11Mbps Wireless LAN Module

Quick Guide

Rev 0.9

Regulatory Compliance

FCC Interference Statement

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 or more 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.

  You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Statements Needed to be Shown on End Product

Since this module is installed inside the end product, the end product should be affixed a label on visible area showing that this product contain a RF module, and also its FCC ID.

FCC 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 20cm between the radiator & your body.

Table of contents

Thank you for using the Wireless LAN module. This high-speed Wireless LAN module provides you with an innovative wireless networking solution. The module is easy to set up and use. With this innovative wireless technology, you can share files and printers on the network—without inconvenient wires! Now you can carry the LAN in your pocket!

Features

- Wire-free access to networked resources from anywhere beyond the desktop
- Low interference & high susceptibility guarantee reliable performance
- Delivers data rate up to 11 Mbps
- Dynamically shifts between 11, 5.5, 2, and 1 Mbps network speed, based on signal strength, for maximum availability and reliability of connection
- Support two external antennas with LEDs indicating Power and Link
- Uses 2.4GHz frequency band, which complies with worldwide requirement
- Used on embedded operating systems
- Ensures great security by providing the Wired Equivalent Privacy (WEP) defined in the IEEE 802.11 standard

What is Wireless LAN?

Wireless Local Area Network (WLAN) systems offer a great number of advantages over traditional wired systems. WLANs are flexible and easy to setup and manage. They are also more economical than wired LAN systems.

Using radio frequency (RF) technology, WLANs transmit and receive data through the air. WLANs combine data connectivity with user mobility. For example, users can roam from a conference room to their office without being disconnected from the LAN.

Using WLANs, users can conveniently access shared information, and network administrators can configure and augment networks without installing or moving network cables.

WLAN technology provides users with many convenient and cost saving features:

- **Mobility:** WLANs provide LAN users with access to real-time information anywhere in their organization, providing service opportunities that are impossible with wired networks.

- **Ease of Installation:** Installing is easy for novice and expert users alike, eliminating the need to install network cables in walls and ceilings.

- **Scalability**: WLANs can be configured in a variety of topologies to adapt to specific applications and installations. Configurations are easily changed and range from peer-to-peer networks suitable for a small number of users to full infrastructure networks of thousands of users roaming over a broad area.

LAN Modes

Wireless LANs can be configured in one of two ways:

Ad-hoc Networking	Also known as a peer-to-peer network, an ad-hoc network is one that allows all workstations and computers in the network to act as servers to all other users on the network. Users on the network can share files, print to a shared printer, and access the Internet with a shared modem. However, with ad-hoc networking, users can only communicate with other wireless LAN computers that are in the wireless LAN workgroup, and are within range.
Infrastructure Networking	Infrastructure networking differs from ad-hoc networking in that it includes an access point. Unlike the ad-hoc structure where users on the LAN contend the shared bandwidth, on an infrastructure network the access point can manage the bandwidth to maximize bandwidth utilization.
	Additionally, the access point enables users on a wireless LAN to access an existing wired network, allowing wireless users to take advantage of the wired networks resources, such as Internet, email, file transfer, and printer sharing.
	Infrastructure networking has the following advantages over ad-hoc networking:
	- **Extended range:** each wireless LAN computer within the range of the access point can communicate with other wireless LAN computers within range of the access point.
	- **Roaming:** the access point enables a wireless LAN computer to move through a building and still be connected to the LAN.
	- **Wired to wireless LAN connectivity:** the access point bridges the gap between wireless LANs and their wired counterparts.

Notes on wireless LAN configuration

When configuring a wireless LAN (WLAN), be sure to note the following points:

- Optimize the performance of the WLAN by ensuring that the distance between access points is not too far. In most buildings, WLAN cards operate within a range of 100 ~ 300 feet, depending on the thickness and structure of the walls.

- Radio waves can pass through walls and glass but not metal. If there is interference in transmitting through a wall, it may be that the wall has reinforcing metal in its structure. Install another access point to circumvent this problem.

- Floors usually have metal girders and metal reinforcing struts that interfere with WLAN transmission.

This chapter covers how to installing the wireless LAN module in your embedded system.

Hardware description

The Wireless LAN Module has a 50-pin connector for attaching to the 50-pin port of embedded system. And please refer to the following table for these 50-pin definition.

Wireless Module 50-PIN Definition

PIN#	DEF	PIN#	DEF	PIN#	DEF
1	GND	21	D0	41	RESET
2	D3	22	D1	42	WAIT
3	D4	23	D2	43	INPACK/
4	D5	24	IOIS16/	44	REG/
5	D6	25	CD2/	45	SPKR
6	D7	26	CD1/	46	STSCHG
7	CE1/	27	D11	47	D8
8	A10	28	D12	48	D9
9	OE/	29	D13	49	D10
10	A9	30	D14	50	GND
11	A8	31	D15		
12	A7	32	CE2/		
13	VCC	33	VS1/		
14	A6	34	IORD/		
15	A5	35	IOWR/		
16	A4	36	WE/		
17	A3	37	IREQ/		
18	A2	38	VCC		
19	A1	39	NC		
20	A0	40	VS2/		

And also please refer to the following for the module's dimension.

Status LEDs

The following table describes the meaning of the LEDs of the module.

LED	MEANING
PWR	Indicates that the Card is powered on.
LINK	Indicates link status. It is normally blinking. When blinking, indicates that the card is scanning the channels, and the link is not active. When lit, indicates that the card is locked to a channel, and the link is active.

Chapter 3

Using the Wireless Utility

The following sections cover the Wireless utility installation and usage.

Installation & description

After you have installed the wireless LAN module on the system, you can install wireless utility on the client side to check wireless status. Please follow the steps below.
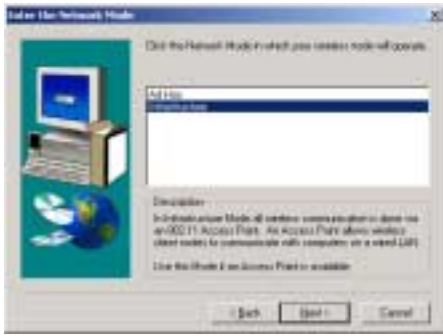
1. Run SETUP.EXE, the following screen appears:

2. Click **Next**. The following screen appears:

3. Read the End User License Agreement and click Yes. The following screen appears:

4. Type in a System ID name for your wireless LAN. This system ID identifies all computers in the wireless LAN. Then click **Next**. The following screen appears:

5. Choose the Network Mode for your wireless node.

6. Click **Next**. The following screen appears:

7. Select the default path for the wireless utility or browse to an alternate path. Then click **Next**. The following screen appears:

8. Type in a Program Folder name or select the default name and click **Next**. Setup installs the software and the following screen appears:

9. Click **Finish** to finish the utility installation.

After you have installed the utility, you will see the wireless utility icon in the Windows taskbar:

FreePort utility icon

Wireless utility icon

Double-click the icon to open the wireless utility.

The following table describes the wireless utility:

State: displays the connection status.

Current Channel: displays the channel.

Current Tx Rate: displays the wireless bandwidth in megabits per second.

Throughput: displays the transfer and receive rates in bytes per second.

Link Quality: when connected to the wired LAN, displays the connection integrity.

Signal Strength: when connected to the wired LAN, displays the signal strength.

Note: Link quality and signal strength are not available when using a peer-to-peer connection.

Mode: displays the current LAN mode, either AdHoc or Infrastructure.

SSID: displays a list of Service Set Identifications.

Ethernet Conversion: displays a list of Ethernet conversion protocols.

Tx Rate: displays a list of transfer rates.

WEP: allows you to enable or disable Wired Equivalency Privacy (WEP) for encryption, with either 64- or 128-bit encryption.

PS Mode: allows you to enable or

disable power saving mode.

Channel: enables you to select a transmission channel.

The Encryption window enables you to create an encryption scheme for Wireless LAN transmissions. Enter a passphrase and press Generate to automatically generate a 64- or 128-bit key (selected from the WEP drop-down menu in the Configuration screen).

You can also manually enter a set of values for each key.

Note: 128-bit encryption requires more system resources than 64-bit encryption. Use 64-bit encryption for better performance.

This screen displays the version number of the Wireless LAN card and the Configuration Utility.

Q&A

These guidelines give you tips to deal with some problems you may encounter while using the Wireless LAN card.

Question: The Wireless Utility icon on system tray is always red.

Answer: Please make sure that all clients have the same SSID. The SSID is case sensitive. And set all clients to the same wireless channel and make sure you are within range of an Access Point or client.

Question: Can not connect to one of the clients in the network.

Answer: First of all, make sure that all clients are up and running with a green Wireless Utility icon. And please check your TCP/IP setup is correct for your network.

Specifications

PHYSICAL SPECIFICATIONS	
Product Name	11Mbps Wireless LAN Module
Type	Module
Standards	IEEE802.11b WLAN Standard
Antenna	Support two Dipole antennas
Power Requirement	DC +3.3V +/- 0.3V 320mA / 3.3V (Max.)
Weight (g)	44g
RADIO SPECIFICATIONS	
Media Access Protocol	IEEE802.11
Bit Error Rate	1E-5 @ -83dBm
Frequency	2.4 2.4835GHz (Industrial Scientific Medical Band)
Channels	11Channels (USA)
Data Rate	11Mbps / 5.5Mbps / 2Mbps / 1Mbps
Modulation Technique	Direct Sequence Spread Spectrum , BPSK / QPSK / CCK
Output Power	15dBm (typical)
Receiver Sensitivity	–80dBm Min.
Coverage Area	Closed Space : 25m @11Mbps , 100m @5.5Mbps or lower Free Space : 50m @ 11Mbps , 115m @ 5.5Mbps or lower
ENVIRONMENTAL	
Temperature	0 to 40
Relative humidity	10% to 90%