



ZPass™ Installation Guidelines

12/03/2008



Zonar Systems Hardware Installation Tips For Professional Installers

Zonar Systems equipment will provide years of reliable service if properly installed and maintained. Zonar equipment is typically installed in heavy vehicle applications and is often subject to extreme temperatures, dust, dirt, vibration, and shock. *Proper installation is the critical first step to equipment longevity and optimal performance.*

This guide is meant to be a *general guideline* for the professional installer and technician. While we attempt to point out the most common installation questions and issues; common sense, good housekeeping procedures, attention to detail, safety adherence, and technical competence of the professional installer is critical for a successful installation.

Please refer to your specific vehicle manufacturer guidelines for the installation of electrical components and wiring.

A professional team of Zonar support technicians and engineers are available to answer your installation questions. Contact Zonar at 1-877-843-3847 or by email at support@zonarsystems.com.

Thank you,

Andre J Horochiwsky
Customer Support Manager - Zonar Systems

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US Patent Numbers 6671646, 6804626, 7117121 and other patents and patents pending.

REV: 12/03/08

Limited Warranty

Zonar[®] will provide customer with a replacement for nonconforming hardware or software within a commercially reasonable time after timely notice from customer. Zonar does not represent or warrant that the hardware and software are free of bugs or errors and shall not be liable for any losses (financial or non-financial) occurring as a result of such bugs or errors. No other warranty expressed or implied, including any warranties of merchantability or particular purpose, is provided for any hardware or software provided pursuant to this contract. Zonar Systems shall not be liable to customer, or any third-party for any general, special, punitive, incidental, indirect or consequential damages, or any loss of profits or business, arising out of this agreement. The terms and conditions of this agreement shall apply to any replacement hardware and software furnished.

CUSTOMER'S SOLE AND EXCLUSIVE REMEDY AND ZONAR'S ENTIRE OBLIGATION UNDER THESE LIMITED WARRANTIES IS TO REPAIR OR REPLACE THE PRODUCTS WITH CONFORMING PRODUCTS SUBJECT TO PROMPT NOTICE FROM LICENSEE OF NON-CONFORMITY AND AT ZONAR'S OPTION IF SUCH ALTERNATIVES ARE NOT FEASIBLE, TO TERMINATE THIS AGREEMENT AND REFUND THE APPLICABLE FEED PAID WITH RESPECT TO SUCH NON-CONFORMING PRODUCT. THIS DISCLAIMER OF WARRANTIES IS AN ESSENTIAL CONDITION OF THE AGREEMENT.



FCC Compliance Statement (Part 15.19)

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada (IC). 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.



Warning: (Part 15.21)

Changes or modifications not expressly approved by Zonar Systems could void the user's authority to operate the equipment.



Caution: RF Exposure (OET Bulletin 65)

To comply with FCC RF exposure requirements for mobile transmitting devices, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20cm (8 inches) from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Use only supplied and approved antenna's. Use of unauthorized antenna's or modifications could impair signal quality, void your warranty and/or result in violation of FCC regulations.



Industry Canada Compliance Statements

"This device has been designed to operate with an antenna having a maximum gain of [5] dB. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is [50] ohms."

"To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication."

"The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website, www.hc-sc.gc.ca/rpb"

Layout

- 1) Mount all equipment in the interior of the vehicle. GPS antenna and RFID tags are the only Zonar components that may be exposed to the outdoor elements.
- 2) Do not install Zonar equipment below windows and doors which open to the vehicles exterior to prevent water damage.
- 3) Lay all components out prior to installation to check for proper cable length and interference issues.
- 4) Avoid mounting equipment in difficult to access areas.
- 5) Avoid mounting equipment in dirty, dusty, or damp areas. (e.g. near floors and entrance ways)



Electrical

- 6) **Consult the vehicles manufacturer for specific installation guidelines. (Highly recommended for Multiplex electrical systems)**
- 7) All power leads (Red and White leads, GPS-Power Cable) must be connected to the vehicles protected circuitry (e.g. fuse panel, circuit breaker panel, protected circuits). Never electrically connect Zonar equipment to unprotected circuits. (e.g. directly to battery)
- 8) It is also required that all power leads (Red and White leads, GPS-Power Cable) be protected with a 3 to 5 amp fuse and inline fuse holder (included) for optimal system protection.

Drill Holes

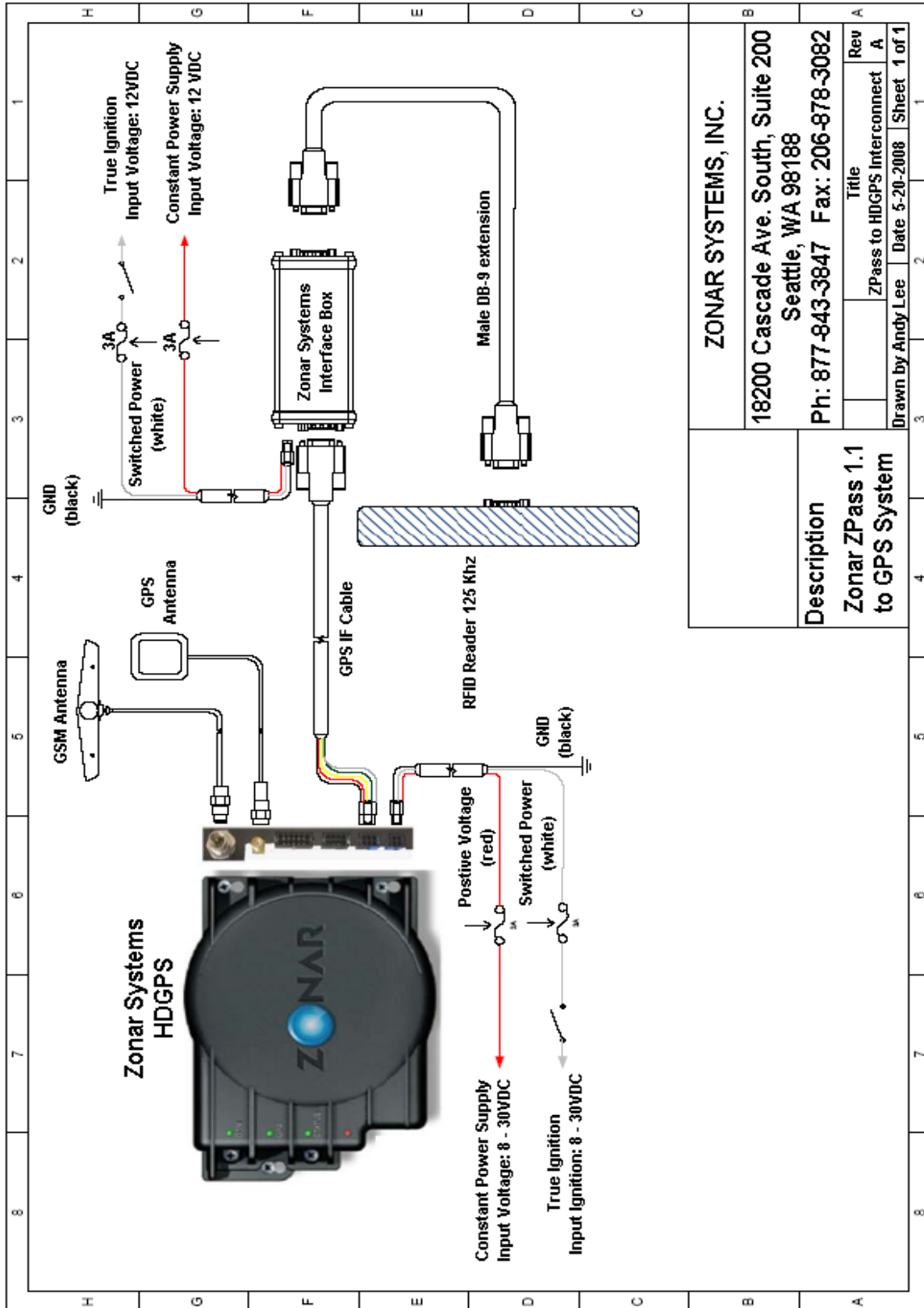
- 9) Capture all drill chips during drilling operations. Do not allow chips to fall onto equipment, furnishings, etc.
- 10) Deburr all drill holes on both sides of drilled surface.
Example deburr tool:
<http://www.grainger.com/Grainger/items/3VB51>
- 11) All drill holes must have a rubber grommet or similar anti-chaffing system installed to protect cable assemblies. (e.g. plastic conduit)
- 12) Seal all penetration drill holes which may pass rain water.

Cable Management

- 13) Strain relief and support all cable installations.
- 14) Avoid sharp bends and tight radius installations of cables.
- 15) Avoid moving components. (e.g. doors, steering, shafts, handles, fans, etc.)
- 16) Provide an adequate "Service Loops" i.e "cable slack" to allow for servicing of equipment.
- 17) Avoid routing cables thru doors, windows, and other pinch points.
- 18) Avoid routing cables in high personnel traffic areas.
- 19) Avoid routing antenna cables near radio and PA equipment.

General Housekeeping

- 20) Capture all drill chips during drilling operations. Do not allow drill chips to fall onto electrical equipment, furnishings, heating ducts, etc. Magnets, sticky tape, vacuums, physical barrier, etc. may all be used to accomplish this task.
- 21) Remove excess sealant. Sealant should be debris/contaminant free (e.g. drill chips), consistent, and uniform in appearance. Clip excess wire tie protrusions.



ZONAR SYSTEMS, INC.	
18200 Cascade Ave. South, Suite 200 Seattle, WA 98188	
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Description	Title
Zonar ZPass 1.1 to GPS System	ZPass to HDGPS Interconnect
Rev A	Rev A
Drawn by Andy Lee	Date 5-20-2008 Sheet 1 of 1



The Mounting System:

- 1) Holds the ZPass™ Reader
- 2) Is generally mounted near passenger entrance/exit

Note: Verify placement acceptability with state DOT/Law Enforcement prior to installation.

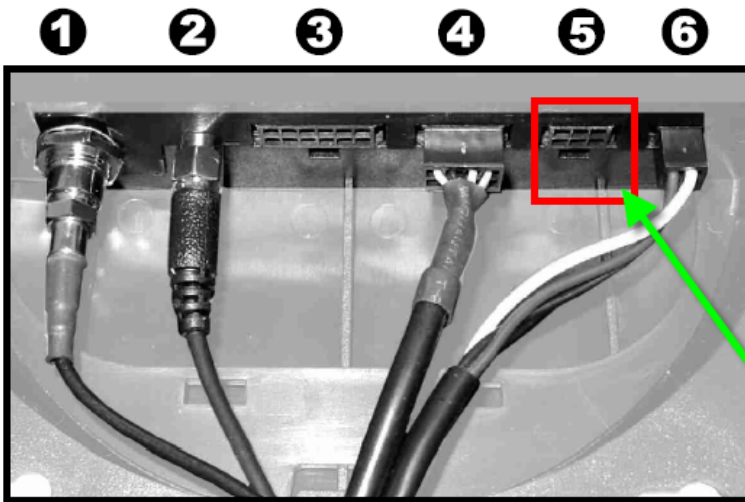
- 3) Ensure location of installed ZPass™ does not block driver view and interfere with vehicle operation and loading/unloading of passengers (e.g. snag coats, book bags, etc.)

Customer Supplied:

- 4 mounting bolts and lock washers (Ram Mount base to vehicle)

Zonar Supplied:

- 4 black mounting screws (Zpass mounting ball – Pictured lower right)



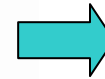
GPS Unit Connections

1. GSM (cellular) antenna (GSM units only)
2. GPS antenna (required)
3. I/O Input (optional)
4. GPS VM (Vehicle Mount) 8PIN Connector (optional)
5. Accessory - ZPass
6. GPS 4PIN Power Input (required)

ZPass™ Power Cable



- 1) Follow all General Guidelines as specified on page 4.
- 2) *All power leads (Red and White leads, GPS-Power Cable) must be connected to the vehicles protected circuitry (e.g. fuse panel, circuit breaker panel, protected circuits). Never electrically connect Zonar equipment to unprotected circuits. (e.g. directly to battery)*
- 3) *It is also required that all power leads (Red and White leads, GPS-Power Cable) be protected with a 3 to 5 amp fuse and inline fuse holder (included) for optimal system protection.*
- 4) Vehicles equipped with “noise kill” switches (late model school buses) – *Do Not* wire any Zonar equipment to the “noise kill” circuitry.
- 5) Power Bundle wiring – 4 Pin, 3 wires
 - a. **Red** – Constant DC (+8VDC - +30VDC, dependent on system type)
 - b. **Black** – Ground
 - c. **White** – Switched Power
 - i. Zpass reader operation desired: +8VDC - +30VDC, dependent on system type
 - ii Zpass operation not needed / desired: 0VDC. Do not connect to constant hot – battery will drain during long periods of vehicle inactivity)



- 6) The White wire must be connected to a power source that is active only when Zpass reader is required to read Zpass RFID cards.

Example: Door-Open (regardless of motor power or ignition key switch position)

