E-Coder®R900i™ Installation and Maintenance Guide
E-Coder® R900™ Installation and Maintenance Guide
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FCC Notice
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

RF Exposure Information
This equipment complies with the FCC RF radiation requirements for uncontrolled environments. To maintain compliance with these requirements, the antenna and any radiating elements should be installed to ensure that a minimum separation distance of 20cm is maintained from the general population.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Professional Installation
In accordance with section 15.203 of the FCC rules and regulations, the MIU must be professionally installed by trained utility meter installers. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
Industry Canada
This Class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareillage numérique de la classe B répond à toutes les exigences de l’interférence canadienne causant des règlements d’équipement. L’opération est sujette aux deux conditions suivantes: (1) ce dispositif ne peut pas causer l’interférence nocive, et (2) ce dispositif doit accepter n’importe quelle interférence reçue, y compris l’interférence qui peut causer l’opération peu désirée.
1 Product Description

- E-Coder)R900/i Programming ................................................................. 2
- RF Protocol Error Detection ................................................................. 2
- RF Frequency Control Algorithm ......................................................... 2
- RF Transmission Period and Randomness ........................................... 2
- Inside and Pit Versions ......................................................................... 2

2 Specifications

- Electrical Specifications ................................................................. 3
- Transmitter Specifications ............................................................... 3
- Environmental Conditions ............................................................... 3
- Functional Specifications ................................................................. 3
- Dimensions and Weight .................................................................... 3
- E-Coder)R900/i Dimensions ............................................................. 4

3 General Installation Guidelines

- Tools and Materials ............................................................................. 5
- Safety and Preliminary Checks ......................................................... 5

4 Activating and Reading the E-Coder)R900/i

- How to Activate LCD Using the Solar Panel ........................................ 6
- How to Read ......................................................................................... 7
- Common Causes of Leaks .................................................................. 8
- How to Tell if Water is in Use ........................................................... 9
- What to Do if There is a Leak ........................................................... 9
- If Continuous Leak is Repaired ......................................................... 9
- If Intermittent Leak is Repaired ......................................................... 10
- Software ............................................................................................ 10
# Contents

## 5 Installing the E-Coder)R900i

- Prior to Installation ........................................... 11
- Storage .......................................................... 11
- Unpacking ......................................................... 11
- Tools Needed .................................................... 12
- Site Selection .................................................... 12
- Installing the E-Coder)R900i ................................ 12
  - New Meter Installation ....................................... 12
  - Retrofit Meter Installation ................................. 13
- Connecting the Optional E-Coder)R900i Through-the-Lid Antenna ........................................... 14
  - Before Connecting the Antenna .......................... 14
  - Installing the Antenna ....................................... 15
  - Attaching Antenna to MIU ................................. 16
  - Upgrading the E-Coder)R900i Antenna ................. 17

## 6 Data Logging Extraction

- About Data Logging ............................................ 18
- Accessing Data Logging ....................................... 18
- Initializing the Data Logger .................................. 20
- Initiating RF Activated Data Logging ..................... 23
- Sample Data Logging Graphs ................................. 25
- Off Cycle Data Extraction .................................... 26
- Belt Clip Transceiver ......................................... 27

## 7 Maintenance and Troubleshooting

- Six and Four Wheel Encoders ................................. 28
  - Six-Wheel Encoder Normal Operation .................... 28
  - Four-Wheel Encoder Normal Operation .................. 28
  - Troubleshooting ............................................... 28
8 Contact Information

Contact Information ................................................................. 30
    By Phone ................................................................. 30
    By Fax ................................................................. 30
    By Email ................................................................. 30

A E-Coder)R900i Flags

Description of Flags ............................................................... 31

Glossary

Index
<table>
<thead>
<tr>
<th>Figure</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>E-Coder)R900/</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>E-Coder)R900/ Inside Dimensions</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>E-Coder)R900/ Antenna Dimensions</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Solar Panel for E-Coder)R900/</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>Activating E-Coder)R900/</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>E-Coder)R900/ Installation</td>
<td>11</td>
</tr>
<tr>
<td>7</td>
<td>E-Coder)R900/ Antenna</td>
<td>14</td>
</tr>
<tr>
<td>8</td>
<td>Inserting Antenna into the Pit Lid</td>
<td>15</td>
</tr>
<tr>
<td>9</td>
<td>Locking Nut on Antenna</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>Securing the Locking Nut</td>
<td>15</td>
</tr>
<tr>
<td>11</td>
<td>Installation Complete</td>
<td>16</td>
</tr>
<tr>
<td>12</td>
<td>Removing the Dust Cover</td>
<td>16</td>
</tr>
<tr>
<td>13</td>
<td>Placing Washer on MIU</td>
<td>16</td>
</tr>
<tr>
<td>14</td>
<td>Connecting the Coaxial Cable</td>
<td>17</td>
</tr>
<tr>
<td>15</td>
<td>Connecting the Plastic Connector</td>
<td>17</td>
</tr>
<tr>
<td>16</td>
<td>Sliding the Gasket</td>
<td>17</td>
</tr>
<tr>
<td>17</td>
<td>HHU Home Screen</td>
<td>18</td>
</tr>
<tr>
<td>18</td>
<td>N_SIGHT R900 Menu Screen</td>
<td>19</td>
</tr>
<tr>
<td>19</td>
<td>Data Logger Option</td>
<td>19</td>
</tr>
<tr>
<td>20</td>
<td>Reader ID Input</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>HHU Time Confirmation</td>
<td>20</td>
</tr>
<tr>
<td>22</td>
<td>Initialize RF Device</td>
<td>21</td>
</tr>
<tr>
<td>23</td>
<td>Enter MIU ID</td>
<td>21</td>
</tr>
<tr>
<td>24</td>
<td>Capture Button</td>
<td>22</td>
</tr>
<tr>
<td>25</td>
<td>Meter Size Selection</td>
<td>22</td>
</tr>
<tr>
<td>26</td>
<td>Start Button</td>
<td>23</td>
</tr>
<tr>
<td>27</td>
<td>Listening for Data</td>
<td>23</td>
</tr>
<tr>
<td>28</td>
<td>Receiving Data</td>
<td>24</td>
</tr>
<tr>
<td>29</td>
<td>Graph Button</td>
<td>24</td>
</tr>
<tr>
<td>30</td>
<td>Examples of Data Logging Graphs</td>
<td>25</td>
</tr>
<tr>
<td>31</td>
<td>HHU Home Screen</td>
<td>26</td>
</tr>
<tr>
<td>32</td>
<td>HHU Menu</td>
<td>26</td>
</tr>
<tr>
<td>33</td>
<td>Off Cycle Option</td>
<td>27</td>
</tr>
</tbody>
</table>
Notes:
## Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Recommended Tools</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Icons and Displays</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>Possible Leaks</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>Checklist for Leaks</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>Data Logging Graph Legend</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>Examples of Reading Values</td>
<td>28</td>
</tr>
<tr>
<td>7</td>
<td>8th Digit Resolution by Meter Size</td>
<td>31</td>
</tr>
<tr>
<td>8</td>
<td>E-Coder)R900i Flags.</td>
<td>31</td>
</tr>
</tbody>
</table>
1 Product Description

This section provides a general description of the E-Coder\textsuperscript{™}R900\textsuperscript{™} register. The E-Coder\textsuperscript{™}R900/i by Neptune is an integrated register that contains both the E-Coder\textsuperscript{™} and R900\textsuperscript{™} technologies in one register that collects meter reading data. It then transmits the data for collection by the meter reader. A Neptune walk-by, mobile, or R900 Gateway fixed network data collection system receives the data and stores it to be downloaded into the utility billing system for processing.

The E-Coder\textsuperscript{™}R900/i is easily installed and operates within an RF band which does not require an operating license. The E-Coder\textsuperscript{™}R900/i meets FCC regulations part 15.247 allowing higher output power and greater range. The E-Coder\textsuperscript{™}R900/i uses frequency-hopping spread spectrum technology to avoid RF interference and enhance security. The transmitted data is updated at 15-minute intervals and transmits a mobile message that includes the meter reading data and the unique 10-digit E-Coder\textsuperscript{™}R900/i ID every 14 seconds. This allows the meter to be read by a handheld unit (HHU) or mobile data collections unit. The E-Coder\textsuperscript{™}R900/i also transmits a high power fixed network message every seven and one-half minutes on an interleaved basis to an R900 Gateway.

The E-Coder\textsuperscript{™}R900/i is designed to offer advantages to utility organizations of all sizes:

- Increases meter reading accuracy
- Eliminates hard-to-read meters
- Protects utility liability by increasing meter reader safety
- Requires no external wiring or programming
- Provides enhanced 8-digit AMR meter reading
- Provides proactive customer service benefits (leak, tamper, and backflow detection)
E-Coder)R900i Programming

The E-Coder)R900i is NOT field-programmable. At the factory, each of the following items is programmed into the MIU:

- Serial number - Each MIU is given a unique 10-digit serial number/identification number.
- Meter size and change gear information.

RF Protocol Error Detection

The RF protocol is comprised of a header, data packet, and an error detection mechanism that reduces the erroneous data.

RF Frequency Control Algorithm

The MIU’s frequency-hopping spread-spectrum (FHSS) has a sequence of at least 50 different channels for transmitting data. Associated with the 50 channels are 50 frequencies that are pre-selected in a pseudo-random manner. These 50 frequencies are coded into the software.

RF Transmission Period and Randomness

The random period generation uses the same random seed created for the channel definition to generate the transmission randomness. The randomness algorithm is defined so that no two consecutive transmissions from two MIUs interfere with one another.

Inside and Pit Versions

The E-Coder)R900i comes in a pit version with a roll sealed metal body and the inside version comes in a laser sealed plastic body.
2 Specifications

This section provides you with the specifications for the E-Coder)R900i.

Electrical Specifications

| Power          | Lithium battery |

Transmitter Specifications

| Transmit Period                        | Every 14 seconds - standard mobile message. |
| Transmitter Period                     | Every seven and one-half minutes - standard, high power, fixed network message. |
| Transmitter Channels                   | 50 |
| Channel Frequency                      | 910-920 MHz |
| Output Power                           | Meets FCC Part 15.247 |
| FCC Verification                       | Part 15.247 |

Environmental Conditions

| Operating Temperature                  | -22°F to 149°F (-30º to 65ºC) |
| Storage Temperature                    | -40°F to 158°F (-40º to 70ºC) |
| Operating Humidity                     | 0 to 100% Condensing (pit only) |

Functional Specifications

| Register Reading                       | 8 digits (AMR) |
| MIU ID                                  | 10 digits |

8 digits (Visual) |

9 digits (AMR) |

9 digits (Visual) |

10 digits |

Dimensions and Weight

| Dimensions                          | Refer to Figure 2 and Figure 3. |
| Weight                              | Inside - 1.39 lbs. (630.5 grams) |
|                                     | Pit - 1.62 lbs. (734.8 grams) |
E-Coder)R900i Dimensions

The following diagrams show both the inside and pit dimensions for the E-Coder)R900i.

![Figure 2 E-Coder)R900i Inside Dimensions](image)

![Figure 3 E-Coder)R900i Antenna Dimensions](image)
3 General Installation Guidelines

This section describes tools, materials, and general installation information for the E-Coder)R900i.

Tools and Materials

Table 1 shows the recommended tools you need to successfully install the E-Coder)R900i.

It is possible that some items do not apply to your specific installation, or the list does not contain all required tools or materials.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description/ Recommendation</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool Kit</td>
<td>Contains standard tools</td>
<td>Perform various installation procedures. Wrench used in connecting TTL antenna to F-connector.</td>
</tr>
<tr>
<td></td>
<td>including:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Screwdrivers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hammer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Pliers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Wrench</td>
<td></td>
</tr>
<tr>
<td>Flashlight</td>
<td></td>
<td>Activate the LCD.</td>
</tr>
</tbody>
</table>

Safety and Preliminary Checks

Observe the following safety and preliminary checks before and during each installation:

- Verify that you are at the location specified on the site work order.
- Verify that the site is safe for you and your equipment.
- Notify the customer of your presence, and tell the customer that you need access to the water meter.
- If the site work order does not have an MIU ID number on it, write in the ID number(s) of the MIU you are about to install. If the site work order already has an MIU ID number on it, verify that it matches the ID numbers on the MIU you are about to install.
4 Activating and Reading the E-Coder)R900i

How to Activate LCD Using the Solar Panel

The E-Coder)R900i has a solar panel to power the LCD display. See Figure 4.

Figure 4 Solar Panel for E-Coder)R900i

The solar panel activates the LCD display when the unit is exposed to a light source. If the LCD does not reactivate as expected, try shining a flashlight on the light sensor. See Figure 5.

Figure 5 Activating E-Coder)R900i
How to Read

It is important to become familiar with the information available from the meter. To identify this information the following icons and displays are helpful.

Table 2 Icons and Displays

Flow/Leak Indicator shows the direction of flow through the meter:

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>Water in use.</td>
</tr>
<tr>
<td>OFF</td>
<td>Water not in use.</td>
</tr>
<tr>
<td>Flashing</td>
<td>Water is running slowly/low flow indication.</td>
</tr>
</tbody>
</table>

Leak indicator displays a possible leak:

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>No leak indicated.</td>
</tr>
<tr>
<td>Flashing</td>
<td>Intermittent leak indicated. Water used during at least 50 of the 96 15-minute intervals during the previous 24-hour period.</td>
</tr>
<tr>
<td>Continuous ON</td>
<td>Continuous leak indicated. Water used during all 96 15-minute intervals during the previous 24-hour period.</td>
</tr>
</tbody>
</table>

Nine-digit LCD displays the meter reading in billing units of measure. The number is shown in odometer style, reading left to right.

1 First four digits – Typical billing digits.
2 Last three digits – Testing units used for meter testing
3 Fifth and sixth reading digits – Reading units
Common Causes of Leaks

If the leak indicator is flashing or continuously on, the E-Coder)R900i is indicating that a possible leak can exist. Leaks can result from various circumstances. To better help you identify a possible leak, the following table contains some common causes of leak problems.

Table 3  Possible Leaks

<table>
<thead>
<tr>
<th>Possible Cause of Leak</th>
<th>Intermittent Leak</th>
<th>Continuous Leak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outside faucet, garden or sprinkler system leaking</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>Toilet valve not sealed properly</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>Toilet running</td>
<td></td>
<td>✅</td>
</tr>
<tr>
<td>Faucet in kitchen or bathrooms leaking</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>Ice maker leaking</td>
<td></td>
<td>✅</td>
</tr>
<tr>
<td>Soaker hose in use</td>
<td></td>
<td>✅</td>
</tr>
<tr>
<td>Leak between the water meter and the house</td>
<td></td>
<td>✅</td>
</tr>
<tr>
<td>Washing machine leaking</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>Dishwasher leaking</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>Hot water heater leaking</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>Watering yard for more than eight hours</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>Continuous pet feeder</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>Water-cooled air conditioner or heat pump</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>Filling a swimming pool</td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>Any continuous use of water for 24 hours</td>
<td>✅</td>
<td></td>
</tr>
</tbody>
</table>
How to Tell if Water is in Use

To determine if water is in use, complete the following steps:

1. Check the flow indicator by closely watching it for two minutes.

2. Determine the following conditions:
   • If the arrow is flashing, then water is running very slowly.
   • If the arrow is continuously ON, water is running.
   • If the arrow does not flash, water is not running.

What to Do if There is a Leak

The following checklist can be helpful if the E-Coder)R900i leak indicator shows a possible leak.

Table 4 Checklist for Leaks

<table>
<thead>
<tr>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check all faucets for possible leaks.</td>
</tr>
<tr>
<td>Check all toilets and toilet valves.</td>
</tr>
<tr>
<td>Check the ice maker and water dispenser.</td>
</tr>
<tr>
<td>Check the yard and surrounding grounds for a wet spot or indication of a leaking pipe.</td>
</tr>
</tbody>
</table>
If Intermittent Leak is Repaired

If an intermittent leak is found and repaired, complete the following steps:

1. Check the leak icon after at least 24 hours.

2. If the leak has been correctly repaired, the leak icon changes from flashing to OFF.

Software

A software update is required for the N_SIGHT™ host software to interpret the enhanced data communicated feature from the Neptune E-Coder)R900i.
5 Installing the E-Coder)R900i

This section describes storage and unpacking instructions, preliminary tests, tools, materials, site selection, and inside installation of the E-Coder)R900i.

Prior to Installation

Storage

Upon receipt, inspect shipping containers for damage, and inspect the contents of any damaged cartons prior to storage.

Once the inspection is complete, store the cartons in a clean, dry environment. The unit should be in sleep mode until it is exposed to light.

Unpacking

As with all precision electronic instruments, the E-Coder)R900i should be handled carefully; however, no additional special handling is required. When shipped, the assembly is lying on its side. You should lift the assembly out of the box by the meter main case.

After unpacking the E-Coder)R900i, inspect it for damage. If the E-Coder)R900i appears to be damaged or proves to be defective upon installation, notify your Neptune Territory Manager or Distributor. If one or more items requires reshipment, use the original cardboard box and packing material.

![Figure 6 E-Coder)R900i Installation](image)
Tools Needed

Table 1 on page 5 shows the recommended tools you need to successfully install the E-Coder)R900i.

It is possible that some items do not apply to your specific installation, or the list does not contain all required tools or materials.

Site Selection

Installation and operation in moderate temperatures increase reliability and product life. See “Environmental Conditions” on page 3.

Follow these guidelines when selecting a location to install the E-Coder)R900i:

- The E-Coder)R900i must be installed in a vertical and upright position.
- The selected location should be clear of all obstructions.

Always follow your company’s safety practices and installation guidelines when installing an E-Coder)R900i. Never perform an installation during a lightning storm or under excessively wet conditions.

Installing the E-Coder)R900i

The following are steps for installation of the E-Coder)R900i.

New Meter Installation

1. Flush the service line prior to meter installation in order to remove debris in the line.
2. Place an electrical grounding strap on the service line, connecting the inlet and outlet service lines on either side of the meter setting.

Suitable inlet and outlet meter valves and couplings/setters must be installed if they are not already present. Appropriate space must be allowed in the line for the meter laying length and two coupling gaskets. The pipe ends must be sufficiently aligned so that the coupling and meter threads can engage without binding or cross-threading.
3 Before installing the meter, remove the thread protectors and spud caps. Be sure that no debris enters the meter during installation.

![Use caution; the meter threads are sharp.]

4 Place the coupling gaskets inside the coupling nuts and set the meter in the line. The meter should be in the horizontal position with the register dial facing upward. The direction of flow marked on the meter must agree with the direction of water flow.

5 Start the coupling nuts by hand then use a wrench and tighten sufficiently to prevent leakage. Be careful not to cross-thread the connections.

6 Open the meter outlet valve slowly. Open a down stream faucet and run enough water to dissipate entrained air and flush the line. While the faucet is open, check to see if the meter is operating correctly.

7 Turn off the faucet and check the meter installation for leaks.

8 To activate the LCD and begin the transmissions, open the LCD cover to let the sunlight shine on the display. If this is in a basement, you can use a small flashlight over the solar panel.

![The solar panel is located in the center of the faceplate.]

**Retrofit Meter Installation**

1 Use a punch/screwdriver and hammer to punch out the tamper proof seal pin on the existing register head.

2 Remove the existing register by twisting counter-clockwise.

3 Install the new E-Coder)R900i register head onto the meter body in the desired orientation by twisting clockwise.

4 Activate the E-Coder)R900i as described in “Activating and Reading the E-Coder)R900i” on page 6.

5 Snap the new tamper-proof seal pin to secure the register to the meter body.
Connecting the Optional E-Coder)R900i Through-the-Lid Antenna

E-Coder)R900i is equipped with a standard internal antenna that works well for most mobile meter reading applications. However, for fixed network applications, Neptune recommends use of the optional, external through-the-lid antenna which can also be used to improve mobile performance.

When ordering an external antenna for the R900i units, Neptune recommends at least a 6 foot cable to allow for easy removal of the pit lid when necessary.

Before Connecting the Antenna

1. Remove the pit lid from the pit box.

The existing pit lid requires a 1¾-inch diameter hole to be drilled or cut into the lid or the pit lid needs to be replaced with a lid that contains a hole.

2. Unscrew the connector nut from the top of the connector housing on the existing whip antenna.

3. Remove the connector housing by turning it counter-clockwise ¼ turn to remove.

4. Remove the flat black rubber washer from the base of "F" connector.

5. Unscrew the whip antenna from the "F" connector.

6. Remove the through-the-lid antenna components from the plastic bag.
Installing the Antenna

1. Insert the antenna cable and housing through the 1¾-inch hole in the meter pit lid. See Figure 8.

2. Thread the locking nut onto the antenna (smooth end towards lid). See Figure 9.

3. Hand tighten the nut securely to the lid. See Figure 10.
Figure 11 shows a completed installation of the antenna.

Attaching Antenna to MIU

1. Remove the dust cover from the “F” connector. See Figure 12.

2. Place the flat black rubber washer on the MIU around the male coax connection. See Figure 13.

3. Apply a coating of Novaguard around the base of the “F” connector and on the flat black rubber washer.
4 Using a torque wrench, connect the coaxial cable connector to the “F” connector on the MIU/register housing, tightening it to 15 inch-pounds. See Figure 14.

5 Make sure the washer is properly seated. Connect the plastic connector housing to the 3-lobed black plastic latch plate. See Figure 15.

6 Slide the black conical-shaped gasket down the cable until it engages the connector housing. See Figure 16.

7 Tighten the connector nut onto the threaded portion of the connector housing. This connection should be hand-tight. Do not use pliers.

Upgrading the E-Coder R900i Antenna

To upgrade the E-Coder R900i antenna, remove the existing or damaged antenna, and follow instructions provided in the previous sections.
6 Data Logging Extraction

About Data Logging

The E-Coder)R900i is capable of storing interval data for data logging and retrieving this data through RF activation. The E-Coder)R900i is activated using the Trimble Nomad and R900® Belt Clip Transceiver (BCT) and is explained in more detail in the following section.

The E-Coder)R900i stores consumption in hourly intervals for a rolling total of 96 days. This is equal to 2,304 hourly intervals of consumption. The data logging data can be extracted through radio frequency (RF) activation. The RF activation allows the utility workers to visit the location and extract the data without physically interacting with the meter itself. This limits exposure by the worker to animals, or dangerous situations. The extraction process, once started, only takes about 30 seconds. The activation is done through the HHU connected to the R900 BCT via Bluetooth. The activation signal is sent by the R900 BCT to the E-Coder)R900i which in turn sends the data intervals to the R900 BCT and are saved in the HHU.

Accessing Data Logging

Complete the following steps for data logging.

1. From the host software home screen on the HHU, click **MENU**. See Figure 17.
2 From the HHU Menu screen, click **UTILS** (option 4). See Figure 18.

3 Click **DATA LOGGER** (option 9). See Figure 19.
4 Type your reader ID and password (if applicable) for the host software. Click LOGIN. See Figure 20.

---

**Initializing the Data Logger**

1 Verify the time is correct, and click YES. See Figure 21.

The HHU must be synchronized prior to data logging in order to set the clock.
2. The Initialize Device screen appears if you are not connected or you are not in range of your Belt Clip. Click **INITIALIZE**. See Figure 22.

3. Select **RF** and type the MIU ID. See Figure 23.

   ![Initialize RF Device](image1)

   Figure 22 Initialize RF Device

   ![Enter MIU ID](image2)

   Figure 23 Enter MIU ID

   You can type the MIU ID with the number pad keys or expand the on-screen keyboard.
4 After you type the MIU ID, click **CAPTURE**. See Figure 24.

5 A prompt appears for you to provide meter size and unit of measure. Type this information now and click **OK**. See Figure 25.
Initiating RF Activated Data Logging

1. Click **START** to initiate RF activated data logging. See Figure 26.

![Figure 26 Start Button](image)

The R900 BCT activates the E-Coder)R900i and listens for the data logger to start transmitting. See Figure 27.

![Figure 27 Listening for Data](image)
The screen displays the data received. See Figure 28.

2 After the data logging process is completed, choose the meter size (see Step 5 on page 22).

3 Click GRAPH (see Figure 29) to display the data in a graph. Examples of graphs are shown in Figure 30 on page 25.

The HHU processes and saves the data. After closing the data logging screen, the unit performs a backup.
Sample Data Logging Graphs

The following are two examples of the graphs that can be produced with data logging.

![Graph Example 1](image1)

![Graph Example 2](image2)

**Figure 30  Examples of Data Logging Graphs**

<table>
<thead>
<tr>
<th>Color Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 red</td>
<td>Intermittent Leak</td>
</tr>
<tr>
<td>2 red</td>
<td>Continuous Leak</td>
</tr>
<tr>
<td>1 gray</td>
<td>Minor Backflow</td>
</tr>
<tr>
<td>2 gray</td>
<td>Major Backflow</td>
</tr>
<tr>
<td>Blue bars</td>
<td>No Flags</td>
</tr>
<tr>
<td>Red bars</td>
<td>Leak</td>
</tr>
<tr>
<td>Gray bars *</td>
<td>Backflow</td>
</tr>
</tbody>
</table>

* If the Backflow flag and the Leak flag appear at the same time, Backflow (Gray bars) has precedence over Leak.
Off Cycle Data Extraction

Off cycle reads are 96 days of daily reads. This allows the utilities to retrieve move-out reads or monitor vacant usage to prevent theft.

To navigate to the off cycle function, complete the following steps.

1. From the host software home screen on the HHU, click **MENU**. See Figure 31.

2. From the HHU menu screen, click **UTILS** (option 4). See Figure 32.
3 Click **OFF CYCLE** (option 4). See Figure 33

4 Type the read ID and/or the password.

5 Click **LOGIN**.

6 Confirm date and time are correct.

7 Click **YES**.

**Belt Clip Transceiver**

To pair the belt clip transceiver (BCT), complete the following steps.

1 Change date if you have a specific day to target.

2 Click **INITIALIZE** to pair with R900 BCT.

3 Type the MIU ID.

4 Click **CAPTURE**.

The reads come in just like the data logger reads. The data logger has 96 days of hourly reads and off cycle has 96 days of daily reads.
7 Maintenance and Troubleshooting

This section takes you through maintenance and troubleshooting procedures for the E-Coder(R900i).

Six and Four Wheel Encoders

Six-Wheel Encoder Normal Operation

If the odometer reads 123456, the display should show 1 2 3 4 5 5 0 0.

Note that the sixth digit displayed is a five if the last digit on the odometer is five through nine. The sixth digit is zero if the last digit on the odometer is zero through four. The E-Coder(R900i) adds and additional two zeros on the end to provide an eight digit reading to the host software.

Four-Wheel Encoder Normal Operation

If the odometer reads 123456, the display should show 1 2 3 4 0 0 0 0.

The E-Coder(R900i) adds an additional four zeros on the end to provide an eight digit reading to the host software.

Troubleshooting

This section provides examples of possible reading values and what they indicate.

Table 6 Examples of Reading Values

<table>
<thead>
<tr>
<th>Reading Value</th>
<th>Definition</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>..............</td>
<td>Failure to retrieve reading</td>
<td>• Because this usually indicates a cut wire, check the connection between the register and MIU.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• If using a non-autodetect ProRead register, verify that it has been programmed for three wire mode.</td>
</tr>
<tr>
<td>??????????</td>
<td>Indicates an ambiguous, bad read, replaces ........ and HHHHHHHHH</td>
<td></td>
</tr>
</tbody>
</table>
### Table 6 Examples of Reading Values

<table>
<thead>
<tr>
<th>Reading Value</th>
<th>Definition</th>
<th>Troubleshooting</th>
</tr>
</thead>
</table>
| MMMMMMMMMM    | Indicates out of range reading (>999999999), diagnostic code from the MIU | • Indicates that no meter reading history is available.  
• Swipe the MIU with a magnet to force the MIU to read the register. |
| UUUUUUUU      | Indicates undefined out of range reading, corrupt valve | |
8 Contact Information

Contact Information

Within North America, Neptune Customer Support is available Monday through Friday, 7:00 AM to 5:00 PM Eastern Standard Time by telephone, e-mail, or fax.

By Phone

To contact Neptune Customer Support by phone, complete the following steps.

1 Call (800) 647-4832.

2 Select one of the following options:
   • Press 1 if you have a Technical Support Personal Identification Number (PIN).
   • Press 2 if you do not have a Technical Support PIN.

3 Enter the six digit PIN number and press #.

4 Select one of the following options.
   • Press 2 for Technical Support.
   • Press 3 for maintenance contracts or renewals.
   • Press 4 for Return Material Authorization (RMA) for Canadian Accounts.

You are directed to the appropriate team of Customer Support Specialists. The specialists are dedicated to you until the issue is resolved to your satisfaction. When you call, be prepared to give the following information.

• 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.

By Fax

To contact Neptune Customer Support by fax, send a description of your problem to (334) 283-7497. Please include on the fax cover sheet the best time of day for a Support Specialist to contact you.

By Email

To contact Customer Support by email, send your email message to hhsupp@neptunetg.com.
Appendix A: E-Coder)R900i Flags

Description of Flags

Two tables in this appendix describe the volume represented by the 8th digit by meter size, and the flags used the by the E-Coder)R900i.

Table 7  8th Digit Resolution by Meter Size

<table>
<thead>
<tr>
<th>Register Size</th>
<th>8th Digit Resolution - Least Significant Digit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential (5/8&quot; - 1&quot; T-10)</td>
<td>1/10 Gallon or 1/100 Cubic feet</td>
</tr>
<tr>
<td>Light Commercial and Industrial</td>
<td></td>
</tr>
<tr>
<td>(1-1/2&quot; and 2&quot; T-10; 1-1/2&quot; - 4&quot; HPT)</td>
<td>1 Gallon or 1/10 Cubic feet</td>
</tr>
<tr>
<td>Large Commercial and Industrial</td>
<td></td>
</tr>
<tr>
<td>(6&quot; - 12&quot; HPT, HPPII and TRU/FLO)</td>
<td>10 Gallons or 1 Cubic feet</td>
</tr>
<tr>
<td>Large Commercial and Industrial</td>
<td></td>
</tr>
<tr>
<td>(16&quot; - 20&quot; HPT)</td>
<td>100 Gallons or 10 Cubic feet</td>
</tr>
</tbody>
</table>

Table 8  E-Coder)R900i Flags

<table>
<thead>
<tr>
<th>Backflow Flag (Resets After 35 Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on reverse movement of the 8th digit. 8th digit is variable based on the meter size.</td>
</tr>
<tr>
<td>No backflow event</td>
</tr>
<tr>
<td>Minor backflow event</td>
</tr>
<tr>
<td>Major backflow event</td>
</tr>
</tbody>
</table>

continued on next page
### Leak Status Flag (Resets After 35 Days)

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leak icon off</td>
<td>8th digit incremented less than 50 of the 96 15-minute intervals</td>
</tr>
<tr>
<td>Flashing leak icon</td>
<td>8th digit incremented in 50-95 of the 96 15-minute intervals</td>
</tr>
<tr>
<td>Solid leak icon</td>
<td>8th digit incremented in all of the 96 15-minute intervals</td>
</tr>
</tbody>
</table>

### Consecutive Days with Zero Consumption Flag (Resets After 35 Days)

Number of days the “leak status” was at a minimum value
### Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>antenna (pit)</td>
<td>The MIU antenna used for pit installations.</td>
</tr>
<tr>
<td>conical-shaped gasket</td>
<td>The cone-shaped rubber gasket on antenna cable used to seal cable at top of connector housing.</td>
</tr>
<tr>
<td>connector housing</td>
<td>The black plastic 1/4-turn connector used to waterproof antenna cable connection to pit MIU.</td>
</tr>
<tr>
<td>connector nut</td>
<td>The black plastic nut used to depress conical-shaped gasket and seal antenna cable at the top of connector housing.</td>
</tr>
<tr>
<td>flat washer</td>
<td>The washer used to seal cable connector housing to pit MIU.</td>
</tr>
<tr>
<td>Liquid Crystal Display (LCD)</td>
<td>The component where the meter reading and value-added icons are displayed.</td>
</tr>
<tr>
<td>MIU</td>
<td>Meter Interface Unit.</td>
</tr>
<tr>
<td>register read time</td>
<td>The default time is 15 minutes for all registers. Custom time is not available.</td>
</tr>
<tr>
<td>seal pin</td>
<td>The small black plastic nail used to secure the E-Coder)R900i to the meter.</td>
</tr>
<tr>
<td>serial number</td>
<td>A unique identification number given to each MIU at the factory. The default value is the last programmed plus one. Custom serial numbers are not available.</td>
</tr>
<tr>
<td>transmission time</td>
<td>The time between MIU transmissions. The default is approximately fourteen (14) seconds. Custom time is not available.</td>
</tr>
</tbody>
</table>
Index

A
activate, solar panel 6
air conditioner, leaks 8
algorithm, RF frequency control 2

C
checklist, for leaks 9
common causes of leaks 8
contact customer support 30

D
damage, in shipping 11
data logging, about 18
dimensions 4
   inside (illus) 4
   pit(illus) 4
dishwasher, leaks 8

E
E-Coder)R900i
general description 1
install inside version 11
reading 6
serial number 2
software for advanced features 10
specifications 3
storage 11
tools and materials 5
unpacking 11

F
faceplate 13
faucet
   kitchen leaks 8
   leaks 8
flashing, indicator 7
flow indicator 9
flow/leak indicator 7
frequency 2

G
garden, leaks 8
general description 1

H
handling, unpack 11
heat pump, leaks 8
heating, leaks 8
HHU
   set the clock 20
   synchronized 20
hose, leaks 8
hot water, leaks 8

I
ice-maker, leaks 8
icon
   LCD 7
   leak 7, 9
indicator
   flashing 7
   flow/leak 7
   possible leak 7
inspect, E-Coder)R900i 11
installation
   general information 5
   positioning of MIU 12
   preliminary checks 5
   preparing for 8
   safety 5
   site selection, guidelines 12
   site selection, inside version 12
   intermittent leak 7, 10

L
LCD display
   9-digit 7
   activate 6
LCD icon 7
LCD, definition 33
leak icon 7, 9
leak, intermittent indicator 7
leaks
   common causes 8
   found 9
   intermittent 10
   repaired 9, 10
Liquid Crystal Display 33
Index

M
maintenance 18
MIU ID number 5
MIU, definition 33

P
pet feeder, leaks 8
possible leaks
  common causes 8
  what to do 9

R
R900 Belt Clip Transceiver (BCT) 18
read E-Coder)R900i 6
return of damaged unit 11
RF
  band 1
  frequency 2
  protocol, error detection 2
  transmission 2

S
safety practices 12
serial number 2
software, for advanced features 10
solar panel 6
sprinkler, leaks 8
storage 11
support, contact customer support 30
swimming pool, leaks 8

T
testing the installation 18
toilet, leaks 8
tools and materials, recommended 12
transmission
  randomness 2
  RF 2
Trimble Nomad 18

W
washing machine, leaks 8
water in use, determine 9