



Itron Mobile Radio User Guide IMR 2.1

Itron Mobile Radio User Guide - IMR 2.1

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Contents

Table of Contents

1	Itron Mobile Radio Compliance	5
1	Introduction	8
	Feature List	8
	Related Documents List	8
2	About Your Itron Mobile Radio	10
	Itron Mobile Radio Parts List	11
3	Daily Operation	13
	Charging the Portable IMR Battery	13
	Providing Power to the Mobile IMR-FT	13
	Turning the Radio On or Off	14
4	LED Status Indicators	15
	Power Indicator LED Table	15
	Comm Indicator LED Table	16
5	Communication Ports	17
6	Carrying the Portable Itron Mobile Radio	18
7	Installing the IMR-FT	19
	External Vehicle Antenna Specifications	19
	Antenna Parts	20
	Installing the Antenna	21
	Selecting an Antenna Location on the Vehicle	21
	Installing the Permanent Antenna Mount	22
	Installing the Magnetic Antenna Mount	23
	Installing the DC Power Cable	24
	Power Cable Routing--All Installations	25
	Power Cable Installation--Removable	25
	Power Cable Installation--Permanent	26
	Installing the Mounting Jacket in the Vehicle	26
	Installing on a Lap Seat Belt	29
	Installing on a Partition or Other Vehicle Structure	29

Installing on a Pedestal	30
Installing the IMR-FT in the Mounting Jacket	30
Removing the IMR-FT from the Mounting Jacket	31
8 Maintaining your Itron Mobile Radio	32
Cleaning the Radio Case	32
Installing a Replacement Battery	33
Servicing the IMR-FT Charge Base	34
Removing the IMR-FT Charge Base	34
Replacing the Charge Base Antenna Cable	35
Servicing the IMR-FT External Antenna	36
Inspecting the Antenna Connectors and Cables	36
Inspecting the Antenna Base and Whip	36
Cleaning the Antenna	37
Replacing the Antenna Gasket	37
Replacing the Antenna Cable	38
9 Storing Your Radio	39
10 Battery Basics	40
Battery Best Practices List	40
11 Safety	42
AC Power Adapter	42
12 Troubleshooting	44
Issue and Solution Table	44
Radio Readings Tips	45
13 Optimizing Bluetooth® Performance	46
Pairing Bluetooth for Itron Mobile for FCS Users	46
Pairing Bluetooth in Windows	46
To Pair Bluetooth in Windows	46
14 Itron Mobile Radio Capabilities and Limitations	49

Itron Mobile Radio Compliance



Important! IMR 2.1 devices (FCC ID: EO9IMRC) are approved for sale and use only in the United States.

Equipment description

Itron Mobile Radio	
Internal Antenna: IMR 2.1	External Antenna: IMR-FT 2.1
FCC ID: EO9IMRC	FCC ID: EO9IMRC

FCC USA intentional radiator compliance statement

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.

FCC USA un-intentional radiator compliance statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Electromagnetic compatibility



Caution: ELECTROMAGNETIC COMPATIBILITY

Use only approved accessories with this equipment. In general all cables must be high quality, shielded, and correctly terminated. Unapproved modifications or operation beyond or in conflict with these instructions for use, may void authorization by the authorities to operate the equipment.



Important! Changes or modifications to the device or its antenna not expressly approved by the party responsible for compliance could void the user's authority to operate the device.

Transportation classification

The Federal Aviation Administration prohibits operating transmitters and receivers on all commercial aircraft. When powered, Itron Mobile Radios are considered operating transmitters and receivers and cannot be shipped by air with the battery installed. To ship by air, remove the battery and follow Li-ion shipping regulations.

Specific absorption rate data

The IMRC devices meet the government's requirements for exposure to radio waves. Your Itron Mobile Radio has a radio transmitter and receiver. It is designed and manufactured not to exceed limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission (FCC) of the U.S. government. These limits are part of comprehensive guidelines and establish permitted levels of RF energy for the general population. The guidelines are based on standards that were developed by independent scientific organizations through periodic and thorough evaluation of scientific studies. The standards include a substantial safety margin designed to assure the safety of all persons, regardless of age or health.

The exposure standard for wireless mobile and/or portable devices employs a unit of measurement known as the specific absorption rate, or SAR. The SAR limit set by the FCC is 1.6 W/kg¹. Tests for SAR are conducted using standard operating positions accepted by the FCC with the radio transmitting at its highest certified power level in all test frequency bands. Although the SAR is determined at the highest certified power level, the actual SAR level of the radio while operating can be well below the maximum level. This is because the Radio is designed to operate at multiple power levels, depending on the needs of the customer.

¹In the United States, the SAR limit for wireless mobile and/or portable devices used by the public is 1.6 W per kilogram averaged over 1 g of tissue. The standard incorporates a substantial margin of safety to get additional protection for the public and to account for any variations in measurements.

Before an Itron Mobile Radio is available for sale to the public in the U.S., it must be tested and certified to the FCC that it does not exceed the limit established by the government for safe exposure. The tests are performed in positions and locations (for example, worn on the body) and reported to the FCC. The highest SAR value for this Itron Mobile Radio, model IMR when tested for use when worn on the body as described in the user's guide is 1.21 W/kg (IMRC). While there may be differences between the SAR levels of various Itron Mobile Radio models and at various positions, they all meet the government requirements for safe exposure. Please note that improvements to this product model could cause differences in the SAR value for later products; and in all cases, products are designed to be within the guidelines.



Warning! Use this device only in a manner consistent with the Itron Mobile Radio User Guide

1

Introduction

This document details the features and functions of the Itron Mobile Radio and provides information relating to its use and maintenance.

The Itron Mobile Radio is available in two models: the original handheld, portable Itron Mobile Radio (IMR) with a built-in antenna and the new IMR-FT Field Tools version that is mounted in a vehicle for curbside endpoint reading and field tool operations, respectively.

All IMR models share many of the same features and operations. Those common to all models will be described and attributed to the IMR in a generic sense. Key differences in models will be described and attributed to either the portable IMR or the mobile IMR-FT.

Feature List

Each Itron Mobile Radio is equipped with the following features.

Table 1

Feature	IMR	IMR-FT
Power button. See Turning the Radio On or Off on page 14 .	X	X
LED status indicators. See LED Status Indicators on page 15 .	X	X
USB communication port. See Communication Ports on page 17 .	X	X
Bluetooth wireless communications. See Optimizing Bluetooth® Performance on page 46	X	X

Related Documents List

For more information about the Itron Mobile Radio and the Itron Mobile for FCS app. See the most current versions of the following documents.

- *Itron Mobile for FCS User Guide* The Itron Mobile Radio is designed for use with handheld and laptop computers running the Itron Mobile for FCS app.
- *Itron Mobile Radio Quick Reference Guide* (TDC-1720-xxx)
- *Itron Mobile Radio Compliance Statement* - IMR 2.1 (815-0411-00)

2

About Your Itron Mobile Radio

When you unpack your radio, make sure you have all of the components listed in the following tables. If any are missing, contact Itron Support Services immediately.

For the portable IMR, an optional Radio Carrying Kit is available for order separately. The Radio Carrying Kit contains a belt clip and a shoulder harness.

Itron Mobile Radio Parts List

Table 2

The portable Itron Mobile Radio comes with the following items.	
Itron Mobile Radio with built-in antenna	
AC power adapter	AC wall plug with USB type A port.
Communication and charging cable	USB cable.
Documentation	<i>Itron Mobile Radio Quick Reference Guide</i> <i>Itron Mobile Radio Compliance Statement</i>
(Optional) Belt clip and shoulder harness	Included if the optional Radio Carrying Kit is ordered.

Table 3

The mobile IMR-FT come with the following items.	
Itron Mobile Radio with attached charge base	
External antenna	26.5 inch antenna whip
Antenna vehicle mount with cable	Antenna mount with attached cable. Available as a permanent mount with a 17-foot cable or a magnetic mount with a 12-foot cable.
IMR-FT mounting jacket with adapter plate	Securely holds the IMR-FT and mounts to a seat belt, partition, or pedestal.
DC power cable	Two-meter cable with 12V DC vehicle accessory plug.
Communication and charging cable	Two-meter USB cable with right-angle micro-USB plug.

Table 3 (continued)

Documentation	<i>Itron Mobile Radio Quick Reference Guide</i> <i>Itron Mobile Radio Compliance Statement</i>
---------------	---

3

Daily Operation

- Inspect the radio for broken, loose, or missing parts and fasteners, taking corrective action as required.
- Ensure that the IMR-FT external whip is securely connected to its mounting base, and the mounting base is securely attached to the vehicle.
- Make sure the radio is operated and stored within the recommended temperature range.
Operating temperature: -5° F to 140° F (-15° C to 50° C)
Storage temperature: -40° F to 158° F (-40° C to 70° C)
 - Cold temperature extremes may result in reduced available energy from the battery pack. This energy is recoverable as the battery pack warms to 68° F (20° C).
 - Do not subject the radio to extreme temperatures, such as leaving it in a vehicle in bright sunlight. Extended exposure to warm temperature extremes can result in permanent reduction in available energy from the battery pack.
- Exit all external applications at the end of each work day and power the radio off. This ensures that all applications communicating with the radio have terminated their communication links and the IMR battery is not being discharged.
- Charge the portable IMR battery nightly.

Charging the Portable IMR Battery

1. Plug the micro-USB cable connector into the radio.
2. Plug the USB cable into a PC or an AC wall adaptor.
3. Allow the radio to charge for at least six hours before you use it for the first time or before you store it.

Providing Power to the Mobile IMR-FT

1. Plug the vehicle DC power cable into the charge base.
2. Connect the DC power cable to 12V DC vehicle power.

The radio remains on and the battery charges as long as power is being supplied by the vehicle.

Note: If the radio is connected to the PC over USB and the vehicle power is removed, the PC will power the radio and charge the battery. If the PC is not externally powered this will drain the PC battery over time.

Turning the Radio On or Off

- Turn on while using battery power:

Press and hold the button for three seconds (until the Power LED turns green) to turn the radio on.

- Turn off while using battery power:

Press and hold the button for three seconds (until the Power LED turns white) to turn the radio off.

- Turn on while using external power:

The radio is always on when using external power.

When a portable IMR is connected to an energy source with the USB cable, pressing the button turns the power LED green until the button is released, but it does not turn the radio off.

When an IMR-FT is connected to 12V DC vehicle power, pressing the button turns the power LED green until the button is released, but it does not turn the radio off. The IMR-FT radio remains on as long as it is powered by the vehicle.



Important! To preserve battery energy, a radio not connected to external power automatically shuts down after one hour of inactivity. If this occurs, turn the unit on as described above.

4

LED Status Indicators

Two multi-color LED status indicators are located on the top of the radio. These indicators are labeled with a power icon  and a communication icon . The color and illumination of the LED lights provide feedback about the Itron Mobile Radio's status.

The LED lights have two patterns for displaying different states.

- **Solid.** LED is on continuously.
- **Flash.** LED turns off and on at a constant interval.

Power Indicator LED Table

The following table describes the LED colors and patterns for the most common power conditions.

Table 4

 Power indicator			
Solid		Flash	
 green	▪ Initializing ▪ Button pressed ▪ Charged	 green	Battery more than 50%
 yellow	N/A	 yellow	Battery more than 20%
 red	Charging	 red	Battery less than 20%
 white	▪ Error: Battery ▪ Turning on	 white	Error: General

Note: When an IMR with a fully discharged battery is connected to power via its USB cable, it may display a white battery error indicator. This is normal behavior while a fully discharged battery is charging to a minimum voltage, at which time it should follow the states shown in the Power indicator LED table. Wait several hours while the battery charges and you should eventually see the power LED turn solid red, indicating it is charging, and finally solid green, indicating that it is fully charged and ready for use. If the white LED never turns off while the IMR is connected to power, the battery is likely bad and must be replaced. This will need to be done approximately every 300 to 500 charge cycles. See [Installing a Replacement Battery on page 33](#).

Comm Indicator LED Table

The following table describes the LED colors and patterns for the most common communication conditions.

Table 5

 Comm indicator			
Solid		Flash	
 green	USB connected	 white	Error
 blue	Bluetooth® connected	 blue	Bluetooth low energy connected
Note: The application connected to the radio may assign a display pattern to the LEDs that is not described in these tables.			

5

Communication Ports

The Itron Mobile Radio has one micro-USB communication port under a protective rubber flap on the side of the radio near the top.

Note: The USB cable supplied with the IMR-FT has a down-angle micro-USB connector to facilitate proper cable management with the mounting jacket. Using a cable with a straight or up-angle connector will put unnecessary stress on the radio USB port and may, over time, lead to a poor cable connection.

In addition, the radio is equipped with an internal port for wireless Bluetooth® communications. If communication is in place through Bluetooth, attaching the USB cable only provides power. Communication may occur through Bluetooth while charging with the USB.

Note: Some Windows 7 or Windows 8 users may experience difficulty connecting to the device via USB or may see a prompt to install an updated Texas Instruments driver for the device. Download and install the Itron Mobile Radio USB driver available from Itron Access at <https://access.itron.com/> (available for registered users).

6

Carrying the Portable Itron Mobile Radio

The portable Itron Mobile Radio's optional shoulder harness and belt clip provide convenient, hands-free ways to carry the radio while installing, reading, and maintaining meters and endpoints. The shoulder harness and belt clip let you wear the radio comfortably while walking or driving.

As a safety feature, the clips are designed to break away if the radio snags or becomes caught, releasing the wearer and reducing the likelihood of injury.

The radio may also be carried in a pocket, backpack, or bag.

The radio is water resistant.

Note: If you are carrying the radio, make sure the side with the ridges is facing away from your body, conductive materials, or anything else which may shield the radio signal.

7

Installing the IMR-FT

Refer to the following procedures for guidance on installing your IMR-FT.

- [Installing the Antenna on page 21](#)
- [Power Cable Routing--All Installations on page 25](#)
- [Installing the Mounting Jacket in the Vehicle on page 26](#)

External Vehicle Antenna Specifications

This section provides the specifications for the external vehicle antenna.



Caution: The mobile IMR system is designed to operate with the external vehicle antenna listed here. Antennas not listed here are strictly prohibited for use with this system. The required antenna impedance is 50 ohms.

Table 6 External Vehicle Antenna Specifications

Specification	915 MHz Mobile Antenna
Ittron part number	MSE-0122-002
Frequency range	908-958 MHz
Maximum gain	5 dBi
Polarization	Vertical omni-directional
Impedance	50 ohms
Termination	1-1/8-inch 18 thread mount
Overall dimensions	26.5-inch length x 1.43-inch diameter

Antenna Parts

Your IMR-FT comes with the whip antenna specified in the table, **External Vehicle Antenna Specifications on page 19** and either a permanent or a magnetic mount. The whip antenna base is compatible with either mount. The antenna mount is attached to the proper coaxial cable and the connector required by the IMR-FT.



Whip Antenna



Whip Antenna Base and Gasket



Permanent Antenna Mount and Cable



Magnetic Antenna Mount and Cable

Installing the Antenna

Installation of the antenna includes the following tasks. Perform the tasks in the order shown in the following list.

1. [Selecting an Antenna Location on the Vehicle on page 21](#)
2. [Installing the Permanent Antenna Mount on page 22](#)
3. [Installing the Magnetic Antenna Mount on page 23](#)

Selecting an Antenna Location on the Vehicle

The antenna remains installed on the vehicle. The manufacturer's instructions, which ship with the antenna components, are summarized in the following procedures. Itron recommends consulting the antenna manufacturer's instructions in addition to this guide.

Note: Do not trim, shorten, or secure any cabling until you are confident of its routing.

Location selection criteria include the following.

- Access from inside the vehicle to the exterior antenna mounting location may be required. If the vehicle has a headliner, remove nearby trim pieces or even a dome light to gain access to the mounting location.

- Install the antenna a minimum of 12 inches from any other antennas or metal structures on the vehicle's roof that could disrupt communication with endpoints. 30 inches is recommended.
- Select a location on the vehicle's roof that has as flat a surface as possible. The metal of the roof must be 0.02 to 0.04 inches thick.
- The location should be no more than one inch deep and at least 2.5 inches in diameter to properly secure the antenna base.
- To meet RF exposure safety requirements, the antenna must be installed a minimum of 21.7 inches (55 centimeters) from where any bystanders may be located.
- The diameter of the ground plane at the antenna base should be at least three feet for best performance. Ideally, the ground plane should be a minimum of three times the wavelength being received. For example, a 900 MHz signal, having a 13 inch wavelength, should have a ground plane of 39 inches.

Installing the Permanent Antenna Mount

The permanent antenna mount is installed through the roof of the vehicle.



1. Drill or cut a $\frac{3}{4}$ -inch diameter hole in the vehicle where the permanent mount antenna is to be located.
2. Carefully feed the connector and coaxial cable through the hole from the top side and thread it out of the headliner near the IMR-FT mounting location.
3. Insert the rest of the cable and the lower tabs of the mount body through the hole from the top.



4. Center the mount body in the hole.
5. Ensure that the rubber O-ring is pressed into the groove in the brass nut and thread the nut onto the mount body.
6. Finger-tighten the nut and then use a wrench to tighten the nut until the O-ring is compressed. If the mount body spins while you are tightening the nut, use a spanner wrench applied to the two holes on the top of the mount body to hold it still.



7. Clean the surface of the vehicle around the antenna mount body.
8. Ensure that the gasket is properly set in the antenna base.
9. Thread the antenna base onto the mount body, making sure not to cross-thread the mount.
10. Continue tightening the antenna base until it seats to the vehicle.
11. Complete the cable routing to the IMR-FT in the vehicle and secure the cable.

Installing the Magnetic Antenna Mount

The magnetic antenna mount can be installed temporarily on the metal roof of the vehicle and then removed as desired.



1. Ensure that the gasket is properly set in the antenna base.
2. Pre-assemble the antenna to the magnetic mount by threading the antenna base onto the mount body, making sure not to cross-thread the mount.
3. Continue tightening the antenna base until it seats to the mount.
4. Before mounting the magnetic base on the vehicle, clean both the magnet surface and the vehicle mounting surface.
5. Place the antenna mount on the vehicle where it is flat and ensure that the entire magnet is making secure contact with the vehicle.
6. Route the antenna cable through an open window or door and secure it in such a way that it will not be accidentally pinched and kinked or damaged. Complete the cable routing to the IMR-FT in the vehicle and secure the cable.



Important! If the vehicle door must be opened with the cable in place, make sure to leave enough slack in the cable so as not to pull on the IMR-FT or the antenna when the door opens. Improper use or damage to the magnetic mount antenna or cable can adversely affect system performance.

7. When removing the antenna, hold the antenna at the bottom of its base and tilt the antenna mount to release the magnetic force. Do not pull on the coaxial cable to release the magnetic force and do not drag the magnet across the surface of the vehicle.

Installing the DC Power Cable

The DC power supply cable connects to the vehicle's electrical system so you can easily connect and disconnect power for the IMR-FT. The DC power cable is shipped with a vehicle accessory (12V) adapter attached so the cable and the IMR can be easily moved between different vehicles. The accessory adapter comes with a replaceable five amp fuse installed. If preferred, the accessory adapter may be cut off and the unterminated end of the cable hardwired permanently to the vehicle fuse block or other 12V DC power source, so the cable remains in the vehicle. The IMR is still removable.

The following illustrations show the vehicle accessory adapter and the unterminated end of the power supply cable with the accessory adapter removed. Notice the polarity and marking of the power supply cable wires.



Table 7

Wire	Description
Black, no writing	Positive
Black, with writing	Negative

Power Cable Routing--All Installations

1. Once the mounting location of the IMR-FT is known, select a location in the vehicle for the IMR connector end of the cable so that it reaches the Itron Mobile Radio power jack without putting stress on the cable or radio.
2. Route the vehicle accessory adapter end of the cable to the desired voltage and grounding sites in the vehicle, typically either an accessory jack for a removable installation or the fuse block for a permanent installation. Leave enough slack in the cable to work with it and so it is not stressed during use.



Caution: Do not route the cable where it can become abraded or damaged, such as under the carpet in high traffic areas, over sharp edges, near hot engine components, near brake or clutch linkages, or where it can be exposed to oil or other corrosive liquids.

Power Cable Installation--Removable

To temporarily install the DC power cable using the vehicle accessory adapter, route the adapter end of the cable to a 12V DC accessory jack and plug the adapter in securely.

To remove the adapter, grip the adapter body and pull; do not pull on the cable.

Note: Some accessory jacks are unswitched and have power always on, and some are switched by the vehicle ignition key. Determine which accessory jacks you have and which you intend to use before routing the cable.

Power Cable Installation--Permanent

1. To permanently hard wire the DC power cable, first remove the vehicle accessory adapter from the DC power cable by cutting the cable where it connects to the adapter. Dispose of the adapter properly.
2. Route the unterminated end of the cable to the fuse block or other 12V DC source. If necessary, trim the cable wires to a suitable length and strip the insulation from the wires according to the requirements of the installation.
3. Connect the plain black wire (without white writing) to a spare fuse location in the vehicle fuse block that has a rating of five amps. If no spare fuse location is available, a five amp inline fuse must be spliced into the positive side of the cable. Then the wire can be connected to either a switched or unswitched 12V DC power source, depending on the user requirements.



Caution: When hard wiring the DC power cable to the vehicle a five ampere fused connection is required.

4. Connect the black wire with white writing directly to the vehicle's chassis ground.

Installing the Mounting Jacket in the Vehicle

The IMR Mounting Jacket and included multipurpose mounting plate are designed to allow installation of the IMR-FT in a vehicle in several possible ways, holding your radio securely in place. Features of the Mounting Jacket and mounting plate are shown and described below.



Figure 1 – Mounting Jacket

Figure 1 shows the plastic side release buckles and straps, used to secure the IMR-FT within the Mounting Jacket. Inside the Mounting Jacket is the Velcro seatbelt retaining flap, used to secure the Mounting Jacket onto a lap seatbelt. This allows for easy temporary installation of the IMR-FT in the vehicle and easy removal.



Figure 2 – Cable Retaining Flap

Figure 2 shows the Velcro cable retaining flap on the side of the Mounting Jacket, used to hold the micro-USB cable securely in place once it is plugged into the installed IMR-FT.



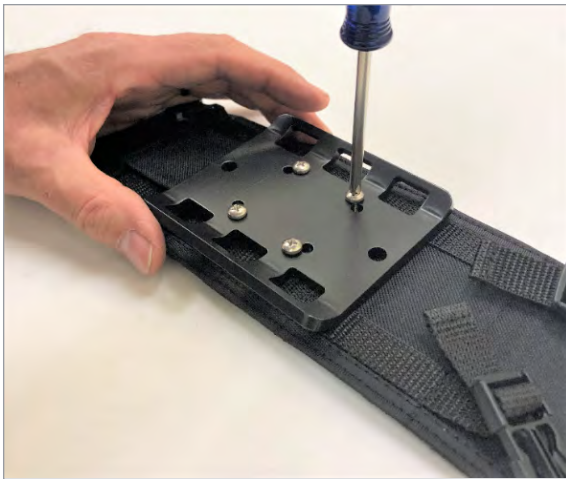
Figure 3 – Mounting Jacket and Mounting Plate

Figure 3 shows the back of the Mounting Jacket with the included mounting plate. The back of the Mounting Jacket has four threaded screw holes arranged in the universal AMPS hole pattern. Four screws are also provided with the Mounting Jacket. This allows the Mounting Jacket to be mounted to a compatible vehicle device mount, such as a pedestal, partition, or other vehicle structure. The vehicle device mount is supplied and installed by the user.

Included with the IMR-FT is a multipurpose mounting plate. The mounting plate can be attached to the Mounting Jacket, and then to the vehicle in several ways. Two orientations of the mounting plate on the Mounting Jacket are shown below.



Vertical Mounting Plate



Horizontal Mounting Plate

- Eight holes in a rectangle are arranged in the universal AMPS hole pattern in two directions, allowing the Mounting Jacket to be attached in either a horizontal or vertical orientation.
- Two through-holes in the ends of the mounting plate allow the plate to be attached to a structure in the vehicle with up to ¼-inch bolts or other fasteners (not supplied by Itron).
- Six slots on the sides of the mounting plate allow the plate to be attached to a structure in the vehicle with locking cable ties or other fasteners (not supplied by Itron).



Warning! The primary consideration when installing the IMR Mounting Jacket is that the IMR be securely attached to the vehicle. Failure to do so could lead to injury or death from unsecured components during a sudden stop, rollover, or collision.

The following procedures describe several possible mounting configurations.

Installing on a Lap Seat Belt

Attach the Mounting Jacket to the lap seat belt using the seat belt retaining flap as shown below. The Mounting Jacket may be installed with the top of the jacket facing either way.



Warning! For safety, the Mounting Jacket should only be attached to a lap seat belt. Attaching it to a shoulder belt may allow the IMR-FT to swing unrestrained, causing a potential hazard.



Caution: When the IMR-FT is installed on a lap seat belt, do not place other items on top of the IMR-FT or its cables. Do not allow passengers to sit on the IMR-FT or to wear a seat belt with an IMR-FT attached to it.

Installing on a Partition or Other Vehicle Structure

1. Attach the supplied mounting plate to the Mounting Jacket in the orientation most useful for your purpose using the screws supplied by Itron. Torque the screws to 17-19 in. lbs.
2. Using cable ties, two ¼-inch bolts, or some other secure fasteners, attach the mounting plate to the vehicle partition or other suitable vehicle structure. (Fasteners are not supplied by Itron.)

Installing on a Pedestal

Attach the Mounting Jacket to a pedestal device mount with the screws supplied by Itron. Torque the screws to 17-19 in. lbs.

The pedestal device mount must match the universal AMPS hole pattern used by the Mounting Jacket. (Itron does not supply pedestal device mounts.)

Installing the IMR-FT in the Mounting Jacket

1. Place the IMR-FT in the Mounting Jacket and engage the plastic side release buckles.
2. Ensure the IMR-FT is securely enclosed in the Mounting Jacket and tighten the straps, if necessary.
3. After installing the IMR-FT in the Mounting Jacket, plug the micro-USB cable into the IMR-FT and secure the cable with the cable retaining flap.
4. Attach the DC power cable and antenna cable to their connectors on the charge base.

Note: The DC power cable connector and antenna cable connector should only be finger tightened. Do not tighten the connectors with a tool.

When complete, your IMR-FT installation should look like this:





Removing the IMR-FT from the Mounting Jacket

1. Disconnect the DC power cable and the antenna cable from the bottom of the IMR-FT.
2. Unplug the micro-USB cable and open the Velcro cable retaining flap.
3. Disengage the plastic side release buckles on the Mounting Jacket and remove the IMR-FT.

8

Maintaining your Itron Mobile Radio

Your Itron Mobile Radio is rugged and water-resistant. However, you should take the following precautions to ensure that it gives you many years of reliable service.

- Do not subject the radio to extreme temperatures, such as leaving it in a vehicle in bright sunlight. For more information, see [Battery Best Practices List on page 40](#).
- Do not leave it in damp or dusty places.
- Do not drop your radio or subject it to severe impacts.
- Do not use products containing DEET near the Itron Mobile Radio. DEET will degrade the radio's casing. DEET is a common ingredient in many insect repellents.
- When installing or replacing the battery, make sure to follow the provided instructions to maintain water tightness.
- Use the rubber flap to protect the radio's USB port in dusty conditions.
- Protect the antenna and power connectors on the IMR-FT charge base when the radio is being installed, removed, or carried.
- The IMR-FT charge base is not water resistant. Protect it from rain and moisture.
- Ensure that the IMR-FT external antenna whip is securely connected to its mounting base.

Cleaning the Radio Case

To clean the radio case:

1. Wipe the radio's case with a damp cloth.
2. Use a soft-bristle brush to remove stubborn deposits.
3. Blow any water out of the connector and then leave the radio to drain and air-dry.



Caution: Never use solvents of any kind on the case. Do not expose it to temperatures above 140° F (50° C).

Installing a Replacement Battery

1. Make sure the IMR is powered off and disconnected from other power sources.
2. Remove the battery compartment door.

For the IMR-FT you must first remove the charge base.

3. Grasp the battery removal tab and carefully slide the battery out of the IMR body.
4. Unplug the old battery from the connector inside the battery compartment.
5. Plug the new battery into the connector inside the battery compartment.

Observe the correct polarity of the connector and seat the connector all the way down.

6. Insert the new battery into the compartment.
 - Make sure the battery label is facing the ridges on the radio case.
 - Make sure the wires are along the same side as the connector.
 - Make sure the removal tab is facing out.



Caution: Do not pinch the battery wires when replacing the battery compartment cover.

7. Replace the battery compartment cover making sure the O-ring gasket is properly aligned for water tightness.



8. Fasten the battery compartment cover in place with the provided screws.

Tighten the screws to ensure water tightness.

For the IMR-FT, reinstall the charge base.
9. Plug the USB cable into the radio.

10. Plug the USB cable into a PC or an AC wall adapter, or connect the charge base cable to a 12V DC vehicle accessory adapter.
11. Allow the radio to charge for at least six hours.

Servicing the IMR-FT Charge Base

Itron recommends changing the antenna cable connection in the charge base every 500 disconnects. If you take the radio out of the vehicle at the end of each day, you will need to replace the antenna cable connector about every 2.5 years.



Important! Servicing the charge base should only be done indoors, at a clean location, with the radio powered off. Safeguards against static electricity should be observed.

Removing the IMR-FT Charge Base

Unscrew four screws to remove the charge base from the IMR-FT.

The charge base is located at the end of the radio opposite the label.



Replacing the Charge Base Antenna Cable

1. Remove the charge base from the IMR-FT.



2. Unscrew the small antenna cable connector (1) from the body of the IMR-FT.
3. Unscrew the large antenna cable connector (2) from the bottom half of the charge base. Note the order of the washers and jam nut as they are removed.



4. Install the large connector (2) of the new antenna cable into the charge base, ensuring that the washers and jam nut are added in the correct order. Tighten the jam nut to 26 to 30 inch-pounds of torque.
5. Carefully attach the small connector (1) of the new antenna cable to its mating connector on the body of the IMR-FT. Tighten the connector to 7 to 9 inch-pounds of torque.
6. Plug the power cable connector back into its mating connector on the body of the IMR-FT.

7. Reattach the two halves of the charge base around the body of the IMR-FT. Insert the four screws into the base and tighten them to 4 to 6 inch-pounds of torque.

Servicing the IMR-FT External Antenna

Regularly perform the following basic maintenance procedures to ensure optimal performance of your antenna.

- [Inspecting the Antenna Connectors and Cables on page 36](#)
- [Inspecting the Antenna Base and Whip on page 36](#)
- [Cleaning the Antenna on page 37](#)
- [Replacing the Antenna Gasket on page 37](#)
- [Replacing the Antenna Cable on page 38](#)

Inspecting the Antenna Connectors and Cables

The connections and cables to the radio typically experience the most wear. Many customers remove the radio on a daily basis. Removing and installing the connectors daily can cause the cable and connector to begin separating. This is considered normal wear and tear.

The coax cables (used in the magnetic mount base) can be damaged if they are accidentally pinched in a window or door jamb. Any damage to the coax cables or the connectors will lead to decreased reading performance and transmitter failures due to high reflected power.

1. Create a regular maintenance schedule and inspect the following.
 - Coax cables
 - Ensure the cable is not loose from the connector.
 - Inspect for hard kinks or bends in the cable, which can cause an electrical short.
 - Inspect for cuts or nicks in the cable.
 - Coax shield. Do not expose the inner cable shield at the connector or anywhere along the cable.
 - Connector. The center pin of the connector should not be recessed or pushed in to the connector housing.
2. Replace the entire antenna mount if the cables or connectors are damaged. Contact Itron Support Services if you need assistance.

Inspecting the Antenna Base and Whip

The antenna whip is the radiating element that both transmits and receives the signals for the system. The whip attaches to a base. The base is either mounted permanently through the roof of the vehicle, or is a magnet mount. Moisture can build up between the base and the mount. This moisture buildup leads to oxidation and corrosion which results in a loss of signal quality.

Evidence of moisture buildup (oxidation) on the antenna base threads is usually light and hazy in appearance. The appearance of darker areas or spots indicates a more severe condition which may lead to corrosion.

1. Create a maintenance schedule and look for the following.
 - Oxidation, corrosion, and dirt on the antenna base.
 - Oxidation, corrosion, and dirt on the whip.
 - Missing contact element in the whip.
 - Loose or damaged coax cable at the antenna base.
 - Missing or damaged O-ring gasket.
2. Use a good contact cleaner to clean the area if oxidation or corrosion is found. Follow with a good conductive protectant. Contact Itron Support Services if you need assistance.

Cleaning the Antenna

Regular cleaning is recommended to maintain both the performance and the appearance of your omni-directional RF antenna.

Clean the antenna in the same manner as your vehicle. Apply a quality car wax to the antenna and base to help protect the finish and extend the life of the antenna.

Note: Before taking the vehicle through an automatic car wash that might damage the antenna, Itron recommends that you remove the antenna whip from the permanent mount or the magnetic mount and antenna from the vehicle.

Replacing the Antenna Gasket

Inspect the gasket regularly to verify that it is intact, free from debris, and properly seals the antenna and base. To maintain the integrity and performance of the antenna, Itron recommends that you replace the gasket located in the antenna base minimally once a year.

For more information about ordering the gasket, log onto Itron Access or contact Itron Support Services at 1.877.487.6602.

1. Turn the antenna base counter-clockwise to remove it from the mount.
2. Remove the gasket from the base.
3. Place a new gasket on the base and push it firmly into place.
4. Ensure that the gasket is level with the antenna base to prevent pinching when the antenna is reconnected.
5. Reconnect the antenna to the mount by turning it clockwise until it is firmly seated on the base.

Replacing the Antenna Cable

Itron recommends changing the antenna cable once a year. For more information about ordering the antenna cable, log onto Itron Access or contact Itron Support Services at 1.877.487.6602.

1. Unscrew the antenna cable from the IMR-FT.
2. Unscrew the antenna cable from the antenna base.
3. Attach the new antenna cable to the antenna base.
4. Attach the antenna cable to the IMR-FT.

9

Storing Your Radio

Your radio can be safely stored for six months or less with simple preparation.

Connect the Itron Mobile Radio to external power and allow the battery pack to fully charge.

For information about charging status, see [LED Status Indicators on page 15](#).

If you are storing the Itron Mobile Radio for an extended period of time, you should let it remain charging or remove its battery.

Note: Remove the Itron Mobile Radio's battery before storing the device for periods longer than six months.

10

Battery Basics

The Itron Mobile Radio uses a rechargeable lithium-ion (Li-Ion) battery pack as its main power source whenever it is not receiving power externally.



Caution: Do not use any battery other than the Itron-recommended battery. Using another battery could damage the radio.



Warning! Danger: Risk of Explosion! There is a risk of explosion if the battery is replaced by an incorrect battery type. Dispose of used batteries in accordance with local regulatory guidelines.



Warning! Danger: Il y a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Charge the radio's battery to 100 percent capacity before using it. Complete charging takes about six hours. Charge the battery pack through the USB cable, which can draw power from a computer, an AC wall adapter, or a 12V DC car adapter.

The Itron Mobile Radio meets the USB 2.0 Power Delivery standards. If the IMR does not charge with your third-party device, validate that your device meets USB 2.0 standards. Not all micro-USB connectors meet the USB 2.0 standards.

Battery Best Practices List

Itron recommends the following practices to ensure long battery life.

- Charge the radio at the end of each work day.
- Check the charge status at the beginning of each work day.
- Charge the radio at room temperature (68° F/20° C).

- Charging is disabled below 32° F (0° C) and above 104° F (40° C) to protect the lithium-ion batteries.
 - In cold weather, keep the portable IMR inside your outer clothing. A cold battery will not last all day even with full charge.
 - In hot weather, keep the radio out of direct sunlight. A hot battery's capacity is degraded over time and eventually the battery will not last all day even with a full charge.
 - If an IMR has been left in a hot vehicle (above 104° F, 40° C), allow the vehicle and the IMR to cool down before powering the IMR on.
- Shallow or partial discharge and charge cycles are preferred, rather than allowing the battery pack to drain completely before recharging it.
- Charging after a shallow or partial discharge does not degrade battery pack life or performance.
- The lithium-ion IMR battery is good for approximately 300 to 500 charge cycles, depending on its usage, before it must be replaced.

11

Safety

Your Itron Mobile Radio is ergonomically designed for safe, comfortable use. However, as with all equipment, you should follow good working practices while using it.

Minimize risk by following these guidelines.

- Maintain good posture while using the radio. Keep your fingers and body relaxed whenever possible.
- Avoid keeping your muscles tense for long periods. Change tasks often to avoid prolonged muscle strain. Support the radio while using it.
- Take frequent short breaks. Use these breaks to exercise the muscles in your hands, arms, shoulders, neck, and back.
- Do not attempt to operate or adjust the IMR-FT while driving.

AC Power Adapter

Follow these instructions to help ensure your safety and extend the life of the adapter.

- Use the adapter indoors only.
- Avoid spilling liquid on the adapter.
Do not connect it if it is damp.
- Make sure ventilation around the adapter is not restricted while it is in use.
- Itron recommends using only the AC adaptor supplied with your portable Itron Mobile Radio.
- Inspect the AC adapter before use.
Do not use it if there are any signs of damage or deterioration.
- Make sure the connector is firmly connected.
- Avoid mechanical strain to cables and connectors.
- In the event of overloading, the AC adapter is designed to be fail-safe and may stop functioning.

- Do not try to use the AC adapter to power any other equipment.
- Avoid use in dusty, damp, or contaminated environments.

12

Troubleshooting

If you have a problem with your radio, review the appropriate troubleshooting steps listed in the following table. If the problem remains unresolved, contact an Itron customer service representative (e-mail: support@itron.com; phone: 1.877.487.6602).

Issue and Solution Table

Table 8

Issue	Possible Solutions
Battery does not charge (portable IMR)	■ Ensure the USB charger adapter is USB 2.0 compliant. Itron recommends using only the supplied adaptor. ■ Make sure the USB ports on the IMR and adapter are clean and free of dirt or other contaminants. ■ If charging from a PC through the USB cable, try a different USB port on the PC. The port may be bad or incapable of providing sufficient current for charging. ■ Try a different AC outlet. ■ If the previous troubleshooting suggestions do not solve the issue, replace the battery.
Radio does not remain on or battery does not charge (IMR-FT)	■ Make sure the DC power connector is securely seated in the IMR-FT charge base. ■ Make sure +12V DC vehicle power is being supplied to the vehicle accessory adapter or fuse block where the power cable is connected. ■ Check that the five amp fuse supplying the accessory adapter or power cable is not blown. ■ If you are using the vehicle accessory adapter, make sure the plug stays seated in the 12V DC vehicle accessory jack. If it does not, try a different 12V accessory jack or change to a hard wired cable installation. ■ If the previous troubleshooting suggestions do not solve the issue, replace the battery.

Table 8 (continued)

Issue	Possible Solutions
Battery power drains quickly	- Make sure the battery indicates a full charge following an overnight charge (see LED Status Indicators). - If the IMR has been in a hot vehicle or in full sun, change location and allow it to cool down. - If the previous troubleshooting suggestions do not solve the issue, replace the battery.
USB connection problems	- If using Windows 7 or 8, install the <i>Itron Mobile Radio USB drivers for Windows 7 & 8</i> available for download from https://access.itron.com. - Inspect the radio and PC USB ports for damage, dirt, or other contaminants. - Inspect the USB cable and connectors for damage, dirt, or other contaminants. - Ensure the USB cable is USB 2.0 compliant. Itron recommends using only the supplied cables.
Bluetooth connection problems	- See your application's user guide for setup information. - Ensure that the portable IMR and PC are near each other and the signal is not blocked.
Radio will not turn off Radio will not turn on	Disconnect the radio from external power sources and press the button firmly for six seconds. This will force the radio to reset.

Radio Readings Tips

The Itron Mobile Radio is used to receive the radio signals from ERT module equipped meters. To maximize the radio performance, consider the following factors when collecting data.

- Absorption.** Conductive material such as steel, metallic pipe and siding, and tree leaves and branches absorb more of a radio signal than concrete, bricks, sheet rock, plastic, and wood. Due to absorption, you may have shorter readability distances in industrial or business areas than in residential areas.
- Shielding.** When conductive materials are close together, as in metal partitions or narrow-mesh fencing, they act as a shield and absorb the entire radio signal. Move a short distance away from conductive material so the ERT module signal is not shielded. Keep moving to assist in receiving signals that may be shielded. Metalized fabrics should not be worn over the radio as they may severely reduce reading success.
- Reflection.** Radio signals can be reflected by some of the same types of conductive material that absorb them. Move a short distance away from the reflective material to find the direct ERT module signal or a strong reflected signal. Keep moving to assist in receiving signals that may be reflected.
- Interference.** Radio signals may be interfered with by noise emanating from other sources of radio signals operating at similar frequencies. This can affect readability. Common sources of noise may be security systems, intercoms, or paging systems. Move to a location where the effect of the noise is minimized.

13

Optimizing Bluetooth® Performance

Bluetooth communication works best when the communicating devices have an unobstructed view from one device to the other. When possible, remove or reduce obstacles between the radio and the mobile device during Bluetooth communication.

Pairing Bluetooth for Itron Mobile for FCS Users

Bluetooth Low Energy (BLE) pairing is performed by Itron Mobile for FCS installed on your mobile device.

Select your radio from the list of radios in Itron Mobile for FCS.

Pairing Bluetooth in Windows

The default Bluetooth Classic PIN is the last 4 digits of the IMR serial number.

If you attempt to pair your Itron Mobile Radio (IMR) with your Windows device using the Windows Settings, two identical Bluetooth connections will be shown for your Itron Mobile Radio. There will be one entry for Bluetooth Low Energy (BLE) and one for Bluetooth Classic. There is no indication of which entry is which version of Bluetooth. For this reason, you should not pair the radio with your Windows device using Windows Settings.

To ensure you are properly connected to Bluetooth Classic, Itron recommends that you download the Itron Bluetooth Pairing Tool from the Itron Access website. The tool will force your Windows device to pair with the Itron Mobile Radio using only Bluetooth Classic.

To Pair Bluetooth in Windows

1. Install the Itron Bluetooth Pairing Tool on your Windows device.
2. Turn on your Itron Mobile Radio.
3. Run the Itron Bluetooth Pairing Tool on your Windows device.

Your Windows device will automatically begin looking for Bluetooth devices to pair with.

4. If necessary, click **RESCAN** until the IMR you are trying to pair with appears in the list of

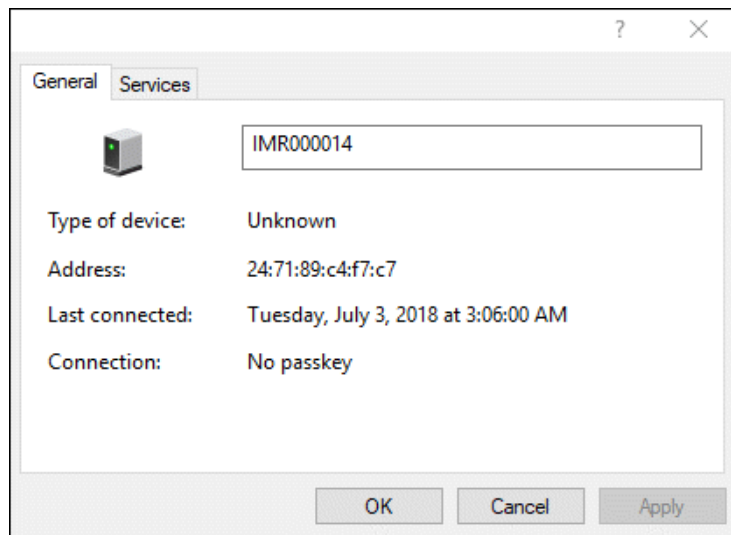
devices.

The device name is IMRnnnnnn where n equals the last six digits of the serial number of the device you are trying to pair with.

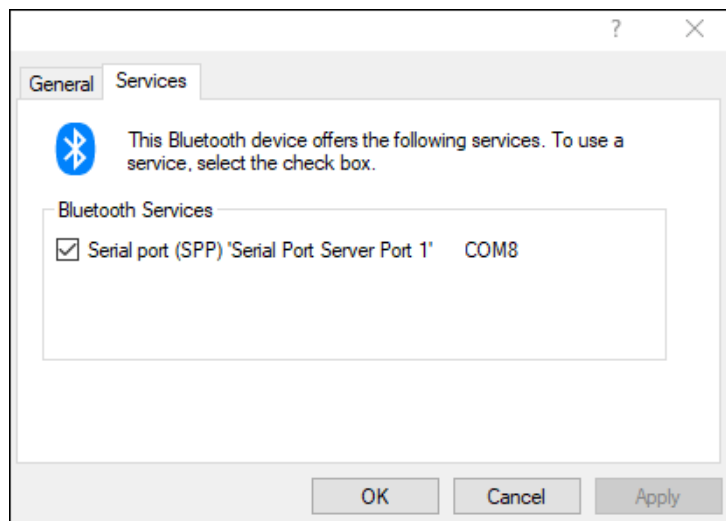
5. Select your device and click **PAIR**.

A tabbed dialog box for the radio appears.

6. Select the **Services** tab.



7. Verify that the **Serial** port is selected. This must be selected for the radio to connect.



If the Serial port check box is not selected, select it and click **OK**.

8. Close the Itron **Pairing Tool**.
9. Select your radio from the list of radios in Itron Mobile for FCS.

If your radio is not listed, click the Refresh button.

14

Itron Mobile Radio Capabilities and Limitations



Important! IMR 2.1 devices (FCC ID: EO9IMRC) are approved for sale and use only in the United States.

Equipment Description

Table 9

Itron Mobile Radio	
Internal Antenna: IMR 2.1	External Antenna: IMR-FT 2.1
FCC ID: EO9IMRC	FCC ID: EO9IMRC

Itron Mobile Radio

Transmitter Information, USA

Transmit frequency MAS, FCC: 952 MHz–959.850 MHz

Transmit frequency ISM: 908 MHz–923.8 MHz

Antenna type:

- **Internal Antenna** (portable IMR models): Internal directional antenna with maximum gain perpendicular to the front face of the Itron Mobile Radio unit.
- **External Vehicle Antenna** (mobile IMR models): External vertical omnidirectional whip antenna with 5 dBi gain.

Receiver Information; USA

Frequency ISM: 908–923.8 MHz

Bluetooth

Manufacturer: Panasonic

Model: PAN1326B

FCC ID: T7V1316

Transmitter class: Class 1

Transmit/receive frequency: 2402 MHz–2480 MHz

Maximum transmitter power: 10.5 dBm

IMR built-in antenna type: integral, chip
