



MRX920™ Getting Started Guide

(Versión en español disponible en www.neptunetg.com)



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Proprietary Rights Notice

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Regulatory Compliance

Federal Communication Commission (FCC) Statement:

FCC ID: P2SMRXV4

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 MRX920v4 contains a Bluetooth transceiver with modular certification, the Laird BT900-SA, whose regulatory identifier is: SQGBT900 (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 must accept any interference received, including interference that may cause undesired operation. (US 47 CFR §15.19)

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.

Approved Antenna List

Type: Omni-Directional

Gain: 5dBi

Impedance: 50 ohms

Freq: 896-970 MHz

Professional Installation

accordance with section 15.203 of the FCC rules and regulations, the MRX920 must be professionally installed by trained installers.

Industry Canada (IC) Notice:

IC:4171B-MRXV4

This radio transmitter (4171B-MRXV4) 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 MRX920v4 contains a Bluetooth transceiver with modular certification, the Laird BT900-SA, whose regulatory identifier is: (Industry Canada) 3147A-BT900.

Le présent émetteur radio (4171B-MRXV4) 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 MRX920v4 contient un émetteur-récepteur Bluetooth avec certification modulaire, le Laird BT900-SA, dont l'identificateur réglementaire est : 3147A-BT900 (Industrie Canada).

Approved Antenna List

Type: Omni-Directional

Gain: 5dBi

Impedance: 50 ohms

Freq: 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.

NOM-208 Statement for Mexico

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.

MRX920™ Getting Started Guide

Literature No. GS MRX920 v4 04.18

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The MRX920™ is a compact, portable, mobile data collection device used for meter reading of Neptune radio frequency (RF) equipped water meters. It is used in conjunction with the MX900 software and a laptop supplied by the utility to conduct automatic meter reading. The data collected is then communicated through the host software to the utility's billing system.



Figure 1.1 MRX920 Mobile Data Collector

The MRX920 provides the meter reading industry with many advantages over current meter reading methods.

- Suitable for any size utility
- Portable and easy to set up
- Significantly reduced man-hours needed to collect readings
- 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 MRX920 is only to be used for in-vehicle purposes.

System Operations

Operators use the N_SIGHT™ host software to make route assignments for meter readers. The routes to be read are obtained from the utility billing system and placed on a USB flash drive or accessed by use of a Bluetooth connection for the meter readers. Routes are loaded into the MX900 software. Each meter reader drives through the assigned routes to collect data broadcast by R900® meter interface units (MIUs). When complete, the meter readings can be uploaded to the N_SIGHT host software. The host software transfers the customer information to the billing computer to generate customer bills. See Figure 1.2.

System Overview

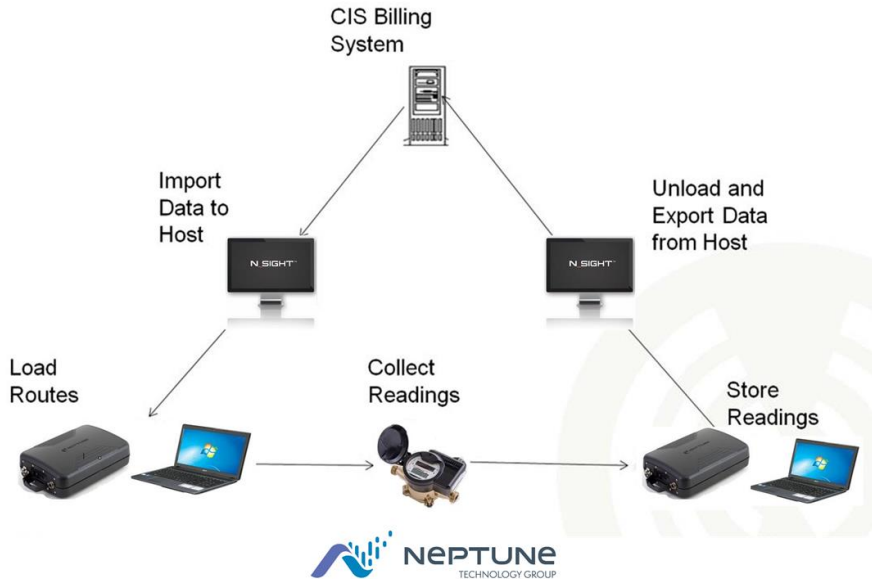



Figure 1.2 MRX920 Meter Reading Operations

About This Guide

The MRX920™ Getting Started Guide describes the system and its features. This guide also provides procedures on how to set up the MRX920, use its MX900 software, exit, and close the unit. This guide contains the following chapters:

Table 1.1 Chapter Overviews

Chapter	Title	Description
2	Specifications	Provides a section that includes all product specifications, including dimensions, weight, and environmental conditions.
3	Getting Started with the MRX920	Provides an overview of the MRX920 unit and how to get started using it. It contains procedures for installing the MX900 software and installing the antenna. It also describes hardware setup instructions, power and antenna connections, and instructions on how to turn on the laptop computer. The chapter also includes information on how to adjust system settings including keyboard back-lighting, display intensity, and the beeper settings. It also provides steps for installing and updating the software.
	The procedures for reading meters, reviewing account information, reading missed meters, using the data logger, using the mapping feature, and exiting the software are contained in the HTML5 Help included in the MX900 software.	

Conventions Used in this Guide

This guide uses the following icons and typographical conventions to identify special information.



The Warning icon identifies actions that can cause injury to the user or permanently damage the product.



The Caution icon identifies important information that is critical to ensuring that data stored with the MRX920 is not lost.



The Note icon identifies information that clarifies a point within the text.

All small caps	Refers to keys. Examples: ENTER , ALT , TAB
All bold initial caps	Refers to field names, menus, buttons, and menu options. Example: Device field or File menu.
+ between keys	Refers to pressing the keys at the same time. Example: ALT+B

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 host software that your MRX920 uses. This information is useful to the Customer Support Specialist who addresses the call.



The version number of MX900 software is located on the title bar at the top of the window.

Contacting Customer Support

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

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 number.
3. Type 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.

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 Customer Support Specialist to contact you.

Email

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

This chapter provides product specifications, including dimensions, weight, and environmental conditions for the MRX920.

Physical Conditions

The following table lists the specifications and weight for the MRX920 data collection device.

Table 2.1 Physical Specifications

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

Dimensions and Weight of the MRX920

The MRX920 is light in weight and compact in size. Refer to Table 2.2 and Figure 2.1 for the dimensions and weight of this unit.

Table 2.2 Dimensions and Weight of the MRX920

Dimensions	Refer to Figure 2.1, measurement in inches.
Weight	Approximately 5.0 pounds (2.27 kg).

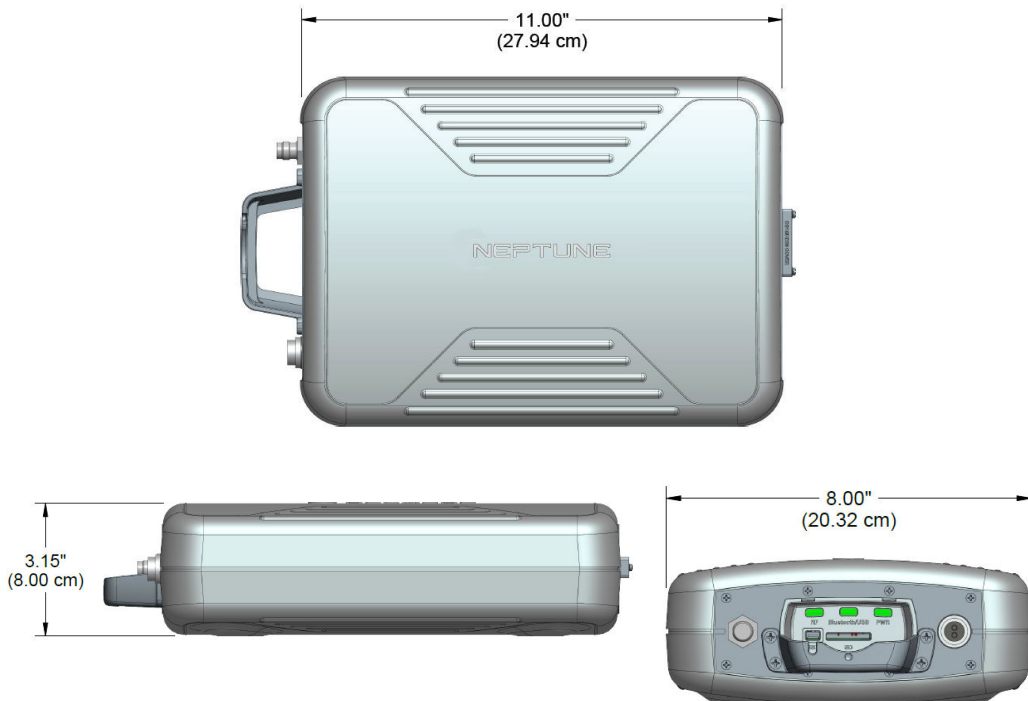



Figure 2.1 MRX920 Dimensions

Hardware Requirements

To run the MX900 software, on your laptop, please adhere to these system requirements below:

Table 2.3 Hardware Requirements

Hardware	Requirements
	<p>The MRX920 is a mobile data collector designed to be used in a vehicle designated for meter reading. It has been constructed to be used occasionally on a bumpy terrain such as in rural meter reading routes. The utility needs to take into consideration the environmental impact, vehicle power source, and laptop's battery life, when selecting a laptop to use with the MRX920 system.</p>
Processor	Intel Pentium Processor 1.7 GHz (minimum)
Operating System	<p>One of the following operating systems is required:</p> <ul style="list-style-type: none"> • Windows 7 Professional (32 or 64 bit) • Windows 8 Professional (32 or 64 bit) • Windows 8.1 Professional (64 bit) • Windows 10 Professional or Enterprise (64 bit)
Memory	1 GB, minimum
Communication	<p>The following to be considered:</p> <ul style="list-style-type: none"> • Internal 802.11 b/g wireless LAN, (WiFi) - optional for wireless synchronization with host system. • Bluetooth 2.1 or newer enabled laptop - optional for wireless connection to the MRX920.
Display	12.1" XGA (800 x 600), minimum
USB	USB 2.0 – one port minim
GPS	GPS receiver (required for the optional mapping and mobility module)

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This chapter provides an overview of the MRX920 along with software installation and hardware setup instructions including power and antenna connection. This chapter also includes information on how to adjust system settings including keyboard back-lighting, display intensity, and the beeper settings.

MRX920 Overview

The MRX920 is a portable, mobile data collection device used in conjunction with a customer supplied laptop computer, and the MX900 software for automatic meter reading. The data collected is then uploaded to the Neptune's head-end system and ultimately transferred to the utility's billing system.

The MRX920 features the following:

- Durable construction in a compact design for everyday use in any vehicle
- Optional map view with GPS capability
- Optional wireless and remote synchronization of routes
- Available Bluetooth connection to laptops
- IR and RF activation for data logging and off-cycle reading
- Wireless loading and unloading
- Ability to read R900 radio transmitters
- Ability to read and process bubbled-up electric SCM & SCM + data packets
- Captured reads stored to the hard drive of the laptop

MRX920 Components

Figure 3.1 shows the various components of the MRX920.

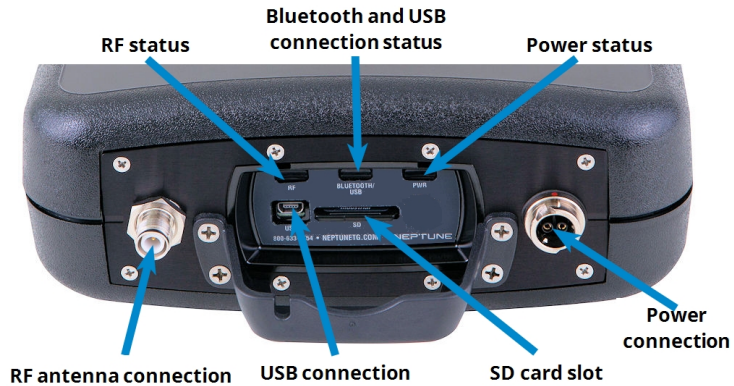


Figure 3.1 MRX920 Receiving/Processing Unit



Before using the MRX920 unit, be sure that the SD card is securely inserted into the SD card slot. If not, the unit will not work. Sometimes in shipment, it can become loose or partially ejected.



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

LED Status Light Indicators

The following table describes the LED status light indications.

Table 3.1 LED Status Light Indicators

LED Name	Description	Color Condition Indication
PWR	Power status	Green - <i>solid</i> when power is present Yellow - <i>solid</i> during power loss.
Bluetooth/ USB	Bluetooth and USB connection status	Off - <i>none</i> when no Bluetooth or USB connection is made Blue - <i>solid</i> during successful Bluetooth connection Green - <i>solid</i> during successful USB connection
RF	RF MIU activity	Green - <i>solid</i> during high RF activity Green - <i>flashing</i> during low RF MIU activity Red - <i>solid</i> when no RF MIU activity is detected

Bluetooth/USB Support

Bluetooth Support

The MRX920 supports Bluetooth connectivity from the MRX920 unit to the laptop. Only one MRX920 at a time can be connected/paired to the MX900 software/PC.

USB Connection

The MX900 software supports a virtual ethernet port over USB. Neptune's driver maps the USB device on the MRX920 to a virtual network interface. The MRX920 must

be plugged into PC via USB cord in order to install the USB driver.



During the installation, prompts provide a warning indicating if the driver is not Windows certified.

Laptop

MRX920 is a receiver unit. It needs to be connected to or paired with a laptop in order to display data captured and processed by the MRX920. This section guides you through setting up the MRX920 with a third-party laptop. The laptop needs a car charger or power inverter in order to be charged in the vehicle while reading.

Software Installation

To install the MX900 software, complete the following steps on your laptop.

1. Close all programs on the laptop before installing the MX900 software.
2. Insert the MX900 USB drive into the laptop computer designated for use with the MRX920.

Depending on the laptop configuration, the InstallShield Wizard Preparing to Install window can appear.

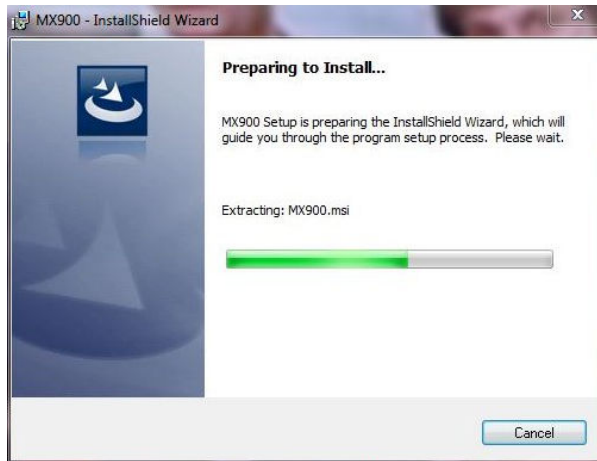


Figure 3.2 InstallShield Wizard Preparing to Install

3. Wait to continue.

The InstallShield Wizard MX900 window appears.



Figure 3.3 InstallShield Wizard MX900

4. Click **Next** to continue.

The InstallShield Wizard Welcome window appears.

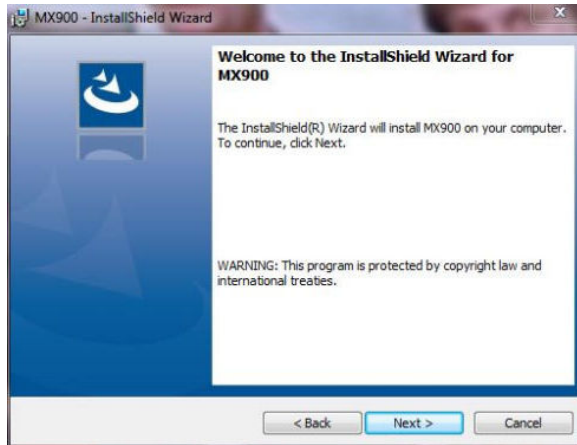


Figure 3.4 InstallShield Wizard Welcome

5. Click **Next** to continue.

Accepting the License Agreement

The Neptune Software License Agreement appears.



Figure 3.5 Neptune Software License Agreement

1. Read the license agreement that appears in the dialog.
2. Click **I accept the terms in the license agreement**.
3. Click **Next** to continue.

Preparing to Install the Software

After accepting the License Agreement, the following window appears.

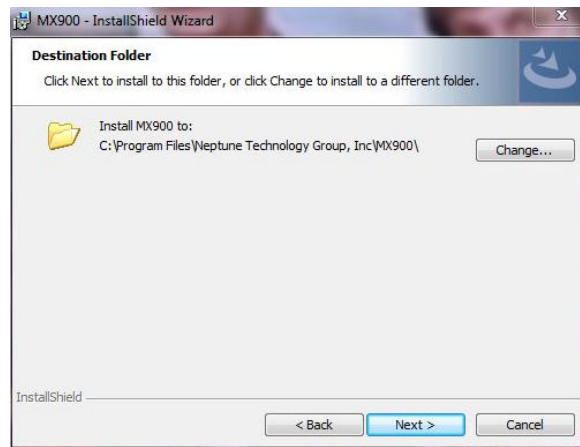


Figure 3.6 Destination Folder

1. Verify the location to install the MX900 software.
2. Do one of the following:
 - Click **Next** to use the default destination folder and continue.
 - Click **Change** to select another folder in a different location.

After selection the destination folder, the following window appears.

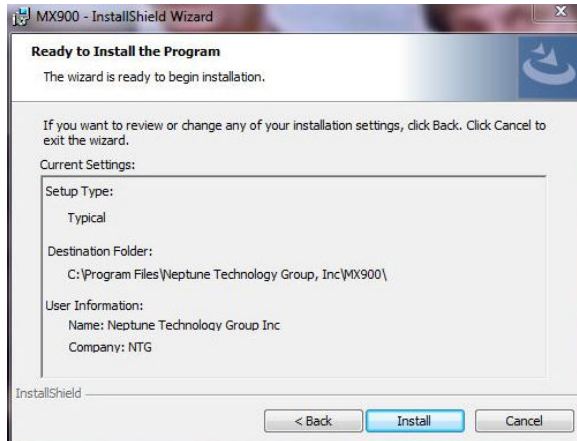


Figure 3.7 Ready to Install Program

3. Click **Install** to continue.

Installing MRX900

After accepting the License Agreement, the following window appears

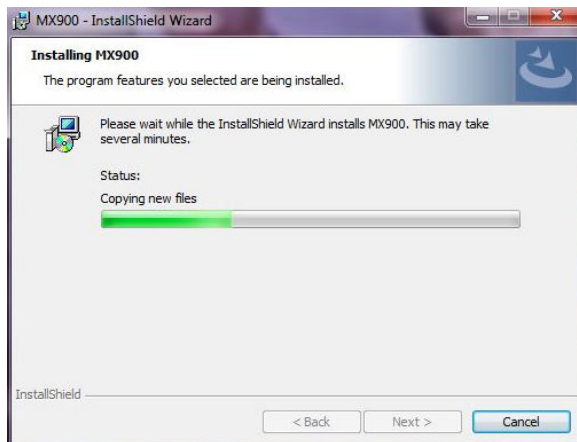


Figure 3.8 Installing MRX900



The installation can take a few minutes. The green progress bar indicates how much time the installation is taking. Please wait to continue.

Finishing the Installation

When the installation is completed, the following dialog appears.

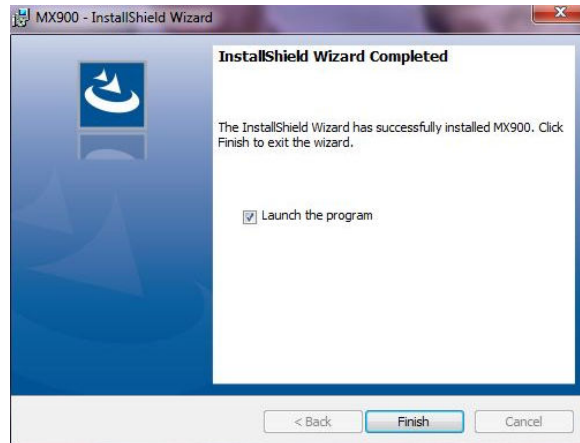


Figure 3.9 Finishing the MRX900 Installation

Click **Finish** to exit the InstallWizard.

Setting Up the Connection

Before you can use your MRX920 or the MX900 software to read meters and manage routes, you need to establish a connection.

Initial Bluetooth Connection

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

1. Turn on the MRX920, and wait approximately one minute for the receiver to gain full power.
2. Start the MX900 software. (See "Starting the Software" on page 3-30.)
3. Click **Settings** on the MX900 main window. (See Figure 3.31 on page 3-32).

The Settings window appears.

4. Click **Receiver Settings**.
5. From the **Bluetooth** selection list, select the device to use.
6. Click **Close**.

Initial USB Connection

To establish a USB connection for the first time, complete the following steps.

1. Turn on the MRX920, and wait approximately one minute for the receiver to gain full power.
2. Using a USB cable, attach the MRX920 to the laptop that is running the MX900 software
3. If a USB driver has not yet been installed, install the USB driver supplied on the installation media.
4. Start the MX900 software. (See "Starting the Software" on page 3-30).
5. Click **Settings** on the MX900 main window. (See Figure 3.31 on page 3-32.)
6. Click **Receiver Settings**.
7. Click **Scan for Devices**.



If the USB driver does not auto install, complete the instructions which follow, describing how to configure the MRX920 for use with MX900.

Scan for Devices

To scan for devices, complete the following steps.

1. In Windows, open **Device Manager** and locate the **RNDIS** network device.
2. Right-click **RNDIS/Ethernet Gadget** and select **Update Driver Software**.
3. Select **Browse my computer for driver software** and then **Let me pick from a list of device drivers on my computer**.
4. Choose **Network adapters** as the device type and click **Next**.
A drop down list of manufacturers and network adapters appear.
5. Select **Microsoft Corporation** and **Remote NDIS Compatible Device**.
6. Click **Next**, and scroll through the **Update Driver Warning Dialog**.
7. In MX900, select the **Settings** tab and then select **Scan For Devices**.

To Upgrade the Receiver

To upgrade the receiver firmware, complete the following steps.

1. Start the MX900 software. (See "Starting the Software" on page 3-30.)

2. Click **Settings** on the MX900 main window. (See "Navigating Within the Software" on page 3-32).
The Settings window appears.
3. Click **Receiver Settings**.
The Receiver Connection Settings window appears.
4. Click **Upgrade Receiver**.
A dialog appears asking you to select the firmware provided by Neptune.
5. Click **Select File** and select the path for the firmware file provided to you by Neptune Support.

Configuring the Driver

To configure the driver, complete the following steps.

1. Open **Devices and Printers** from the **Windows Start** menu.
2. Right-click the new **Remote RNDIS Compatible Device**.
3. Select **Network Settings**.

The following dialog appears.

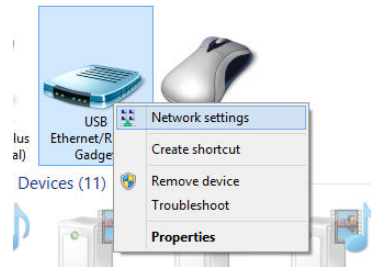


Figure 3.10 Devices and Printers Network Settings

4. Select one of the active networks in the **Network and Sharing Center** dialog. See Figure 3.11 for available options.

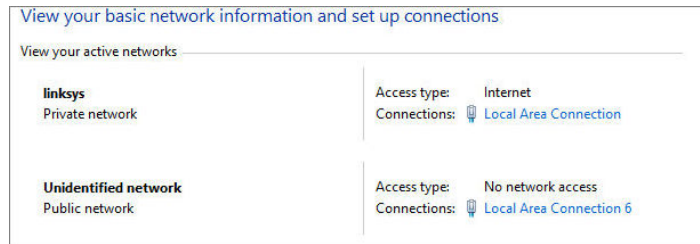


Figure 3.11 Network and Setup Connections

5. Click the connection, and then **Properties**.
A dialog similar to the following appears. See Figure 3.12.

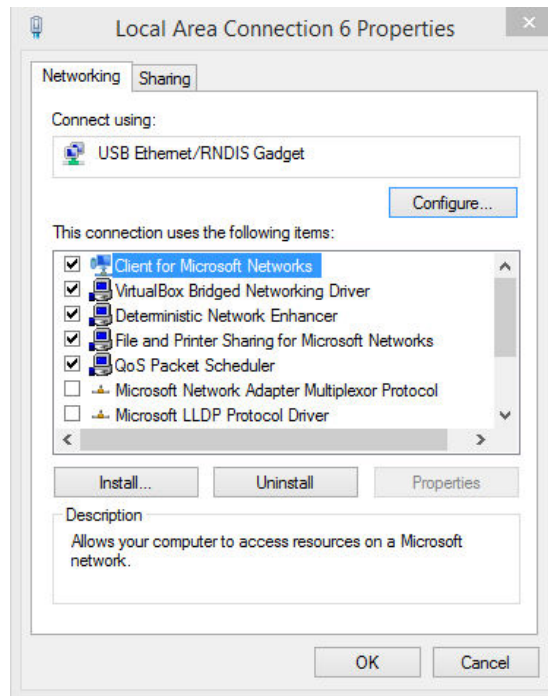


Figure 3.12 Local Area Connection 6 Properties

6. Double-click Internet Protocol Version 4 and set values to match Figure 3.13.

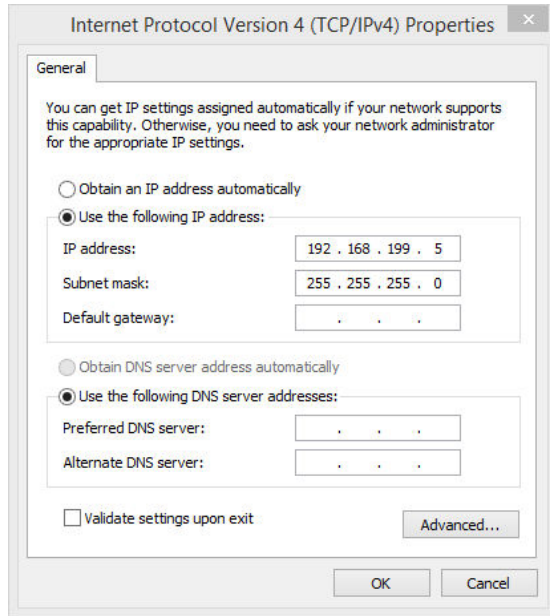


Figure 3.13 Internet Protocol Version 4



You can use any IP address on the 192.168.199 subnet as long as the value is 192.168.199.3 or higher.

The IP address of the MRX920 is 192.168.199.2 and is listening on port 43431.

If Windows 7 or Higher Does Not Recognize Driver

If Windows 7 or higher does not automatically prompt you for the device driver, complete the following steps.

1. Select **Start**.
2. Select **Control Panel**.
3. Select **View devices and printers**.
4. Scroll down to select **Neptune MRX920**.

The following dialog appears.



Figure 3.14 Selecting Neptune MRX920 Properties

5. Right-click and select **Properties**.

The following dialog appears.

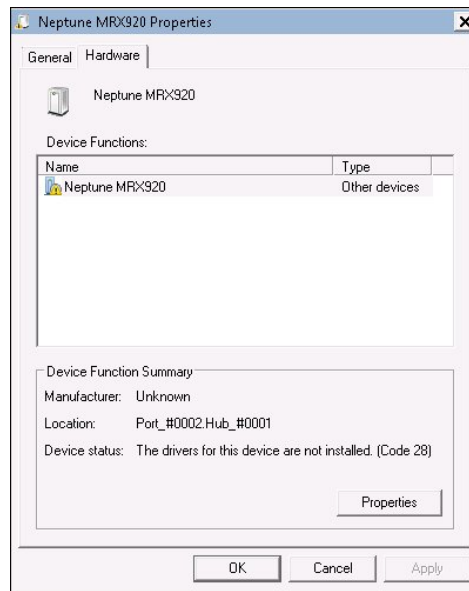


Figure 3.15 Neptune MRX920 Properties

6. Select the **Hardware** tab.

The following dialog appears. See Figure 3.16 on the facing page.

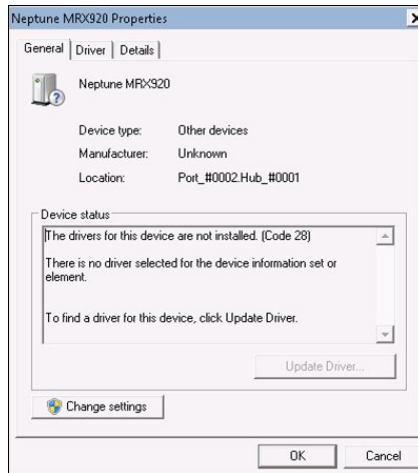


Figure 3.16 Neptune MRX920 Properties General Tab

Updating the Driver

Complete the following steps.

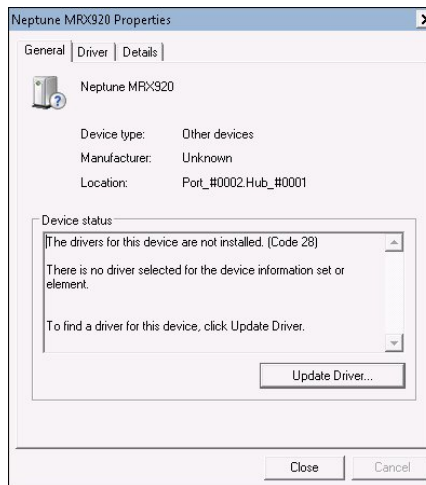


Figure 3.17 Update Driver Dialog

1. Click 

The following dialog appears.

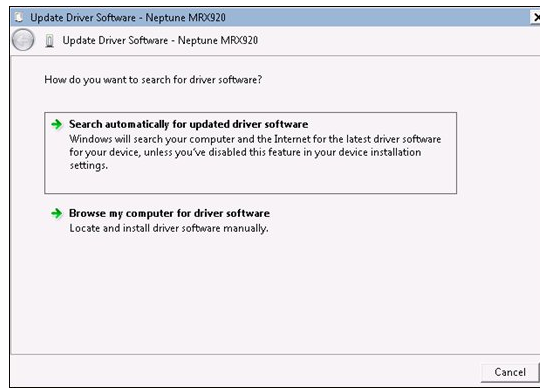


Figure 3.18 Update Driver Software

2. Select Browse my computer for driver software.

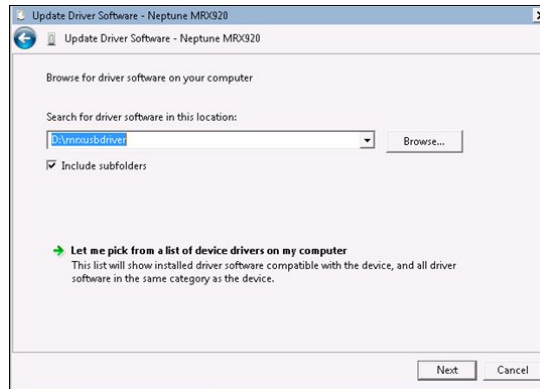


Figure 3.19 Browse for Driver

3. Click **Browse** to locate the `mrxusbdriver` folder on the installation media.

The following dialog appears.

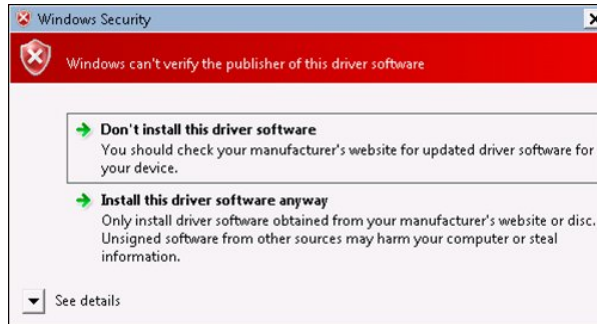


Figure 3.20 Windows Security Dialog

4. Select **Install this driver software anyway**.

The following dialog appears.

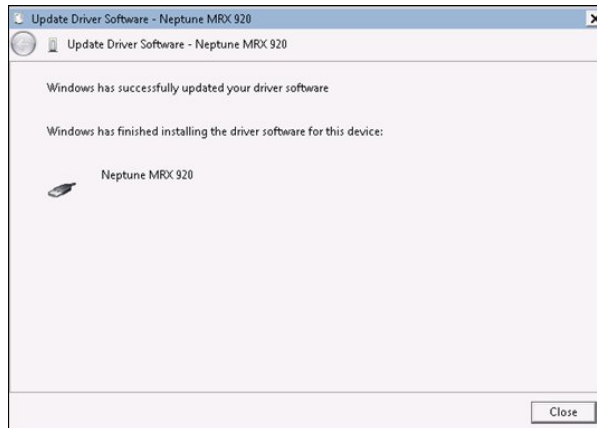


Figure 3.21 Update Driver Software Successful

5. Click **Close**.
6. Close all dialogs and go back to **Devices and Printers**.

The driver installation is complete.


Accessing the MX900 Software



It is imperative that the system date on your laptop (located in the lower right corner of your laptop display) is the correct current date and time. MX900 relies on this accurate date and time to process meter reading data. When starting the MX900 software, a dialog can appear prompting you to verify the date and time. If the date and time displayed is incorrect, exit MX900 and adjust your laptop's date and time. Refer to the Microsoft Windows Help or your laptop manual.

Verifying the Laptop Date and Time

When you first start the MX900 software, it displays your laptop's date and time.

1. Double-click the  icon on your Windows desktop.
The following dialog appears.

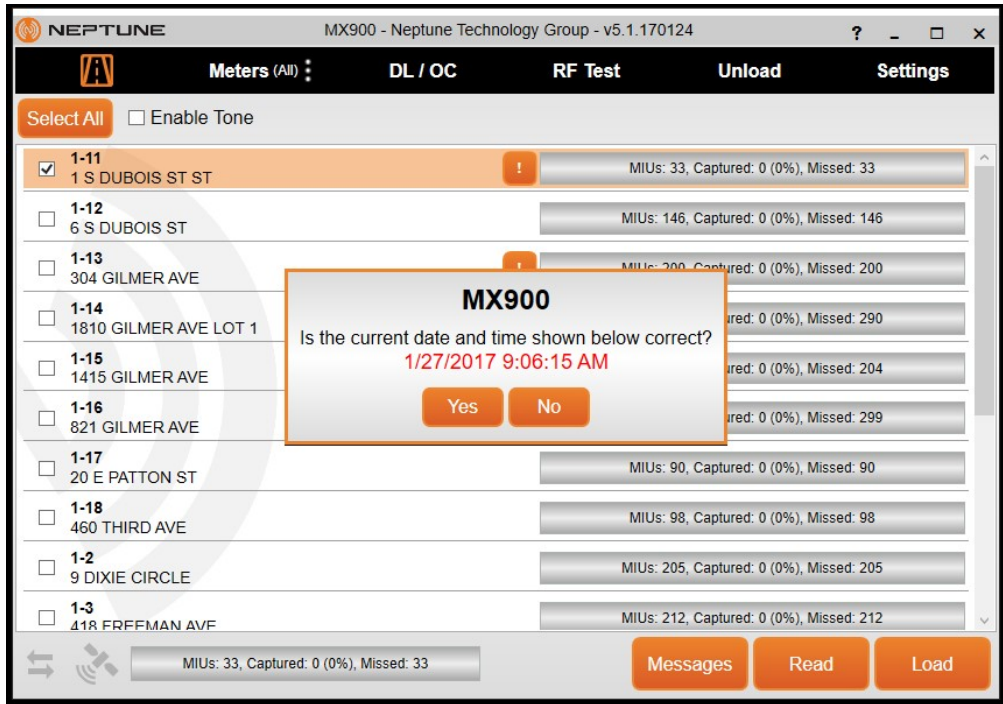


Figure 3.22 Dialog with Laptop's Date and Time

2. Do one of the following.
 - Click **Yes** if the date and time displayed are the correct date and time. Proceed to "Starting MX900" on page 3-23.
 - Click **No** if the date and time displayed are incorrect. Proceed to the "If the Date and Time are Incorrect."

If the Date and Time are Incorrect

If you click No because the date and time on the dialog are not the current date and time, the following dialog appears.

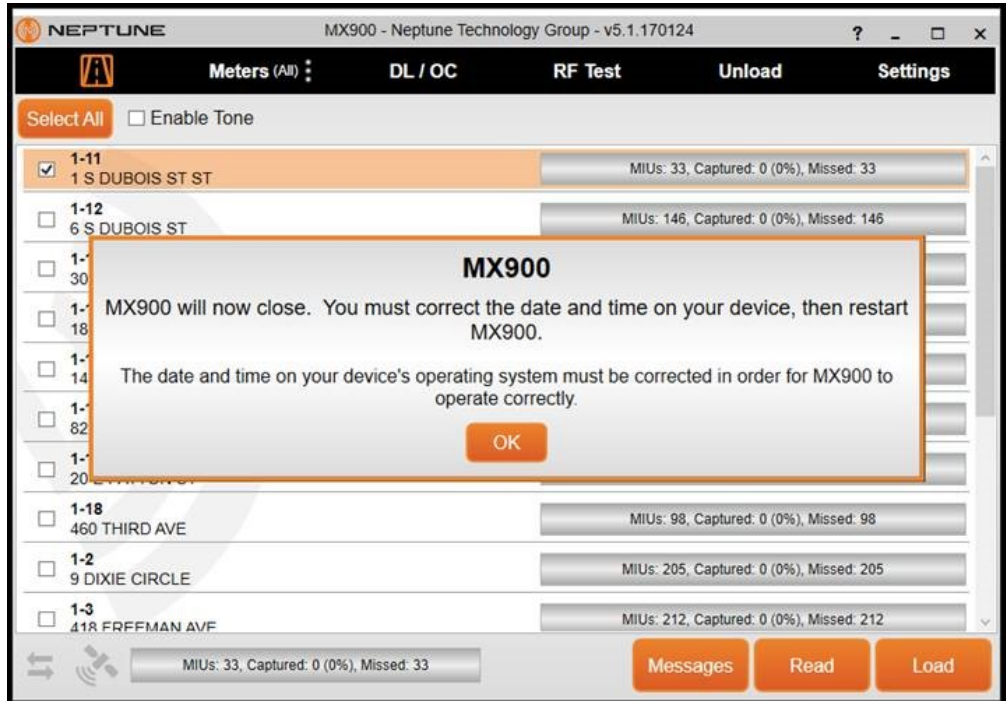


Figure 3.23 Incorrect Date and Time Dialog

You now need to exit the software and change the date and time on your laptop. Refer to Windows Help or your laptop manual to correct the date and time on your laptop.

Starting MX900

Complete the following steps to start the MX900 software on your laptop.

1. When you click **Yes** to verify the current date and time, the following dialog appears.



The image shows a dialog box titled "MX900 Login". It has a light gray background and a black border. At the top, the title "MX900 Login" is centered in bold black text. Below the title, there are two labels: "Username" and "Password". The "Username" label is followed by a dropdown menu showing "BR" with a small downward arrow. The "Password" label is followed by an empty text input field. At the bottom of the dialog, there are two orange buttons: "OK" on the left and "Cancel" on the right.

Figure 3.24 MX900 Login Dialog

2. Select or enter your **Username**.
3. Type your **Password**.
4. Click **OK**.

MX900 automatically opens and the Routes window appears.



Within the software, click  in the toolbar at the top right of the window, to get information and instructions on how to use the software.

Setting Up the MRX920

To set up the MRX920, please refer to the following sections of this guide for the following instructions.

- "Installing the MRX920 in the Vehicle" below.
- "Plugging in the Power Cable" below.
- "Installing the Antenna" on page 3-26.
- "Inserting the USB Flash Drive" on page 3-29.
- After installing the MX900 software, refer to "Setting Up the Connection," in the *MX900 Online Help*.

Installing the MRX920 in the Vehicle

With the MRX920, you have flexibility as to where to place the unit, for example, under the seat, in the back seat, and so forth. The most optimum way of using the unit is to place the unit in the passenger seat and fasten the seat belt through the straps on the carrying case, Part No. 13125-001.

Plugging in the Power Cable

Complete the following steps to connect the vehicle power supply power cable to the MRX920, 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 power cable into the connector on the MRX920, as illustrated in Figure 3.25 below.

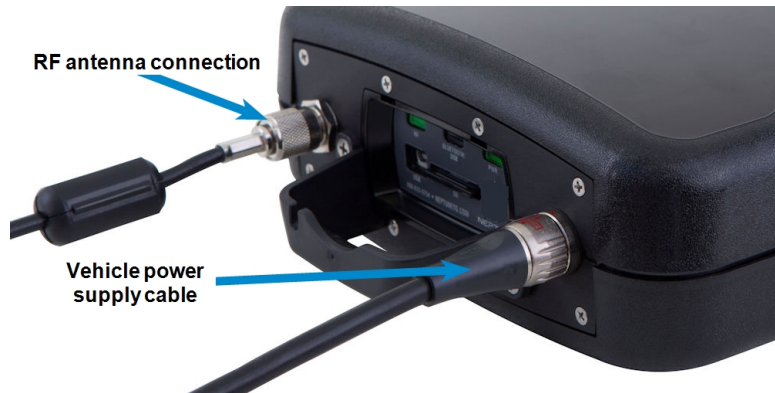


Figure 3.25 Vehicle Power Supply Power Cable

6. Plug the other end of the power cable into the vehicle power supply receptacle as illustrated in Figure 3.26.



Figure 3.26 Vehicle Power Supply Cable Inserted in Car

Installing the Antenna

The proper installation of the antenna cable is critical for the optimal performance of the MRX920. If the cable is crimped, the performance of the unit degrades significantly.

There are several options for running the cable. Whichever method works best for you depends on the type of vehicle being 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, you must remove this cap prior to the installation of the antenna to its base.

1. Referring to Chapter 3 on page 3-1, connect the RF antenna to the MRX920 and hand-tighten the connector by turning it clockwise until it is secured.

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.

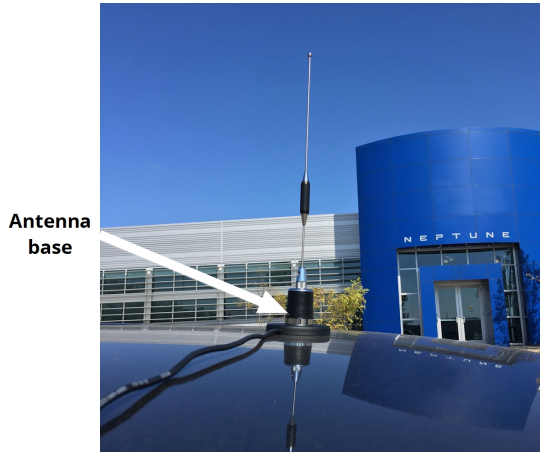


Figure 3.27 Antenna Installation

3. Route the antenna wire through the passenger window or through the door. See Figure 3.28. To prevent the cable from crimping, protect the cable as illustrated in the following figure.



Figure 3.28 Antenna Cable Through Window



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

4. Use the cable protector that is included with the MRX920 to keep the cable from being pinched by the window.



Figure 3.29 Cable Protector



In some vehicles, there is enough room to run the cable through the doorframe of the vehicle without crimping the cable. Other vehicles do not always have enough clearance (especially vehicles with rain gutters). Running the cable through a rear door can be an option. You can also run the cable through a window.

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



Pressure on the antenna cable can cause damage.

Inserting the USB Flash Drive



Neptune recommends that you insert the USB flash drive into the laptop after you place the laptop in the vehicle.

Complete the following steps to insert the USB flash drive containing the routes you plan to read.

1. Remove the cover over the USB flash drive, if applicable.
2. Remove the dust cover from the USB port.

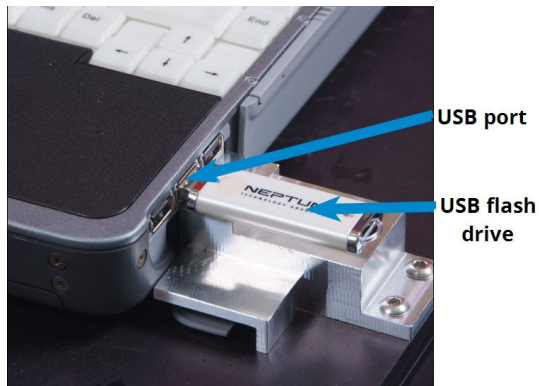


Figure 3.30 USB Port and Drive


3. Insert the USB flash drive into the port on the laptop.



Be careful not to force the USB flash drive into the slot. Forcing can cause damage to the drive or to the data contained on the drive. If the drive does not insert easily, rotate it 180°, and try to insert it again.

Starting the Software


Complete the following steps to start the software on your laptop.

1. Double-click the  icon on your Windows desktop.
After verifying the date and time, the MX900 automatically attempts to import a route file.



If the date and time do not match what is in the lower right corner of your laptop, see "Vehicle Power Supply Power Cable" on page 3-25.

When the import process is complete, the Routes window appears. See Figure 3.31 on page 3-32.

2. Within the software, click  in the toolbar at the top right of the window, get information and instructions on how to use the software.

Becoming Familiar with the MRX920

When the installation is complete, you are ready to begin using the MRX920 for meter reading. Please refer the *MX900*

Online Help within the MX900 software for instructions on navigating the MRX920.

An audible tone or beeper is available in MX900 to emit a beep tone for every account that is read and stored in the MX900 software. This allows you to safely monitor the reading progress without having to look at the laptop screen.

The audible tone only sounds while the MRX920 is performing readings and stops when all readings are complete. There are three available options for the tones you can use. See “Enabling the Audible Tone” in the *MX900 Online Help* to hear the actual sounds and their distinctions.



To protect the driver's safety, use the beeper function on the MRX920 to monitor meter reading.

The laptop computer retrieves meter readings from the receiver in realtime and stores them in nonvolatile memory. It checks meter reading completeness against route files that are downloaded from the MX900 software. About one second after a reading is received, the message area and progress bar update the reading status of the route.

Navigation

All MX900 functions are performed by using the tabs at the top of the MX900 window. You click the appropriate tab to perform the tasks.

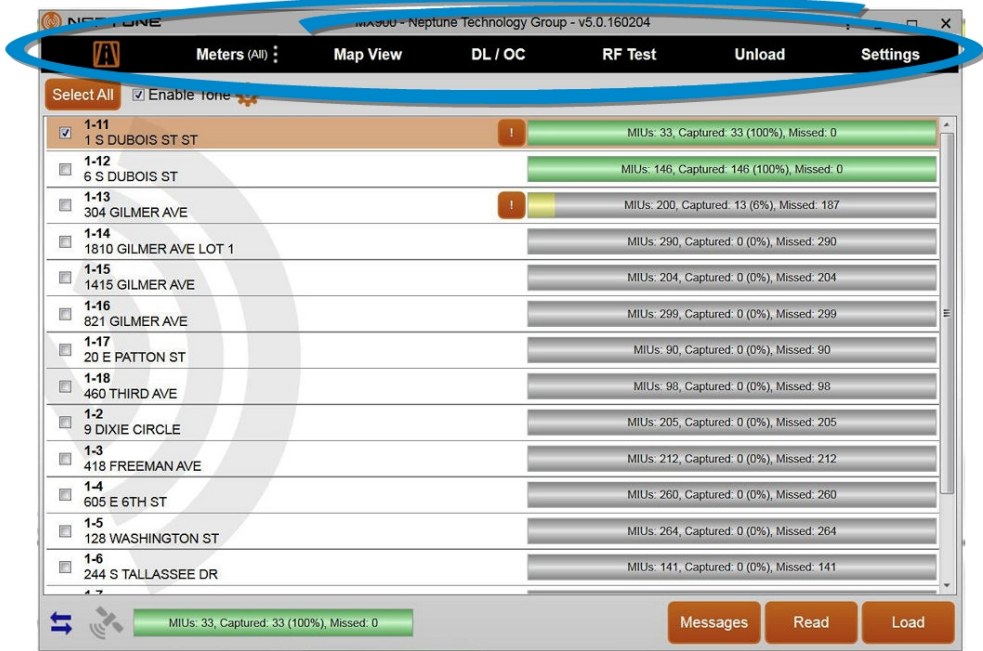


Figure 3.31 Navigating Within the Software


For example, Figure 3.31 shows the Routes window with the route icon highlighted.

Software

The MX900 software application runs on the laptop computer that works in conjunction with the MRX920. The purpose of the software is to log meter readings from routes where R900s are installed. Messages from MIUs outside of the route are identified as such and are discarded. The MX900 software also provides a visual interface for the operator to monitor route progress.

Although the MX900 software can start and stop the reading of message data, it does not control the receive frequency or the decoding of message data. Instead, the MRX920 contains a receiving and processing unit that collects data only from R900s.

The file transfer between the software and the utility company billing system is in a file format specific to Neptune's software application.

Within the software, click  in the toolbar at the top right of the window, to get information and instructions on how to use the software. The latest release of MX900 incorporates extensive online help to guide you through use of the software.

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B

bluetooth

A facility 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 and 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.

D

database

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

default setting

A computer term that is similar in meaning to factory setting. The default setting is one that the MX900 software automatically supplies to an item. For example, the default setting for Enable Tone On/Off mode is Enable Tone Off. The Enable Tone is always off 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.

direction keys

Special keys on the laptop keyboard that allow you to move up or down a list of items. The direction keys, the Up (F5) and Down (F4) keys are indicated by arrow key icons on the laptop display.

display

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

download

The process of sending readings and route information from the Host Computer to the USB flash drive used for readings.

F

function key

Special key on the laptop keyboard that allows you to perform tasks quickly. The function keys used by the software are on the top row of the laptop computer (PF1 - PF7) and in the two rows of F keys (F1 - F17). PF keys and F keys have an equivalent function in the MX900 host software.

G

GPS

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

H

highlighted

Describes an item that is selected. When you select an item using the direction keys, the software lets you know that it has been selected by accenting the item in negative image.

host computer

A computer that is accessed by a user working on another PC or workstation; for example, the host computer contains all the Mobile, RouteMAPS, or EZRouteMAPS data to which the billing computer and other PC operators can connect.

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.

microprocessor

A chip that contains a central processing unit. At the heart of all personal computers and most workstations is a microprocessor. Microprocessors also control the logic of almost all digital devices.

MIU

meter interface unit

MIU ID

An abbreviation for meter interface unit identifier, which is a discrete number used to identify a specific meter interface unit.

MRX920

The compact, portable, mobile data collection device used for meter reading of Neptune radio frequency/RF-equipped water meters. It is used in conjunction with the MX900 host software to conduct automatic meter reading. The data collected is then communicated to the utility's billing system.

MX900

The software that displays the information collected from your MRX920 mobile collection device and allows you to download and upload route information to and from the host software system.

O

operating system

A critical program that runs on a computer that is used to run other programs. Operating systems perform basic tasks, such as, recognizing input from the keyboard, sending output to the display screen, keeping track of files and

directories, and controlling any peripheral devices such as disk drives, ports, and printers.

P

PC

An abbreviation for personal computer, in the case of MRX920, this refers to the laptop.

personal computer

A general-purpose, single-user microcomputer designed to be operated by one person at a time. All are based on the microprocessor technology that enables manufacturers to put an entire central processing unit on one chip.

R

RF

radio frequency

S

screen

The graphic portion of a display. The MX900 software windows show information in three different areas to present the information shown on the display: - A meter reading and load indicator area with a graphic progress bar and pulsing reading indicator - A message and information display area - An active function key display bar

U

upload

The process of sending readings and route data from the MRX920 to the host computer via Bluetooth/USB/serial port connection.

USB

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

USB flash drive

A small, device that allows you to add memory, mass storage, and other capabilities to portable computers. USB flash drives are sometimes called thumb drives.

W

Windows

The operating system required for MX900: - Windows 7 Professional (32 and 64 bit) - Windows 8 Professional (32 and 64 bit) - Windows 8.1 Professional (64 bit) - Windows 10 Professional (64)

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