

QUICK INSTALLATION GUIDE

# XR Series Wireless Access Points

XR520H

April 29, 2013

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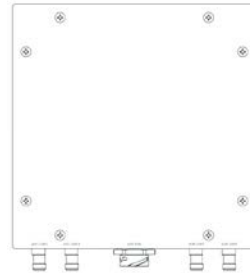
Please see Warranty and License Agreements in the *Wireless Array User's Guide*.

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# XR520H Quick Installation Guide

The XR520H Hardened Wireless Access Point provides Xirrus wireless technology in a hardened case for installation outdoors and in other harsh environments. This guide describes how to install the XR520H on a pole or wall and execute the initial power up of the Access Point. The pole or wall can be a structure that is installed at ground level or on a roof. The XR520H is not compatible with other Xirrus mounting options. For additional information, see the *Wireless Array User's Guide*.



*This document is intended ONLY for XR520H model Access Points. For other XR models please see the Quick Installation Guide for that model series.*

## 1) You Need the Following Items

- Accessory Kit (included in each Wireless Access Point carton) includes:
  - Mounting bracket and mounting screw
  - Grounding cable and short ground wire
  - Watertight RJ connector assembly
- Appropriate tools, bands, screws, and/or anchors required for the desired mounting location (not provided with the Access Point).
- Workstation with a Web browser to configure the Wireless Access Point.
- RJ-45 Ethernet connection(s) to your wired network.
- Power—XR520H Access Points are powered via Power over Gigabit Ethernet (PoGE) using an outdoor-rated Ethernet Cat 5e or Cat 6 cable that also carries data traffic. Only Xirrus-supplied power injectors, or 802.3af or 802.3at PoE-compliant switches, may be used to power the XR520H. The XR520H is powered by one injector port rated at 20W or higher. The Xirrus PoGE Power Injector requires an AC outlet. See the *PoGE Installation Guide* for more information.

*NOTE: Xirrus PoGE Injectors must be installed and used indoors.*

## 2) Choose a Suitable Location

The XR520H is tested to IP65 water proof and dust proof requirements to protect against severely wet and dusty environments. For optimal placement, we recommend that a predictive survey be performed by a qualified Xirrus partner.

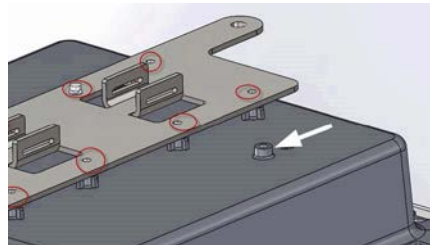
- Choose a location that is not subjected to submersion.
- Direct sunlight may raise the effective ambient temperature many degrees above the air temperature. It is best to choose a location that has some level of protection from the sun.

- The maximum cable length between the XR520H and the RJ-45 Ethernet Network is 100 meters. The PoGE Injector is not a repeater, so its location will not increase this distance.
- The XR520H can operate from a Wireless Distribution System (WDS) link. However, the unit will need to be configured via the Ethernet connection prior to mounting and power must still be supplied via the RJ-45 Ethernet connector.
- Keep the unit away from electrical devices or appliances that generate RF noise—at least 3 to 6 feet (1 to 2 meters).

### 3) Prepare the Mounting Location

Part of the mechanical installation is to ensure that the Access Point is grounded to earth ground to dissipate any static electric charge that may develop due to wind.

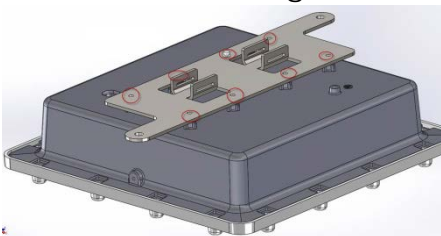
- Determine a good electrical earth ground point near the Access Point mounting location. If an earth ground point is not available, consult an electrician to have one installed.
- Crimp a terminal lug to a sufficient length of 16 gauge wire to reach from the mounted Access Point to the earth ground point.
- Before the Access Point is attached to a wall or pole, secure the terminal lug to the Access Point with the #6 screw provided in the location indicated by the white arrow, below..



### 4) Attach the Mounting Plate to the Access Point

The accessory kit includes a small mounting plate. Mounting plate dimensions are included in the Drawings section at the end of this guide. The mounting plate can be used for wall or pole mounting by reversing the side of the plate exposed. Attach the mounting plate to the Access Point using the eight provided screws in the locations indicated below (secure in at least 4 places). The Pole Mounting position of the bracket is shown below.

For Pole Mounting:

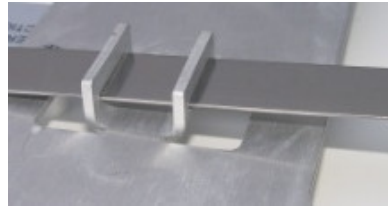


## 5) Mount the Access Point on a Pole or Wall

### 5a) Pole Mounting

For pole mounting, Xirrus recommends using metal straps (not included with the Access Point). The metal straps can be obtained from BAND-IT-IDEX, Inc. ([www.BAND-IT-IDEX.com](http://www.BAND-IT-IDEX.com)). See their web site for additional contact information. Complete the following steps to mount the Access Point to a pole.

- Install the metal bands through the holes in the mounting bracket.
- Hand tighten the Band-It strap through the pole mounting bracket, thread it through the strap buckle and then bend the strap back.
- Using the Band-It tool, place the tool onto the strap.
- Rotate the Band-It tool so that it can pull the excess strap through the buckle and turn the crank until the strap is very tight.



- Once the strap is satisfactorily tight, rotate the Band-It tool back so that the strap cannot slide back through the buckle.



- Using the built in cutting tool on the Band-It tool, cut the excess strap.



- Your installation should now appear as shown here.



- Using a hammer, bend back and flatten the remaining strap.



- Using a hammer, bend and flatten the two tabs on the buckle, so that they hold the flattened strap end in place.



- The completed attachment should have the mounting bracket firmly seated against the pole. One band should be enough for most installations however a second band can be used for additional mounting security.

## 5b) Wall Mounting

- Place the Access Point in the desired location and mark the location of the mounting holes on the wall.
- Drill and prepare the holes for the desired screw type. In metal walls the holes may be tapped to the proper thread or alternatively the Access Point may be mounted with sheet metal screws. For concrete walls a plastic anchor and screw are suggested.

*NOTE: Mounting screws for attaching the plate to the wall are not provided in the kit.*

- Attach the Access Point to the mounting plate before attaching the mounting plate to the wall.

## 6) Ground to Earth Ground

*WARNING: This equipment must be externally grounded using a customer-supplied ground wire before power is applied. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.*

Part of the mechanical installation is to insure that the Access Point is grounded to earth ground to dissipate any static electric charge that may develop due to wind. In Step 3, you secured a terminal lug to the Access Point with the provided #6 screw (see Step 3 if this has not been done).

- After Step 3 is completed and the Access Point is mounted to the wall or pole, attach the 16 gauge wire from the Access Point to the electrical earth ground point that you located or had installed in Step 3. The following illustration shows an earth ground connection where the Access Point is mounted on a pole at ground level and the 16 gauge wire is attached to a stake driven into the ground.





- Continue the installation by mounting the antenna and attaching the cables as described in Steps 7, 8, and 9.

## 7) Install an Antenna

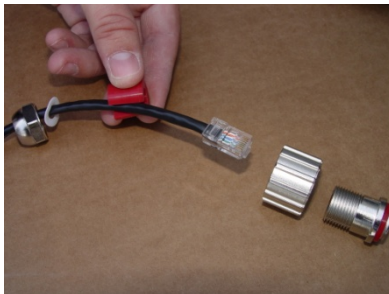
*NOTE: Use only Xirrus-approved or recommended external antennas. Also see the Notices and Warnings regarding external antennas in the Warning & Notices section of this guide.*

*NOTE: Be sure to configure the Access Point's IAPs to the proper bands (2.4 GHz and 5.0 GHz) in Step 11. Each must match the band of the antenna to which it is connected.*

Low loss cable is available such that the antenna can be mounted in an appropriate location that could be several feet away from the Access Point.

## 8) Prepare the Ethernet Cable with the Waterproof Shell

- Place the split washer and split rubber grommet over the cable.
- Slide all the sections together and tighten the nut on the end to 5kg but not more than 8kg torque force to insure a water tight fit.





## 9) Connect the Cables

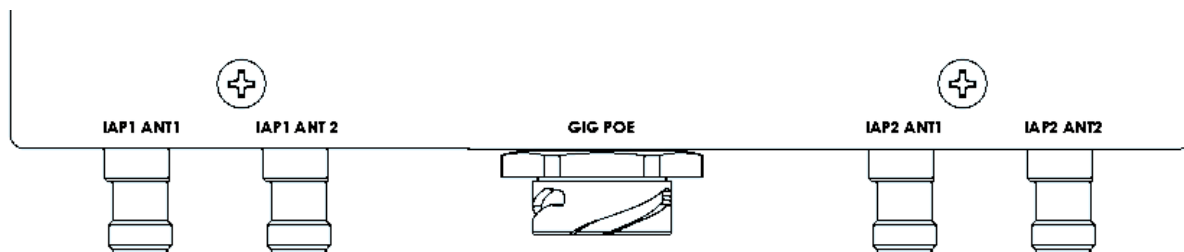
### 9a) POE port

All XR520H Access Points are powered directly via their Gigabit Ethernet connection.

- **Power:** These Access Points are only powered through the **GIG POE** port. Only Xirrus-supplied power injectors, or 802.3af or 802.3at PoE-compliant switches, may be used to power the XR520H.
- **Data:** Data is supplied to the Gigabit port via the same cable that powers the Access Point.
- Connect the outdoor-rated Ethernet cable carrying data and power from the PoGE injector to the Access Point's **GIG POE** port as indicated.



### 9b) Antenna ports



Both IAP1 cables from the Access Point (**IAP1 ANT1** and **IAP1 ANT2**) must be attached to connectors for the same frequency band on the antenna (e.g., 2.4GHz), and IAP1 must be assigned to that band on the Access Point (see Step 11). Similarly, both IAP2 cables need to go to the other frequency band on the antenna (e.g., 5.8GHz). For simplicity, we suggest that you connect **IAP1 (ANT1 and ANT2)** to 2.4GHz on the antenna, and connect **IAP2 (ANT1 and ANT2)** to 5.8GHz. Then you **must** configure the Access Point to correspond in Step 11: set IAP1 to the 2.4GHz band and IAP2 to the 5GHz band.

To use a 3x3 MIMO antenna type with the XR520H, connect cables to the **+45** and **-45** connectors. Do not use the connector marked "V".

The XR520H has RP-TNC connectors for the antenna.

## 10) Log In to the Access Point

- **NOTE:** *If you are a Xirrus Cloud customer, your Access Points are completely managed by XMS Cloud, and you may skip all of the remaining steps (10, 11 and 12). In fact, you will not be able to access CLI or the Web Management Interface under normal operating circumstances.*

*Xirrus Cloud customers should wait five minutes, then log on to XMS Cloud to view/manage this Access Point. In the event that your connection to the Cloud has been interrupted for an extended period of time, you may contact Xirrus technical support for help with local access to the Access Point.*

- Establish a network connection to the Access Point using a web browser. If you are using DHCP and DNS, enter the Access Point's default host name in the URL field. The default host name is its serial number (for example, XR0823090CACD).
- If you are not using DNS and DHCP, enter the IP address in the URL field. Be aware of the following:
  - By default, the Access Point tries to obtain an IP address via DHCP. If it cannot do so, the factory default is a static IP address of 10.0.2.1 with a mask of 255.255.255.0 on its Gigabit POE port.

*Take care to ensure that your network is not using the 10.0.2.1 IP address prior to connecting the Access Point to the network.*


- To connect to the Access Point in this case, you must set your computer to be in the same subnet as the Access Point: set your IP address to be in the 10.0.2.xx subnet, and set its subnet mask to 255.255.255.0. If this subnet is already in use on your network, you may connect your computer directly to the Access Point by connecting the computer to the power injector's IN port temporarily (this port may be called the SWITCH port or the DATA port on your injector).
- If the assigned IP address is unknown, you may use the Xirrus Xircon utility to communicate with any XR520H on the local network. Note that the XR520H does not have a console port, so Xircon has been specifically designed to substitute for the use of a console port. See "Secure Low Level Access to the Access Point" in Step 12 for more information about Xircon.
- If your browser reports a Security exception, accept it and continue on to the Access Point's Web Management Interface (WMI).
- At the login prompt, enter the default user name / password (the default is **admin** for both).

Name: XR1000H ( 10.100.55.149 )		Location: Back in XMS Laboratory	
Current Status:	Logged Out		
User Name:	<input type="text" value="admin"/>		
User Password:	<input type="password" value="•••••"/>		

- You are now logged in to the Wireless Access Point.

## 11) Configure the Access Point

- Click **Express Setup**.

Status	Name: XR4012802207C ( 10.100.44.113 )	Location: SE_Corner	Uptime: 0 days, 23 hours, 29 mins
<ul style="list-style-type: none"> <li>Array</li> <li>Network</li> <li>RF Monitor</li> <li>Stations</li> <li>Statistics</li> <li>Application Control</li> <li>System Log</li> <li>IDS Event Log</li> </ul>	Save changes to flash		
<b>Configuration</b>	License		
	License Key:	0WNVA-0CQ0E-10KVM-V <input type="button" value="Apply"/>	
	Network Settings		
	Host Name:	XR4012802207C	
	Address Type:	<input checked="" type="radio"/> DHCP <input type="radio"/> Static	
	IP Settings:	Address: 10.100.44.113	Subnet Mask: 255.255.255.0
		Default Gateway: 10.100.44.1	<input type="button" value="Apply"/>
	SSID Settings		
	SSID Name (Replaces SSID "xirrus"):	<input type="text"/>	
	Wireless Security:	Open <input type="button" value="Apply SSID Settings"/>	
	Current SSIDs	Operations xirrus	
	Admin Settings		
	New Admin User (Replaces user "admin"):	<input type="text"/>	
	New Admin Privilege Level:	1 : read-write <input type="button" value="Apply Admin Settings"/>	
	New Admin Password:	<input type="text"/>	
	Confirm Admin Password:	<input type="text"/>	
<b>Tools</b>	Time and Date Settings		
Help 	Time Zone:	(GMT) Greenwich Mean Time: Dublin, Lisbon, London <input type="button" value="Apply"/>	
System Tools	Quick Configuration		
CLI	Apply Quick Configuration Template:	<input type="button" value="Apply"/>	
API Documentation	IAP Settings		
Options	Enable/Configure All IAPs:	<input type="button" value="Execute"/>	
Logout			

- The Access Point will automatically contact Xirrus and obtain its license key, based on its serial number and MAC address. This auto-licensing function requires the Access Point to have an Internet connection. A license is needed to enable the full functionality of the Access Point.
- In the **Admin Settings** section, change both the default admin username and password to improve Access Point security. Enter **New Admin User** and **New Admin Password**, then **Confirm Admin Password**. Leave **New Admin Privilege Level** at read/write. Click **Apply Admin Settings** when done.

*Be sure to record the new account name and password, because the default admin user will be deleted!*

- If you make changes to the **SSID Settings** section, click the associated **Apply** button to apply your changes.
- Click **Save Changes to Flash** on the upper right to save your settings.

- Click **Execute** at the bottom of the page to set up/enable all IAPs (radios) automatically.
- Be sure to configure the Access Point's IAPs to the proper bands (2.4 GHz or 5.0 GHz), to match the antenna connections that you made in Step 9b. Each must match the band of the antenna to which it is connected.

Click **IAPs > IAP Settings** and select the correct value for each IAP in the **Band** column.

*For improved security, you must also take the additional steps described in "Secure Low Level Access to the Access Point" in Step 12.*

- With a basic configuration established the Wireless Access Point is now functional. Refer to the *Wireless Array User's Guide* for additional configuration information. Look for the section titled *Performing the Express Setup Procedure* near the end of the *Installing the Wireless Array* chapter of the *Guide* for more details on Express Setup settings. The chapter titled *Configuring the Wireless Array* discusses all of the settings available for the Access Point.

*Note: The channel set available in an outdoor application is different than indoor so some channels typically used will not be shown.*

## 12) Secure Low Level Access to the Access Point

Management of the Xirrus Access Point is done via the Web Management Interface (WMI) or Command Line Interface (CLI). The Access Point also has a lower level interface: XBL (Xirrus Boot Loader), which allows access to more primitive commands. You won't normally use XBL unless instructed to do so by Xirrus Customer Support. For proper security, you should replace the default XBL login username and password with your own, as instructed below. XBL has its own username and password, separate from the ArrayOS Admin User and Password (used for logging in to the WMI and CLI).

Xirrus also provides the Xircon utility for connecting to Access Points that are not reachable via the normal access methods (such as Secure Shell (SSH) or WMI) and that do not have a physical console port (XR520H), or whose console port is not accessible. Xircon discovers Access Points on your network subnet and can then establish an encrypted console session to the Access Point via the network even if the Access Point IP configuration is incorrect. Xircon allows you to manage the Access Point using CLI, just as you would if connected to the console port. Xircon also has an option for easily accessing XBL.

Xircon access to the Access Point may be controlled. Since the XR520H does not have a console port, this model has Xircon access to both XBL and CLI enabled by default. To avoid potentially being locked out of the Access Point, Xircon should always be enabled at the XBL level at least.

*If you disable Xircon access to both XBL and CLI on the XR520H, you must ensure that you do not lose track of the username and password to log in to CLI/WMI! In this situation, there is no way to recover from a lost password, other than returning the Access Point to Xirrus. If you have Xircon access to XBL enabled, you can reset the password, but this recovery will require setting the unit to factory defaults with loss of all configuration data.*

Use the following steps to replace the default XBL username and password. These steps use CLI commands.

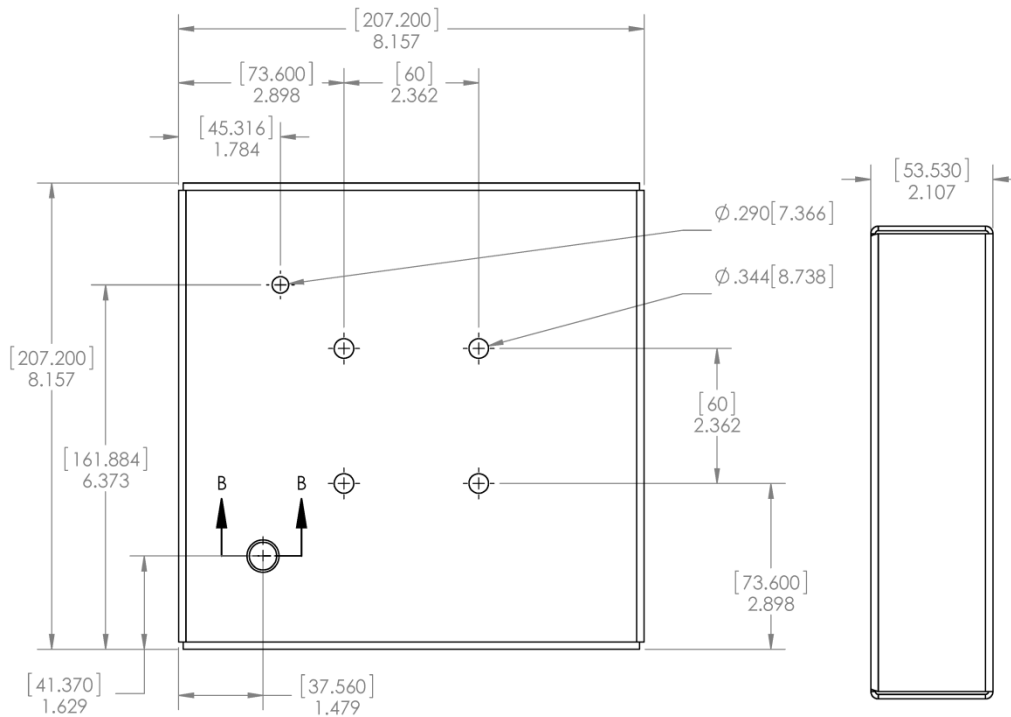
1. To access CLI via the WMI, click **CLI** under the **Tools** section on the left.
2. If Xircon access at the XBL level is to be allowed, use the following three commands to change the XBL username and password from the default values of **admin/admin**. In the example below, replace **newusername** and **newpassword** with your desired entries. Note that these entries are case-sensitive.

```
Array42#(config)#boot-env
Array42#(config-boot)#set username newusername
Array42#(config-boot)#set password newpassword
Array42#(config-boot)#save
Saving boot environment .... OK
Array42(config-boot)# exit
```

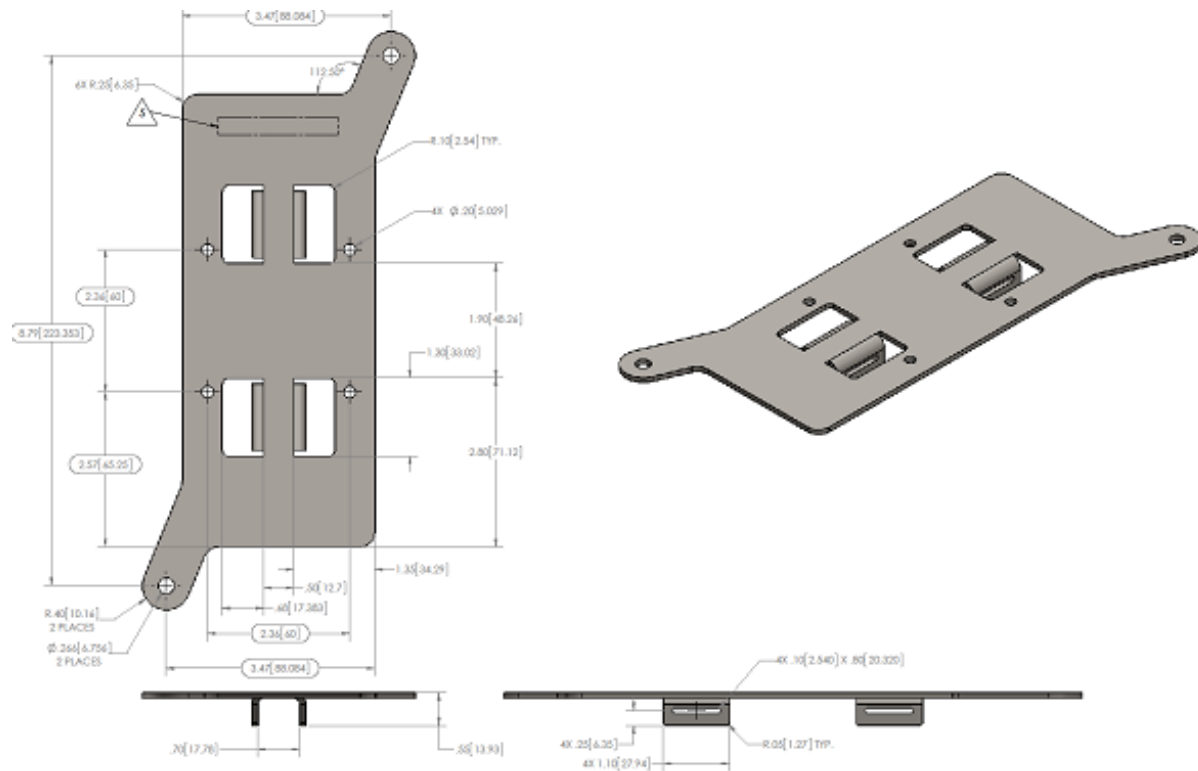
3. It is possible to change Xircon access permission to allow Xircon to access the Access Point at the CLI level only, or at the XBL level only. See the *Xircon User Guide* for details.

## Drawings

### XR520H Dimensions



## Mounting Bracket Dimensions xxxx



## Customer Support

Xirrus Customer Service Representatives are available 24 x 7 via:

**Email:** [support@xirrus.com](mailto:support@xirrus.com)

**Chat:** (Available Mon-Fri 12AM-12AM PST)

**Phone:**

- United States and Canada: +1.800.947.7871 (US Toll Free) or +1.805.262.1600 (Direct)
- Europe, Middle East, and Africa: +44.20.3239.8644
- Australia: 1 300 XIRRUS (1300 947 787 - Local Call Cost)
- Asia and Oceania: +61.2.8006.0622
- Latin, Central, and South America: +1.805.262.1600

## Notices, Warnings, & Compliance Statements

### Notices







- Read all user documentation before powering this device. Please verify the integrity of the system ground prior to installing Xirrus equipment. Additionally, verify that the ambient operating temperature does not exceed 65°C.

- Software used by the modular Access Points (APs) is covered by the Xirrus Software License and Product Warranty Agreement.
- Non-Modification Statement: Unauthorized changes or modifications to the device are not permitted. Use only Xirrus-approved external antennas supplied or recommended by the manufacturer. Modifications to the device will void the warranty and may violate FCC regulations.
- UL Statement: Use only with listed ITE product.
- Operating Frequency: The operating frequency in a wireless LAN is determined by the access point. It is important that the access point is correctly configured to meet the local regulations. If you have questions regarding the compliance of Xirrus products, please contact us at: Xirrus, Inc., 2101 Corporate Center Drive, Thousand Oaks, CA 91320, USA. Tel: 1.805.262.1600/1.800.947.7871 Toll Free in the US, Fax: 1.866.462.3980, [www.xirrus.com](http://www.xirrus.com)
- The 2-GHz b/g/n radio operates in 2.4 GHz ISM band. It supports channels 1-11 in US, 1-13 in Europe, and 1-13 in Japan. It has two transmitters with a maximum total output power of 25dBm for 802.11b/g/n operation. Output power is configurable to 5 levels. It has three receivers that enables maximum-ratio combining (MRC).
- The 5-GHz a/n radio operates in the UNII-2 band (5.25 - 5.35 GHz), UNII-2 Extended/ETSI band (5.47 - 5.725 GHz), and the upper ISM band (5.725 - 5.850 GHz). It has two transmitters with a maximum total output power of 26 dBm for UNII-2 and Extended/ETSI bands for the A-domain. The total maximum output power for the upper ISM band is 28 dBm for A-domain. Power settings will change depending on the regulatory domain
- High power radars are allocated as primary users (meaning they have priority) in the 5250MHz to 5350MHz and 5650MHz to 5850MHz bands. These radars could cause interference and/or damage Wireless LAN devices.
- Calculating the Maximum Output Power: The regulatory limits for maximum output power are specified in EIRP (equivalent isotropic radiated power). The EIRP level of a device can be calculated by adding the gain of the antenna used (specified in dBi) to the output power available at the connector (specified in dBm).
- The FCC limits the amount of power this device can transmit. Power transmitted is a combination of the amplification of the signal and the antenna gain. This device has been designed to operate with antennas having an effective maximum gain of 9dBi in the 2.4 GHz band and 6 dBi in the 5 GHz band. Antennas having a gain greater than this are strictly prohibited for use with this device. The required antenna impedance is 50 ohms. Effective maximum gain is antenna gain minus cable loss.










## Warnings

### GENERAL SAFETY GUIDELINES





	<b>WARNING:</b> This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.
	<b>WARNING:</b> Only trained and qualified personnel should be allowed to install, replace, or service this equipment.
	<b>WARNING:</b> Ultimate disposal of this product should be handled according to all national laws and regulations.
	<b>WARNING:</b> Incorrect installation of Xirrus Access Points may invalidate FCC, CE mark, or other regulatory compliance approvals. Customers are responsible for any legal violations from operation of un-approved equipment or incorrect installation.
	<b>WARNING:</b> Do not operate the Access Point near unshielded blasting caps or in an explosive environment unless the device has been modified to be especially qualified for such use.
	<b>CAUTION:</b> The liquid-tight adapters must be used on all input/output connections to the Access Point where the installation is a non-hazardous location (and conduit is not used).

### POWER

	<b>WARNING:</b> Read the installation instructions before connecting the system to the power source.
	<b>WARNING:</b> Installation of the equipment must comply with local and national electrical codes.
	<b>WARNING:</b> This equipment must be externally grounded using a customer-supplied ground wire before power is applied. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.
	<b>WARNING:</b> Do not work on the system or connect or disconnect cables during periods of lightning activity.
	<b>WARNING:</b> To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.
	<b>CAUTION:</b> When the Access Point is installed outdoors or in a wet or damp location, the AC branch circuit that is powering the Injector should be provided with ground fault protection (GFCI), as required by Article 210 of the National Electrical Code (NEC).

	<p><b>CAUTION:</b> Xirrus PoGE Injectors rely on the building's installation for over current protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A (U.S.) or 240 VAC, 10A (International) is used on all current-carrying conductors.</p>
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### *EXTERNAL ANTENNAS*

	<p><b>WARNING:</b> In order to comply with radio frequency (RF) exposure limits, the antennas for this product should be positioned no less than 26 cm from your body or nearby persons.</p>
	<p><b>WARNING:</b> Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna, take extreme care not to come into contact with such circuits, because they may cause serious injury or death. For proper installation and grounding of the antenna, please refer to national and local codes (for example, U.S.:NFPA 70, National Electrical Code, Article 810, Canada: Canadian Electrical Code, Section 54).</p>
	<p>This device has been designed to operate with antennas having an effective maximum gain of 9dBi in the 2.4 GHz band and 6 dBi in the 5 GHz band. Antennas having a gain greater than this are strictly prohibited for use with this device. The required antenna impedance is 50 ohms. Effective maximum gain is antenna gain minus cable loss.</p>
	<p>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 permitted for successful communication.</p>

### **Wi-Fi Alliance Certification**



[www.wi-fi.org](http://www.wi-fi.org)

### **Federal Communications Commission (FCC) Statements & Instructions**

#### *FCC Declaration of Conformity 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.

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 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/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Operations in the 5.15-5.25GHz band are restricted to indoor usage only.

### **Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 26cm between the radiator & your body.

### *FCC-Specific Instructions (DFS band-master device is for future option)*

The FCC, National Telecommunications and Information Administration (NTIA), Federal Aviation Administration (FAA), and industry are working to resolve interference to Terminal Doppler Weather Radar (TDWR) systems used near airports that has occurred from some outdoor wireless systems operating in the 5470 MHz – 5725 MHz band. These wireless devices are subject to Section 15.407 of our rules and while operating as a master device they are required to implement radar detection and Dynamic Frequency Selection (DFS) functions.

- Devices must be professionally installed when operating in the 5470 – 5725 MHz band
- Any installation of either a master or a client device within 35 km of a TDWR location shall be separated by at least 30 MHz (center-to-center) from the TDWR operating frequency (as shown in the TDWR location at <http://www.spectrumbridge.com/udia/home.aspx>). This will require that channel 116 is not used in these locations.
- The installers and the operators must register the devices in the industry-sponsored database with the appropriate information regarding the location and operation of the device and installer information. A voluntary Wireless Internet Service Providers Association (WISPA) sponsored database has been developed that allows operators and installers to register the location information of the Unlicensed National Information Infrastructure (UNII) devices operating outdoors in the 5470 – 5725 MHz band within 35 km of any TDWR location (see <http://www.spectrumbridge.com/udia/home.aspx>). This database may be used by government agencies to expedite resolution of any interference to TDWRs.

### *FCC Safety Compliance Statement*

The FCC with its action in ET Docket 96-8 has adopted a safety standard for human exposure to radio frequency (RF) electromagnetic energy emitted by FCC certified equipment. When used with approved Xirrus antennas, Xirrus XR products meet the uncontrolled environmental limits

found in OET-65 and ANSI C95.1, 1991. Proper installation of this radio according to the instructions found in this manual will result in user exposure that is substantially below the FCC recommended limits.

## Industry Canada Statements and Warnings

**Industry Canada Notice and Marking:** This Class B digital apparatus complies with Canadian ICES-003.

*Cet appareil numérique de la Class B est conforme à la norme NMB-003 du Canada.*

The term "IC:" before the radio certification number only signifies that Industry Canada technical specifications were met.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

*Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.*

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

*Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

Xirrus Access Points are certified to the requirements of RSS-210. The use of this device in a system operating either partially or completely outdoors may require the user to obtain a license for the system according to the Canadian regulations. For further information, contact your local Industry Canada office.

### **Radiation Exposure Statement:**

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 26cm between the radiator & your body.

### **Déclaration d'exposition aux radiations:**

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 26 cm de distance entre la source de rayonnement et votre corps.

**Caution :** (i) the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

(ii) high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

**Avertissement:**(i) les dispositifs fonctionnant dans la bande 5 150-5 250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

(ii) De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5 250-5 350 MHz et 5 650-5 850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

## EU Directive 1999/5/EC Compliance Information

This section contains compliance information for the Xirrus Wireless Access Point family of products. The compliance information contained in this section is relevant to the European Union and other countries that have implemented the EU Directive 1999/5/EC.

This declaration is only valid for configurations (combinations of software, firmware and hardware) provided and/or supported by Xirrus Inc. The use of software or firmware not supported/provided by Xirrus Inc. may result that the equipment is no longer compliant with the regulatory requirements.

### Declaration of Conformity

**Cesky [Czech]** Toto zahzení je v souladu se základními požadavky a ostatními odpovídajícími ustanoveními Směrnice 1999/5/EC.

**Dansk [Danish]** Dette udstyr er i overensstemmelse med de væsentlige krav og andre relevante bestemmelser i Direktiv 1999/5/EF.

**Deutsch [German]** Dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 1999/5/EU.

**Eesti [Estonian]** See seande vastab direktiivi 1999/5/EU oluliste nõuetele ja teistele asjakohastele sätetele.

**English** This equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

**Español [Spain]** Este equipo cumple con los requisitos esenciales así como con otras disposiciones de la Directiva 1999/5/CE.

**Ελληνική [Greek]** Αυτόζ ο εξοπλισμός είναι σε συμμόρφωση με τις ουσιώδειζ απαιτήσειζ και ύλλεζ σχετικέζ διατάξειζ της Οδηγιαζ 1999/5/EC.

**Français [French]** Cet appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la Directive 1999/5/EC.

**Íslenska [Icelandic]** Þetta tæki er samkvæmt grunnkröfum og öðrum viðeigandi ákvæðum Tilskipunar 1999/5/EC.

**Italiano [Italian]** Questo apparato é conforme ai requisiti essenziali ed agli altri principi sanciti dalla Direttiva 1999/5/CE.

**Latviski [Latvian]** Šī iekārta atbilst Direktīvas 1999/5/EK būtiskajā prasībām un citiem ar to saistītajiem noteikumiem.

**Lietuvių [Lithuanian]** Šis įrenginys tenkina 1995/5/EB Direktyvos esminius reikalavimus ir kitas šios direktyvos nuostatas.

**Nederlands [Dutch]** Dit apparant voldoet aan de essentiele eisen en andere van toepassing zijnde bepalingen van de Richtlijn 1995/5/EC.

**Malti [Maltese]** Dan l-apparant huwa konformi mal-htigiet essenzjali u l-provedimenti l-oħra rilevanti tad-Direttiva 1999/5/EC.

**Magyar [Hungarian]** Ez a készülék teljesíti az alapvető követelményeket és más 1999/5/EK irányelvben meghatározott vonatkozó rendelkezéseket.

**Norsk [Norwegian]** Dette utstyret er i samsvar med de grunnleggende krav og andre relevante bestemmelser i EU-direktiv 1999/5/EF.

**Polski [Polish]** Urządzenie jest zgodne z ogólnymi wymaganiami oraz szczególnymi mi warunkami określony mi Dyrektywą. UE:1999/5/EC.

**Português [Portuguese]** Este equipamento está em conformidade com os requisitos essenciais e outras provisões relevantes da Directiva 1999/5/EC.

**Slovensko [Slovenian]** Ta naprava je skladna z bistvenimi zahtevami in ostalimi relevantnimi popoji Direktive 1999/5/EC.

**Slovensky [Slovak]** Toto zariadenie je v zhode so základnými požiadavkami a inými príslušnými nariadeniami direktiv: 1999/5/EC.

**Suomi [Finnish]** Tämä laite täyttää direktiivin 1999/5//EY olennaiset vaatimukset ja on siinä asetettujen muiden laitetta koskevien määräysten mukainen.

**Svenska [Swedish]** Denna utrustning är i överensstämmelse med de väsentliga kraven och andra relevanta bestämmelser i Direktiv 1999/5/EC.

**Assessment Criteria:** The following standards were applied during the assessment of the product against the requirements of the Directive 1999/5/EC:

- Radio: EN 301 893 and EN 300 328 (if applicable)
- EMC: EN 301 489-1 and EN 301 489-17
- Safety: EN 50371 to EN 50385 and EN 60601

**CE Marking:** For the Xirrus Wireless Access Point, the CE mark and Class-2 identifier opposite are affixed to the equipment and its packaging:





**WEEE Compliance:** Natural resources were used in the production of this equipment.



- This equipment may contain hazardous substances that could impact the health of the environment.
- If you need more information on collection, re-use and recycling systems, please contact your local or regional waste administration.
- Please contact Xirrus for specific information on the environmental performance of our products.

**National Restrictions:** In the majority of the EU and other European countries, the 2.4 GHz and 5 GHz bands have been made available for the use of Wireless LANs. The following table provides an overview of the regulatory requirements in general that are applicable for the 2.4 GHz and 5 GHz bands.

Frequency Band (MHz)	Max Power Level (EIRP) (mW)	Indoor	Outdoor
2400–2483.5	100	X	X**
5250–5350*	200	X	N/A
5470–5725*	1000	X	X

\*Dynamic frequency selection and Transmit Power Control is required in these frequency bands.

\*\*France is indoor use only in the upper end of the band.

The requirements for any country may change at any time. Xirrus recommends that you check with local authorities for the current status of their national regulations for both 2.4 GHz and 5 GHz wireless LANs. The following countries have additional requirements or restrictions than those listed in the above table:

**Belgium:** The Belgian Institute for Postal Services and Telecommunications (BIPT) must be notified of any outdoor wireless link having a range exceeding 300 meters. Xirrus recommends checking at [www.bipt.be](http://www.bipt.be) for more details.

*Draadloze verbindingen voor buitengebruik en met een reikwijdte van meer dan 300 meter dienen aangemeld te worden bij het Belgisch Instituut voor postdiensten en telecommunicatie (BIPT). Zie [www.bipt.be](http://www.bipt.be) voor meer gegevens.*

*Les liaisons sans fil pour une utilisation en extérieur d'une distance supérieure à 300 mètres doivent être notifiées à l'Institut Belge des services Postaux et des Télécommunications (IBPT). Visitez [www.bipt.be](http://www.bipt.be) pour de plus amples détails.*

**Greece:** A license from EETT is required for the outdoor operation in the 5470 MHz to 5725 MHz band. Xirrus recommends checking [www.eett.gr](http://www.eett.gr) for more details.



*Η δη ιουργβάικτ ωνεξωτερικo ρουστη ζ νησν νοτ των 5470–5725 MHz ε ιτρ ετάιωνo ετάά όάδειά της EETT, ου ορηγεβτάι στερά ά ό σ φωνη γν η του ΓΕΕΘΑ. Ερισσότερες λε τομ ρειεωστο [www.eett.gr](http://www.eett.gr)*

**Italy:** This product meets the National Radio Interface and the requirements specified in the National Frequency Allocation Table for Italy. Unless this wireless LAN product is operating within the boundaries of the owner’s property, its use requires a “general authorization.” Please check with [www.comunicazioni.it/it/](http://www.comunicazioni.it/it/) for more details.

*Questo prodotto é conforme alla specifiche di Interfaccia Radio Nazionali e rispetta il Piano Nazionale di ripartizione delle frequenze in Italia. Se non viene installato all’interno del proprio fondo, l’utilizzo di prodotti wireless LAN richiede una “autorizzazione Generale.” Consultare [www.comunicazioni.it/it/](http://www.comunicazioni.it/it/) per maggiori dettagli.*

**Norway, Switzerland and Liechtenstein:** Although Norway, Switzerland and Liechtenstein are not EU member states, the EU Directive 1999/5/EC has also been implemented in those countries.

## RF Exposure

### *Generic Information*

The Xirrus Access Point products are designed to comply with the following national and international standards on Human Exposure to Radio Frequencies:

- US 47 Code of Federal Regulations Part 2 Subpart J
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers / IEEE C 95.1 (99)
- International Commission on Non Ionizing Radiation Protection (ICNIRP) 98
- Ministry of Health (Canada) Safety Code 6. Limits on Human Exposure to Radio Frequency Fields in the range from 3kHz to 300 GHz
- Australia Radiation Protection Standard

To ensure compliance with various national and international Electromagnetic Field (EMF) standards, the system should only be operated with Xirrus approved antennas and accessories.

### *Declaration on Conformity*

This access point product has been found to be compliant to the requirements set forth in CFR 47 Section 1.1307 addressing RF Exposure from radio frequency devices as defined in Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.

Use is permitted with antennas having an effective maximum gain of 9 dBi in the 2.4 GHz band and 6 dBi in the 5 GHz band. Antennas having a gain greater than this are strictly prohibited for use with this device. The required antenna impedance is 50 ohms. Effective maximum gain is

antenna gain minus cable loss. A minimum separation distance of .26 cm between the antenna and all persons is required during normal operation.

Only antennas provided by Xirrus for use with the product should be installed. The use of any other antennas may cause damage to the access points or violate regulatory emission limits and will not be supported by Xirrus.

### *International Guidelines for Exposure to Radio Waves*

The Xirrus Access Points include radio transmitters and receivers. It is designed not to exceed the limits for exposure to radio waves (radio frequency electromagnetic fields) recommended by international guidelines. The guidelines were developed by an independent scientific organization (ICNIRP) and include a substantial safety margin designed to ensure the safety of all persons, regardless of age and health.

As such the systems are designed to be operated as to avoid contact with the antennas by the end user. It is recommended to set the system in a location where the antennas can remain at least a minimum distance as specified from the user in accordance to the regulatory guidelines which are designed to reduce the overall exposure of the user or operator.

Separation Distance		
MPE	Distance	Limit
1.34 mW/cm <sup>2</sup>	.26 cm	1.00 mW/cm <sup>2</sup>

The World Health Organization has stated that present scientific information does not indicate the need for any special precautions for the use of wireless devices. They recommend that if you are interested in further reducing your exposure then you can easily do so by reorienting antennas away from the user or placing the antennas at a greater separation distance than recommended.

### *FCC Guidelines for Exposure to Radio Waves*

The device includes a radio transmitter and receiver. It is designed not to exceed the limits for exposure to radio waves (radio frequency electromagnetic fields) as referenced in FCC Part 1.1310. The guidelines are based on IEEE ANSI C 95.1 (92) and include a substantial safety margin designed to ensure the safety of all persons, regardless of age and health.

As such the systems are designed to be operated as to avoid contact with the antennas by the end user. It is recommended to set the system in a location where the antennas can remain at least a minimum distance as specified from the user in accordance to the regulatory guidelines which are designed to reduce the overall exposure of the user or operator.

Separation Distance		
MPE	Distance	Limit
1.34 mW/cm <sup>2</sup>	26 cm	1.00 mW/cm <sup>2</sup>

The device has been tested and found compliant with the applicable regulations as part of the radio certification process.

The US Food and Drug Administration has stated that present scientific information does not indicate the need for any special precautions for the use of wireless devices. The FCC recommends that if you are interested in further reducing your exposure then you can easily do so by reorienting antennas away from the user or placing the antennas at a greater separation distance than recommended or lowering the transmitter power output.

### *Industry Canada Guidelines for Exposure to Radio Waves*

The Xirrus Access Points include radio transmitters and receivers. It is designed not to exceed the limits for exposure to radio waves (radio frequency electromagnetic fields) as referenced in Health Canada Safety Code 6. The guidelines include a substantial safety margin designed into the limit to ensure the safety of all persons, regardless of age and health.

As such the systems are designed to be operated as to avoid contact with the antennas by the end user. It is recommended to set the system in a location where the antennas can remain at least a minimum distance as specified from the user in accordance to the regulatory guidelines which are designed to reduce the overall exposure of the user or operator.

Separation Distance		
MPE	Distance	Limit
1.34 mW/cm <sup>2</sup>	26 ' cm	1.00 mW/cm <sup>2</sup>

Health Canada states that present scientific information does not indicate the need for any special precautions for the use of wireless devices. They recommend that if you are interested in further reducing your exposure you can easily do so by reorienting antennas away from the user, placing the antennas at a greater separation distance than recommended, or lowering the transmitter power output.

### *Additional Information on RF Exposure*

You can find additional information on the subject at the following links:

- FCC Bulletin 56: Questions and Answers about Biological Effects and Potential Hazards of Radio Frequency Electromagnetic Fields
- FCC Bulletin 65: Evaluating Compliance with the FCC guidelines for Human Exposure to Radio Frequency Electromagnetic Fields
- FCC Bulletin 65C (01-01): Evaluating Compliance with the FCC guidelines for Human Exposure to Radio Frequency Electromagnetic Fields: Additional Information for Evaluating Compliance for Mobile and Portable Devices with FCC limits for Human Exposure to Radio Frequency Emission

You can obtain additional information from the following organizations:

- World Health Organization Internal Commission on Non-Ionizing Radiation Protection at this URL: [www.who.int/emf](http://www.who.int/emf)
- United Kingdom, National Radiological Protection Board at this URL: [www.nrpb.org.uk](http://www.nrpb.org.uk)

- Cellular Telecommunications Association at this URL: [www.wow-com.com](http://www.wow-com.com)
- The Mobile Manufacturers Forum at this URL: [www.mmfa.org](http://www.mmfa.org)



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