

Mobile Data Collector Getting Started Guide



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Regulatory Compliance

Federal Communication Commission (FCC) Statement:

FCC ID: P2SMRXV4E

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. (US 47 CFR §15.19)

The MRX920V4E contains a Bluetooth transceiver with modular certification, the Laird BL653U, whose regulatory identifier is: SQGBL653U (FCC) .



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 7 must accept any interference received, including interference that may cause undesired operation. (US 47 CFR §15.19) Changes or modifications not expressly approved by the party responsible for compliance could void the users' authority to operate the equipment. (US 47 CFR §15.21).

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 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

To comply with FCC/IC RF exposure limits for general population / uncontrolled exposure, the antenna(s) used for this transmitter must be installed on non-permanent objects and structures to provide a separation distance of at least 20 cm from all persons (US 47 CFR §2.1091), and must not be co-located or operating in conjunction with any other antenna or transmitter.

This Radio transmitter has been approved by the FCC to operate with the antenna types listed below. Antenna types not included in this list, having a gain greater than the maximum listed below. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Professional Installation

In accordance with section 15.203 of the FCC rules and regulations, the mobile data collector must be professionally installed by trained installers.

Industry Canada (IC) Notice:

IC: 4171B-MRXV4E

This radio transmitter (4171B-MRXV4E) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated.

Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

The mobile data collector contains a Bluetooth transceiver with modular certification, the Laird BL653U whose regulatory identifier is: (Industry Canada) 3147A-BL653U.

Le présent émetteur radio (4171B-MRXV4E) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Le collecteur de donnèes mobile (mobile data collector) contient un émetteurrécepteur Bluetooth avec certification modulaire, le Laird BT900-SA, dont l'identificateur réglementaire est : 3147A-BL653U (Industrie Canada).

Approved Antenna List

Type: Omni-Directional

Gain: 5dBi

Impedance: 50 chms Freg: 896-970 MHz

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Exposure

Cet équipement est conforme aux limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20 cm entre le radiateur et votre corps. Cet émetteur ne doit pas être colocalisées ou opérant en conjonction avec tout autre antenne ou transmetteur.

Notice of Operation in Mexico

Aviso para México

La operación de este equipo está sujeta a las siguientes dos condiciones:

- (1) es posible que este equipo o dispositivo no cause interferencia perjudicial y
- (2) este equipo o dispositivo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

Modelo del producto: MRXV4E

Marca:Neptune Technology Group

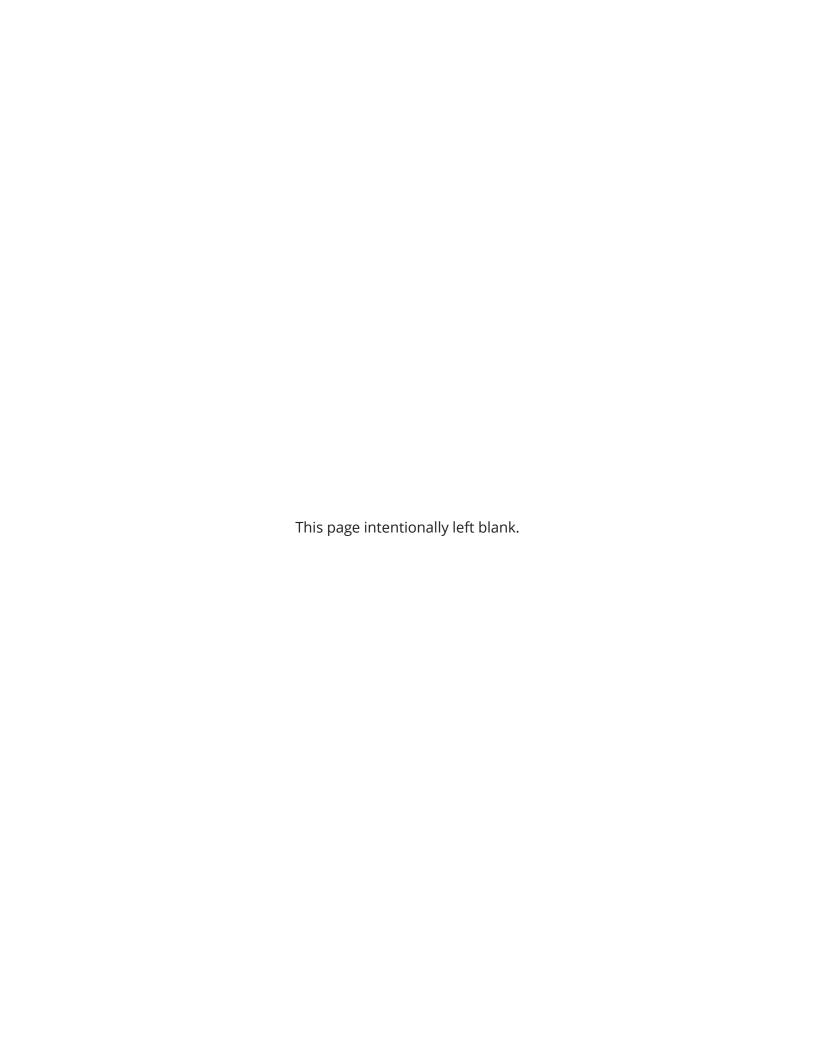
Mobile Data Collector Getting Started Guide

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Chapter 1: Introduction

The Neptune[®] R900 System[®] mobile data collector is a compact, portable, mobile data collection device used for meter reading of Neptune radio frequency (RF) equipped water meters. Readers use it in conjunction with the Neptune[®] 360[™] Mobile app on a utility supplied smartphone or tablet. The data collected is then communicated through Neptune 360 to the utility's billing system.



Figure 1 – Mobile Data Collector

The mobile data collector provides the utility with many advantages over current meter reading methods.

- Suitable for any size utility.
- Portable and easy to set up.
- Significantly reduces work-hours needed to collect meter reading data.
- Maximized meter reading success rates.
- Improved meter reading accuracy.
- Access for meters that are "hard-to-read" or "dangerous-to-read".
- Increased safety and minimized liability exposure.



The mobile data collector is only used for in-vehicle purposes.

System Operations

Operators use Neptune[®] 360[™] to make route assignments for meter readers. The routes read are obtained from the utility billing system and imported into Neptune 360. Routes are loaded into the Neptune 360 Mobile app. Each meter reader drives through the assigned routes to collect the endpoints data. The data collected is synced and uploaded into Neptune 360 and transferred to the billing system to generate customer bills.



Figure 2 - Mobile Data Collector Meter Reading Operations

Chapter 2: Specifications

This chapter provides product specifications, including dimensions, weight, and environmental conditions for the mobile data collector.

Physical Conditions

The following table lists the specifications and weight for the mobile data collector.

Table 1 - Physical Specifications

Operating Temperature	-4°F to +122°F (-20°C to +50°C)
Storage Temperature	-40°F to +185°F (-40°C to +85°C)
Operating Humidity	5% to 95% non-condensing relative humidity

Dimensions and Weight of the Mobile Data Collector

The mobile data collector is lightweight and compact. Refer to Table 2 Figure 3 and Figure 4 for the dimensions and weight of this unit.

Table 2 – Dimensions and Weight of the Mobile Data Collector

Dimensions	Refer to Figure 3 and Figure 4 for measurements in inches.
Weight	Approximately 5.0 pounds (2.27 kg).

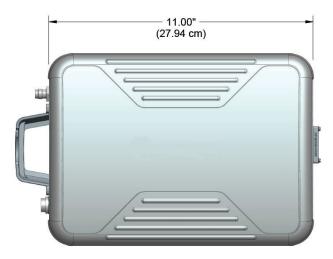


Figure 3 - Mobile Data Collector Dimensions - Length

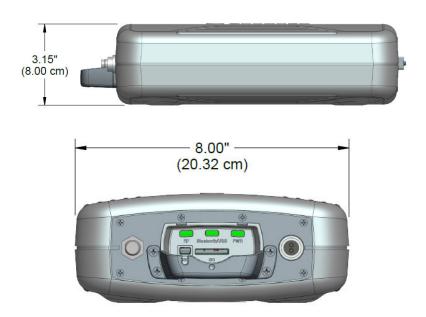


Figure 4 – Mobile Data Collector - Height and Width

Neptune[®] 360[™] Mobile Specifications

This section provides information on the Neptune[®] 360™ Mobile app.

Supported Devices and Operating Systems

Neptune 360 Mobile supports Android™ and Apple® operating systems for both smartphones and tablets. Neptune has tested the mobile app on the following operating systems and performs additional testing as new versions of these operating systems are made available.

Android Operating Systems

- 7.0.X Nougat.
- 7.1.X Nougat.
- 8.1.X Oreo.
- 9.0.X Pie.
- 10.0.X.
- 11.0.X.
- 12.0.X.
- 13.0.X.

Neptune recommends using Neptune 360 Mobile on devices from the following Original Equipment Manufacturers (OEMs):

- Samsung
- Google
- Motorola

Apple iOS Operating Systems

- 13
- 14
- 15
- 16

Neptune 360 Mobile supports the following iOS devices:

- iPhone
- iPad

Required Devices and Equipment

The Android or iOS phone or tablet that runs one of the supported operating systems listed above is required to use Neptune 360 Mobile app.



The mobile device requires a minimum of 2 GB of RAM to run the software.

Required Credentials

The Neptune 360 Mobile app is linked to Neptune 360. Utility administrators are responsible for ensuring that all Mobile app users have an account established within Neptune 360. Users can use their Neptune 360 email address and password credentials to log into the Mobile app.



Chapter 3: Getting Started

This chapter provides an overview of Neptune's mobile data collector along with the Neptune[®] 360™ Mobile app. Instructions for hardware setup including power and antenna connections are included.

Mobile Data Collector Overview

Neptune's mobile data collector is a portable collection device for automatic meter reading that is used in conjunction with a utility-supplied smartphone or tablet and the Neptune 360 Mobile app. The data collected is uploaded to the Neptune 360 head-end system and ultimately transferred to the utility's billing system.

The mobile data collector features the following:

- Durable construction in a compact design for everyday use in any vehicle.
- Map view with GPS capability in the Neptune 360 Mobile app.
- Wireless and remote route synchronization.
- Bluetooth connectivity to smartphones and tablets.
- IR and RF activated data logging and off-cycle reading.
- Ability to read R900 RF endpoints.

Mobile Data Collector Components

This section provides information on the various components of the mobile data collector.

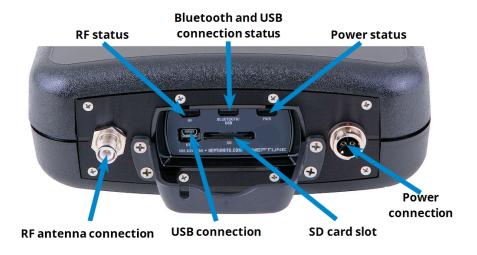


Figure 5 – Mobile Data Collector Components



The SD card is only used for firmware update purposes. Neptune recommends keeping it installed to keep the SD card slot free from debris.



WARNING: Attempting to repair or modify the mobile data collector on your own can result in personal injury or damage to the unit and voids the warranty.

Mobile Data Collector LED Status Light Indicators

The following table describes the LED status light indications.

Table 3 – LED Status Light Indicators

LED Name	Description	Color Condition Indication		
Power (PWR)	Power status	Yellow – Solid during the power up process.		
		• Green – Solid when the unit is fully powered up.		
		• Yellow – Solid during power loss.		
		• Red – Solid if the unit overheats.		
Diactoriii, COD	Bluetooth and USB	Off – None when there is no Bluetooth or USB connection.		
	connection status	Blue – Solid during successful Bluetooth connection.		
		Green – Solid during successful USB connection.		
		• Red – <i>Solid</i> could indicate an internal issue with the device. Contact Customer Support.		
RF RF endpoint activity		Green – Solid during high RF endpoint activity.		
		Green – Flashing during low RF endpoint activity.		
		• Red – <i>Solid</i> when no RF endpoint activity detected (after two minutes).		

Bluetooth® Supported Connection

The mobile data collector supports $Bluetooth^{@}$ Low Energy (BLE) connectivity from the device to a smartphone or tablet.

Setting Up Neptune[®] 360™ Mobile App

This section includes the procedures to download and log on to the Neptune[®] 360™ Mobile app, which is used in conjunction with the mobile data collector to collect meter reading data while in the field.

Downloading the App

Complete the following steps to download the Neptune 360 Mobile app.

- 1. Open the Google Play Store (Android) or the App Store (Apple) on your device.
- 2. Search for Neptune 360 Mobile.
- 3. Tap one of the following to install the app:
 - Install, for an Android device, then go to step 4.
 - Get, for an iOS/Apple device. You can now open the app and log in.
- 4. On your Android device, review the app permissions and then tap **Accept** to continue the download.

Logging Into Neptune[®] 360™ Mobile App

Complete the following steps to log in to the Neptune 360 Mobile app.

1. Open the app.

The Login screen is displayed



Figure 6 - Neptune[®] 360™ Mobile Login Screen

- 2. To select a different default country than the one displayed, tap **the country name** to display the selections.
- 3. Tap the country you want as your default and then tap **OK**.
- 4. In the **Email Address** field, type the email address you use for Neptune 360.

- 5. In the **Password** field, type the password you use for Neptune 360.
- 6. Tap Login.

If you have access to multiple utilities, the system displays the Select Site ID screen as shown in Figure 7. Otherwise, the system displays the landing screen as shown in Figure 8.



Figure 7 - Select Site ID Screen

7. Type the five-digit Site ID for your utility.

The app displays the Neptune 360 Mobile landing page.



Figure 8 – Selecting a Function

8. Select the function you want.

Setting Up the Mobile Data Collector

To set up the mobile data collector, refer to the following sections of this guide:

- Installing the Mobile Data Collector in the Vehicle
- Plugging in the Power Cable
- Installing the Antenna

Installing the Mobile Data Collector in the Vehicle

With the mobile data collector, you have flexibility with where to place the unit. The preferred placement is in the passenger seat with the seat belt fastened through the straps on the carrying case (Part No: 13125 001).



Figure 9 – Mobile Data Collector Set Up

Plugging in the Power Cable

Complete the following steps to connect the vehicle power supply power cable to the mobile data collector and plug it into the vehicle power supply receptacle.

1. Start the vehicle.



It is very important to first start the vehicle before connecting the cable.

- 2. Grip the vehicle power supply cable by the black sleeve, not the metal casing.
- 3. Line up the red arrows and insert the power connector until the metal locking mechanism twists and locks into place.



You might need to wiggle the power supply cable a little to get the connector to click.

- 4. After the power supply cable is connected, the red dot and red arrow should align ensuring the cable is connected.
- 5. Insert the appropriate end of the vehicle power supply cable into the connector on the mobile data collector.

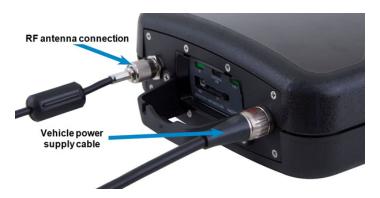


Figure 10 – Vehicle Power Supply Cable

4. Plug the other end of the power cable into the vehicle power supply receptacle.



Figure 11 - Power Supply Cable Inserted into Vehicle

Installing the Antenna

The installation of the antenna and cable is critical for the optimal performance of the mobile data collector. If the cable is crimped, the performance of the unit degrades significantly.

There are several options for running the cable. The best method depends on the type of vehicle used. The most important consideration when installing the antenna is for the cable to remain undamaged.

To ensure proper installation of the antenna, complete the following steps.



If there is a red cap on the base assembly, remove this cap prior to installing the antenna.



Figure 12 – Antenna and Cable

1. Connect the RF antenna to the mobile data collector and turn it clockwise to hand-tighten until secure.



Figure 13 – Mobile Data Collector RF Antenna Connector

2. Place the magnetic base of the antenna in the center of the roof approximately one foot (30 cm) behind the leading edge of the roof.



Figure 14 – Antenna Installation

3. Run the antenna cable through the passenger window.



Figure 15 - Antenna Cable Through Window



Exercise caution to ensure that there is sufficient room for the cable and that it does not get crimped.

4. Attach the cable protector included with the mobile data collector to the window. The protector keeps the window from pinching the cable.



Figure 16 - Cable Protector



Some vehicles, have enough room to run the cable through the door frame of the vehicle without crimping the cable. Other vehicles do not have enough clearance (especially vehicles with rain gutters). Running the cable through the rear door is an option.

5. Gently close the window, positioning the antenna cable so there is no pressure on it.



WARNING: Pressure on the antenna cable can cause damage.

Setting Up the Connection

Before you can use your mobile data collector and Neptune 360 Mobile to read meters and manage routes, you must establish a connection between the two. Before establishing a connection, make sure both the mobile data collector and Neptune 360 Mobile are set up. (Refer to "Setting Up Neptune® 360™ Mobile App" on page 9 and "Setting Up the Mobile Data Collector" on page 11).

Initial Bluetooth® Connection

To establish a Bluetooth[®] connection for the first time, complete the following steps.

- On your Android™ or Apple® / iOS device, enable Bluetooth capability. For Android, verify that the Location permission for the app is enabled. This permission handles Bluetooth functionality and is here in your Android settings: Settings / Apps / Application Manager / Neptune 360 Mobile.
- 2. In Neptune 360 Mobile, tap the menu icon in the top left corner of the screen to display the menu options.



Figure 17 – Connecting to a Mobile Data Collector

- 1. Tap Receiver.
- 2. Tap the serial number of the mobile data collector you want to connect to. If the mobile data collector does not appear in the list, tap **Refresh** toward the bottom of the screen and then try connecting.

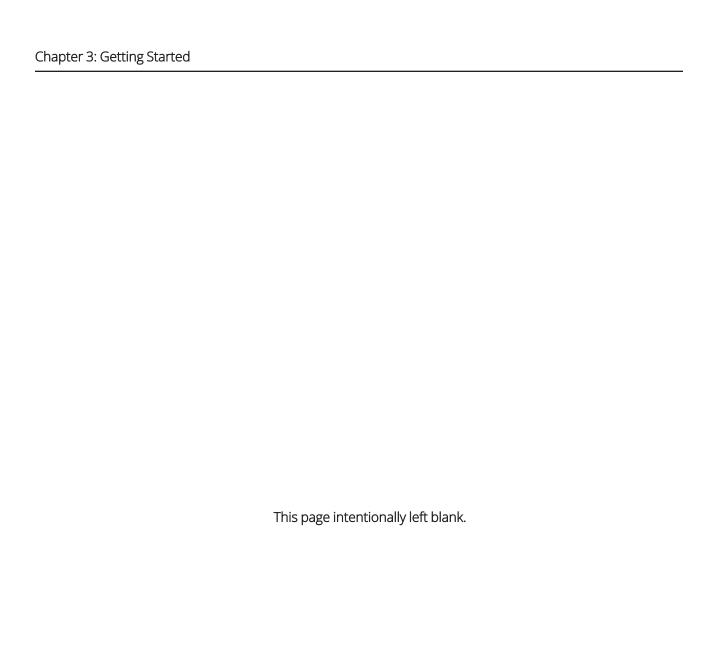
After successfully connecting, the Neptune 360 Mobile dashboard is displayed. At the bottom of the screen the connected mobile data collector displays in green text.

Becoming Familiar with the Mobile Data Collector

When the set up is complete and a successful connection between the mobile data collector and Neptune 360 Mobile is established, you are ready to begin using the mobile data collector for meter reading.

For instructions and help with reading meters, please refer to the *Neptune 360 Mobile User's Guide* Chapter 5: Reading Meters.

RF testing and data logging procedures are covered in Chapters 3 and 4, respectively, of the *Neptune 360 Mobile User's Guide*.



Chapter 4: Troubleshooting

The chapter provides diagnostics procedures for troubleshooting mobile data collector problems.

Mobile Data Collector is Not Connecting to the Smartphone or Tablet

Complete the following steps:

- 1. Check and confirm Bluetooth[®] capability on the device (smartphone and tablet) is turned on and operational.
 - Newer mobile data collectors (serial number ranges MRX4B0001 MRX4B9999 and MRX4E0001 – MRX4E9999) support only Bluetooth Low Energy (BLE) communications. Confirm the device supports BLE.
 - For Android devices that support Bluetooth Classic communication and older versions of the mobile data collector (serial number ranges MRX300001 – MRX499999), attempt switching Bluetooth communication options in the Neptune 360 Mobile app:
 - Select the Menu icon.
 - Select Receiver.
 - Select "For Connection Issues Click Here".
 - Switch between Bluetooth Classic and Bluetooth Low Energy (BLE). If the mobile data collector is a V3, switch between Bluetooth Low Energy (BLE) and Bluetooth Classic.
 - Confirm Bluetooth LED light is not red. If solid, contact Customer Support (see "Contacting Customer Support" on page 22).
- 2. Check and confirm Permissions settings are:
 - For Android™:
 - Open Device Settings.
 - Select Apps.
 - Select Application Manager.
 - Select Neptune[®] 360™.
 - Confirm the following permissions are enabled:
 - Location.
 - Storage and Media.

- · Nearby Devices.
- Permissions should read "No permissions denied".
- For iOS / Apple[®]:
 - Select Settings.
 - Find and select the Neptune 360 Mobile app.
 - Confirm the following permissions are enabled:
 - Location*.
 - · Bluetooth.
 - Siri™ & Search.
 - Cellular Data (if applicable).

* If Location is not present, assign a route to this user in Neptune 360. After they synchronize, they should receive a pop up to allow Neptune 360 Mobile to use their location.

- 3. Confirm and ensure **Battery** / **Power Saver Mode** on the device is disabled:
 - For Android:
 - Open Settings.
 - Select Battery Device Care.
 - Select Battery.
 - Disable Power Saver (Unrestricted).
 - For iOS / Apple:
 - Open Settings.
 - Select Battery.
 - Disable Low Power Mode.
- 4. If Bluetooth is enabled, turned on, and permissions are correct, reset the mobile data collector by powering the unit down and then removing the SD card for five minutes, re-insert the SD card and power on the mobile data collector.
- 5. After you complete and check the mobile data collector and it still cannot connect to the smartphone or tablet, please contact Neptune Customer Support (see "Contacting Customer Support" on page 22).

Neptune[®] 360[™] Mobile App Crashes When Trying to Connect to the Mobile Data Collector

Complete the following steps.

- 1. Double check all permissions are allowed on the smartphone or tablet (see the above section on how to check this for an iOS / Android device).
- 2. Check for a Neptune 360 Mobile app update.
- 3. Try deleting the Neptune 360 Mobile app and reinstalling it.
- 4. If you have tried all of the above and the Neptune 360 Mobile app still crashes when trying to connect to the mobile data collector, please contact Neptune Customer Support (see "Contacting Customer Support" on the next page).

LED Light Indicators

This section provides information on what the LED light indicators mean and what to do.

- 1. If the RF LED light on the mobile data collector is white:
 - Reset the mobile data collector by powering down the unit.
 - If this doesn't resolve the issue, please contact Neptune Customer Support (see "Contacting Customer Support" on the next page).
- 2. A solid red Bluetooth LED light on a v4 and older mobile data collector could indicate internal failure with the Bluetooth module in the device. To resolve the issue, complete the following steps.
 - Reset the mobile data collector by powering down the unit.
 - If this does not resolve the issue, please contact Neptune Customer Support (see "Contacting Customer Support" on the next page).
- 3. A solid red RF LED light on the mobile data collector indicates:
 - The device has not detected any RF activity from R900 endpoints for a least two consecutive minutes.
 - An RF error. Please contact Neptune Customer Support (see "Contacting Customer Support" on the next page).

- 4. If a firmware update is attempted and is:
 - Successful The mobile data collector's Bluetooth and RF LED lights flash green simultaneously three times.
 - Unsuccessful— The mobile data collector's Bluetooth and RF LED lights will flash red simultaneously three times. Attempt the firmware update a second time, if still unsuccessful, please contact Neptune Customer Support (see "Contacting Customer Support" below).
- 5. A blinking red Power LED light is an indication that the mobile data collector is overheating. Power down the device and place in a cooler environment. The amount of time for the mobile data collector's temperature to cool down to normal operating conditions varies.

Product Support within North America

Neptune offers various methods to receive high-quality, responsive customer support. However, before contacting Neptune, it is important that you know the version number of the Neptune 360 Mobile app being used. This information is useful to the customer support specialist who addresses the call.



The Neptune 360 Mobile app version number is located in the About section of the main menu.

Contacting Customer Support

Neptune Customer Support is available in the United States Monday through Friday, 7:00 A.M. to 5:00 P.M. Central Standard Time by telephone or email.

By Phone

To contact Neptune Customer Support by phone, call **(800) 647-4832** and complete the following steps.

- 1. Press one of the following:
 - 1 for Customer Service.
 - 2 for System Support.
 - 3 for Return Material Authorizations (RMAs).
 - 4 for Subscriptions or Renewals.
 - 5 for Customer Success and Onboarding.
- 2. For System Support or Customer Success and Onboarding press one of the following.

- 1 if you know your site ID.
- 2 to input your personal identification number (PIN) or if you do not have a PIN.
- 3. For RMAs, press one of the following.
 - 1 for reading device support.
 - 2 for meter, endpoint, and register support.

Neptune Customer Support Specialists are dedicated to you until the issue is resolved to your satisfaction. When you call, please be prepared to give the following information:

- Your name and callback number.
- Your utility name, company name, or site ID / PIN.
- A description of what occurred and what you were doing at the time.
- A description of any actions taken to correct the issue.

Email

To contact Neptune Customer Support by email, send your message with a description of the problem to support@neptunetg.com.



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В

Bluetooth®

A technology allowing computers, smart phones, or other devices to connect to the Internet or communicate with one another wirelessly within a particular area.

C

Central Processing Unit

Often abbreviated as CPU, it is the brain of the computer. Sometimes referred to as the processor or central processor, the CPU is where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system.

\Box

Database

The collection of information that is organized so that it can easily be accessed, managed, and updated.

Default Setting

A setting Neptune® 360™ Mobile app automatically supplies to an item. For example, the default setting for Enable Tone On / Off is Enable Tone On. The Enable Tone is always on unless the meter reader changes the Enable Tone setting.

Dialog

A window displaying some action required on the part of the user. For example, the user must click Yes or No to continue the action.

Display

The top part of the laptop computer where selections and information about routes and accounts are shown.

Ε

Endpoint

A piece of equipment that collects water usage readings and transmits them via radio frequency.

Endpoint ID

An endpoint's unique identifier, which is a discrete number used to identify one specific endpoint.

G

GPS

Global Positioning System. A satellite navigation system that allows users to determine their location.

ı

IR

Infrared.

M

Message Area

A portion of a window that displays a message.

Meter Number

The number by which a utility identifies a meter.

MHz

Abbreviation for megahertz. One MHz represents one million cycles per second.

MIU

Meter interface unit. Also called an endpoint.

0

OEM

Original Equipment Manufacturer.

R

Receiver

A device that receives RF communications.

RF

Radio frequency.

Т

Transceiver

Device that transmits and receives RF communications, in particular a combined radio transmitter and receiver.

U

Upload

The process of sending readings and route data to and from the Neptune® 360™ headend system and Neptune 360 Mobile.

USB

Universal Serial Bus that defines the cables, connectors and communications protocol used for connection, communication, and power supply between computers and electronic devices.



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