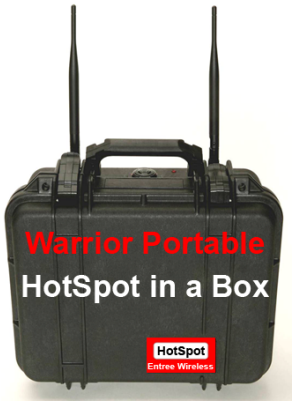
Entrée Wireless
Mobility Solutions for Demanding Applications



FAQ – Frequently Asked Questions

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Pricing/Where to buy	The Entrée sales channel includes dealers, integrators and distributors supported by reps. See details and pricing on web site. www.EntreeWireless.com
General Application	**Portable Wireless-IP Equipment.** The Warrior HotSpot in a Box extends the reach and capability of existing mobility solutions. It is designed to provide portability for a wide range of wireless-IP (Ethernet, RJ45, CAT5) based equipment. Typical Applications
Hot Spot in a Box	Entrée Wireless develop the original HotSpot in a Box in early 2004. This included the worlds first 3G/EVDO to Wi-Fi router and the Warrior Battery Pack. Today Entrée Wireless sells a broad range of full 'HotSpot in a Box' solutions. These solutions include full integrated, best of class wireless IP routers, video, VoIP and command and control packages. For system integrators, Entrée Wireless also provides basic Warrior Battery Packs that can be integrated with a variety of equipment.
Non IP Solutions	Custom solutions can be provided for non-IP equipment. Consult factory for details.
Typical Customer	Has mobile workers using Wi-Fi based software applications. Has experience with the capability of broadband Internet connectivity over 3G cellular. Is looking for a low cost portable broadband solution for multi-person teams.

How far does the Warrior Wi-Fi transmit – (ie. What is the range of Wi-Fi?)

Wi-Fi transmission is a two way connection. The range is determined by the distance between the end points, the obstructions along the path and the capability of the weakest link which is typically a laptop or PDA on one end.

The Warrior battery pack provides a high gain 5.5 dpi antenna, which increase the range of a Wi-Fi link by theoretical 90%. If a typical Wi-Fi AP has a range of 100m then the Warrior will have a range of 190m.

Adding gain (ie. An amplifier) has limited value unless you add gain to both ends of the network. If you only have control of one end of a network, then a high gain antenna on one end always works better than an amplifier.

How far can the Warrior connect to the Internet? (ie. What is the range of 3G cellular?)

The Warrior can connect to the Internet any place there is cellular service. You will get higher speeds on a 3G network (see below). The Warrior battery pack provides a 2.5 db dual band, broadband antenna. This increases the range of the 3G link by a theoretical 30%. Typically if your cell phone works the Warrior Battery Pack will connect.

Will the Warrior Connect to other devices?

Yes - The Warrior when combined with a 3G/Wi-Fi router provides a standard IP connection to the Internet (ie a WAN). This WAN connection can be either wireless (Wi-Fi) or wired (Ethernet CAT5 LAN) and will connect with most devices. In addition devices on the Wi-Fi/LAN side of the router may connect to each other directly.

Are Cross band solutions supported?

Yes, The Warrior battery pack can be configured for a wide range of connectivity solutions. Typical Applications

Is Video Conferencing, Video Surveillance and VoIP supported?

Yes and No. First of all these applications require significant bandwidth. The answer is Yes, if the 3G cellular connection is fast enough. The Sprint Rev A network can support most applications. Verizon on the other hand has Rev A but prohibits the use of Video on their network that exceeds their bandwidth guidelines.

Is 2 way Voice or Land Mobile Radio (LMR) supported?

Yes and No. LMR that is not IP based cannot connect to the Warrior equipment. Yes, the Warrior can be used to control equipment that is used to integrate and cross connect various LMR systems provided they have an IP (CAT 5 Ethernet) interface.

Does the Warrior support APCO25 standards?.

The Warrior battery pack can be used to provide portability to APCO25 radios. Consult factory for details.

3G Cost

The cost for unlimited 3G service is $60 - $80 per month. Shop for the best rebates on 3G cards and routers

3G Providers - CDMA

Verizon, Sprint/NexTel, Central South
http://b2b.vzw.com/broadband/coveragearea.html
http://b2b.vzw.com/productsservices/wirelessinternet/index.html
http://www.sprint.com/business/products/products/evdoCoverage.jsp

3G Providers - GSM

ATT/Cingular, T-Mobile
http://www.cingular.com/coverageviewer
http://www.cingular.com/learn/why/technology

3G Speed		Average Speed - bps		Max Speed - bps	
CDMA		Down	Up	Down	Up
	EVDO-A	450-850 K	300-400 K	3.1 M	1.8 M
	EVDO-0	300-500 K	60 - 90 K	2.4 M	154 K
	1xRTT	60 - 90 K	60 - 90 K	154 K	154 K
GSM					
	HSDPA	500-800 K	200-300 K	1.8 M	384 K
	UMTS	220-320 K	220-320 K	384 K	384 K
	EDGE	70-90 K	50-60 K	236 K	118 K
	GRPS	30-50 K	30-50 K	76 K	76 K

Speed Test

Many free online speed tests are not accurate especially for wireless Download the free speed test 'client'. Use the 'socket' test mode
http://myspeed.visualware.com

Video transmission

Sprint supports video transmission at 350Kpbs. The frame rate depends on image size and compression.

Warrior Add-ons

The Warrior Battery Pack does not include; a 3G Card, 3G service or a 3G to Wi-Fi router/bridge. A 3G card external antenna adaptor is also required. These items are generally supplied by 3rd party integrators or the end user.

Antenna Adaptors

The Warrior Battery Pack does not include an external antenna adaptor (pigtail) for the 3G card (They are different for each card). The best place to buy these adaptors is on the Verizon web site under accessories.
http://www.verizonwireless.com/b2c/index.html
Adaptors can also be purchased at
http://www.wilsonelectronics.com/Adapters.php?ID=22

Sprint Service, Solutions & Equipment

Warrior Portability Solutions
Sprint Mobile Broadband Services Overview
Sprint EVDO Coverage Map by Zip Code
Sprint/Sierra Wireless S720 EVDO Card (w/ ext antenna port)
Sprint/Linksys WRT54G3G EVDO/Wi-Fi Router (w/ Alt Wan fall back)

Video Camera Notes

The Warrior products will work with most video cameras with IP (web server) support. A common question is low light operation. You might see 1 lux at 30 IRE. The lux is the light on the image and the 30 IRE is the brightness of the output display. 100 IRE is full brightness. 30 IRE is 30% brightness. MPEG4 or H264 video compression is recommended. How much storage or bandwidth is required. For A 640 x 480 video, 30 fps, 24/7 recording – MJPEG 350 G/week, MPEG4 80G/week
http://www.axis.com/products/video/design_tool/calculator.htm

Here are some sample cameras:
Sony PTZ, IP cameras
Sony SNCRX570N/W - PTZ, Day/night
Sony SNCRZ50N, PTZ, Day/Night - 0.3lux night, wireless
http://pro.sony.com/bbsc/ssr/cat-securitycameras/cat-ip/?navId=4294966757+124+4294965807&refine=60

Axis PTZ, IP cameras
Axis 214 PTZ - low light, 0.3 lux day, 0.005 lux night
AXIS 233D PTZ Dome – low light, 0.5 lux day, 0.008 lux night, 2 way audio
http://www.axis.com/products/video/camera/ptz/index.htm
http://www.axis.com/products/video/camera/productguide_ptzdome.htm

3G Card Adaptors

These adaptors are required when using the Warrior external 3G antenna. The adaptor connects from the customer connector on the 3G card to a standard FME connector on the internal cable. The internal cable connects to the external 3G antenna which uses a TNC connector.

MFG	Model	Verizon PN	Ext Ant.	MFG	Cross Ref to
Verizon	595 (PC)			Sierra	
Verizon	PC 5740				
Verizon	PC 5750				
Verizon	USB 720	PCCAB-720		Novatel	V640, S620, S720
Verizon	V620 (PC)	PCCAB-620		Novatel	V640, S620, S720
Verizon	V640				
Verizon	V740 (EX)				
Kyocera	KPC 650	PCCAB-650		Kyocera	
Audiovox	PC 3220		MC card	Sierra	
Audiovox	PC 3320				
Audiovox	PC 5220	PCCAB-5220	MC card	Sierra	555, 580, 3320, 5220, Option GT
Sierra	AC 580		MC card	Sierra	
Sierra	555D				

3G Router Notes

Kyocera KR1 3G to Wi-Fi Router

Factory default – hold reset button for 10 sec
IP – 192.168.0.1, User name – admin, Password - <leave blank>, SSDI – KR1
10/2/07 - latest firmware – v 1.0011 w/S720 support

Linksys WRT54G3G 3G to Wi-Fi Router

Factory default – hold reset button for 5 sec
IP – 192.168.1.1, User name – <leave blank>, Password - admin
10/2/07 - latest firmware – V 2.00.9 w/ WAN failover
Click 'Setup, Mobile Network' – set Fail Over (Mobile, WAN),
Auto Connect (Auto = 60 min, Manual), i.e. disconnects after 60 min

Antenna Adaptor Notes

KPC650 Adaptor – Viewed from the antenna end

Right Port – disconnects both internal antennas, becomes transmit and receive
Left Port – Internal is Transmit antenna, External is receive antenna
Right is recommended by Wilson

External Antenna Adaptors

For semi permanent external antenna installations a type N cable connector may be preferred. Here are some adaptors.

Definitions – Male/female connector – Center pin is male/female; Plug = Threads on inside, rotates, normally M; Jack – Threads on outside, panel mount, normally F; RP - Reverse Polarity ie the center pin is reverse sex so a RPSMA-M plug has a F center pin.

These adaptors will connect from the Warrior case to an N-Male antenna cable.
http://www.sharperconcepts.net/
AXA-NFRSP RPSMA plug to N female, for Wi-Fi
AXA-NFTM TNC male to N female, for 3G

This adaptor will connect from the 3G card adaptor cable to an N-Male antenna cable.
http://www.alternativewireless.com/cellular-antennas/adapters.html
AC971107 FME female to N female for 3G, connects to the card adaptor

Battery Life

The Warrior pack utilize sealed lead acid batteries that are good for more than 400 complete discharge/charge cycles. The battery are rated at 12V and 7AmpHours = 84 What hours. A typical router is about 10 – 15 watts. The operation time is 84/10 = 8.4 hours. A conservative estimate is 6 hours. When the Warrior kit is turned off the current draw is diode protected and virtually zero. You can safely store the Warrior with the switch off for the storage rating for the battery itself which is greater than 3 months.

12V Vehicle Power Adaptors

These adaptors plug into the Warrior internal vehicle power outlet and provide power to the router. Be sure to purchase the correct voltage and connector size.

Router	Voltage	Connector	Adaptor PN	Description	Vendor
KR1	+5V	5.5 x 2.1	TXCLA10059	12V to 5V converter	Kyocera
KR1	+5V	5.5 x 2.1	273-1818	12V 2A, 5V/ universal	Radio Shack
Linksys WRT54-G3G	+12V	5.5 x 2.1	270-1533	12V-12V power adaptor	Radio Shack
MB8000	+5V	5.5 x 2.5?	AT51VP	12V 2A to 5V converter	Top Global

273-1818 adaptaplug
A 2.35 x 0.7mm, B 4 x 1.7mm, H 3.4 x 1.3mm, M 5.5 x 2.1mm, O 5.5 x 2.8mm

12V Vehicle Power Operation

The Warrior battery packs can be recharged/operated from a vehicle power outlet (AKA cigarette lighter) by connecting to 12V >50W DC to AC inverter such as:

Zantrex Xpower Mobile Plug 75 – Available from
Amazon - $30,
Radio Shack - Catalog #: 55017852 - $30

Multi Mode 12V Battery Charger

The Warrior Battery Packs utilize a 3 stage multimode battery charger. This charger provides
1. fast charging (1 – 2 hrs),
2. long term charging without damaging the battery and
3. simultaneous equipment operation and charging.

The charger indicator light on the panel indicates the state of charging. Green = fully charged with a 13.5 – 13.8 V 'float' voltage, Red = charging with a 14.5 – 14.8 'fast charge' voltage. NOTE: for heavily discharged batteries, the charger (light red) operates in a constant current mode with a <14.5V voltage.

NOTE – The charger will indicate fully charged (Green) if the battery is disconnected or the fuse has been blown. In that case the red power light will go off when the AC to the charger is disconnected.

CHARGING DEAD BATTERIES – CAUTION - 15 MINUTES MAX - CAUTION

The Sealed Lead Acid (SLA) battery in the Warrior Battery Pack can be damaged if it becomes fully discharged.

The WBP battery is likely dead or nearly dead if the router (or other equipment in the WBP) does not operate properly or the Red Power LED does not turn on.

If the battery is suspected to be dead, charge the battery for only 15 minutes with the case open.

Check the battery for warmth or swelling. Allow to cool and repeat until fully charged. **If the charger light stays red or the battery is warm after charging for several hours it should be replaced.**

If the charger light is green and the battery is cool it is most likely OK.

Battery Voltage vs Operation Time and Temperature

12V 7AH Battery, Load = 0.7 A (ie a typical 3G/Wi-Fi Router)

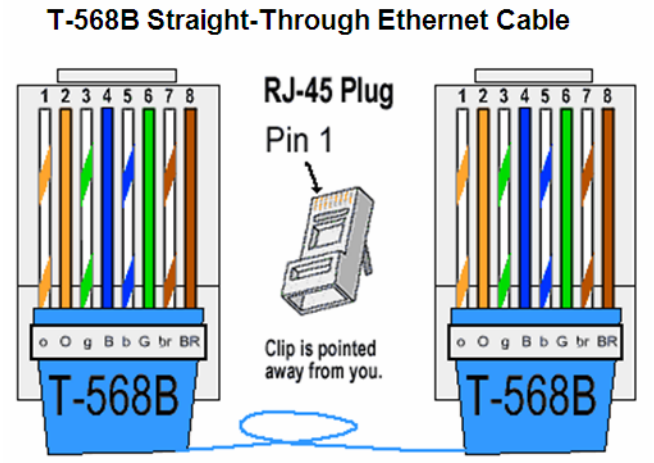
Deg C		0 C	20 C	40 C
Deg F		32 F	68 F	104 F
Volt change		-0.6	0	0.6
95%	0.3hr	12.1	12.7	13.3
75%	3 hr	11.9	12.5	13.1
50%	6 hr	11.6	12.2	12.8
25%	9 hr	11.3	11.9	12.5
5%	12hr	10.6	11.2	11.8

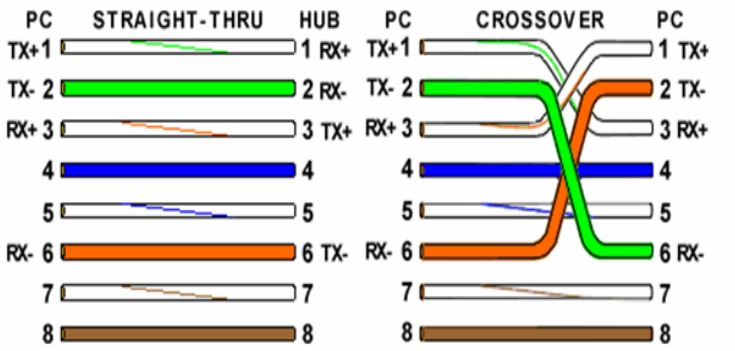
12V Battery Replacement

The Warrior Battery Pack utilize 12V 7AH –F1 Sealed Lead Acid Batteries (SLA). The industry standard size is 5.95"Lx2.56"Wx3.7"H, approx. 6lbs. A good replacement battery is the 84 Wh Universal Battery UB1270 with F1 (0.187) terminals. Note that the UB 1280-F1 will also fit in the mounting bracket and provides 96Wh for extended operating time.

Cat 5 Wiring

POE Pins 4/5 = +V, Pins 7/8 = -V (Cisco may be reversed)





Acronyms

2 G	Cellular phone service, circuit switched, TIA/EIA IS-95 networks
2.5 G	Cellular phone service, some packet switched features, ie EDGE networks see below
3 G	Cellular phone services provide the ability to simultaneously transfer both voice data (a telephone call) and non-voice data (such as downloading information at high speed
3GPP	Third Generation Partnership Project, coordinates 3G activity, GSM http://www.3gpp.org
3GPP2	Third Generation Partnership Project, coordinates 3G activity, CDMA2000 http://www.3gpp2.org
CDMA	Cellular Network, Code division multiple access (CDMA), Started in the US and is gaining on GMS because of technical merits. It is a form of multiplexing and a method of multiple access that divides up a radio channel not by time (as in time division multiple access), nor by frequency (as in frequency-division multiple access), but instead by using different pseudo-random code sequences for each user. CDMA phones don't use SIM cards. Instead, your phone's identity and number are programmed into the handset by your carrier, and you can't easily switch numbers on CDMA phones as you can with SIM-equipped GSM phones.
CDMA 2000	3G cellular netwok, evolution of CDMA networks, See CDMA2000 Development Group http://www.cdg.org http://www.cdg.org/technology/3g_1xEV-DO.asp#revA
GSM	Cellular network - Global System for Mobile Communications, Large worldwide foot print. GSM is the most widespread standard for cell phones networks in the world. Here in the U.S., AT&T and T-Mobile are both GSM carriers. The main distinction of a GSM phone is that it comes with a SIM (Subscriber Identity Module) card—a little plastic chip that, as its name implies, identifies your phone on the GSM network. If you take the SIM card out of your GSM phone and put it into another GSM handset, you'll be able to place and receive calls on the second phone using your own cell phone number. GSM phones are also capable of handling six-way conference calls.
WCDMA	3G Celluilar Network - evolution of GSM networks to a CDMA based technology
1xRTT	3G CDMA network, speed down/up 153Kbps/153Kbps peak, 60-100Kbps/60-100Kbps average, 1xRTT" (1 times Radio Transmission Technology) is used to identify the version of CDMA2000 radio technology that operates in a pair of 1.25-MHz radio channels (one times 1.25 MHz, as opposed to three times 1.25 MHz in 3xRTT). 1xRTT almost doubles voice capacity over IS-95 networks. Although capable of higher data rates, most deployments have limited the peak data rate to 144 kbit/s. While 1xRTT officially qualifies as 3G technology, 1xRTT is considered by some to be a 2.5G (or sometimes 2.75G) technology. http://www.cdg.org/technology/3g_1X.asp
EVDO Rev 0	3G CDMA Network, speeds down/up 2.4Mbps/153Kbps peak, 300-700Kbps/70-90Kbps average, Evolution-Data Optimized, abbreviated as EV-DO or EVDO and

	often DO or EV, is a wireless radio broadband data standard adopted by many CDMA mobile phone service providers in United States, Canada, Mexico, Europe, Asia, Russia, Brazil, and Australia. It is standardized by 3GPP2, as part of the CDMA2000 family of standards. http://www.cdg.org/technology/3g_1xEV-DO.asp#rel0
EVDO Rev A	3G CDMA Network, speeds down/up 3.1Mbps/1.8Mbps peak, 450-800Kbps/300-400Kbps average, http://www.cdg.org/technology/3g_1xEV-DO.asp#revA
EVDO Rev B	3G CDMA Network,speeds down/up 4.9Mbps/2.8Mps peak, 3xOption to 14.7Mbps, fast upload speeds http://www.cdg.org/technology/3g_1xEV-DO.asp#revB
GPRS	2G GSM network, speeds up to 85.6Kbps, General Packet Radio Service (GPRS) is a Mobile Data Service available to users of GSM and IS-136 mobile phones. GPRS data transfer is typically charged per megabyte of transferred data, while data communication via traditional circuit switching is billed per minute of connection time, independent of whether the user has actually transferred data or has been in an idle state. GPRS can be utilized for services such as WAP access, SMS and MMS, but also for Internet communication services such as email and web access.
"EDGE/GPRS-E"	"2.5G GSM network, speeds up to 247 kbps, Enhanced Data rates for GSM Evolution (EDGE) or Enhanced GPRS (EGPRS), is a digital mobile phone technology that allows to increase data transmission rate and improve data transmission reliability. It is generally classified as a 2.75G network technology. EDGE has been introduced into GSM networks around the world since 2003, initially in North America. EDGE Evolution, an upgrade to EDGE that permits 1 MBit/s peak speeds and latencies down to 100 ms, using the existing network infrastructure. EDGE Evolution is included in Release 7 of the 3GPP standard, and products are expected to arrive in 2008.[2]"
UMTS	3G GSM network, speeds up to 384 kbps,Universal Mobile Telecommunications System (UMTS) is one of the third-generation (3G) mobile phone technologies. See - http://www.umtsworld.com/umts/faq.htm#f1
HSDPA	3G GSM network, speeds up to 1.8 Mbps., 400-700Kbps average, High Speed Downlink Packet Access. This is a W-CDMA based technology.
SIM	Subscriber Identity Module a card or little plastic chip that, as its name implies, identifies your phone on the GSM network
MIMO	Multiple Input Multiple Output, high performance antennas
Diversity	Diversity antennas, High performance, leverage reflections and multipath signals
OFDM	Orthogonal Frequency Division Multiplexing, high performance wireless modulation