spy Unit and R450 MIU Installation

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After the R450 MIU has been installed and connected to the Leak Spy, follow these steps to verify that the MIU is working properly.

### MIU Activation

- 1 Position the magnet against the left side of the MIU directly in line with the Neptune logo, as shown.
- 2 After completing the programming procedure, take the Leak Spy unit and MIU to the location you want to monitor.



- 3 Swipe it bringing it from the side and around the corner to the top to activate the MIU. See Figure 18.

**Figure 18 Activation Magnet**

- The MIU transmits its configuration packet to the R450™ Data Collector (DC) or R450™ Mini Collector (MC) approximately 30 seconds following the magnet swipe.
  - The MIU sends the register reading to the R450 DC or R450 MC approximately 15 seconds following the configuration packet.
  - The R450 DC or R450 MC sends an email confirmation to the installer, after the R450 DC or R450 MC receives the configuration packet and meter reading. This allows for verification of proper installation and MIU location.
- 4 Look for an MIU config email similar to the following.

Subject: 0028/G/-105/Collector Two/MIU Config

```
MIU <- Coll.....Marginal[-104]
Coll<- MIU.....Pass[-105]
Register.....Valid Read
Collector.....Collector Two
Signal/Noise.....39
Noise.....130
MIU ID.....110500028
MIU ID (secondary)....10500028
=====
```

# RSSI Values and N\_SIGHT™ PLUS Host Software Capabilities

In the N\_SIGHT PLUS host software (formerly N\_SIGHT R450, ARB N\_SIGHT R450, or ARB N\_SIGHT FixedBase), the Signal Strength (RSSI values) is a key indicator of the system health as well as the communication capabilities of the MIU with the R450 DC.

The RSSI values are associated in the following way:

- *Uplink*— the ability of the R450 DC to hear reading information from the MIU.
- *Downlink*— the ability of the MIU to hear instructions from the R450 DC.

The MIU Config Email provides feedback on the RSSI values between the MIU and the collector following MIU activation. Depending on the RSSI values recorded, the system indicates the values as:

- Pass
- Marginal
- Fail (should they fail)

It is important to note that RSSI values in the Pass range are required for both the Downlink and the Uplink to ensure full, two-way capabilities of the MIU as part of the R450 System. See Table 3.

**Table 3 MIU RSSI Downlink**

RSSI Description	RSSI Values	Result in Performance
Pass	RSSI $\geq$ -95	Full capability
Marginal	-105 $<$ RSSI $<$ -95	Occasional two-way capability - not reliable
Fail	RSSI $\geq$ -105	MIU not capable of two-way communications

## 9 Checklist

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Before leaving the installation site, be sure to:

- Record the MIU ID for each Leak Spy unit.
- Verify that you have followed all requirements of this Quick Install Guide.
- Verify that you have recorded all required information.
- Clean up any installation debris.
- Verify that the requirements of the site work order have been completed.

## 10 Contact Information

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Within the United States, Neptune Support is available Monday through Friday, 7:00 AM to 5:00 PM Eastern Standard Time.

### Phone

- 1 Call (800) 647-4832, and
  - Press **1** if you have a Technical Support Personal Identification Number (PIN).
  - Press **2** if you do not have a Technical Support PIN.
- 2 Enter the six digit PIN number and press #.
  - Press **2** for Technical Support.
  - Press **3** for maintenance contracts or renewals.
  - Press **4** for Return Material Authorization (RMA) for Canadian Accounts.

The Customer Support Specialists are dedicated to you until the issue is resolved to your satisfaction. Be prepared with:

- Your name and utility or company name.
- A description of what occurred and what you were doing at the time.
- A description of any actions taken to correct the issue.

### Fax

- 1 Send a description of your problem to (334) 283-7497.
- 2 Include the best time to contact you.

### Email

Send your letter to: [hhsupp@neptunetg.com](mailto:hhsupp@neptunetg.com).





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