Broadband Wireless Connectivity Solution

ALINK-PW5 Pre-WiMAX

Revision 1.0

User Guide

Version	Date	Notes
1.0	Aug. 24, 2009	Initial Version

The Wireless Technology

Broadband Wireless Connectivity Solution

The Product line are adopting Wireless TDMA concept to provide an affordable and reliable rural connectivity platform. All of products are high performance outdoor deployable wireless bridge that provides wireless connectivity between multiple network locations. With the high throughput and long distance transmission, it is the appropriate backhaul solution for Network Carriers, Internet Service Providers, System Integrators and Enterprises.

About this manual

The purpose to use this manual is for install the Pre-WiMAX capacity Wireless TDMA Backhaul. This user manual is including disposing course and method and helping the customer to solve the unpredictable problem. The following typographical conventions are used in this purpose:

Planning Your Wireless Network

Network Topology

A wireless network is a group of computers, each equipped with one wireless adapter. Computers in a wireless network must be configured to share the same radio channel. Several PCs equipped with wireless cards or adapters can communicate with one another to form an ad-hoc network. The wireless adapters also provide users access to a wired network when using an access point or wireless router. An integrated wireless and wired network is called an infrastructure network. Each wireless PC in an infrastructure network can talk to any computer in a wired network infrastructure via the access point or wireless router. An infrastructure configuration extends the accessibility of a wireless PC to a wired network, and may double the effective wireless transmission range for two wireless adapter PCs. Since an access point is able to forward data within a network, the effective transmission range in an infrastructure network may be doubled.

Network Layout

The Wireless Bridge has been designed for use with proprietary 5 GHz based on IEEE 802.11a standard products, products using these standards can communicate with each other. When you wish to connect your wired network with your wireless network, the Wireless Bridge's network port can be used to connect to any of switches or routers.

Installation Considerations

The AP lets you access your network, using a wireless connection, from virtually anywhere within its operating range. Keep in mind, however, that the number, thickness and location of walls, ceilings, or other objects that the wireless signals must pass through, may limit the range. Typical ranges vary depending on the types of materials and background RF (radio frequency) noise in your home or business. The key to maximizing wireless range is to follow these basic guidelines:

- Keep your product away (at least 3-6 feet or 1-2 meters) from electrical devices or appliances that generate RF noise.
- Keep the number of walls and ceilings between the AP and other network devices to a minimum each wall or ceiling can reduce your AP's range from 3-90 feet (1-30 meters.) Position your devices so that the number of walls or ceilings is minimized.
- Be aware of the direct line between network devices. A wall that is 1.5 feet thick(.5 meters), at a 45-degree angle appears to be almost 3 feet (1 meter) thick. At a 2-degree angle it looks over 42 feet (14 meters) thick! Position devices so that the signal will travel straight through a wall or ceiling (instead of at an angle) for better reception.
- Building materials can impede the wireless signal a solid metal door or aluminum studs may have a negative effect on range. Try to position wireless devices and computers with wireless adapters so that the signal passes through drywall or open doorways and not other materials.

Applications

The wireless LAN products are easy to install and highly efficient. The following list describes some of the many applications made possible through the power and flexibility of wireless LANs:

• Difficult-to-wire environments

There are many situations where wires cannot be laid easily. Historic buildings, older buildings, open areas and across busy streets make the installation of LANs either impossible or very expensive.

• Temporary workgroups

Consider situations in parks, athletic arenas, exhibition centers, disaster-recovery, temporary offices and construction sites where one wants a temporary WLAN established and removed.

• The ability to access real-time information

Doctors/nurses, point-of-sale employees, and warehouse workers can access real-time information while dealing with patients, serving customers and processing information.

• Frequently changed environments

Show rooms, meeting rooms, retail stores, and manufacturing sites where

frequently rearrange the workplace.

• Wireless extensions to Ethernet networks

Network managers in dynamic environments can minimize the overhead caused by moves, extensions to networks, and other changes with wireless LANs.

• Wired LAN backup

Network managers implement wireless LANs to provide backup for mission-critical applications running on wired networks.





PC or NB x 8

Installation Diagram





Wireless Bridge Configuration Using Web User Interface

Before Setup...

Verify the IP address setting

You need to configure your PC's network settings to obtain an IP address. Computer use IP addresses to communicate with each other across a network, such as the Internet.

- 1. From the taskbar, click the **Start** button, select **Settings** > **Control Panel**. From there, double-click **the Network connections** icon.
- 2. Right click the **Local Area Connection** icon **Properties**; select the **TCP/IP** line for the applicable Ethernet adapter. Then, click the **Properties** button.
- Click the IP Address tab page, select USE the following IP address, type 192.168.1.254 (but, 192.168.x.x for the device use) in the IP Address field and 255.255.0.0 in the Subnet Mask field, then click OK button.

Start Setup by Browser...

1. After getting the correct connection, start the web browser (make sure you disable the proxy) and type <u>192.168.x.x (x is outdoor unit IP Address)</u> in the

Address field. Press Enter.

🙋 http://192.168.1.1

You will see a popup menu below:



Clicking "Yes" ushers you into login.

 Enter the factory default User name and Password fields: User Name: admin Password: password

then click **Login** button.

	Pre <i>WiMAX</i> TDM			
Name				
Password				
	Login	Reset		

3. You will enter the Utility homepage.

Device Information

About Basic Setup Wireless Setup Status Statistics Management Logout	Pre WiMAX			
About Basic Setup Wireless Setup Status Statistics Management .ogout	TDM			
Device Information Basic Setup Wireless Setup Status Statistics Version Management Logout		About		
Basic Setup Device Name DEVICE121314 Mireless Setup MAC Address 00:22:03:12:13:14 Status Firmware Version Statistics Checksum 2e958648 Build Time Mon Aug 24 12:13:28 2009	About	Device Information		
MAC Address 00:22:03:12:13:14 tatus Firmware version 1.04D Checksum 2e958648 Build Time Mon Aug 24 12:13:28 2009	asic Setup	Device Name	DEVICE121314	
atus Firmware atistics Version 1.04D anagement Checksum 2e958648 Build Time Mon Aug 24 12:13:28 2009	ireless Setup	MAC Address	00:22:c3:12:13:14	
Version 1.04D tistics Checksum pagement Build Time	tus	Firmware		
IsuitS Checksum 2e958648 agement Mon Aug 24 12:13:28 2009 out	liation	Version	1.04D	
Inagement Build Time Mon Aug 24 12:13:28 2009	usucs	Checksum	2e958648	
pout	hagement	Build Time	Mon Aug 24 12:13:28 2009	
	gout			

The first page appears in main page will show "**Device Information**" automatically, you can find the Device Name, MAC address, Firmware version.

Basic Setup

- Device Name You'll see the Device Name. You may assign any device name to this CPE. This name is only used by the CPE administrator for identification purposes. Unique, memorable names are helpful, especially if you are employing multiple access points on the same network. This name is composed of 15 characters with 0-9, A-Z, a-z or "-".
- Ethernet Data Rate 10/100 Mbps Base-T

IP Address -

IP Address – Default is "Manual" or set to DHCP

IP Subnet Mask –

Default Gateway -

Primary DNS Server -

Secondary DNS Server -

NIMAX		
TDM		
	IP Settings	
About	Device Name	DEVICE121314
Basic Setup	Ethernet Data Rate	Automatic
IP Setup		
STP Setup	IP Address	Manual ODHCP
Vireless Setup	IP Address	192.168.1.1
Status	IP Subnet Mask	255.255.255.0
Statistics	Default Gateway	0.0.0.0
	Primary DNS Server	0.0.0.0
Management	Secondary DNS Server	0.0.0.0
Logout	-	
		Apply Cancel

• **Spanning Tree Protocol (STP)** –Spanning-Tree Protocol is a link management protocol that provides path redundancy while preventing undesirable loops in the network.

Pre			
WINAX			
	Spanning Tree Protocol Settin	gs	
About	Spanning Tree Protocol (STP)	⊙Enable ○Disable	
Basic Setup	Bridge Priority (0-65535)	32768	
IP Setup	Hello Time (1-10)	2 seconds	
STP Setup	Max Age (6-40)	20 seconds	
Wireless Setup	Forward Delay (2-30)	2 seconds	
Status			
Statistics		Apply Cancel	
Management			
Logout			

Wireless Setup

• Radio Frequency (RF) – Default is "Enable"

Pre MAX	
UTVI	
Radio Freqency (RF)	 Enable Disable
etup Bemete MAC Address	00.22.52.15.15.17
etup	00:22:03:15:16:17
Security	
Cipher	NONE 💌
Cipher Phrase	
Radio	
RF Bandwidth	40MHz 💌
Channel / Frequency	5800.000MHz 💌
TX Rate Range	BPSK 1/2 💌 - 64QAM 3/4 💌
TX Power	full 💌
Antenna	Fixed on Primary
	Apply Cancel

- Remote MAC Address –Wireless Bridge (Peer-to-Peer) can allow Bridge point to point network architecture, In order to establish the wireless link between bridge radios, the MAC address of remotes bridge(s) need to be registered in the address table. Type the MAC address with format xx:xx:xx:xx:xx (x is the hexadecimal digit)
- Security -

Cipher – Default is "NONE", WEP and AES Cipher Phrase –

2	
AX	
1	
Wireless Settings	
Radio Fregency (RE)	
P Remote MAC Address	00:22:c3:15:16:17
Security	
Cipher	NONE 💌
Cipher Phrase	WEP
Radio	AES
RF Bandwidth	40MHz 💌
Channel / Frequency	5800.000MHz 🛩
TX Rate Range	BPSK 1/2 💌 - 64QAM 3/4 💌
TX Power	full 💌
Antenna	Fixed on Primary
	Apply Cancel
	(type)

www.cordless4u.com

Radio

- RF Bandwidth –Optimize the network and increase its bandwidth, the options are 5,10, 20 and 40MHz, default is 20MHz

Pre		
WIMAX		
TDM		
	Wireless Settings	
About	Radio Freqency (RF)	Enable O Disable
Basic Setup	Pomoto MAC Addroso	00.00.00.00.00.00
Wireless Setup	Remote MAC Address	00:22:03:15:16:17
Status	Security	
Statistics	Cipher	NONE 🚩
Management	Cipher Phrase	
Logout	Radio	
	RF Bandwidth	40MHz
	Channel / Frequency	10MHz Hz
	TX Rate Range	5MHz • - 64QAM 3/4 •
	1X Power	
	Antenna	Fixed on Primary
		Apply Cancel

- Channel/Frequency –The channels available are based on select the appropriate channel from the list provided to correspond with your network settings.

Pre WIMAX TDM		5120.000MHz 5160.000MHz 5200.000MHz 5240.000MHz 5240.000MHz 5280.000MHz 5360.000MHz 5360.000MHz
	Wireless Settings	5440.000MHz 5480.000MHz
About	Radio Freqency (RF)	5520.000MHz 5560.000MHz 5600.000MHz able
Basic Setup	Remote MAC Address	5640.000MHz 5680.000MHz 6:17
Status	Security	5720.000MHz 5760.000MHz
Statistics	Cipher Cipher Phrase	5840.000MHz 5880.000MHz
Management Logout	Radio RF Bandwidth Channel / Frequency TX Rate Range	5920.000MHz 5960.000MHz 6040.000MHz 5800.000MHz 5800.000MHz BPSK 1/2 - 640AM 3/4
	Antenna	Fixed on Primary
	A	pply Cancel

- TX Rate Range –In data rate column you can select all bit rate supported in current operation mode. Default value is "BPSK 1/2 to 64QAM 3/4" means the system will adjust the connection speed dynamically according to your current link status.

e		
AX		
N/I		
	Miroloss Sottings	
	Radio Fregency (RF)	Enable O Disable
	Remote MAC Address	00.22.c3.15.16.17
tup		
	Security	
	Cipher	NONE
	Cipher Phrase	
	Radio	
	RF Bandwidth	40MHz 🗸
	Channel / Frequency	5800.000MHz 💌
	TX Rate Range	BPSK 1/2 💌 - 64QAM 3/4 💌
	TX Power	full V BPSK 1/2 BPSK 3/4
	Antenna	Fixed on Primary QPSK 1/2
		Apply Cancel 16QAM 1/2
		16QAM 3/4 64QAM 2/3
		64QAM 3/4

- TX Power – Default is "full", you can reduce RF output power by selecting adjustable transmit power full, half, quarter, eighth and min. To change transmit power may decrease your wireless signal coverage. This feature can be helpful in restricting the coverage area of the wireless network.

re		
ΛΑΧ		
	Wireless Settings	
	Radio Freqency (RF)	Enable O Disable
р		
etup	Remote MAC Address	00:22:03:15:16:17
	Security	
	Cipher	NONE 💌
nt	Cipher Phrase	
	Radio	
	RF Bandwidth	40MHz 💌
	Channel / Frequency	5800.000MHz 💌
	TX Rate Range	BPSK 1/2 💙 - 64QAM 3/4 💙
	TX Power	full 💌
	Antenna	half
	Apply	quarter
	, debrid	min

 Antenna – Default setting is "Fixed on Primary", if you need "Tx on Primary; Rx on Secondary" option for customization and contact to our sales window for special deliver.

re –		
ЛАХ		
00/1		
	Wireless Settings	
	Radio Freqency (RF)	Inable O Disable
up	Pamoto MAC Addrose	00.22.22.15.15.17
etup	Remote MAC Address	00:22:03:13:16:17
	Security	
	Cipher	NONE Y
ıt	Cipher Phrase	
	Radio	
	RF Bandwidth	40MHz 🛩
	Channel / Frequency	5800.000MHz 🖌
	TX Rate Range	BPSK 1/2 🗸 - 64QAM 3/4 🖌
	TX Power	full 💌
	Antenna	Fixed on Primary
	Apply	Ca Tx on Primary Ca Tx on Primary; Rx on Secondary



<u>Status</u>

Peer-to-Peer link show the Bridge ID of neighborhood, Time, MAC address, IP Address, Channel Info. ,Rx/Tx rate, RSSI (dBm), Remote RSSI, Best Remote RSSI (dBm) and Status

Status	
Time	Tue Oct 13 13:23:05 2009
MAC Address	00:22:c3:15:16:17
IP Address	
Channel Info	40MHz@5800.000MHz
Rx Rate	64QAM 3/4
Tx Rate	64QAM 3/4
RSSI	-50dBm
Remote RSSI	-48dBm
Best Remote RSSI	-44dBm
	Reset

Statistics –



Management

Change Password –In the "Change Password" page, you can modify "**Password**". Changing the sign-on password is as easy as typing the string you wish in the column. Then, type the password into second column to confirm. This option allows you to create a password for the device. By default, this device is configured with a password is "**password**". For security reasons it is highly recommended that you create a new password.

Click "**Apply**" to finish the procedure. Be sure you noted the modification before apply all changes.

Pre	
/iMAX	
Change Decoverd	
ut Current Password	
ic Setup New Password	
eless Setup Repeat New Password	
US Rectore Default Paceward	
istics	
agement Apply Cancel	
Change Password	
Remote Management	
Jpgrade Firmware	
3ackup/Restore	
ïme Setting	
evnt Log	
leboot	
out	

Remote Management –

Remote Console is recommended that Putty is your right option to access this device's management.

- Open putty.exe by double clicking Putty
 - 1. Enter 192.168.1.1 in the "Host Name" field, port number is 22 and "Protocol".



 From the "Connection", select "SSH"; from the "Preferred SSH protocol version", select"2"; from the "Encryption cipher selection policy", make"3DES"the top position.

ategory:	
📮 Session 🔄	Options controlling SSH connections
Logging ⊡ Terminal Keyboard Bell	Data to send to the server <u>R</u> emote command:
→ Features → Window → Appearance → Behaviour → Translation → Selection → Colours → Colours → Data	Protocol options Don't allocate a pseudo-terminal Don't start a shell or command at all Enable compression Preferred SSH protocol version: 1 only 1 2 2 0 2 only Encryption options
 Proxy Telhet Blogin SSTI Kex Auth X11 Tunnels 	Encryption cipher selection policy: AES (SSH-2 only) Blowfish 3DES ·· warn below here ·· DES DES Enable legacy use of single-DES in SSH-2

3. Click Open and a page will open like below:



- 4. Enter username: admin and password: password in the separate field
- 5. For Help information, enter "help" command.

Under System Management, click **SNMP** to display and change settings for the Simple Network Management Protocol.

To communicate with the access point, the **SNMP** agent must first be enabled and the Network Management Station must submit a valid community string for authentication. Select **SNMP** Enable and enter data into the fields as described below. When you are finished, click "**Apply**"

Setting	Description
SNMP	Enables or disables SNMP.
Contact Location	Sets the location string that describes the system location. Maximum length is 255 characters.
Community Name (Read Only)	Specifies a community string with read-only access. Authorized management stations are able to retrieve MIB objects. Maximum length is 32 characters. Default is " public "
Community Name (Read Write)	Specifies a community string with read-write access. Authorized management stations are able to both retrieve and modify MIB objects. Maximum length is 32 characters. Default is " private "
Trap Destination IP Address	Enter the IP address of the trap manager that will receive these messages.
Trap Destination Community Name	Enter the community name of the trap manager that will receive these messages. Default is " public "

Pre			
WIMAX			
TDM 🚽			
	Remote Management		
About	Remote Console		
Basic Setup	Secure Shell (SSH)	● Enable ○ Disable	
Wireless Setup	SNMP		
Status	SNMP	⊙ Enable ○ Disable	
Statistics	Read Community	public	
Management	Write Community	private	
Change Password	System Contact		
Remote Management	System Location		
Upgrade Firmware	IP Address to Receive Traps	0.0.0	
Backup/Restore	Enterprise MIB	Download	
Time Setting		Apply Cancel	
Event Log			
Reboot			
Logout			

Upgrade Firmware –

Enter the location of the firmware upgrade file in the file path field, or click the **"Browse"** button to find the firmware upgrade file. Then click on the **"Upgrade"** button, and follow the on-screen instructions. The whole firmware upgrade process will take around 60 seconds. Before upgrade, make sure you are using correct version. Please check with your technical support service if new firmware available.

Pre		
WIMAX		
	🗖 Upgrada Eirmuuara	
About	Browse to locate the firmware file	
Basic Setup	· · · · · · · · · · · · · · · · · · ·	
Wireless Setup	Upload	
Status		
Statistics		
Management		
Change Password		
Remote Management		
Upgrade Firmware		
Backup/Restore		
Time Setting		
Event Log		
Reboot		
Logout		



Backup/Restore Settings -

In Management section, you can **Backup/Retrieve Setting** and **Restore to Factory Default Settings** the system in following pages.

- **Backup the current settings to a file –** Click on the "Backup" button, system will prompt you where to save the backup file. You can choose the directory to save your configuration file.
- **Retrieve backed up settings from a file –** Here you can restore the configuration file from where you previous saved.
- Restore to factory default settings Be very carefully before restore system back to default since you will lose all current settings immediately.
 If you act the function, the IP address will restore the establishing value situation.
 192.168.1.1 in the IP Address field and 255.255.255.0 in the Subnet Mask field,

Pre		
WIMAX		
	Backup / Restore Settings	
About	Backup current settings to a file	
Basic Setup		Backup
Wireless Setup	Retrieve backed up settings from a file	
Status	File 瀏覽	Retrieve
Statistics	Restore factory default settings	
Management	······································	Restore
Change Password		
Remote Management		
Upgrade Firmware		
Backup/Restore		
Time Setting		
Event Log		
Reboot		
Logout		

Time Setting -

Time Server – This allows you to configure the time on the device. You may do this automatically by connecting to a NTP server. Select the time zone from the drop down list and then specify the IP address of the NTP server.

From the **"Time Server**", enter the correct time server. The following provides the time server website.

time.windows.com

time-a.nist.gov

time.nist.gov

- Time Server Port 123
- **Time Zone –** From the" **Time Server** "pop-menu, select your time zone.
- From the "Adjust for Daylight Saving Time", you have the option of daylight saving time or not.

Pre			
WIMAX			
	Time Setting		
About	Time		
Basic Setup	Time Server		
Wireless Setup	Time Server Port	123	
Status	Time Zone	(GMT-08:00) Pacific Time (US & Canada); Tijuana	~
Statistics		(GMT-08:00) Pacific Time (US & Canada); Tijuana	^
	Current Time	(GMT-07:00) Chihuahua, La Paz, Mazatlan	
Management		(GMT-07:00) Mountain Time (US & Canada)	
Change Password		(GMT-06:00) Central America	
Remote Management		(GMT-06:00) Guadalaiara Mexico City Monterrey	
Lingrada Eirmunara		(GMT-06:00) Saskatchewan	
Opgrade Firmware		(GMT-05:00) Bogota, Lima, Quito	=
Backup/Restore		(GMT-05:00) Eastern Time (US & Canada)	
Time Setting		(GMT-05:00) Indiana (East) (GMT-04:00) Atlantic Time (Canada)	
Event Log		(GMT-04:00) Adante Time (Canada) (GMT-04:00) Caracas La Paz	
Event Log		(GMT-04:00) Santiago	
Reboot		(GMT-03:30) Newfoundland	
Logout		(GMT-03:00) Brasilia	
		(GMT-03:00) Buenos Aires, Georgetown (GMT-03:00) Groopland	
		(GMT-02:00) Mid-Atlantic	
		(GMT-01:00) Azores	
		(GMT-01:00) Cape Verde Is.	
		(GMT) Casablanca, Monrovia	
		(GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London	
		(GMT+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna (GMT+01:00) Belgrade, Braticlava, Budapost, Liubliana, Braguo	
		(GMT+01:00) Brussels, Copenhagen, Madrid, Paris	
		(GMT+01:00) Sarajevo, Skopje, Warsaw, Zagreb	
		(GMT+01:00) West Central Africa	
		(GMT+02:00) Athens, Istanbul, Minsk	1000
		(GM1+02:00) Bucharest	V

Event Log –The **Log** page displays a list of events that are triggered on the Ethernet and Wireless interface. This log can be referred when an unknown error occurs on the system or when a report needs to be sent to the technical support department for debugging purposes.

Pre WiMAX	
TDM	Event Log
About	Enable SysLog
Basic Setup	Syslog Server IP Address 0.0.0.0
Wireless Setup	Syslog Server Port Number 514
Status	Apply Cancel
Statistics	Event Log Window
Management Change Password Remote Management Upgrade Firmware Backup/Restore Time Setting Event Log	Mon Aug 24 12:13:16 2009 WLANO: Station 00:22:C3:15:16:17 associated. Mon Aug 24 12:13:16 2009 WLANO: 00:22:C3:12:13:14 is ready in service. Mon Aug 24 12:13:16 2009 WLANO: 00:22:C3:12:13:14 is predy in service. Mon Aug 24 12:13:12 2009 WLANO: 00:22:C3:12:13:14 is ready in service. Mon Aug 24 12:13:12 2009 WLANO: 00:22:C3:12:13:14 is ready in service. Mon Aug 24 12:13:12 2009 WLANO: 00:22:C3:12:13:14 is ready in service. Mon Aug 24 12:13:12 2009 WLANO: 00:22:C3:12:13:14 is ready in service. Mon Aug 24 12:13:12 2009 WLANO: 00:22:C3:12:13:14 is ready in service.
Reboot Logout	Refresh Save As

Reboot –Click on "**Yes**" button to restart Bridge and wait 30 seconds for system rebooting.

Pre			
NIMAX			
	Reboot		
About	Reboot System	OYes ⊙No	
Basic Setup			
Nireless Setup		Appry Cancer	
Status			
Statistics			
Management			
Change Password			
Remote Management			
Upgrade Firmware			
Backup/Restore			
Time Setting			
Event Log			
Reboot			
_ogout			

Logout-





Appendix A: Specification

Standards Compliance	IEEE 802.11 silicon to non-standard; IEEE 802.3; IEEE 802.3u; IEEE802.3af(option)			
SDRAM	64 M Byte			
Flash	16M Byte			
Radio Frequency Type	Proprietary 5GHz based on 802.11a OFDM			
Modulation	64QAM 3/4, 64QAM 2/3, 16QAM 3/4, 16QAM 1/2, QPSK 3/4, QPSK 1/2, BPSK 3/4, BPSK 1/2			
Frequency Band	5120~6060MHz			
Transmission Power	300mW (Adjustable output power)			
Data Rate	Up to 40Mbps over 50Km connection			
Access Point Interfaces	Auto sensing MDI/MDI-X Ethernet 10/100Base-TX: RJ-45			
Sensitivity	-92dBm @ 6Mbps; -72dBm @ 54Mbps, PER < 10%			
Antenna Type	N-type external high gain antenna			
Security Systems	WEP/ AES encryption;			
Wireless Setting	Operation Mode –Wireless PtP Bridge Channel Bandwidth adjustable 5/10/20/40 MHz Adjustable transmit power			
Software/Firmware	DFS Spanning Tree settings Reset to default by WebUI Web-based configuration via popular browser (MS IE, Netscape) Firmware upgrade and configuration Backup/Restore via Web 802.1Q VLAN pass-through Signal strength LED indicator (5 LEDs) EventLog Remote Log Server SNMP v1/v2c MIB support: MIB I, MIB II (RFC-1213) and Private MIB Support Time settings Hardware Watch dog			
Operating Environment	Operating Temperature: -30 ~ +70°C			
Power	DC 48 Volt ±5%; 1A (Max.)AC adapter AC 100V ~ 240V			
Network Management System OS Support	Windows 2000/XP/Vista Home BASIC			
Warranty	One year limited			

Appendix B: Notice

Please refer to the following system grounding diagram for your installation reference. When in doubt, refer to the NEC code to determine proper grounding techniques. For detailed information regarding grounding the outdoor wireless system.



Appendix C: SSH settings List

get	set	del	keyword		-	_	descriptions
			system				system setting
			version				system firmware version
			apname				system name
			macaddress				system MAC address
			country				country/region
			routemode				system route mode
			anyiponrout				system any ip on route
v	v		e				mode
			bridge				system bridge port
				iptype			system dhcp client
				ipaddr			system IP address
				netmask			system network mask
				gateway			system gateway
				dns primary			system primary DNS
_	_			dns			system secondary DNS
v	v			secondary			system secondary DIVS
			ethernet				system ethernet port
				iptype			system dhcp client
				ipaddr			system IP address
				netmask			system network mask
				gateway			system gateway
				dns primary			system primary DNS
	./-			dns			sustan secondary DNS
Ň	v			secondary			system secondary DINS

		IP start			IP range start
		IP End			IP range end
		IP Range Netmask			IP range netmask
	 wireless	5			system wireless port
		iptype			system dhcp client
		ipaddr			system IP address
		netmask			system network mask
		gateway			system gateway
		dns primary			system primary DNS
		dns secondary			system secondary DNS
		IP start			IP range start
		IP End			IP range end
		IPRange Netmask			IP range netmask
\checkmark	 stp				enable spanning tree protocol
	ethstats				ethernet statistics
	 radius				radius setting
		auth			authentication radius setting
			primary		primary
				ipaddr	radius IP address
				port	radius port number
				secret	radius secret string

				secondary		
					ipaddr	radius IP address
					port	radius port number
					secret	radius secret string
			account			
				primary		primary
					ipaddr	radius IP address
					port	radius port number
					secret	radius secret string
				secondary		
					ipaddr	radius IP address
					port	radius port number
					secret	radius secret string
		ssh				enable remote SSH access
		snmp				SNMP setting
			server			enable SNMP agent
_						SNMP TrapServer IP
V	V		trap server			address
_			read			
V	V		community			SNMP Readcommunity
_	_		write			SNMD Writecommunity
v	v		community			SNMP whieconinunity
			description			SNMP System
			description			Description
		 wlan	description			SNMP System Description wireless setting

 		wirelessmo de		wireless mode
 		channel		wireless channel(depends on country and wireless mode)
 		rate		wireless transmission data
 		ssid		wireless network name(1-32chars)
 		power		wireless transmit power
 		fragmentati onthreshold		wireless fragmentation threshold (even only)
 		rtsthreshold		wireless RTS/CTS threshold
 		super		enable Super-A/G mode
 		beaconinter val		wireless beacon period in TU(1024us)
 		dtim		wireless DTIM period in beacon interval
 		preamble		wireless preamble(only effect on 802.11b rates)
 		wirelessisol ate		wireless isolate communication between clients
 		oprationmo de		wireless operation mode



				remoteap			wireless remote AP(s) (depends on oprationmode)
					p2p(+ap)		remote ap address for p2p mode
_	_	_			p2mp(+ap		remote ap address for
V	v	v)		p2mp mode
						1	1st remote ap address for p2mp mode
							2nd remote ap address for
						2	p2mp mode
						3	3rd remote ap address for
v	v	v				5	p2mp mode
	√	√				4	4th remote ap address for
v	v	v				Т	p2mp mode
						5	5th remote ap address for
·	•	v				-	p2mp mode
						6	6th remote ap address for
							p2mp mode
						7	7th remote ap address for
							p2mp mode
			~			8	8th remote ap address for
							p2mp mode
			acl				wireless access control
				mode			enable wireless access
							control (ACL)
				list			

		_			-11	(delete only) all local
		V			an	ACL address
					null	edit local ACL address
~			. ,.			list of associated wireless
V			association			clients
			wlanstats			wlan statistics
_	_		authenticati			wireless authentication
V	V		on			type
			encryption			wireless data encryption
			key			wireless wep key setting
				type		wireless wep key type
_	_			default		wireless wep default key
V	V			default		index
_	_	_		naganhraga		wireless wep passphrase
v	v	v		passpinase		key
				1		wireless wep key 1
				2		wireless wep key 2
				3		wireless wep key 3
				4		wireless wep key 4
			wpa			wireless WPA setting
						wireless pre-shared key
				psk		(PSK) for WPA-PSK
	~			roovthtim-		wireless WPA re-auth
V	V			reautintime		period (in seconds)
				keyupdate		enable wireless WPA

						global key update
						wireless WPA global key
				mode		update condition
						wireless WPA global key
				interval		update interval
	./				SAC	wireless WPA global key
v	v				see	update interval (in seconds)
	./				nkt	wireless WPA global key
v	v				ркі	update interval (in packets)
		SmartWDS				SmartWDS settings
			ID			Auto WDS ID
			remotes			Auto WDS remote AP list
			status			Auto WDS status
	./	spaceinmete				wireless space in meter
v	v	r				whereas space in meter
		maxrssi				wireless max rssi
	./	downflowwi				wireless down flow width
v	v	dth				whereas down now width
		RFlinewaste				RF line waste
		localplus				local plus
		remoteplus				remote plus
~	_	testremotem				remote test mag
V	v	ac				remote test mac



		linkrx		MIB_WLAN_LINK_RX
		linktx		MIB_WLAN_LINK_TX
		linktime		 MIB_WLAN_LINK_TIME
		linkpktsize		 MIB_WLAN_LINK_PKT_S IZE
		linkpktinter val		 MIB_WLAN_LINK_TEST_ INTERVAL
		linklocalrssi		 MIB_WLAN_LINK_LOCA L_RSSI
\checkmark		linkremoters si		 MIB_WLAN_LINK_REMO TE_RSSI
		linkaction		 MIB_WLAN_LINK_ACTIO N
		password		system password
		reboot		reboot system
		exit		logout from CLI
		quit		quit CLI