802.11a/b/g SDIO WiFi Module

User Manual

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Federal Communication Commission 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 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 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.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

This device is going to be operated in 5.15~5.25GHz frequency range, it is restricted in indoor environment only.

IMPORTANT NOTE:
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.

IMPORTANT NOTE:
This module is intended for OEM integrator. The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module.

20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

USERS MANUAL OF THE END PRODUCT:
In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the users manual: This device complies with Part 15 of 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.

LABEL OF THE END PRODUCT:
The final end product must be labeled in a visible area with the following " Contains TX FCC ID: MQ4SDM310". If the size of the end product is larger than 8x10cm, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of 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.

INTRODUCTION

An IEEE 802.11a/b/g SDIO WiFi Module work for various applications. The 802.11a/b/g SDIO WiFi Module is a compact size wireless module for cellular handset and consumer electronic devices that require low power consumption. The module works with a lot of wireless LAN security protocols. Open, 64-bit and 128-bit WEP encryptions are supported.

FEATURES

- Module size as 20 x 20 x 3.0 mm.
- Host interface support for SDIO.
- Supports the IEEE802.11 wireless.
- High radio performance.
- Low power consumption.
- Data rates of 6-54Mbps for 802.11a and 1-54Mbps for 802.11g.
- Embedded 40MHz reference clock supported.
- Sleep clock using 32 KHz clock.
- Ready OS support as WinCE 5.0 and 6.0, Linux 2.6.9.

SD WLAN MODULE WIRELESS NETWORKS

The SD WLAN Module enables you to:

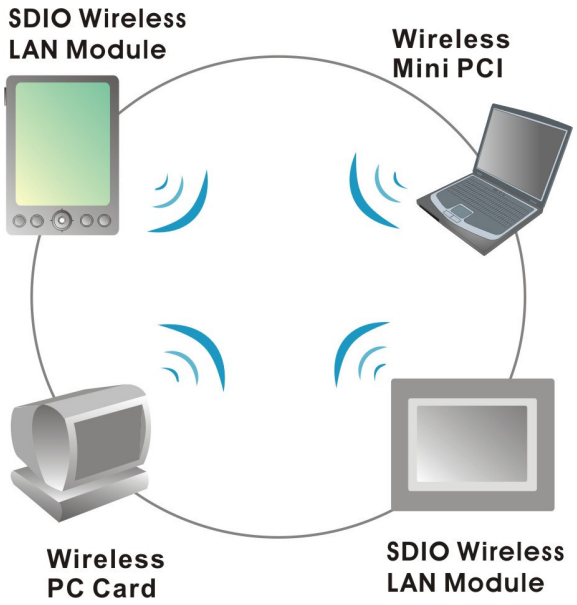
- Connect your computer to a Peer-to-Peer workgroup of wireless computing devices.
- Connect your computer to a Small Office/Home Office (SOHO) network that includes Wi-Fi access points.
- Connect your computer to a Local Area Network (LAN) Infrastructure that includes the SD WLAN Module or other IEEE 802.11 a/b/g compliant LAN systems.

Wireless stations can be equipped with the SD WLAN Module, but also with other WLAN PC Cards. Both the SD WLAN Module and the WLAN PC Card share the same wireless functionality.

Peer-to-Peer (Ad-hoc) Workgroup

The Peer-to-Peer workgroup configuration enables you to quickly set up a small wireless workgroup, where the workgroup participants can exchange files using features like "Files and Printer Sharing" as supported by Microsoft® Networking.

You can use this option to setup a temporary or Ad-hoc network in environments where no access points are available (for example in Small Office/Home Office "SOHO" environments). As long as the stations are within range of one another, this is the easiest and least expensive way to set up a wireless network.



Home Networking

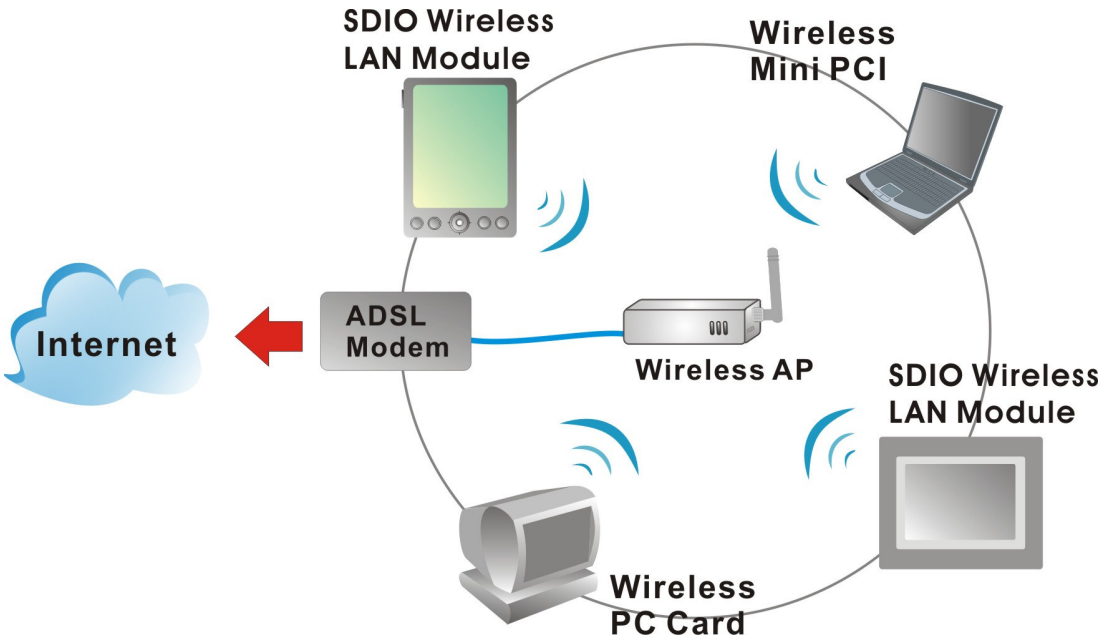
With SD WLAN Module, wireless access to the Internet or other devices is at your fingertips. All you need to do is connect the SD WLAN Module to an existing access point that may be connected to the external Cable or xDSL modems and you are ready to:

- Share files and printers, and
- Access the Internet.

Enterprise (Infrastructures) Networking

With the Wi-Fi certified Access Point in the corporate network system, you can connect to a corporate Local Area Network (LAN) infrastructure to access all network facilities in wireless. LAN Infrastructures may either be:

- Stand-alone wireless LANs.
- Wireless network infrastructures connected to an existing Ethernet network.



INSTALL THE DRIVER

Install the SD WLAN Module Driver into the PDA that using Microsoft WinCE 5.0 or higher.

Note: ***Do not insert the SD WLAN Module into the SD slot of your PDA until the Driver installation has been performed completely.***

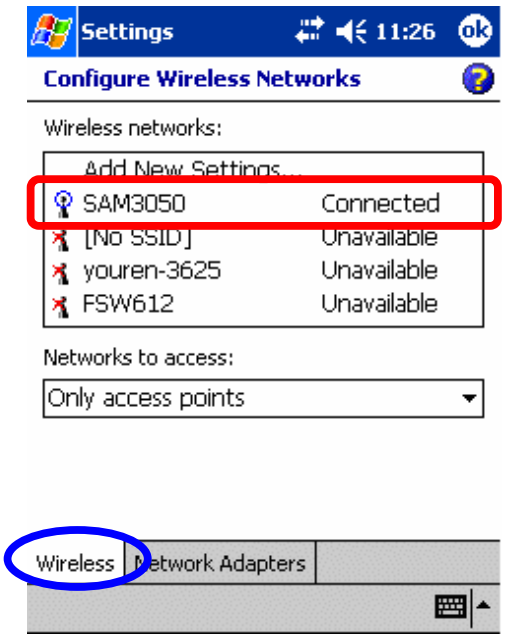
1. Install the driver into the PDA, double click the file to start the driver installation, then it will install automatically.
2. After the installation process finished, go to **Start > Program > Setup > System > Remove programs** to confirm the driver **"Atheros AR6000 SDIO WLAN Adapter"** has been installed in the PDA.

ACCESS THE WLAN UTILITY

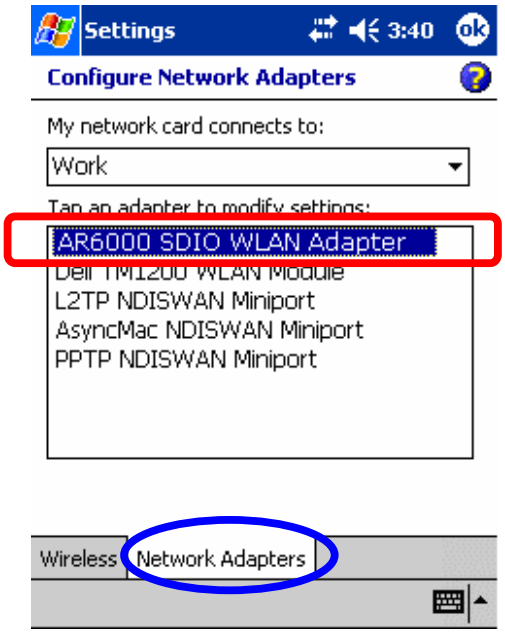
1. Insert the **SDIO Wireless LAN Module** into the SD slot of your PDA.
2. Go to **Start > Settings > Connections tab > Wireless Ethernet** to access the Windows CE built-in WLAN utility.

CONFIGURE WIRELESS NETWORKS

Select an available AP or router from the list then tap to make a connection.



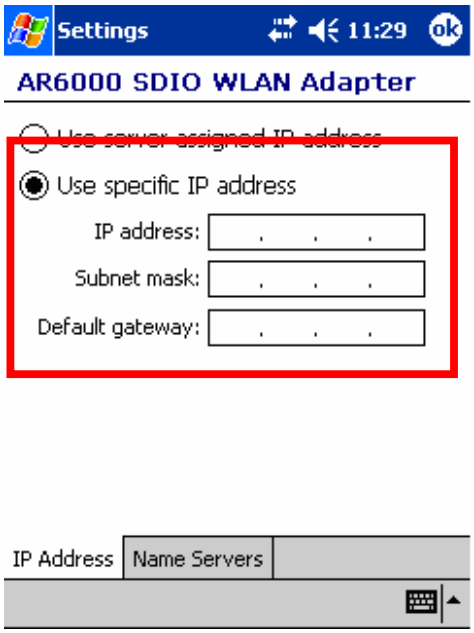
Wireless tab	
Wireless Networks	Select an available AP or router from the list then tap to make a connection.
Networks to access	Select the type of network access from the pull-down list. **All available**: A group of wireless devices communicating with both access points and network adapters. **Only access points**: A group of wireless devices communicating directly with only access points. **Only computer-to-computer**: A group of wireless devices communicate directly to each other without using any access point.



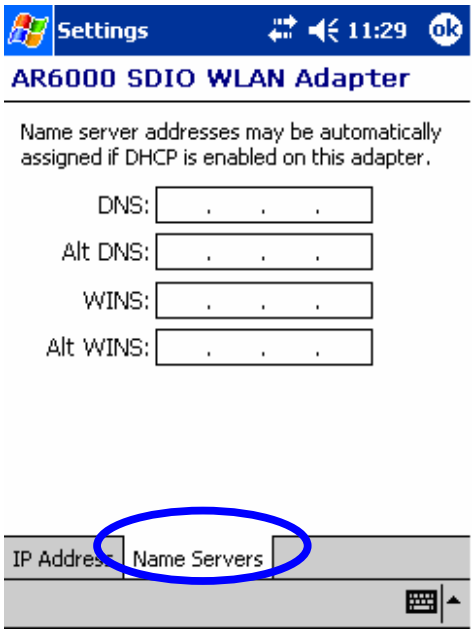
Network Adapters tab	
My network card connects to	Tap **Work** or **The Internet** from the pull-down menu. **Work**: Connects to the network in your office. **The Internet**: Connects to your ISP at home.
Tap an adapter to modify settings	Tap an adapter from the list to enter its configuration screen.

If **AR6000 SDIO WLAN Adapter** is tapped, the following screen will appear for you to configure:

IP Address tab

Use server-assigned IP address	 To use DHCP (Obtain IP address automatically), select **Use server- assigned IP address**. The Wireless Router will act as a DHCP server. An IP Address will be obtained from the Wireless Router automatically.
Use specific IP address	 **IP Address**: Enter the IP address (within the range of the wireless router's IP address, for instance, if the IP address of the router which you wish to connect is 192.168.1.254, you may enter the IP

	address here from 192.168.1.1 to 192.168.1.253). For example: 192.168.1.199. **Subnet mask**: The Subnet Mask must be the same as that set on your Ethernet network. For example: 255.255.255.0 **Default Gateway**: Enter the IP address of your network's gateway. The gateway is the device that enables communication between your computers and the Internet. In most cases, your router acts as your gateway. For example: 192.168.1.254



Name Servers tab	
DNS	Enter the IP address of your ISP's server, which translates the names of websites into IP addresses. For example: 168.95.1.1
Alt DNS	The secondary IP address of your ISP's server.
WINS	The Windows Internet Naming Service (WINS) converts NetBIOS names to IP addresses. If using a WINS server, please enter that server's IP address. Otherwise, leave this field blank.
Alt WINS	The secondary IP address of your WIN server.

TROUBLESHOOTING

This chapter provides typical problems with their own specific troubleshooting tips.

Cannot Connect To Network

If your SD WLAN Module seems to be working fine, but you are not able to connect to the network, this error might be due to a configuration mismatch.

For example the problem is likely to be caused by a configuration mismatch of:
- Network Name (The SD WLAN Module Network Name (SSID) is case-sensitive).
- Encryption Key of the AP that you try to make a connection.

Other causes may be:
- No driver loaded.
- Station not authorized to access network.
- SD WLAN Module defect.

- The most common cause is simple mistake. First check whether the card is inserted properly or not.
- Check whether any APs are available or not. If you see many APs, select any of one those APs to make a connection. If you do not see any APs in the AP list field, there might be no active AP nearby. Please move around or change the PDA orientations.

Cannot Find the AP

Check the available access point in the neighborhood the system will scan automatically. If the access point requires WEP key, input the same WEP key then try to make a connection again. If you do not know the WEP key, contact the system administrator to obtain the appropriate key.

For identifying the specific AP, check the wireless networks available in the neighborhood. If the AP shows ESSID, use the same ESSID to connect the AP. ESSID is assigned to the specific AP for that purpose.

The System is Very Slow

Some devices with non-powerful CPU may suffer their performance significantly. If the system is very slow, go to check:

- If you are opening too many windows close them please.
- Change the antenna orientation for better signal reception.
- Check the signal strength if it is weak move toward the AP.

SD WLAN Module Does Not Operate After Returning From the Stand-by or Sleeping Mode

This may happen when the driver is not functioning. Please try to remove and reinstall the SD WLAN Module driver that might solve the problem.

SPECIFICATIONS

Standard	IEEE 802.11a/b/g standards
Chipset	Atheros AR6001XL MAC /Base band /Radio chip
PA Chip	FM7705
Host Interface	SDIO 1.1
Operating Voltage	3.3V +/-5%
Power Requirement	Power consumption at 11a/g TX: 360 mA, RX: 185 mA Power consumption at 11b TX: 360 mA, RX: 185 mA Sleep mode: 995uA
Antenna Type	One HRS U.FL compatible connector on board
Frequency Range	11b/g:2.412GHz-2.4835GHz 11a:4.9GHz-5.85GHz
Modulation	11a/g:Orthogonal Frequency Division Multiplexing (OFDM) 54Mbps/48Mbps:64QAM 36Mbps/24Mbps:16QAM 18Mbps/12Mbps:QPSK 9Mbps/6Mbps:BPSK 11b:Direct Sequence Spread Spectrum (DSSS) 11Mbps/5.5Mbps:CCk 2Mbps:DQPSK 1Mbps:DBPSK
Number of Selectable Channels	11b/g: USA, Canada (FCC): 11 channels (2.412GHz~2.462GHz) Europe (CE): 13 channels (2.412GHz~2.472GHz) Japan (TELEC): 14 channels (2.412GHz~2.4835GHz) 11a: depend on regulatory domain
Modulation Technique	802.11b: Direct Sequence Spread Spectrum System
	802.11a/g: Orthogonal Frequency Division Multiplexing System

Data Rate	802.11b(11 Mbps, 5.5 Mbps, 2 Mbps, 1 Mbps)
	802.11a/g(54 Mbps, 48 Mbps, 36 Mbps, 24 Mbps, 18 Mbps, 12 Mbps, 9 Mbps, 6 Mbps)
Security	Hardware-Based Encryption/Decryption Using 64, and 128-Bit Wired-Equivalent Privacy (WEP) Keys
RF Output Power	11a 54Mbps OFDM: 9 dBm +1/-1.5dBm 11g 54Mbps OFDM: 11 dBm +1/-1.5dBm 11b 11Mbps CCK: 15dBm +1/-1.5dBm

Supported OS	Microsoft Windows CE/Linux
Receiver Sensitivity	-68 dBm at 54Mpbs/11a, 10% PER -68 dBm at 54Mpbs/11g, 10% PER -76 dBm at 11Mpbs/11b, 8% PER
Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
Physical Specifications	Dimension: 20 (L) x 20 (W) x 3 (H) mm
Environment Specifications	Operating Temperature: -5~60℃ ambient temperature Storage Temperature: -20~70℃ ambient temperature Operating humidity: 90% maximum (non-condensing) Storage humidity: 90% maximum (non-condensing)
EMC Certification	FCC Part 15.2475 in US EN300328 and EN300826 (EN301489-17) in Europe