AW-NU153H

IEEE 802.11b/g/n

USB Half-Mini-Card Wireless Module

I. Introduction

i. Overview

AzureWave Technologies, Inc. introduces the pioneer of the IEEE 802.11b/g/n USB Half-Mini-Card wireless module ---AW-NU153H. The AW-NU153H USB Half-Mini-Card wireless module is a highly integrated wireless local area network (WLAN) solution to let users enjoy the digital content through the latest wireless technology without using the extra cables and cords. It enables a high performance, cost effective, low power, compact solution that easily fits onto one side of a USB Half-Mini-Card.

Compliant with the IEEE 802.11b/g/n standard, the AW-NU153H uses Direct Sequence Spread Spectrum (DSSS), Orthogonal Frequency Division Multiplexing (OFDM), BPSK, QPSK, CCK and QAM baseband modulation technologies.

A high level of integration and full implementation of the power management functions specified in the IEEE 802.11 standard minimize system power requirements by using AW-NU153H.

Longer Range and Faster Speed

Comparing to 802.11g technology, 802.11n standard make big improvement on speed and range. It Increases wireless range by up to 2 times and reduces dead spots in coverage area. The data rate can up to 150Mbps data rate.

ii. Features

- **USB Half-Mini-Card.**
- **Compliant with IEEE802.11n standard**
- **2** antennas to support 1(Transmit) × 1(Receive) and RX diversity technology
- High speed wireless connection up to 150MbpsLow power consumption and high performance
- **Enhanced wireless security**

iii. Product Review

1. Connection Mode

◎Infrastructure Mode

Infrastructure mode needs an access point to establish the network, which can provide wireless accesses within valid range for users to communicate with others or transmit data with a wired network. There are several benefits of Infrastructure networking:

 $\sqrt{\text{Roaming: a wireless LAN enabled computer can physically move from the operating range of one access point to the other without losing connection. There is a quick association made between new access point and wireless device as the computer traverses from the coverage of one access point to another.$

 $\sqrt{\text{Range Extension: each wireless LAN enabled computer within the range of access point can communicate with other wireless LAN enabled computers within the effective range from the access point.$

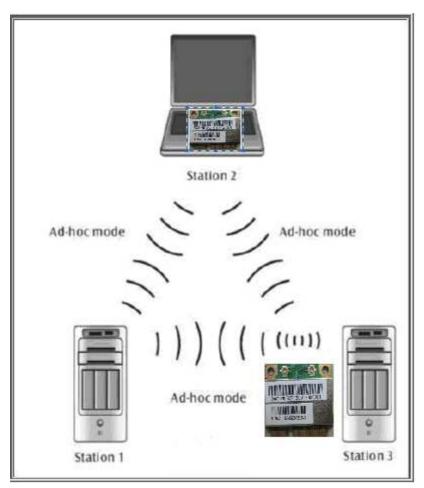
 $\sqrt{\text{Wired to wireless LAN connection: the access point will establish a bridge between wireless LAN and other wired counterparts.}$

Internet	ADSL or Cable Modem (If any)	Access Point
•		() ()
		NU153 Desktop PC

Infrastructure Mode

◎Ad-hoc Mode

The difference between Ad-hoc mode and Infrastructure mode is that Ad-hoc mode does not need the access point or router. When you use this mode, your computer will act as a server within the valid range and connect directly to others in the same LAN workgroup.



Ad-hoc Mode

It is recommended to choose this mode when there is no access point showed on your wireless network.

II. Installation

i. System Requirements

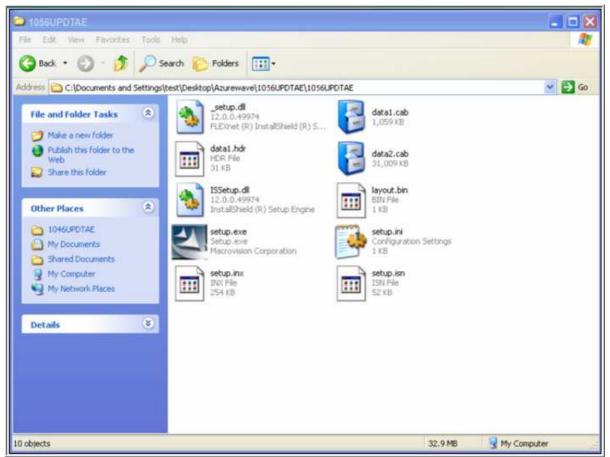
*Minimum of 64MB system memory

*Operating system: XP/Vista

* Driver installation

ii. Setup: Windows XP OS

1. Find out the Driver, and launch the Setup Wizard



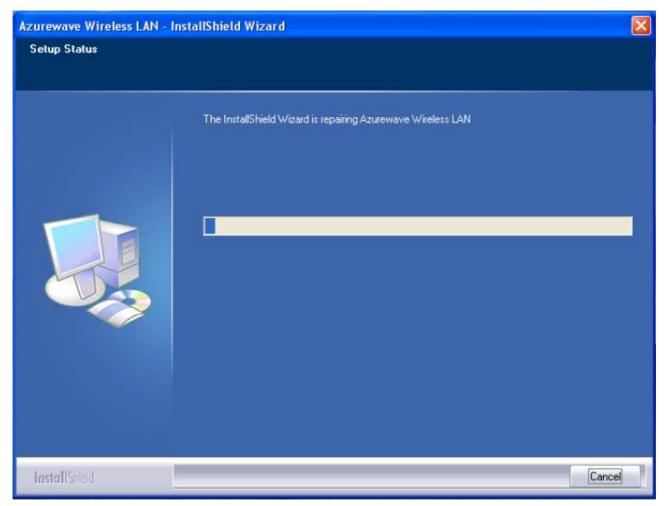
2. Please wait few seconds for wizard to prepare installation

Azurewave Wireless LAN -	installShield Wizard	
Preparing Setup Please wait while the InstallSh	eld Wizard prepares the setup.	
	Azurewave Wireless LAN Setup is preparing the InstallShield Wizard, which will guide you through the rest of the setup process. Please wait	
InstallShield	Cano	.el

3. Please select click [Install] to proceed

Azurewave Wireless LAN - Inst	allShield Wizard 🛛 🛛 🔀
Ready to Install the Program The wizard is ready to begin install	stion.
	Click Install to begin the installation. If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield	< <u>B</u> ack [Instal] Cancel

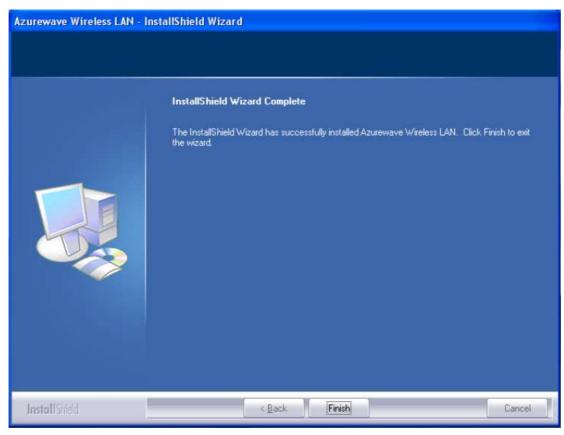
4. The Wizard is running installation



5. Please wait few seconds for Wizard to setup



6. When it is completed, please click [Finish]



iii. Setup: Windows Vista OS

Please follow the steps to complete installation.

1. Launch the setup driver

Organize - III View	vs 👻 🕙 Burn				
orite Links	Name	Date modified	Туре	Size	
Documents Pictures Music Recently Changed Searches Public	 _setup.dll data1 data1.hdr data2 ISSetup.dll layout.bin setup setup setup.inx setup.isn 	5/18/2006 12:21 AM 7/10/2007 5:14 PM 7/10/2007 5:14 PM 7/10/2007 5:14 PM 7/10/2007 5:14 PM 5/25/2006 1:10 AM 7/9/2007 5:28 PM 7/10/2007 5:14 PM 5/17/2006 3:44 AM	Application Extens Cabinet File HDR File Cabinet File Application Extens BIN File Application Configuration Sett INX File ISN File	365 KB 1,059 KB 31 KB 31,009 KB 540 KB 1 KB 445 KB 1 KB 254 KB 52 KB	
lders 🔺	-				

2. When you see the permission dialogue box, please click [Continue]

User Account	Control ogram needs your pe	ermission to conti	nue
If you starte	ed this program, continue. Setup.exe Macrovision Corporatio	2n	
🕑 Details		Continue	Cancel
User Accour	it Control helps stop unautl	horized changes to you	r computer.

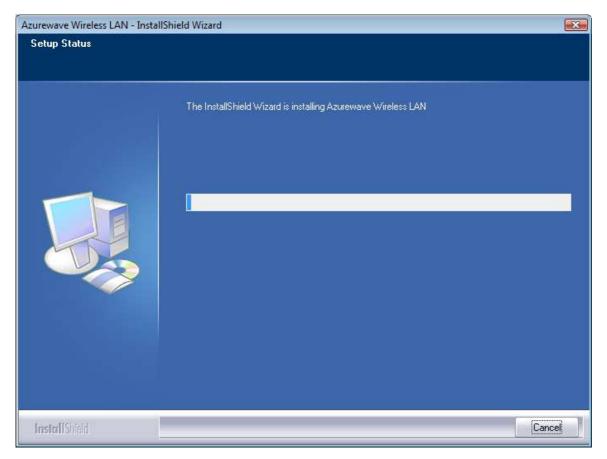
3. Now the Wizard is preparing installation

Azurewave Wireless LAN - Install	Shield Wizard	
Preparing Setup Please wait while the InstallShie	old Wizard prepares the setup.	
	Azurewave Wireless LAN Setup is preparing the InstallShield Wizard, which will through the rest of the setup process. Please wait	guide you
InstallShield		Cancel

4. Please click [Install] to proceed

Azurewave Wireless LAN - InstallSh	ield Wizard 🗾
Ready to Install the Program The wizard is ready to begin instal	lation.
	Click Install to begin the installation. If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield	< <u>B</u> ack [Install] Cancel

5. The system is processing installation



6. Please wait few seconds for Wizard to setup



7. When the setup is completed, please click [Finish]

Azurewave Wireless LAN - InstallSt	nield Wizard
	InstallShield Wizard Complete The InstallShield Wizard has successfully installed Azurewave Wireless LAN. Click Finish to exit the wizard.
InstallShield	< Back Finish Cancel

III. Network Connection

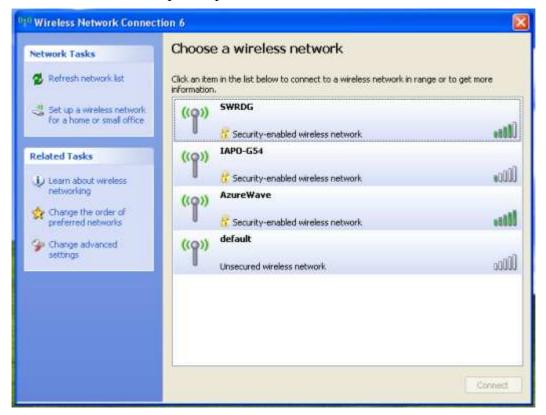
i. For Windows XP OS

Please see the following steps to setup network connection for Windows XP.

1. Find the network icon on the desktop shortcut and right-click on it. Choose "View Available Wireless networks"



2. You will see several options, please select one and click [Connect]



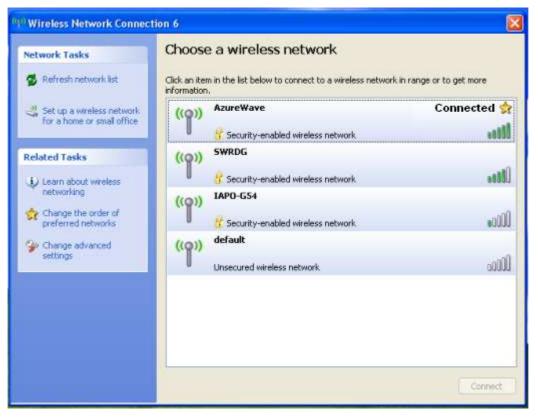
3. Please wait for few seconds to let system connecting to selected wireless network



4. You may need to type the network key when it is required (if the network doesn't request the key, the network will connect directly.)

Wireless Network Cor	nnection
network key helps preven	requires a network key (also called a WEP key or WPA key). A it unknown intruders from connecting to this network.
Type the key, and then d	lick Connect.
Type the key, and then d Network key:	ick Cannect.

5. Now the selected wireless network is connected



6. You can check the connection status by clicking [Status] in the pop-up dialogue



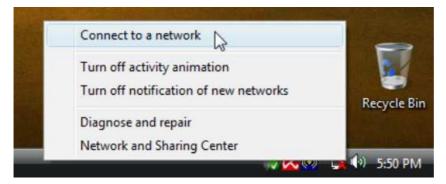
7. Here is the wireless network connection status

	eneral Support
	Connection
Acquiring network address	Status:
AzureWave	Network:
00:01:54	Duration:
54.0 Mbps	Speed
1000	Signal Strength:
	Activity
- 👘 — Received	Sen
a 0	Packets:
View Wireless Networks	Properties Disab

ii. For Windows Vista OS

Following are the instructions to setup wireless connection for Windows Vista.

1. Right-click on the network icon located on desktop shortcut. When you see the dialogue, please click [Connect to a network]



2. Choose wireless network within your range and click [Connect]

Show All	-	ſ
SWRDG	Security-enabled network	llte
bu bu	Unsecured network	lltee
IAPO-G54	Security-enabled network	lltre

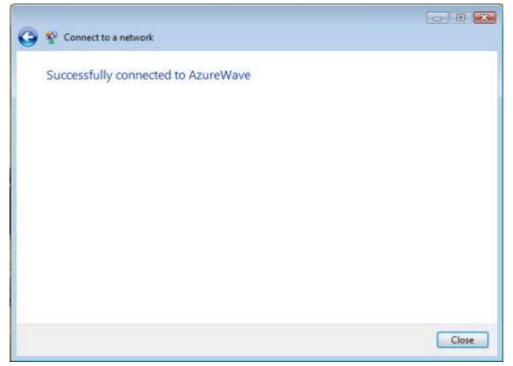
* If selected network is not secure, please choose [Connect anyway]

15

3. You may need to wait for few seconds when Windows connects to wireless network

Connect to a network	
Connecting to AzureWave	
A -	 ¢
	Cancel

4. Now the selected wireless network is connected



5. If you want to see the connection status, please right-click on the network you choose and select [Status]

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💊 Organ	uze 👻 📲 Vie	ws 👻 🏦 Connec	t To 🥌 Disable	e this network device	📑 Diagnose t	his connection	1 × 0
Name	Status	Device Name	Connectivity	Network Category	Owner	Туре	Phone # or Host Addre
120	igh-Speed Inten Wireless Networ						^
	2 AzureWave	Disable Connect / Di Status Diagnose Bridge Conne Create Shorto Delete Rename Properties	R ections				

6. This is the information of network status

eneral	
Connection	
IPv4 Connectivity:	Internet
IPv6 Connectivity:	Limited
Media State:	Enabled
SSID:	AzureWave
Duration:	00:03:42
Speed:	48.0 Mbps
Signal Quality:	lltee
Details Wireless Proper	tes
Activity	
Sent —	Received
Bytes: 60,071	2,286,765
Properties Plisable	Diagnose

IV. Setup for Ad-hoc Mode

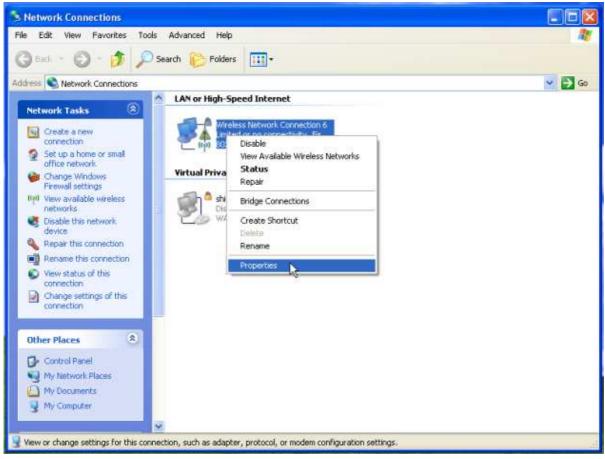
i. For Windows XP OS

If you want to choose Ad-hoc mode, please right-click network icon on desktop shortcut and choose "Open Network Connections", or go to [Control Panel] and double-click "Network Connection" icon.

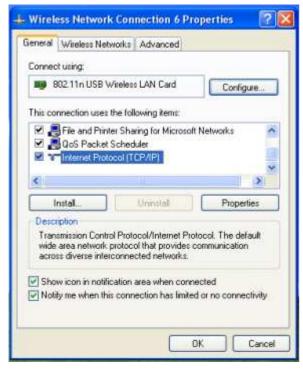
Status Repair			BSET				
View Available Wireless Netwo	orks						
Change Windows Firewall sett	tings		CHE AN				
Open Network Connections		11 () <mark>(</mark>	4:52 PM				
ontrol Panel							
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Switch to Category View	Accessibility Options	Add Hardware	Add or Remov	Administrative Tools	Automatic Updates	Avira Antivir PersonalEdi	CMI Audio Config
See Also	P	R	I		all a	1	*
Windows Update	Date and Time	Display	Folder Options	Fonts	Game Controllers	Internet Options	Keyboard
Help and Support	3		6	1	-		۲
	Mouse	Network Connections	Network Setup Wizard	Phone and Modem	Power Options	Printers and Faxes	Regional and Language
	S	3	۲	O,	R		
	Scanners and Cameras	Scheduled Tasks	Security Center	Sounds and Audio Devices	Speech	System	Taskbar and Start Menu
	92	3		1	0		
	User Accounts	Windows CardSpace	Windows Firewall	Wireless Network Set	郵件		

When you see the "Network Connections" screen, please follow the steps below to setup Ad-hoc mode.

1. Double-click "Wireless Network Connection" icon to enter its properties



2. Click "General" tab and double-click the "Internet Protocol (TCP/IP)" item



3. Choose "Use the following IP address:" and type the IP address; then click [OK]

Internet Protocol (TCP/IP)	Properties 🛛 🛛 🔀
General	
	ed automatically if your network supports need to ask your network administrator for
Obtain an IP address auto	omatically
Use the following IP address	
IP address:	192.168.0.10
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	
C Obtain DNS server addre	ts automatically
Our State	rver addresses:
Preferred DNS server:	E 27 - 27
Alternate DNS server.	
	Advanced
	OK Cancel

*Note: the IP address of the other wireless card should be set with the same subnet mask

4. Right-click the "Wireless Network Connection" icon and choose "properties"

S Network Connections	
File Edit View Favorites Tools Advanced Help	10 A
🕝 Back 🕤 🜍 - 🎓 🔎 Search 🜔 Folders 🛄 •	
Address S Network Connections	💙 🄁 Go
Network Tasks An or High-Speed Internet Create a new Wreless Network Connection 6 United or no connection 6	
connection Image: Train Stress Disable Set up a home or small office networks View Available Wireless Networks Gride Networks Virtual Priva Finewall settings Repair	
Image: New available wireless network device Shi Disable this network device Bridge Connections Image: Disable this network device Shi Disable this network device Create Shortcut Delete Image: Repair this connection Rename this connection Properties Image: Connection Properties Image: Connection Properties	
Other Places Control Panel My Network Places My Computer	
View or change settings for this connection, such as adapter, protocol, or modem configuration settings.	4

5. Select "Wireless Network" tab and choose [Add]

eneral Wireless Networks	Advanced
cricial monore memories	Autaicea
Use Windows to conligue	re my wireless network settings
Available networks:	
	t from, or find out more information range, click the button below.
	View Wireless Networks
122010	
	Move up Move down
Add Remo	Move down
Add Remo	Wove down
Learn about setting up wire	Move down

6. Type "Network name (SSID)" and choose "Data encryption" if you want to protect the network security

ssociation	Authentication	Connection	
Network na	ame (SSID):	test	
Wreless	network key		
This netv	vork requires a ke	ey for the following:	
Network	Authentication	Open	*
Data en	cryption	Disabled	2
Network.	kej:		
Cordinar	etwork key		
Key inde	(advanced)	1 0	
	ay is provided (a		

7. When you see the dialogue showing your network is unsecured, please click [Continue Anyway]

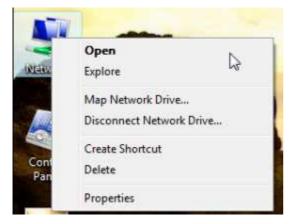
8. Now your network is in Ad-hoc mode

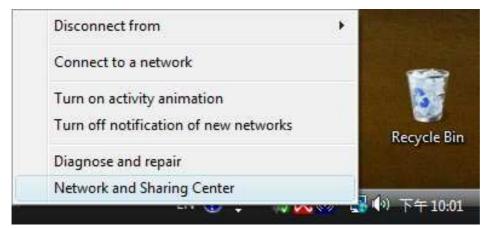
eneral Wireless Networks	Advanced
Use Windows to configu	re my wireless network settings
Available networks:	
	t from, or find out more information range, click the button below.
	View Wireless Networks
Preferred networks Automatically connect to a below.	available networks in the order listed
Automatically connect to a	wailable networks in the order listed Move up Move down
Automatically connect to a below.	Move up Move down

ii. For Windows Vista OS

Please follow the steps to setup Ad-hoc mode for Windows Vista.

1. Right-click the Network neighbor to choose "properties," or you can right-click network icon on desktop shortcut and choose "Network and Sharing Center"





r=

2. When you see the "Network and Sharing Center" windows, please select "Manage network connection" bar

en l

Tasks View computers and devices	Network and Sharing Co	enter	1
Connect to a network Manage wireless networks Set up a connection or network <u>Manage network connections</u>	TEST-PC (This computer)	AzureWave	View full map
Diagnose and repair	💐 AzureWave (Public netwo	ork)	Customize
	Access	Local and Internet	
	Connection	Wireless Network Connection (AzureWave)	View status
		Signal strength: Excellent	Disconnect
	3 Sharing and Discovery		
	Network discovery	On On	\odot
	File sharing	• On	\odot
	Public folder sharing	© Off	\odot
	Printer sharing	Off (no printers installed)	\odot
	Password protected sharing	On On	\odot
See also			

3. Right-click the connected network icon and choose "Properties"

					-	
				100.10194		acta at the second
00-	📝 « Netwo	ork and Internet + I	Network Connections	- 4	Search	\$
					-	201
🔄 Carpenne	er 😹 Ve	900 - 1				Ű
Vame	Status	Device Name	Connectivity Net	work Category Owner	Туре	Phone # or Host Addre.
LAN or Hig	h-Speed Interr	net (2)				
	ocal Area Conr		Wireless Network	Connection		C.
Par II	letwork cebie L Iarvell Yukon S	unplugged 💦 🔭	CARLE_MODEM :	Disable	1	
20				Connect / Disconne	set	
				Status		
				Diagnose		
				ongnose		
				Bridge Connections		
				Create Shortcut		
				Delete		
				Rename		
				Kename		
				Properties		
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4. When you see the warning message, please click [Continue]



5. Choose "Networking" tab and double-click the "Internet Protocol Version 4 (TCP/IPv4)" item

Connect using:		
🔮 802.11n U	SB Wireless LAN Card	
		Configure
This connection u	uses the following items:	
and the second se	r Microsoft Networks	
	Intermediate Driver	
QoS Pa		
· · · · · · · · · · · · · · · · · · ·	Printer Sharing for Micros	
	Protocol Version 6 (TCP/I Protocol Version 4 (TCP/I	
	Paratoccal Version & LLCPU	Inve)
and the second s		The second secon
🗹 🔺 Link-Lay	ver Topology Discovery Ma	
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✓ → Link-Lay ✓ → Link-Lay Install Description Transmission C wide area netw	ver Topology Discovery Ma ver Topology Discovery Ra	Properties Properties rotocol. The default

6. Choose "Use the following IP address:" and type the IP address; then click [OK]

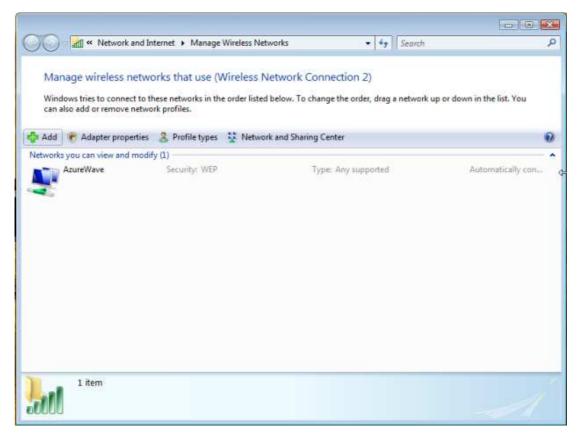
ieneral										
this capa	get IP settin ablity. Other appropriate I	wise, yo	ou need t							
) Ob	tain an IP ad	idress a	utomatic	slly						
@ Use	e the followir	ng IP ad	dress:							
IP ad	dress:			192 .	168	-	0	•	10	
Subne	et mask:			þ55 .	255		255	3	0	
Defau	ult gateway:			1		•		÷		
00	tain DNS ser	v er add	ress auto	matically						
O Use	e the followin	ng DNS s	server ad	dresses:						
Prefe	rred DNS ser	ver:				÷		÷		
Altern	hate DNS ser	ver:		(-		_	2	-	

*Note: the IP address of the other wireless card should be set with the same subnet mask

7. Choose "Manage wireless networks" bar

	rnet Network and Sharing Center	← ← Search	
Tasks	Network and Sharing Center		
View computers and devices Connect to a network			View full m
Manage wireless network	🔌 —×	_ 🔘	
Set up a connection or network Manage network connections	TEST-PC (This computer)	Internet	
Diagnose and repair			
i A	Not connected		
	Wireless networks are available.		
	Connect to a network		
11.7			
11 11			
23 × 1			
11			
See also			
Internet Options Windows Firewall			

8. Select [Add]



9. Choose "Create ad-hoc network"



10. Please click [Next]



11. Enter "Network name" and if you want to protect the network security, please choose in "security type"; then click [Next]

Give your network	c a name and choose security	opuons
Network name:	test	
Security type:	No authentication (Open)	Help me choose
Security key/Passphrase	s [Display characters
Save this netwo	ork	

12. Now your network is in Ad-hoc mode

The tes	t network is ready to use	
disconne	ork will appear in the list of wireless networks and will stay active until everyone cts from it. Give the network name and security key (if any) to people you want ct to this network.	
	Wireless network name: test	
	Network security key: unsecured	
To share	files, open Network and Sharing Center in Control Panel and turn on file sharing.	

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.

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.

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

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna,
- 3) For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.

As long as 3 conditions above are met, further <u>transmitter</u> test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: TLZ-NU153H".

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

For Taiwan 警語:

★ 第十二條

經型式認證合格之低功率射頻電機,非經許可,公司、商號或使用者均不得擅自變更頻 率、加大功率或變更原設計之特性及功能。

★ 第十四條

低功率射頻電機之使用不得影響飛航安全及干擾合法通信;經發現有干擾現象時,應立 即停用,並改善至無干擾時方得繼續使用。前項合法通信,指依電信法規定作業之無線 電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之 干擾。

Note:

- 1. 本模組於取得認證後將依規定於模組本體標示審驗合格標籤
- 2. 系統廠商應於平台上標示「本產品內含射頻模組: ₩CCXXXXYYyyyZzW」字樣