

# Houston Radar Armadillo Crossfire Quick Start Guide

## **STEP1: Select installation location**

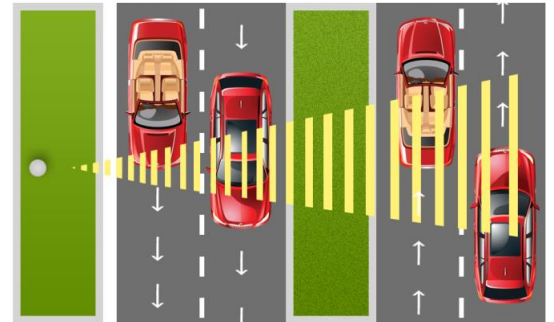
Pick a location where the traffic is usually free flowing and the Armadillo Crossfire can be mounted high enough that it has a clear view of vehicles in all the lanes. Refer to the user manual on the included CDROM (or our website) for a handy table of recommended mounting heights and setback distance from the closest lane. Avoid mounting inside tunnels or where there may be strong reflectors on the other side of the road. Avoid mounting where trees, branches or other objects are obstructing the Armadillo's view of the traffic.



Armadillo on the side with 1 lane each direction



Armadillo on the side with 2 lanes incoming or outgoing.



Armadillo on side with any lane configuration even with wide median. Max useful range is 105 feet

## **STEP2: Strap the box to a pole by the side of the road**

Using the provided quick release straps, mount the Armadillo at least 12 feet (1.8m) high for detection on multiple lanes with low density of truck traffic. Otherwise it must be mounted high enough to clear the height of the trucks. **Adjust the bracket** to tilt the box to **point down** to look at a spot about midway between the 1<sup>st</sup> and last lanes of traffic.

*You may mount as low as 5 feet (1.5m) if you are detecting only the nearest lane of traffic. The face of the box must be least 6 feet away from the edge of the road.*

Connect to the Armadillo Crossfire and use the built-in camera to verify proper orientation. Refer to the user manual for details or download and use our free Android App.

## **STEP3: Power ON and verify proper detection**

Turn the key switch to the ON position and verify that you hear just one **1 second beep**. Ten beeps indicate that **less than 30% battery** capacity is remaining and battery should be re-charged. A **fully charged battery** will operate the box for **about 9 days**.

You must setup lanes and adjust the background clutter. Please refer to the provided user manual for details.



Scan the QR code on the right on your smart phone to download the user manual from our website.



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## Connecting to the Armadillo to Retrieve Data

There are two ways to connect to retrieve data from the Armadillo:

### **Retrieving data using the USB interface:**

1. Connect the provided cable to the weatherproof connector on the bottom of the box and **tighten to secure** the connection. Plug the USB connector on the other end in a USB slot on a Microsoft Windows computer.
2. Power on the Armadillo. Windows will detect a USB to RS232 converter and install a COM port. If your computer is connected to the Internet it will automatically install the drivers. Otherwise drivers are located on the provided CD ROM in the **USBdrivers** folder.




*When connected to the USB port or USB charger, the stats box will also slow charge the internal battery and supply power to the Armadillo in the case of a depleted battery.*

USB and Charger Connection

### **Retrieve data using the built in Bluetooth wireless interface:**


You must have a Bluetooth adapter on your computer or an Android smartphone or tablet to

make a Bluetooth connection. On the computer, Bluetooth is indicated by the  icon in the task bar. A Bluetooth Class I USB adapter is provided.



*We highly recommend using the provided Class I USB Bluetooth adapter even if your computer has a built-in Bluetooth adapter. Built in adapters are usually 10m range Class II adapters and will only allow a connection if you are next to the box. The Armadillo has a high performance very long range Class I adapter that will perform best when paired with the provided Class I adapter.*

If you have **previously paired** your computer's Bluetooth adapter with the Armadillo, you can **skip to the next section**. If this is the **first time** you are connecting to this particular box, you must **first pair the two Bluetooth** adapters.

1. Open the Bluetooth interface on your computer by clicking on the  icon and then scan for devices (or click on "Add a device"). All Houston Radar Bluetooth device names start with "**HR-BT**" and the complete and unique name is also printed on the box. **You must pair once with each Armadillo from your PC.**
2. Once the scan locates the Armadillo, right click and select "pair" and establish the connection. Windows will then assign a COM port to this paired connection. A pairing key is not required but in case it is requested, **enter 1234**.

***The Bluetooth interface in the Armadillo is not operational if its USB port is plugged in to a computer. It is not affected by the AC fast charger or a dedicated USB charger.***





You can also connect to the Armadillo via the free Houston Radar Android app. Then download and share the data file with your computer via email, Dropbox or Google Drive (third party apps are required for sharing).

The app also allows you to take snapshots via the built in camera in the Armadillo Crossfire. This is a very handy feature. In a future release it will also allow you to view real-time traffic detections and setup lanes.

Search for "Houston Radar LLC" in the Android Playstore to download and install the app. Then connect via Bluetooth, download the data file, share to your PC and then import the file as described in the next section.



Scan the QR code above with your Android smart phone or tablet to install the app from the Android Playstore.



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## Importing Data

1. Start the previously installed “Houston Radar Stats Analyzer” and then go to *Data->Data Import Wizard...*
2. Select “Import From Radar...” option.
  - a. If you downloaded the .dat file via the Android app and shared it with this PC (via email or a file sharing service), select “Import From File...” option.
3. Drag and drop the data from the pane on the right a project on the left (you can right click to create a new project). If you have more than one data set, you can drag them to different projects.
4. Once the traffic stats are read you may choose to erase the data memory. This will avoid the same data being imported next time.
5. Click on OK at which point you may enter either a direction name for this location or a location name. If you do not pick a direction name, the data will be automatically labeled “Incoming Direction” and “Outgoing Direction”.



You must setup lanes in the Armadillo Crossfire to properly analyze the data. Please refer to the user manual for details.

## Analyzing Data

Please refer to the *Houston Radar Advanced Stats Analyzer user manual* (supplied as a PDF file) on the provided **CD ROM** for a detailed tutorial on analyzing the data. The latest version of this file is always available on our **website** at:

<http://www.houston-radar.com/user-manuals/HoustonRadarAdvancedStatsAnalyzerUserManualRelease.pdf>



Scan the QR code with smart phone to download manual in pdf format.



## Charging the Battery

The Houston Radar Armadillo features a state-of-the-art Lithium Iron Phosphate (LiFePO4) battery that will allow the unit to run about 9 days on a full charge. Additionally it will retain the charge for many weeks when switched off and placed on the shelf, thus being ready when needed. ***You must fully charge the battery once initially using the provided fast AC charger for the on-board fuel gauge to work properly.***

There are 3 methods to charge the battery:

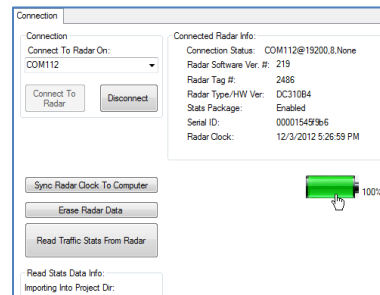
### **Charging Via the Fast AC Charger (recommended)**

Connect the provided fast charger to the black connector on the weather proof cable provided with the product and plug the circular connector into its mate on the bottom of the box. Plug the AC charger into a 110 to 240V AC wall socket. Ensure that the light on the quick charger turns on. A **red** light means that the battery is **charging**. A **green** light means that the battery is **fully charged**.



Fast AC Charger Connector

A fully depleted battery will take about **3.5 hours** for a full charge. You may also monitor the percentage charge via the Houston Radar Stats Analyzer. Connect to the Armadillo and go to *File->Connect To Radar...* and click on “Connect To Radar”. Once connected, a battery icon will be shown in the window.



Battery Charge Status Icon

The charging status is shown via a blinking thunder bolt and the percentage charge remaining is listed next to the battery icon.

### **Charging Via USB**

1. Connecting to a powered USB hub (any desktop USB port and most notebook USB ports) will charge the battery at the rate of about 1.5Watt/Hour. This will take about 2 days for a full charge and is recommended only for a quick top off.
2. Connecting to an AC powered high power USB **wall charger** will allow the battery to charge with as much power is available from that source. You can typically purchase a charger in the open market with an output current of 1 or 1.8A. This will provide about 3.3Watt/Hour or 6Watt/Hour respectively. This will charge the battery in **11 to 19 hours**.
3. Plug the USB connector into the 12VDC car adapter provided with the unit. This will charge the battery at 1.8A and is convenient for a quick top off while in your vehicle out in the field.



*The unit will **not charge** from an Apple wall USB charger as those chargers do not follow standard the USB high power charger specification. The unit **will usually charge** from high power USB chargers of other smart phones and tablets (e.g. Android and Samsung etc.) as these typically follow the USB specification.*



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## Charging Via the Optional Built-In High Performance MPPT Solar Charger

If you have purchased the solar kit option to use in a permanent installation, connect the provided 10W solar panel to the solar panel circular connector on the bottom of the box. This will provide full autonomy in practically all locations even in winter.

In the northern hemisphere, the solar panel must be pointed towards **true South** (not magnetic south) and angled based on the latitude of the location. Most **smart phones** feature a **compass** that may be set to point towards true South.

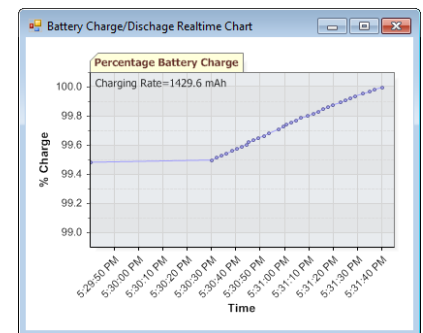
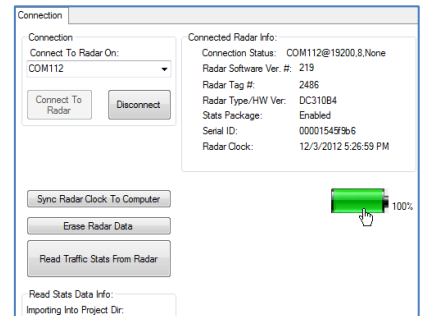
The suggested angle from the horizontal is **(location latitude + 15°)**. The solar panel will **charge the battery** even with the **key switch** in the **off** position but you will not be able to connect to the Armadillo if the switch is off.



Recommended Solar Panel Angle

*To see a visual history of the Armadillo's charge/discharge status, simply connect to the Armadillo via the Houston Radar Stats Analyzer and then **click on the battery icon**. A window will open that will track the charge status of the battery. It will also calculate the rate of charge or discharge of the battery. This is a very helpful tool when debugging charging issues.*

*The Armadillo also logs the battery charge, voltage and ambient temperature every hour to internal data memory. These parameters are extracted when you retrieve the traffic statistics data from the Armadillo and may be plotted. This will allow you to ensure that the solar charger is keeping the battery adequately charged.*



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. The device must be located 20 cm or more from persons. The device must not be co-located with other transmitters.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Any modification or use other than specified in this manual will strictly void the certification to operate the device.

This product contains a rechargeable Lithium Iron Phosphate battery (LiFePO<sub>4</sub>). Charging must be performed indoors in a dry environment only by the provided LiFePO<sub>4</sub> battery charger. Do not charge unsupervised or hidden from view. Do not expose charger to rain, water or moisture. Securely cap the connectors on the bottom when installing box outdoors.

Battery must be recycled or disposed properly per local recycling regulations or may be returned to us for recycling.

Do not crush, pierce, and incinerate product or the battery. Discontinue use immediately if any leaking occurs.

Product contains no user serviceable parts inside. Do not attempt to open or repair. Doing so will void all warranty.

Specifications may change without notice.



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