AdvanceMobile™

Installation / User Manual
Part No. AT3550A

Index

The AdvanceTec AdvanceMobile™ is designed to provide secure and convenient vehicular communication with GPS tracking if needed.

The AdvanceMobile™ consists of:
1. Part # AT8246A   Junction Box
2. Part # AT8231A   Speaker
3. Part # AT8230A   Visor Microphone (Visor Mic.)
4. Part # AT8232A   Power cable
5. Part # AT9299B   Push-To-Talk (PTT)
6. Part # AT8407A   Antenna Magnet Mount (Mag. Mount)

Optional Extras
1. Part # AT8410A   Palm Microphone
2. Part #AT7107A   Privacy Handset with cradle
3. Part #AT9298A   RED Emergency PTT
4. Part # ATAT8408A   Antenna GPS
5. Part # AT3510A   AdvanceMobile Control Module

! Note

A properly installed AdvanceMobile™ will minimize service calls and equipment downtime. Because of the wide variations in vehicle design, these instructions should be modified to suit each particular installation.

Before beginning the installation process, determine the locations for the mounting of the PTT, Visor Microphone, Speaker and Junction Box, and Magnetic Mount Antenna.

Consider the following guidelines when planning the installation:
- DO use all mounting hardware provided.
- DO ensure that cables are not placed under stress.
- DO follow proper + and - connections.
- DO crimp connectors securely.
- DO NOT attach components to any part of the vehicle that is not rigid or is subject to excessive vibration.
- DO NOT install components in areas where rain or snow can easily get into them, such as next to a vehicle window, which may be left open.
- DO NOT dress cables over sharp edges that could cause wear or tearing of cable insulation.
- DO NOT install components in locations where they might interfere with the vehicle operator or operating controls.
- DO NOT install the PTT where it will be difficult for the operator to reach.

VEHICLES EQUIPPED WITH AIR BAGS
An air bag inflates with great force. DO NOT place objects, including communications equipment, in the area over the air bag or in the air bag deployment area. If the communication equipment is improperly installed and the air bag inflates, this could cause serious injury.

It is recommended that the installation of the vehicle communication equipment be performed by a professional installer/technician trained in the requirements for such installations. An air bag's size, shape and deployment area can vary by vehicle make, model, and front compartment configuration (for example, bench seat vs. bucket seats). Contact the vehicle manufacturer's corporate headquarters, if necessary, for specific air bag information for the vehicle make, model, and front compartment configuration involved in your communication equipment installation.

! WARNING

VEHICLES WITH ANTI-SKID BRAKING SYSTEMS
For vehicles with electronic anti-skid braking systems, refer to the "Anti-Skid Braking Precautions," Motorola publication 68P81109E34. This publication can be ordered from Motorola® Worldwide Systems and Aftermarket Parts Department.

<u>Operating the AdvanceMobile™</u>

The AdvanceMobile™ will allow:
1. PTT calls from the unit to a pre-set private ID or group ID.
2. PTT and Cellular calls to the unit.
3. When used with the Optional Control Module, PTT calls from the unit to a Group ID and 9 different Private ID numbers.

<u>Set up of AdvanceMobile™</u>

NOTE! *The AdvanceMobile™ requires an iDEN SIM card. To acquire such a SIM card, contact your local iDEN Provider sales representative or retail store.*

<u>Installation of AdvanceMobile™</u>

A.<u> Speaker Installation</u>

1. Mount the Speaker beneath the dashboard, on the passenger's side of the vehicle, out of the way of the passenger. Do not mount the Speaker on the dashboard or the rear window shelf.
2. The Speaker should be located more than four feet from the junction box.
3. The Speaker includes a mounting bracket, permitting it to be mounted in a variety of ways. Loosen the thumbscrews on the side of the speaker and using the mounting bracket as a template, drill the necessary mounting holes and secure the bracket with the self-tapping screws provided.

Mounting Bracket

Thumb Screws

Diagram 1

4. Position the Speaker on the mounting bracket and secure it by tightening the thumbscrews. The mounting bracket is used to permanently mount the Speaker in place while permitting it to be tilted to a desired angle.
5. Feed the cable out of sight to the location where you intend to mount the junction box.
6. The speaker should be located at least 3 ft (1m) from the visor mic. Avoid placing the speaker where it faces the visor microphone.

B. Mounting of the PTT

1. To attach the PTT to the gear lever, strap the PTT around the gear lever using the Velcro strip attached, with the cord facing down.
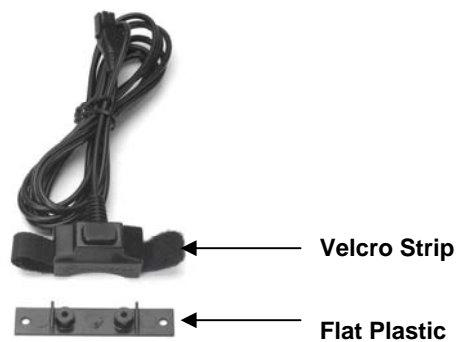
Velcro Strip

Flat Plastic

Diagram 2

2. To attach the PTT to a flat surface, remove the 2 screws from the bottom of the PTT, which holds the Velcro strip in place. Remove the strips and replace the small plastic part that held the strips in place with the larger flat plastic part supplied with the PTT. Screw the new plastic part in place.
3. Feed the cable out of sight to the location where you intend to mount the junction box.

Caution: **Make sure there is sufficient slack in the cable to allow the free movement of the gear lever without stretching the PTT cable.**

C. Mounting the Microphone

Selecting the correct position for the microphone is vital for the successful performance of the AdvanceMobile™

1. The Microphone should be mounted either on the sun visor directly above, and facing, the driver or on the headliner just above, and facing, the driver. One of the following two microphones will be supplied with this kit.
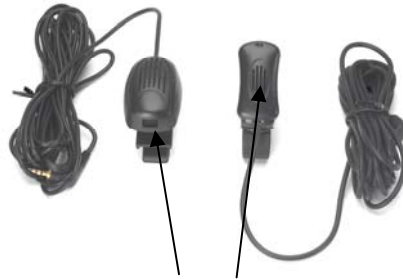
Facing the driver
Diagram 3

2. The microphone supplied has a noise canceling feature so must be mounted facing the driver as shown in the picture above.
3. To avoid visual or physical obstruction, route the microphone cable down inside the door molding. Allow sufficient slack in the connector end of the cable to reach the Junction Box.
4. Feed the cable to the location where you intend to mount the junction box.

Note: **The microphone should not be mounted near a window or in a spot where road and ambient background noise would be substantially high (above 85dB SPL).**

D. Installing the Power Cable

Caution: The AdvanceMobile™ should be used with a negative ground electrical system only. Reverse polarity (positive ground) will trigger protection circuits which cause the cable fuse to open. Check the ground polarity before you begin the installation to prevent wasted time and effort. 12V DC or 24V DC automotive systems are directly supported

Determine the best cable route to the vehicle ignition for the Power Cable from the location where you intend to mount the Junction Box.

Diagram 4

1. The DC power cable shipped with the AdvanceMobile™ is suitable for installation in most vehicles.
2. Route the black lead of the main power cable to a convenient chassis ground and the red lead to the positive supply voltage connection points. If it is necessary to penetrate the firewall, try to use an existing opening.
3. If there is no existing opening, drill a new hole approximately 9/16" or 3.5cm in diameter. Make sure that there is enough clearance on the opposite side. Insert a grommet into the hole to prevent damage to the power cable. When making connections on the engine side of the firewall, additional in-line fuse holder (included) should be used at the connection points.
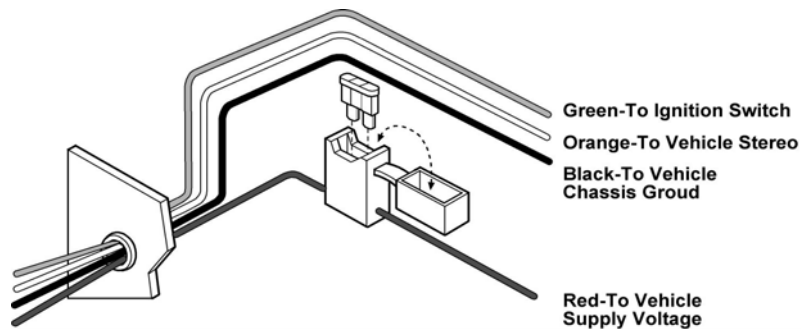

Green-To Ignition Switch
Orange-To Vehicle Stereo
Black-To Vehicle Chassis Groud
Red-To Vehicle Supply Voltage

Diagram 5

4. Cut the black lead to the desired length.
5. If the connection is being made under the dash or in the vehicle cabin, connect the black lead directly to the chassis of the vehicle.
6. If the connection is being made in the engine compartment, connect the in-line fuse holder between the black lead of the power cable and the desired chassis connection point.

Note! **Do not connect the black lead to the negative (-) battery terminal. The AdvanceMobile™ could be damaged if there were a malfunction in the vehicle's electrical system.**

7. Cut the red lead to the desired length. This lead will be connected such that it has positive supply voltage at all times, even when the vehicle is turned off.
8. If the connection is being made under the dash or in the vehicle cabin, connect the red lead to a positive supply voltage point.
9. If the connection is being made in the engine compartment or directly to the battery, connect the in-line fuse holder between the red
lead of the power cable and the desired positive voltage connection point.
10. Route and connect the green lead to a convenient ignition switch supply point in the vehicle.

Note! **An ignition switch accessory terminal can be verified by measuring the terminal while operating the vehicle's key switch. With the ignition key in the "accessory ON" position, the terminal voltage should measure the vehicle's battery voltage. With the switch in the "OFF" position, it should measure near zero**

Stereo Mute
If the vehicle's stereo system supports an external muting feature, route and connects the orange wire to the car stereo system. Otherwise, the orange wire may be left unconnected and cut off or tied out of the way.

Note! **The Car Kit supports an "Entertainment Mute" function when connected to a car stereo system that provides for external muting. This function is compatible with systems that mute the audio output when the control line is connected to ground**

E. Mount the Vehicular Antenna & GPS Antenna

1. Screw the antenna to the external magnetic (Mag) mount antenna base.
2. Mount the Mag Mount antenna or other external vehicular antenna (to be purchased separately if the supplied Mag Mount Antenna does not fit your purposes).

For best performance use a low-loss coaxial cable with the highest gain antenna.

3. Position the antenna, maintaining a separation distance of at least 8 inches (20 cms) between the antenna and the body of any user and
nearby person, to assure compliance with the U. S. FCC regulations on RF exposure.

GPS Antenna   External Antenna
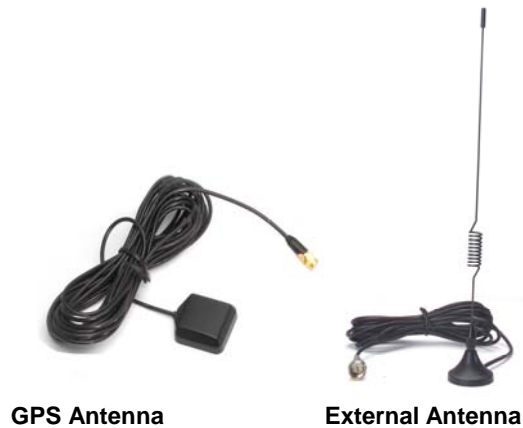
Diagram 6

4 Connect the antenna cable to the external antenna connector on the junction box.

GPS   USB   Emergency   External
Antenna   Data Output   PTT   Antennas

Diagram 7

5. If you intend to make use of the GPS feature, connect the GPS antenna cable to the GPS antenna connector on the junction box. The GPS antenna is an optional extra that is available to be purchased from AdvanceTec.
6. Feed the antenna cables out of sight to the location where you intend to mount the junction box.

F. Emergency PTT

The RED Emergency PTT is available as an optional extra

1. To attach the Emergency PTT to the gear lever, strap the PTT around the gear lever using the Velcro strip attached, with the cord facing down.

Velcro Strip
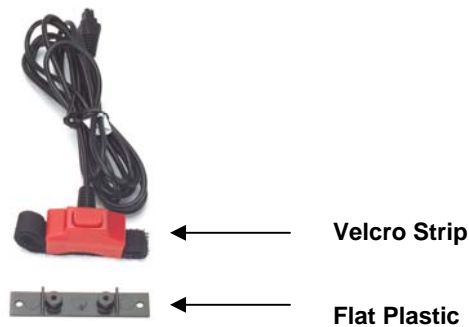
Flat Plastic

Diagram 8

2. To attach the Emergency PTT to a flat surface, remove the 2 screws from the bottom of the PTT, which holds the Velcro strip in place. Remove the strips and replace the small plastic part that held the strips in place with the larger flat plastic part supplied with the PTT. Screw the new plastic part in place.
3. Feed the cable out of sight to the location where you intend to mount the 4 pin connector on the junction box.
Caution: Make sure there is sufficient slack in the cable to allow the free movement of the gear lever without stretching the PTT cable.

Inserting SIM into Junction Box

1. Open the SIM door cover on the bottom of the junction box by removing the screw holding it shut

Screw

Diagram 9

2. Slide the metal SIM cover to the left and lift the cover.

Diagram 10

3. Insert the SIM card under the metal cover and close the metal cover and slide to the right to lock.

Diagram 11

4. Replace the plastic SIM cover and screw it closed.
NOTE: The SIM card can not be inserted or removed while the Junction Box is powered. To remove or replace the SIM card after installation has been completed, the power cable must be disconnected from the Junction Box

Connecting cables to Junction Box.

1. Locate a position for the junction box beneath the dashboard on the passenger's side of the vehicle or on the center side post between the front seats. It must be protected from dirt and moisture and must be afforded adequate space for cooling. There must be sufficient space to allow for connection of all cabling.

2. DO NOT mount the junction box at this stage. Connect the PTT, Microphone, Speaker, Power cable and to their corresponding connections on the Junction Box as indicated in Diagram below.

| Mic. | Speaker | PTT | Optional Control Module | Optional Palm Mic/. Handset w/Cradle | Power |

Diagram 8

3. Connect the coaxial antenna cable to the corresponding connector on the opposite side of the Junction Box.
4. After connecting the power cable's connector to the Junction Box,
cut in half the red wire attached to the fuse housing supplied. Cut the long red power lead to the desired length and connect (crimp) it to the one end of the wire to the fuse housing.
5. Connect the other end of the wire from the red fuse housing to the positive (+) side of the ignition. The fuse housing can be secured in place by using a plastic tie or screw through the hole in the fuse's plastic housing

System Registration and Programming

1. Once the AdvanceMobile™ is powered and the SIM is inserted, it will begin the registration process onto the iDEN system. The initial registration onto the iDEN system can take up to 3 minutes.
2. Once the AdvanceMobile™ has successfully registered onto the iDEN system, 5 short pulses will be heard through the speaker.
3. After registration, the Private ID or Group ID with which the AdvanceMobile™ will communicate must be loaded into the AdvanceMobile™
4. To program the Private ID or Group ID, initiate a PTT call to the AdvanceMobile™ from the phone with the Private ID or a phone that is part of a Group ID with which you want the AdvanceMobile™ to communicate. Keep the PTT button pressed
5. When the incoming PTT call is heard on the AdvanceMobile™ speaker, with the PTT button still pressed, press in the programming button next to the SIM flap by using a pen refill or similar devise.

NOTE! **Both the PTT and the   Programming button must be kept depressed until the programming has been successfully completed and the 5 fast beeps are heard on the speaker.**

Diagram 12

3. Once the Private ID or Group ID has been successfully loaded, proceed to permanently mount the junction box with the screws provided ensuring that all extra cabling is secured out of harms way.

Mounting holes →   ← Mounting holes

Diagram 13

Making a PTT call to Private ID or Group ID programmed.

1. Press and hold down the PTT button.
2. Speak towards the visor microphone.

Incoming PTT

1. To respond to an incoming PTT call that is from the PTT Private ID or Group programmed into the AdvanceMobile ™, press and hold down the PTT button.
2. Speak towards the visor microphone
3. To respond to an incoming PTT call that is <u>NOT</u> from the Private ID or Group programmed into the AdvanceMobile ™, press and hold down the PTT button _within 15 seconds_ of the receipt of the PTT call.
4. Speak towards the visor microphone.

Incoming Cellular call

1. To answer an incoming cellular call press and hold the PTT button for 3 seconds. Once the incoming call is answered, release the PTT to continue the cellular conversation.
3. Speak towards the visor microphone.
4. To end the cellular call, press and hold down the PTT.

Turning AdvanceMobile™ OFF

1. When the car ignition is ON, the AdvanceMobile™ will stay on.
2. When the ignition is turned OFF and there is no active call or dispatch in progress, the AdvanceMobile™ will turn OFF after 30 seconds.
3. The AdvanceMobile ™ will remain on if an active call or dispatch is in progress even if the ignition is turned OFF>

Optional Extra Accessories

AdvanceMobile™ Control Module (Part # AT3510A)

The AdvanceMobile™ control module (Control Module) is an optional extra which will enhance the features and functions of the AdvanceMobile™. With the addition of the Control Module, PTT calls from the AdvanceMobile™ can be increased from a single Private ID or Group ID to a Group ID and 9 different Private IDs.

Channel Control Buttons

Volume Control Buttons

Diagram 14

Program

1. Attach the connector at the end of the cable of the Control Module to the corresponding connector on the AdvanceMobile™ junction box.
2. With the AdvanceMobile™ powered, press the UP or DOWN Channel Control Button. Channel numbers from 1 to 9 will show in the Control Module screen. (Channel number 0 will show "E" and is used for an Emergency number)
3. A flashing number in the screen indicates that the channel is open (not programmed) and available to be programmed.
4. With a channel number flashing, initiate a PTT call to the AdvanceMobile™ from the phone with a Private ID that you want the AdvanceMobile™ to communicate. Keep the PTT button pressed
5. When the incoming PTT call is heard on the AdvanceMobile™ speaker, with the PTT button still pressed, press in the programming button next to the SIM flap by using a pen refill or similar devise.

Diagram 15

NOTE! Both the PTT and the Programming button must be kept depressed until the programming has been successfully completed and the 5 fast beeps are heard on the speaker.

5. Once the new private ID is successfully programmed, the channel number in the screen will no longer flash.
6. This process can be repeated with the other open channels until each of the 9 channels are programmed with different private IDs

Operation

1. Select a channel by pressing the Left Channel Keys Up and Down.
If the Display shows a <u>steady number</u> (1-9), the channel displayed is the channel selected and programmed. When the PTT is pressed, it will transmit on that channel.
2. If the Display shows a <u>slow flashing</u> number (1-9), the channel is not programmed. If the PTT is pressed, a reject tone will be heard.
3. If the Display shows a <u>fast flashing</u> number (1-9), a call is coming in from the remote user who is programmed into the AdvanceMobile™ on that channel number. Press the PTT to answer the incoming caller.
4. If the Display shows a <u>fast flashing "U"</u> a call is coming in from an unknown remote user who is not programmed into the AdvanceMobile. Press the PTT to answer the incoming caller.
5. If the Display shows fast <u>flashing "E"</u> a call is coming in from a remote user programmed as an Emergency number.

6. Adjust the volume by pressing the Right Volume Buttons Up or Down. After a volume button is pressed a blinking dot will appear in the bottom right corner of the screen to indicate that it is in the volume mode. The Minimum volume is 0 and the Maximum is 5.

After the volume has been adjusted, the blinking dot will disappear to indicate that the unit is back in the channel mode.
7. The Channel and Volume selected will be saved when the Control Module is powered off and will resume when it is next powered up.
8. If the Control Module looses communication with the main unit, it will show 3 horizontal lines.

LED indicators:

Flashing red	**Unit not yet registered**
Steady Green	**Unit registered - OK**
Blinking Green	**Unit registered OK and Ignition is off. The Unit is about to shut off.**
Steady Green & Red (Amber)	**PTT is in operation**
Alternating Green & Red	**Data is transmitting for GPS.**

Privacy Handset (Part # AT7107A)

Diagram 16

1. PTT calls can be made and PTT and cellular calls can be received in the same way with the Privacy Handset as with the PTT described above.
2. Lift the privacy handset out of the cradle and using the PTT button on the back of the privacy handset follow the instructions for making and receiving calls as set out above.
3. A cellular call can be terminated by pressing and holding down the PTT button.

Palm Mic (Part # AT8410A)

Diagram 17

1. To use a Palm Mic. with the AdvanceMobile™, plug the connector on the end of the coil cord of the Palm Mic. into the corresponding RJ45 receptacle on Junction Box.
2. Once connected, the pressing of the switch on the Palm Mic. will deactivate the Visor Mic. and activate the Palm Mic.

Specifications

Input/Output

- **Input voltage 10.5Vdc to 32V dc**
  Ignition detection:
- **Ignition "ON" 2.5Vdc to 32Vdc**
- **Ignition "OFF" 0V to 2.5V or OPEN**
- **Outputs Entertainment Mute**
- **Open Drain**
- **Continuous current capacity: 50Ma**

Audio Specifications

- **RJ45 Supports, Palm MIC # AT8410A and Privacy Handset Part # AT7107A**
- **2.5mm Stereo audio jack**
- **Speaker impedance: 4 Ohms 10W**
- **Microphone: Eco Canceling Noise Canceling**

Communication Specifications

- **Full Duplex Communication**
- **Automatic Start up**
- **Antenna Impedance: 50 Ohms**
- **SIM card: 3 Volts**
- **SIM cars PIN: Programmed by user one time, automatically introduced**
- **Onward. PIN saved on Non-Volatile memory**

Receiver Specifications

- **Frequency Range 851 min 870 MHz Max in the 800MHz band**
- **Frequency Range 935 min 941 MHz max in the 900MHz band**
- **Channel Spacing 25 N/A KHz**
- **Sensitivity (10% BER) – 111dBm max**
- **Strong Signal BER 0.1% max RF level = -80 dBm**
- **Overload Immunity 10% max on channel =_20dBm**
- **Intermodulation Immunity -45 dBm min Far-out interferers**
- **(On cannel= -108dBm)**
- **Adjacent Channel Immunity -51 dBm min**
- **Spurious Response Immunity -51 dBm min**
- **Stability, unlocked 5 ppm max**
- **Stability, unlocked 1.9 ppm max**
- **Spurious Emissions per FCC requirements (3m)**

- **Conducted -57 dBm**
- **Radiated 500 uV/m**
- **Transient Response 0.01% BER during RX-TXRX**
- **Frequency Acquisition 0.01% max ± 220 Hz RF input**
- **Blocking Immunity 10% max**

Transmitter Specifications

- **Frequency Range min 806 max 825 MHz band**
- **Frequency Range min 896 max 900 MHz band**
- **Channel spacing 25 KHz**
- **Power 0.44W min 0.7W max. Pulse average power: basic**
- **Terminal class**
- **TX BER 0.7% max**
- **ACCPR @ 25 KHz 60 dB min**
- **Frequent Stability 5 ppm max Unblocked to base**
- **Spurious Emissions – 13dBm max per FCC and IPU-R requirements**

iDEN / GPS Specifications

GPS Module

- **Sensitivity : -152 dBm Tracking, -142 dBm Acquisition**
- **Protocol: TAIP (ASCII)**
- **Frequency: L1 type (1575.42 MHz) C/A code**

- **Channels: 12 channel simultaneous operation**
- **Update rate: 1Hz**

Accuracy

- **Horizontal: <3 meters (50%). <8 meters (90%)**
- **Altitude: <16 meters (50%), <16 meters (90%)**
- **Velocity: 0.06 m/sec.**
- **PPS" +/- 50 nanoseconds**

Acquisition

- **Reacquisition: 2 sec.**
- **Hot Start 9 sec.**
- **Warm Start 35 sec.**
- **Cold Start (TTFF): 39 sec. Out of the box: 41 sec**

GPS Antenna Connection
- **SMA (Sub Miniature A) connection with a male center contact. Use this contact for the GPS Antenna provided with the unit.**
- **50 Ohms impedance**

GPS Antenna Spec.
Patch

- **Center Frequency 1575.42 ± 1.023 MHz (when covered with a radome and measured by LNA ground plane)**
-
- **Bandwidth (10dB return loss) 10 MHz min**
- **Gain at Zenith 1dB type**
- **Gain ay 10° elevation -5 dBic type**
- **Polarization R.H.C.P.**
- **Axial Ratio 5.0 dB type**

Filter / LNA

- **Center Frequency 1575.42 ± 1.023 MHz**
- **Gain 30~37 dB (pc:3V/32dB)**
- **Noise Figure 1.4 dB type (ps:3V / 1.35 dB)**
- **Filer out band attenuation**
- **Dielectric filter**
- **7dB min   fo±20 MHz**
- **20dB min   fo±50MHz**
- **30dB Min   fo±100MHz**
- **(fo=1575.42MHz)**
- **Output V.S.W.R 2.0 max**
- **Voltage DC = 2.5~5.5V**
- **Current DC = 8~23mA (ps:3V / 10mA)**

iDEN antenna connector

- **Mini USB connector with a female center contact (Use this connector for the iDEN Antenna provided with the unit.**
- **50 Ohms impedance**

Environmental Specifications
- **Operational Temperature -20 to +60°C**
- **Storage Temperature -40 to +85°C**
- **Shock MIL-STD-810E METHOD 516.4 Proc. 1, 18 shocks 40 G half-sine 6 – 9 msec 18**
- **Shocks 2500g's, 0.00075-second pulse**
- **Vibration 2X-EIA (not tested electronically during vibration) Sine 20 – 2000 Hz, 4G peak**
- **1 hr per axis – 3 axis (X, y, z) Random 20 – 2000 Hz, 6G RMS; 1 hr per axis – axis (x, y, z)**

AdvanceMobile™ GPS services

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