

X S

**Wireless  
LAN Array**

3900

3700

3500

# Wireless LAN Array

XS-3900, XS-3700, XS-3500

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**Part Number: 800-0006-001**  
(Revision C)

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## Notices

### FCC Notice

This device complies with Part 15 of the FCC Rules, with operation 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 unwanted operation.

This equipment has been tested and found to comply with the limits for a Class A 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 RF 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 or more of the following safety measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Consult the dealer or an experienced wireless technician for help.

Use of a shielded twisted pair (STP) cable must be used for all Ethernet connections in order to comply with EMC requirements.

### RF Radiation Hazard Warning

To ensure compliance with FCC RF exposure requirements, this device must be installed in a location where the antennas of the device will have a minimum distance of at least 25 cm (9.84 inches) from all persons. Using higher gain antennas and types of antennas not certified for use with this product is not allowed. The device shall not be co-located with another transmitter.

## **Non-Modification Statement**

Unauthorized changes or modifications to the device are not permitted. Use only the supplied internal antenna, or external antennas supplied by the manufacturer. Modifications to the device will void the warranty and may violate FCC regulations. Please go to the Xirrus Web site for a list of all approved antennas.

## **Indoor Use**

This product has been designed for indoor use. Operation of channels in the 5150MHz to 5250MHz band is permitted indoors only to reduce the potential for harmful interference to co-channel mobile satellite systems.

## **Maximum Antenna Gain**

Currently, the maximum antenna gain for external antennas is limited to 5.2dBi for operation in the 2400MHz to 2483.5MHz, 5250MHz to 5350MHz and 5725MHz to 5825MHz bands. The antenna gains must not exceed maximum EIRP limits set by the FCC / Industry Canada.

## **High Power Radars**

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 to LELAN devices used in Canada.

## **Industry Canada Notice and Marking**

This Class A digital apparatus complies with Canadian ICES-003.

*Cet appareil numérique de la classe A 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.

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.

## EU Directive 1999/5/EC Compliance Information

This section contains compliance information for the Xirrus Wireless LAN Array family of products, which includes the XS-3900, XS-3700 and XS-3500. 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.

### 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 ουσιώδεις απαιτήσεις και ύλλες σχετικές διατάξεις της Οδηγίας 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 apparaat voldoet aan de essentiële 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 [Portugese]** 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

### **CE Marking**

For the Xirrus Wireless LAN Array (XS-3900, XS-3700 and XS-3500), 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.
- In order to avoid harm to the environment and consumption of natural resources, we encourage you to use appropriate take-back systems when disposing of this equipment.
- The appropriate take-back systems will reuse or recycle most of the materials of this equipment in a way that will not harm the environment.
- The crossed-out wheeled bin symbol (in accordance with European Standard EN 50419) invites you to use those take-back systems and advises you not to combine the material with refuse destined for a land fill.
- 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 ONLY	Outdoor ONLY
2400–2483.5	100	X	X**
5150–5350*	200	X	
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.*

## France

The use of the band from 5470 MHz to 5725 MHz is **not allowed** in France. The band from 5150 MHz to 5350 MHz can only be used **indoors**. If the product is used outdoors, the use of any 5 GHz frequency is **not allowed**, and power output is restricted in some portions of the 2.4 GHz band. Refer to the following table or go to [www.art-telecom.fr](http://www.art-telecom.fr) for more details.

*L'utilisation de la bande 5470 MHz à 5725 MHz n'est pas autorisée en France. La bande de 5150 MHz à 5350 MHz ne peut être utilisée qu'à l'intérieur d'un bâtiment. Dans le cas d'une utilisation en extérieur aucune fréquence dans le bandes des 5 GHz n'est permise, tandis que la puissance est limitée dans certaines parties de la bande des 2.4 GHz. Reportez-vous à la suivre table ou visitez [www.art-telecom.fr](http://www.art-telecom.fr) pour de plus amples détails.*

The following table shows the applicable power levels for 2.4 GHz and 5 GHz in France (*Puissances utilisables dans les bandes 2.4 GHz et 5 GHz en France*).

Location	Frequency Range (MHz)	Power (EIRP)
Indoor (Intérieur)	2400–2483.5	100 mW (20 dBm)
	5150–5350	200 mW (23 dBm)
	5470–5725	Not allowed ( <i>Interdit</i> )
Outdoor (Extérieur)	2400–2454	100 mW (20 dBm)
	2454–2483.5	10 mW (10 dBm)
	5150–5350	Not allowed ( <i>Interdit</i> )
	5470–5725	Not allowed ( <i>Interdit</i> )

## 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.

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āñéóóüðāñâð èâ ðù ñāéáùóðî [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.*

## Noway, 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.

## Calculating the Maximum Output Power

The regulatory limits for maximum output power are specified in EIRP (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).

## **Antennas**

The Xirrus Wireless LAN Array family of products employs integrated antennas that cannot be removed and which are not user accessible. Nevertheless, as regulatory limits are not the same throughout the EU, users may need to adjust the conducted power setting for the radio to meet the EIRP limits applicable in their country or region. Adjustments can be made from the product's management interface—either Web Management Interface (WMI) or Command Line Interface(CLI).

## **Operating Frequency**

The operating frequency in a wireless LAN is determined by the access point. As such, it is important that the access point is correctly configured to meet the local regulations. See [National Restrictions](#) in this section for more information.

If you still have questions regarding the compliance of Xirrus products or you cannot find the information you are looking for, please contact us at:

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Tel: 1.805.497.0955  
Fax: 1.805.449.1180

[www.xirrus.com](http://www.xirrus.com)

## Safety Warnings

- ! **Safety Warnings**  
Read all user documentation before powering this device. All Xirrus interconnected equipment should be contained indoors. This product is not suitable for outdoor operation. Please verify the integrity of the system ground prior to installing Xirrus equipment. Additionally, verify that the ambient operating temperature does not exceed 50°C.
- ! **Explosive Device Proximity Warning**  
Do not operate the XS-3900/XS-3700/XS-3500 unit near unshielded blasting caps or in an explosive environment unless the device has been modified to be especially qualified for such use.
- ! **Lightning Activity Warning**  
Do not work on the XS-3900/XS-3700/XS-3500 or connect or disconnect cables during periods of lightning activity.
- ! **Circuit Breaker Warning**  
The XS-3900/XS-3700/XS-3500 relies 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.

Translated safety warnings appear on the following page.

## Translated Safety Warnings

### Avertissements de Sécurité

- ! **Sécurité**  
Lisez l'ensemble de la documentation utilisateur avant de mettre cet appareil sous tension. Tous les équipements Xirrus interconnectés doivent être installés en intérieur. Ce produit n'est pas conçu pour être utilisé en extérieur. Veuillez vérifier l'intégrité de la terre du système avant d'installer des équipements Xirrus. Vérifiez également que la température de fonctionnement ambiante n'excède pas 50°C.
- ! **Proximité d'appareils explosifs**  
N'utilisez pas l'unité XS-3900/XS-3700/XS-3500 à proximité d'amorces non blindées ou dans un environnement explosif, à moins que l'appareil n'ait été spécifiquement modifié pour un tel usage.
- ! **Foudre**  
N'utilisez pas l'unité XS-3900/XS-3700/XS-3500 et ne branchez pas ou ne débranchez pas de câbles en cas de foudre.
- ! **Disjoncteur**  
L'unité XS-3900/XS-3700/XS-3500 dépend de l'installation du bâtiment pour ce qui est de la protection contre les surintensités. Assurez-vous qu'un fusible ou qu'un disjoncteur de 120 Vca, 15 A (États-Unis) ou de 240 Vca, 10 A (International) maximum est utilisé sur tous les conducteurs de courant.

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BY USING ANY LICENSED MATERIALS OR THE EQUIPMENT THAT CONTAINS THIS PRODUCT, YOU ACKNOWLEDGE THAT YOU HAVE READ AND UNDERSTOOD ALL THE TERMS AND CONDITIONS OF THIS AGREEMENT AND THAT YOU ARE CONSENTING TO BE BOUND BY THIS AGREEMENT. IF YOU DO NOT AGREE TO ALL OF THE TERMS OF THIS AGREEMENT, RETURN THE UNUSED PRODUCT TO THE PLACE OF PURCHASE FOR A FULL REFUND.

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This warranty does not apply if the software (a) has been altered, except by Xirrus, (b) has not been installed, operated, repaired, or maintained in accordance



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LIMITED WARRANTY. Xirrus warrants that for a period of one year from the date of purchase by the original purchaser ("Customer"): (i) the Xirrus Equipment ("Equipment") will be free of defects in materials and workmanship under normal use; and (ii) the Equipment substantially conforms to its published specifications. Except for the foregoing, the Equipment is provided AS IS. This limited warranty extends only to Customer as the original purchaser. Customer's exclusive remedy and the entire liability of Xirrus and its suppliers under this limited warranty will be, at Xirrus' option, repair, replacement, or refund of the Equipment if reported (or, upon request, returned) to the party supplying the Equipment to Customer. In no event does Xirrus warrant that the Equipment is error free or that Customer will be able to operate the Equipment without problems or interruptions.

This warranty does not apply if the Equipment (a) has been altered, except by Xirrus, (b) has not been installed, operated, repaired, or maintained in accordance with instructions supplied by Xirrus, (c) has been subjected to abnormal physical or electrical stress, misuse, negligence, or accident, or (d) is used in ultrahazardous activities.

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The foregoing limitations shall apply even if the above-stated warranty fails of its essential purpose. SOME STATES DO NOT ALLOW LIMITATION OR EXCLUSION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES.

The above warranty DOES NOT apply to any evaluation Equipment made available for testing or demonstration purposes. All such Equipment is provided AS IS without any warranty whatsoever.

Customer agrees the Equipment and related documentation shall not be used in life support systems, human implantation, nuclear facilities or systems or any other application where failure could lead to a loss of life or catastrophic property damage, or cause or permit any third party to do any of the foregoing.

All information or feedback provided by Customer to Xirrus with respect to the Product shall be Xirrus' property and deemed confidential information of Xirrus.

Equipment including technical data, is subject to U.S. export control laws, including the U.S. Export Administration Act and its associated regulations, and may be subject to export or import regulations in other countries. Customer agrees to comply strictly with all such regulations and acknowledges that it has the responsibility to obtain licenses to export, re-export, or import Equipment.

This Agreement shall be governed by and construed in accordance with the laws of the State of California, United States of America, as if performed wholly within the state and without giving effect to the principles of conflict of law. If any portion hereof is found to be void or unenforceable, the remaining provisions of this Warranty shall remain in full force and effect. This Warranty constitutes the entire agreement between the parties with respect to the use of the Equipment.

Manufacturer is Xirrus, Inc. 370 North Westlake Blvd #200 Westlake Village, CA 91362.

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- Trademarks
- Notices
- EU Directive 1999/5/EC Compliance Information
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# Introduction

This chapter introduces the Wireless LAN Array, including an overview of its key features and benefits, and a detailed listing of the product's physical, environmental, technology and regulatory specifications. Section headings for this chapter include:

- "The Xirrus Family of Products" on page 1
- "About this User's Guide" on page 2
- "Why Choose the Xirrus Wireless LAN Array?" on page 5
- "Product Overview" on page 6
- "Key Features and Benefits" on page 10
- "Product Specifications (XS-3900 and XS-3700)" on page 13
- "Product Specifications (XS-3500)" on page 17

## The Xirrus Family of Products

The Xirrus family of products includes the following items:

- **Xirrus Wireless LAN Array (XS-3900 / XS-3700 / XS-3500)**  
The Wireless WLAN Array is specifically designed for the Enterprise market. There are three versions of this product, each with a different wireless capacity—16 IAPs (Integrated Access Points—radios) with the XS-3900, 8 IAPs with the XS-3700, and 4 IAPs with the XS-3500.
- **Xirrus Wireless Management System (XM-3300)**  
The XM-3300 is used for managing large Wireless WLAN Array deployments from a centralized Web-based interface. If you need detailed information about this product, refer to the XM-3300 User's Guide, part number 800-0007-001.
- **Xirrus Remote DC Power System (XP-3100)**  
The XP-3100 provides distributed DC power to multiple Wireless WLAN Arrays, eliminating the need to run dedicated AC power to each unit and facilitating backup power when connected via a UPS.

## Nomenclature

Throughout this User's Guide, the Wireless LAN Array is also referred to as the **Xirrus Array**, or simply the **Array**. In some instances, the terms **product** and **unit** are also used. When discussing specific products from the Xirrus family, the product name is used (for example, XS-3900, XS-3700 or XS-3500).

The Xirrus Wireless Management System (XM-3300) and the Xirrus Remote DC Power System (XP-3100) are referred to as the **XM-3300** and **XP-3100**, or **XM** and **XP** respectively.

## About this User's Guide

This User's Guide provides detailed information and procedures that will enable wireless network administrators to install, configure and manage the Xirrus Array so that end users can take full advantage of the product's features and functionality without technical assistance.

## Organization

Topics and procedures are organized by function under the following chapter headings:

- **Introduction**  
Provides a brief introduction to wireless technology, an overview of the product, including its key features and benefits, and presents the product specifications.
- **Installing the Xirrus Array**  
Defines the prerequisites for deploying and installing the Array and provides instructions to help you plan and complete a successful installation.
- **The Web Management Interface**  
Offers an overview of the product's embedded Web Management Interface, including its content and structure. It also emphasizes what you need to do to ensure that any configuration changes you make are applied, and provides a list of restricted characters.

- **Configuring the Xirrus Array**  
Contains procedures for configuring the Array using its embedded Web Management Interface. It also includes instructions for logging in to the Array with your Web browser, and procedures for upgrading the system firmware and resetting the Array to its factory defaults.
- **The Command Line Interface**  
Provides instructions for configuring the Array using keywords and commands via its embedded Command Line Interface—with examples and syntax conventions—and includes a procedure for establishing a Secure Shell (SSH) connection to the product.
- **Appendix A: Servicing the Xirrus Array**  
Contains procedures for servicing the Array, including the removal and reinstallation of major hardware components.
- **Appendix B: Quick Reference Guide**  
Contains product reference information, including a review of the Web Management Interface pages and their content, an alphabetical listing of keywords available with the Command Line Interface, the product's factory default settings, a sample event log, and some useful keyboard shortcuts.
- **Appendix C: Technical Support**  
Offers guidance to resolve technical issues, including some general hints and tips to enhance your product experience, and a procedure for isolating problems within an Array-enabled wireless network. Also includes Frequently Asked Questions (FAQs), a table of error messages generated by the product, and Xirrus contact information.
- **Glossary of Terms**  
Provides an explanation of terms directly related to Xirrus product technology, organized alphabetically.
- **Index**  
The index is a valuable information search tool. Use the index to locate specific topics discussed in this User's Guide. Simply click on any page number in the index to jump to the referenced topic.

## Notes and Cautions

The following symbols are used throughout this User's Guide:



*This symbol is used for general notes that provide useful supplemental information.*



*This symbol is used for cautions. Cautions provide critical information that may adversely affect the performance of the product.*

## Screen Images

Some screen images of the Web Management Interface have been modified for clarity. For example, an image may have been cropped to highlight a specific area of the screen, and/or sample data may be included in some fields.

## Your User's Guide as a PDF Document

This User's Guide is also made available as a secure PDF (Portable Document Format) file and can be viewed using the Adobe® Acrobat Reader® product. It cannot be edited or modified. If you don't have Acrobat Reader, you can download it free-of-charge from: <http://www.adobe.com>.

## Hyperlinks

If you click on body text that appears in the color **TEAL** (with the exception of headings or notes) the embedded hyperlink within the text will immediately take you to the referenced destination. All internal and external cross-references, including page numbers within the **List of Figures** and the **Index**, have associated hyperlinks. After "jumping" to a referenced topic, if you want to return to the previous page (reference source), simply click on Acrobat's **previous page** button.



Previous page button

Figure 1. Adobe Acrobat (Version 6 and above)

## Why Choose the Xirrus Wireless LAN Array?

In 2003 there were approximately 30,000 Wireless Local Area Networks (WLANs) operating in the public domain. Research suggests that the number will more than quadruple by 2006. Enterprise WLANs in the private sector are also becoming increasingly common as businesses strive for greater flexibility in the workplace and the need for employee mobility rises. The only requirements for an effective wireless deployment are a power source, a couple of screws, and an imagination.

Wireless LAN is also fully compatible with standard Ethernet protocols, so connectivity with existing wired infrastructures is transparent to users—they can still access and use the same applications and network services that they use when plugged into the company's wired LAN infrastructure (it's only the plug that no longer exists).

Wireless LAN has come a long way in the past few years and now offers the performance, reliability and security that Enterprise customers have come to expect from their networks. The technology is being driven by three major IEEE standards:

- **802.11a**  
Operates in the 5 GHz range with a maximum speed of 54 Mbps.
- **802.11b**  
Operates in the 2.4 GHz range with a maximum speed of 11 Mbps. It has a range of about 100 meters indoors and 300 meters outdoors.
- **802.11g**  
Supports a higher transmission speed of 54 Mbps in the 2.4 GHz range and is backwards compatible with 802.11b.

Whether you're a small company with just a handful of employees, or a large corporation with thousands, wireless has the scalability and flexibility to serve your needs.

## Product Overview

Part of the family of Xirrus products, the Wireless LAN Array is a high capacity, multi-mode device designed for the Enterprise market, with twice the range and up to sixteen times the capacity of competitive wireless products.



Figure 2. Wireless LAN Array (XS-3900)

The Xirrus Array (regardless of the product model) is Wi-Fi® compliant and simultaneously supports 802.11a, 802.11b and 802.11g clients. Enterprise class features such as **VLAN** support and multiple **SSID** capability enable robust network compatibility and a high level of scalability and system control. The optional Xirrus Wireless Management System (XM-3300) allows global management of hundreds of Arrays from a central location.

The XS-3700 and XS-3500 versions of the Wireless LAN Array deliver a correspondingly lower capacity than the XS-3900.

## Enterprise Class Security

The latest and most effective wireless encryption security standards, including WPA (Wi-Fi Protected Access) with 802.11i AES (Advanced Encryption Standard) are provided with the Xirrus Array. In addition, the use of an embedded RADIUS server (or 802.1x with an external RADIUS server) ensures user authentication—multiple Arrays can authenticate to the optional XM-3300 ensuring only authorized Xirrus Wireless LAN Arrays become part of the wireless network. Rogue AP detection and site monitoring is performed in the background by the Array automatically.

### Deployment Flexibility

Xirrus' unique multi-radio architecture generates 360 degrees of sectored high-gain 802.11a/b/g coverage that provides extended range and the highest possible data rates for a large volume of clients. Each sector can be controlled automatically or manually, creating a pattern of wireless coverage perfectly tailored to individual customer needs. For example:

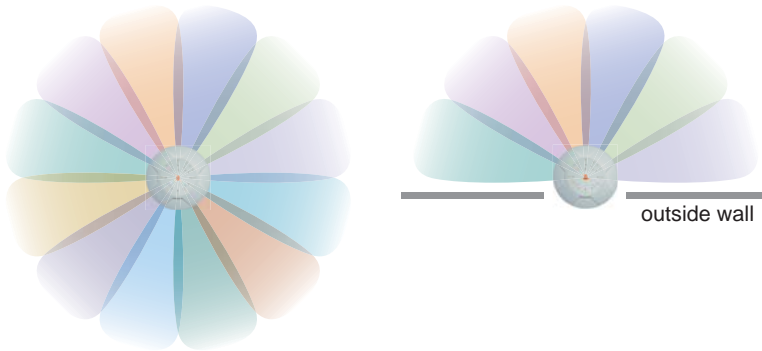


Figure 3. Wireless Coverage Patterns

Figure 2 depicts the following two scenarios:

- **Full pattern coverage**  
All radios are activated with coverage spanning 360 degrees. If within range, clients will always receive coverage regardless of their geographic position relative to the Array.
- **Partial pattern coverage**  
If desired, the Xirrus Array can be deployed close to an exterior wall. In this case, half of all available radios have been deactivated to prevent redundant signals from “bleeding” beyond the site’s perimeter wall. This configuration may also be used in those cases where you want to restrict wireless coverage to selected areas of the building’s interior.

**Remote DC Power System (Optional)**

The Xirrus Remote DC Power System (XP-3100) provides distributed DC power to your Array (DC version) deployments, eliminating the need to provide an AC power outlet in close proximity to the unit(s).

In the following example, DC power is supplied to four Xirrus Arrays while utilizing only one AC power outlet.

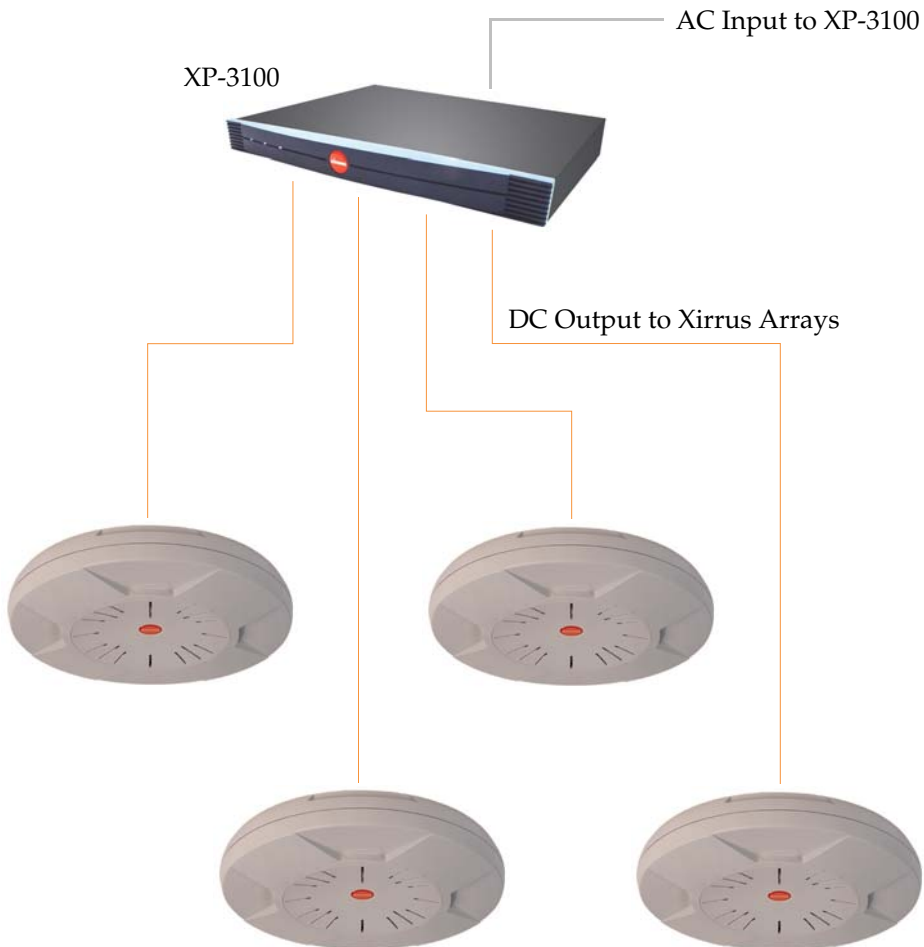



Figure 4. Remote DC Power Distribution




## Enterprise Class Management

The Xirrus Array can be configured with its default RF settings, or the RF settings can be customized using the Array's embedded Web Management Interface (WMI). The WMI enables easy configuration and control from a graphical console, along with a full compliment of troubleshooting tools, reports and statistics.

**XS-3900 Wireless LAN Array** 

Array Status	WLAN Array Status				
Express Set-Up	<b>Network Interface</b>	<b>Status</b>	<b>Management</b>	<b>Configuration</b>	<b>IP Address</b>
▶ Network Interfaces	10/100 Megabit	Enabled	Enabled	DHCP	192.168.0.7
▶ IAP Interfaces	Gigabit Interface 1	Enabled	Enabled	DHCP	10.0.1.2
▶ SSID	Gigabit Interface 2	Enabled	Enabled	DHCP	10.0.1.2
▶ Security	<b>Integrated Access Points</b>				
▶ Stations	<b>IAP Interface</b>	<b>Status</b>	<b>Channel</b>	<b>Cell Size</b>	<b>Associated Users</b>
▶ Services	abg1	Enabled	1	Large	0
Array Info	abg2	Enabled	6	Large	0
Tools	abg3	Enabled	11	Large	0
Show Config	abg4	Enabled	6	Large	0
Event Log	a1	Enabled	36	Large	0
	a2	Enabled	52	Large	0
	a3	Enabled	149	Large	0
	a4	Enabled	40	Large	0
	a5	Enabled	56	Large	0
	a6	Enabled	157	Large	0
	a7	Enabled	44	Large	0
	a8	Enabled	60	Large	0
	a9	Enabled	153	Large	0
	a10	Enabled	48	Large	0
	a11	Enabled	64	Large	0
	a12	Enabled	161	Large	0



- Critical Msgs: 1
- Warning Msgs: 0
- General Msgs: 9

**Location:** Name: Xirrus\_WLAN\_Array Gigabit 1 IP: 10.0.1.2

Figure 5. WMI: Array Status Page

In addition, a fully featured Command Line Interface (CLI) offers IT professionals a familiar management and control environment. **SNMP** (Simple Network Management Protocol) is also supported to allow management from an SNMP compliant management tool, such as the optional Xirrus Wireless Management System.



*For deployments of more than two Arrays, we recommend that you use the Xirrus Wireless Management System (XM-3300). The XM-3300 offers a rich set of features for fine control over large deployments.*

## Key Features and Benefits

This section describes some of the key product features and the benefits you can expect when deploying the Xirrus Array (the XS-3900 product is highlighted in this section).

### High Capacity and High Performance

The XS-3900 easily handles time-sensitive traffic, such as voice, and can enable wireless connectivity for 1,024 users. The unit includes two Gigabit uplink ports for connection to the wired network. A total of sixteen IAPs provides a maximum wireless capacity of 864 Mbps, which offers ample reserves for the high demands of current and future applications. Of the sixteen IAPs, twelve operate in the 802.11a mode and four operate in any combination of 802.11a, 802.11b and 802.11g.

If desired, IAP (radio) **abg2** can also be configured in RF monitoring and rogue AP detection mode.

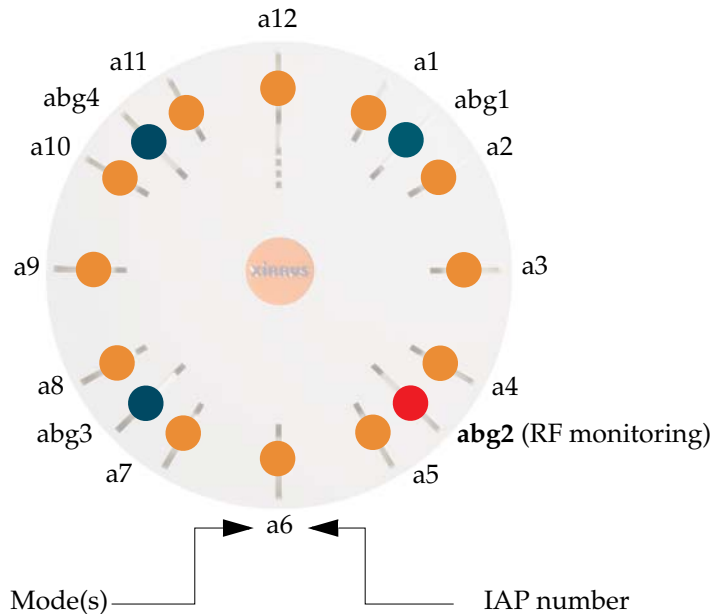
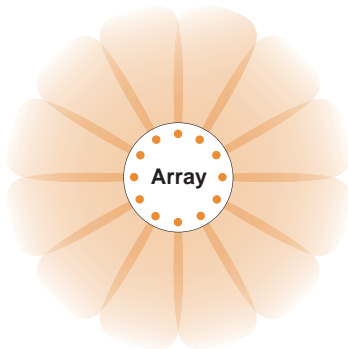


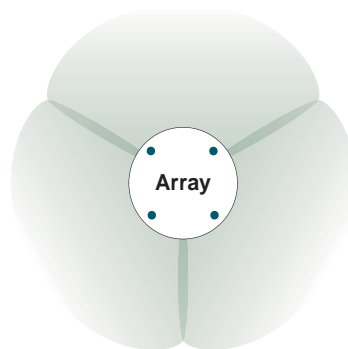
Figure 6. Layout of IAPs (XS-3900)

### Extended Coverage

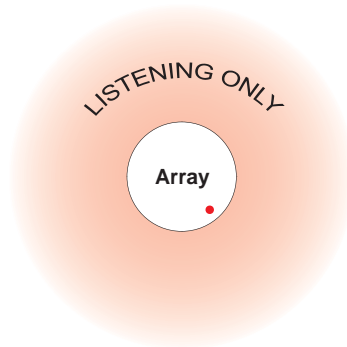
One XS-3900 solution enables you to replace up to sixteen access points (includes one omnidirectional IAP for monitoring the network). Fifteen IAP radios with integrated directional antennas provide increased wireless range and enhanced data rates in all directions. With a Xirrus Array deployed, far fewer access points are needed for your wireless network. Radio **abg2** (see [Figure 6](#)) can be switched to use an integrated omnidirectional antenna—for listening only—and can be dedicated to the tasks of site monitoring and rogue AP detection.



802.11a (directional)



802.11a/b/g (directional)



802.11a/b/g (omnidirectional)

Figure 7. Antenna Patterns

### **Non-Overlapping Channels**

Complete use of non-overlapping channels limits interference and delivers maximum capacity. On the XS-3900, all 16 non-overlapping channels are fully utilized across the 5Ghz and 2.4Ghz spectrums (12 across the 5GHz spectrum and 4 across the 2.4GHz spectrum).

### **Secure Wireless Access**

Multiple layers of authentication and encryption ensure secure data transmissions. The Xirrus Array is 802.11i compliant with encryption support for 64 bit and 128 bit WEP, and WPA with TKIP and AES encryption.

Authentication support is provided via 802.1x, including PEAP, EAP-TLS, and EAP-TTLS.

### **Applications Enablement**

QoS (Quality of Service) functionality combined with true switch capabilities enable high density Voice over Wireless LAN deployments. Compliant with 802.1p and 802.1q standards.

### **SDMA Optimization**

SDMA (Spatial Division Multiple Access) technology provides full 360° coverage while allowing independent channel and power output customization. Also supports fast inter-zone handoffs for time-sensitive applications and roaming support.

### **Easy Deployment**

The Xirrus Wireless Management System (XM-3300) offers real time monitoring and management capabilities of the wireless network—ideal for the Enterprise market. It also allows you to import floor plans to help you plan your deployment. The Xirrus Wireless LAN Array chassis has a plenum rated, lockable and tamper resistant case.

## Product Specifications (XS-3900 and XS-3700)

Element	Specifications
<b>Number of Users</b>	Maximum of 64 associated users per radio 1024 users per Array (XS-3900) 512 users per Array (XS-3700)
<b>Physical</b>	Diameter: 18.65 inches (47.37 cm) Height: 3.87 inches (9.83 cm) Weight: 8lbs (3.63 kg)
<b>Environmental</b>	<b>Operating Temperature:</b> -10°C to 50°C 0% to 90% relative humidity (non-condensing) <b>Storage Temperature:</b> -20°C to 60°C 5% to 95% relative humidity (non-condensing) <b>Maximum Operating Altitude:</b> 2000 meters (6561 feet)
<b>System</b>	825 MHz CPU 128MB RAM, expandable 512MB system flash, expandable Expansion slot for future options
<b>Electrical</b>	Input Power (AC version): 90VAC to 265VAC at 47Hz to 63Hz Input Power (DC version): 48VDC
<b>Interfaces</b>	<b>Serial:</b> 1 x RS232 – RJ45 connector <b>Ethernet Interfaces:</b> 2 x Gigabit 10/100/1000 Mbps w/failover 1 x Fast Ethernet 10/100 Mbps <b>Status LEDs:</b> System status, Ethernet, Radio

Element	Specifications
<b>Management</b>	Web-based HTTPS SNMP v3 CLI via SSHv2 or Telnet FTP TFTP Serial Proprietary Xirrus Wireless Management System Syslog reporting for alerts/alarms
<b>Networking</b>	DHCP client, DHCP server, NTP client RFC
<b>VLAN Support</b>	802.1Q, P VLAN Supports up to 16 VLANs
<b>Multiple SSID Support</b>	Allows up to 16 separate SSIDs to be defined with map security, VLAN and QoS settings for each SSID
<b>Performance</b>	<b>Client Load Balancing</b> Automatic load balancing between system radios  <b>Quality of Service:</b> 802.1P wired traffic prioritization Wireless packet prioritization MAP CoS to TCID Fair queuing of downstream traffic

Element	Specifications
<b>Security</b>	<p><b>Wireless Security:</b> WEP 40bit/128bit encryption WPA with TKIP and AES encryption Misappropriated APs automatically reset to factory defaults (requires the Xirrus Wireless Management System) Rogue AP detection, with alerts and classification</p> <p><b>User and System Authentication:</b> WPA Pre-Shared Key authentication Embedded RADIUS Server 802.1x EAP-TLS 802.1x EAP-TTLS 802.1x PEAP External RADIUS servers Authentication of Xirrus Arrays to the Xirrus Management System (XM-3300)</p>

Element	Specifications
<b>Wireless</b>	<p><b>Number of Radios:</b></p> <p><b>XS-3900:</b> 12 x 802.11a radios 4 x 802.11a/b/g radios</p> <p><b>XS-3700:</b> 4 x 802.11a radios 4 x 802.11a/b/g radios</p> <p><b>Wireless Standards:</b> 802.11a/b/g and g-only mode 802.11e (draft), 802.11i</p> <p><b>Channel Selection:</b> Manual Automatic</p> <p><b>Frequency Bands:</b> 11a: 5.15-5.25 GHz (UNII 1) 11a: 5.15-5.25 GHz (TELEC) 11a: 5.25-5.35 GHz (UNII 2) 11a: 5.470-5.725 (ETSI) 11a: 5.725-5.825 GHz (UNII 3) 11b/g: 2.412-2.462 GHz (FCC) 11b/g: 2.412-2.472 GHz (ETSI) 11b/g: 2.412-2.484 GHz (TELEC)</p> <p><b>Antenna:</b> Internal 6 dBi sectorized antenna External RP-TNC connector</p> <p><b>Radio Approvals:</b> FCC (United States) EN 301.893 (Europe)</p>
<b>Compliance</b>	UL / cUL 60950 and EN 60950 FCC Part 15.107 and 15109, Class A EN 301.489 (Europe)
<b>Warranty</b>	One year (hardware), 90 day (software)



## Product Specifications (XS-3500)

Element	Specifications
<b>Number of Users</b>	Maximum of 64 associated users per radio (256 users per Array). Recommended number of typical users per Array is 20.
<b>Physical</b>	Diameter: 12.58 inches (31.95 cm) Height: 2.58 inches (6.55 cm) Weight: 4lbs (1.81 kg)
<b>Environmental</b>	<b>Operating Temperature:</b> -10°C to 50°C 0% to 90% relative humidity (non-condensing) <b>Storage Temperature:</b> -20°C to 60°C 5% to 95% relative humidity (non-condensing) <b>Maximum Operating Altitude:</b> 2000 meters (6561 feet)
<b>System</b>	825 MHz CPU 128MB RAM, expandable 512MB system flash, expandable Expansion slot for future options
<b>Electrical</b>	Input Power (AC version): 90VAC to 265VAC at 47Hz to 63Hz Input Power (DC version): 48VDC
<b>Interfaces</b>	<b>Serial:</b> 1 x RS232 – RJ45 connector <b>Ethernet Interfaces:</b> 1 x Gigabit 10/100/1000 Mbps w/failover <b>Status LEDs:</b> System status, Ethernet, Radio

Element	Specifications
<b>Management</b>	Web-based HTTPS SNMP v3 CLI via SSHv2 or Telnet FTP TFTP Serial Proprietary Xirrus Wireless Management System Syslog reporting for alerts/alarms
<b>Networking</b>	DHCP client, DHCP server, NTP client RFC
<b>VLAN Support</b>	802.1Q, P VLAN Supports up to 16 VLANs
<b>Multiple SSID Support</b>	Allows up to 16 separate SSIDs to be defined with map security, VLAN and QoS settings for each SSID
<b>Performance</b>	<b>Client Load Balancing</b> Automatic load balancing between system radios  <b>Quality of Service:</b> 802.1P wired traffic prioritization Wireless packet prioritization MAP CoS to TCID Fair queuing of downstream traffic