Badger Meter

# ORION® CE Serial Repeater

## For Trimble® Ranger 3

ORI-UM-01140-EN-02 (February 2015)

# User Manual

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# INTRODUCTION

## Audience and Purpose

The ORION® CE Serial Repeater ("Repeater") is a receiver/transmitter that is used to increase transmission range of ORION Classic (CE) water or gas endpoints. The ORION CE Repeater Programmer 1.3.0 software application is designed for use with the Trimble® Ranger 3 handheld computer ("handheld") for programming the Repeater to receive and send transmissions from ORION CE endpoints. The instructions in this document are intended for utilities who use the Repeater for mobile meter reading.

## System Information

### Serial Repeater

The Repeater is a receiver/transmitter that can be used to increase transmission range of any ORION CE water or gas endpoint. Repeaters are typically installed in network applications to increase the endpoint performance in remote areas where the endpoint is installed far away from the collection device. Transmissions are received from an ORION endpoint and then re-transmitted by the Repeater.

With its plastic enclosure, the Repeater can be placed indoors or in a non-submersed outdoor location. A size D lithium battery provides power. The unit is shipped in the OFF mode.

### Software Application

The ORION CE Repeater Programmer software application is designed to be easy to operate on the handheld. Buttons on the software screens are activated by touch. Use the stylus that comes with the handheld or you can simply tap the screen with your finger. The handheld keypad can be used to manually enter serial numbers and other information on the screens.

For complete information about the handheld operation, refer to the ORION Field Application User Manual for Trimble Ranger, available at *www.badgermeter.com*.

## Narrow Band / Frequency Hopping

You can read and program endpoints into the Repeater using narrow band or frequency hopping technology, based on the endpoint type you are adding to the Repeater. During the endpoint list setup, the Repeater listens for approximately 120 seconds in frequency hopping mode or 12 seconds in narrow band mode. Refer to *"Endpoint Broadcast Type" on page 27* to see instructions for choosing narrow band or frequency hopping.

## Positioning the Serial Repeater

The purpose of the Repeater is to receive and re-transmit signals from meter/endpoints whose signals are not being received where needed—near the road, for example. This might be due to distance alone, obstructions or a combination.

Ideally, the Repeater should be placed within clear, line-of-sight path of the ORION gas or water endpoints it is programmed to receive signals from. However, this is not always possible. Obstructions such as trees, shrubbery, buildings, decks, vehicles and uneven terrain are often present and might affect reception and transmission.

Obstructions might also change. Different seasons, increasing vegetation and new construction are among the factors that can affect a Repeater's performance.

**NOTE:** It is important to test the Repeater to make sure it is able to receive the signals that need to be retransmitted and to verify that its transmissions are received in the desired location. Another handheld or other receiver device is required for testing.

Once programmed, the Repeater re-transmits all the signals it hears from the endpoints.

## Programming the Serial Repeater

The ORION Serial Repeater can be programmed in the field using the Serial Repeater Programmer software application. The Repeater can also be programmed at the utility office if the required endpoint serial numbers are known but the Repeater must be tested in the location where it is being used.

## About This Manual

This manual includes instructions for the following procedures.

- Programming the Repeater to receive transmissions from specific endpoints.
- Testing to make sure the Repeater is receiving the correct transmissions.
- Verifying the Repeater's re-transmissions are being received.

### Typographic Conventions

- Items you will be asked to select or choose by clicking a button, highlighting, checking a box or another similar means are in **bold** text and capitalized in the manual.

  Example: Click the **View Report** button.

- Names of options, boxes, columns, fields, and sections are *italicized*. In most cases, first letters will be capitalized.

  Example: The information is noted in the *Meter Reading Cycle* field.

- Messages and special markings are italicized and in quotation marks, with first letters capitalized.

  Examples*: "Service Stopped"* displays in the title bar.

# HANDHELD SETUP

Before using the software to program the Repeater, connect the serial port on the handheld to the port inside the Repeater with the supplied DB9 null modem cable (PN: 62159-006).

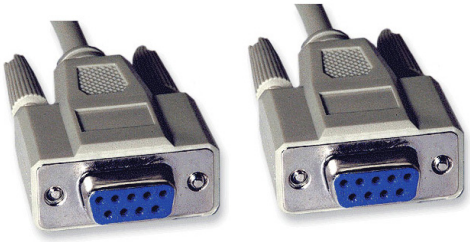

*Figure 1: DB9 null modem cable connector ends*

1. Using a screwdriver, loosen the four screws on the Repeater and remove the cover.
2. Connect one end of the DB9 cable to the port on the Repeater circuit board.

   The words "NULL MODEM CABLE ONLY" appear above the cable port on the Repeater circuit board as shown in *Figure 2*.

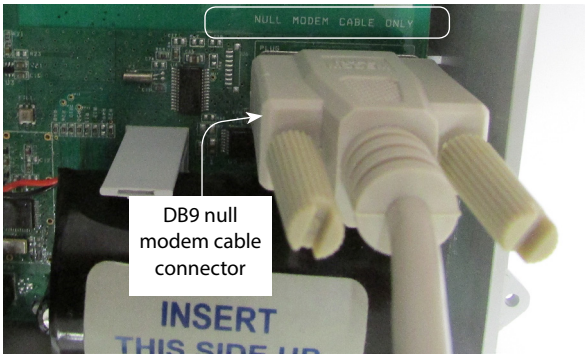


*Figure 2: Close up of DB9 cable connected to Repeater circuit board port*

3. Connect the other end of the DB9 cable to the serial port on the bottom of the handheld. The setup should look like the example in *Figure 3*.

   **IMPORTANT**

   *The COM port for the Repeater must be set correctly for the handheld and the software to operate correctly. See* *"SETTING COM Ports" on page 12*

*Figure 3: Repeater connected with DB9 to handheld*

# PROGRAM STARTUP AND EXIT

1. Press the green power key on the keypad to turn on the handheld.
2. On the Windows® home screen, tap the **Start** button in the left corner of the navigation bar at the bottom of the screen.

   *Result: The Windows desktop displays.*

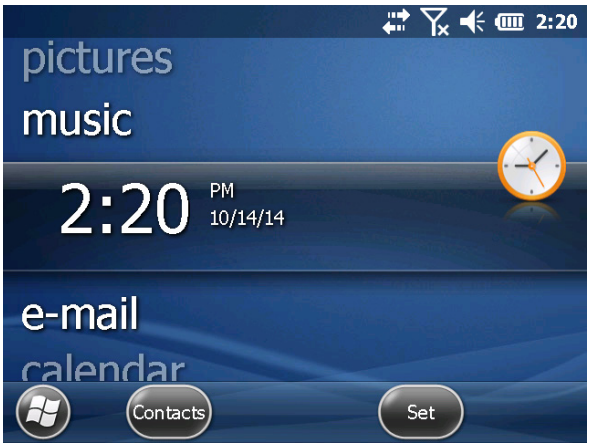


*Figure 4: Windows home screen*

3. Tap the **Badger Meter Applications** folder.

*Figure 5: Windows desktop*

4. Tap **ORION CE Repeater Programmer** to open the application.

   *Result: The Verify Date and Time screen opens.*

*Figure 6: Badger Meter Applications*

**NOTE:** The first time you access the application, the License Agreement screen opens automatically.

The License Agreement must be accepted by an authorized representative of the customer/licensee.

Read the agreement and tap **I Accept**.

The License Agreement screen closes automatically. To see the License Agreement at any time, tap the **Menu** button in the navigation bar at the bottom of the screen after login.

*Figure 7: Software License*

5. Verify the date and time shown on the screen. The time continually updates.

   **NOTE:** The date and time on the handheld must be accurate to ensure communication with the ORION endpoints.

   If the date and time are correct, tap **Ok** and continue to step 8.

   If the date and time need to be adjusted, tap Change Time.

   *Result: A screen opens as shown in Figure 9.*

*Figure 8: Date and Time*

6. Tap the arrows to make changes to the date, time and/or time zone as needed. Then tap **OK**.

   *Result: The Clock & Alarms screen closes and the Windows home screen is displayed.*

7. Go back to step 2 and restart the application.

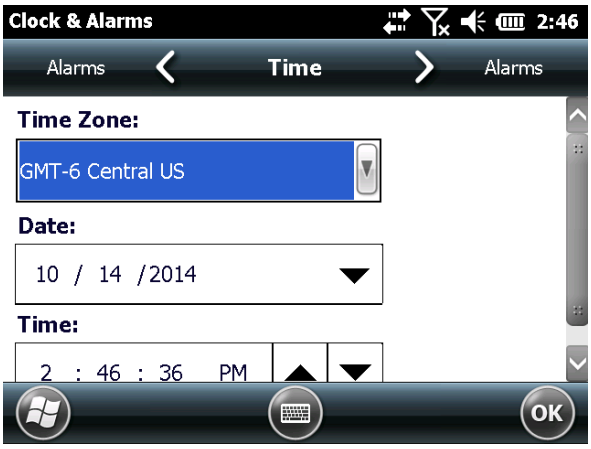


*Figure 9: Adjust date and/or time*

8. Using the keypad, enter a three…seven personal identification number (PIN).

   **NOTE:** The PIN must be entered by an authorized representative of the customer/licensee. The PIN is user defined and can be a name, initials, an ID number or other information.

9. Tap **Ok** or press **ENTER** on the keypad.

   **NOTE:** If an invalid PIN is entered, the **Ok** button will not activate. Re-enter a valid PIN and tap **Ok** or press **ENTER**.

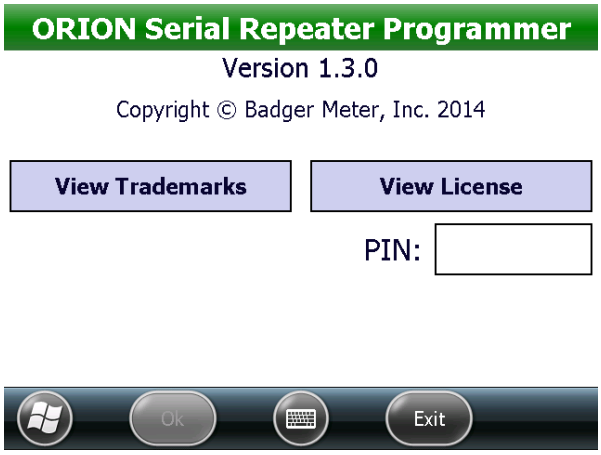


*Figure 10: Login screen*

*Result: The Repeater Programmer main menu opens. The software is ready to use.*

## Exiting the Software

To exit the software application, tap the **Exit** button in the navigation bar of the screen. If the **Exit** button does not display, tap **Menu**> **Exit**.

# MAIN MENU

The main menu is the starting point for all ORION CE Serial Repeater Programmer operations.

*Figure 11: Main menu*

## Menu Options

**Read/Program**

The **Read/Program** option is used to enter and program up to 12 endpoint serial numbers into the Repeater. **Read** initiates communication with the Repeater. **Program** stores the endpoint serial numbers in the Repeater. See *"Read/Program" on page 13*.

**NOTE:** A feature called **Automatically Listen** is available in Settings. When selected, **Read/Program** can be used not only to set up the Repeater endpoint list but also to check that the Repeater is hearing the programmed endpoints and sending the signals to the desired reading location. When **Automatically Listen** is not selected in Settings, the next two options on the main menu—ORION CE REPEATER LISTEN and ORION CE REPEATER TRANSMIT—can be used to check that the Repeater is hearing the programmed endpoints and sending signals to the desired reading location. See *"Automatically Listen" on page 27* for more information.

**ORION CE Repeater Listen**

Determines the best location for the Repeater to hear the signals from the programmed endpoints. See *"ORION CE Repeater Listen" on page 22*.

**ORION CE Repeater Transmit**

Transmits a programmed endpoint signal from the Repeater to ensure a handheld or laptop with Quick Read software can hear the transmissions. See *"ORION CE Repeater Transmit" on page 23*.

**Settings**

Set or change the communication (COM) ports, choose the endpoint broadcast type and set the Repeater to automatically listen for incoming signals. See *"Settings" on page 24*.

**NOTE:** The Repeater must be configured and the COM port(s) must be set correctly on the handheld *before* using the software application. See *"SETTING COM Ports" on page 12*.

# SETTING COM PORTS

Before you start using the software functions, go to **Settings**> **Hardware Settings** to set the COM ports for the equipment attached to the handheld.

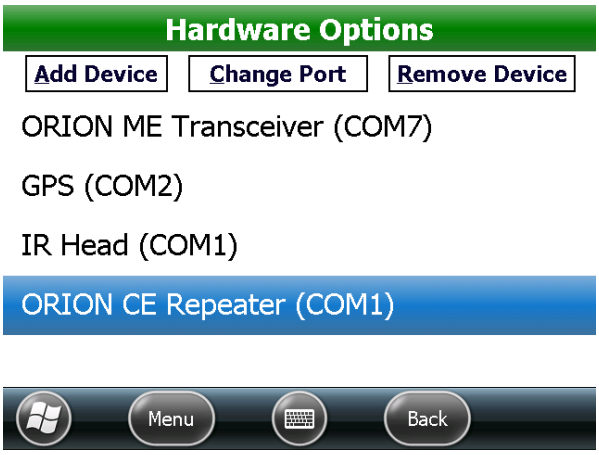


*Figure 12: COM ports for handheld hardware*

## Using an IR Programming Cable

If you use an IR programming cable (IR Head) to read endpoints, you will disconnect the Repeater temporarily while using the IR Head, since they share the nine-pin serial port on the handheld. The IR Head and the ORION CE Repeater will both be assigned to COM 1 as shown in *Figure 12*.

For complete information about the Settings option, see *"Settings" on page 24*.

# READ/PROGRAM

Use **Read/Program** to perform the following tasks.

- Add and store (**Program**) endpoint serial numbers in the Repeater. Up to 12 endpoints can be stored.
- Change (**Edit**) an endpoint serial number.
- Remove (**Clear, Delete**) serial numbers from the Repeater.

1. On the main menu, tap **Read/Program**.
   *Result: A message displays, reminding you to connect the handheld and Repeater using the DB9 NULL modem cable.*
2. Tap the **Read** button (*Figure 13*).
   *Result: The Repeater Setup Step 2 screen displays. On first time use, or when no endpoints are added, the screen is blank as in Figure 14.*

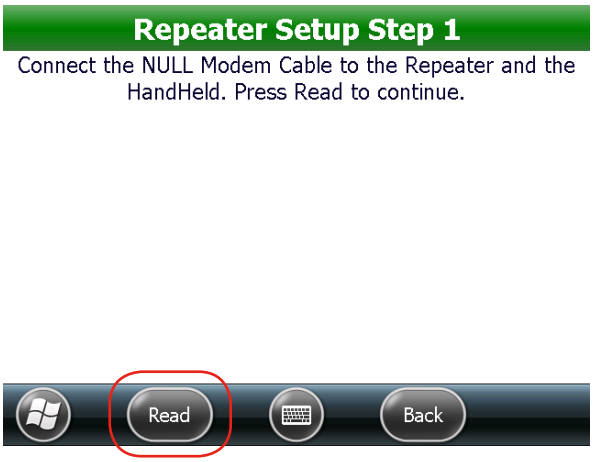


*Figure 13: Connect NULL modem cable*

*Figure 14: Repeater Setup screen*

## Repeater Setup Screen

The Repeater Setup screen (*Figure 14*) is used to add, change and remove endpoint serial numbers and to program endpoint serial numbers. Endpoint serial numbers programmed into the Repeater will display on this screen.

| Repeater Function | Description |
|---|---|
| **Add** | Used to enter an endpoint serial number using an IR programming cable or the handheld keypad. |
| **Listen** | Causes the Repeater to listen and display all ORION CE endpoints within range. |
| **Edit** | Used to change an endpoint serial number. |
| **Clear** | Temporarily removes all endpoints from the list on the screen. Tap **Clear**> **OK**> **Program** to permanently clear the list of endpoints. See *"Clear Endpoint Serial Numbers" on page 20* for more information. |
| **Delete** | Temporarily removes a selected serial number from the list on the screen. Tap **Delete**> **Program** to permanently delete the endpoint. See *"Delete Endpoint Serial Numbers" on page 21* for more information. |
| **Buttons** | |
| **Program** | Stores and saves endpoint serial numbers and broadcast type into the Repeater. The **Program** button is also used to save changes made with the **Clear** and **Delete** options. |
| **Back** | Returns to the previous screen. Any changes that are not programmed on the Repeater Setup screen will not be saved. See *"Back Button" on page 21* for more information. |

# ADDING AND PROGRAMMING ENDPOINTS

You can add and program endpoint serial numbers to the Repeater in one of three ways: with the IR programming cable, the handheld keypad or using the **Listen** feature.

## Adding Endpoints with the IR Programming Cable

1. From the main menu, tap **Read/Program**. Then tap the **Read** button on the screen that displays.
2. Disconnect the DB9 cable from the handheld serial port and connect the IR cable to the handheld serial port.

   **NOTE:** Make sure the COM port is set for the IR cable. See *"Hardware Options" on page 24*.
3. On the Repeater Setup screen, tap **Add**.

   *Result: The Add/Edit Endpoint screen opens with the Serial Number field highlighted as shown in Figure 16.*

*Figure 15: Blank Setup screen*

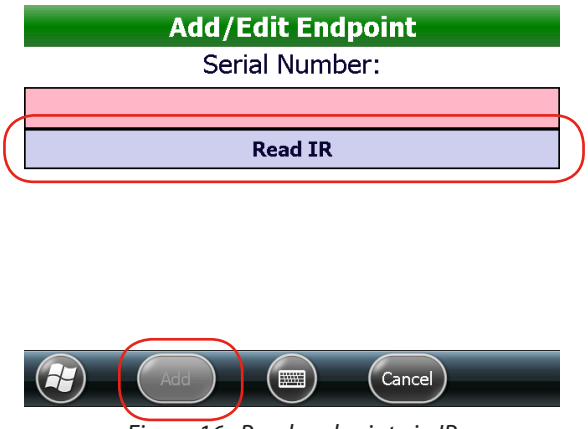


*Figure 16: Read endpoint via IR*

4. Align the optical head of the IR cable with the IR LED port of the endpoint you want to add.
5. Tap the **Read IR** button (*Figure 16*).

   *Result: The serial number is displayed, the **Add** button becomes active and the field is no longer highlighted.*

   **NOTE:** A message displays if you read an endpoint already on the list. See the example in *Figure 17*.
6. Tap the **Add** button at the bottom of the screen to add the endpoint serial number.

   *Result: The Repeater Setup screen (Figure 18) opens showing the endpoint serial number. If you already have a list of endpoints, the new endpoint serial number is added to the list.*

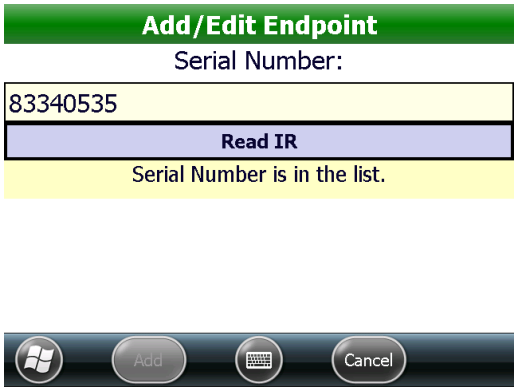


*Figure 17: Duplicate endpoint serial number*

*Figure 18: Serial number added*

7. Repeat steps 3…6 to add additional endpoints.
8. When finished adding endpoints, remove the IR cable and reconnect the DB9 cable to the handheld serial port.
9. Tap the **Program** button.

   *Result: The endpoint serial numbers are now programmed into the Repeater.*

## Adding Endpoints Using the Keypad

**NOTE:** Make sure the DB9 cable is connected to the handheld and the Repeater.

1. From the main menu, tap **Read/Program**. Then tap the **Read** button on the screen that displays.
2. On the Repeater Setup Step 2 screen, tap **Add**.

   *Result: The Add/Edit Endpoint screen opens as shown in Figure 19.*

3. Tap in the highlighted *Serial Number* field and enter an endpoint serial number using the handheld keypad.

   *Result: The field is no longer highlighted when you enter a valid serial number and the **Add** button becomes active.*

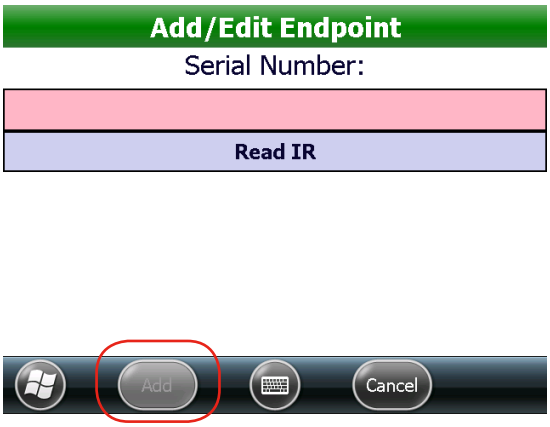


*Figure 19: Add serial number*

4. Tap the **Add** button at the bottom of the screen.

   *Result: The Repeater Setup screen (Figure 20) opens showing the endpoint serial number. If you already have a list of endpoints, the new endpoint serial number is added to the list.*

5. Repeat steps 2…4 to add additional endpoints.
6. Tap the **Program** button.

   *Result: The endpoint serial number(s) are now programmed into the Repeater.*

*Figure 20: Serial number added*

## Adding Endpoints in Listen Mode

During the time the Repeater is in Listen mode, endpoint serial numbers display with the meter/encoder type and additional information, as available. An example of the screen is shown in *Figure 21* when the Listen process is complete.

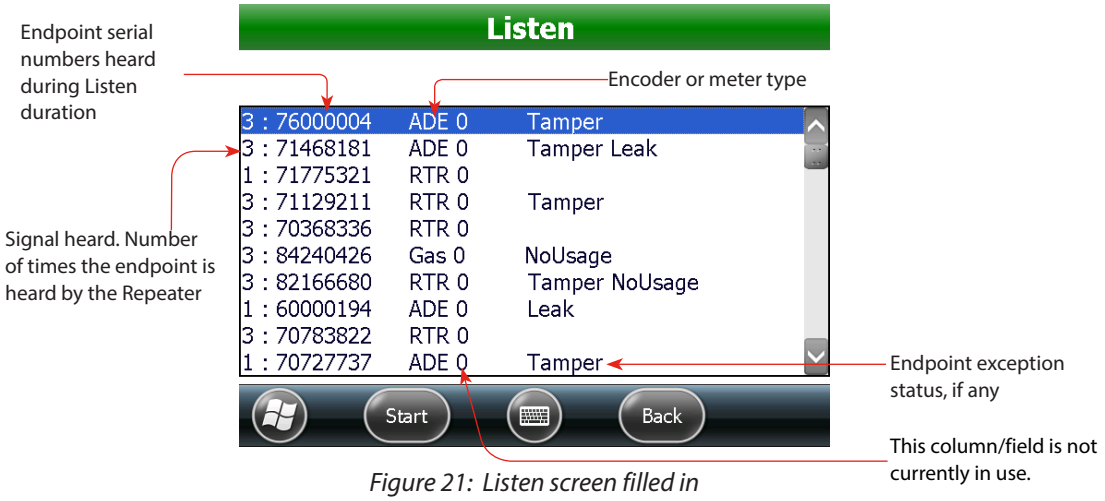


*Figure 21: Listen screen filled in*

The table below describes the column information, from left to right, on the screen shown in *Figure 21*.

| | |
|---|---|
| **Signal Heard** | Number of times the endpoint is heard by the Repeater during Listen mode. |
| **Serial Number** | ORION CE endpoint serial numbers heard during Listen mode. |
| **Encoder/Meter** | The encoder or meter type connected to the endpoint. Options are ADE, RTR or Gas. |
| **Exception Status** | Any status reported by the encoder or meter such as No Usage or Tamper. The status depends on the encoder or meter. |

**NOTE:** The column to the right of the *Encoder/Meter* field is not currently in use.

### Listen Mode

When you select **Listen** on the Repeater Setup screen, the Repeater stays in Listen mode for 120 seconds when using Frequency Hopping, or 12 seconds when using Narrow Band. See *"Endpoint Broadcast Type" on page 27* for additional information.

### Frequency Hopping Channel Selection

*Figure 22: Listen screen*

*Figure 23: Select Frequency Hopping channel*

When the Repeater is programmed to **Listen** using Frequency Hopping, the Listen screen displays the Frequency Hopping channel you are using as a button on the Listen screen. In *Figure 23*, the Listen screen shows the Narrow channel. If you are getting interference on the channel you are using, tap the channel button to select a different Frequency Hopping channel. Options are **Low**, **Narrow** and **High**.

## Procedure

**NOTE:** Make sure the DB9 cable is connected to the handheld and the Repeater.

Follow these steps to add endpoints using the **Listen** option on the Repeater Setup screen. This procedure has instructions for the complete process, including testing the Repeater signal reception from the endpoints and the repeated signal from the Repeater.

**NOTE:** For this procedure, the **Automatically Listen** option is selected in Settings, so the Repeater automatically begins to listen for endpoints again after they are added and programmed.

1. From the main menu, tap **Read/Program**. On the screen that displays, tap the **Read** button.

   *Result: The Repeater Setup screen opens (Figure 24).*

2. Tap **Listen**.

   *Result: The Repeater listens for ORION CE endpoint signals within range. Listen Time Remaining in seconds displays at the top of the screen (Figure 25). The screen fills with endpoint information, including the endpoint serial number, encoder type, reading and any extended status messages.*

*Figure 24: Blank Setup screen*

*Figure 25: Listen in process*

To stop listening at any time, tap **Stop**.

**NOTE:** There may be a second or two delay when you tap **Stop** while the current action completes.

To start listening again, tap **Start.** The countdown starts over again, each time you tap the **Start** button.

3. When the countdown is at 0 (zero), the Repeater stops listening and the **Add** button becomes active. Tap to select an endpoint you want to add to the Repeater.
4. Tap the **Add** button.

   *Result: The endpoint you select is added to a list.*

5. Repeat steps 3 and 4 for each endpoint you want to store in the Repeater, up to 12 endpoints.

**NOTE:** A message displays if you attempt to add more than 12 endpoints (*Figure 26*). Tap **Ok** to close the message screen.

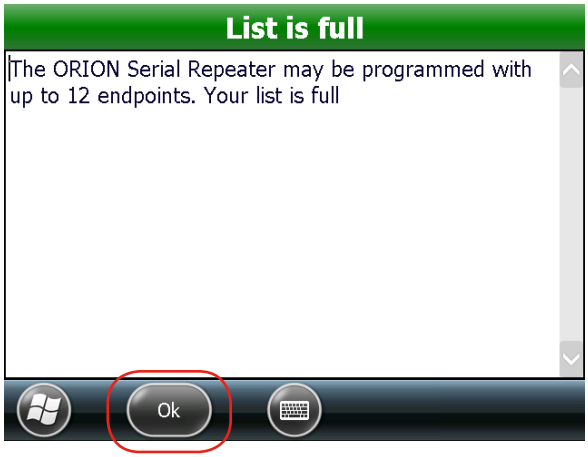


*Figure 26: List full*

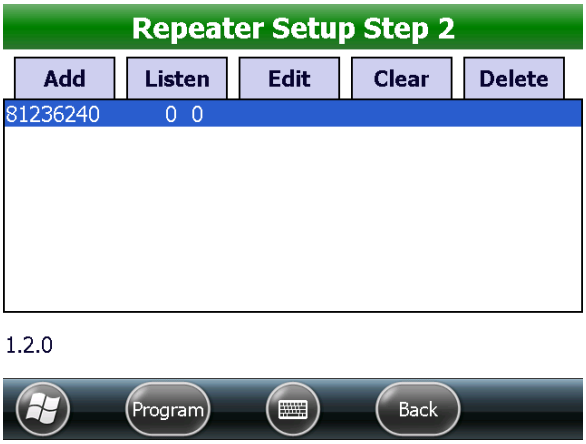


*Figure 27: Endpoint list ready to program*

6. Tap **Back** to see the endpoint list on the Repeater Setup screen.
7. Tap **Program**.

   *Result: The Repeater is programmed with the endpoint(s) you added.*

## Testing the Repeater

8. After programming, Listen - Step 3 displays. When the countdown is at 0 (zero), the Repeater stops listening and the **Next** button becomes active.

   Verify that the endpoints you programmed all display on the screen. If they do not, reposition the Repeater and tap **Start** to listen again.

   **NOTE:** Listen - Step 3 (*Figure 28*) and Transmit -Step 4 (*Figure 29*) only display if **Automatically Listen** is checked in Settings. If not checked, the main menu displays after the endpoints are programmed. You can then select **ORION CE Repeater Listen** and **ORION CE Repeater Transmit** on the main menu to perform the same operations in steps 8…14.

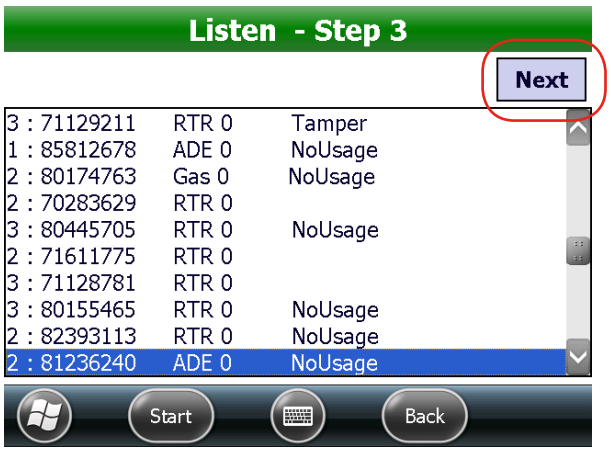


*Figure 28: Verify endpoints*

10. Repeat step 8 until the Repeater hears all the programmed endpoints.
11. Tap the **Next** button at the top right of the screen.

    *Result: The Transmit screen displays (Figure 29).*

### IMPORTANT

*To test the Repeater ability to re-transmit the endpoint signal, you need another handheld or laptop with Quick Read software.*

12. Make changes to the Transmit screen as needed.
    - **Serial Number:** Tap the field to see the list of programmed endpoint serial numbers. Select the endpoint you want to transmit for the test.
    - **Delay Time**: Set the number of seconds you need to delay the transmission. Tap the field to select a Delay Time from 0…105 seconds.

      **Transmit Time:** Set the number of seconds you want the Repeater to transmit the endpoint signal for the test. Tap the field to select a Transmit Time from 5…120 seconds

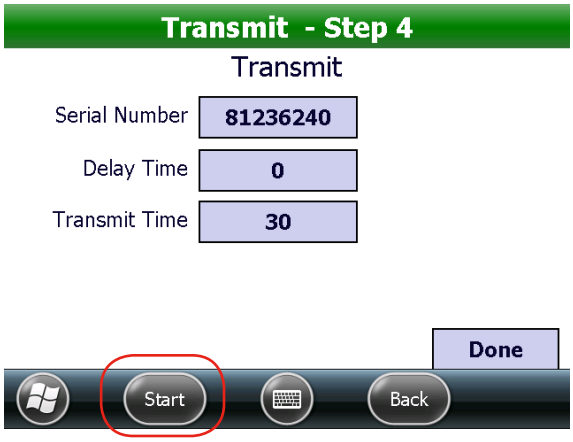


*Figure 29: Set delay and transmit time*

13. Tap **Start**. Then move immediately to the meter reading location to test the Repeater.

    The Repeater starts transmitting the signal of the selected endpoint when the Delay Time counts down, for the amount of seconds you set in Transmit Time.

    Example: If Delay Time is 30 and Transmit Time is 30, the Repeater waits 30 seconds, then re-transmits the endpoint signal approximately every second for 30 seconds.

    After a successful test, you do not need to test another endpoint.

14. Tap **Done**. The main menu is displayed.
15. The Repeater is programmed and ready to use. Unplug the DB9 cable from the Repeater and the handheld and replace the cover on the Repeater.

## Edit Endpoint Serial Numbers

Tap **Edit** to change an endpoint serial number.

1. On the Repeater Setup screen, select the endpoint serial number you want to edit from the list (*Figure 30*).
2. Tap **Edit**.

   *Result: The Add/Edit screen opens with the Serial Number field highlighted (Figure 31).*
3. Tap in the field to activate it and use the keypad to change the serial number. When a valid serial number is entered, the field is no longer highlighted.
4. Tap **Save**.

**NOTE:** If you do not want to make a change, tap **Cancel** to return to the endpoint list.

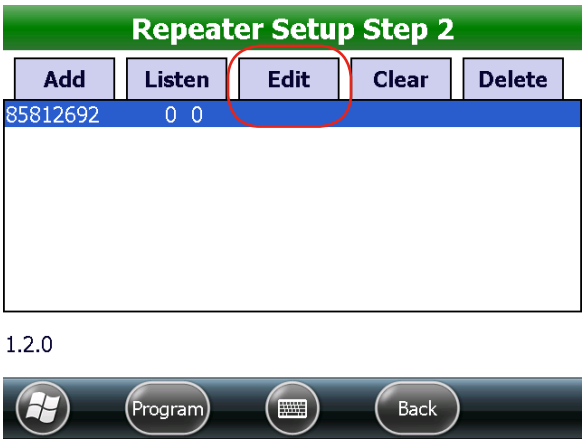


*Figure 30: Select serial number to edit*

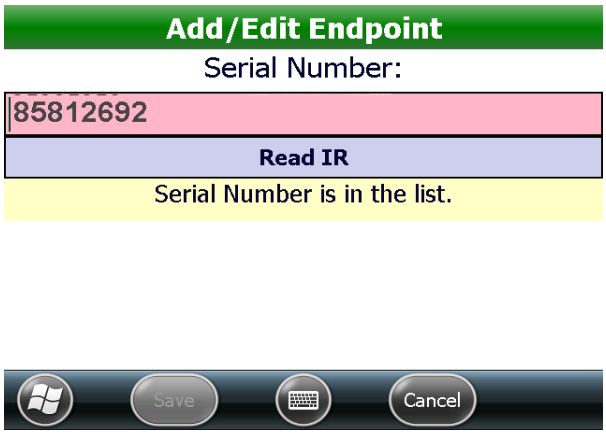


*Figure 31: Change serial number*

## Clear Endpoint Serial Numbers

To remove all endpoints from the list, use the **Clear** button.

1. On the Repeater Setup screen, tap **Clear** (*Figure 32*).
2. On the Verify screen, tap **Ok** to confirm.

   *Result: All endpoints are removed from the list on the screen.*
3. To complete the Clear process, tap the **Program** button.

   *Result: The endpoints are removed from the Repeater.*

   **NOTE:** If the **Automatically Listen** option is selected in Settings, the Repeater automatically begins to listen for endpoints again after tapping **Program**.

*Figure 32: Clear endpoints from the Repeater*

## Delete Endpoint Serial Numbers

Use **Delete** to remove one or more endpoints from the list.

1. On the Repeater Setup screen, tap an endpoint in the list to select it.
2. Tap **Delete**.

   *Result: The endpoint is removed from the list.*
3. Repeat step 1 and 2 for all the endpoints you want to delete.
4. To complete the **Delete** process, tap the **Program** button.

   *Result: The endpoints are removed from the Repeater.*

   **NOTE:** To clear all endpoints from the list, use the **Clear** button instead of **Delete**.

*Figure 33: Remove an endpoint from the list*

## Back Button

When you tap the **Back** button (*Figure 34*) on the Repeater Setup screen, a warning message displays, "All data will be lost" (*Figure 35*).

In the warning message, "data" refers to any changes you made to the screen that have not been programmed. Changes are temporary until you tap **Program**.

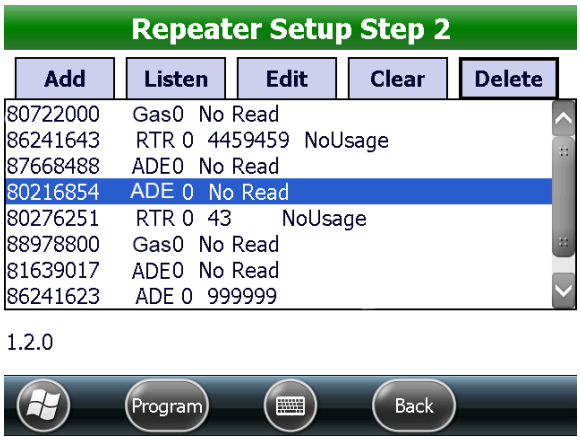


*Figure 34: Repeater Setup screen*

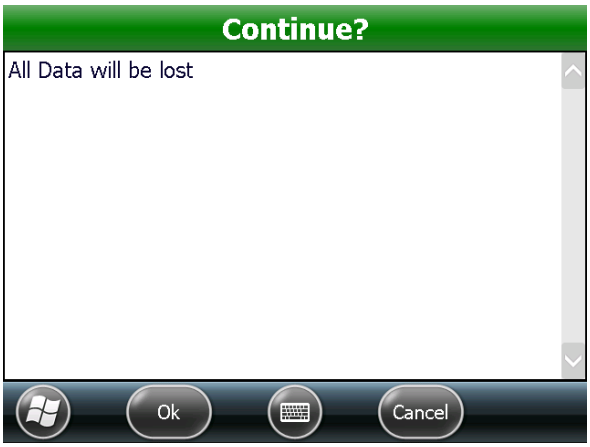


*Figure 35: Data will be lost*

Tap **Ok** to go back to the previous screen.

# ORION CE REPEATER LISTEN

Use this option to verify that the endpoints you programmed are heard by the Repeater. This option is designed to help you determine the best location for the Repeater to receive signals from the programmed endpoints.

**NOTE:** If you performed this operation after programming the endpoints (*"Testing the Repeater" on page 18*), you can skip this procedure.

1. Tap **ORION CE Repeater Listen** on the main menu (*Figure 36*).

   *Result: A message displays, reminding you to connect the handheld and Repeater using the DB9 NULL modem cable.*

2. Tap **Read**.

   *Result: The Listen screen displays without data (Figure 37).*

3. Tap **Start**.

   *Result: A countdown timer displays and the Listen screen begins to fill with endpoints as shown in Figure 38.*

   **NOTE:** *To stop listening, tap **Stop**. To start listening again, tap **Start**. The countdown starts over again, each time you tap the **Start** button.*

*Figure 36: Main menu*

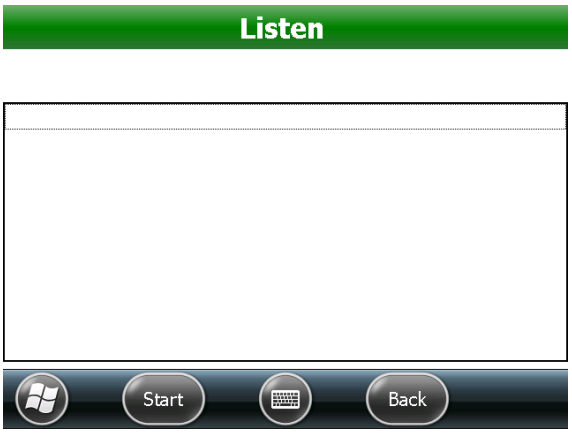


*Figure 37: Listen screen*

*Figure 38: Listen process started*

4. When the countdown timer is at 0 (zero), the Repeater stops listening.

   Verify that all the endpoints you programmed display on the screen. If they do not, reposition the Repeater and tap **Start** to listen again.

   The process is complete when Repeater hears all the programmed endpoints.

*Figure 39: Listen process ended*

# ORION CE REPEATER TRANSMIT

Use this option to test the Repeater ability to re-transmit the endpoint signal to the meter reading location.

**NOTE:** If you already performed this operation after programming the endpoints (*"Testing the Repeater" on page 18*), you can skip this procedure.

## IMPORTANT

*To test the Repeater, you need another handheld or a laptop with Quick Read software.*

1. Tap **ORION CE Repeater Transmit** on the main menu.

   *Result: A message displays, reminding you to connect the handheld and Repeater using the DB9 NULL modem cable.*

2. Tap **Read**.

   *Result: The Transmit screen displays.*

*Figure 40: Transmit*

Adjust the following options on the Transmit screen:

- **Serial Number:** Tap the field to see the list of programmed endpoint serial numbers. Select the endpoint you want to transmit.
- **Delay Time**: Set the number of seconds you need to delay the transmission. Tap the field to select a Delay Time from 0…105 seconds.
- **Transmit Time:** Set the number of seconds you want the Repeater to transmit the endpoint signal for the test. Tap the field to select a Transmit Time from 5…120 seconds

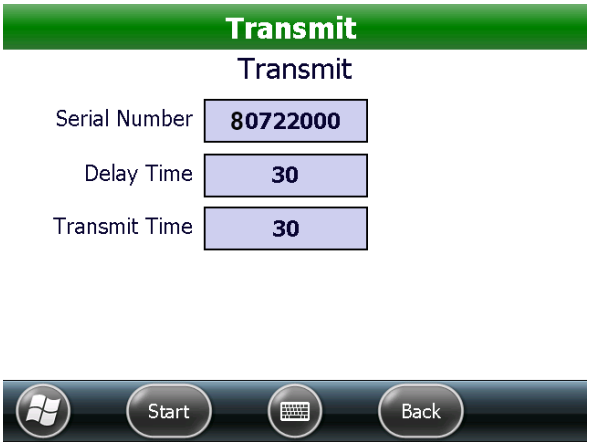


*Figure 41: Select Delay and Transmit Time*

3. Tap **Start**. Then move immediately to the meter reading location to test the Repeater.

   The Repeater starts transmitting the signal of the selected endpoint when the Delay Time counts down, for the amount of seconds you set in Transmit Time.

   For example, if Delay Time is 30 and Transmit Time is 30, the Repeater waits 30 seconds, then re-transmits the endpoint signal approximately every second for 30 seconds.

**NOTE:** At this point, use another handheld or a laptop to perform a Quick Read to verify you are receiving the transmissions from the Repeater.

After a successful test, you do not need to test another endpoint.

4. Tap **Done**. The main menu is displayed.
5. The Repeater is ready to use. Unplug the DB9 cable from the Repeater and the handheld and replace the cover on the Repeater.

# SETTINGS

Choose **Settings** from the main menu to open the Settings menu and view, configure or modify the handheld settings for working with the Repeater. Each menu option is described in this section.

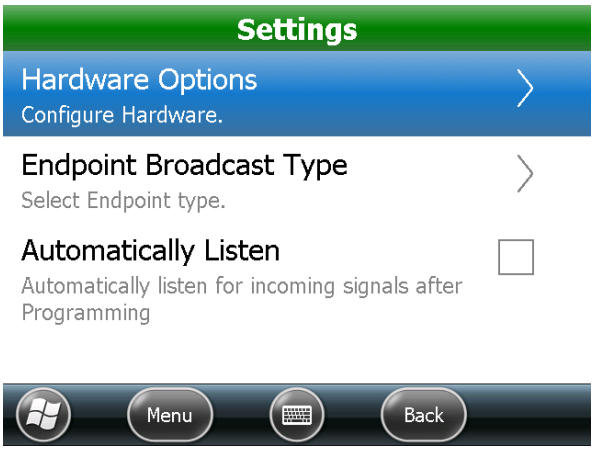


*Figure 42: Settings menu*

**NOTE:** Make sure the handheld is connected to the repeater with the DB9 null modem serial cable before using the Repeater software application. If you need help, see *"Handheld Setup" on page 7*.

## Hardware Options

On the Settings screen, tap **Hardware Options** to open the Hardware Options screen (*Figure 43*). This screen is used to add or remove a device attached to the handheld, and to view and change the communication (COM) ports for the handheld. The screen shows the following default settings, depending on the type of handheld.

- The handheld internal technology uses COM 7.
- The handheld built-in GPS uses COM 2. GPS does not display if the handheld does not have built-in GPS.
- Technology connected to the handheld nine-pin serial port uses COM 1. The default shows the IR Head programming cable.

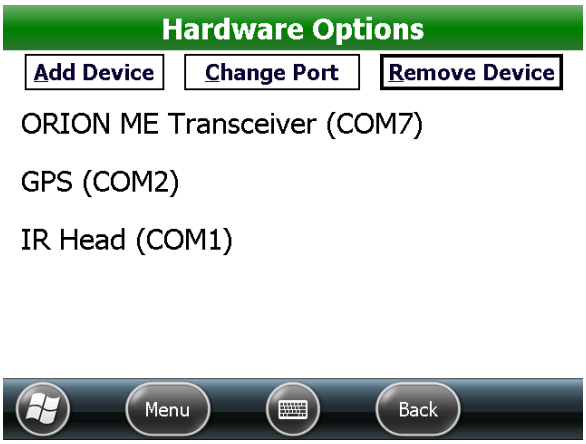


*Figure 43: Add/Remove device and set COM ports*

## Adding the Repeater

1. On the Hardware Options screen, tap **Add Device**.

   *Result: The Add Device screen opens (Figure 44).*

2. Tap **Type** to see a list of device types to select from. Tap the device type you want to add. In this example, the **ORION CE Repeater** is selected (*Figure 45*).

   *Result: ORION CE Repeater displays in the Type field on the Add Device screen (Figure 47).*

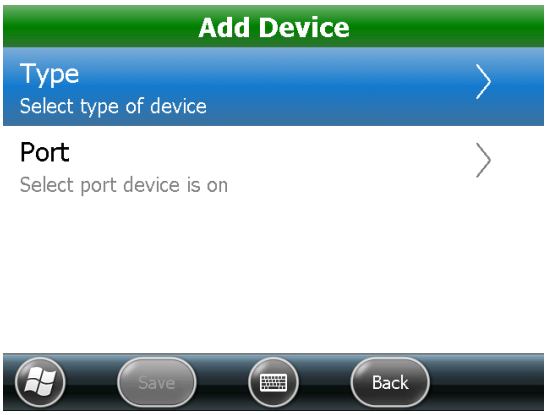


*Figure 44: Select **Type** to add a device*

*Figure 45: Select the device*

3. Tap **Port**. Then tap the COM port for the device. In this example, **COM 1** is selected for the Repeater (*Figure 46*).

   *Result: COM1 displays in the Port field on the Add Device screen.*

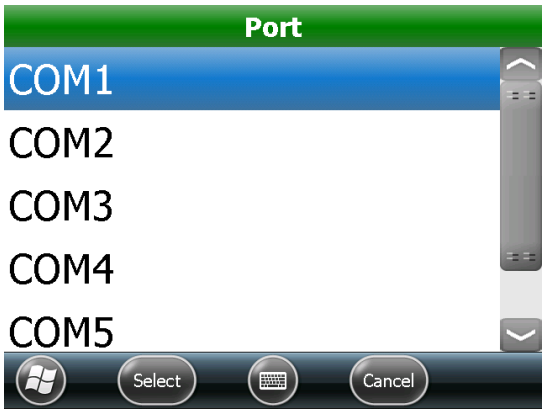


*Figure 46: Select COM1*

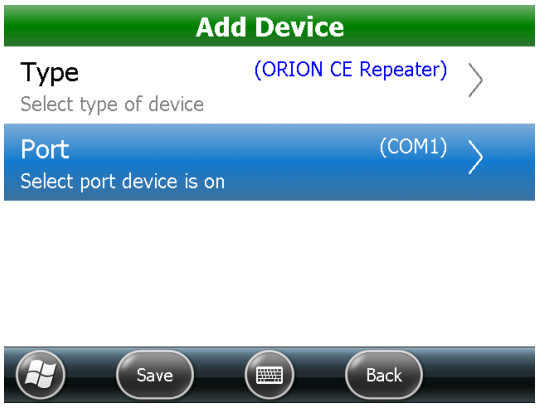


*Figure 47: Device and COM port display on screen*

4. Tap the **Save** button.

   *Result: The Repeater and COM port settings are saved. Figure 48 shows an example of the Hardware Options screen with the ORION CE Repeater added.*

   **NOTE:** Since they share the nine-pin serial port on the handheld, the IR Head and the ORION CE Repeater are both assigned to COM 1 as shown in *Figure 48.* If you use an IR programming cable to read endpoints, you will disconnect the Repeater temporarily while using the IR programming cable.

5. Tap the **Back** button to return to the Settings main menu.

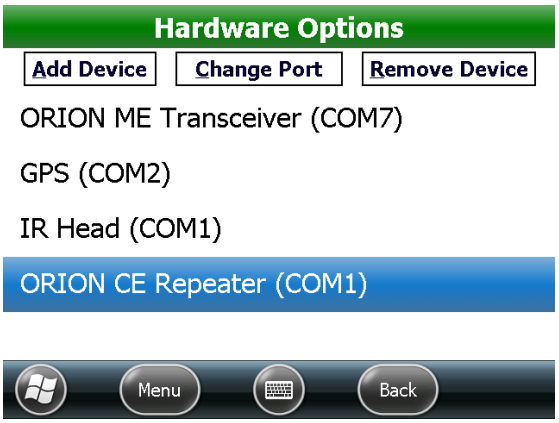


*Figure 48: Repeater on Hardware Options screen*

## Change COM Port

### IMPORTANT

*The COM ports must be set correctly for the handheld and the software to operate correctly. Adjustments to the COM ports should be made only with the assistance of Badger Meter Technical Support.*

1. On the Hardware Options screen, tap to select the hardware type. Then tap **Change Port**.

   *Result: The COM port selection screen opens. The title bar shows the device you selected. In this example, the IR Head Port was selected.*

2. Tap to select the new COM port from the list. The COM port change is made automatically and displays on the Hardware Options screen.

   If you do not want to change the COM port, tap **Cancel** to return to the Hardware Options screen.

3. Tap the **Back** button to return to the Settings screen.

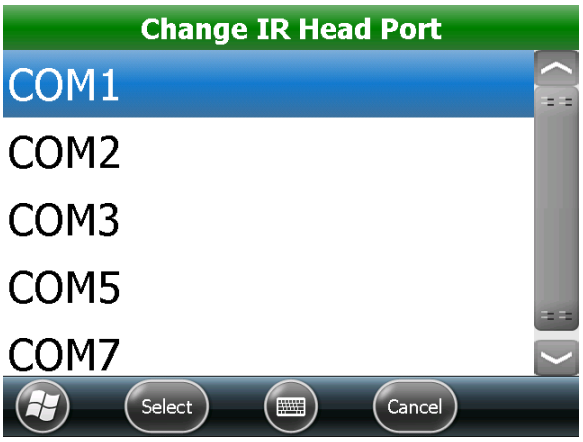


*Figure 49: Valid COM ports*

## Remove Device

1. On the Hardware Options screen, select the device you want to remove.
2. Tap **Remove Device** (*Figure 50*).

   *Result: A confirmation screen displays, asking you to confirm the request.*

3. Tap **Yes** to remove the device. If you do not want to remove the device, tap **No**.

   *Result: If you tap **Yes**, the device is removed from the list on the Hardware Options screen.*

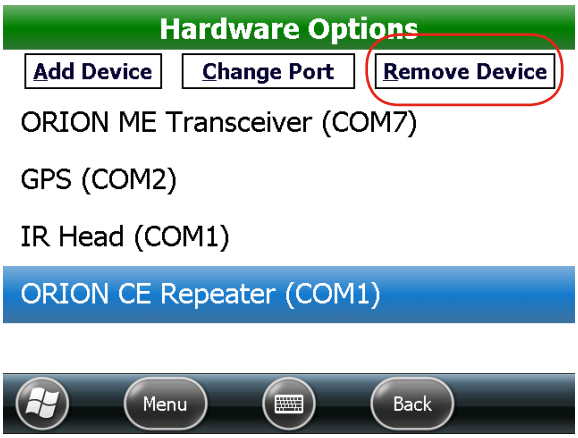


*Figure 50: Select device and tap **Remove Device***

## Reset Default Settings

If you want to quickly reset the factory default settings after making changes to Hardware Options, press the **CLEAR** button on the handheld keypad and respond **Yes** to confirm you want to return to the default Hardware Options settings.

## Endpoint Broadcast Type

Use **Endpoint Broadcast Type** to choose narrow band or frequency hopping, based on the endpoint type you are adding to the Repeater.

**NOTE:** During the endpoint list setup, the Repeater listens for approximately 120 seconds in frequency hopping mode or 12 seconds in narrow band mode.

1. On the Settings menu, tap **Endpoint Broadcast Type** (*Figure 51*).
2. On the screen that displays, select **Freq Hopping** or **Narrow Band**.

   **NOTE:** If you are adding frequency hopping endpoints to the Repeater, make sure to select the **Freq Hopping** Broadcast Type.

   *Result: The selection displays on the Settings screen and is programmed into the Repeater during **Read/Program**.*

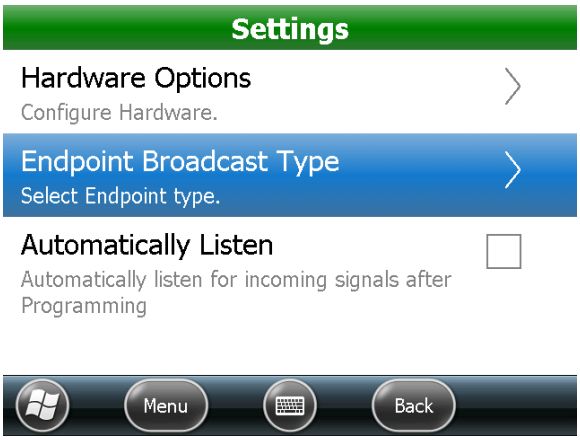


*Figure 51: Broadcast Type*

## Automatically Listen

**Automatically Listen** sets the Repeater to automatically listen for incoming signals after endpoints are programmed.

When selected, all Repeater functions, including Listen and Transmit, can be performed using the **Read/Program** menu selection. For more information, go to *"Main Menu" on page 11* and see the **NOTE** under **Read/Program**.

On the Settings screen, tap the box next to **Automatically Listen** to activate the option (*Figure 52*). To deactivate the option, tap in the box again to remove the check mark.

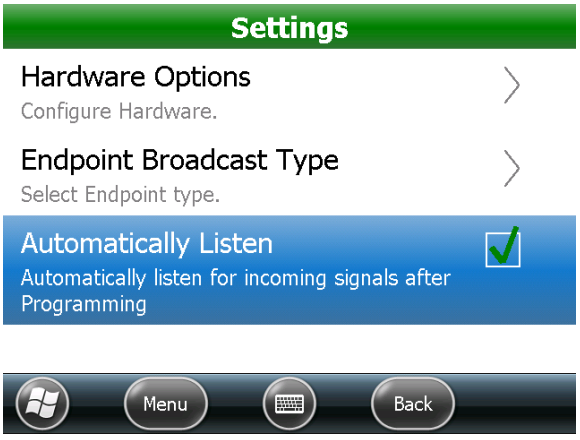


*Figure 52: Sets the Repeater to listen automatically*

# TECHNICAL SUPPORT

Contact Badger Meter Technical Support if you have a question about the software application or if you receive an error message you cannot resolve.

## What To Report

If possible, give the following information to the Support Specialist:

- The screen that was active when the problem occurred.
- The steps being performed.
- Any entries that were made on the screen.
- Any error code or explanation that is shown.
- The current state of the Serial Repeater Programmer.

## Contact Badger Meter Technical Support

Phone: 800-456-5023

Email: TechSupport@BadgerMeter.com

Fax: 888-371-5982

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